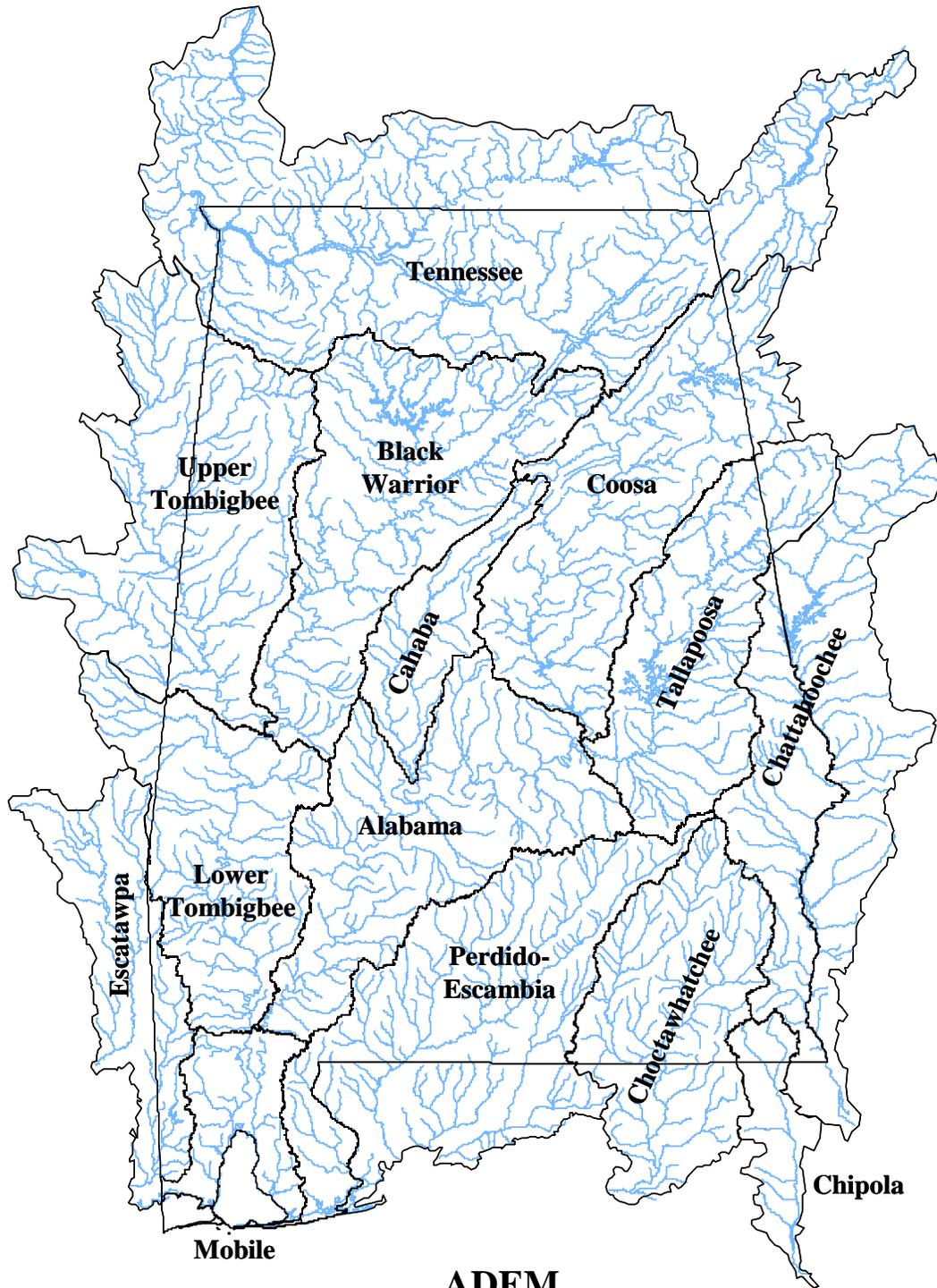


**Alabama's 2004
Integrated Water Quality Monitoring & Assessment Report**



ADEM
Alabama Department of Environmental Management
PO Box 301463 Montgomery, Alabama 36130-1463
www.adem.state.al.us

**The Great Seal of Alabama
“The River State”**



Prepared by:

Joseph Roy

A special thanks to all the contributors!

Joel Alther	Kathy Keller
Cammie Ashmore	Reggie Knox
Norman Blakey	Michael Len
Scott Brown	Fred Leslie
Adreian Burkette	Joe Lister
John Carlton	Stacey Little
Kirk Chandler	Missy Middlebrooks
Roy Collins	Laura Ming
Jeff Davies	John Pate
Lee Davis	Carla Phillips
Tom DeLoach	Enid Probst
Nyla Fussell	Mike Reif
Brian Haigler	Charlie Reynolds
Johnathon Hall	Whit Sagle
Dennis Harrison	Stan Shirley
Joie Horn	Lynn Sisk
Lisa Huff	Marla Smith
Patricia Hurley	David Thompson
Chris Johnson	

Table of Contents

Executive Summary	ix
List of Acronyms.....	vii
List of Figures and Tables	iii
Part 1 Water Quality Standards	
1.1 Water Quality Standards Program	1
1.2 Water Quality Rule Changes	1
1.3 Numeric Water Quality Criteria Development for Nutrients	2
1.4 Implementation of Alabama’s Antidegradation Policy	3
1.5 Other Water Quality Rule Changes	5
1.6 Proposed Water Quality Rule Changes	6
1.7 Surface Water Use Classification Maps	6
Part 2 Rivers and Streams	
2.1 Monitoring Programs	15
2.2 ALAMAP Program.....	16
2.3 Ecoregions	18
2.4 Alabama’s §303(d) Listed Waters	20
2.5 Upland Trend Stations	26
Part 3 Lakes	
3.1 Reservoir Water Quality Program	31
3.2 Trophic Status.....	32
3.3 Control Methods	34
3.4 Restoration Efforts.....	34
3.5 Impaired Lakes	34
3.6 Toxic Effects on Lakes	38
3.7 Acid Effects on Lakes.....	38
3.8 Trends	38
Part 4 Wetlands	
4.1 Alabama Coastal Counties Wetland Management Plan	49
4.2 Baldwin County Wetlands Statistics.....	62
4.3 Alabama Wetlands Program	63
Part 5 Ground Water Assessment	
5.1 Overview of State Ground Water Protection Programs.....	91
5.2 Coordination of State Ground Water Programs.....	91
5.3 Significant State Ground Water Program Developments	91
5.4 Summary of Ground Water Contamination Sources	92
5.5 Summary of Groundwater Quality	95
Part 6 Coastal Waters	
6.1 Alabama Coastal Nonpoint Pollution Control Program (ACNPCP)	105
6.2 Surface Water Monitoring Program	107
6.3 Coastal Assessment	111

Table of Contents

Part 7 Watershed Projects

7.1	The Watershed Protection Approach.....	117
7.2	Watershed Protection Highlights.....	117
7.3	The Alabama Clean Water Partnership.....	119
7.4	Additional Watershed Protection Partnerships.....	121
7.5	Watershed Dams at Risk.....	122
7.6	Watershed Based Plans.....	123

Part 8 Nonpoint Source Management

8.1	The Nonpoint Source Management Program.....	125
8.2	Alabama Water Watch Program/Association.....	132

Part 9 Public Health

9.1	Fish Tissue Monitoring Program.....	133
9.2	Fish Kills 2002-2003.....	138
9.3	Shellfish Harvesting Areas.....	139
9.4	Public Water Supply/Drinking Water.....	144
9.5	Source Water Assessment Program.....	148
9.6	Wellhead Protection Program.....	149
9.7	Coastal Beach Monitoring.....	150

Part 10 Concerns and Recommendations..... 157

Appendix A - ASSESS.....	A-1
Appendix B - Alabama's Water Quality Assessment Methodology.....	B-1
Appendix C - Alabama's Water Quality Categorization Methodology.....	C-1
Appendix D - Categorization of Alabama's Waters.....	D-1
Appendix E - 303(d) Fact Sheet.....	E-1
Appendix F - 303d List].....	F-1

List of Figures and Tables

Executive Summary

Table ES-1 Atlas	xi
Table ES-2 ADEM Water Monitoring Activities	xii

Part 1 Water Quality Standards

Table 1-1 Surface Water Use Classifications and Designations	1
Table 1-2 Nutrient Criteria Implementation Schedule for Alabama Reservoirs	3
Figure 1-1 Implementation Schedule for Alabama's Lakes and Reservoirs	4
Figure 1-2 Little River and Tributaries.....	7
Table 1-3 Little River and Tributaries.....	8
Figure 1-3 Sipsey Fork and Tributaries	9
Table 1-4 Sipsey Fork and Tributaries	10
Figure 1-4 Cahaba River and Tributaries	11
Table 1-5 Cahaba River and Tributaries	11
Figure 1-5 Hatchet Creek and Tributaries	12
Table 1-6 Hatchet Creek and Tributaries	12
Figure 1-6 Tensaw River, Weeks Bay and Tributaries.....	13
Table 1-7a. Tensaw River, and Tributaries	13
Table 1-7b. Weeks Bay and Tributaries.....	13

Part 2 Rivers and Streams

Table 2-1 State Agencies Involved with Water Quality/Quantity/Natural Resources	15
Table 2-2 Alamap Summary	16
Figure 2-1 1997-2001 Upland Alabama Wadable Stream Random Sampling Stations	19
Figure 2-2 Ecoregional Reference Stations	21
Table 2-3 Alabama Ecoregion Reference Stations.....	22
Table 2-4 TMDL Development Progress	23
Table 2-5 FY 2002 Water bodies that had monthly sampling	23
Table 2-6 FY 2003 Water bodies that had monthly sampling	24
Table 2-7 TMDL Program Activities Scheduled for FY 2004.....	25
Table 2-8 TMDL Developmental Schedule for 2004.....	25
Table 2-9 Parameters Sampled at all Stations	26
Table 2-10 Parameters Sampled at Selected Stations.....	26
Figure 2-3 Alabama's Active Upland Trend Stations (Ambient Monitoring).....	27
Table 2-11 Draft 2004 §303(d) Cause Mileages Rivers and Streams	28
Table 2-12 Draft 2004 §303(d) Source Mileages Rivers and Streams.....	28
Figure 2-4 Causes – Percent of 2004 Draft §303(d) River and Stream Miles	29
Figure 2-5 Source – Percent of 2004 Draft §303(d) River and Stream Miles	30

Part 3 Lakes

Table 3-1 Overall Use Support Summary for Lakes and Reservoirs (acres)	32
Figure 3-1 Publicly Accessible Reservoirs of Alabama	33
Table 3-2 Trophic Status of Significant Publicly Owned Lakes	34
Figure 3-2 Lake and Reservoir Tropic State Index Values	35
Table 3-3 List of Clean Lakes Program Projects	36
Table 3-5 Total Sizes of Waters Not Fully Supporting for Lakes (By Causes)	36
Table 3-6 Total Sizes of Waters Not Fully Supporting Uses for Lakes (By Sources)	36
Table 3-4 Reservoir and Lake Trophic Status.....	37

List of Figures and Tables

Table 3-7	Lakes Affected By Acidity	38
Table 3-8	Sources of High Acidity in Lakes and Reservoirs	39
Table 3-9	Status of Trends for Lakes and Reservoirs	39
Table 3-10	State Owned and Operated Public Fishing Lakes.....	39
Table 3-11	Total Reservoir Size Affected by Toxicants	39
Figure 3-3	Woodruff Reservoir	40
Figure 3-4	Dannelly Reservoir	40
Figure 3-5	Clairborne Reservoir.....	40
Figure 3-6	Purdy Reservoir	41
Figure 3-7	West Point Reservoir	41
Figure 3-8	Harding Reservoir.....	41
Figure 3-9	Walter F. Reservoir.....	42
Figure 3-10	Gantt Reservoir	42
Figure 3-11	Point A Reservoir.....	42
Figure 3-12	Frank Jackson Lake	43
Figure 3-13	Weiss Reservoir	43
Figure 3-14	Neely Henry Reservoir	43
Figure 3-15	Logan Martin Reservoir.....	44
Figure 3-16	Lay Reservoir.....	44
Figure 3-17	Mitchell Reservoir	44
Figure 3-18	Jordan Reservoir	45
Figure 3-19	Big Creek Reservoir.....	45
Figure 3-20	Harris Reservoir.....	45
Figure 3-21	Martin Reservoir	46
Figure 3-22	Yates & Thurlow Reservoirs	46
Figure 3-23	Tombigbee Reservoirs	46
Figure 3-24	Inland Reservoir.....	47
Figure 3-25	Smith Reservoir	47
Figure 3-26	Tuscaloosa Reservoir	47
Figure 3-27	Warrior Reservoir	48
Figure 3-28	Yellow River Reservoir	48

Part 4 Wetlands

Table 4-1	Project Schedule (Fall 2001 - Fall 2003).....	57
Figure 4-1	Coastal Wetlands Restoration Grant Management Areas.....	60
Figure 4-2	Baldwin County Wetland Identification Project.....	61
Figure 4-3	Baldwin County Wetland Types.....	62
Table 4-2	Size specific scoring criteria for the Alabama Wetland Project	66
Table 4-3	Wetland type and rarity criteria for the Alabama Wetlands Project	67
Table 4-4	Location criteria relative to population centers	68
Table 4-5	Location criteria relative to other public use areas	69
Table 4-6	Surrounding land use criteria	69
Table 4-7	Surrounding land cover criteria for the Alabama Wetlands Program.....	70
Table 4-8	Hydric soils criteria for the Alabama Wetlands Program	71
Table 4-9	Hydrologic source criteria for the Alabama Wetlands Program.....	71
Table 4-10	Plat criteria for the Alabama Wetlands Program	72

List of Figures and Tables

Figure 4-4	Alabama River Watershed Potential Wetland Restoration Sites	73
Table 4-11	Alabama River Watershed Potential wetland restoration Sites.....	74
Figure 4-5	Lower Black Warrior River Watershed Potential Wetland Restoration sites	77
Table 4-12	Lower Black Warrior River Potential Wetland Restoration Sites	78
Figure 4-6	Sipsey River Watershed Potential Wetland Restoration Sites	80
Table 4-13	Sipsey River Watershed Potential Wetland Restoration Sites	81
Figure 4-7	Baldwin and Mobile Counties Potential Wetland Restoration Sites.....	83
Table 4-14	Mobile County Potential Wetland Restoration Sites	84
Table 4-15	Statewide Wetlands Landuse Data Estimates by River Basin	87
Part 5 Ground Water Assessment		
Table 5-1	Summary of State Ground Water Protection Programs	93
Figure 5-1	Potentiometric surfaces of the major Montgomery/Prattville aquifers	97
Figure 5-2	Aquifers in Alabama	98
Figure 5-3	Alabama Ground Water Provinces	99
Table 5-2	Ground Water Contamination Summary	100
Table 5-3a	Aquifer Monitoring Data	101
Table 5-3b	Aquifer Monitoring Data	102
Table 5-4	Estimated Groundwater Withdrawals for Selected Counties 2001-2002	103
Part 6 Coastal Waters		
Figure 6-1	Alabama's §6217 Coastal Zone Management Area	106
Table 6-1	Active Coastal Trend Stations	109
Figure 6-2	Active Coastal Trend Stations	110
Table 6-2	Coastal Alamp Conventional Parameter Sampling Summaries	113
Figure 6-3	Alabama's Coastal Alamp Program Stations	114
Part 7 Watershed Projects		
Table 7-1	Alabama Watershed Projects Since 1976	118
Figure 7-1	Alabama Watershed Project 1976-2002	120
Table 7-2	Major Benefits of the Small Watershed Protection Program.....	123
Table 7-3	Dam Repairs Needed in Alabama.....	123
Part 8 Nonpoint Source Management		
Table 8-1	Section 319(h) Nonpoint Source Grant Allocations	125
Figure 8-1	Alabama's Nonpoint Screening Assessment Watersheds.....	128
Table 8-2	Rotational River Basin Approach Strategy	131
Table 8-3	Nonpoint Source River Basin Assessment Groupings.....	131
Table 8-4	5-Year Rotational NPS River Basin Assessment Status	132
Part 9 Public Health		
Figure 9-1	Fish Tissue Sampling Stations	135
Figure 9-2	2004 Fish Consumption Advisories.....	136
Table 9-1	2004 Fish Consumption Advisories.....	137
Table 9-2	Fish Kills During 2002 and 2003.....	138
Figure 9-3	Oyster/Shellfish Harvesting Areas.....	139
Table 9-3	Shellfish Harvesting Area Closures/Reopening.....	140
Table 9-4	Public Notices of Sewage Release-for Baldwin and Mobile Counties	141
Table 9-5	Surface Source Public Water Systems with Compliance Violations	144
Table 9-6	Public Water Supply Elemental Contaminants	145

List of Figures and Tables

Table 9-7	Public Water Supply Radiological Contaminants.....	145
Table 9-8	Public Water Supply Synthetic Organic Chemicals (non-volatile/SOVs).....	146
Table 9-9	Public Water Supply Disinfection Byproducts	147
Table 9-10	Public Water Supply Volatile Synthetic Organic Chemicals (VOCs).....	147
Table 9-11	Total Number of SWAP Water Systems that needed Assessments.....	148
Table 9-12	Number of SWAP Water Systems Abandoned or Completed Requirements.....	148
Figure 9-4	Coastal Beach Monitoring	151
Figure 9-5	Alabama Point.....	152
Figure 9-6	Bay Front Park.....	152
Figure 9-7	Bear Point Civic Association	152
Figure 9-8	Bon Secour NWR	152
Figure 9-9	Boggy Point	152
Figure 9-10	Camp Beckwith.....	152
Figure 9-11	Camp Dixie	153
Figure 9-12	Cotton Bayou	153
Figure 9-13	Dauphin Island Public Beach.....	153
Figure 9-14	Gulf Shores Public Beach	153
Figure 9-15	Dauphin Is.East End	153
Figure 9-16	Dog River at Alba Club	153
Figure 9-17	Fairhope Public Beach	154
Figure 9-18	Fowl River at HW 193.....	154
Figure 9-19	Kee Ave	154
Figure 9-20	Fort Morgan Public Beach.....	154
Figure 9-21	Gulf State Park Pavilion	154
Figure 9-22	KOA Camp Ground.....	154
Figure 9-23	Little Lagoon Pass	155
Figure 9-24	May Day Park	155
Figure 9-25	Orange Street Pier/Beach.....	155
Figure 9-26	Mary Ann Nelson Beach.....	155
Figure 9-27	Orange Beach Waterfront Park.....	155
Figure 9-28	Pirate's Cove	155
Figure 9-29	Volanta Ave	156

Part 10 Concerns and Recommendations

Table 10-1	State Agencies Involved with Water Quality/Quantity/Natural Resources	159
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List of Acronyms

A&I	Agriculture and Industry water supply use classification
AAES	Alabama Agricultural Experiment Station
ACES	Alabama Cooperative Extension Service
ACT/ACF	Alabama-Coosa-Tallapoosa/Apalachicola-Chattahoochee-Flint River Basins study
ACWI	Alabama Coastal Waters Initiative
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADE	Alabama Department of Education
ADEM	Alabama Department of Environmental Management
ADPH	Alabama Department of Public Health
AEEI	Alabama Environmental Education Initiative
AEMA	Alabama Emergency Management Agency
AEMC	Alabama Environmental Management Commission
AFC	Alabama Forestry Commission
AGPT	Algal Growth Potential Test
ALUS	Aquatic Life Use Assessment
ANHP	Alabama Natural Heritage Program
ASCS	Agricultural Stabilization & Conservation Service
ASMC	Alabama Surface Mining Commission
ASWCC	Alabama Soil and Water Conservation Committee
AWPCA	Alabama Water Pollution Control Act
B/H	Biological/Habitat data
BMP	Best Management Practices
CBEP	Community-Based Environmental Protection
CERS	Center for Environmental Research and Service at Troy State University
CPYRWMA	Choctawhatchee-Pea and Yellow Rivers Watershed Management Authority
CLP	Clean Lakes Program
CNPCP	Coastal Nonpoint Pollution Control Program
CSO	Combined Sewer Overflow
CWA	Clean Water Act
CWP	Clean Water Partnership
DA	Drainage Area
DIZ	Discharge Information Zone for NPDES Coastal Permits
DO	Dissolved Oxygen
EMAP	Environmental Monitoring Assessment Program
EPA	U.S. Environmental Protection Agency
ERL-A	EPA's Environmental Research Laboratory at Athens, GA
ERL-C	EPA's Environmental Research Laboratory at Corvallis, OR
F&W	Fish and Wildlife use classification
FDA	U.S. Food and Drug Administration
FDER	Florida Department of Environmental Regulation
GIS	Geographical Information System
GPS	Global Positioning System
GDNR	Georgia Department of Natural Resources
GSA	Geological Survey of Alabama
IO	Industrial Operations
MBP	Multihabitat Bioassessment Protocol
MCL	Maximum Contaminant Level

List of Acronyms

MESC	Marine Environmental Sciences Consortium of Dauphin Island, AL
MGD	Million Gallons per Day
MOPC	Mississippi Office of Pollution Control
MOU	Memorandum of Understanding
MPSs	Hester-Dendy Multiplate Samplers
MRD	Marine Resources Division of the ADCNR
NEP	National Estuary Program
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPL	Superfund National Priority Listed Sites
NRCS	Natural Resource Conservation Service of the USDA
NWI	National Wetland Inventory of the USFWS
OAW	Outstanding Alabama Water use classification
ONRW	Outstanding National Resource Water designation
P/C	Physical/Chemical data
PACE	Pollution Abatement Costs and Expenditures
PCB	Polychlorinated Biphenyls
PWS	Public Water Supply use classification
RBP	Rapid Bioassessment Protocol
RC&D	Resource Conservation and Development Councils of the USDA
RM	River Mile
RWC	Receiving Water Concentration
S	Swimming and Other Whole Body Water contact Sports use classification
SH	Shellfish Harvesting use classification
SM/LG	Sand Mountain/Lake Guntersville watershed study
SMZ	Streamside Management Zone
SOC	Synthetic Organic Compound
SOD/NR	Sediment Oxygen Demand/Nutrient Release studies
SOP	Standard Operating Procedures
SRF	State Revolving Fund of Alabama
SSO	Sanitary Sewer Overflow
STP	Sewage Treatment Plant
SWCD	Soil and Water Conservation District
SWCP	State Wetland Conservation Plan
TMDL	Total Maximum Daily Loads
TOT	Time-of-travel studies
TRE	Toxicity Reduction Evaluation
TSI	Trophic State Index
UAA	Use Attainability Analysis
USACE	U.S. Army Corps of Engineers
USCG	U.S. Coast Guard
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service of the Department of the Interior
USGS	U.S. Geological Survey
WCAMI	Wetlands Conservation and Management Initiative
WLA	Wasteload Allocation
WWTP	Wastewater Treatment Plant
VOC	Volatile Organic Compound

Executive Summary

Alabama's 2004 Integrated Water Quality Assessment and Monitoring Report contains some significant changes from previous §305(b) reports. This document combines information about Alabama's surface and ground water resource management programs with a comprehensive listing of State waters consistent with EPA's 2003 guidance. The new guidance requests that states report on the condition of all surface waters by categorizing rivers, streams, lakes, estuaries, and coastal waters according to their designated uses and the degree to which water quality is supporting those uses. State waters have been segmented consistent with the National Hydrography Dataset (NHD) and assigned a unique assessment unit identification number (AU) based on the recently completed twelve-digit hydrologic units (watersheds) for Alabama. Waters have been placed in one of five major categories as follows:

1. Waters attaining all designated uses
2. Waters which may be attaining some designated uses but for which there is insufficient data to make a use support decision for all uses
3. Waters for which there is no data or information on which to base a use support determination
4. Waters for which one or more designated uses are impaired but for which a Total Maximum Daily Load (TMDL) is not required
 - a. Waters for which all TMDLs necessary to ensure compliance with water quality standards have been approved
 - b. Waters for which other pollution control mechanisms are expected to result in attainment of water quality standards within a reasonable period of time
 - c. Waters in which impairment is not caused by a pollutant but is due to man-induced habitat alterations or changes in flow
5. Waters which are impaired for one or more designated uses and require the development of one or more TMDLs (i.e. 303(d) List).

Categorizing Alabama's surface waters represents a significant effort. With approximately 47,072 miles of perennial rivers and streams and approximately 30,170 miles of intermittent streams, this process will be ongoing and will require substantial resources and time. While the State's monitoring efforts have increased dramatically during the last 10 to 15 years, much of that effort has been focused on impaired waters or waters with special concerns, such as reservoirs or coastal waters. The five part list included in the appendix of this report represents an initial categorization based on information currently available. As new information becomes available the list will be updated and placed on the Department's web site to give the public the most complete and accurate picture of the water quality status of Alabama's surface water resources.

Alabama has a population in excess of 4,447,100 (2000 Census), a 10.1% increase in population from the 1990 census, and covers a surface area of 51,609 square miles. The cities of Birmingham, Huntsville, Montgomery, Mobile, and their surrounding suburbs contain approximately half of Alabama's population. The state is comprised of sixty-seven (67) counties. A large percentage of Alabama's industries are related to forestry, agriculture, and mining. The State is divided into fourteen (14) major river basins containing 77,272 miles of rivers and streams. Alabama has ponds, lakes, and reservoirs in excess of 490,472 acres. Freshwater wetlands occupy an estimated 3,600,000 acres. Alabama's coastal wetlands are estimated at 27,600 acres (National Wetland Inventory estimates). Coastal Alabama also contains an estimated 610 square miles of estuaries and a coastal shoreline that is 337 miles long (includes Mobile Bay and island shorelines). Table ES-1 shows atlas of Alabama Water Statistics.

Assessing the State's abundant surface water resources requires a significant effort and significant resources. During FY 02 the Alabama Department of Environmental Management (ADEM) sampled an average of 483 sites as a part of its 303(d), ambient trend monitoring, probabilistic monitoring, and reservoir monitoring programs. For FY 03 the average number of sites sampled was 509 sites. Table ES-2 shows the sampling activity by quarter for FY 02 and FY 03.

Alabama's surface water is of generally high quality. An indication of full support of rivers and streams can be determined by analyzing Alabama's Final 2004 §303(d) List. The total mileage for rivers and streams not supporting designated uses is 1,815.3 miles. This total is 2.3% of the 77,272 total rivers and streams miles. This is a good indication that Alabama has a high percentage of full use support for rivers and streams. Alabama's publicly accessible lakes and reservoirs have a 82.6% full support status. Much of the non support acreage is related to historic as well as recent PCB contamination and eutrophic conditions in the Coosa River Basin reservoirs. Naturally higher nutrients in the soils of the Coosa River Basin, to a large extent, dictate its reservoirs' eutrophic conditions. In an effort to manage eutrophic conditions more directly, the Department has developed nutrient criteria for 13 reservoirs (Weiss Lake, Lake Harris, West Point Lake, Walter F. George Lake, Lake Martin, Yates Lake, Thurlow Lake, Lake Guntersville, Wheeler Lake, Wilson Lake, Pickwick Lake, Little Bear Creek Lake, and Cedar Creek Lake). Alabama's estuaries enjoy overall good health considering the following two facts. The majority of estuaries are affected by a single pollutant category which is pathogens. The random coastal sampling performed over the last 11 years (1993-2003) indicates generally full support of dissolved oxygen, temperature and pH criteria.

Alabama has initiated a Wetlands Identification Program in coastal Alabama (Baldwin County) and has completed an extensive study of the possible wetland restoration locations for 5 areas of the State (Alabama River Watershed, Lower Black Warrior River Watershed, Sipsey River Watershed, and Baldwin and Mobile Counties). Statewide wetland estimates derived from EPA landuse data are also included in the wetlands section. ADEM and the US Army Corps of Engineers continue to partner in the management and mitigation of impacts to wetlands in the water quality certification processes of Section 401 and 404 of the Clean Water Act. Alabama has one of the best preserved major river deltas in the U.S., that being the Mobile-Tensaw River Delta. To preserve such a valuable national resource the Alabama Department of Natural Resources and Conservation - State Lands Division has purchased a very large percentage of the Delta through the US Department of Interior's North American Wetlands Conservation Act (NAWCA) funding. The coastal section contains a map of wetland tracts purchased through NAWCA. Wetlands have also been purchased at Weeks Bay, a National Estuarine Reserve.

Alabama's ground water continues to be managed effectively through efforts under the Underground Storage Tank (UST) Program, the Resource Conservation and Recovery Act (RCRA) and Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), and the Underground Injection Control (UIC) Program, as well as the Wellhead Protection Program (WHPP). The lack of chronic detections of pollutants in public water supply groundwater sources is a good indication of Alabama's high ground water quality and effective management of the resource.

Approximately 850,000,000 gallons of drinking water are taken from ground and surface sources each day, provided with treatment, and made available to approximately four million citizens in Alabama. Six hundred and seven (607) community systems, seventy-two (72) transient non-community systems and thirty-two (32) non-transient non-community systems are permitted by the ADEM. Approximately sixty-five (65) percent of the water used is obtained from surface sources such as lakes, rivers, and streams and provided with full treatment to include coagulation, sedimentation, filtration, and disinfection. One hundred (100) percent of these systems meet turbidity requirements, ninety-seven (97) percent meet trihalomethane standards,

one hundred (100) percent meet haloacetic acid standards and one hundred (100) percent meet inorganic and radiological drinking water standards.

There is much new work to be done regarding water quality management with the §303(d) process and implementation of Total Maximum Daily Loads in Alabama and the recent management efforts of the Source Water Protection Program and the Wellhead Protection Program. Management efforts continue in the UST, RCRA, CERCLA, and UIC Programs and through National Pollutant Discharge Elimination System (NPDES) permitting. Continuing watershed coordination efforts in Alabama are vital to coordinate limited resources for effective surface and ground water management. Implementation of controls for nonpoint source runoff is an integral component of watershed management in Alabama.

**Table ES-1
Atlas**

Topics	Value
State population	4,447,100
State surface area	51,609
Number of river basins	14
Total miles of rivers and streams	77,274
Miles of perennial rivers/streams	47,072
Miles of intermittent (nonperennial) streams	30,170
Miles of ditches and canals	32
Border miles of shared rivers/streams	210
Number of lakes/reservoirs/ponds	7,694
Number of significant publicly-owned lakes/reservoirs/ponds	43
Acres of lakes/reservoirs/ponds	490,472
Acres of significant publicly-owned lakes/reservoirs/ponds	380,939
Square miles of estuaries/harbors/ponds	610
Miles of ocean coast (includes bays and inlets)	337
Acres of freshwater wetlands*	3,600,000
Acres of tidal wetlands*	27,600

*historic National Wetland Inventory estimates

**Table ES-2
ADEM Surface Water Monitoring Activities**

Activity	FY 02				FY 03			
	1 st Qtr.	2 nd Qtr.	3 rd Qtr.	4 th Qtr.	1 st Qtr.	2 nd Qtr.	3 rd Qtr.	4 th Qtr.
303d Stations	198	594	282	160	117	138	505	484
Trend Stations	57	48	86	97	90	57	91	91
Upland ALAMAP	0	0	0	89	0	0	0	153
Coastal ALAMAP	55	50	50	0	43	28	30	30
Reservoir Stations	0	0	83	83	0	0	90	90
Total Sites Sampled	310	692	501	429	250	223	716	848

Part 1 Water Quality Standards

1.1 Water Quality Standards Program

The Water Quality Standards Program at the Alabama Department of Environmental Management (ADEM) has been very active since the last 305(b) Report was submitted in April of 2002. ADEM's Water Quality Standards (WQS) Program, consisting of the Water Quality Criteria (Rule 335-6-10) and Water Use Classifications for Interstate and Intrastate Waters (Rule 335-6-11) has been the subject of numerous changes over the last two last years. The subject regulations, which govern our water quality program have been amended four times within a 20-month period and are once again undergoing public review as a result of additional proposed changes. Use classification changes for stream segments, implementation procedures for the Department's antidegradation policy, and nutrient criteria development for lakes have been the primary focus of water quality standards development within ADEM's WQS Program over the past two years. The sections that follow provide a brief summary of the subject rules. The Department believes the recent changes to the WQS Program is a direct reflection of our ongoing commitment to restore, maintain, and protect the physical, chemical, and biological integrity of Alabama's waters. Table 1-1 shows Surface Water Classifications and Designations.

**Table 1-1
Surface Water Classifications and Designations**

Use Classifications	
Outstanding Alabama Water	OAW
Public Water Supply	PWS
Swimming and Other Whole Body Water Contact Sports	S
Shellfish Harvesting	SH
Fish and Wildlife	F&W
Limited Warmwater Fishery	LWF
Agricultural and Industrial Water Supply	A&I
Special Designations	
Outstanding National Resource Water	ONRW

1.2 Water Quality Rule Changes

On April 9, 2002, the State of Alabama adopted regulations that became effective May 24, 2002. Highlights of the rule changes are listed below. Several of the changes are in response to comments received during the Department's last triennial review of water quality standards in January 2003. A more detailed discussion for a number of the following changes is provided thereafter.

- Establishment of lake-specific, nutrient criteria (expressed as chlorophyll a targets) for 9 additional reservoirs within Alabama, including Martin, Yates, Thurlow, Pickwick, Wilson, Wheeler, Guntersville, Cedar Creek, and Little Bear Creek Lakes. (*See Section 1.1*)
- Addition of the Swimming and Other Whole Body Water Contact Sports use classification to the two remaining segments of Lay Lake on the Coosa River in Shelby, St. Clair and Talladega counties.

- Upgrade from the Agricultural and Industrial Water Supply use classification to the Fish and Wildlife classification for segments of the following water bodies: Pepperell Branch (from Sougahatchee Creek to its source) in Lee County; Shirtee Creek (from Tallassesshatchee Creek to its source) in Talladega County; and Valley Creek (from the head of backwater above Bankhead Lock and Dam to Blue Creek) in Jefferson County.
- Upgrade from the Agricultural and Industrial Water Supply use classification to the Limited Warmwater Fishery classification for segments of the following water bodies: Valley Creek (from Blue Creek to its source) and Village Creek (from Bayview Lake Dam to its source) in Jefferson County.

1.3 Numeric Water Quality Criteria Development for Nutrients

The development of nutrient criteria has continued to be a top priority within Alabama's water quality program. As of May 24, 2002, ADEM adopted water quality regulations that established numeric, lake-specific criteria for nine reservoirs within Alabama. Specifically, chlorophyll a criteria were adopted for Lake Martin, Yates Lake, and Thurlow Lake in the Tallapoosa River Basin and Gunterville Lake, Wheeler Lake, Wilson Lake, Pickwick Lake, Little Bear Creek Lake, and Cedar Creek Lake in the Tennessee River Basin. The chlorophyll a criteria is established on a growing-season basis, which is defined as April through October for all reservoirs with the exception of the reservoirs in the Tennessee River basin, which have a defined growing season of April through September. The chlorophyll a criteria is expressed as the mean of samples (taken as photic-zone composites) collected monthly during the defined growing season. The criteria is established at specific locations within the reservoir, such as dam forebay or mid-reservoir, and is not applied as lake-wide averages or as levels that shall be maintained at all locations within the lake at any given time.

The Department is well underway in developing plans for future nutrient criteria development for Alabama's lakes and reservoirs. Because criteria development is largely dependent upon available data, sampling plans have been prepared and efforts are underway to gather the necessary data to establish numeric nutrient criteria for the remaining lakes and reservoirs throughout Alabama. Located within 14 major river basins and 25 different sub-ecoregions, Alabama's reservoirs represent some of the most biologically diverse aquatic ecosystems in the United States. Because of this large diversity in geographic and climate conditions from one region to another, as well as the significant variability in dam operations between reservoirs, the Department developed nutrient criteria on a lake-specific basis rather than on a more aggregate basis such as an ecoregional approach. The lake-specific approach captures the large variability inherent in man-made reservoirs, where chlorophyll a concentrations are typically a strong function of such factors as reservoir depth, reservoir retention time, and scheduling of power generation.

Table 1-2 provides the implementation schedule for numeric nutrient criteria for the 41 public lakes and reservoirs located throughout Alabama. Figure 1-1 provides a pictorial representation of the 41 lakes and the dates in which nutrient criteria is scheduled for adoption.

For the remaining types of water bodies, such as rivers and streams, estuarine and coastal waters, and wetlands the Department is in the process of developing strategies, goals, technical advisory teams, sampling plans and implementation plans that address nutrient issues for each of these types of waters. Nutrient criteria development for Alabama's rivers and streams has already begun via the formation of a nutrient workgroup comprising technical experts throughout the region. As for Wetlands and Coastal/Marine Waters the Department is in the process of reviewing EPA Headquarters technical guidance manuals and 304(a) ambient water quality criteria for these water body types. Also, the Department is participating in a nutrient pilot study directed by EPA's Gulf of Mexico Program office. This study is a scientific assessment of nutrient

concentrations, loads, and biological responses in the northern Gulf of Mexico and will help provide the Department with the information and data necessary to develop nutrient criteria for the Mobile Bay and other Alabama coastal waters. In addition, the Department has and will continue to actively participate as a member of the EPA Region 4-Regional Technical Advisory Group (RTAG) in order to ensure Alabama’s nutrient program is technically sound via peer review from experts throughout the Southeast.

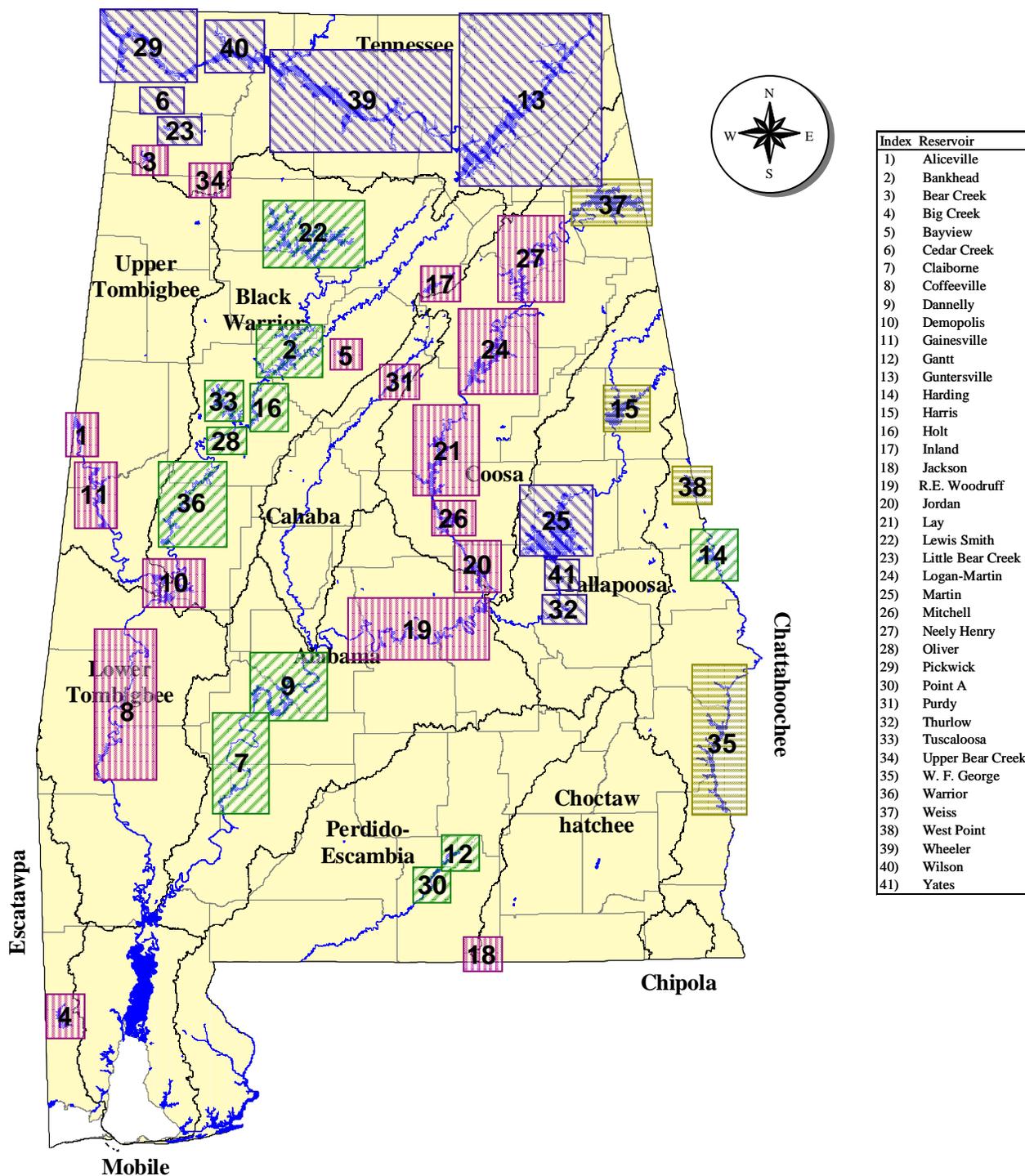
**Table 1-2
Nutrient Criteria Implementation Schedule for Alabama Reservoirs**

Year	Number of Reservoirs	Major Basin(s)	Name of Reservoirs
2001	4	Chattahoochee, Coosa, Tallapoosa	West Point, W.F. George, Weiss, R.L. Harris
2002	9	Tallapoosa, Tennessee	Martin, Yates, Thurlow, Guntersville, Wheeler, Wilson, Pickwick, Little Bear, Cedar
2004	11	Alabama Black Warrior Chattahoochee Perdido-Escambia	Claiborne, Dannelly Bankhead, Holt, Lewis Smith, Oliver, Tuscaloosa, Warrior Harding Gantt, Point A
2005	17	Alabama Black Warrior Cahaba Coosa Escatawpa Perdido-Escambia Tennessee Lower Tombigbee Upper Tombigbee	Woodruff Bayview, Demopolis, Inland Purdy Jordon, Lay, Logan Martin, Mitchell, Neely Henry Big Creek Jackson Bear, Upper Bear Coffeeville Aliceville, Gainsville

1.4 Implementation of Alabama’s Antidegradation Policy

On June 25, 2002, the Alabama Environmental Management Commission adopted Rule 335-6-10-12, Implementation of the Antidegradation Policy. This rule codifies procedures for implementing the Department’s antidegradation policy (contained in Rule 335-6-10-.04) which was last amended in 1991 and approved that same year by the U.S. Environmental Protection Agency (EPA), Region 4. In response to a petition from the Legal Environmental Assistance Foundation (LEAF), in 1997 EPA requested that ADEM develop written procedures for implementing the state’s antidegradation policy. Final written implementation procedures were submitted to EPA in December 1998 and approved by EPA in August 1999. In November 1999, LEAF sued ADEM alleging that the Department’s use of the EPA-approved implementation procedures in the NPDES permitting process was improper because these procedures were, in act, “rules” that had not been adopted through the formal rulemaking process. The Montgomery Circuit Court found in favor of ADEM; a decision later affirmed by the Court of Civil Appeals.

Figure 1-1
Implementation Schedule for Alabama's Lakes and Reservoirs



Index	Reservoir
1)	Aliceville
2)	Bankhead
3)	Bear Creek
4)	Big Creek
5)	Bayview
6)	Cedar Creek
7)	Claiborne
8)	Coffeeville
9)	Dannelly
10)	Demopolis
11)	Gainesville
12)	Gantt
13)	Guntersville
14)	Harding
15)	Harris
16)	Holt
17)	Inland
18)	Jackson
19)	R.E. Woodruff
20)	Jordan
21)	Lay
22)	Lewis Smith
23)	Little Bear Creek
24)	Logan-Martin
25)	Martin
26)	Mitchell
27)	Neely Henry
28)	Oliver
29)	Pickwick
30)	Point A
31)	Purdy
32)	Thurlow
33)	Tuscaloosa
34)	Upper Bear Creek
35)	W. F. George
36)	Warrior
37)	Weiss
38)	West Point
39)	Wheeler
40)	Wilson
41)	Yates

Nutrient Criteria Implementation Year



LEAF then applied for a writ of certiorari to the Alabama Supreme Court, which was granted, and thereafter the Alabama Supreme Court concluded in a decision dated March 1, 2002, that the implementation procedures are “rules” within the context of the Alabama Administrative Procedure Act, reversed the judgment of the Court of Civil Appeals and remanded the case to the lower courts.

As a result of the Supreme Court decision, the Department ceased the review of permit applications for new or expanded discharges of treated wastewater to those waters affected by the Supreme Court decision until April 10, 2002, following adoption by the Alabama Environmental Management Commission of emergency rule (335-6-10-.12-.01ER) establishing implementation procedures. As adopted, the emergency rule procedures incorporate suggestions made by EPA and are essentially equivalent to the written procedures utilized by the Department prior to the Supreme Court decision. The provisions of the permanent rule adopted on June 25, 2002, are the same as those of the emergency rule and, as such, have been determined by EPA to be consistent with the federal requirement for implementation procedures included in EPA’s water quality standards regulation. The final implementation procedures rule became effective on August 1, 2002.

The Department’s antidegradation policy serves to conserve and protect the waters of Alabama and their beneficial uses and to prevent the deterioration of a water body even when its water quality surpasses the level necessary to meet the fishable and swimmable goals of the Clean Water Act. The antidegradation implementation policy addresses three categories of waters and beneficial uses:

- High-quality waters that constitute an outstanding national resource (Tier 3 waters);
- Waters where the quality exceeds levels necessary to support propagation of fish, shellfish, and wildlife as well as recreation in and on the water (Tier 2 waters); and
- Existing instream water uses and the level of water quality necessary to protect the existing uses (Tier 1 waters).
- The implementation policy codifies procedures for reviewing applications for new or expanded discharges to waters designated as Tier 2 waters. The two basic components of the implementation policy involve:
 - The Department’s determination, based on the applicant’s demonstration, that the proposed discharge is necessary for important economic or social development in the area in which the waters are located; and
 - An evaluation by the applicant of alternatives other than the proposed discharge to Tier 2 water.
- The antidegradation implementation procedures comply with federal law and provides ADEM with adequate guidelines for making environmentally and economically sound decisions, industries with the predictability needed to operate and the public with the assurances needed to guarantee clean water.

1.5 Other Water Quality Rule Changes

On February 25, 2003, the State of Alabama adopted a use classification upgrade for Fivemile Creek in Jefferson County effective on May 24, 2002. A segment of Fivemile Creek, extending from Newfound Creek to Ketona, was upgraded from the Agricultural and Industrial Water Supply use classification to the Fish and Wildlife use classification. This upgrade consolidated all three segments of Fivemile Creek into a single segment classified as Fish and Wildlife extending from Locust Fork to its source.

On December 23, 2003, the State of Alabama adopted the addition of a Public Water Supply (PWS) use classification for a segment of the Coosa River effective on January 28, 2004. A 10.8-mile segment of the Coosa River (from Broken Arrow Creek to Trout Creek) was designated the PWS classification to provide a source of drinking water for the Coosa Valley Water Supply Board. This segment of the Coosa River transects St. Clair, Calhoun, and Talladega Counties in the Logan Martin Lake area.

1.6 Proposed Water Quality Rule Changes

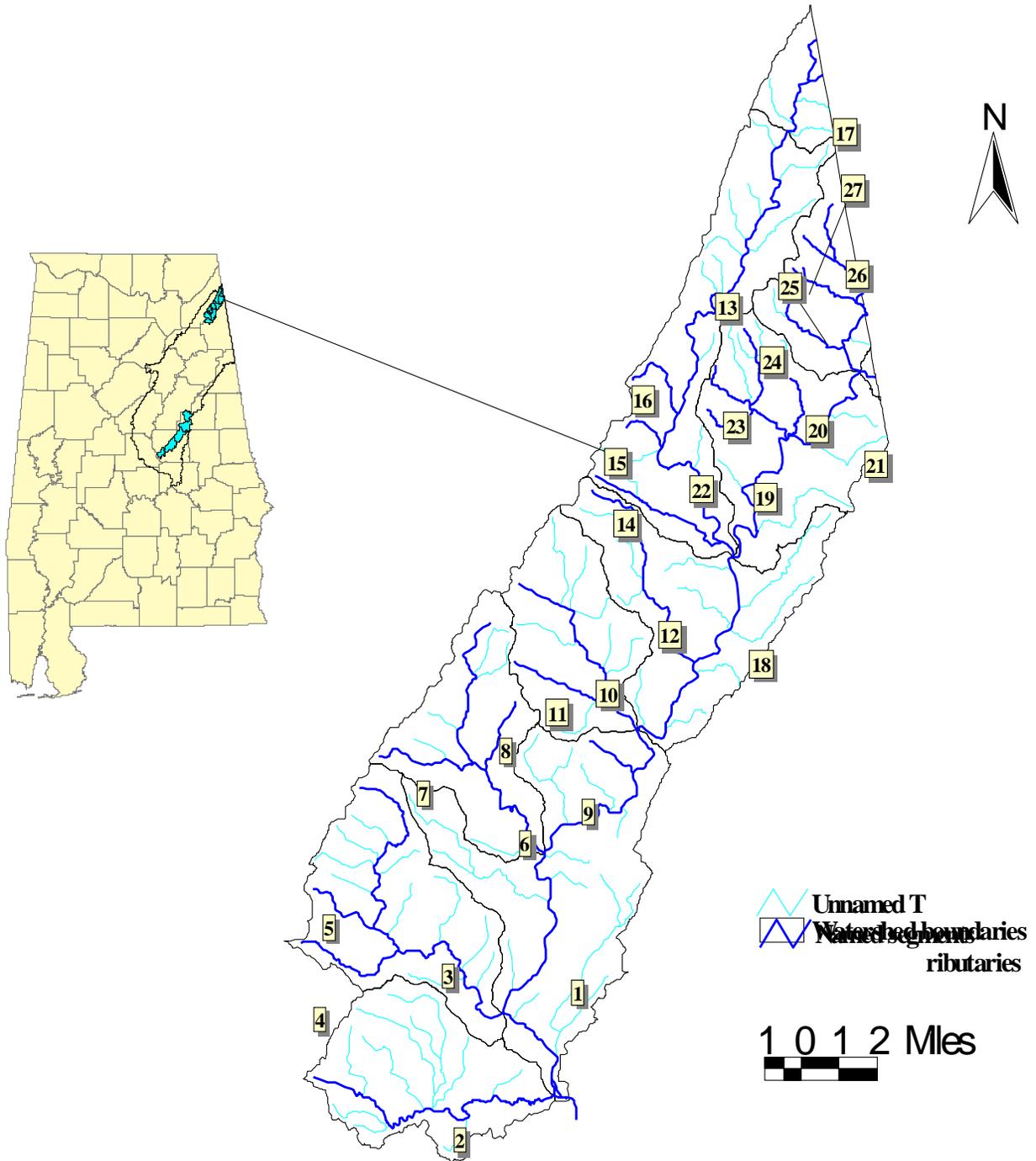
The following proposed water quality rule changes will go before the Alabama Environmental Management Commission on April 20, 2004 and, if adopted, will be effective on May 26, 2004. These proposed rule changes include:

- Establishment of lake-specific, nutrient criteria (expressed as chlorophyll a targets) for 11 additional reservoirs within Alabama, including Claiborne Lake, Dannelly Lake, Lake Harding, Point A Lake, Gantt Lake, Warrior Lake, Oliver Lake, Holt Lake, Lake Tuscaloosa, Bankhead Lake, and Lewis Smith Lake.
- Addition of the Public Water Supply use classification to Whitesides Mill Lake on the western border of the Talladega National Forest. This change is proposed to provide classification for this reservoir for use as a water supply source for the city of Anniston.
- Revision of Rule 335-6-10-.09 (Specific Water Quality Criteria) to replace fecal coliform with enterococci as the bacterial indicator to use when monitoring recreational coastal waters for bacterial contamination and the presence of potential human pathogens. This proposed rule revision meets the requirements mandated by the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act. In marine water studies conducted by EPA, it was determined that enterococcus was the most effective bacterial indicator to use as the basis for bacteriological criteria in coastal waters since it is best suited for indicating potential pathogens associated with fecal pollution.

1.7 Surface Water Use Classification Maps

The following maps depict Outstanding Alabama Waters and Outstanding National Resource Waters. Alabama's classified surface waters are listed in *ADEM Water Division-Water Quality Program-Chapter 335-6-11-Water Use Classifications for Interstate and Intrastate Waters (effective 01/28/2004)*. For more Surface Water Use Classification Maps (Statewide and by River Basin) go to Water Quality and see "Use Classification" at www.adem.state.al.us. Figures 1-2 through 1-5 and Tables 1-3 through 1-7b show waters classified as Outstanding Alabama Waters (OAW) and waters with the special designation of Outstanding National Resource Waters (ONRW).

Figure 1-2
Little River and Tributaries



**Table 1-3
Little River and Tributaries**

#	Assessment Unit #	Name	From	To	Use classification	Miles
1.	AL03150105-0806-100	Little River	Coosa River	Its source	PWS/S/F&W (ONRW)	22.2
2.	AL03150105-0805-100	Wolf Creek	Little River	Its source	PWS/S/F&W (ONRW)	8.9
3.	AL03150105-0804-100	Johnnies Creek	Little River	Its source	PWS/S/F&W (ONRW)	11.5
4.	AL03150105-0804-200	Camprock Creek	Johnnies Creek	Its source	PWS/S/F&W (ONRW)	3.3
5.	AL03150105-0804-300	Dry Creek	Johnnies Creek	Its source	PWS/S/F&W (ONRW)	2.3
6.	AL03150105-0803-100	Bear Creek	Little River	Its source	PWS/S/F&W (ONRW)	8.2
7.	AL03150105-0803-300	Hicks Creek	Bear Creek	Its source	PWS/S/F&W (ONRW)	3.0
8.	AL03150105-0803-200	Falls Branch	Bear Creek	Its source	PWS/S/F&W (ONRW)	2.1
9.	AL03150105-0806-200	Brooks Branch	Little River	Its source	PWS/S/F&W (ONRW)	1.5
10.	AL03150105-0802-100	Yellow Creek	Little River	Its source	PWS/S/F&W (ONRW)	5.8
11.	AL03150105-0802-200	Straight Creek	Yellow Creek	Its source	PWS/S/F&W (ONRW)	2.7
12.	AL03150105-0801-200	Hurricane Creek	Little River	Its source	PWS/S/F&W (ONRW)	6.3
13.	AL03150105-0705-100	West Fork of Little River	Little River	AL-GA state line	PWS/S/F&W (ONRW)	18.7
14.	AL03150105-0705-200	Straight Creek	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	4.1
15.	AL03150105-0705-300	Sharp Branch	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	1.4
16.	AL03150105-0705-400	Seymour Branch	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	2.4
17.	AL03150105-0704-201	East Fork West Fork of Little River	West Fork of Little River	AL-GA state line	PWS/S/F&W (ONRW)	0.4
18.	AL03150105-0703-100	East Fork of Little River	Little River	AL-GA state line	PWS/S/F&W (ONRW)	9.3
19.	AL03150105-0703-200	Laurel Creek	East Fork of Little River	Its source	PWS/S/F&W (ONRW)	3.9
20.	AL03150105-0703-300	Gilbert Branch	East Fork of Little River	Its source	PWS/S/F&W (ONRW)	1.9
21.	AL03150105-0702-101	Middle Fork of Little River	East Fork of Little River	AL-GA state line	PWS/S/F&W (ONRW)	2.4
22.	AL03150105-0703-400	Shrader Branch	Laurel Creek	Its source	PWS/S/F&W (ONRW)	1.8
23.	AL03150105-0703-500	Armstrong Branch	Laurel Creek	Its source	PWS/S/F&W (ONRW)	1.8
24.	AL03150105-0702-200	Brush Creek	Middle Fork of Little River	Its source	PWS/S/F&W (ONRW)	3.3
25.	AL03150105-0702-300	Anna Branch	Middle Fork of Little River	Its source	PWS/S/F&W (ONRW)	2.2
26.	AL03150105-0702-400	Blalock Branch	Anna Branch	Its source	PWS/S/F&W (ONRW)	3.3
27.	AL03150105-0702-500	Stillhouse Branch	Blalock Branch	Its source	PWS/S/F&W (ONRW)	1.1
		Unnamed Tributaries				141.0
					Total Miles	277.0

Figure 1-3
Sipsey Fork and Tributaries



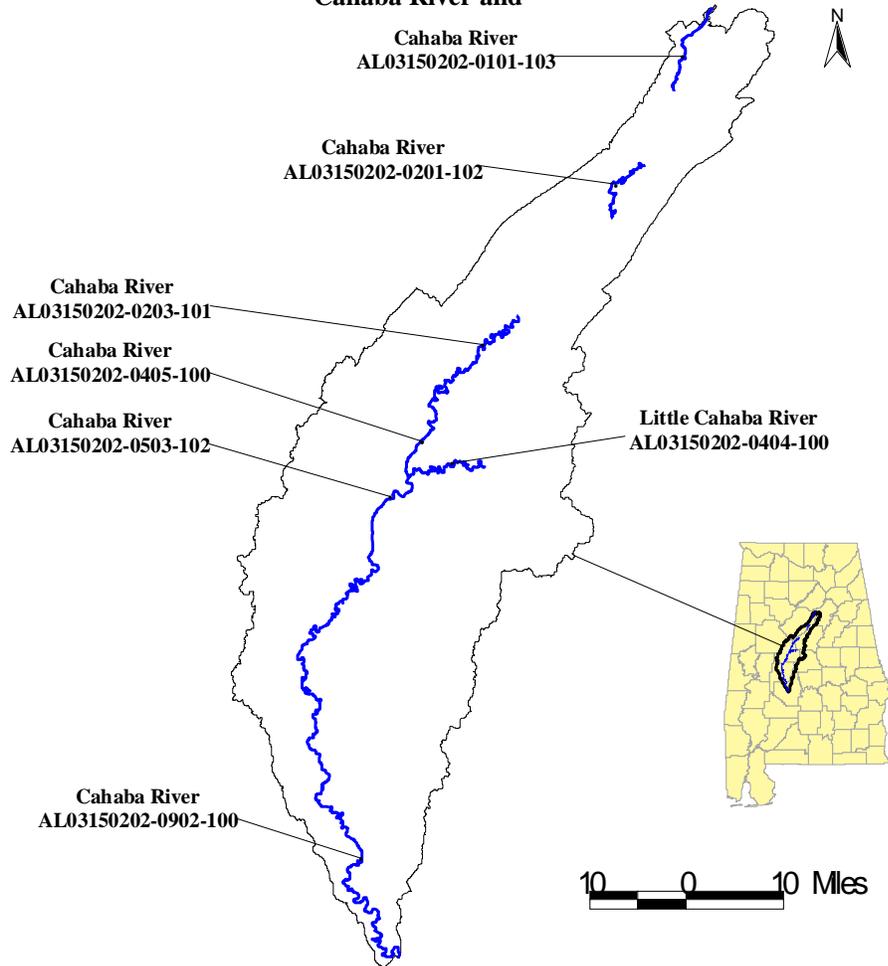
**Table 1-4
Sipsey Fork and Tributaries**

#	Assessment Unit #	Name	From	To	Use Classification	Miles
1.	AL03160110-0104-102	Sipsey Fork	Sandy Creek	Its source	F&W (ONRW)	21.2
2.	AL03160110-0103-200	Payne Creek	Sipsey Fork	Its source	F&W (ONRW)	3.9
3.	AL03160110-0103-300	Caney Creek	Sipsey Fork	Its source	F&W (ONRW)	4.7
4.	AL03160110-0103-700	South Fork Caney Creek	Caney Creek	Its source	F&W (ONRW)	5.1
5.	AL03160110-0103-600	North Fork Caney Creek	Caney Creek	Its source	F&W (ONRW)	6.4
6.	AL03160110-0103-400	Hurricane Creek	Sipsey Fork	Its source	F&W (ONRW)	2.3
7.	AL03160110-0103-500	Davis Creek	Sipsey Fork	Its source	F&W (ONRW)	2.8
8.	AL03160110-0102-500	Montgomery Creek	Borden Creek	Its source	F&W (ONRW)	4.0
9.	AL03160110-0102-400	Horse Creek	Borden Creek	Its source	F&W (ONRW)	1.8
10.	AL03160110-0102-100	Borden Creek	Sipsey Fork	Its source	F&W (ONRW)	16.6
11.	AL03160110-0102-300	Flannagin Creek	Borden Creek	Its source	F&W (ONRW)	10.0
12.	AL03160110-0102-700	Dry Creek	Flannagin Creek	Its source	F&W (ONRW)	2.2
13.	AL03160110-0102-600	Hagood Creek	Braziel Creek	Its source	F&W (ONRW)	4.2
14.	AL03160110-0102-200	Braziel Creek	Borden Creek	Its source	F&W (ONRW)	5.7
15.	AL03160110-0101-200	Fall Creek	Sipsey Fork	Its source	F&W (ONRW)	2.1
16.	AL03160110-0101-300	Bee Branch	Sipsey Fork	Its source	F&W (ONRW)	2.1
17.	AL03160110-0101-400	Thompson Creek	Sipsey Fork	Its source	F&W (ONRW)	8.6
18.	AL03160110-0101-700	Mattox Creek	Thompson Creek	Its source	F&W (ONRW)	3.3
19.	AL03160110-0101-800	Ross Branch	Tedford Creek	Its source	F&W (ONRW)	2.1
20.	AL03160110-0101-600	Tedford Creek	Thompson Creek	Its source	F&W (ONRW)	3.7
21.	AL03160110-0101-900	Quillan Creek	Hubbard Creek	Its source	F&W (ONRW)	3.8
22.	AL03160110-0101-140	Basin Creek	Hubbard Creek	Its source	F&W (ONRW)	2.8
23.	AL03160110-0101-500	Hubbard Creek	Sipsey Fork	Its source	F&W (ONRW)	6.6
24.	AL03160110-0101-110	Parker Branch	Hubbard Creek	Its source	F&W (ONRW)	3.8
25.	AL03160110-0101-120	Whitman Creek	Hubbard Creek	Its source	F&W (ONRW)	3.7
26.	AL03160110-0101-160	Natural Well Branch	Maxwell Creek	Its source	F&W (ONRW)	1.5
27.	AL03160110-0101-150	Dunn Branch	Maxwell Creek	Its source	F&W (ONRW)	1.3
28.	AL03160110-0101-130	Maxwell Creek	Hubbard Creek	Its source	F&W (ONRW)	2.0
		Unnamed Tributaries				249.0
					Total Miles	387.0

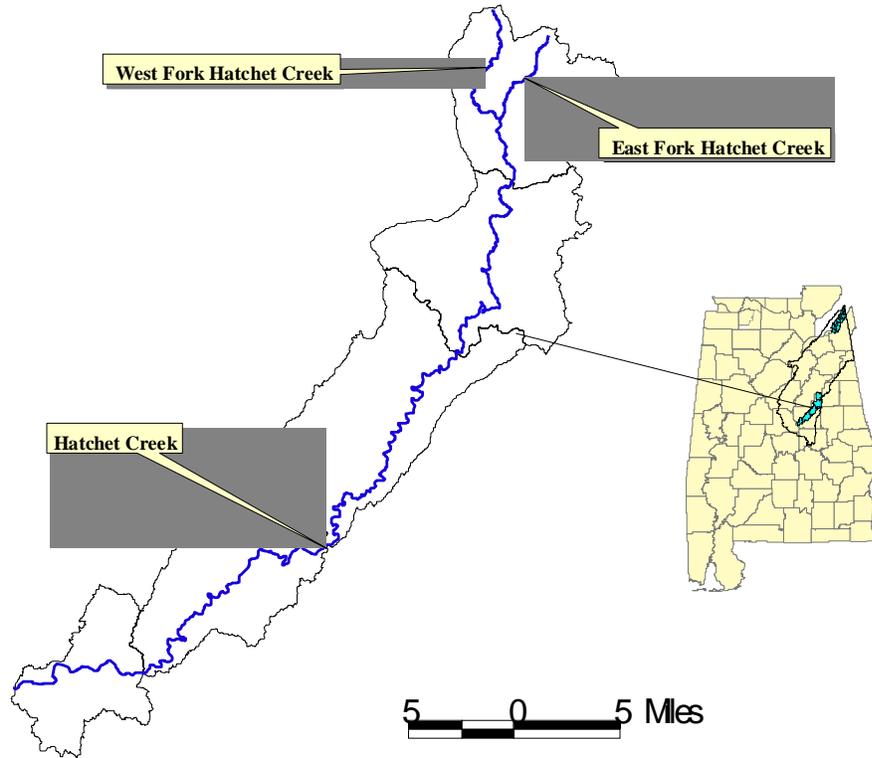
**Table 1-5
Cahaba River and**

Assessment Unit #	Name	From	To	Use Classification	Miles
AL03150202-0503-102	Cahaba River	Alabama Highway 82	lower Little Cahaba River	OAW/S	10.5
AL03150202-0203-101	Cahaba River	Shades Creek	Shelby County Road 52	OAW/F&W	23.6
AL03150202-0405-100	Cahaba River	lower Little Cahaba River	Shades Creek	OAW/F&W	13.5
AL03150202-0201-102	Cahaba River	dam near U.S. Highway 280	Grant's Mill Road	OAW/PWS	13.3
AL03150202-0101-102	Cahaba River	US Highway 11	I-59	OAW/F&W	3.1
AL03150202-0101-103	Cahaba River	I-59	Its source	OAW/F&W	8.8
AL03150202-0404-100	Little Cahaba River	Cahaba River	Its source	OAW/F&W	16.5
AL03150202-0902-100	Cahaba River	Alabama River	Alabama Highway 82	OAW/S	89.4
				Total Miles	178.8

**Figure 1-4
Cahaba River and**



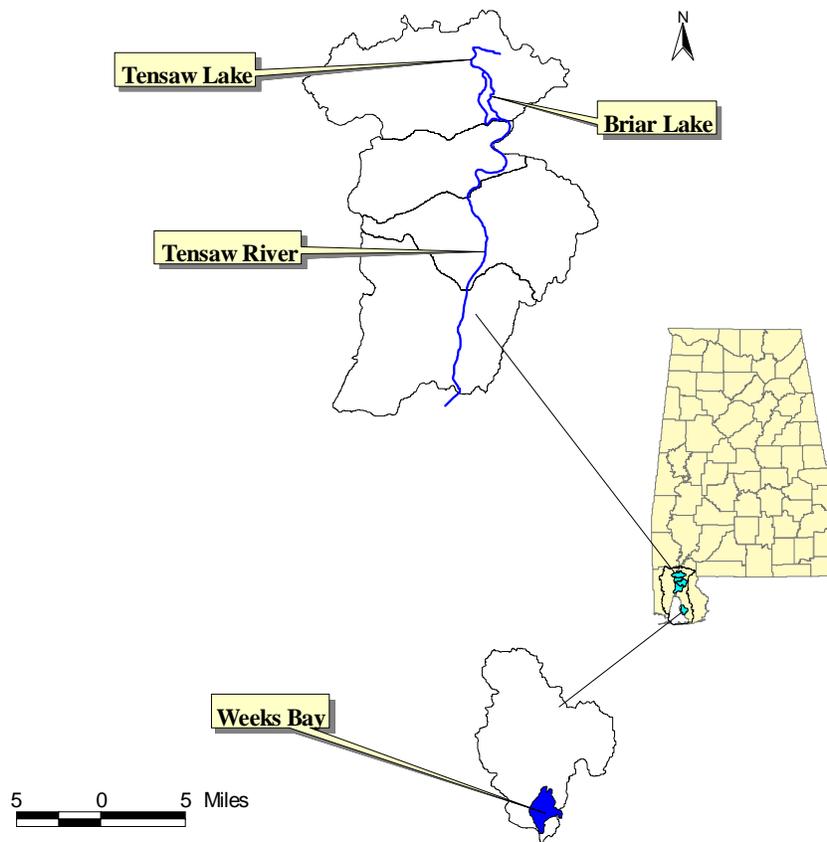
**Figure 1-5
Hatchet Creek and Tributaries**



**Table 1-6
Hatchet Creek and Tributaries**

Assessment Unit #	Name	From	To	Use Classification	Miles
AL03150107-0807-100	Hatchet Creek	Coosa River	Norfolk Southern Railway	OAW/S/F&W	44.4
AL03150107-0802-102	Hatchet Creek	Norfolk Southern Railway	Its source	OAW/PWS/S/F&W	17.7
AL03150107-0801-300	East Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W	5.3
AL03150107-0801-400	West Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W	7.7
				Total Miles	75.1

**Figure 1-6
Tensaw River, Weeks Bay and Tributaries**



**Table 1-7 a. & 1-7 b.
Tensaw River, Weeks Bay and Tributaries**

1-7 a. Tensaw River and Tributaries

Assessment Unit #	Name	From	To	Use Classification	Miles
AL03160204-0505-202	Tensaw River	Junction of Tensaw and Apalachee Rivers	Junction of Briar Lake	OAW/S/F&W	21.8
AL03160204-0105-302	Tensaw River	Junction of Briar Lake	Junction of Tensaw Lake	OAW/F&W	2.9
AL03160204-0105-700	Briar Lake	Junction of Tensaw River	Junction of Tensaw Lake	OAW/F&W	3.6
AL03160204-0105-801	Tensaw Lake	Junction of Tensaw River	Bryant Landing	OAW/F&W	5.2
				Total Miles	33.5

1.7 b. Weeks Bay and Tributaries

Assessment Unit #	Name	From	To	Use Classification	Square Miles
AL03160205-0307-101	Weeks Bay	Bon Secour Bay	Fish River	S/F&W (ONRW)	2.7
				Total Miles	2.7

Part 2 Rivers and Streams

2.1 Monitoring Programs

In the last five years ADEM has assessed more than 1,100 river and stream locations as a part of six major long-term riverine-focused monitoring programs. Data collected from each of these programs contribute to the overall understanding of Alabama’s surface water quality and provides valuable into the sources of impairments to Alabama’s mainstream rivers and reservoirs. Five of the six monitoring programs are described in Part VII. The Nonpoint Source Assessment Program comprises Part V.

- Nonpoint Source Assessment Program
- Point Source Assessment Program
- Ecoregion Reference Assessment Program
- Upland Alamp Monitoring and Assessment Program
- Clean Water Act §303(d) Support Assessment/Monitoring Program
- Fixed Ambient Trend Monitoring Program

Agencies, as listed in Table 2-1, have contributed valuable information, time, and resources in surface and ground water management program development, sampling efforts and analysis, flow information, data contribution and management, and GIS development, whether through contracts and cooperative efforts. The Alabama Water Watch (AWW) Program and Association routinely provide quality citizen volunteer monitoring data to ADEM. The ADEM and AWW Program/Association staff meets to discuss water quality issues. Alabama Water Watchers play a key role in identifying waters that need immediate or long-term attention. See Part 8 Nonpoint Source Management Program for a map and further summary information on the AWW Program.

**Table 2-1
State Agencies Involved with Water Quality/Quantity/Natural Resources**

ACES	Alabama Cooperative Extension Service
ADAI	Alabama Department of Agriculture and Industries
ADCNR-SLD	Alabama Department of Conservation and Natural Resources-State Lands Division
ADCNR-MRD	ADCNR-Marine Resources Division
ADECA-OWR	Alabama Department of Economic and Community Affairs-Office of Water Resources
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ADPH	Alabama Department of Public Health
AEMA	Alabama Emergency Management Agency
AEMC	Alabama Environmental Management Commission
AFC	Alabama Forestry Commission
ASWCC	Alabama Soil and Water Conservation Commission
ASMC	Alabama Surface Mining Commission
FSA	Farm Service Agency
GSA	Geological Survey of Alabama
MESC	Marine Environmental Sciences Consortium

2.2 ALAMAP Program

The Alabama Monitoring and Assessment Program (ALAMAP) is a statewide monitoring effort developed to provide data that can be used to estimate the current status of all streams and coastal/estuarine waters within the state using environmental indicators.

The Upland ALAMAP program is designed to enhance the current ambient monitoring program developed during the 1970's. Stations in the historical ambient monitoring program were generally selected to monitor trends in water quality downstream of specific existing point sources. To augment this type of monitoring, 60 stations on wadeable streams are selected statewide each year by EPA-Gulf Breeze using a probabilistic (random) design (Summers and Engle 1996) and are sampled annually during August. The characteristics of these sites are representative of the proportion of these characteristics found in the true population, and therefore reflect the condition of 100% of the wadeable streams in Alabama. The data collected at these stations will statistically represent all upland stream miles and, along with data from similarly conducted monitoring within the coastal area, will result in an assessment of percent impaired waters throughout the state with a measurable confidence level. (Summers and Engle 1996). This type of assessment will be used in the 305(b) Water Quality Report to Congress to address overall State water quality.

The data provided by this program is used, in part, by the EPA to evaluate the State's overall water quality and to estimate percent surface waters monitored by the Department. An assessment of overall water quality based on historical trend stations results in a worst-case scenario of water quality in Alabama. Table 2-2 shows an Alamap Summary.

**Table 2-2
Alamap Summary**

HA Evaluation.	92.3% of the sites visited had excellent or good HA evaluations while 7.7% had fair/poor evaluations.
HA DescriptionFlow	53.9% of sites evaluated were evaluated using the glide-pool format while 46.1% were evaluated using the riffle-run format.
pH	20.5% of sites visited had no flow.
D.O.	75.5% of sites sampled had pH concentrations between 6.0 and 8.5.
Temperature	81.4% of sites sampled had dissolved oxygen concentrations of 5.0 or higher. 99.9% of sites sampled had temperatures below 90 degrees Fahrenheit
Fecal Coliform	96% of sites sampled had fecal concentrations below 2,000 colonies/100ml.
There are a number of other parameters collected in ALAMAP sampling for which cumulative distribution graphs have been prepared by EPA. Examples include specific conductivity, turbidity, PO4-P, NO2-NO3, chloride, TSS, TDS, and BOD5. These parameters do not have limits that I am aware of and so I am not sure what statements we can make about them. Let me know if you have ideas about how to express them and if there is anything I can do to assist with this.	
215 ALAMAP stations were sampled over the five year period. The statistics say this represents a total of 45,147 miles of wadeable, perennial stream in Alabama.	

A. Methodology

1. Fixed Ambient Monitoring Stations: Assessment of Trends in Water Quality

Nine stations have been deleted from the fixed ambient monitoring stations to be assessed during 1997 (A-1a, A-2, A-3, CO-2, T-2, BEA-1, BEA-2, BL-1, and W-1). These stations were removed because they are assessed in conjunction with the Reservoir Monitoring Program (ADEM 1996c). The remaining stations will be sampled during June, August, and October as recommended by the Water Division (Table 1).

To assess trends in water quality, the EPA (1996) recommends analyzing water samples for the following variables: total suspended solids, total dissolved solids, fecal coliform, total phosphorus, nitrite / nitrate, ammonia, chlorides, biochemical oxygen demand, and dissolved oxygen. These parameters are also identified as environmental indicators in ADEM's Water Quality Monitoring Strategy (ASSESS) for evaluating the effectiveness of point and nonpoint water quality controls. They will be measured at each station during each sampling event. In addition, in-situ pH, turbidity, and conductivity, water temperature and air temperature will be measured. Other parameters may be added to monitor special or suspected problems within the watershed.

Currently, the Department collects water samples quarterly to detect concentrations of metals in the water column. Review of monthly ambient monitoring data by the ADEM indicates that metals have never been detected in water samples at stations where the metal content of sediments and fish tissue was found to be high (ADEM 1996). They will be discontinued. In lieu of water samples, sediment samples will be collected at appropriate stations during the October sampling event and analyzed for content of Iron, Manganese, Arsenic, Lead, Mercury, Zinc, Chromium, Cadmium, Copper, Nickel, and Silver.

2. Probabilistic Stations: Assessment of Overall Water Quality in Alabama

In the past, data provided by the Department's Ambient Monitoring Program has been used, in part, by the Department and EPA to evaluate the state's overall water quality and to estimate percent surface waters monitored. Because the program is designed to monitor water quality in systems known to be impacted, an assessment of overall water quality based on this data overestimates percent impaired waters in Alabama.

In order to address these issues, the Environmental Indicators Section of the Field Operations Division requested the EPA, Gulf Breeze, to randomly generate a list of two-hundred and fifty stations throughout the state. The study sites are chosen randomly, but the characteristics of the sites are representative of the proportion of these characteristics found in the true population, and therefore reflect the condition of 100% of the surface waters in Alabama. Fifty of the two-hundred and fifty stations are sampled annually during August. At the end of the five year reporting cycle, all two-hundred and fifty sites will have been sampled. The data from these sites, along with data from similarly conducted monitoring within the coastal area, will result in an assessment of percent impaired waters throughout the state with a measurable confidence level. The following parameters are collected at each station:

1. Evaluation of channel alteration and habitat quality.
2. Assessment based on ecological indicators recommended by the EPA.
 - collection of in-situ measurements of D.O., pH, conductivity, turbidity, water temperature, air temperature; and
 - collection of water samples for analysis of fecal coliform, nitrite / nitrate, total phosphorus, total dissolved solids, total suspended solids, chlorides, and biochemical oxygen demand; and,

3. Documentation of impacts at each station with at least two photographs (upstream and downstream of sampling point). All samples will be collected, preserved, and transported to the appropriate ADEM laboratory in accordance with the ADEM Field Operations Standard Operating Procedures Manual, Volume I (1995). An approved chain-of-custody form will be completed for each sample per station

B. Data Management and Reporting

Chemical data and appropriate STORET parameter codes will be submitted for entry into STORET. All raw data sheets, chain-of-custody forms, memoranda, and study proposals shall be maintained in the Environmental Indicators Section of the Field Operations Division. The chemical information can be used to update the CWA 303(d) list and the 305(b) Report to Congress.

C. Literature Cited

Alabama Department of Environmental Management. 1994. Water quality trends of selected ambient monitoring stations in Alabama utilizing aquatic macroinvertebrate assessments: 1974-1992. 113 pp.

Alabama Department of Environmental Management. 1995. ADEM's Standard Operating Procedure Manual: Physical / Chemical, Volume I.

Alabama Department of Environmental Management. 1996a. Trends in water quality of ambient monitoring stations of the Coosa and Tallapoosa Watersheds: aquatic macroinvertebrate assessments, 1980-1995. 34 pp.

Alabama Department of Environmental Management. 1996b. Freshwater ambient water quality monitoring stations: biological and chemical assessments, proposal. 6 pp.

Alabama Department of Environmental Management. 1996c. Reservoir water quality program report: 1990-1995. 307 pp.

National Research Council (U.S.). 1992. Restoration of aquatic ecosystems: science, technology, and public policy. National Academy Press, Washington, D.C. pp. 44-47.

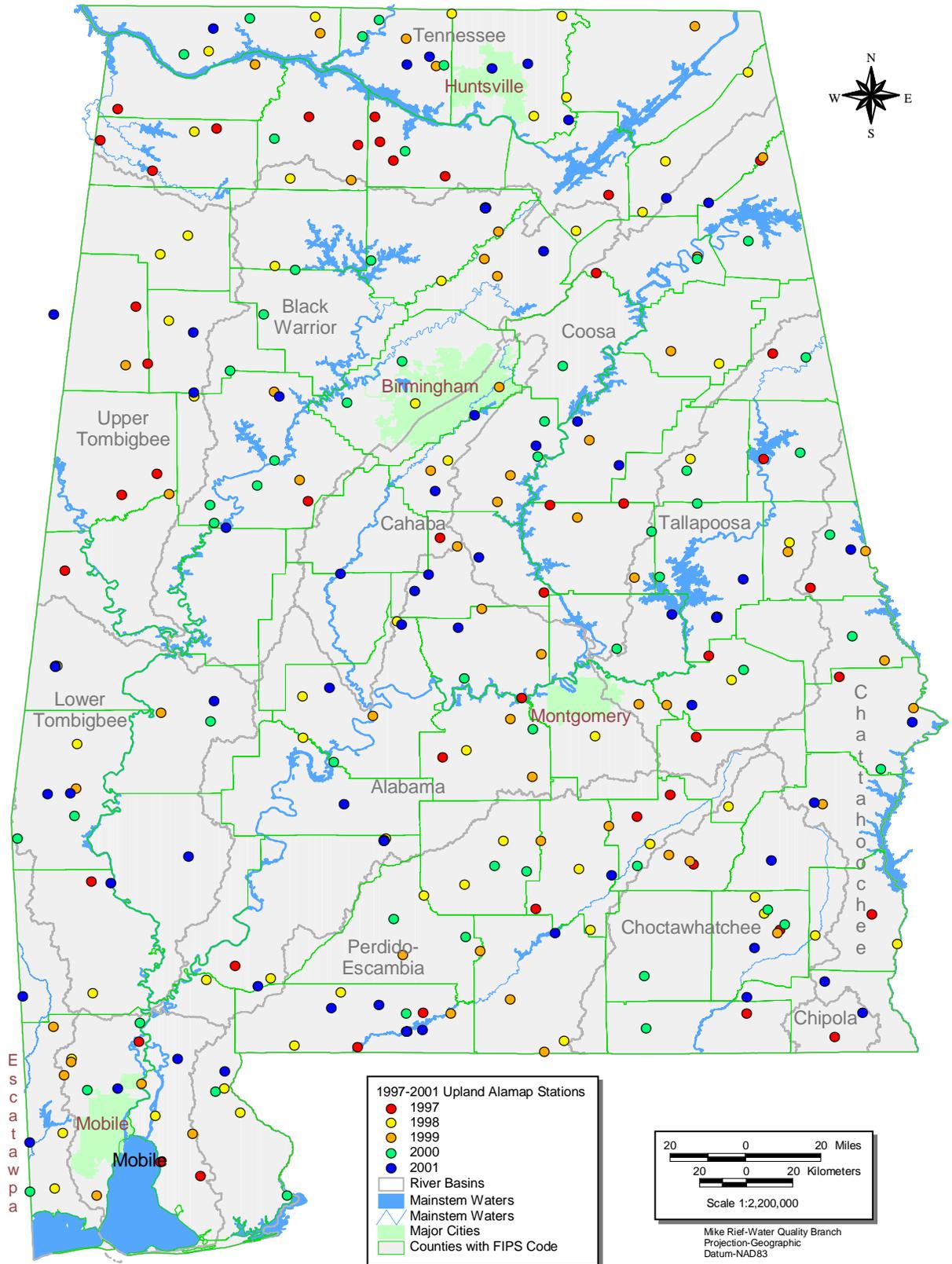
Summers, K. and V. Engle. December 2, 1996. Alternative designs for Alabama surface water monitoring for 305(b) reporting. Invited presentation. Montgomery, Alabama.

Upland ALAMAP sampling began in August of 1997 and has taken place each August through FY-2001. August 2001 sampling completed the state of Alabama's first five-year reporting cycle. EPA-Gulf Breeze is presently analyzing the data for wadeable stream overall use support assessment statements for dissolved oxygen, temperature, pH, and fecal coliform. Figure 2-1 shows 1997-2001 Upland Alabama Wadeable Stream Random Sampling Stations. For further information on Alabama's Upland Alamac Program contact Mr. Lee Davis at (334) 260-2759 or mld@adem.state.al.us.

2.3 Ecoregions

Innate regional differences exist in climate, landform, soil, natural vegetation, and hydrology. These factors, in turn, affect nutrient regime, substrate characteristics, and the composition of biological communities within aquatic ecosystems. By defining relatively homogeneous ecological areas, ecoregions provide a geographic framework for more efficient management of aquatic ecosystems and their components (Hughes et al. 1986, Hughes 1985, and Hughes and Larsen 1988). The USEPA has recommended the development of ecoregional reference conditions as a scientifically defensible method of defining expected habitat, biotic, and chemical conditions within streams, rivers, reservoirs, and wetlands. Level IV ecoregions have been developed or are under development in 37 states nationwide. Griffith et al. (2001) delineated six Level III ecoregions in Alabama: Piedmont, Southeastern Plains, Ridge and Valley, Southwestern

Figure 2-1
1997-2001 Upland Alabama Wadeable Stream
Random Sampling Stations



Appalachians, Interior Plateau, and the Southern Coastal Plain. Within these, they delineated 27 Level IV ecoregions. Figure 2-2 and Table 2-3 list Alabama Ecoregion Reference Stations.

ADEM has maintained an Ecoregional Reference Reach Monitoring Program since 1991 (ADEM 2001b). 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 subcoregions (Griffith et al. 2001). ADEM's ecoregional reference database was analyzed during 2003 to develop assessment guidelines for ADEM's habitat assessments, screening-level macroinvertebrate assessments, and chemical parameters, including nutrient concentrations for 10 of the 29 subcoregions.

Specific selection criteria are used to ensure that reference reaches are typical of the subcoregion and relatively unimpaired. Watersheds containing the highest percentage of natural vegetation are first located using topographic maps and land use information compiled by USEPA and local Soil and Water Conservation Districts. Departmental databases are used to ensure that potential reference watersheds do not contain any point source discharges, mining, or urban runoff, and minimal agricultural sources. Improved GIS capabilities are enhancing ADEM's ability to more accurately quantify land use within each of the reference reach watersheds. Field reconnaissance is then conducted to ground truth land use estimates. In situ field parameters are

collected and visual macroinvertebrate surveys are conducted to screen for obvious impacts to chemical and biological conditions. Substrate composition, gradient, canopy cover, sinuosity, and habitat quality and availability are estimated to assess stream condition and comparability to other streams in the subcoregion. Intensive site assessments are then conducted to verify that the reaches are in relatively good condition.

Through this process, a total of 594 locations have been investigated as potential reference reaches statewide. Information from these site visits has identified 53 ecoregional reference reaches across the state. An additional 13 candidate reaches are currently being monitored to validate their selection. The program has concentrated on wadeable streams and rivers, for which the USEPA and ADEM have developed rapid bioassessment protocols (Plafkin et al. 1989, Barbour et al. 1999, ADEM 1996, ADEM 1999, ADEM in press). Large river ecoregional reference reaches have been recently established on Sipsey Fork and Hatchet Creek to assess specific impacts to Locust Fork, Mulberry Fork, and the Cahaba River.

For further information on Alabama's Ecoregions contact Ms. Lisa Huff at (334) 260-2752 or ehh@adem.state.al.us.

2.4 Alabama's §303(d) Listed Waters

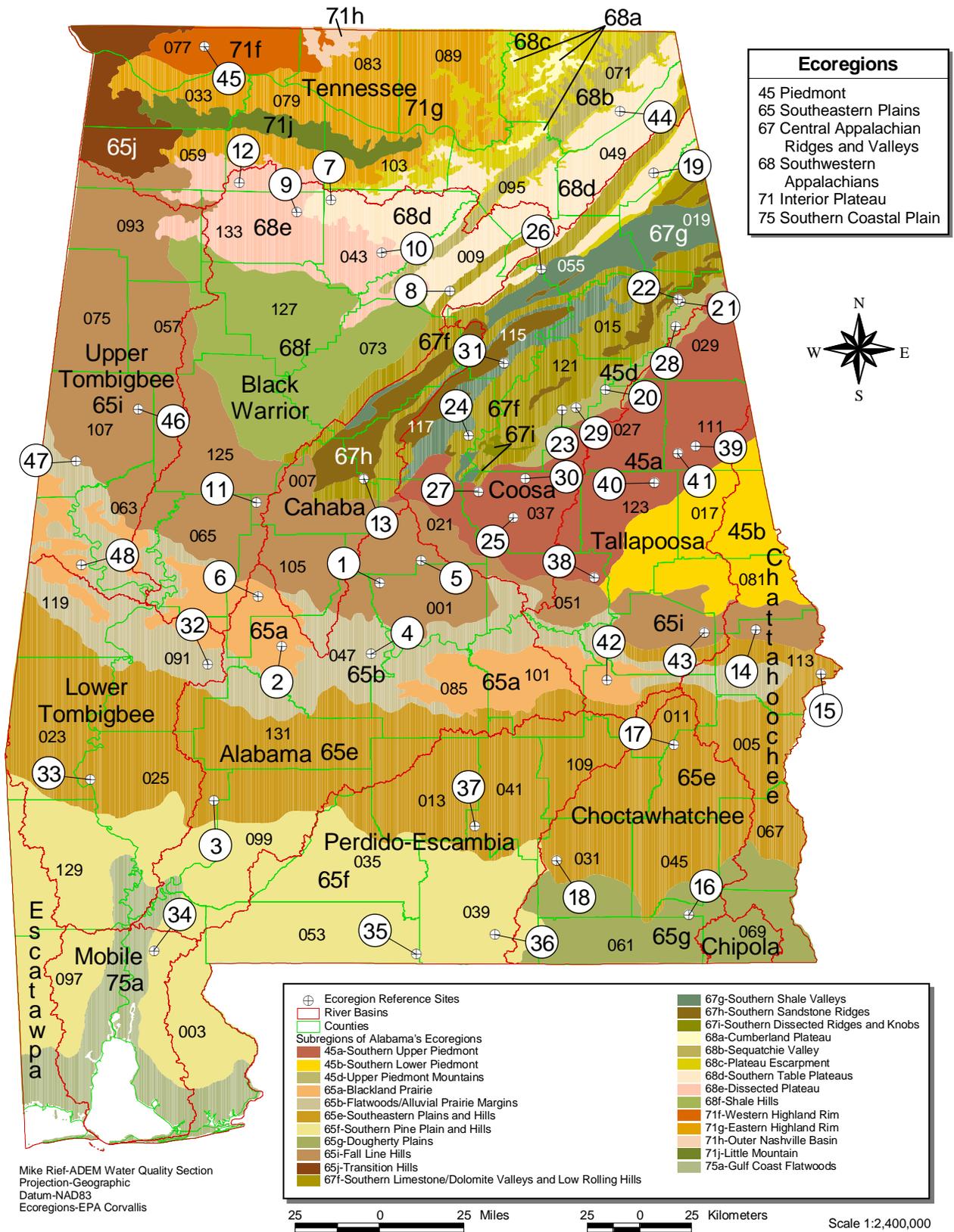
A. FY 2003-2004 §303(d) Sampling/Other Ambient Sampling

During 2002, and 2003 monthly sampling of §303(d) List waters were performed at the following water bodies. Data was used in the development of the Draft 2004 §303(d) List contained in Appendix F. Table 2-4 and 2-5 show water bodies that had monthly sampling in FY 2002 and FY 2003 respectively.

B. Intensive Studies

Two Intensive Studies were performed on each of the following water bodies: Bayou Sara, Norton Creek, Puppy Creek, Rabbit Creek, Sougahatchee Creek, and Wolf Creek. This collected data was/will also be used in Total Maximum Daily Load (TMDL) or Waste load Allocation (WLA) development.

Figure 2-2
Ecoregion Reference Stations
Subregions of Alabama's Ecoregions-River Basins-Counties



Mike Rief-ADEM Water Quality Section
 Projection-Geographic
 Datum-NAD83
 Ecoregions-EPA Corvallis

**Table 2-3
Alabama Ecoregion Reference Stations**

Index	Station	Stream Name	River Basin	Lat	Lon
1	BCKA-26	Buck Creek	Alabama	32.6265	-86.8693
2	CYD-1	Chaney Creek	Alabama	32.3544	-87.2894
3	SRC-1	Silver Creek	Alabama	31.6952	-87.5816
4	SPD-1	Soapstone Creek	Alabama	32.3222	-86.9063
5	SWFC-1	Swift Creek	Alabama	32.7217	-86.6920
6	WASP-1	Washington Creek	Alabama	32.5700	-87.3914
7	BLVC-1	Blevens Creek	Black Warrior	34.2674	-87.0776
8	HNMB-4	Hendrick Mill Branch	Black Warrior	33.8761	-86.5689
9	INMW-1	Inman Creek	Black Warrior	34.2153	-87.2245
10	MRTC-1	Marriott Creek	Black Warrior	34.0421	-86.8628
11	SSB-1	South Sandy	Black Warrior	32.9699	-87.3978
12	TPSL-1	Thompson Creek	Black Warrior	34.3409	-87.4711
13	MAYB-1	Mayberry	Cahaba	33.0713	-86.9385
14	BCR-1	Brush Creek	Chattahoochee	32.4247	-85.2607
15	IHGR-1	Ihagee Creek	Chattahoochee	32.2385	-84.9807
16	BRH-1	Bear Creek	Choctawhatchee	31.2077	-85.5462
17	DRYB-1	Dry Creek	Choctawhatchee	31.9347	-85.6104
18	PATC-1	Patrick Creek	Choctawhatchee	31.4384	-86.1121
19	BERD-9	Bear Creek	Coosa	34.3809	-85.6979
20	CHEC-6	Cheaha Creek	Coosa	33.4528	-85.9027
21	CHOC-2	Chocolocco Creek	Coosa	33.8295	-85.5817
22	DRYC-2	Dry Creek	Coosa	33.8424	-85.5942
23	DRYT-9	Dry Creek	Coosa	33.3657	-86.0896
24	FRMS-9	Fourmile Creek	Coosa	33.2565	-86.4898
25	JNSC-16	Jones Creek	Coosa	32.9049	-86.2976
26	LCNE-1	Little Canoe Creek	Coosa	33.9701	-86.1789
27	PNTC-11	Panther Creek	Coosa	33.0184	-86.4474
28	SHLC-3	Shoal Creek	Coosa	33.7253	-85.6012
29	TCT-5	Talladega Creek	Coosa	33.3784	-86.0303
30	WGFC-1	Weogufka Creek	Coosa	33.0726	-86.2480
31	WLFS-9	Wolf Creek	Coosa	33.5688	-86.3382
32	PPM-1	Poplar Creek	Lower Tombigbee	32.2773	-87.6067
33	ULCC-1	Ulcanush Creek	Lower Tombigbee	31.7841	-88.1081
34	HLB-1	Halls Creek	Mobile	31.0529	-87.8368
35	BRE-1	Bear Creek	Perdido-Escambia	31.0376	-86.7126
36	CLC-1	Clear Creek	Perdido-Escambia	31.1215	-86.3758
37	PYW-1	Pineywoods Creek	Perdido-Escambia	31.5838	-86.4619
38	CHNE-18	Channahatchee Creek	Tallapoosa	32.6502	-85.9509
39	CRHR-9	Cornhouse Creek	Tallapoosa	33.2120	-85.5181
40	EMKT-14	Emuckfaw Creek	Tallapoosa	33.0553	-85.6949
41	HCR-1	Hurricane Creek	Tallapoosa	33.1803	-85.5941
42	LINB-1	Line Creek	Tallapoosa	32.2088	-85.8975
43	LBM-1	Long Branch	Tallapoosa	32.4132	-85.4812
44	BYTJ-1	Bryant Creek	Tennessee	34.6466	-85.8430
45	INCL-1	Indian Camp Creek	Tennessee	34.9243	-87.6211
46	BRP-1	Bear Creek	Upper Tombigbee	33.3696	-87.9036
47	BLBP-1	Blubber Creek	Upper Tombigbee	33.1473	-88.1705
48	JNS-1	Jones Creek	Upper Tombigbee	32.7016	-88.1478

Table 2-4 provides the total number of TMDLs that have been developed and approved/finalized by the ADEM Water Quality Branch and by Region 4 EPA for 62 water bodies within Alabama.

**Table 2-4
TMDL Development Progress**

ADEM	
•	Proposed 21 TMDLs
•	Proposed 22 Delistings
•	Proposed 7 Decision Documents
•	22 Siltation TMDLs were Approved by EPA
EPA	
•	Finalized 34 TMDLs
•	Proposed 2 TMDLs
•	Re-proposed 9 TMDLs

**Table 2-5
FY 2002 Water Bodies that had monthly sampling**

FY 2002	1. Avondale Br	2. Cahaba R	3. Fivemile Cr	4. Newfound Cr	5. Ryan Cr
	6. Bayou La Batre	7. Camp Br	8. Hog Bayou	9. North R	10. Short Cr
	11. Bayview Lake	12. Cane Cr	13. Hogue Cr	14. North R	15. Spring Cr
	16. Beaver Dam Cr	17. Carls Cr	18. Huntsville Spring Br	19. Olin Basin	20. Valley Cr
	21. Big Yellow Cr	22. Cold Creek Swamp	23. Little Cahaba R	24. Opossum Cr	25. Village Cr
	26. Black Cr	27. Coon/Flat Rock Cr	28. Little Yellow Cr	29. Patton Cr	30. Warren Smith Cr
	31. Brier Fork	32. Dry Br, UT to	33. Locust Fork	34. Pond Creek	35. Weiss Lake, UT to
	36. Brindley Cr	37. Dry Cr	38. Lost Cr	39. Rock Creek	40. Wolf Cr
	41. Caffee Cr	42. Elk R	43. Mud Cr	44. Rocky Br	

**Table 2-6
FY 2003 Water bodies that had monthly sampling**

FY 2003	1. Anderson Creek	2. Cahaba River	3. Hester Creek	4. Ohatchee Cr	5. Talladega Cr
	6. Bear Creek	7. Cane CR	8. Hughes Creek	9. Paint Cr	10. Tallaseehatchee Cr
	11. Beaver Cr	12. Cane Creek	13. Hurricane Creek	14. Patton Creek	15. Terrapin Cr
	16. BeaverDam Creek	17. Cedar Cr	18. Kelly Creek	19. Peckerwood Cr	20. Town Creek
	21. Big Conoe Cr	22. Chestnut Cr	23. Lee Branch	24. Pond Cr	25. Trout Cr
	26. Big Cove Creek	27. Choccolocco Cr	28. Little Dice Branch	29. Second Creek	30. UT to Dry Branch
	31. Big Creek	32. Cotaco Creek	33. Little Wills Creek	34. Shegog Creek	35. Walnut Cr
	36. Big Wills Cr	37. Dry Creek (embayment)	38. Locust Fork	39. Shoal Cr	40. Waxahatchee Cr
	41. Black Creek	42. First Creek	43. Lt. Conoe Cr.	44. Shoal Cr to Jordan Lake	45. Weogufka Cr
	46. Brier Fork	47. Flint River	48. McKiernan Creek	49. Shoal Creek	50. Weoka Cr
	51. Brindley Creek	52. French Mill Creek	53. Mckiernan Creek (embayment)	54. Sofkahatchee Cr	55. Wst Frk Cotaco Ck
	56. Broken Arrow Cr	57. Goose Creek	58. Mill Pond Creek	59. South Sauty Creek	60. Yelloleaf Cr
	61. Buck Creek	62. Guess Creek	63. Mountain Fk Flint R	64. Sugar Creek	65. Yellow Bank Creek
	66. Buxahatchee Creek	67. Hatchet Cr	68. Mud Creek	69. Swamp Cr	70. Yellow Leaf Cr to Lake Mitchell

C. TMDL Program Activities Scheduled for FY 2004

Table 2-7 shows a list of the TMDL Program Activities for FY 2004. Table 2-11 shows TMDL Development Schedule for 2004.

**Table 2-7
TMDL Program Activities Scheduled for FY 2004**

1. Finalize Draft TMDLs from FY02 for EPA Review & Approval
2. Prepare Water Quality Monitoring Plans for Impaired Waters
3. Compile Public Comments & Prepare Responsiveness Summary for FY03 TMDLs, Delistings & Decision Document's recently/currently out on Public Notice
4. New TMDL Development Scheduled for 24 Segments & 32 Pollutants

**Table 2-8
TMDL Development Schedule for 2004**

Water Body Name	Water Body ID (HUC)	River Basin	County	Pollutant
Brindley Creek	AL/03160109-030_01	Black Warrior	Cullman	Ammonia
Brindley Creek	AL/03160109-030_01	Black Warrior	Cullman	Nutrients
Brindley Creek	AL/03160109-030_01	Black Warrior	Cullman	OE/DO
Opossum Creek	AL/03160112-020_01	Black Warrior	Jefferson	OE/DO
Sougahatchee Creek	AL/Yates Res_01	Tallapoosa	Lee	Nutrients
Embayment/Pepperell Branch	AL/03150110-030-01			OE/DO Nutrients
Lee Branch	AL/03150202-020_01	Cahaba	Shelby	Pathogens
Cahaba River	AL/Cahaba R_01	Cahaba	Jeff/Shelby	Nutrients
Cahaba River	AL/Cahaba R_02	Cahaba	Jeff/Shelby	Nutrients
Cahaba River	AL/Cahaba R_03	Cahaba	Shelby	Nutrients
Cahaba River	AL/Cahaba R_04	Cahaba	Bibb/Shelby	Nutrients
Sugar Creek	AL/03150109-190_01	Tallapoosa	Tallapoosa	Metals (Cu)
Sugar Creek	AL/03150109-190_01	Tallapoosa	Tallapoosa	Chlorides
Sugar Creek	AL/03150109-190_01	Tallapoosa	Tallapoosa	Nutrients
Sugar Creek	AL/03150109-190_01	Tallapoosa	Tallapoosa	Color
Warren Smith Creek	AL/06030001-160_03	Tennessee	Jackson	Siltation
Mountain Fork	AL/06030002-160_01	Tennessee	Madison	Pathogens
Hester Creek	AL/06030002-160_02	Tennessee	Madison	Nutrients
Hester Creek	AL/06030002-160_02	Tennessee	Madison	Pathogens
Flint River	AL/06030002-190_02	Tennessee	Madison	Pathogens
Flint River	AL/06030002-210_03	Tennessee	Madison	OE/DO
Hurricane Creek	AL/06030002-200_01	Tennessee	Madison	Pathogens
Town Creek	AL/06030002-270_01	Tennessee	Morgan	OE/DO
Cotaco Creek	AL/06030002-270_02	Tennessee	Morgan	Pathogens
West Fork Cotaco Cr.	AL/06030002-270_03	Tennessee	Morgan	Pathogens
West Fork Cotaco Cr.	AL/06030002-270_03	Tennessee	Morgan	Siltation
Mill Pond Creek	AL/06030002-270_04	Tennessee	Marshall	Siltation
Mill Pond Creek	AL/06030002-270_04	Tennessee	Marshall	Pathogens
Hughes Creek	AL/06030002-270_05	Tennessee	Morgan	Siltation
French Mill Creek	AL/06030002-320_02	Tennessee	Limestone	Pathogens
Second Creek	AL/06030002-440_01	Tennessee	Lauderdale	Pathogens
First Creek	AL/06030002-440_02	Tennessee	Lauderdale	Pathogens
Shoal Creek	AL/06030004-060_01	Tennessee	Limestone	Pathogens
Big Creek	AL/06030004-080_01	Tennessee	Limestone	OE/DO

2.5 Upland Trend Stations

Upland Trend Stations sampling frequency presently occurs 3 times a year during the months of May, August, and October. Tables 2-9 and 2-10 show parameters that were sampled at all or selected upland trend stations respectively. Figure 2-3 show's Alabama's Active Upland Trend Stations. Tables 2-11 thru 2-12, and Figures 2-4 thru 2-5 show Draft 2004 303(d) cause and source mileages respectively.

Table 2-9
Parameters sampled at all stations

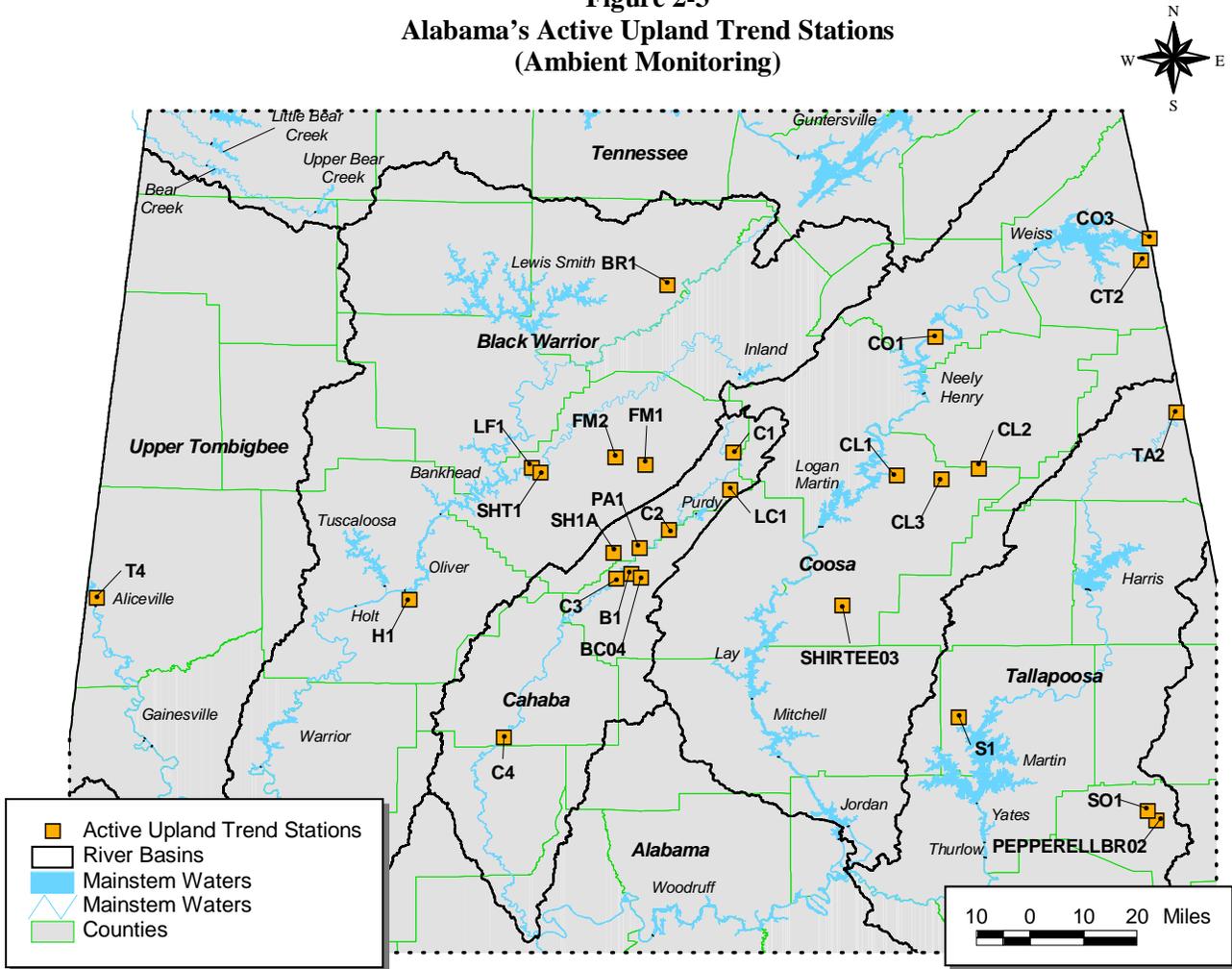
Parameter	STORET Code	Parameter	STORET Code
water temperature	(00011)	total dissolved solids	(00515)
air temperature	(00021)	total suspended solids	(00530)
turbidity	(00076)	nitrates	(00620)
specific conductance	(00095)	hardness	(00900)
dissolved oxygen	(00300)	fecal coliform	(31613)
pH	(00400)	phosphates	(70505)

Table 2-10
Parameters sampled at selected stations:

Parameter	STORET Code	Parameter	STORET Code
biochemical oxygen demand	(00310)	cyanide	(00720)
chemical oxygen demand	(00335)	chlorides	(00940)
alkalinity	(00410)	phenolics	(32730)
volatile suspended solids	(00535)	flow	(00060)
total kjeldahl nitrogen	(00625)		

Consult Appendix A for a thorough discussion of Alabama's surface water monitoring program. For further information on Alabama's Trend Stations contact Mr. Hugh Cox at (334) 260-2759 or hec@adem.state.al.us.

Figure 2-3
Alabama's Active Upland Trend Stations
(Ambient Monitoring)



Station	Description	Latitude	Longitude
B1	Buck Creek above dam @ Helena	33.296944	-86.842639
BC04	Buck Creek off Shelby Co. Rd. 52	33.285833	-86.816111
BR1	Broglen River @ AL Hwy 91 crossing	34.075583	-86.744667
C1	Cahaba River @ Camp Coleman	33.624722	-86.566667
C2	Cahaba River @ Caldwell Ford Bridge	33.415278	-86.740000
C3	Cahaba River west of Helena	33.284417	-86.882556
C4	Cahaba River southeast of Harrisburg	32.857222	-87.186111
CL1	Choccolocco Cr @ Talladega Co. Rd. 326 crossing	33.561917	-86.126306
CL2	Choccolocco Cr @ Talladega Co. Rd. 103 crossing	33.581944	-85.905556
CL3	Choccolocco Cr @ Talladega Co. Rd. 399 crossing	33.551389	-86.005278
CO1	Coosa River @ AL. Hwy 77 crossing	33.935444	-86.023111
CO3	Coosa River @ the AL./GA. State Line	34.200000	-85.444722
CT2	Chattooga River near Cherokee County Road 140 @ AL/GA State Line	34.141670	-85.468111
FM1	Five Mile Creek @ US Hwy 31	33.591111	-86.803611
FM2	Five Mile Creek @ AL Hwy 105	33.611111	-86.885556
H1	Hurricane Creek @ Tuscaloosa Co. Rd. 116	33.228611	-87.439000
LC1	Little Cahaba River south of Leeds	33.524444	-86.575556
LF1	Locust Fork of Black Warrior River near Powhatan	33.583333	-87.110056
PA1	Patton Creek @ Paradise Lake	33.367222	-86.819444
PEPPERELLBR02	Pepperell Branch @ US Hwy 29	32.634444	-85.425278
S1	Sugar Creek @ AL. Hwy 63	32.910444	-85.960361
SH1A	Shades Creek @ AL Hwy 150	33.355278	-86.890556
SHIRTEE03	Shirtee Creek @ Talladega Co. Rd. 24	33.211667	-86.273056
SHT1	Short Creek @ Coosa Co. Rd. 61	33.569167	-87.086972
SO1	Sougahatchee Creek @ Lee Co. Rd. 35	32.659528	-85.450444
T4	Tombigbee River @ AL Hwy 70	33.233333	-88.283333
TA2	Tallapoosa River @ bridge crossing east of Muscadine	33.732722	-85.372167

Mike Rief ADEM Water Quality Branch Projection-Geographic Datum-NAD83

Table 2-11
Draft 2004 §303(d) Cause Mileages
Rivers and Streams

Cause	Miles	Percent of Total Impaired Miles
Ammonia	44	2.5%
Biology	3	0.2%
Chlordane	8.1	0.5%
Chlorides	5	0.3%
Metals	491.7	28.1%
Nutrients	293.5	16.8%
Organic Enrichment/Dissolved Oxygen	279.1	15.9%
Other Habitat Alteration	421	24.0%
Pathogens	321.2	18.3%
Pesticides	7.6	0.4%
pH	62.8	3.6%
Priority Organics	53	3.0%
Siltation	638.2	36.4%
Turbidity	56.3	3.2%
Unknown Toxicity	30.3	1.7%

Table 2-12
Draft 2004 §303(d) Source Mileages
Rivers and Streams

Source	Miles	Percent of Total Impaired Miles
Agriculture	338.5	19.3%
Collection System Failure	20.5	1.2%
Contaminated Sediments	53	3.0%
Dam Construction	20.2	1.2%
Flow Regulation/Modification	20.2	1.2%
Highway/Road/Bridge Construction	71.4	4.1%
Industrial	61	3.5%
Intensive Animal Feeding Operations	5.5	0.3%
Land Development	256.4	14.6%
Landfills	4.2	0.2%
Mill Tailings-Abandoned	16.8	1.0%
Mine Tailings-Abandoned	16.8	1.0%
Municipal	248.5	14.2%
Natural Sources	15.6	0.9%
Nonirrigated Crop Production	108.3	6.2%
Onsite Wastewater Systems	26.7	1.5%
Pasture Grazing	184.5	10.5%
Removal of Riparian Vegetation	56.3	3.2%
Subsurface Mining-Abandoned	16.8	1.0%
Surface Mining	70.5	4.0%
Surface Mining-Abandoned	285.4	16.3%
Unknown Source	469.5	26.8%
Urban Runoff/Storm Sewers	465.5	26.6%

Figure 2-4
Cause
Percent of Total Draft 2004 303(d) River and Stream Miles

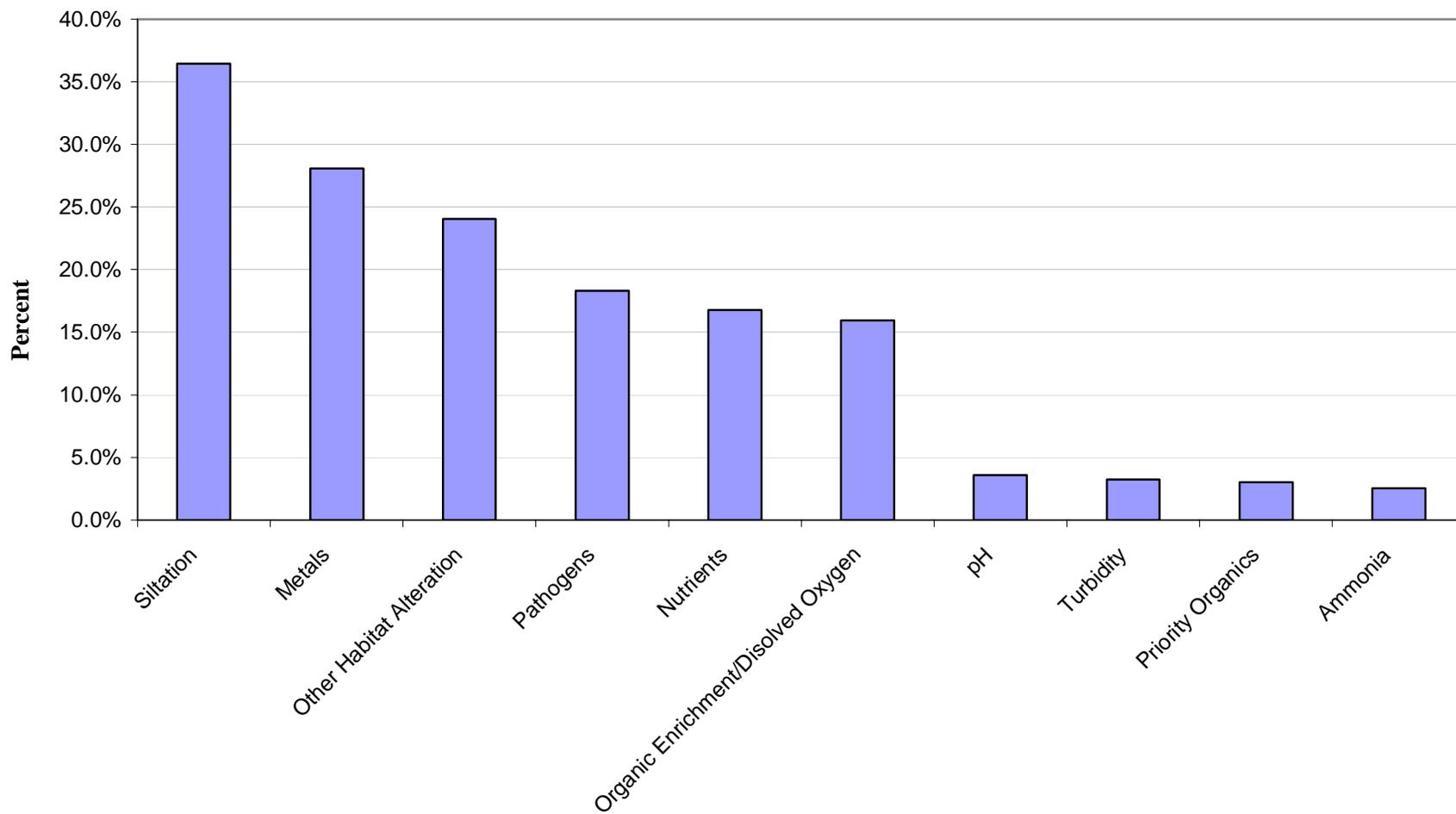
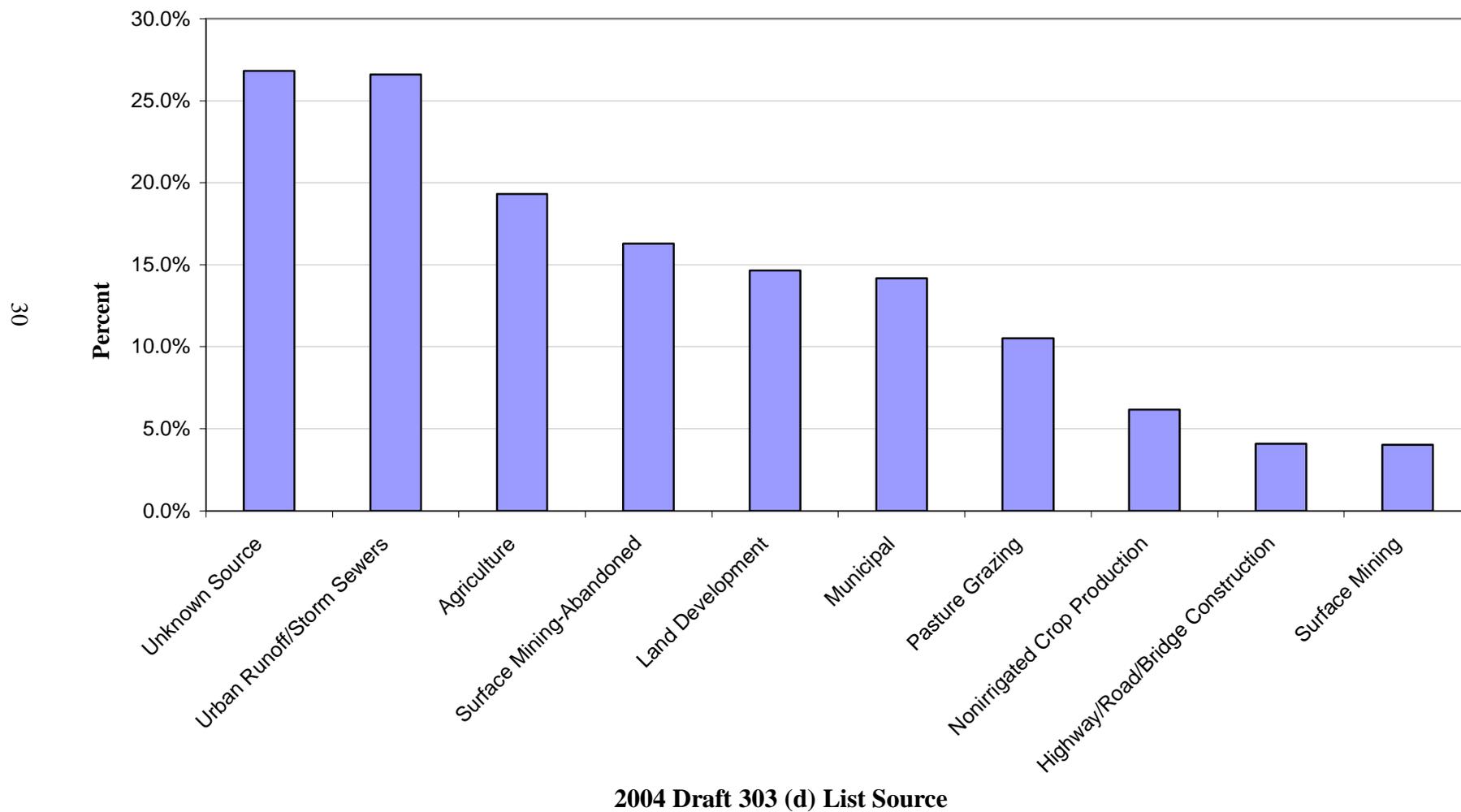


Figure 2-5
Source
Percent of Total Draft 2004 303(d) River and Stream Miles



Part 3 Lakes

3.1 Reservoir Water Quality Program

Section 314 (a) (2) of the Clean Water Act, as amended by the Water Quality Act of 1987, requires states to conduct assessments of publicly-owned lake water quality and report the findings as part of the biennial §305(b) Water Quality Report to Congress. The assessment process is conducted through the use of federal and matching funding, including that available pursuant to Sections 106 and 319 of the Act.

The Department has defined publicly-owned lakes/reservoirs as those that are of a multiple-use nature, publicly accessible, and exhibit physical/chemical characteristics typical of impounded waters. Lakes designated strictly for public water supply, privately owned lakes, or lakes managed by the Alabama Department of Conservation and Natural Resources (ADCNR) strictly for fish production are not included in this definition. Lakes currently meeting the above definition are included in the tables that follow.

In 1985, the need for information on the trophic state of Alabama's publicly-owned lakes led to the initial survey, conducted by the ADEM with the assistance of the U.S. Environmental Protection Agency Region IV. During the survey, limited baseline data was collected and used to rank the lakes according to trophic condition.

In 1989, Clean Lakes Program funds enabled the ADEM to conduct required water quality assessments of thirty-four (34) publicly-owned lakes in the State and submit collected information as part of the 1990 Water Quality Report to Congress. Trophic state index (TSI) values calculated from data gathered for the water quality assessments indicated potentially significant increases when compared to the TSI values derived from the study conducted in 1985.

In 1990, the Reservoir Water Quality Monitoring (RWQM) Program was initiated by the Field Operations Division of ADEM. Objectives of the program are as follows:

- a) to develop an adequate water quality database for all publicly-owned lakes in the State;
- b) to establish trends in lake trophic status that can only be established through long-term monitoring efforts; and,
- c) to satisfy the requirement of Section 314(a)(1) of the Water Quality Act of 1987 that states conduct assessments of the water quality of publicly-owned lakes and report the findings as part of their biennial "Water Quality Report to Congress".

Acquiring this information enables the ADEM to determine lake water quality and identify lakes in which water quality may be deteriorating. Should a deterioration in water quality be indicated by collected data, a more intensive study of the lake can be instituted to establish the causes and extent of the deterioration.

From 1990-1992, thirty-one publicly-owned lakes in the State were monitored at least once. Lakes indicated to be use-threatened or impaired from previously collected data were monitored annually. Additional funding received in 1991 through the Clean Lakes Program allowed the expansion of the Program to include all of the thirty-two (32) publicly-owned lakes in the State, with the exception of those in the Tennessee River system. These reservoirs are monitored through the TVA Reservoir Vital Signs Program.

Beginning in 1994, the frequency of reservoir monitoring in the RWQM Program was increased to a minimum of once every two years so that the water quality database and trends in trophic status could be more rapidly developed. Lakes indicated to be use-threatened or impaired continued to be monitored annually. Realignment of the reservoir sampling schedule was also initiated in 1994 so that reservoir sampling by basin could be instituted.

In 1997, intensive monitoring of reservoirs by basin was initiated, with spring season sampling for the RWQM Program discontinued to allow allocation of resources toward this effort. Intensive monitoring consists of monthly sampling of multiple mainstem and tributary embayment stations in each reservoir from April-October. Reservoirs intensively monitored to date are as follows:

- a) Coosa and Tallapoosa River Basin reservoirs, 1997;
- b) Black Warrior River Basin reservoirs, 1998;
- c) Chattahoochee and Conecuh River Basin reservoirs, 1999;
- d) Coosa, Tallapoosa, and Alabama River Basin reservoirs, 2000;
- e) Tombigbee and Escatawpa reservoirs, 2001;
- f) Black Warrior River Basin reservoirs, 2002; and,
- g) Tennessee River Basin tributary embayments, 2003.

Initiated in 1989, water quality monitoring of lakes of the Tennessee River system continues through the Tennessee Valley Authority (TVA) Reservoir Vital Signs Monitoring Program. The Program provides results of its monitoring activities to the ADEM on an annual basis through Program reports. Activities of the Program are based on the examination of appropriate physical, chemical, and biological indicators in the forebay, mid-region, and headwater areas of each lake. Objectives of the Program are to provide basic information on the “health” or integrity of the aquatic ecosystem in each TVA lake and to provide screening level information describing how well each reservoir meets the “fishable” and “swimmable” goals of the Clean Water Act. Table 3-1 shows Overall Use Support Summary for Lakes and Reservoirs (acres). Figure 3-1 shows Publicly Accessible Reservoirs of Alabama.

Table 3-1
Overall Use Support Summary for Lakes and Reservoirs (acres)

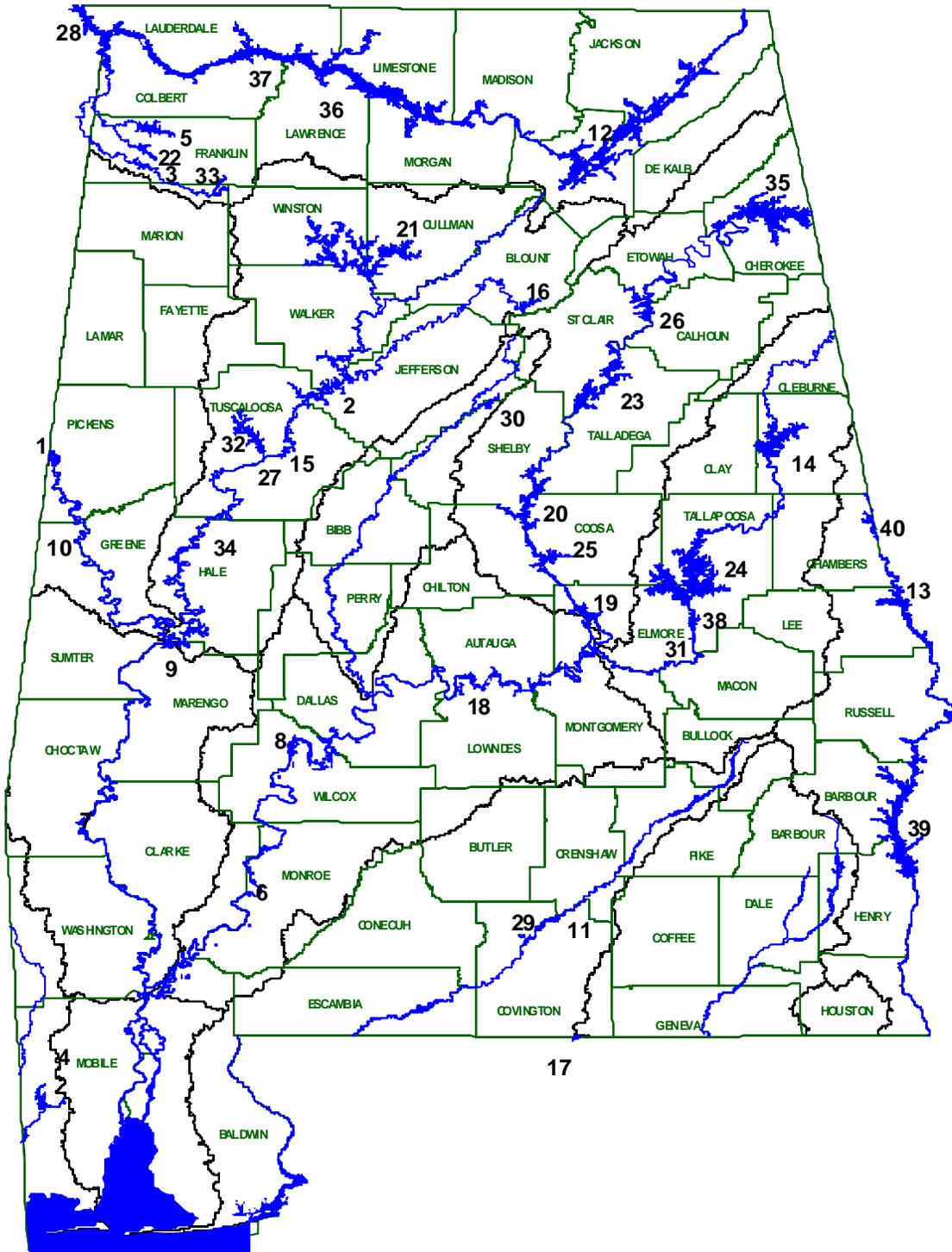
Degree of Use Support	Assessment Category		Total Assessed
	Monitored	Evaluated	
Size Fully Supporting	218,438	0	218,438
Size Not Supporting	66,832	0	66,832
TOTAL ASSESSED	285,270	0	285,270

3.2 Trophic Status

In the RWQM Program, the ADEM uses Carlson’s trophic state index (TSI) for determination of the trophic state of Alabama lakes. Carlson suggests the use of chlorophyll a concentrations in calculations of the trophic state of lakes during the summer months. Using chlorophyll a concentrations to determine trophic state is considered to give the best estimate of the biotic response of lakes to nutrient enrichment when phytoplankton is the dominant plant community.

Carlson’s TSI provides the limnologist and the public with a single number that serves as an indicator of trophic status of a lake but does not necessarily define it. Lakes with a TSI of seventy (70) or greater are generally considered to be hypereutrophic and in need of regulatory action appropriate for protection and restoration. A TSI of fifty (50) to seventy (70) indicates eutrophic conditions in a lake. Trophic state index values from forty (40) to fifty (50) indicate mesotrophic conditions. Oligotrophic conditions are indicated by TSI values less than forty (40). The number and surface area of lakes for each trophic classification appear in Table 3-2, which was developed using current monitoring data. Figure 3-2 shows Lake and Reservoir Trophic State Index Values (August Forebay and Trophic State). Table 3-4 shows Reservoir and Lake Trophic Status. Figures 3-3 through 3-28 shows Trophic State Index Graphs.

**Figure 3-1
Publicly Accessible Reservoirs of Alabama**



- 1) Aliceville
- 2) Bankhead
- 3) Bear Creek
- 4) Big Creek
- 5) Cedar Creek
- 6) Claiborne
- 7) Coffeerville
- 8) Dannelly
- 9) Demopolis
- 10) Gainesville
- 11) Gantt
- 12) Guntersville
- 13) Harding
- 14) Harris
- 15) Holt
- 16) Inland
- 17) Jackson
- 18) Jones Bluff
- 19) Jordan
- 20) Lay
- 21) Lewis Smith
- 22) Little Bear Creek
- 23) Logan-Martin
- 24) Martin
- 25) Mitchell
- 26) Neely Henry
- 27) Oliver
- 28) Pickwick
- 29) Point A
- 30) Purdy
- 31) Thurlow
- 32) Tuscaloosa
- 33) Upper Bear Creek
- 34) Warrior
- 35) Weiss
- 36) Wheeler
- 37) Wilson
- 38) Yates
- 39) W. F. George
- 40) West Point

**Table 3-2
Trophic Status of Significant Publicly Owned Lakes**

	Number of Lakes	Acreage of Lakes
Total	41	481,757
Assessed	32	285,270
Oligotrophic	1	585
Mesotrophic	8	86,715
Eutrophic	23	197,970
Hypereutrophic	0	0
Dystrophic	0	0
Unknown	9	196,487

3.3 Control Methods

The ADEM has not defined control methods specifically for lakes. Instead, the pollution controls of ADEM’s Point Source Program (NPDES permitting) and the Nonpoint Source Program are applicable for all of the State’s surface waters.

3.4 Restoration Efforts

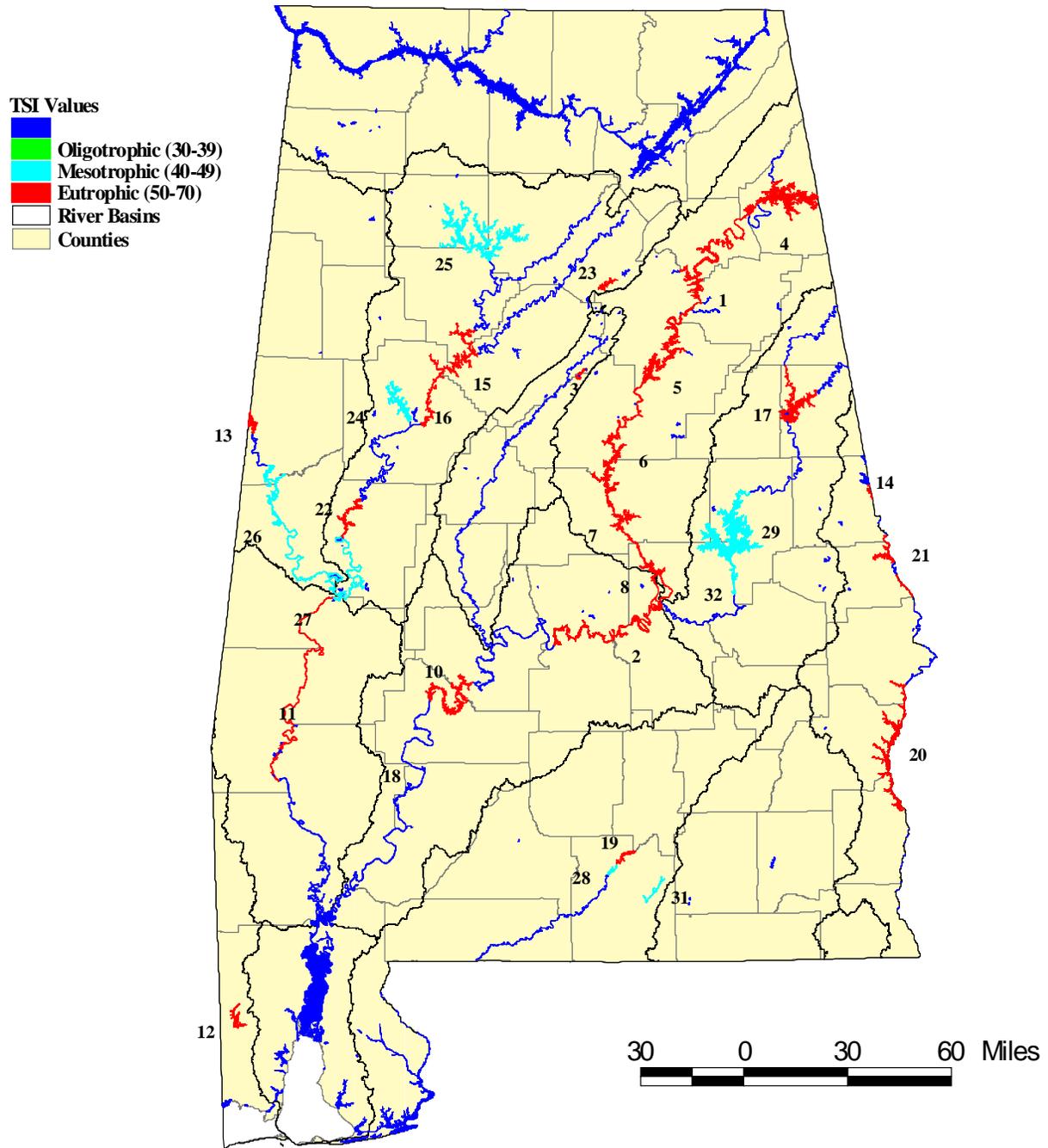
Water quality data collected by the RWQM Program enabled the ADEM to determine lakes in need of Clean Lakes Program Phase I Diagnostic/Feasibility Studies. All Clean Lakes Program Phase I Diagnostic/Feasibility Studies were conducted through cooperative agreements between ADEM and Auburn University. A list of the Clean Lakes Program Projects of Alabama appears in Table 3-3. Table 3-10 shows State Owned and Operated Public Fishing Lakes.

3.5 Impaired Lakes

Cause categories for lake waters not fully supporting uses and for lake waters considered threatened appear in Tables 3-5. Summary information on support of individual uses of lakes appears in Table 3-12. Source categories for lake waters not fully supporting uses appear in Table 3-6.

Water quality data collected by the RWQM Program, Clean Lakes Program Phase I Studies, TVA Reservoir Monitoring Program, and ADEM intensive reservoir surveys were used for determination of use support status. Available data from each reservoir was examined for repeated violations of specific water quality criteria established by the ADEM and evaluated with adherence to the Guidelines For Preparation of the State Water Quality Assessments (305(b) Reports). Waters affected by health advisories related to fish consumption were determined to be either partially supporting or not supporting. This determination was dependent upon whether advisories specified limited consumption or no consumption of a particular species as directed in the guidelines entioned bove

Figure 3-2
Lake and Reservoir Tropic State Index Values
(August Forebay and Tropic State)



**Table 3-3
List of Clean Lakes Program Projects**

Name of Project	Type of Project	Federal Funding	Problems Addressed	Management Measures Proposed or Undertaken
West Point Reservoir	Phase I	100,000	Diagnostic/Feasibility	See Report
W.F. George Reservoir	Phase I	70,000	Diagnostic/Feasibility	See Report
Neely Henry Reservoir	Phase I	92,000	Diagnostic/Feasibility	See Report
Weiss Reservoir	Phase I	142,583	Diagnostic/Feasibility	See Report
Smith Reservoir	Phase I	93,000	Diagnostic/Feasibility	See Report

**Table 3-5
Total Sizes of Waters Not Fully Supporting Uses for Lakes
(By Causes)**

Causes	Acres
Ammonia	0
Nutrients	65, 820
Dissolved Oxygen	37, 195
Pathogens	0
Pesticides	65
pH	9, 071
Priority organics	53, 574
Siltation	440
Thermal modifications	0

**Table 3-6
Total Sizes of Waters Not Fully Supporting Uses for Lakes
(By Sources)**

Source Category	Acres
Industrial Point Sources	9, 735
Municipal Point Sources	9,735
Combined Sewer Overflows	0
Agriculture	224
Silviculture	0
Urban Runoff/Storm Sewers	20, 875
Resource Extraction	440
Land Disposal	0
Hydromodification/Habitat Modification	65,596
Contaminated Sediments	30, 864
Unknown Source	0
Natural Sources	0
Wildlife	0

**Table 3-4
Reservoir and Lake Trophic Status***

Trophic State Designation	Index	Reservoir	River Basin	August TSI Value	August TSI Year	*Average TSI Value
Eutrophic	1	Neely Henry	Coosa	67	2002	64
	2	Woodruff	Alabama	64	2002	58
	3	Purdy	Cahaba	64	2003	57
	4	Weiss	Coosa	61	2003	64
	5	Logan Martin	Coosa	60	2002	59
	6	Lay	Coosa	59	2002	59
	7	Mitchell	Coosa	59	2002	58
	8	Jordan	Coosa	59	2002	55
	9	Dannelly	Alabama	58	2003	56
	10	Oliver	Warrior	56	2003	54
	11	Coffeetown	Tombigbee	56	2003	52
	12	Big Creek	Escatawpa	56	2003	50
	13	Aliceville	Tombigbee	55	2003	57
	14	West Point	Chattahoochee	55	2003	53
	15	Bankhead	Warrior	54	2003	51
	16	Holt	Warrior	53	2003	52
	17	Harris	Tallapoosa	53	2003	47
	18	Claiborne	Alabama	52	2003	53
	19	Gantt	Conecuh	52	2003	46
	20	W.F. George	Chattahoochee	51	2003	55
	21	Harding	Chattahoochee	51	2003	53
	22	Warrior	Warrior	50	2003	53
	23	Inland	Warrior	50	2003	42
Mesotrophic	24	Tuscaloosa	Warrior	48	2003	41
	25	Smith	Warrior	47	2002	43
	26	Gainesville	Tombigbee	46	2003	53
	27	Demopolis	Tombigbee	46	2003	51
	28	Point A	Conecuh	46	2003	48
	29	Martin	Tallapoosa	46	2003	41
	30	Yates	Tallapoosa	45	2002	43
	31	Jackson	Yellow	44	2003	44
Oligotrophic	32	Thurlow	Tallapoosa	38	2002	35

*Average values (1985-present) from dam forebay stations during August/September.

Average values may not reflect a lake's current trophic state.

Oligotrophic < 40 Mesotrophic 40-49 Eutrophic 50-69 Hypereutrophic > 69

3.6 Toxic Effects on Lakes

Lake-specific monitoring information for toxic pollutants is limited. Point source control efforts are directed at the source of toxic pollutants through NPDES permitting programs. Total lake acres affected by toxicants appear in Table 3-11. Lake acreage monitored for toxicants consists of lakes for which fish have been collected and analyzed through the ADEM Fish Tissue Monitoring Program and the TVA Reservoir Program. Lake acreage with elevated levels of toxicants consists of lake areas upon which health advisories have been instituted that relate to consumption of fish contaminated with certain priority pollutants.

Fish will continue to be collected from major lakes, rivers, and certain waterbodies of concern and analyzed for toxic pollutants as part of the ADEM Fish Tissue Monitoring Program. Fish tissue sampling results are contained in the Fish Tissue Monitoring section of Part V Public Health Information.

3.7 Acid Effects on Lakes

The number and acreage of lakes affected by acidity appear in Table 3-7. The number and acreage of lakes affected by sources of high acidity appear in Table 3-8. No reservoirs monitored by the ADEM have been determined to be impacted by high acidity based on data collected through the RWQM Program. However, the following reservoirs are considered vulnerable to acidity based on low alkalinities and pH values observed in monitoring data that were near limits of specific ADEM water quality criteria: Big Creek; Inland; Jackson; Point A; Smith; and Tuscaloosa. Low pH values measured in Big Creek, Jackson, and Point A Reservoirs are determined to be of natural origin and are considered unlikely to cause adverse impacts. In the case of both Smith and Tuscaloosa Reservoirs, mining activities in the watershed were also considered in determining the vulnerability of the reservoirs to acid effects.

3.8 Trends

Trend information is included in Table 3-9. Trends were determined by reviewing three (3) or more years of water quality data from multiple sources, if available, for each reservoir during the period 1985 to 2003.

The reservoirs considered to be degrading were listed based on data collected through the RWQM Program.

Assignment of a particular reservoir to the “Stable” category does not necessarily indicate desirable water quality but only that the water quality appears stable.

Future data collection is critical in further establishing trends in water quality of reservoirs in the State.

**Table 3-7
Lakes Affected By Acidity**

	Number of Lakes	Acreage of Lakes
Assessed for Acidity	41	481,757
Impacted by High Acidity	0	0
Vulnerable to Acidity	6	33,030

**Table 3-8
Sources of High Acidity in Lakes and Reservoirs**

Source	Number of Lakes Impacted	Acreage of Lakes Impacted
Acid Deposition	0	0
Acid Mine Drainage	0	0
Natural Sources	0	0
Other (list)	0	0

**Table 3-9
Status of Trends for Lakes and Reservoirs**

	Number of Lakes	Acreage of Lakes
Assessed for Trends	32	285,270
Improving	0	0
Stable	30	271,710
Degrading	2	13560
Trend Unknown	0	0

**Table 3-10
State Owned and Operated Public Fishing Lakes**

County	County Fishing Lakes	Acres	County	County Fishing Lakes	Acres
Barbour Co.	Barbour Co. Lake	75	Fayette Co.	Fayette Co. Lake	60
Bibb Co.	Bibb Co. Lake	100	Geneva Co.	Geneva Co. Lakes	65
Chambers Co.	Chambers Co. Lake	183	Lamar Co.	Lamar Co. Lake	68
Clay Co.	Clay Co. Lakes	74	Lee Co.	Lee Co. Lake	130
Coffee Co.	Coffee Co. Lake	80	Madison Co.	Madison Co. Lake	105
Crenshaw Co.	Crenshaw Co. Lake	53	Marion Co.	Marion Co. Lake	37
Dale Co.	Dale Co. Lake	92	Monroe Co.	Monroe Co. Lake	94
Dallas Co.	Dallas Co. Lake	100	Pike Co.	Pike Co. Lake	45
DeKalb Co.	DeKalb Co. Lake	120	Walker Co.	Walker Co. Lake	163
Escambia Co.	Escambia Co. Lake	184	Washington Co.	Washington Co. Lake	84
Totals				20 State Fishing	1,061

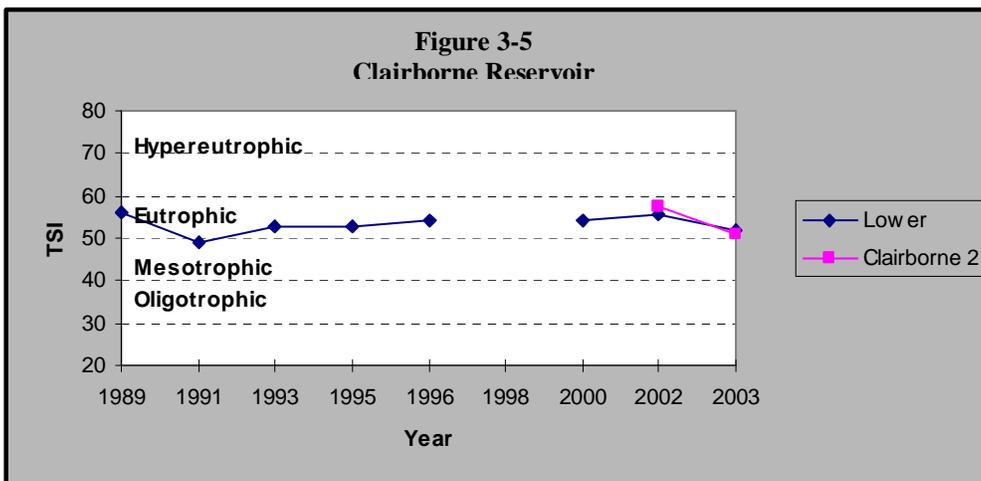
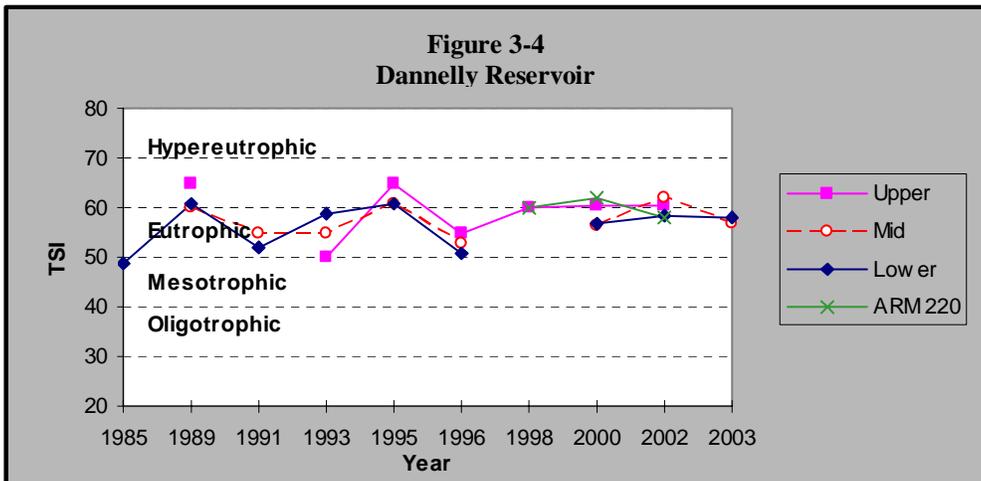
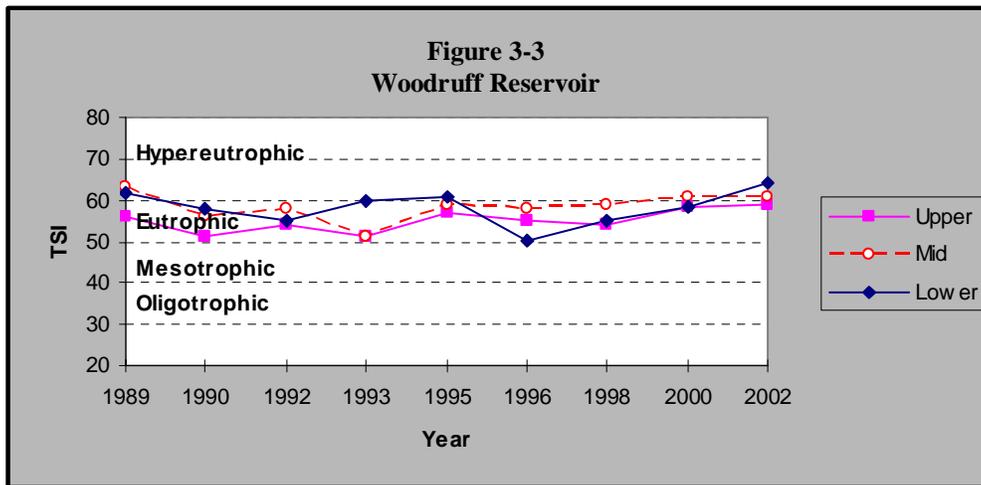
**Table 3-11
Total Reservoir Size Affected by Toxicants**

Waterbody	Size Monitored for Toxicants	Size with Elevated Levels of Toxicants
Rivers (miles)		
Lakes (acres)	339,406	66,832
Estuaries (sq. miles)		
Coastal waters (miles)		
Freshwater wetlands (acres)		
Tidal wetlands (acres)		

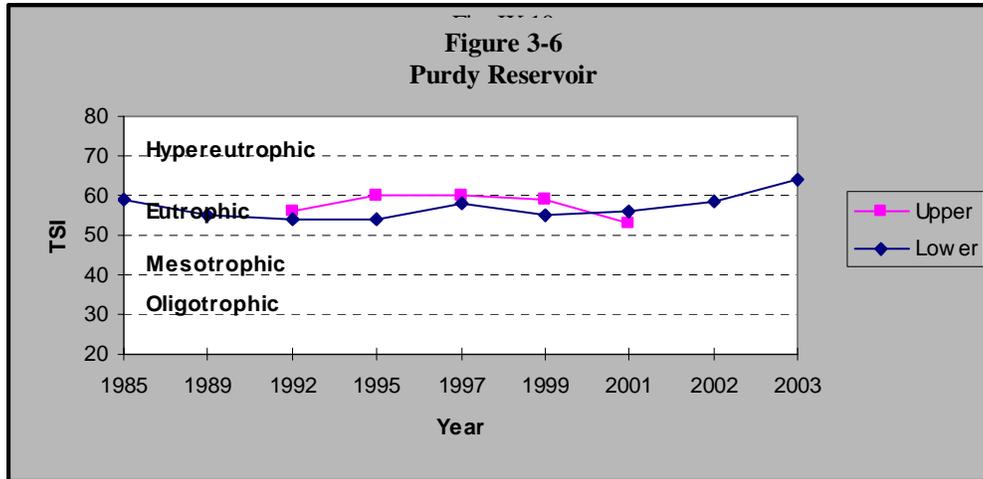
For Lake-specific information contact Mr. Fred Leslie at (334) 260-2752 or at fal@adem.state.al.us

Trophic State Index Graphs

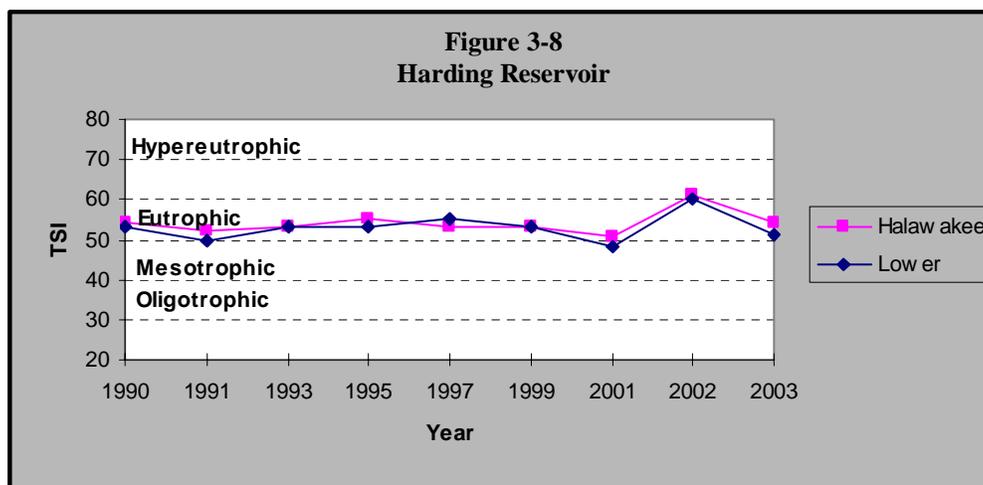
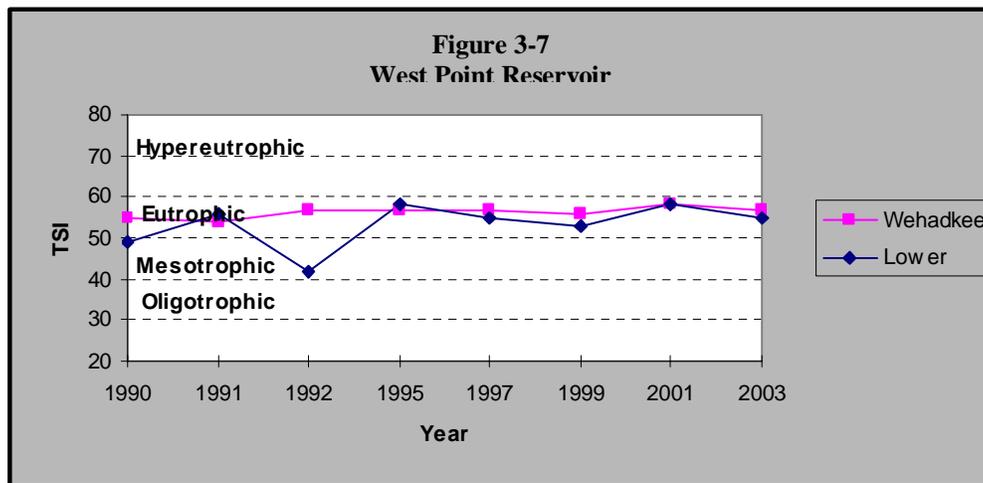
Alabama River Basin



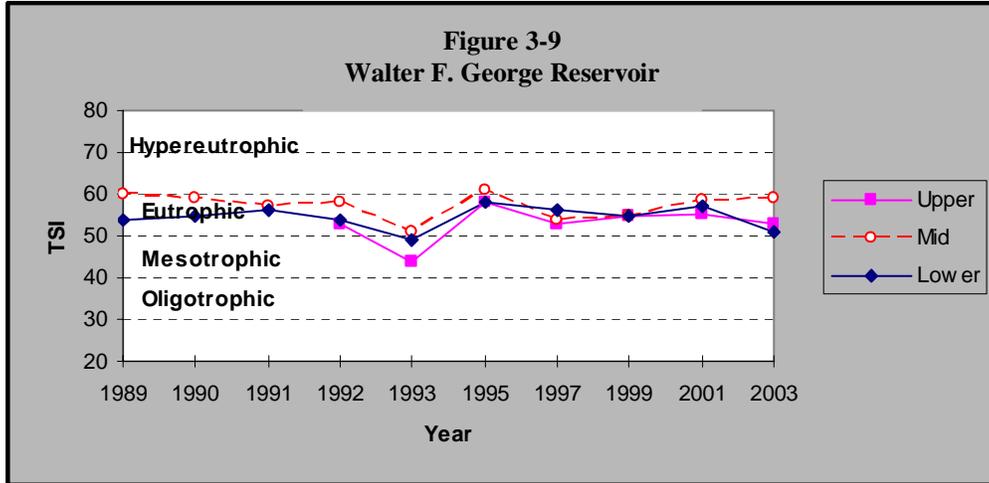
Cahaba River Basin



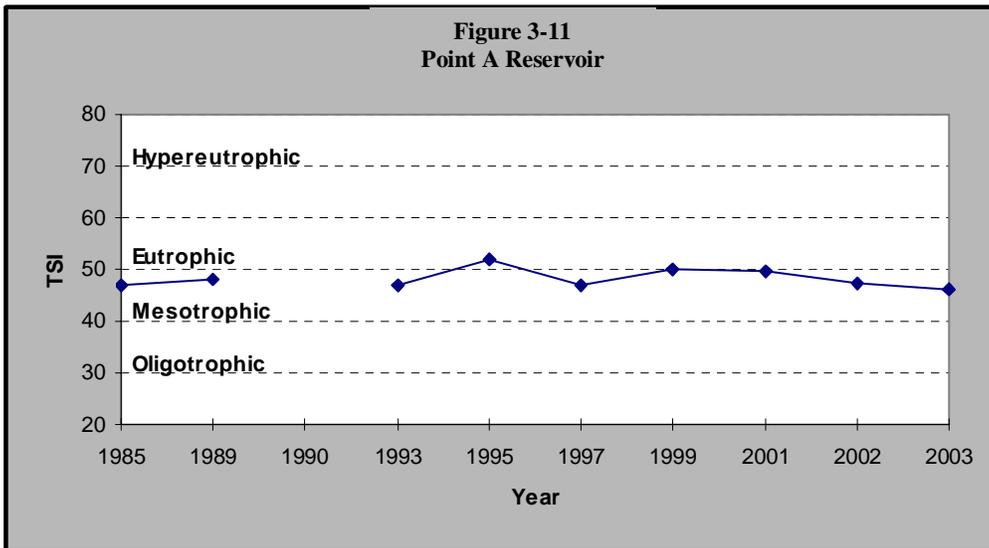
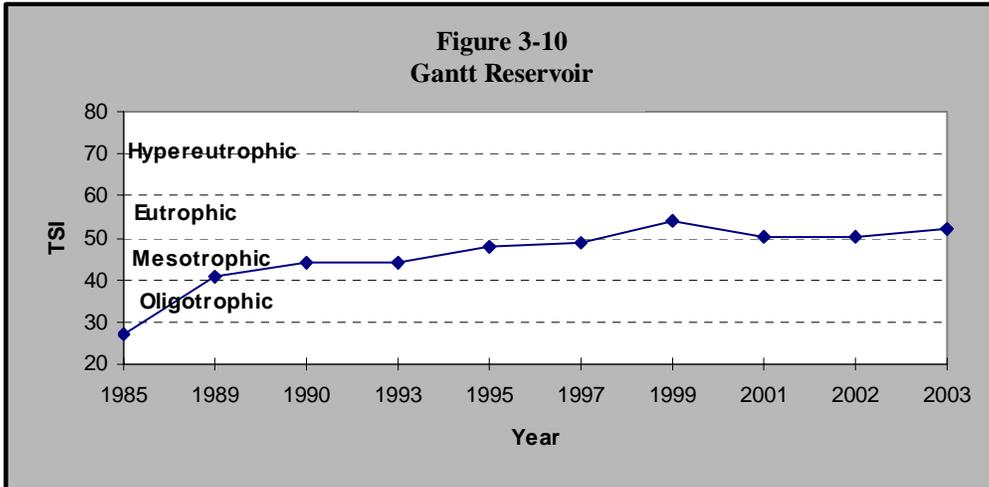
Chattahoochee River Basin



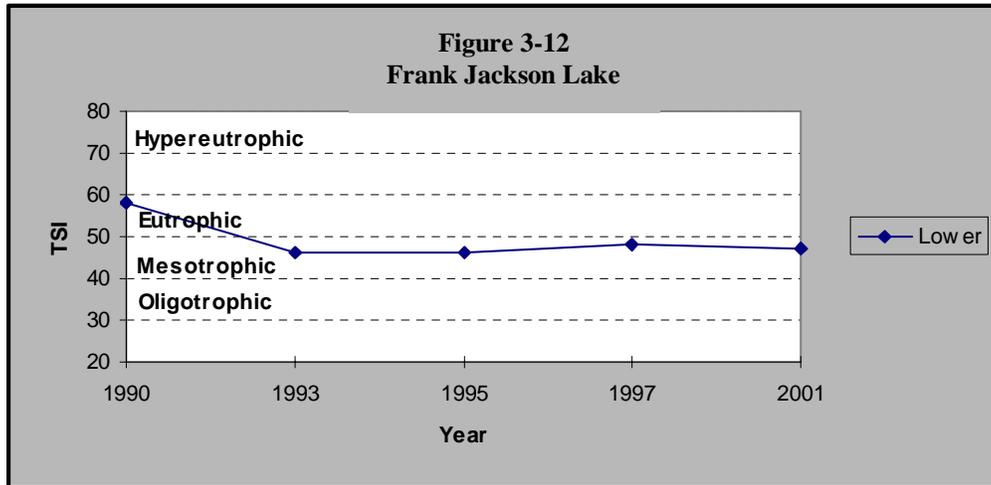
Chattahoochee River Basin (cont.)



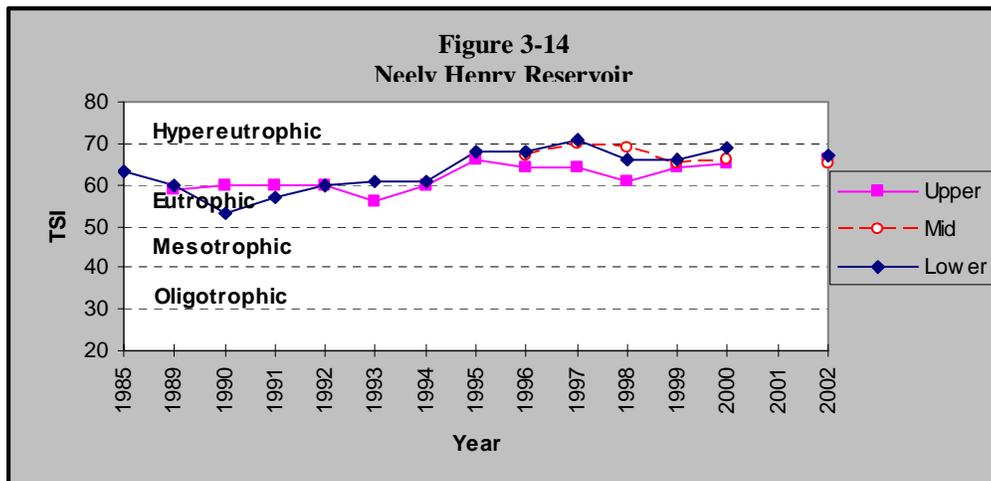
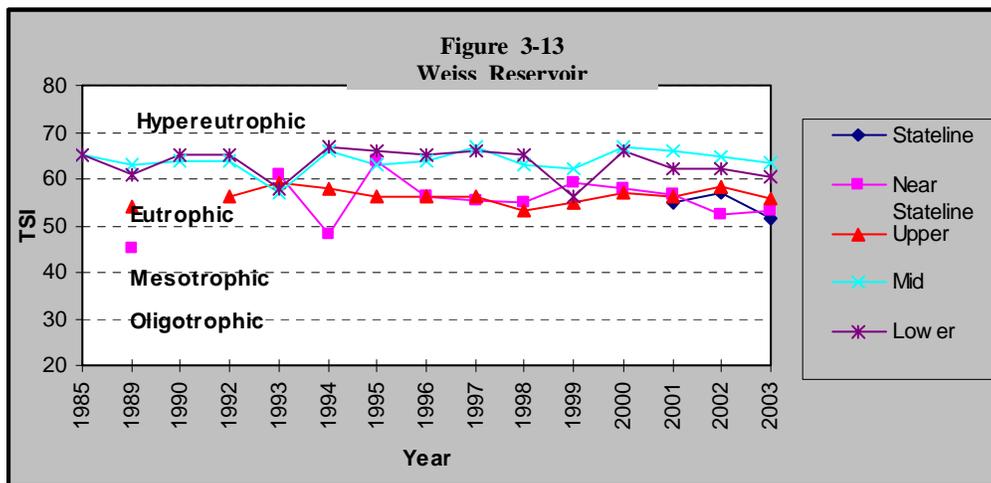
Conecuh River Basin



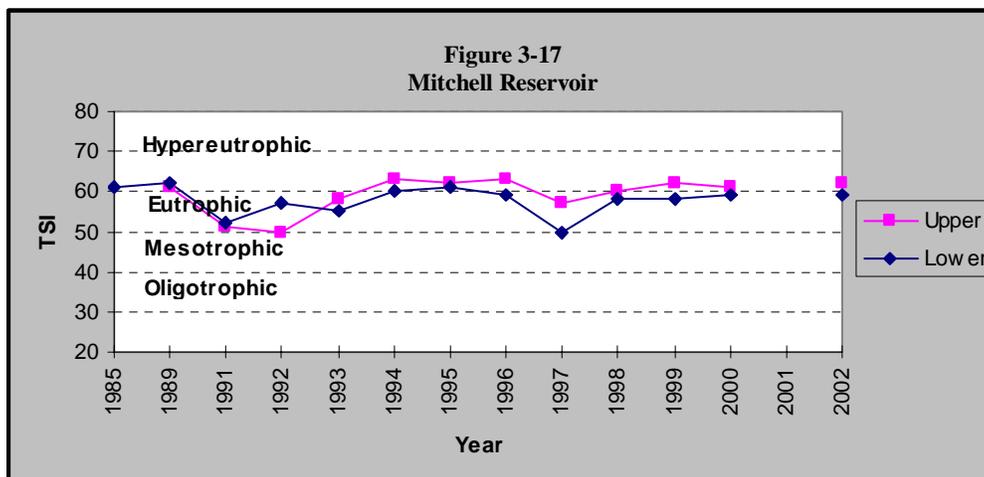
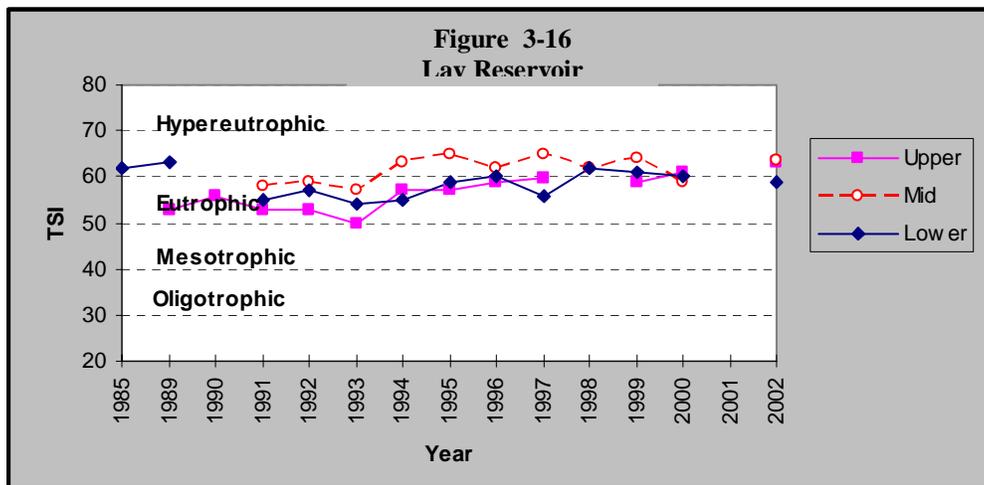
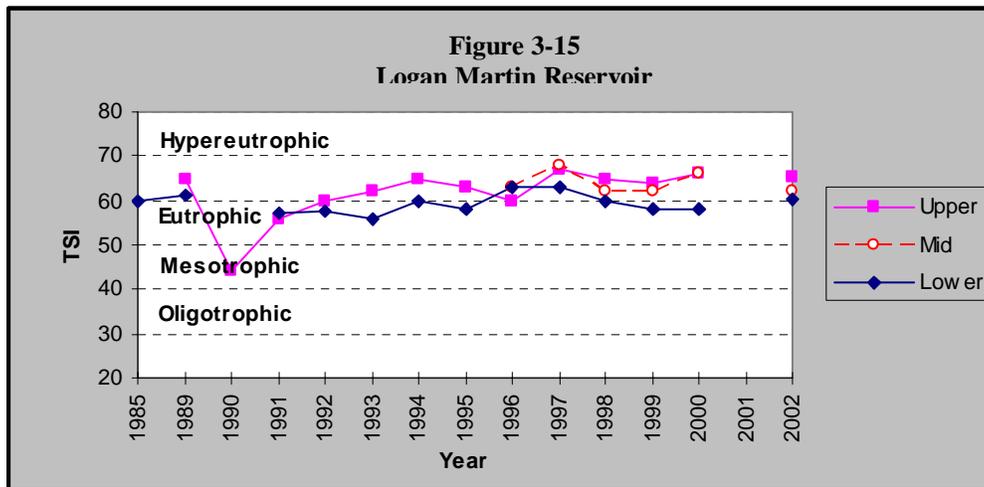
Conecuh River Basin (cont.)



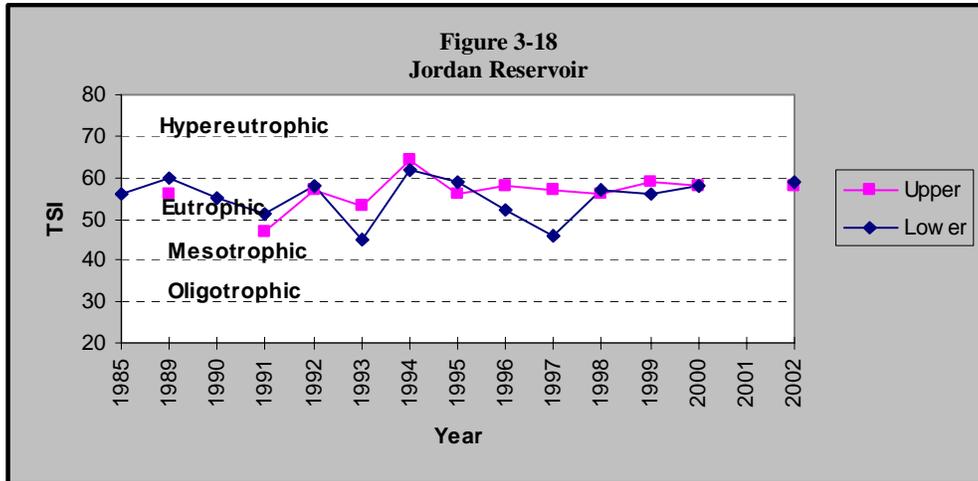
Coosa River Basin



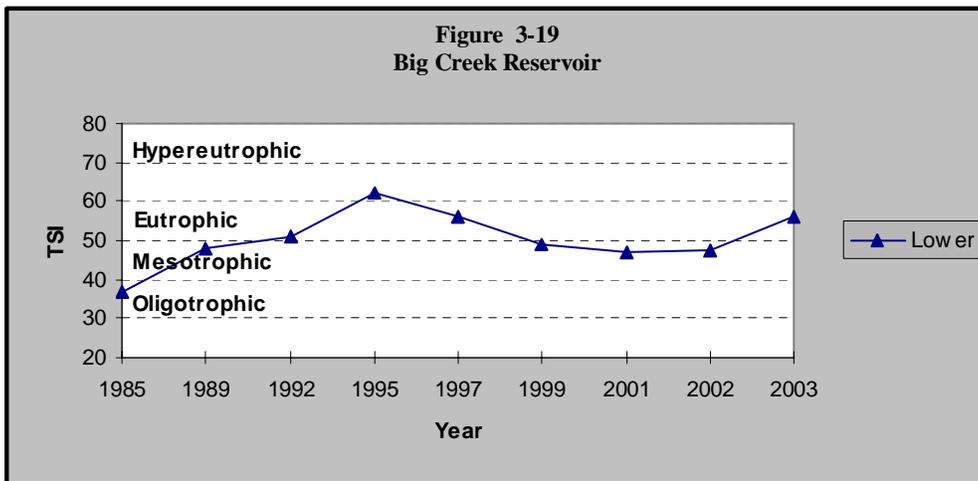
Coosa River Basin (cont.)



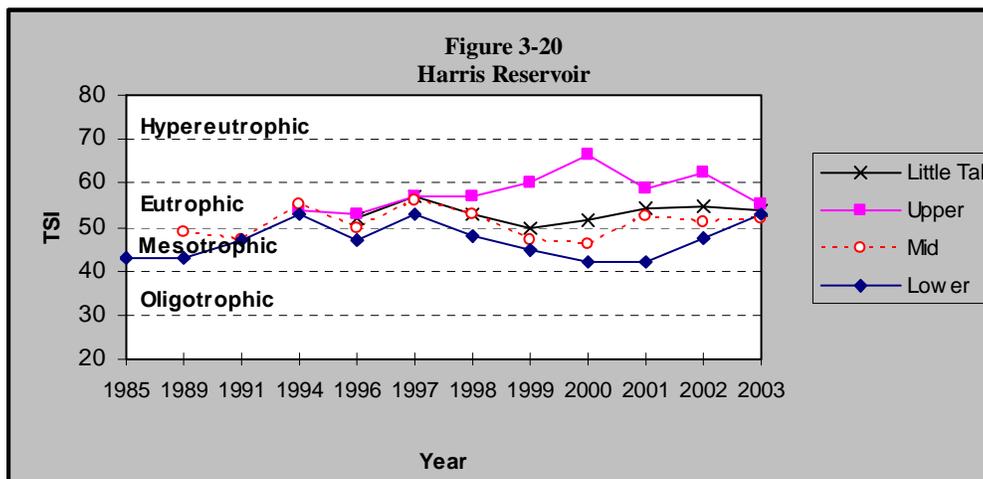
Coosa River Basin (cont.)



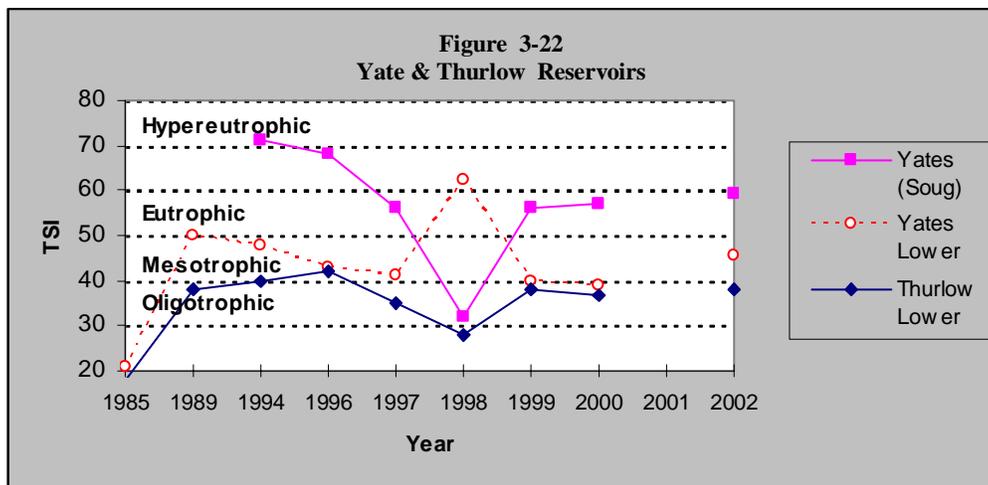
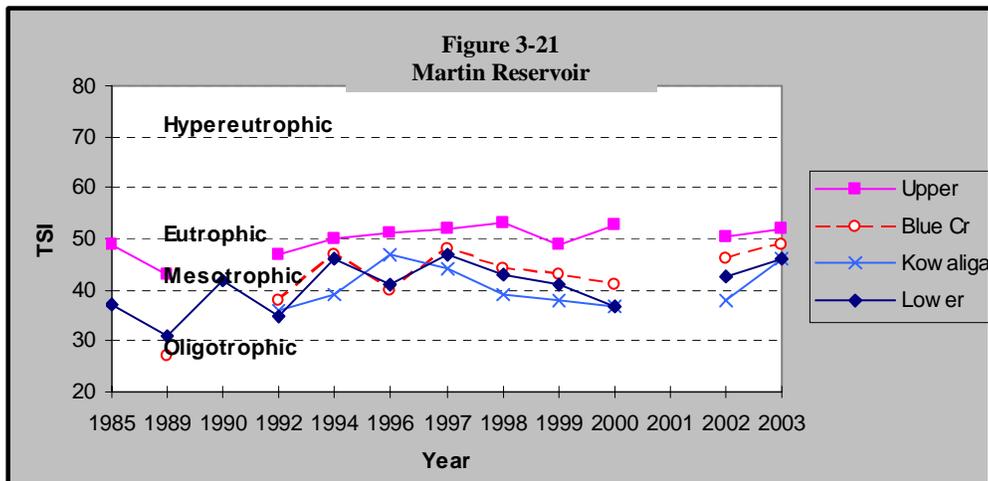
Escatawpa River Basin



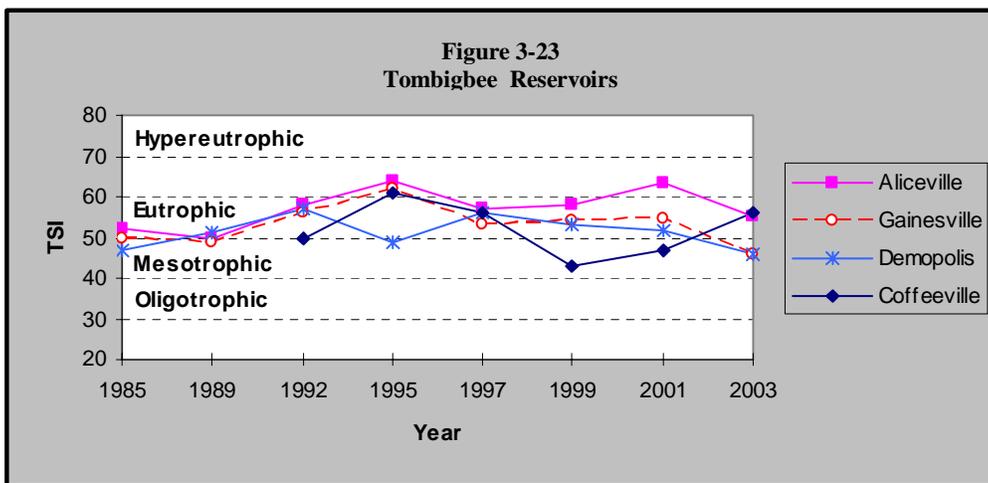
Tallapoosa River Basin



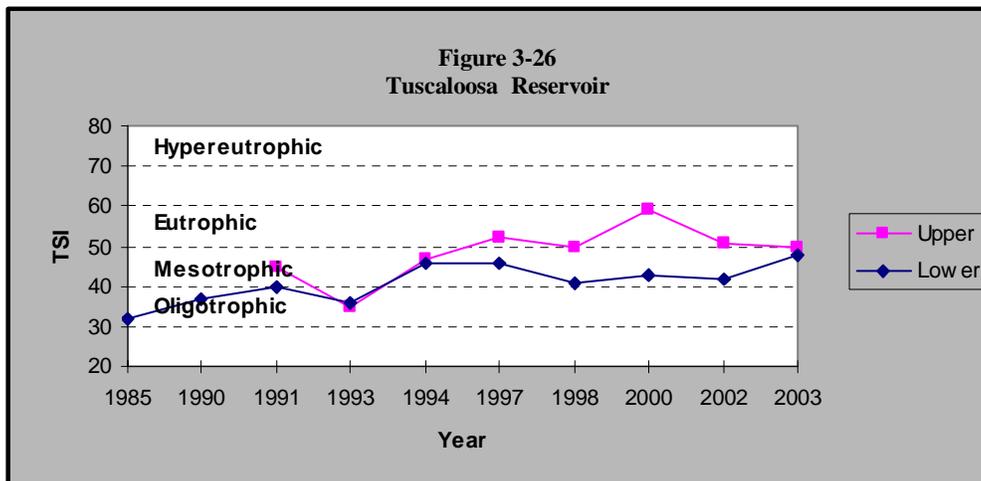
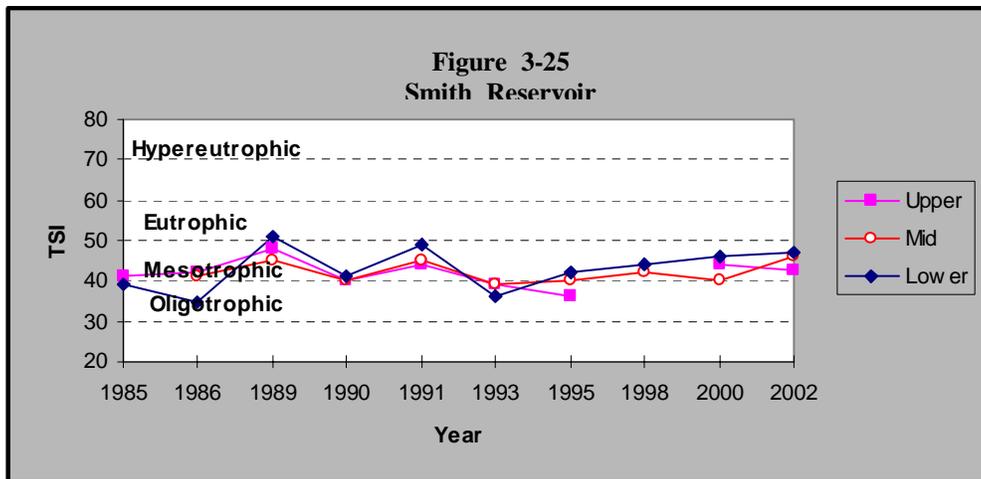
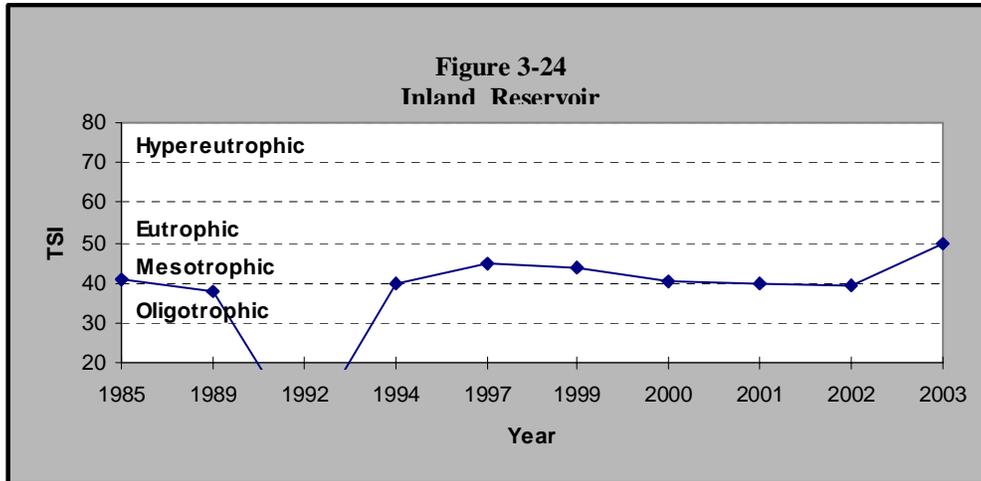
Tallapoosa River Basin (cont.)



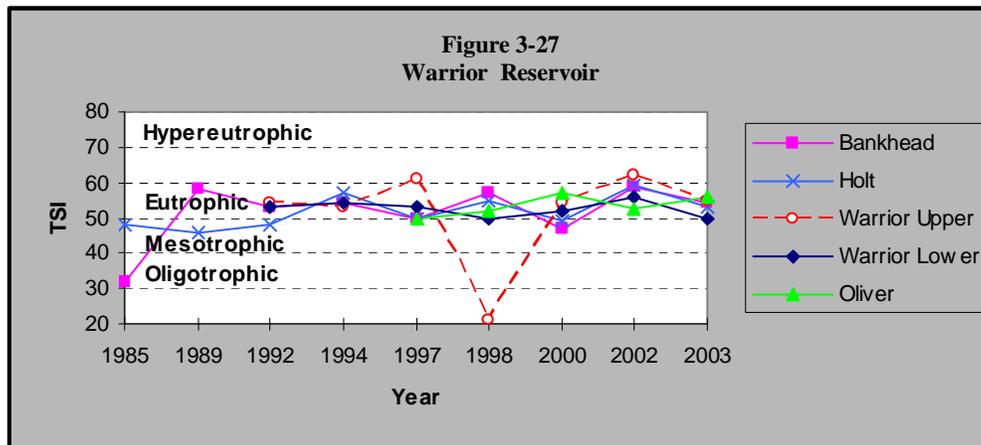
Tombigbee River Basin



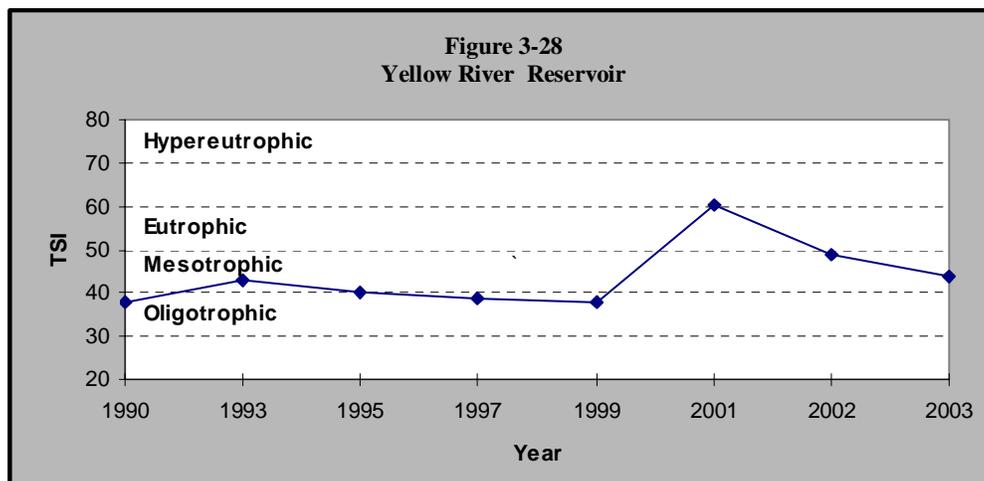
Warrior River Basin



Warrior River Basin (cont.)



Yellow River Basin



Part 4 Wetlands

4.1 Alabama Coastal Counties Wetland Management Plan

The Alabama Coastal Nonpoint Source Pollution Control Program (ACNPCP) has participated in the development of a “Alabama Coastal Counties Wetland Conservation Plan”, which is due for release in March, 2001. ADEM Coastal Programs has received a Wetland Restoration Grant to implement restoration strategies and address State lands within the ACNPCP Management Area. ADEM Coastal Programs participates in the development and approval of wetland mitigation banks. Three local banks, totaling over 3,000 acres of wetlands, service the ACNPCP Management Area. Additionally the Alabama Department of Public Health has promulgated new rules effective January 2000, which prohibit the placement of onsite sewage disposal systems in flood prone, wetlands or hydric soil areas. This new rule is currently being tested in Baldwin County, Alabama.

The following narrative through page 10 contains the specifics of the FY2000 Wetland Restoration Grant.

A. Project Cooperators The Wetland Restoration Grant involves the following Agency and Public/Private Partnerships.

1. Regional, State and local agencies

- Alabama Department of Economic and Community Affairs (Coastal Programs, Team Member)
- Alabama Department of Environmental Management (Co-lead Coordination, Coastal Programs, CZARA/6217, Education and Outreach, Team Member)
- Alabama Department of Transportation (Technical Support)
- Alabama Dept. of Conservation & Natural Resources - Lands Division (Co-lead Coordination, Team Member, Technical Support, Restoration)
- Baldwin County Commission (Team Member, Technical Support)
- Baldwin County Soil and Water Conservation District (Team Member, Technical Support)
- Mobile Bay National Estuary Program (Team Member, Education and Outreach)
- Natural Resources Conservation Service (Team Member, Technical Support)
- The Nature Conservancy - Natural Heritage Program (Team Member, Technical Support)
- U.S. Army Corps of Engineers (Team Member, Technical Support)
- U.S. Fish and Wildlife Service (Team Member, Technical Support)
Weeks Bay Watershed Project Coordinator (Team Member, Outreach and Education)

2. Public/Private Partnerships:

- Weeks Bay Watershed Project Citizen Advisory Committee (Team Member, Education and Outreach, Technical Support)
- Wolf Bay Watershed Watch (Team Member, Education and Outreach)

B. Targeted Area

With a current population estimated at 150,000 citizens, Baldwin County is one of the fastest population growth areas in Alabama (e.g., growth rate of approximately 26% from 1990-1996). The urban development boom is not expected to slow in this highly desirable area on the Gulf Coast. Indeed, the rate of wetland loss or degradation is expected to parallel the

continued increase in development since waterfront and coastal areas are prime real estate development locations.

This project targets restoration and protection of priority tracts in approximately 50,000 acres of wetlands in Baldwin County as identified by USDA hydric soils maps. Many waterways in the project area are listed on the State of Alabama's latest CWA Section 303(d) list as impaired and include: Fish River, Magnolia River, Bon Secour Bay, and Mobile Bay. Surface water quality problems are generally attributed to runoff or nonpoint source pollution and include urban development, agriculture, dirt roads, and malfunctioning septic systems. Pollutants of concern include sediment, nutrients, pesticides, and bacteria.

A new Alabama Department of Transportation bridge is under construction in the Wolf Bay watershed. This bridge and the resulting connecting network of roads and associated transportation corridors dramatically increase the need for wetland protection and restoration in this ecologically sensitive area. The Wolf Bay and Weeks Bay Watersheds currently benefit from active grassroots stakeholder support dedicated to the protection of water quality and natural resources.

C. Area Significance

The U.S. EPA - Region 4 has identified the Mobile Bay coastal drainage area as a wetland restoration priority area. In addition, the Gulf of Mexico Program has identified the Mobile Bay area as a priority area for water quality and habitat improvement projects as well as for projects that will decrease nutrient loading. The Baldwin County Soil and Water Conservation District's Community Based/Locally Led Conservation Watershed Assessment have listed the Fish River (Weeks Bay Watershed), Wolf Creek Watershed, and Mobile Bay as critical need watershed protection priority areas. Weeks Bay is a Gulf of Mexico GEMs site and has been designated as an Outstanding National Resource Water (February 1992).

The Alabama Forever Wild Program, administered by the State Lands Division (ADCNR), recently allocated over \$15 million to acquire pristine and impaired wetlands within the Mobile-Tensaw River Delta, an area nationally recognized as a National Natural Landmark by the National Parks Service. The majority of these wetlands encompass the Tensaw River/Lake Watershed, designated by ADEM as an Outstanding Alabama Waterway. This grant will provide wetland restoration and protection resources that will greatly enhance this significant and nationally recognized State of Alabama wetland acquisition effort.

Federally listed endangered species documented in coastal Baldwin County wetland areas include the Alabama red-bellied turtle (*Pseudemys alabamensis*) and the Alabama beach mouse (*Peromyscus polionotus ammobates*). Additionally, the federally threatened eastern indigo snake (*Drymarchon corais couperi*) and the flatwoods salamander (*Ambystoma cingulatum*) possibly occur in Baldwin County wetlands. An additional 57 plant and animal species are listed within the Mobile-Tensaw River Delta by the State Lands Division's Natural Heritage Section as being either State protected, federally listed under the Endangered Species Act, or recognized as rare.

D. Description

1. Wetland Identification

Wetland types identified in the Baldwin County Wetland Advanced Identification (BC ADID) include **riverine** (overbank flooding of associated rivers and streams), **fringe** (shoreline of coastal ecosystems, marshes), **flat** (wet pine flats, pine savannas, and pitcher plant bogs), and **depressional** (grady ponds or interdunal swales).

The BC ADID project also identified highly functioning wetlands and connecting corridors. Protection and enhancement will ensure maintenance of the beneficial wetland functions. Many of the lower functioning ability wetlands identified through the ADID project are also suitable for restoration or enhancement activities. The primary land use surrounding the lower functioning wetlands is agriculture. Landowners are likely to be receptive to wetland restoration activities on areas that are too wet to farm.

2. Priority Project Target Areas

Field efforts performed by the State Lands Division Team will focus on state lands (including submerged aquatic vegetation) in *four principal areas*:

1. Forever Wild Tracts within the Mobile-Tensaw Delta
2. Weeks Bay
3. Perdido Bay
4. Other Team prioritized candidate wetland restoration sites (e.g., Wolf Bay, Bon Secour Bay, Fort Morgan Peninsula, Gulf Shores State Park, etc.)

These four principal areas have been selected because they support both ecologically and economically significant wetlands. Examples of the wetland types located in these four areas are: red river hardwood bottomlands supporting sloughs, muck swamp, deepwater swamp, oxbow lakes, river levees and meander scrolls, first and second bottoms, and backswamp; black river hardwood bottomlands supporting sloughs, muck swamp, deepwater swamp, oxbow lakes, river levees and meander scrolls, first and second bottoms, and backswamp; deepwater swamp; muck swamp; piney wet flatwoods (pine savannahs); hardwood wet flatwoods (bay/gum heads); seepage slope bogs; freshwater marsh; salt marsh; submerged aquatic vegetation beds (seagrass); scrub-shrub bogs; citronelle ponds (grady ponds); and maritime forests supporting inter-dune swale wetlands.

National Wetlands Inventory mapping for state lands will be ground-truthed to insure that habitat-type identification was correctly designated. Additional review of pertinent wetland delineation and classification will be incorporated (e.g., review of NRCS hydric soil maps).

E. Estimation of Wetlands Acreage Needing Restoration

The following estimates of wetlands needing restoration on state lands in the four principal areas of Baldwin County are based on recent field reconnaissance, aerial photography, anecdotal observations, recent natural resource surveys/reports (Weeks Bay NERR), and interviews with local natural resource managers. It is important to emphasize that these data are preliminary estimates, based on the best available information. However, it is fully expected that as these state lands are more thoroughly investigated, via the identification, evaluation, and restoration recommendations phases of this project, actual acres requiring restoration will both increase and decrease within the four principal focus areas.

Best estimates of wetlands needing restoration on state lands in the four principal focus areas of Baldwin County, shown through NWI coverage's in the attached maps, are:

1. Forever Wild Tracts within the Mobile-Tensaw Delta presently identified as needing restoration - about *10,000 acres*. Property recently acquired from Kimberly-Clarke Corporation, which has historically been managed for timber production, has numerous stands/sites which support impaired wetlands. Alterations and impacts include ditched drains, altered hydrology resulting from forest roads, species monoculture, and unnatural species composition resulting from timber harvest and

random flood events during the growing season. For example, numerous stands in first and second bottoms were dominated by oak species prior to harvest, and began regenerating in oaks following harvest. Summer floods have resulted in high mortality of naturally regenerating oak saplings, and in-turn favored volunteer species such as cottonwood, ash and willow. Several stands which should be dominated by oak forest communities are presently dominated by the above mentioned three species, resulting in impaired natural communities and loss of species richness.

2. GIS coverages provided to SLD by Kimberly-Clarke Corporation allow for a partial delineation of recently harvested stands (see maps; delineated as "Stand Established," meaning the year re-growth began following harvest: 1985 to 1989- 3,040 acres; 1990 to 1994- 3,018 acres; 1995 to 1997- 2,386 acres [1997 partial data-set]). However, harvest data (GIS) for 1997 and 1998 was unavailable from Kimberly-Clarke Corporation. Data derived through the evaluation phase of this grant for stands harvested during 1997 and 1998 are likely to increase the present estimate of acres requiring restoration on these tracts. Such restoration will likely involve tree planting for community restoration from monocultural species composition, as well as reduction of exotic species (e.g., chinese tallow tree; leaves toxic to aquatic invertebrates).
3. Weeks Bay - over 2,000 acres of state lands (SLD and ADECA), as well as about 600 acres presently being considered for purchase by the Forever Wild Program. The predominant habitat within this area is classified by NWI maps (see attached GIS maps) as broad-leaved deciduous and needle-leaved evergreen forests (1,662 acres). This habitat is largely pine savannah being encroached by hardwood species because of a lack of naturally occurring fires and prescribed fires; an impaired wetland community. While prescribed burning will likely be a primary restoration activity, the extent of other anthropogenic alterations and impairments will be more fully understood following the evaluation phase of this grant proposal. Additional restoration may involve replanting sea-grass beds in adjacent waters (state of Alabama submerged lands managed by SLD).
4. Perdido Bay - 420 acres of Mental Health Trust Lands managed by SLD within Lillian Swamp, which are adjacent to 640 acres of an Alabama Department of Transportation Wetland Mitigation Bank (restoration plans presently being evaluated by ALDOT). The surrounding 2,600 acres of property is presently being reviewed by state and federal officials as an entrepreneurial Wetland Mitigation Bank. Thus restoration of impaired wetlands within the 420 acre tract managed by LD will compliment present state and private plans for wetland restoration within Lillian Swamp, an area identified in the 1992 Fish and Wildlife Service National Wetlands Priority Conservation Regional Plan as a major interior wetland area, and a priority wetland for Alabama, a declared GEMS Site, and identified as an ecologically significant wetland within the 1988 *Statewide Comprehensive Outdoor Recreation Plan* for Alabama. The extent of other anthropogenic alterations and impairments will be more fully understood following the project's evaluation phase. A primary restoration activity will likely involve development and implementation of a prescribed burning program within needle-leaved evergreen palustrine forests (pine savannah) and adjacent broad-leaved evergreen scrub-shrub (pitcher plant bogs) habitats. Additional restoration may involve replanting sea-grass beds in adjacent waters (State of Alabama submerged lands managed by SLD).
5. Other candidate sites include, but are not limited to, state lands within Wolf Bay, Bon Secour Bay, Fort Morgan Peninsula, and Gulf Shores State Park. Wolf Bay is an area with tremendous wetland acreage, but no state owned wetlands other than

submerged aquatic vegetation (SAV) within submerged lands of adjacent waters. Possible restoration activities for these candidate sites could include prescribed burning programs, replanting and posting sea-grass beds, and exotic species control programs.

F. Restoration

Allocation of restoration funds are tentatively scheduled to target the following four principal areas:

- 1) Forever Wild Tracts within the Mobile - Tensaw Delta, *50% of restoration funds*
 - 2) Weeks Bay, *20% of restoration funds*
 - 3) Perdido Bay, *20% of restoration funds*
 - 4) Other candidate sites (e.g., Wolf Bay, Bon Secour Bay, *10% of restoration funds* Fort Morgan Peninsula, and Gulf Shores State Park)
- **Recommendations:** Recommendations will be prepared for restoration of wetlands on state lands, based on data gathered during evaluation procedures. Recommendations will incorporate all data available for analyses, including any public domain GIS coverages. Recommendations will consider incorporation of restoration funds available through this grant, as well as other state and federal resource agency options.
 - **Implementation:** Restoration activities will be implemented on state lands as deemed appropriate via the Restoration Recommendations Process/Stage. Physical restoration of wetlands will use Wetland Grant federal funds augmented by SLD match (personnel). Restoration activities will make full use of resources available from grant Team Partners (e.g., trees of select species for replanting altered palustrine forest sites may be available from the Alabama Forestry Commission; heavy equipment necessary for correcting altered hydrology may be available through the Baldwin County Public Works Department).
 - **Monitoring:** Physical restoration of wetlands will be monitored and success/failure assessed through empirical pre- and post-restoration data. All restoration activities are expected to exhibit measurable success and failure criteria such as:
 1. road beds holding water in up-stream areas of natural drains can be re-contoured with swales that allow water within drains to flow through road beds, resulting in restoration of natural hydro-periods for areas upstream and downstream of the road
 2. man-made ditches draining wetlands can be plugged, and hydrology restored, with pre- and post-restoration conditions measured to evaluate success/failure
 3. success/failure of habitat maintenance via implementation of prescribed burning in pine savannahs and pitcher plant bogs can be measured through pre- and post-analyses of species richness for wetland plants representative of those habitats
 4. success/failure of planting of trees and other wetland specific plants intended to restore species richness and natural community composition (both terrestrial and aquatic) can be measured through data-derived species richness indices and monitoring of post-planting mortality, whereby planting criteria standards for wetland mitigation banking within Alabama would be applied
 5. success/failure of control of exotic plants measured via monitoring of mortality of target non-native species following applied control treatments (e.g., herbicides approved for wetland sites, tree girdeling).

G. Evaluation

Evaluation for *replanting* native hardwoods in bottomland forest sites will follow U.S. Department of Agriculture/Forest Service General Technical Report SO-26 A Practical Field Method of Site Evaluation for Commercially Important Southern Hardwoods by Baker and Bradfoot. Native oaks which are covered under this technique include swamp chestnut oak, cherrybark oak, nuttall oak, willow oak, shumard oak, and water oak. Oak seedlings from the Alabama Forestry Commission cost between \$185-250/1,000 seedlings. Site evaluation may determine that more *advanced saplings are required* for some locations due to competition. Of the 10,000 acres within the Forever Wild Mobile-Tensaw Delta Tracts which have been identified as impacted, perhaps 6,000 acres necessitates planting to restore community/species balance. Standard planting of hardwoods is at a rate of 300 seedlings/acre, however, underplanting and micro-site planting will likely require only 150 seedlings/acre. Thus, a rough estimate of cost for seedlings (without cost of planting) to cover 6,000 acres is \$166,500 to \$225,000. Based on an estimate of acres that will require replanting, it is clear that this value exceeds resources available through this grant for this principal site. During the course of the project, efforts will be made to secure donations of seedlings (of some species) from the corporate timber industry. Efforts will also be made to pursue other mechanisms by which funds can be secured to purchase seedlings.

- Evaluation of *wetland condition*, relative to the need for restoration, will be performed on state wetlands within the above four principal areas (“d” above). Evaluation methodology will focus on impact’s which impair functional values of wetland habitats (e.g., flood retention, water filtration, fish and wildlife habitat). Specifically, evaluations will be conducted for exotic species (e.g., cogon grass, chinese tallow tree, Japanese climbing fern), hydrologic alteration (e.g., roads constricting natural drains), unnatural species composition related to anthropogenic effects (e.g., stand monoculture resulting from timber management and random fluctuations in hydro-period [flood induced tree mortality of oaks in 1st and 2nd bottoms]), altered ecological processes (e.g., restriction of fire in pine savannah wetlands), other habitats impairments (e.g., propellar scars in seagrass beds).
- Evaluation procedures will follow a selected *standard methods protocol* (e.g., Wetlands Rapid Assessment Process [WRAP]), following review of all applicable procedures. Empirical data will be gathered, and documentation procedures will incorporate digital and chemical photographs, DGPS, as well as data analysis that incorporates additional information coverages within the State Lands Division and other resource agency GIS.

H. Objectives and Deliverables

Note: Overall project milestones will generally follow those presented in “**9: Project Schedule**” below. However, tasks milestones for each of the four principal wetland areas may be implemented at various times and phases during the expected three year duration of the project.

Task 1. Identify wetland areas in need of restoration or enhancement.

Methods: Compile list of wetlands considered appropriate for restoration or enhancement activities based on input from Team members and other local, state, and federal stakeholders.

Milestones:

1. Identify low functioning wetlands as ranked by the BCADID.

2. Identify restoration recommendations suggested by the BC Wetland Conservation Plan.
3. Request local technical expertise in developing restoration lists (create Technical Advisory Committee).
4. Identify hydric soils listed as altered in the Baldwin County soil survey.
5. Identify wetlands listed as ditched or drained (d/h) on FWS National Wetland Inventory (NWI) maps.
6. Prioritize wetlands for restoration activities based on the above information. Ground truthing of maps and acquired information will be conducted before prioritized restoration activities proceed.

Task 2. Obtain landowner permission for restoration projects.

Methods: Secure MOAs or other agreements with landowners willing to participate in wetland restoration projects. Explain the importance of wetland function and restoration in regards to stormwater retention, flood control, nutrient/sediment sinks, etc. Cost share programs such as the Natural Resources Conservation Service Wetland Reserve Program will be promoted to offset landowner cost and provide a vehicle for long term preservation. Conservation easements and deed restrictions will be explored for long term management possibilities.

Milestones:

1. Use Baldwin County plat maps, tax assessor records, and local contacts to identify landowners whose property is suitable for restoration/enhancement projects. Field work will accompany to ensure accurate assessment of prioritization areas.
2. Approach landowner to request cooperation. Create restoration plans with input from landowners and technical input from Team members.

Task 3. Restore, enhance, or facilitate other activities that protect wetlands and improve functions.

Methods: Develop a restoration plan for each principal wetland area based on the technical advice of Team members. Return wetlands to historical functioning conditions. Use GPS and GIS technologies to facilitate restoration construction work such as plugging ditches, removing fill and/or sediment, implementing best management practices on surrounding lands, and removing invasive, exotic species.

Milestones:

1. Complete restoration or enhancement work to restore hydrology of impaired wetland areas.
2. Complete restoration or enhancement work to remove invasive, exotic species and plant native vegetation to improve habitat quality and environmental integrity.
3. Complete restoration or enhancement work to promote improved wetland functions, including implementation of best management practices on lands contributing stormwater to wetland areas.
4. Complete restoration or enhancement work to remove fill and/or sediment from impaired wetlands.

Task 4. Increase public awareness of wetlands and their importance.

Method: Develop educational program on wetlands in coastal Baldwin County and implement recognition program for landowners who participate in wetland restoration activities.

Milestones:

1. Partner with stakeholders to produce a wetland education program (e.g., Georgia Adopt-a-Wetland).
2. Facilitate a minimum of 10 presentations to target local governments, civic groups, and schools
3. Create or utilize current wetland educational brochures and handouts. Make these available at presentations and in public locations such as the Weeks Bay National Estuarine Research Reserve.
4. Promote National Wetlands Month activities in the project area.
5. Co-sponsor wetland technical workshops with Baldwin County, Weeks Bay Watershed Project, and the Army Corps of Engineers.
6. Investigate and facilitate posting of workshop outreach and training materials on an interactive web site, similar to the EPA “Watershed Academy” format, for statewide applications.
7. Implement a participating landowners recognition program using newsletters/press releases and/or placing of acknowledgment signage on properties.

Task 5. Monitor wetland restoration activities and successes.

Method: Evaluate wetland function restoration success based on subsequent site visits and observation of hydrology, established native vegetation, and proper installation/functioning of management measures.

Milestones:

1. Conduct site visits to restoration areas before, during, and after restoration activities to empirically assess, monitor water quality, and/or photo-document improvements or failures.
2. Based on restoration plan and desired wetland function enhancement/restoration, determine if function is likely to be improved through observation and onsite monitoring. Determine whether functioning has improved and goals have been achieved.
3. Develop contingency actions for wetlands where functions have not been adequately restored or other goals have not been achieved. Take additional actions to correct situations in which exotics re-invade the site, native plants do not survive, ditch plug failures, etc.

I. Long-term Onsite Management Support and Commitments

Local cooperators that will provide long-term management include the Weeks Bay National Estuarine Research Reserve (on properties within their boundaries), Wolf Bay Watershed Watch, Weeks Bay Watershed Project, Baldwin County Soil and Water Conservation District, Baldwin County Commission, and participating landowners. Each of these entities has exhibited a strong interest in wetland protection and are working to achieve long-term, holistic restoration and protection of coastal natural resources. Landowner management commitments will be secured based on wetland restoration type and geographical location. Additionally, the use of deed restrictions and conservation easements will be explored and implemented where possible. Landowner participation in established programs

that promote long term management, such as the NRCS Wetlands Reserve Program, will also be encouraged.

J. Integration with Other Programs in the Area and State

1. Resources provided by this grant provide a logical next step for wetland restoration activities identified by previous EPA-Region 4 wetland grants. For example, the BC ADID identified poorly functioning wetlands in the project area appropriate for restoration and/or enhancement efforts. In addition, the Baldwin County Wetland Conservation Plan will identify priority areas not included in the BC ADID project area for restoration activities through resource inventories and functional assessments.

Table 4-1 shows the Project Schedule (Fall 2001-Fall 2003).

**Table 4-1
Project Schedule (Fall 2001 - Fall 2003)**

Activity	F 00	W 01	Sp 01	Sm 01	F 01	W 02	Sp 02	Sm 02	F 02	W 03	Sp 03	Sm 03	F 03
Reporting/Status Updates to EPA			X		X		X		X		X		X
Technical Advisory Committee Created	X												
Identify wetland areas in need of restoration or enhancement		X	X	X						X	X		
Create wetland restoration/enhancement plan for selected areas			X	X	X	X				X	X		
Seek ADEM & EPA project administrator approval for wetland restoration plans			X	X	X	X				X	X		
Obtain landowner permission for enhancement/restoration projects				X	X	X	X						
Restore, enhance, or implement activities which protect and/or improve wetland functions							X	X	X	X	X		
Monitoring of restoration success							X	X	X	X	X	X	X
Promote wetland restoration grant, participate in educational activities.		X		X		X		X		X		X	
Partner on wetland technical workshop.				X								X	
Press releases and landowner recognition program.				X	X	X	X	X	X	X	X	X	X

2. Local environmental groups have been working to increase awareness of wetland functions and values. The Weeks Bay Watershed Project and the Wolf Bay Watershed Watch have a history of local stakeholder commitments have already implemented numerous water quality degradation solutions which are intricately tied to wetland functions. In addition, the Weeks Bay Watershed Project Management Plan lists habitat restoration and protection - in particular wetlands - as one of four categories for watershed water quality maintenance. Their support and willingness to partner on this grant project is definitive.
3. Alabama's Land Trust Program "Forever Wild" exemplifies the state's commitment to the preservation of unique coastal wetlands. A \$15 million land acquisition represents a significant contribution toward maintenance of ecosystem functions within the Delta and also provides tremendous benefits to the commercial and recreational fisheries in the Mobile Bay Estuary downstream. Further, the acquisition initiative supports national wetland loss prevention and restoration efforts. Overall, this endeavor supports the protection, restoration, and monitoring of over 100,000 acres of state and federal wetlands within the Delta. Pending wetland acquisitions by Forever Wild in Baldwin County are not limited to the Delta area. Several active projects are on-going and include the Maritime Forest near Orange Beach, as well as tracts near Bon Secour National Wildlife Refuge, Gulf Shores State Park and the Weeks Bay National Estuarine Research Reserve.
4. State agency support is also high as demonstrated by Alabama Department of Environmental Management (ADEM) and the Alabama Department of Economic and Community Affairs (ADECA) Coastal Programs. These two programs offer invaluable technical advice and guidance based on years of work in the wetland arena.
5. The USDA-Natural Resources Conservation Service (NRCS) and the U.S. Fish and Wildlife Service (FWS) will serve as technical advisors to the project. These federal agencies have been partners in past endeavors regarding wetland issues and serve as important local landowner contacts. As wetland delineators, the U.S. Army Corps of Engineers will also partner.

K. Measureable Environmental Results

Environmental indicators and project success will be measured by:

1. The number of wetland acres protected, restored, and/or enhanced.
2. Visual inspection of the entire area for any problems such as re-invasion by exotic plants species.
3. Monitoring of wetland hydrology to assure that:
4. a minimum of one primary hydrology indicator (inundation, saturation in the upper 12", water marks, drift lines, or sediment deposits) or,
5. a minimum of two secondary hydrology indicators (oxidized root channels in the upper 12", water stained leaves, passing of the FAC-Neutral test) can be identified at all times with the exception of extended periods of little or no precipitation
6. Qualitative assessments of successful native plant communities established.

L. Wetland Grant Project Coordinator

This grant provides resources to support a Project Coordinator staff position. The Project Coordinator will be assigned to the ADEM Mobile Field Operations Office, and will coordinate grant activities between the project co-lead grant implementation agencies (ADEM, ADCNR); workplan cooperators and additional stakeholders as identified; and other coastal, natural resource, and wetland associated efforts.

1. Specific project coordinator tasks are as follows:

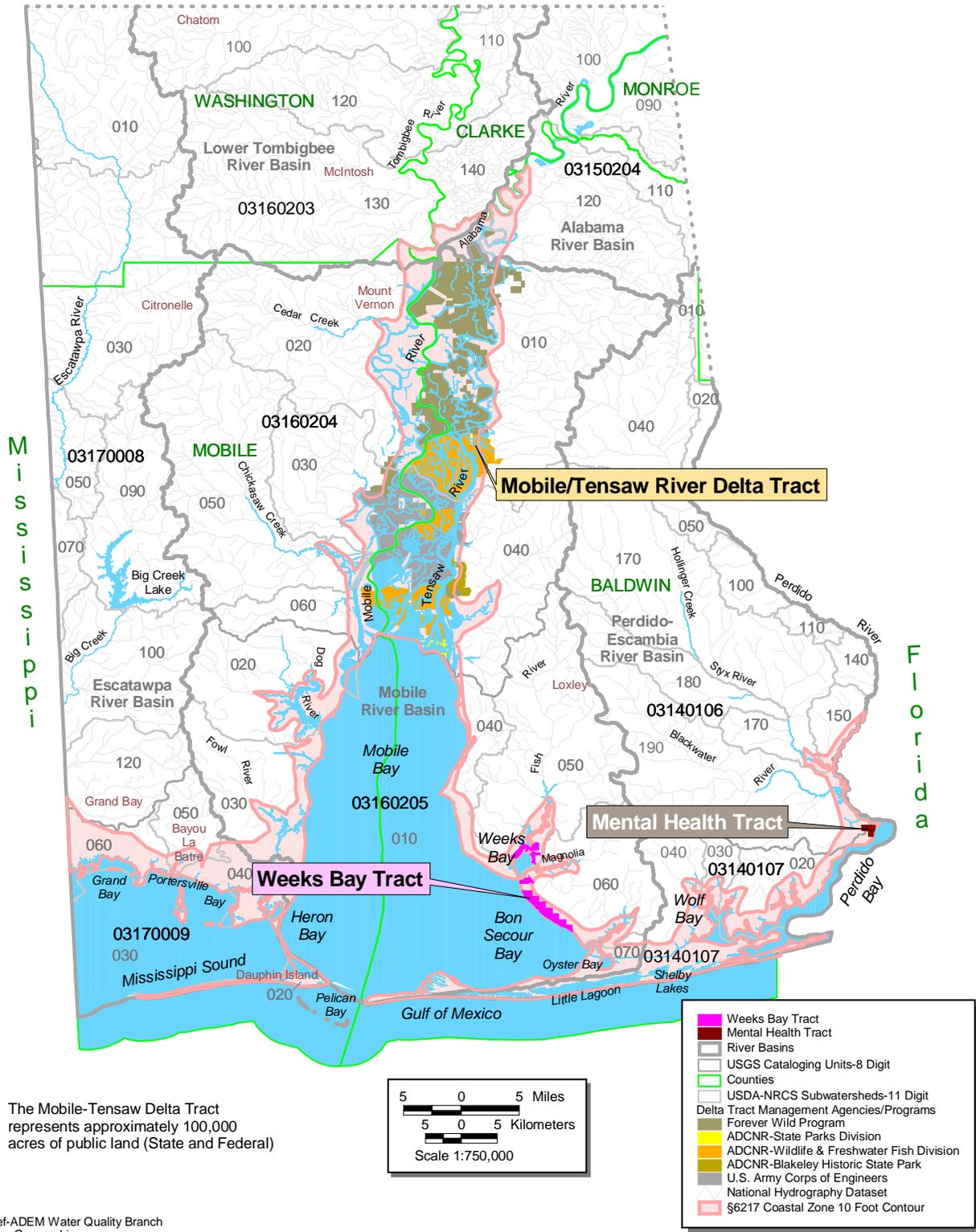
- a. Provide technical assistance and local point-of-contact to stakeholders involved in this project
- b. Provide educational outreach and training coordination and assistance
- c. Prepare and submit semiannual and annual progress reports of project status and accomplishments
- d. Provide training for certification of citizen volunteer water quality monitors
- e. Facilitate grant implementation assistance to ADEM and ADCNR and other stakeholders:
 - plan , coordinate, form, and/or participate in wetland related stakeholder committees and meetings
 - track project activities and progress toward achievement of workplan goals and objectives
 - respond to public inquiries about the project and to wetland related matters in general
 - provide assistance in planning, installing, operating, and maintaining wetland restoration strategies
 - provide input into a long-term conservation plan for Baldwin County wetland acreage
- f. Provide and/or promote wetland educational outreach activities through multi-media presentations, task forces, work groups, committees, tours, etc.
- g. Establish, organize, and manage an Adopt-A-Wetland program similar to the Georgia Adopt-A-Wetland
- h. Submit annual project update newsletter articles to various newsletters, newspapers, and/or to other public outreach media

2. Outputs and Deliverables:

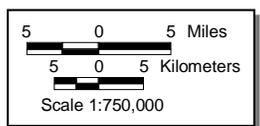
- a. *Semiannual* report of plans, accomplishments, and additional program needs including photographic documentation of individual project tasks for the duration of the project
- b. An *annual* report of plans, accomplishments, and additional program needs including photographic documentation of individual tasks for the duration of the project
- c. A *comprehensive final report* of accomplishments and additional program needs including photographic documentation of individual tasks within 60 days of grant end date
- e. Wetland educational outreach activities and Alabama Water Watch certified water quality monitoring citizen volunteers sampling wetland project areas
- g. Facilitated education outreach and training using conferences, workshops, electronic/slide presentations, tours, etc, to promote the project.

Figure 4-1 shows Alabama's Coastal Wetlands Restoration Grant Management Areas. For further information pertaining to Alabama's Coastal Wetlands contact Mr. Jim Moore at in ADEM's Office of Education and Outreach at (334) 394-4359 or jmm@adem.state.al.us, Mr. Greg Lein at the Alabama Department of Conservation and Natural Resource's Natural Heritage Section at (334) 242-7998 or glein@dcnr.state.al.us, or Mr. Randy Shaneyfelt in ADEM's Mobile Field Office at (334) 432-6533 or rsc@adem.state.al.us.

Figure 4-1
Alabama's Coastal Wetlands Restoration Grant Management Areas

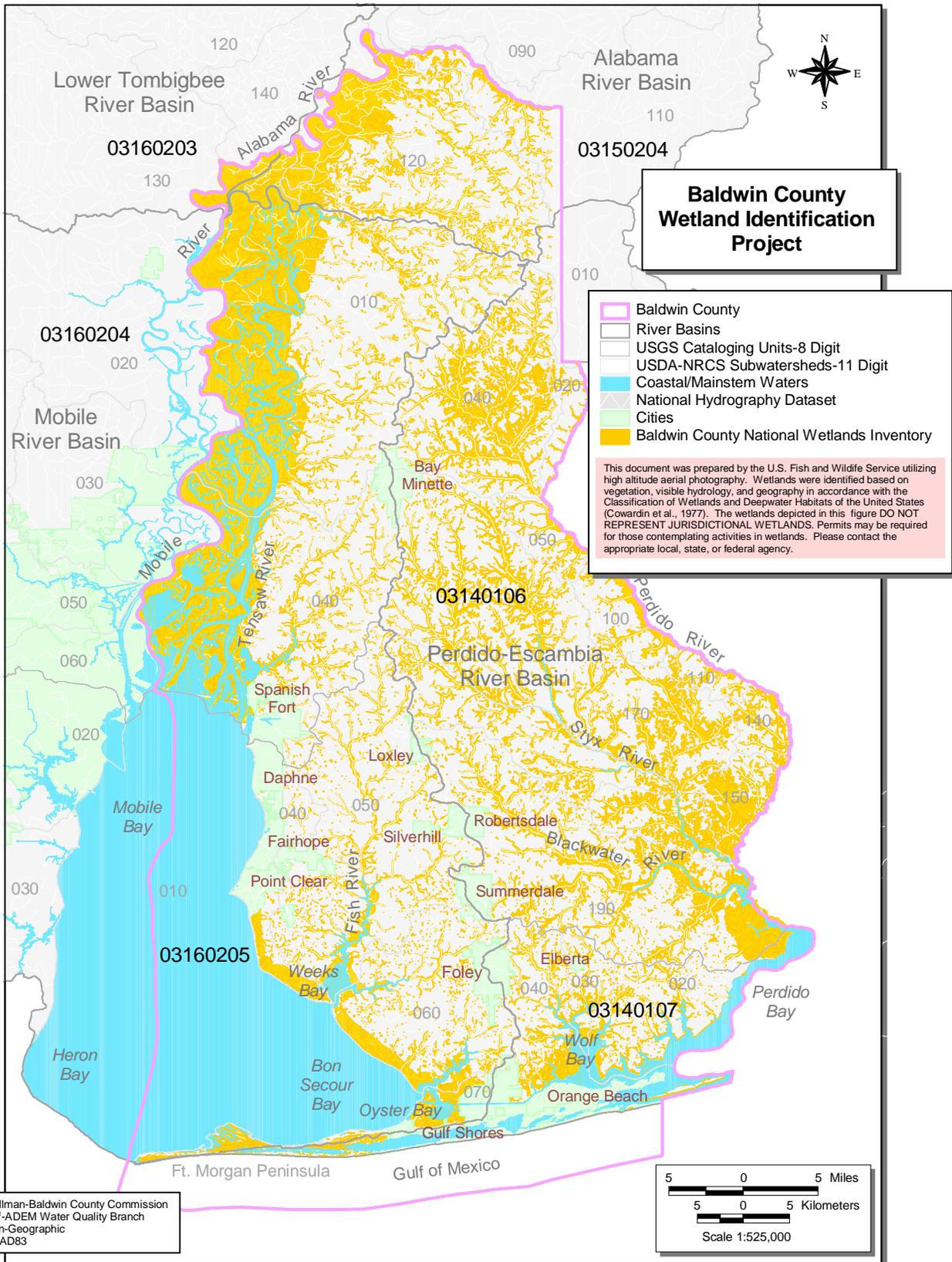


The Mobile-Tensaw Delta Tract represents approximately 100,000 acres of public land (State and Federal)



Mike Rief-ADEM Water Quality Branch
 Projection-Geographic
 Datum-NAD83

Figure 4-2

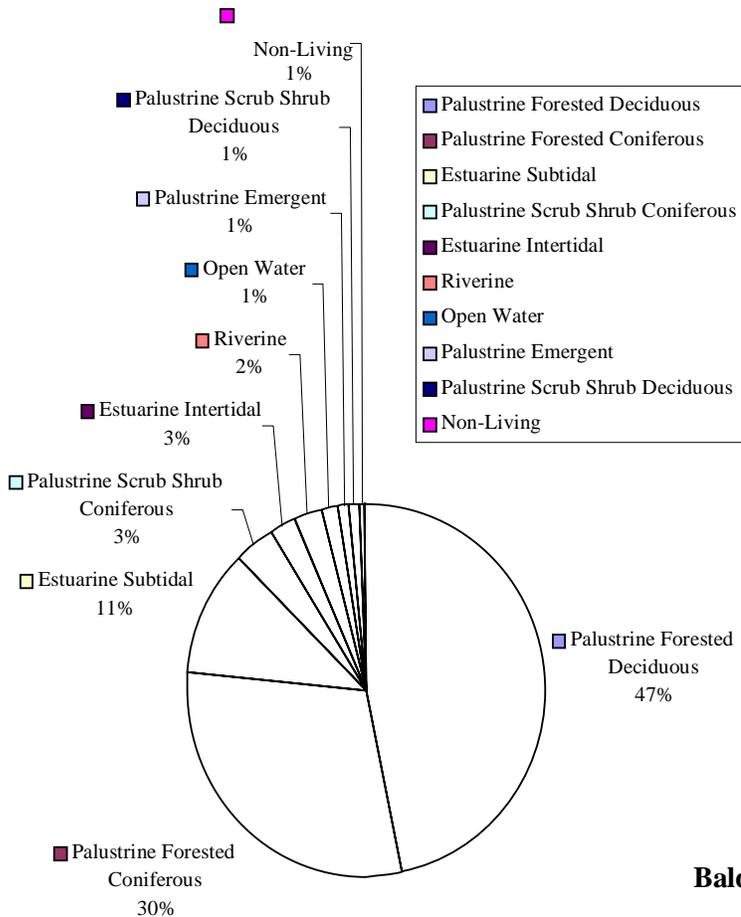


4.2 Baldwin County Wetlands Statistics

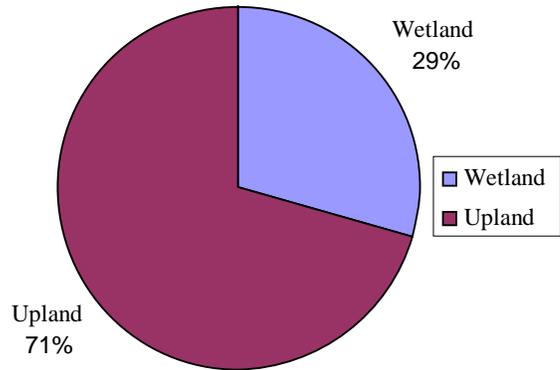
Figure 4-2 shows the Baldwin County Wetland Identification Project. Figure 4-3 shows The Baldwin County Wetland Types. The Baldwin County Commission is in the final stages of National Wetland Inventory data verification. These are some preliminary statistics contributed by Ms. Cara Stallman.

Figure 4-3

Baldwin County Wetland Types
Percent of Total County Wetlands



Baldwin County
Percent of Wetlands and Upland Areas



Baldwin County
Upland and Wetland Areas

	Miles ²	Acres	Percent of Baldwin County
Wetland	1,127.53	301,336.30	29.5%
Upland	470.84	721,621.35	70.5%
Total	1,598.37	1,022,957.65	

Baldwin County Wetland Types

Wetland Type	Miles ²	Acres	Percent Total Wetlands
Palustrine Forested Deciduous	220.29	140,987.10	46.79%
Palustrine Forested Coniferous	139.81	89,481.33	29.69%
Estuarine Subtidal	52.07	33,322.27	11.06%
Palustrine Scrub Shrub Coniferous	16.44	10,524.24	3.49%
Estuarine Intertidal	12.17	7,790.13	2.59%
Riverine	11.12	7,116.49	2.36%
Open Water	6.54	4,185.54	1.39%
Palustrine Emergent	6.16	3,943.74	1.31%
Palustrine Scrub Shrub Deciduous	3.40	2,178.71	0.72%
Non-Living	2.82	1,806.74	0.60%
Upland Land Area	1,127.53	721,621.35	
Total	1,598.37	1,022,957.65	

4.3 Alabama Wetlands Program

The following Executive Summary, Introduction, Methods, Results and Discussion, and References are from the *Alabama Wetlands Program* document (Natural Heritage Section-State Lands Division-Alabama Department of Conservation and Natural Resources, 2001)

Summary

The State of Alabama has a wealth of wetland resources that provide ecological and economic benefits to the public. With continued growth and development some of these wetland areas will be adversely impacted. Wetlands that are currently degraded can be restored to a more healthy and functional state to offset unavoidable impacts from development.

The purpose of the Alabama Wetlands Program pilot project was to locate potential wetland restoration sites using existing remote sensing data: overflight photos, National Wetland Inventory maps, and soil type maps. The projects focus was limited to areas that are experiencing rapid growth and consequently impacting wetlands. Degraded wetland sites were located in each of the study areas using remote sensing data. Tract sizes are highly variable and represent the viability of the potential restoration. A scoring system was developed to rank the sites within each watershed.

Introduction

Since the State of Alabama was settled by Europeans there has been an estimated loss of more than 50% of the overall wetland acres (Dahl 1990). With the instigation of the federal 'no-net-loss of wetlands' philosophy, unavoidable wetlands impacts associated with the process of development must be compensated or mitigated for. This means that when wetlands are damaged or destroyed the damage will be compensated for by creating, enhancing, or restoring wetlands. Ideally the restoration work will occur as close as possible to the impact site and preferably within the same watershed, often termed "within basin". The restoration work must also be conducted on similar wetland types, often termed "in-kind". For ecological reasons it is sometimes better, and easier, to group the restoration efforts for many small impacts into a single larger site, a 'wetland bank'.

The Alabama Department of Conservation and Natural Resources (ADCNR) three objectives in the Alabama Wetland Program pilot project, as per contract AGY8025 with ADEM, were to identify potential wetland restoration sites, develop a scoring system, and rank the sites within each study area. Using the U.S. Army Corp of Engineers (COE) wetland impact permit database, watersheds and counties were selected based on the greatest number of impacts. The two coastal counties, Baldwin and Mobile, have the greatest number of permits issued in the state. The Birmingham, Montgomery, and Tuscaloosa metropolitan areas are active permit areas and hence the Central Alabama River and Sipsey River were included in the project. The Black Warrior River was later added to better address wetland restoration within the basin affected by development in Birmingham and Tuscaloosa.

Potential restoration sites were identified using existing available digital and non-digital remote sensing data sources; aerial photography, National Wetland Inventory (NWI) maps, and U.S. Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS) soil survey maps. When possible, potential restoration sites were ground-truthed from highway crossings to verify the impacts seen on the remote sensing images. Using Geographic Information System (GIS) software (ArcView®) individual site maps were created. With the GIS the different data sources are all georeferenced and overlaid onto 1:24,000 digital topographic maps. Each data source is a data layer that can be turned on and manipulated as needed. This allows the calculation of wetland or soil type acreage for each site and an acreage update if the site footprint changes.

A scoring system was developed to rank the sites within each area against other sites in that watershed or county. As per the project proposal the following components were included: size, wetland type, location within the watershed, location relative to other preservation or management areas, surrounding land use, surrounding land cover, presence of hydric soils, presence of source of hydrology, and results of GAP analysis. The first eight items were included in the scoring system. It was determined that meaningful GAP analysis can not be conducted for Alabama at this time. One additional category, plat coverage was added. Some components and concepts from the tract scoring procedures for the Alabama Forever Wild Program were incorporated in this scoring system. The final scoring system was reviewed by the Alabama-Mississippi Mitigation Bank Review Team (MBRT) and ADCNR biologist. Comments and concerns were addressed and incorporated into the scoring system. The finished scoring system (Appendix F) was then used to rank the restoration sites within each of the study areas.

Methods

GIS Development

The project was initiated by delineating the study areas on 1:250,000 digital topographic maps in ArcView®, a GIS software. The Alabama River, Black Warrior River, and Sipsey River watersheds were available from the EPA via the BASINS 1.0 data system for Region 4. The Sipsey River watershed was usable without modification. The Alabama River study area began at Claiborne Dam and ran to the confluence of the Coosa and Tallapoosa Rivers. This required delineating the watershed for Claiborne Reservoir. The Cahaba River, draining into the Alabama River below Selma, was excluded from the study area; its watershed was delineated and removed from the watershed map. The Black Warrior River study area began at the confluence with the Tombigbee River and ran upstream to Tuscaloosa.

The National Wetland Inventory (NWI) quad maps were the second data layer acquired. The digital NWI maps for the Alabama River are available on the USFWS internet website (22 of the 35 quad maps were digitized). Some of the NWI maps for Baldwin and Mobile counties were also available through the website (20 quads). Additional NWI maps for the coastal counties were obtained from the Geological Survey of Alabama (GSA)(40 quads) and the USGS National Wetland Research Center (NWRC)(13 quads). There was no digital NWI coverage for either the Sipsey River or Black Warrior River. The digital NWI coverages were converted to a format compatible with the ADCNR topographic maps using ArcInfo®.

The NWI maps identify wetlands with a hierarchical coded classification system developed by Cowardin et al (1979). While this allows for precise identification it also leads to a great variety of coded types, Mobile and Baldwin Counties each have over 500 coded wetland types. In order to make this a less visually cluttered data layer, the wetland types were consolidated into 60 color and pattern coded types. This allowed quick visual assessment of the wetland types within a study area. The calculation of NWI wetland acreage on the individual sites was conducted using the original, and more specific, identification codes.

USDA NRCS soil survey data was used to develop the third data layer. Wilcox County was the only digital soils coverage available for the study area. Additional data layers were created in ArcView® using the published paper maps and a digitizing pad. The manual digitizing process was very time intensive and was only completed for the Alabama River and Sipsey River sites. The process, as conducted by ADCNR, is not highly accurate but it does represent a reasonable approximation of what would be found at a restoration site.

The last data layer identifies plat boundaries. This data layer was created in ArcView® using county plat books. This layer was used to identify the location of nearby state or federal properties that are managed for public use. This layer was also used to identify the number of

entities, individuals or corporations, encumbering a potential restoration site. As with the soil digitization layers, this layer is not highly accurate but it is a reasonable representation of existing plats.

While the soils and plat layers were being developed, USDA Farm Service Agency (FSA) county offices were being visited to examine aerial photography. Potential wetland restoration sites were identified by looking at paper copies of the countywide aerial photography while referencing the respective county soils book to identify areas with hydric soils. This was followed up by looking at recent aerial photography on color slides to locate additional sites and to better identify surrounding land use and land cover types.

Scoring System Development

A scoring system composed of nine unique criteria was developed to rank the tracts within each watershed or county. Some components for this scoring system were pulled from the ADCNR Natural Heritage Section - Forever Wild Ranking Protocols. Many principles and ideas were gleaned from island conservation biology concepts. Of the nine criteria initially proposed for the scoring system only one, GAP analysis, was dropped. In April 2001 the coordinator for Alabama GAP analysis estimated that Alabama was two or three years away from being able to conduct meaningful GAP analysis. Many of the concepts used in GAP analysis are represented in the other criteria. One category, plat coverage, was added to score how the site was encumbered. The logic behind the development of the categorical scoring is presented in the following sections.

In an effort to keep any one component from potentially overpowering the others, a multiplier was introduced to even out the final scores of each component. The intent was to make the potential maximum score “fall out” in the 12-16 point range for each category. As an example the ‘Size’ category has a maximum score of 7 points, by incorporating a multiplier of 2 it has the potential to score 14 points. See the score sheet example in Appendix F for multipliers associated with each category.

1. Size.

Within the concepts of island biogeography, larger tracts are thought to be more stable and could buffer themselves from minor disturbances. Conversely, smaller tracts would tend to be more susceptible to outside disturbances and a single natural or unnatural event could result in significant ecological damage. Species diversity increases as the tract size increases but this is generally a logarithmic type progression and overall diversity would not double when the tract size doubles.

The point scale for size is a two pronged approach with points being awarded strictly for the tract size and points for the ecological stability of the site. Simple tract size follows a logarithmic type progression for acreage. The ecological aspects are pulled from the Forever Wild Program scoring protocol and reflect the ability of the site to maintain its biological integrity over time. In the Forever Wild Protocol if the site does not score a 2 or better then it is dropped. For this project, sites that did not score a 2 or better were either dropped or their footprint was altered to increase biological integrity.

Table 4-2 shows the size specific scoring criteria for the Alabama Wetland Project.

**Table 4-2
Size specific scoring criteria for the Alabama Wetland Project**

Size.		
less than 10 acres	0	
10<50 acres	1	
50<200 acres	2	
200<1000 acres	3	
>1000 acres	4	
<hr/>		
The site has sufficient acreage to support expansion of the natural features for which the site is to be purchased.	3	
The site has enough acreage to support the natural features for which the site is to be purchased.	2	
The site does not have sufficient acreage to support the existing natural features, but adjacent acreage may be available.	1	
The site does not have sufficient acreage to support the existing natural features and no adjacent acreage is available for expansion.	0	
Total #1		0

2. Wetland Type relative to occurrence and status of the type in the watershed.

Rarity of the Type.

Wetlands that are unusual relative to their watershed can provide refuges for plants and animals that require a specific habitat to survive. Tupelo gum swamps are not unusual in the Mobile Tensaw Delta but in the Paint Rock River Watershed they would be an oddity. In this case the more northern wetlands could provide a range extension for some species or be supporting flora and fauna not found in the southern wetlands.

Wetlands that are common in a particular watershed and that are not in danger of being converted to other uses would not be considered as high priority sites. However, if those same wetlands were common but as a whole they exist in a degraded capacity then the restoration of a tract to its functional capacity would warrant a higher ranking.

Points are accrued in the first part of this category based on the NWI wetland types on or expected to be on the site. The more wetland types that are present the more points that would accrue.

NWI status and trends information is not available on a watershed basis. In their most detailed form the NWI status and trends reports make estimates on a statewide basis. In ArcView® a summary of the acreage by wetland types was done for each project area when NWI coverage was available. This summary was used to determine if wetland types were very common, common, somewhat common, or uncommon within the project areas. The Alabama River summary was used for the Sipsey River and Black Warrior River study areas.

Overall rarity of the wetland type should also be considered. Here again unusual wetland types can support uncommon flora and fauna. The USFWS in their Regional Wetlands Concept Plan (1992) has a list of important and priority wetlands in Alabama. This priority list was used to answer the final question in this section. Table 4-3 shows Wetland type and rarity criteria for the Alabama Wetland Project.

**Table 4-3
Wetland type and rarity criteria for the Alabama Wetlands Project.**

2: Wetland Type relative to occurrence and status of the type in the watershed. Rarity of the Type.			
	Estuarine Wetlands	0	1
Wetland Class:	FO - Forested	0	1
	SS - Shrub/Scrub	0	1
	EM - Emergent	0	1
Wetland Subclass:	1 - Broad-leaved deciduous	0	1
	2 - Needle-leaved deciduous	0	1
	3 - Broad-leaved evergreen	0	1
	4 - Needle-leaved evergreen	0	1
	1 - Persistent	0	1
	2 - Nonpersistent	0	1
Water Regime:	A - Temporarily flooded	0	1
	B - Saturated	0	1
	C - Seasonally flooded	0	1
	F - Semipermanently flooded	0	1
	GH - Intermittently exposed/ Permanently flooded	0	1
	PR - Tidal: Irregularly Flooded/Seasonal Tidal	0	1
The tract contains wetland types that are uncommon, somewhat common, common, very common in the watershed.		3	2 1 0
The tract contains wetlands that are very degraded, degraded, somewhat degraded, or not degraded.		3	2 1 0
The tract contains wetlands that are Nationally rare, somewhat rare, common, very common.		3	2 1 0
The tract contains wetlands that are recognized on a National Priority list.		3	0
Total #2			0

3. Location within the watershed.

This category was developed with the location being in reference to developed areas. Wetlands above developed areas would provide an area for floodwater storage and help prevent flooding downstream. Wetlands below developed areas would help slow the water velocity and reduce flashiness of rain events downstream as well as filtering urban runoff. This criteria was modified from one of the Forever Wild Program scoring protocols.

Location relative to institutions of higher learning would also affect the usefulness as an educational center or research area. This criteria was pulled from one of the Forever Wild Program scoring protocols.

Additionally, is the tract located adjacent to a waterway listed on the state 303d list? If so then the tract would serve as a buffer to prevent overland flow of nutrients into the waterway. During high water events the wetland could also serve as a nutrient or sediment sink for the waterway. Table 4-4 shows location criteria relative to population centers.

**Table 4-4
Location criteria relative to population centers**

3: Location within the watershed.		
1. Relative to population centers.		
Tract is located within 20 miles upstream of a population center of 250,000.	3	
Tract is located within 20 miles downstream of a population center of 250,000, OR is located within 20 miles upstream of a population center of 100,000.	2	
Tract is located within 20 miles downstream of a population center of 100,000, OR is located within 20 miles upstream of a population center of 50,000.	1	
Tract is not located within 20 miles of a population center of 50,000.	0	
2. Suitability for educational/scientific use.		
The site is within 50 miles of an academic institution which has biological research capability and an interest in using the site for research.	0	1
The site is within 50 miles of schools or institutes of higher learning which have the desire and ability to use the site for educational purposes.	0	1
Educational programs on the site are compatible with resource protection.	0	1
Will the tract serve as a buffer zone or nutrient sink for a waterway listed on the state 303d list?	0	3
Total #3		0

4. Location relative to other preservation or management areas.

Proximity to other federal, state, or local management areas would rank higher than being an isolated site (Table 9.3-4). Adjacent public land would increase the effective ecological size of a site. This ties back in with the size component and island biogeography concepts where larger sites are more stable. Isolated sites would score the lowest in this category. The one mile distance is an accepted limit for wildlife interaction between sites. When sites are more than 1 mile apart the wildlife interactions between sites is minimal. The plat coverage was used in this category to identify property managed for public usage. Table 4-5 shows location criteria relative to other public use areas.

**Table 4-5
Location criteria relative to other public use areas**

4: Location relative to other preservation or management areas.		
Tract is an In-holding to an existing management area.	3	
Tract is adjacent to an existing management area.	2	
Tract is located within 1 mile of an existing management area.	1	
Tract is isolated.	0	
Total #4		0

5. Surrounding Land Use.

The surrounding land usage could limit the success of a restoration project. While most restoration projects would have a buffer zone around the sensitive areas, severe outside influences could overwhelm the buffer area. Different land uses would have different influences on adjacent property. The land usage was determined from overflight photos and slides. In broad categories the land use ranking from highest to lowest is: River, Forestry, Agriculture, Residential, and Commercial. Where natural grasslands exist they were grouped with forestry, as forestry impacts would be more similar than impacts from of agriculture. Tidally influenced marsh areas were included in the river category as both are aquatic influences on adjacent areas.

The percent columns represent the percentage of the site perimeter that is occupied by the land use type. Areas uphill from the site have a multiplier attached since uphill usage would affect the site more than a similar adjacent downhill area. The uphill/downhill multiplier is a good idea but can be difficult to determine. Table 4-6 shows surrounding land use criteria.

**Table 4-6
Surrounding land use criteria**

5: Surrounding Land Use.								
Land Use	Points	% Uphill	Multi-plier	Total Uphill	Points	% Downhill	Total Downhill	Total Uphill + Downhill
River	4	---	---		4	0	0	0
Forestry	3	0	1.5	0	3	0	0	0
Agricultur e	2	0	1.5	0	2	0	0	0
Residential	1	0	1.5	0	1	0	0	0
Commerci al	0	0	1.5	0	0	0	0	0
Total of all Land Use Categories (#5)								0

6. Surrounding Land Cover.

As with the land use component surrounding land cover could limit the success of a restoration project. This is a more specific classification than the land use category. In the scale, types with similar levels of impact have been grouped. Here again a percentage multiplier and an uphill/downhill multiplier have been included. With this category it is recognized that some land cover types can have negative impacts on adjacent properties. The final scores for this category can be negative. Land cover was determined from

overflight photos and slides. On site verification was conducted when the sites were visually assessable from the highway.

Categories ranked from lowest to highest would be:

Riverine, Forested, Grassland, Cropland, Residential, Commercial.

Each category is further subdivided:

Forested: Natural and Monoculture
 Mature, Intermediate, Early Successional
 Grassland: Natural, Pasture/hay, Sod
 Cropland: No till or Plowed Rowcrops
 Residential: High, medium, low density
 Commercial: <33%, 33<66%, 66<100% impermeable surface

During the scoring process some decisions were made on how to categorize difficult to determine and unusual land cover types. With forested sites when a determination of mature or intermediate stand age could not be made then scoring was completed using the intermediate subcategory. On several sites a cemetery served as adjacent property; after some deliberation the decision was made that impacts would be similar to those from low density residential areas. Highways and railroads were classified as light commercial impacts. Table 4-7 shows surrounding land cover criteria for the Alabama Wetlands Program.

**Table 4-7
 Surrounding land cover criteria for the Alabama Wetlands Program.**

6: Surrounding Land Cover.							
Land Cover	Points	% Uphill	Multiplier	Total Uphill	% Down	Total Downhill	Total Uphill + Downhill
Water Body / Mature natural forest	5	0	1.5	0	0	0	0
Intermediate natural forest / Mature monoculture	4	0	1.5	0	0	0	0
Early successional natural forest / Intermediate monoculture	3	0	1.5	0	0	0	0
Natural Grassland	2	0	1.5	0	0	0	0
Early Monoculture / Pasture/Hay	1	0	1.5	0	0	0	0
Sod Farm / No till cropland	0	0	1.5	0	0	0	0
Plowed rowcrops / Low density residential	-1	0	1.5	0	0	0	0
Medium density residential	-2	0	1.5	0	0	0	0
High density residential / Commercial < 33% impermeable surface	-3	0	1.5	0	0	0	0
Commercial 33 < 66% impermeable surface	-4	0	1.5	0	0	0	0
Commercial 66 < 100% impermeable surface	-5	0	1.5	0	0	0	0
Total for all Land Cover Categories (#6)							0

7. Presence of hydric soils.

All sites would need to have hydric soils in order to have jurisdictional wetlands. Hydric soils are those listed on the federal hydric soils list developed by NRCS. In the Sipsey River Watershed the soils are not on the list. However, the soils on the sites evaluated under this study are inundated for more than seven consecutive days during the growing season. Therefore, the hydric soils qualification is still being met.

For scoring purposes, the percentage of the site comprised of hydric soils is being used. Where no digital coverage exist, a visual estimate from the soil maps is made. When this visual estimate methodology was used on tracts with digital coverage, there was usually no change in the score. In cases where the score did change, the overall site ranking remained in the same area; the ranking would not jump or fall five places based on a one point change in the hydric soil parameter. Table 4-8 shows hydric soils criteria for the Alabama Wetlands Program.

**Table 4-8
Hydric soils criteria for the Alabama Wetlands Program.**

7: Presence of hydric soils.			
Percentage of the tract that is Hydric Soils:	80 - 100%	4	
	60 < 80%	3	
	40 < 60%	2	
	20 < 40%	1	
	< 20%	0	
Total #7			0

8. Presence of source(s) of hydrology.

If the hydrologic sources are contained within the perimeter of the site, then the influences of adjacent properties would be reduced. This is a percentage scale and sites that completely include the features affecting the hydrology score higher. For seep springs, upland bogs, grady ponds, and other isolated wetland types it might be possible to purchase the entire watershed and all the hydrologic features. With riverine wetlands it is not possible to buy the entire watershed. If the hydrology of the site is dominated by the influences of a third order or larger stream then the site is given one point. Table 4-9 shows the hydrologic source criteria for the Alabama Wetlands Program.

**Table 4-9
Hydrologic source criteria for the Alabama Wetlands Program.**

8: Presence of source(s) of hydrology.			
The primary source affecting the hydrology of the tract is a river or large creek.		0 1	
Percentage of the landscape features	75 < 100%	4	
affecting the wetland hydrology that	0 < 75%	3	
are incorporated into the tract.	25 < 50%	2	
	10 < 25%	1	
	< 10%	0	
Total #8			0

9. Plat Coverage.

Based on the ADCNR’s land management experience, the fewer entities involved in land management decisions the more easily decisions are made. This is a 3 point scale where restoration sites on publicly owned lands score the highest. The plat coverage is used for this determination. In some instances restoration efforts could be successful if the site size was reduced and only the major owner(s) are included. Some potential restoration sites were dropped after it was determined that there were many owners and the plats were small. Table 4-10 shows plat criteria for the Atabama Wetlands Program.

**Table 4-10
Plat criteria for the Alabama Wetlands Program.**

9: Plat density.		
Site is on Publically Owned/Managed Property	3	
Site is owned by a single entity.	2	
Site has two owners.	1	
Site has three or more owners.	0	
Total #9		0

Results and Discussion

Potential wetland restoration sites were successfully located in all of the study areas. Figures 4-4 through 4-7, and Tables 4-11 through 4-14 contain maps for each site, a summary of the scoring criteria for each site and a summary of how the sites rank for each area. Within each study area the site scores have a 30 to 45 point variation, while the scores range from a low of 36.85 to a high of 93.84. Actual on-the-ground site verification may reveal that some of these sites do not meet the current standards for wetland restoration sites.

Table 4-15 shows statewide wetlands land use data estimates by river basin. This report is by no means a comprehensive list of all potential restoration sites for each study area. There are undoubtedly many more restoration sites in each area. Many of the individual references for potential restoration sites could not be verified with remote sensing technologies available at the time. In some watersheds, the counties do not have soil type documents or NWI coverage and hence many sites have been overlooked (e.g. Lowndes County).

Since this project was initiated the regulatory world of wetlands has made progress. The MBRT has established itself and become very active in wetland restoration. Privately owned wetland mitigation banks have been permitted and are selling credits. Wetland regulations have been refined and in some instances, activities that were once permitted are now restricted. Sites that were once suitable for restoration credit no longer qualify if, given reasonable time, they can naturally restore themselves. New, less subjective, systems are being used, and refined, to assess wetland impacts and to calculate functional lift at restoration sites. Stream restoration, once a foreign concept, is becoming accepted and the MBRT is developing guidelines for stream restoration banks.

The world of digital data has also progressed rapidly. Instead of using contour intervals on topographic maps to determine the watershed area of a site, Digital Elevation Models (DEMs) are available that can calculate uphill area with contour intervals as low as one foot. Thanks to the GSA, digital NWI maps are now available for the Sipsey River and Black Warrior River watersheds, the gaps in the Alabama River Corridor have been filled, and for the coastal counties the elusive Stiggins Lake Quadrangle now exist in digital form. The NRCS is producing additional digital county soil coverages each year. Some counties that do not currently have a complete soil survey document will be getting digital coverages. The State of Alabama will soon begin developing a statewide digital plat coverage. The State of Alabama is developing a

statewide GIS government users group to streamline the development of additional georeferenced data-layers.

During the course of this study, Alabama experienced a severe two year drought. The drought presented opportunities for timber harvest to occur in areas that would normally have been inaccessible. Many of these logged areas, previously forested in hardwoods, were replanted with pines. Unless these areas were mechanically site prepped they are not eligible as restoration sites until the pine trees have become well established. These wetland areas, planted to pines, will be potential restoration areas in seven to ten years if the pines are able to establish themselves.

References

Cowardin et al. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. U.S. Fish and Wildlife Service. Biological Services Program. FWS/OBS-79/31. 131 pp.

Dahl, T. E. 1990. *Wetland Losses in the United States 1780's to 1980's*. U.S. Department of the Interior, Fish and Wildlife Service, Washington D.C. 21 pp.

U.S. Fish and Wildlife Service. 1992. *Regional Wetlands Concept Plan Emergency Wetlands Resource Act - Southeast Region, Atlanta, Georgia*. 259 pp.

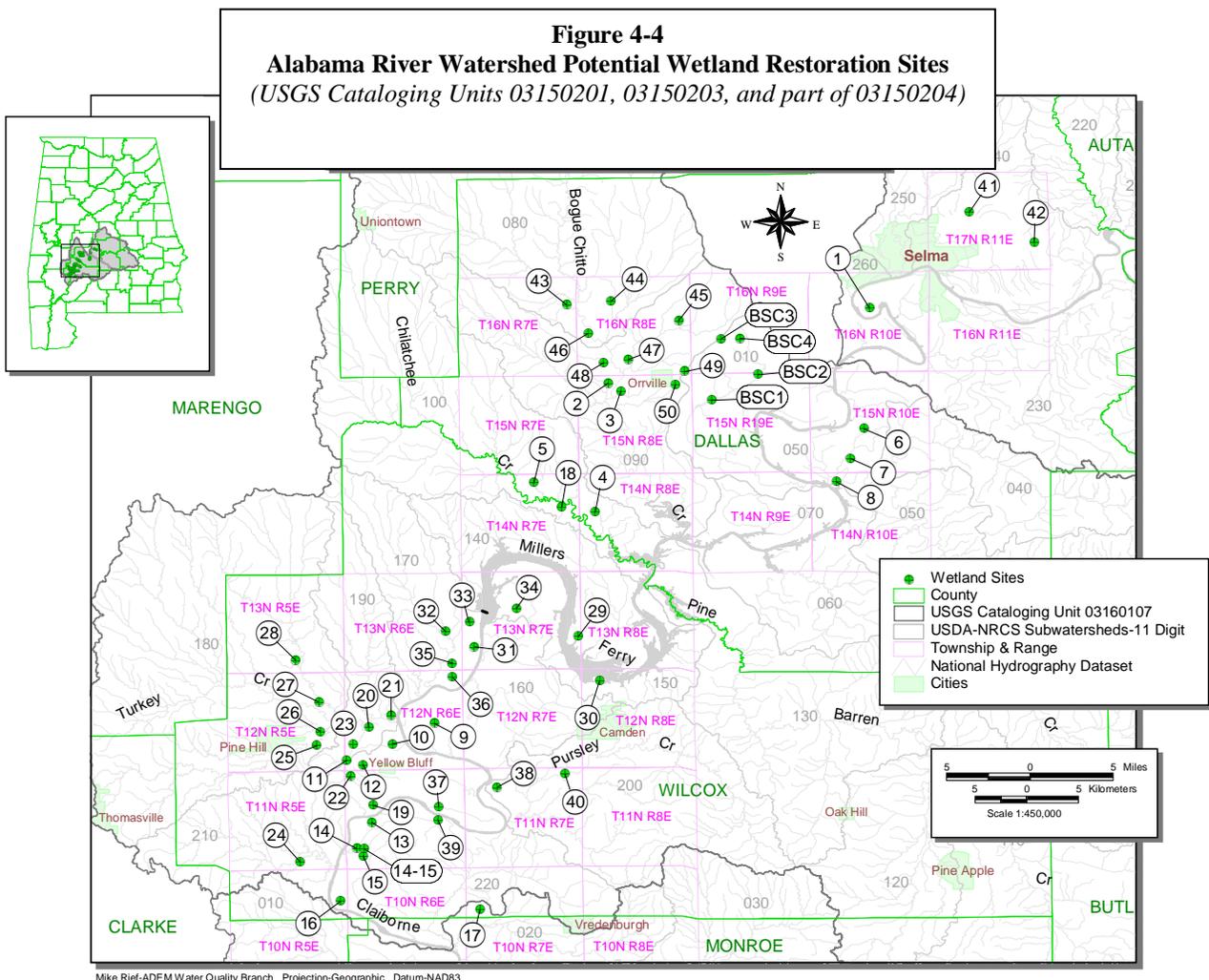


Table 4-11
Alabama River Watershed Potential Wetland Restoration Sites

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
AL1	7	68.95	16N 10E 9,10,15,16	Dallas	781	Agriculture & Forestry	Vegetation Type	SW of Selma, in Kings Bend
AL2	41	50.60	15N 8E 4,5,32	Dallas	447	Agriculture	Vegetation Type	W of Orrville, Bouge Chitto Cr.
AL3	29	57.96	15N 8E 4,5,8,9	Dallas	548	Agriculture	Vegetation Type	W of Orrville, Bouge Chitto Cr.
AL4	30	56.93	14N 8E 7,18	Dallas	253	Forestry	Vegetation Type	S of Crumptonia, Chilatchee Cr
AL5	36	54.02	14N 7E 3	Dallas	165	Agriculture	Vegetation Type	S of Safford
AL6	26	59.28	15N 10E 21,22	Dallas	550	Agriculture	Vegetation Type & Hydrology	S of Selma
AL7	23	60.97	15N 10E 28,29 32,33	Dallas	392	Agriculture	Vegetation Type & Hydrology	S of Selma
AL8	9	68.13	14N 10E 5,6	Dallas	515	Forestry	Vegetation Type	S of Selma, Cedar Cr.
AL9	35	54.25	12N 6E 14,23	Wilcox	874	Forestry	Vegetation Type	NE of Yellow Bluff
AL10	19	62.52	12N 6E 28	Wilcox	460	Forestry	Vegetation Type	N of Yellow Bluff
AL11	49	47.10	12N 6E 31	Wilcox	168	Forestry	Vegetation Type	W of Yellow Bluff
AL12	32	56.16	12N 6E 31,32	Wilcox	378	Forestry	Vegetation Type	W of Yellow Bluff
AL13	15	65.98	11N 6E 17,20	Wilcox	234	Forestry	Vegetation Type	S of Yellow Bluff
AL14	8*	68.26*	11N 6E 30	Wilcox	143	Forestry	Vegetation Type	S of Yellow Bluff
AL15	34*	54.57*	11N 6E 31	Wilcox	92	Forestry	Vegetation Type	S of Yellow Bluff
AL16	18	63.47	10N 5E 11,12,13	Wilcox	589	Forestry	Vegetation Type	E of Lower Peach Tree
AL17	14	66.26	10N 7E 17,18	Wilcox	906	Forestry	Vegetation Type	E of Lower Peach Tree
AL18	4	71.44	14N 7E 11,12 13,14	Wilcox	507	Forestry	Vegetation Type	SW of Crumptonia
AL19	1	76.17	11N 6E 8,9,17	Wilcox	684	Forestry	Vegetation Type	S of Yellow Bluff
AL20	6	69.31	12N 6E 17,19,20	Wilcox	249	Forestry	Vegetation Type	NW of Yellow Bluff
AL21	21	61.39	12N 6E 16,21	Wilcox	322	Agriculture & Forestry	Vegetation Type	N of Yellow Bluff
AL22	11	67.92	12N 5E,6E 36,31 11N 1,6	Wilcox	412	Agriculture	Vegetation Type & Hydrology	W of Yellow Bluff

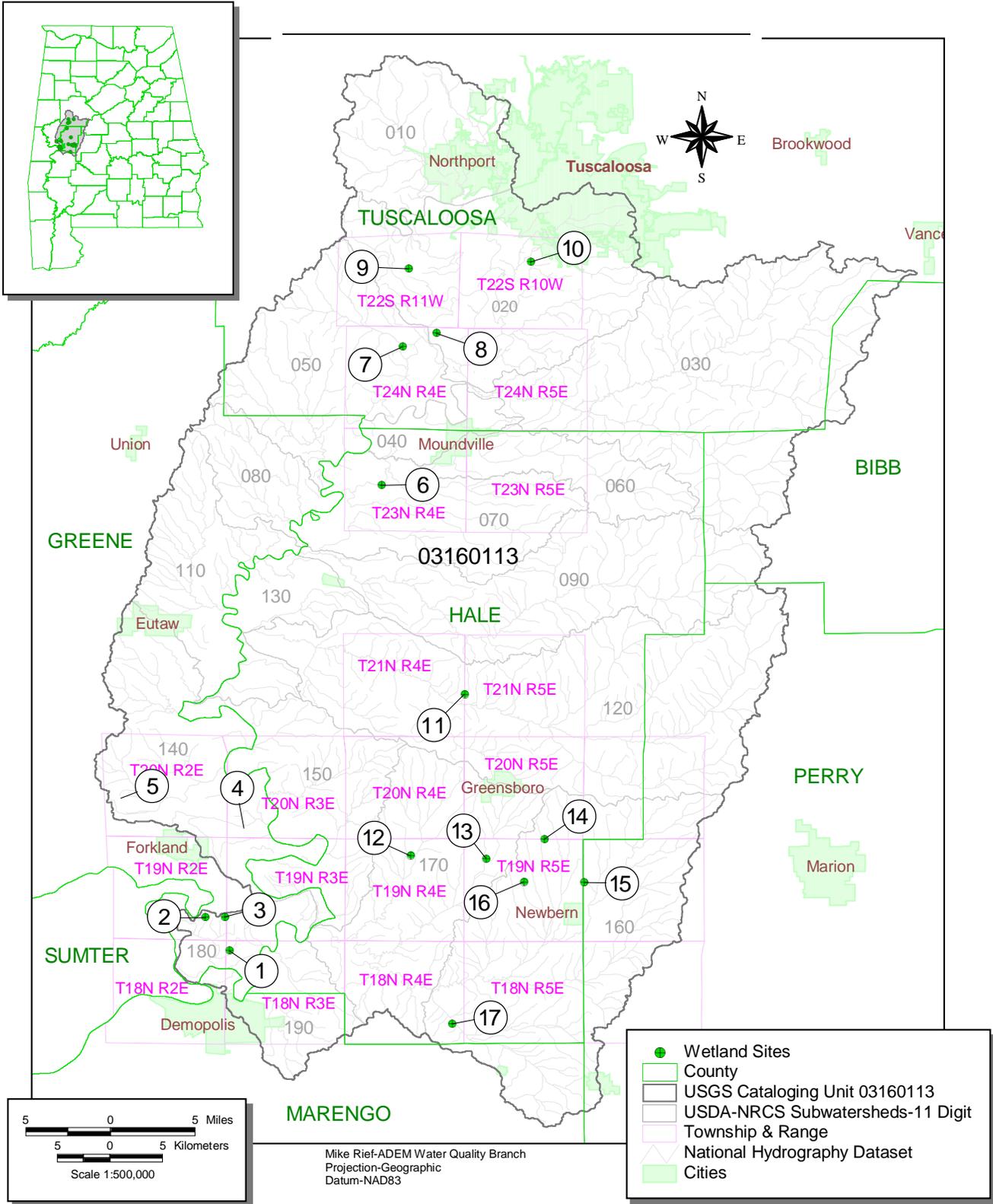
**Table 4-11
Alabama River Watershed Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
AL23	40	51.00	12N 6E 30	Wilcox	195	Agriculture	Vegetation Type & Hydrology	W of Yellow Bluff
AL24	12	67.12	11N 5E 34	Wilcox	367	Agriculture	Vegetation Type & Hydrology	N of Lower Peach Tree
AL25	50	46.84	12N 5E 23,26,27	Wilcox	680	Forestry	Vegetation Type & Hydrology	W of Yellow Bluff
AL26	46	47.80	12N 5E 23	Wilcox	229	Forestry	Vegetation Type	W of Yellow Bluff
AL27	54	40.70	12N 5E 11,12,13,14	Wilcox	515	Forestry	Vegetation Type & Hydrology	NW of Yellow Bluff
AL28	42	50.37	13N 5E 34	Wilcox	156	Forestry	Vegetation Type & Hydrology	N of Anne Manie
AL29	53	40.98	13N 7E 24,25 8E 19,30	Wilcox	194	Agriculture	Vegetation Type	W of Boykin
AL30	3	72.43	12N 8E 5,6,7	Wilcox	330	Agriculture & Forestry	Vegetation Type	E of Canton Bend
AL31	5	69.47	13N 7E 19,30	Wilcox	415	Agriculture	Vegetation Type & Hydrology	S of Midway
AL32	20	62.41	13N 6E 23,24	Wilcox	79	Agriculture	Vegetation Type	SW of Midway
AL33	24	60.24	13N 7E 18,19	Wilcox	356	Forestry	Vegetation Type	W of Midway
AL34	37	53.95	13N 7E 15,16	Wilcox	135	Agriculture	Vegetation Type & Hydrology	N of Millers Ferry
AL35	13	66.47	13N 6E 35,36	Wilcox	538	Forestry	Vegetation Type	SW of Midway
AL36	2	75.46	13N 6E,7E 31 12N 1,6,12	Wilcox	1039	Forestry	Vegetation Type	SW of Midway
AL37	28	58.65	11N 6E 10,11 13,14	Wilcox	750	Forestry	Vegetation Type	SE of Yellow Bluff
AL38	10	68.08	11N 7E 4,5,7,8,9	Wilcox	1520	Agriculture & Forestry	Vegetation Type	SE of Yellow Bluff
AL39	16	65.48	11N 6E 13,14,15 22,23,24	Wilcox	650	Agriculture	Vegetation Type & Hydrology	SE of Yellow Bluff
AL40	44	49.10	11N 7E 1,2	Wilcox	772	Agriculture & Forestry	Vegetation Type & Hydrology	SW of Camden

**Table 4-11
Alabama River Watershed Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
AL41	38	52.29	17N 11E 8,9,16,17	Dallas	670	Forestry	Vegetation Type	E of Selma
AL42	52	45.64	17N 11E 25	Dallas	221	Agriculture	Vegetation Type	E of Selma
AL43	39	51.43	16N 7E 12	Dallas	210	Forestry	Vegetation Type	NW of Orrville
AL44	51	46.22	16N 8E 5,6,8	Dallas	427	Forestry	Vegetation Type	N of Orrville
AL45	47	47.59	16N 8E 11,12,13 14,23,24	Dallas	803	Agriculture	Vegetation Type & Hydrology	N of Orrville
AL46	43	50.11	16N 7E 13,24 8E 18,19	Dallas	869	Agriculture & Forestry	Vegetation Type & Hydrology	NW of Orrville
AL47	33	55.50	16N 8E 27,28 32,33	Dallas	808	Agriculture & Forestry	Vegetation Type & Hydrology	W of Orrville
AL48	48	47.27	16N 8E 29,32,33	Dallas	1010	Agriculture & Forestry	Vegetation Type & Hydrology	W of Orrville
AL49	45	48.80	16N 8E 36 15N 1	Dallas	265	Agriculture	Vegetation Type & Hydrology	E of Orrville
AL50	55	36.85	15N 8E 1,2	Dallas	132	Agriculture	Vegetation Type & Hydrology	SE of Orrville
BSC1	31	56.30	15N 9E 7,8	Dallas	423	Agriculture & Forestry	Vegetation Type & Hydrology	SW of Selma
BSC2	22	61.00	16N 9E 34,35 15N 2,3	Dallas	1596	Forestry	Vegetation Type & Hydrology	SW of Selma
BSC3	25	60.14	16N 9E 21,28	Dallas	572	Forestry	Vegetation Type	SW of Selma
BSC4	27	58.74	16N 9E 20,29	Dallas	445	Forestry	Vegetation Type & Hydrology	SW of Selma

Figure 4-5
Lower Black Warrior River Watershed Potential Wetland Restoration Sites
(USGS Cataloging Unit 03160113)



**Table 4-12
Lower Black Warrior River Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
BW1	12	53.255	18N 2E,3E 1,6	Greene	741	Agriculture & Forestry	Vegetation Type & Hydrology	N of Demopolis
BW2	1	75.995	19N 2E 25,26 35,36	Greene	1746	Agriculture & Forestry	Vegetation Type & Hydrology	N of Demopolis
BW3	5	64.56	19N 3E 30,31	Greene	1073	Agriculture & Forestry	Vegetation Type	N of Demopolis
BW4	3	69.35	20N 2E 13,24 3E 18,19	Greene	1230	Forestry	Vegetation Type	N of Demopolis
BW5	9	60.74	20N 1E 16,21,28	Greene	1333	Agriculture & Forestry	Vegetation Type & Hydrology	N of Demopolis
BW6	2	72.79	23N 3E,4E 25 30 36 31,32 22N 1 6	Hale	2256	Agriculture & Forestry	Vegetation Type	SW of Moundville
BW7	14	49.62	24N 4E 9	Tuscaloosa	303	Forestry	Vegetation Type	SE of Tuscaloosa
BW8	6	62.90	24N 4E 2	Tuscaloosa	645	Agriculture & Forestry	Vegetation Type & Hydrology	SW of Tuscaloosa
BW9	17	45.60	22S 11W 10,15	Tuscaloosa	627	Agriculture & Forestry	Vegetation Type & Hydrology	W of Tuscaloosa
BW10	4	65.48	22S 10W 9,10 15,16	Tuscaloosa	740	Agriculture & Forestry & Commercial	Vegetation Type & Hydrology	S of Tuscaloosa

**Table 4-12
Lower Black Warrior River Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
BW11	10	55.84	21N 4E,5E 19,24	Hale	898	Agriculture & Forestry	Vegetation Type	NW of Greensboro
BW12	11	53.61	20N 4E 34 19N 2,3,9,10 11,15,16	Hale	2440	Agriculture & Forestry	Vegetation Type & Hydrology	SW of Greensboro
BW13	13	52.78	19N 5E 5,7,8	Hale	736	Agriculture & Forestry	Vegetation Type & Hydrology	S of Greensboro
BW14	15	48.91	19N 5E 34,35 18N 2,3	Hale	1021	Agriculture & Forestry	Vegetation Type & Hydrology	SW of Newbern
BW15	7	61.595	18N 5E 13,18	Hale/Perry	970	Agriculture & Forestry	Vegetation Type & Hydrology	S of Newbern
BW16	8	61.225	18N 5E 15,16	Hale	1267	Agriculture & Forestry	Vegetation Type & Hydrology	S of Newbern
BW17	16	48.79	18N 4E 25,36 5E 31,32	Hale	1810	Agriculture	Vegetation Type & Hydrology	SW of Newbern

Figure 4-6
Sipsey River Watershed Potential Wetland Restoration Sites
(USGS Cataloging Unit 03160107)

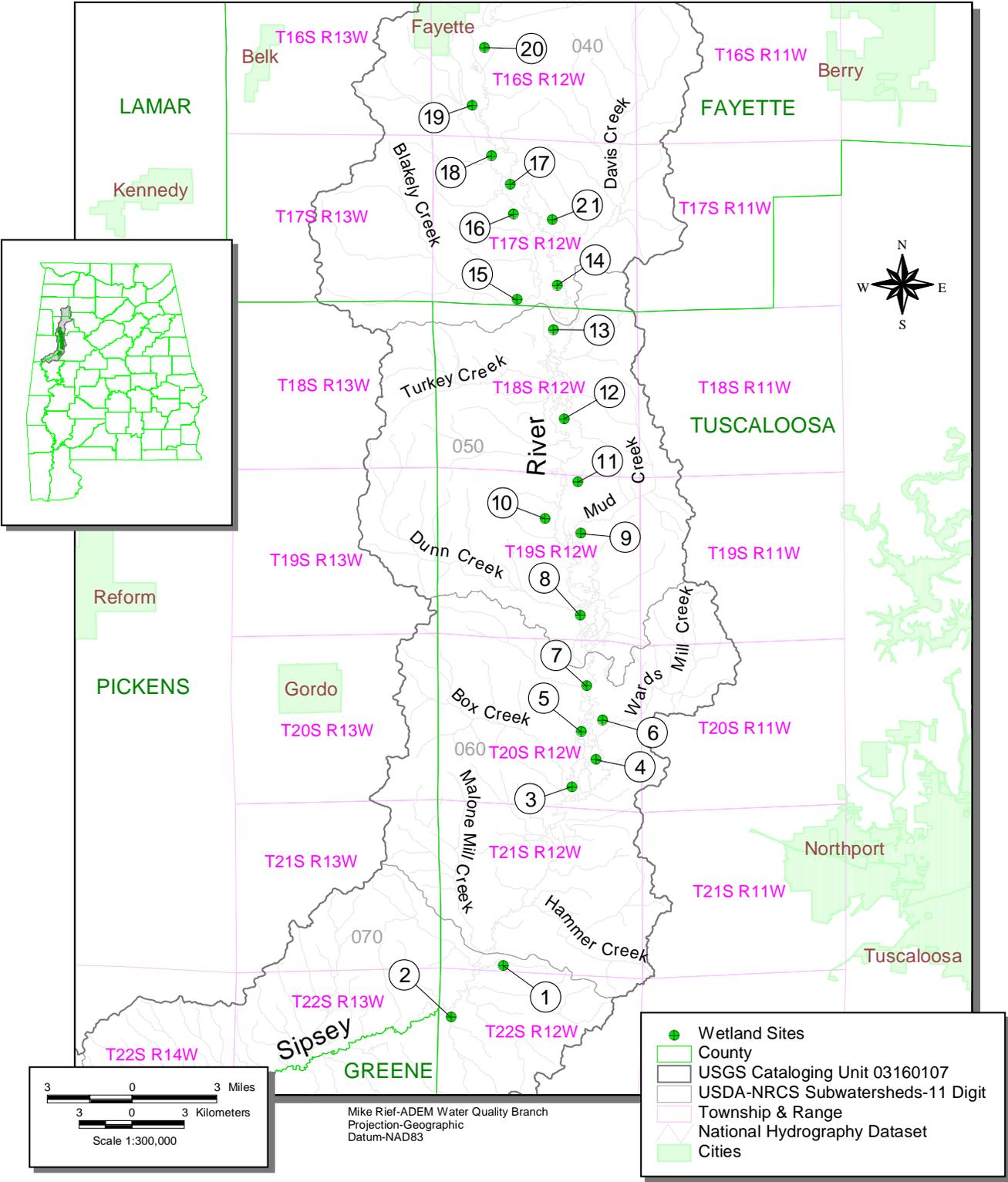


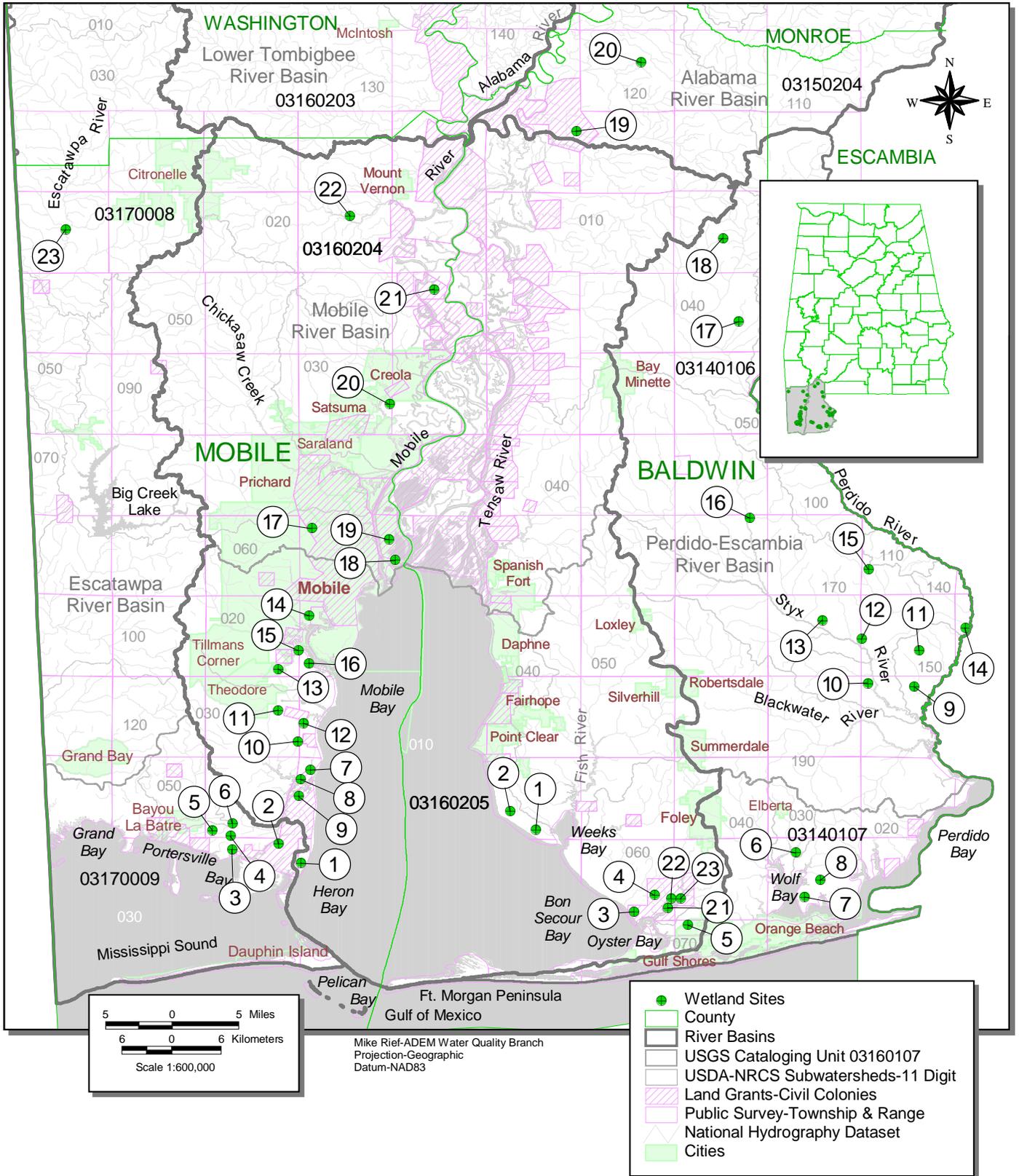
Table 4-13
Sipsey River Watershed Potential Wetland Restoration Sites

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
S1	3	79.23	21S 12W 32,33 22S 4,5	Tuscaloosa	960	Forestry	Vegetation Type	SW of Buhl, E of Sipsey Tract
S2	4	78.38	22S 13W 17,18	Greene & Tuscaloosa	444	Forestry	Vegetation Type & Hydrology	NE of Jena, S of Sipsey Tract
S3	12	69.59	20S 12W 26,27 34,35	Tuscaloosa	775	Forestry	Vegetation Type & Hydrology	NW of Buhl
S4	5	77.69	20S 12W 23,26	Tuscaloosa	302	Forestry	Vegetation Type & Hydrology	NW of Buhl
S5	6	77.03	20S 12W 23	Tuscaloosa	190	Forestry	Vegetation Type	NW of Buhl
S6	18	61.73	20S 12W 13,14,23	Tuscaloosa	490	Forestry	Vegetation Type	NW of Buhl
S7	17	63.26	20S 12W 2,10,11,14	Tuscaloosa	850	Forestry	Vegetation Type	SE of Echola
S8	8	72.98	19S 12W 26,35	Tuscaloosa	237	Forestry	Vegetation Type	NE of Echola
S9	10	70.71	19S 12W 11,14,15	Tuscaloosa	753	Forestry	Vegetation Type	NW of Brownville
S10	19	60.62	19S 12W 10	Tuscaloosa	280	Agriculture	Vegetation Type	NW of Brownville
S11	2	80.31	19S 12W 34,35 18S 2,3	Tuscaloosa	935	Forestry	Vegetation Type	N of Brownville
S12	9	70.88	18S 12W 22,26,27	Tuscaloosa	874	Forestry	Vegetation Type	N of Brownville
S13	1	81.55	18S 12W 3,10	Tuscaloosa	480	Forestry	Vegetation Type	N of Brownville
S14	7	74.26	17S 12W 27,34	Fayette	1080	Forestry	Vegetation Type	E of Newtonville
S15	20	51.33	17S 12W 33	Fayette	107	Agriculture & Forestry	Vegetation Type & Hydrology	E of Newtonville

**Table 4-13
Sipsey River Watershed Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
S16	15	67.74	17S 12W 16	Fayette	339	Agriculture & Forestry	Vegetation Type & Hydrology	N of Newtonville
S17	16	66.10	17S 12W 8,9	Fayette	363	Agriculture & Forestry	Vegetation Type & Hydrology	N of Newtonville
S18	14	68.40	17S 12W 5,8	Fayette	358	Forestry	Vegetation Type & Hydrology	N of Newtonville
S19	11	69.63	16S 12W 29-32	Fayette	1046	Agriculture & Forestry	Vegetation Type & Hydrology	S of Fayette
S20	21	49.70	16S 12W 17,20	Fayette	458	Agriculture & Forestry	Vegetation Type & Hydrology	SE of Fayette
S21	13	68.47	17S 12W 15,22	Fayette	1080	Forestry	Vegetation Type	NE of Newtonville

Figure 4-7
Baldwin and Mobile Counties Potential Wetland Restoration Sites
 (USGS Cataloging Units 03140106-7, 03150201, 03160203-4-5, 03170008-9)



**Table 4-14
Mobile County Potential Wetland Restoration Sites**

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
MC1	16	65.70	7S 1W 7	Mobile	97	Salt Marsh	Hydrology	S of Alabama Port
MC2	8	77.96	7S 2W 2	Mobile	262	Forestry	Vegetation Type & Hydrology	W of Alabama Port
MC3	10	75.39	7S 2W 4,5,8,9	Mobile	426	Forestry	Vegetation Type & Hydrology	E of Bayou La Batre
MC4	11	74.94	7S 2W 31,32,33 8S 4,5,6	Mobile	811	Agriculture	Vegetation Type & Hydrology	E of Bayou La Batre
MC5	14	67.13	7S 2W 31	Mobile	238	Agriculture	Vegetation Type & Hydrology	E of Bayou La Batre
MC6	7	79.61	7S 2W 28,29,32	Mobile	240	Agriculture	Vegetation Type & Hydrology	E of Bayou La Batre
MC7	21	61.13	7S 1W 9	Mobile	17	Salt Marsh	Hydrology	N of Mon Louis
MC8	23	47.14	7S 1W 9	Mobile	61	Agriculture	Vegetation Type & Hydrology	NW of Mon Louis
MC9	18	62.65	7S 2W 37 1W 33	Mobile	80	Agriculture	Vegetation Type & Hydrology	SW of Mon Louis
MC10	20	61.36	6S 2W 25,36 1W 30,31	Mobile	315	Agriculture	Vegetation Type & Hydrology	W of Bellefontaine
MC11	5	79.81	5S 2W 14	Mobile	175	Commercial	Vegetation Type & Hydrology	NW of Bellefontaine
MC12	15	66.93	6S 1W 18,19,37	Mobile	483	Forestry	Vegetation Type	NW of Bellefontaine
MC13	4	82.51	5S 2W 35	Mobile	141	Commercial	Vegetation Type & Hydrology	SE of Tillmans Corner
MC14	19	62.48	4S 1W 7,36	Mobile	78	Commercial	Vegetation Type & Hydrology	S of Mobile
MC15	13	67.33	5S 1W 1,19 2W 25	Mobile	17	Salt Marsh	Hydrology	S of Mobile
MC16	22	55.04	5S 1W 1	Mobile	43	Salt Marsh	Hydrology	S of Mobile
MC17	17	65.28	4S 1W 6,7	Mobile	128	Commercial	Vegetation Type & Hydrology	In Mobile

Table 4-14
Mobile County Potential Wetland Restoration Sites

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
MC18	1	94.84	4S 1E 2	Mobile	85	Commercial	Vegetation Type & Hydrology	E of Mobile
MC19	3	88.32	4S 1W 00	Mobile	253	Commercial	Vegetation Type & Hydrology	E of Mobile
MC20	6	79.76	2S 1E 19,20 1W 24	Mobile	660	Forestry	Hydrology	E of Satsuma
MC21	2	91.52	1S 1E 4,5,40	Mobile	1217	Forestry	Hydrology	NE of Creola
MC22	9	77.22	1N 1W 9,10	Mobile	350	Forestry	Vegetation Type	W of Mount Vernon
MC23	12	74.31	1N 4W 15,22	Mobile	513	Forestry	Vegetation Type	W of Citronelle
BC1	7	77.17	7S 2E 27,28 33,34,38	Baldwin	890	Forestry	Vegetation Type	South of Fairhope
BC2	16	70.59	7S 2E 19,20,29,30	Baldwin	442	Forestry	Vegetation Type	South of Fairhope
BC3	2	88.46	8S 3E 27,33,34 9S 7	Baldwin	470	Forestry	Vegetation Type	West of Bon Secour
BC4	23	54.84	8S 3E 26,38,39	Baldwin	255	Agriculture	Vegetation Type & Hydrology	Northwest of Bon Secour
BC5	20	66.37	8S 4E 31,32 9S 5,6	Baldwin	1,256	Commercial	Vegetation Type & Hydrology	Northwest of Gulf Shores
BC6	4	79.36	8S 5E 8	Baldwin	88	Agriculture	Vegetation Type & Hydrology	East of Mifflin
BC7	8	77.07	8S 5E 21,28	Baldwin	442	Forestry	Vegetation Type & Hydrology	Southeast of Mifflin
BC8	22	59.25	8S 5E 22	Baldwin	80	Agriculture	Vegetation Type & Hydrology	Southeast of Mifflin
BC9	1	95.88	5S 6E 25,26,27,28 33,34,35,36	Baldwin	6,710	Forestry	Vegetation Type	North of Seminole

Table 4-14
Mobile County Potential Wetland Restoration Sites

Site	Rank	Score	Location TRS	County	Acreage	Current Land Use	Impact Type	Nearest Town
			6S 1,2,3,4,5,6 7,8,9,10,11 15,16,17					
BC10	3	80.73	6S 6E 6 5S 31	Baldwin	650	Forestry	Vegetation Type	South of Fairhope
BC11	15	70.70	5S 6E 26,27,28 21,22	Baldwin	1965	Forestry	Vegetation Type	North of Seminole
BC12	14	71.55	5S 6E 18,19 5E 13,14	Baldwin	390	Forestry	Vegetation Type	N of Seminole
BC13	12	73.12	5S 5E 9,10,15,16	Baldwin	863	Forestry	Vegetation Type	North of Seminole
BC14	21	65.74	5S 7E 18	Baldwin	185	Forestry	Vegetation Type	Northeast of Seminole
BC15	13	72.99	4S 6E 19,30	Baldwin	661	Forestry	Vegetation Type	East of Gateswood
BC16	17	70.54	3S 3E 35 4S 2	Baldwin	341	Forestry	Vegetation Type	East of Stapleton
BC17	6	78.61	1S 4E 14,23,26,27	Baldwin	740	Forestry	Vegetation Type	Southeast of Dyas
BC18	19	68.46	1N 4E 15,16, 21,22	Baldwin	990	Forestry	Vegetation Type	East of Rabun
BC19	10	74.31	2N 2E 56	Baldwin	275	Forestry	Vegetation Type	West of Tensaw
C20	18	69.15	3N 3E 15	Baldwin	440	Agriculture	Vegetation Type & Hydrology	Northwest of Blacksher
BC21	5	79.33	8S 3E 40	Baldwin	17	Commercial	Hydrology	Southeast of Bon Secour
BC22	9	74.98	8S 3E,4E 25,30	Baldwin	238	Forestry	Hydrology	East of Bon Secour
BC23	11	73.54	8S 4E 30	Baldwin	24	Commercial	Hydrology	East of Bon Secour

Table 4-15
Statewide Wetlands Landuse Data Estimates by River Basin

River Basins	Total		Woody Wetlands		Emergent Wetlands		Total Wetlands
	Acres	Percent of RB	Acres	Percent of RB	Acres	Acres	
Alabama	3,707,839	10.35%	383,794	0.39%	14,292	398,085	
Black Warrior	3,934,894	3.38%	132,936	0.15%	5,813	138,749	
Cahaba	1,135,698	5.90%	67,028	0.16%	1,855	68,882	
Chattahoochee	1,584,962	4.14%	65,554	0.20%	3,202	68,756	
Chipola	157,907	13.63%	21,515	0.33%	518	22,033	
Choctawhatchee	1,911,634	6.09%	116,422	0.24%	4,515	120,937	
Coosa	3,380,685	1.18%	39,992	0.16%	5,468	45,461	
Escatawpa	614,555	6.52%	40,049	1.99%	12,235	52,285	
Lower Tombigbee	2,488,088	12.05%	299,805	0.28%	7,061	306,866	
Mobile	1,118,408	13.61%	152,162	2.26%	25,315	177,477	
Perdido-Escambia	3,270,846	5.97%	195,147	0.22%	7,136	202,283	
Tallahassee	2,501,214	3.84%	96,060	0.16%	3,988	100,047	
Tennessee	4,329,619	3.27%	141,780	0.26%	11,337	153,116	
Upper Tombigbee	2,287,320	11.35%	259,526	0.42%	9,709	269,234	
Totals	Acres	32,423,668	2,011,768		112,444	2,124,212	
	Square Miles	50,662	3,143		175	3,319	

The combined woody and emergent wetland acreage comprises 6.55% of Alabama.

The landuse data used for wetland size determinations was acquired from EPA Region IV. The following information is pertains to this data set.

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 mosaicking 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 mosaicking, mosaicked 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 which 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.

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 versus 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.

Part 5 Ground Water Assessment

5.1 Overview of State Ground Water Protection Programs

Many of elements of Alabama's ground water programs listed in Table 5-1 are managed by subdivisions within the Alabama Department of Environmental Management (ADEM), including the Land, Field Operations, and Water Divisions. The Ground Water Branch in the Water Division provides the hydrogeological support for these programs. Other programs related to ground water management and protection are managed by other state and federal agencies. The on-site sewage program is managed by the Alabama Department of Public Health and the Class II Underground Injection Control Program is managed by the State of Alabama Oil and Gas Board. Ground water quantity issues are addressed by the Alabama Department of Economic and Community Affairs Office of Water Resources. Other ground water monitoring and regulatory programs are managed by the Geological Survey of Alabama and the Alabama Surface Mining Commission. The U.S. Environmental Protection Agency (EPA) provides oversight on all federally funded and delegated ground water programs.

5.2 Coordination of State Ground Water Programs

The State of Alabama recognizes that there is a need to coordinate management of ground water programs and as a result set up the Ground Water Programs Advisory Committee (GWPAC) in 1994 to aid in completing the requirements for EPA's Core Comprehensive State Ground Water Protection Program (CSGWPP). The ADEM Ground Water Branch and the GWPAC continue to work toward a fully integrated CSGWPP. This work includes coordinating ground water regulatory programs and addressing program refinements identified during the CSGWPP core review process.

Meetings of the GWPAC are now being held twice a year. This committee includes representatives of other state and federal agencies, consultants, water system representatives, and others who work in ground water related fields. The meetings are used to provide ground water program information, receive feedback and coordinate ground water projects. A subcommittee of agencies involved in area wide ground water monitoring programs was formed in late 1997. This subcommittee is working to maximize resources to provide the best monitoring coverage of the state.

5.3 Significant State Ground Water Program Developments

The following items summarize some of the recent ground water developments that are underway in Alabama:

- Implementation of the Source Water Assessment Program within the ADEM Water Supply Branch regulations.
- Implementation of guidance for Risk Based Corrective Action (RBCA) for petroleum fuels.
- A RBCA approach for releases other than petroleum related fuels that are regulated under the State Ground Water Program was developed and is currently under review.
- Initiation of a ground water quality database for reporting.
- The deadline for UST upgrades with spill, overflow and corrosion protection was December 22, 1998. Tanks should have been upgraded, replaced with a new system or permanently closed by this date. The compliance rate with these regulations is increasing with continuing enforcement of these requirements.
- A contract was signed with the Geological Survey of Alabama, in September 1997, to revise a series of 13 Aquifer Vulnerability Reports. These reports are being revised by updating geologic names and terms to match the most recent state mapping, revising vulnerability maps from 1:250,000 scale to 1:100,000 scale, revising the vulnerability rating methods, and to include text maps and figures in an electronic CDROM format. Area 13 (Baldwin and Mobile Counties), Area 10 (Washington, Choctaw and Clarke Counties), and Area 5 (Coosa,

Cleburne, Clay, Randolph, Tallapoosa, Chambers and Lee Counties) have been completed and published as a compact disc. Area 11 has completed the review process and will be available for distribution in April 2004. Area 2 and 4 are in final review and should be available in July 2004. Area 7 is currently in the review process and should be complete late in 2004.

- The Non-Point Source Program has provided funding for pesticide sampling of residential wells in vulnerable areas in the southernmost half of the Coastal Plain Ground Water Province. Sampling and analysis, and the development of the final report have been completed. The State Groundwater Program has provided funding for pesticide sampling of residential wells in vulnerable areas in the northernmost half of the Coastal Plain Ground Water Province. Sampling and analysis, and the development of the final report have been completed.
- In 2002, eleven counties hosted a Groundwater Festival. These counties included Colbert, Pike, Lauderdale, Limestone, Montgomery, Madison, Geneva, Houston, Blount, Etowah, and St. Clair. In addition to the counties hosting festivals in 2002, 5 more festivals were added in 2003. Two of the festivals were combined counties. The counties hosting festivals included Jefferson, Cullman, Autauga, Barbour/Bullock, and Sumter/Marengo. The total number of Counties involved with hosting a festival in 2003 was 18. In 2003, approximately 17,500 4th grade students participated in Water Festival.
- Regulations have been developed by ADEM and implemented to deal with Concentrated Animal Feeding Operations (CAFOs). Hydrogeologic site evaluations and ground water monitoring requirements have been included in the regulations as part of siting and operation requirements for CAFO lagoons and land application sites.
- The U.S. Geological Survey is working on the National Water Quality Assessment for two study units that include significant parts of Alabama's Mobile River and Lower Tennessee River Basins.
- The Alabama Department of Public Health is revising its on-site sewage regulations.
- ADEM is near completion of a state wide ambient ground water quality monitoring effort using the probabilistic monitoring grid approach.
- ADEM has implemented an ambient ground water monitoring program in the Piedmont District for radionuclides. Sampling was completed and a report was developed in December 2003.
- ADEM has implemented an ambient ground water monitoring program for nutrients in watersheds with heavy poultry industry.
- The Alabama Department of Agriculture and Industries (ADAI) provided funding for pesticide and metals sampling of residential wells in vulnerable areas in the Valley and Ridge and the Cumberland Plateau Provinces of Central and North Alabama. Sampling has been completed and a report is in development. The ADAI also provided funding for sampling of residential wells in vulnerable areas of the Tennessee River Watershed. Sampling has been completed and a report is in development.

5.4 Summary of Ground Water Contamination Sources

A. Reporting Area

The Alabama Department of Environmental Management has selected the physiographic districts of the Fall Line Hills district and the Black Prairie districts in Alabama for evaluation during this reporting period. These two districts included in this report complete the ADEM's coverage of the East Gulf Coastal Plain Province that appeared in the year 2002 report. These districts are underlain by the Alluvial Aquifer, Eutaw aquifer, Gordo aquifer, and Coker aquifer. These

**Table 5-1
Summary of State Ground Water Protection Programs**

Programs or Activities	Check	Implementation Status	Responsible State Agency (1)
Active Sara Title III Program	X	Fully established	EPA/ADEM/FOD/EMA
Ambient ground water level monitoring program	X	Fully established	GSA
Aquifer vulnerability assessment	X	Fully established Being updated	ADEM/GWB
Aquifer mapping	X	Fully established	GSA
Aquifer characterization	X	Fully established	GSA
Comprehensive data management system	X	Under development	ADEM/GWB
EPA-Endorsed Core Comprehensive State Groundwater Protection Program	X	Fully established	ADEM/GWB
Ground water discharge permits	X	Established in UIC Regs.	ADEM/UIC .
Ground water Best Management Practices			
Ground water legislation			
Ground water classification	X	Established in UIC Reg Definition	ADEM/UIC
Ground water quality standards			
Interagency coordination for ground water protection Initiatives	X	Continuing efforts	ADEM/GWB
Non-point source controls	X	Under development	ADEM/FOD
Pesticide State Management Plan	X	Generic Draft	ADAI
Pollution Prevention Program	X	Under Development	ADEM/OEO
Resource Conservation and Recovery Act (RCRA) Primacy	X	Fully established	ADEM/HWB
Source Water Assessment Program	X	Fully established	ADEM/WSB
State Superfund	X	Fully established	ADEM/LD
State RCRA Program incorporating more stringent requirements than RCRA Primacy	X	Fully established	ADEM/HWB
State septic system regulations	X	Fully established	ADPH
Underground storage tank installation requirements	X	Fully established	ADEM/GWB
Underground Storage Tank Remediation Fund	X	Fully established	ADEM/GWB
Underground Storage Tank Registration Program	X	Fully Established	ADEM/GWB
Underground Injection Control Program	X	Fully established	ADEM/GWB/OGB
Vulnerability assessment for drinking water/wellhead protection	X	Fully established	ADEM/GWB
Well abandonment regulations	X	WSB Regs & Guidelines	ADEM/WSB GWB
Wellhead Protection Program (EPA-approved)	X	Fully established	ADEM/WSB
Well installation regulations	X	Fully Established	ADEM/WSB
State Ground Water Program	X	Statute Based Program	ADEM/GWB
NPDES Permits for Land Application Sites	X	Fully Established	ADEM/MUN/IIND
Subtitle D Solid Waste Program	X	Fully Established	ADEM/SWB
Ground Water Use	X	Fully Established	ADECA/WRD

I. ADEM = AL Dept Env Mngt, FOD = Field Operations Division, GWB = Ground Water Branch, WSB = Water Supply Branch, LD = Land Division, HWB = Hazardous Waste Branch, OEO=Office of Education and Outreach, SWB=Solid Waste Branch, MUN=Municipal Branch, IND=Industrial Section GSA = Geological Survey of Alabama, ADPH = AL Dept. of Public Health, ADAI = AL. Dept. Agriculture & Industries, OGB = Oil & Gas Board; ADECA=Alabama Department of Economic and Community Affairs, Office of Water Resources, EPA= Environmental Protection Agency, EMA= Emergency Management Agency

districts are underlain by the Alluvial Aquifer, Eutaw aquifer, Gordo aquifer, and Coker aquifer. These aquifers are significant sources of drinking water supplies for private residential use as well as for municipalities. Counties included in the reporting area in whole or part are Autauga, Bibb, Bullock, Chilton, Dallas, Elmore, Fayette, Greene, Hale, Lamar, Lee, Lowndes, Macon, Marengo, Marion, Montgomery, Perry, Pickens, Russell, Sumter, Tallapoosa, Tuscaloosa, and Wilcox. Data contained in Table 5-3a through 5-4 were queried and retrieved by county. Some overlap of data from physiographic districts not included in the reporting area is shown where the above mentioned counties do not lie wholly within the report's selected physiographic districts.

B. Data Review and Compilation

Hydrogeologists from the ADEM Ground Water Branch are assigned to the major ground water regulatory programs as part of the Comprehensive State Ground Water Protection Program. The information contained in Table 5-2, Ground Water Contamination Summary, was researched from ADEM's electronic databases and prepared by the hydrogeologists assigned to each of the programs listed under the Source Type column.

C. Superfund CERCLIS and DOD Sites

ADEM's Land Division works with EPA and the Department of Defense to manage these types of sites. No facilities identified in Table 5-2 are listed on the National Priority List (NPL).

The CERCLIS listings include 11 non-NPL sites located in the report area. These are sites where State and Federal Funds have been used to conduct preliminary and secondary assessments by ADEM and EPA. Three (3) of the eleven sites have had confirmed releases of contaminants into groundwater.

Two Department of Defense Sites (DOD) are listed in Table 5-2. The ongoing site assessments are being funded by the Defense Environmental Restoration Fund.

D. Underground Storage Tank Program

The largest category of sites listed in Table 5-2 is underground storage tanks (UST). These sites are managed by the ADEM Ground Water Branch. Assessment and clean up of eligible sites is funded through the State UST Trust Fund. Many of the cleanups listed include free product, source and soil removals. Active ground water remediation systems are also included. Most of these cleanups involve gasoline spills and leaks, but also include diesel and fuel oils. These petroleum fuels include soluble compounds such as Benzene, Ethyl Benzene, Toluene, Xylene (BETX), Polynuclear Aromatic Hydrocarbons (PAH's), Methyl Tertiary Butyl Ether (MTBE) and lead that affect ground water quality. Monitoring for MTBE at UST sites has been required since 1996. A monitoring effort for all public water supplies for MTBE was conducted in 2000.

E. Hazardous Waste Management Program (RCRA)

Fifteen (15) hazardous waste sites (RCRA) were identified in the study area. The ADEM Land Division manages these sites. These sites include extensive assessment, permitting and reporting requirements. Releases associated with these sites are persistent and difficult to assess and remediate. Compounds such as Chlorinated Volatile Organic Compounds (VOCs), and Non-Aqueous Phase Liquids (Dense and Light) associated with Wood Treating Activities are present in many instances and have properties that make remediation problematic.

F. Underground Injection Control Program

The Underground Injection Control (UIC) program is managed by the ADEM Ground Water Branch. In this reporting area permits are issued to Class V sites for the subsurface injection of treated wastewater, and for the disposal of treated ground water resulting from the remediation of

recovered contaminated groundwater. UIC Class V permits are issued for the subsurface injection or placement of materials such as oxygen release compounds, chlorine, experimental bacteria stimulation solution, and other substances to aid in the remediation of contaminated groundwater. Most of the UIC sites are greenfield (new) sites and involve laundromats, car washes, truck washes, meat processors, and treated industrial or commercial waste water. Some UIC sites involve the issuance of a permit for the injection of heat pump return water or condensate from boiler blowdown that contain no contaminants. Class I and Class IV UIC wells are prohibited in the State of Alabama, and Class II injection wells are managed by the State of Alabama Oil and Gas Board.

G. State Ground Water Program

State Ground Water Program sites are those that are not regulated by established programs such as RCRA, UST, UIC or CERCLA. Sites such as releases from bulk petroleum storage tanks, pipelines, and otherwise unregulated chemical spills are assessed and remediated using the authority of the Alabama Water Pollution Control Act (AWPCA). Releases from these sites are in many cases reported by the responsible party through company initiated environmental audits or are discovered as a result of real-estate assessments during property transactions. Other ground water incidents are discovered and reported to the Department by citizens or discovered through inspections. Assessment and cleanup of these sites is required to be conducted by the responsible party. Many types of contaminant releases have been addressed by this program.

H. Non Point Source Program

The non-point source sites are new sites where hydrogeologic site evaluations have been conducted by the Department for the land application of treated effluent from municipal facilities. Two (2) non-point source sites were identified in the study area for years 2002-2003.

I. Ambient Monitoring Network

Aquifer monitoring data listed in Table 5-3 was evaluated for counties in the reporting area. The monitoring data were obtained from the Geological Survey of Alabama (GSA) and from ADEM's computer databases. The GSA maintains an ambient ground water level monitoring network throughout the state. Four hundred and ninety (490) sites are monitored in the fall for water levels. Fifty of these water level sites are springs.

Since 1996, budgetary constraints have not allowed the GSA to do any routine monitoring of water quality. However, in 2000 and 2001, 304 wells were sampled in the coastal plain region of the state. One hundred thirty-five of these wells fell into the Dougherty Plain district, the Hatcherigbee Dome subdistrict, the Lime Hills district, the Buhrstone Hills subdistrict, the Flatwoods subdistrict, the Southern Red Hills district, the Chunnenugee Hills district, or the Alluvial-Deltaic Plain of the East Gulf Coastal Plain Province and are shown in table 4.3. Of the 140 wells sampled in the reporting area, 14 reported presence of fecal coliform, one sample from a Dallas County well had excess Aldicarb levels (4.55 mg/L), and one excessive lead levels (Butler County, 17.8 mg/L). Two samples had fluoride levels in excess of 2.0 mg/L. Many samples exceeded the MCL for secondary drinking water standards: 16 samples had iron in excess of 0.3 mg/L, 9 had total dissolved solids levels above 500 mg/L, and 9 had manganese levels above 0.05 mg/L. The complete results for this study can be reviewed in open file reports on file at GSA (Gillett, 2001)

5.5 Summary of Groundwater Quality

A. Hydrogeology

The physiographic districts in this 305(b) Report, are the Black Prairie district and the Fall Line Hills district of the East Gulf Coastal Plain. Generally speaking they trend from northwest

to southeast and/or west to east. Depending on the area of the State evaluated, the various districts are comprised of as few as a single geologic formation to as many as four separately identifiable geologic formations. The more southern district in this report is the Black Prairie district. The three districts are described below as they appear from south to north across the area of this report's interest.

B. (Alluvial-Deltaic Plain District)

The Alluvial-Deltaic Plain district is found in and adjacent to valleys associated with all major and minor rivers and creeks throughout the study area. It is sometimes called the Watercourse aquifer because these areas are characterized by flat flood plains and terraces. These deposits consist of alluvial sediments and terrace deposits associated with the flood plains of present and ancestral large streams. They consist mainly of gravel, sand, silt, and clay. The alluvial deposits are a potential source of water for large supplies in the flood plains of the major rivers in the area but have generally not been developed for public water systems.

C. (Black Prairie District)

The Black Prairie Physiographic district consists of portions of thirteen (13) counties in Alabama. They are Bullock County, Dallas County, Greene County, Hale County, Lowndes County, Macon County, Marengo County and Montgomery County, Perry County, Pickens County, Russell County, Sumter County, and Wilcox County. The Black Prairie district, named for the black soil that occurs in the area, is a gently- to moderately-rolling prairie that is characterized by extensive grasslands but very few trees. The land surface in the area generally ranges in altitude from 150 to 420 ft. above sea level (Scott, Cobb, Castleberry 1987) (Kidd 1987) (Mooty 1987).

The Black Prairie district underlying geologic formations are the Mooreville Chalk and Demopolis Chalk.

- **Mooreville Chalk**

The Mooreville Chalk is up to 420 feet thick in the reporting area and was formed in warm, shallow seas so that microfossils compose a large percentage of the chalk. The Mooreville consists of compact, very calcareous clay, marl, and clayey chalk. The Mooreville is relatively impermeable and is not an aquifer in the reporting area. It unconformably overlies the Eutaw Formation which is the first zone encountered capable of producing significant quantities of potable groundwater.

- **Demopolis Chalk**

The Demopolis Chalk overlies the Mooreville Chalk and consists of up to 440 feet of chalk, calcareous clay and sandy clay. The Demopolis is relatively impermeable and is not an aquifer in the reporting area.

E. (Fall Line Hills District)

The Fall Line Hills Physiographic district consists of portions of twenty-one (21) counties in Alabama. They are Autauga County, Bibb County, Bullock County, Chilton County, Colbert County, Dallas County, Elmore County, Fayette County, Franklin County, Greene County, Hale County, Lamar County, Lauderdale County, Lee County, Macon County, Marion County, Perry County, Pickens County, Russell County Tallapoosa County, and Tuscaloosa County. These areas consist mainly of flat to moderately-rolling sandy, uplands dissected by deeply-entrenched southward-flowing streams. The land surface ranges in altitude from about 160 feet above NGVD to 850 feet. The Fall Line Hills District underlying geologic formations are the Eutaw Formation and Tuscaloosa Group comprised of the Gordo Formation and Coker Formation. (Scott, Cobb, Castleberry 1987) (Kidd 1987) (Mooty 1987)

F. Eutaw Formation

The Eutaw Formation overlies the Gordo Formation. The Eutaw consists of upper and lower zones of marine sand separated by a zone of clay. The Eutaw Formation ranges in thickness from about 200 to 400 feet where the entire formation is present. It is a major aquifer in the vicinity of Montgomery, and is a potential aquifer throughout Montgomery County.

- **Tuscaloosa Group**

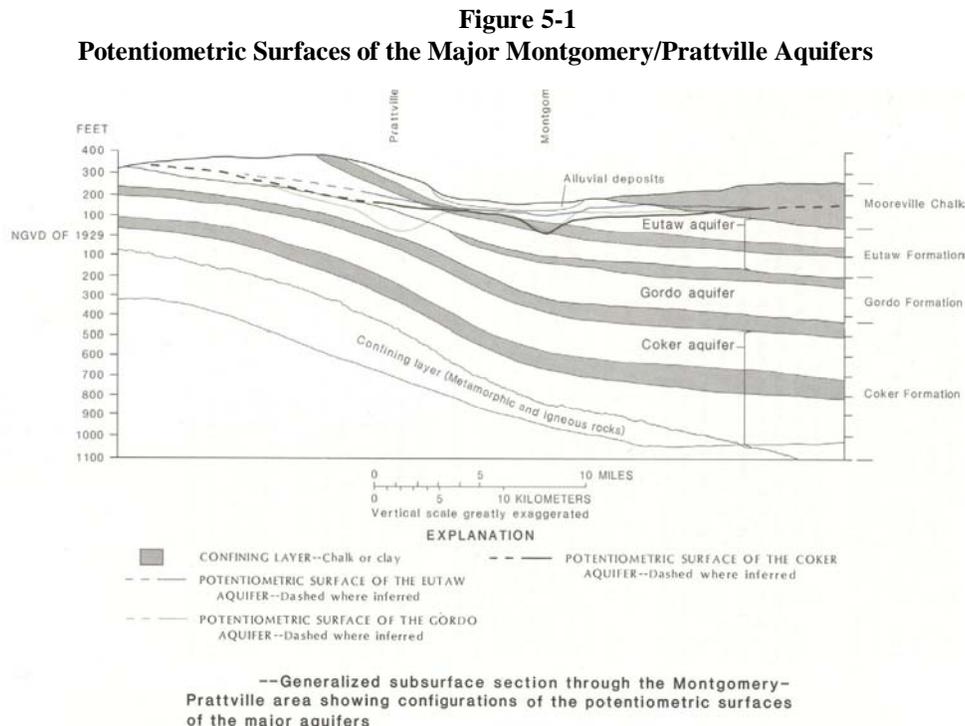
The Tuscaloosa Group crops out mainly in the western part of the reporting area. It consists of unconsolidated sand, gravel, and clay that dip gently toward the southwest. It ranges in thickness from 50 to 400 feet. Massive beds of highly-permeable gravel and gravelly sand commonly occur near the base of the Tuscaloosa Group and are normally underlain by a thick basal clay. These unconsolidated sands and gravels of the Tuscaloosa Group comprise a major aquifer known as the Tuscaloosa aquifer. The Gordo Formation and Coker Formation are stratigraphic units within the Tuscaloosa Group.

The Gordo Formation overlies the Coker Formation and consists of a basal zone of gravelly sand overlain by alternating lenticular beds of sand and varicolored mottled clay. The Gordo ranges in thickness from about 100 feet at outcrops to more than 300 feet in the subsurface. It is one of the major aquifers in the reporting area.

The Coker Formation is one of the major aquifers in the reporting area. It consists of a basal zone of nonmarine gravel, sand, and clay and an upper zone of marine sand and clay beds. The marine sand beds in the Coker are tapped by numerous wells in the reporting area.

G. Aquifers

The major aquifers in the reporting area are sand and gravel beds in the Eutaw, Gordo, and Coker Formations. Water in these aquifers occurs under artesian conditions in most parts of the reporting area. The Watercourse or Alluvial aquifer is characterized by flat flood plains and terraces. These materials consist of alluvial sediments and terrace deposits associated with the flood plains of present and ancestral large streams. They are comprised mainly of gravel, sand, silt, and clay. Figure 5-1 shows potentiometric surfaces of the Major Montgomery/Prattville Aquifers. Figure 5-2 shows aquifers in Alabama.



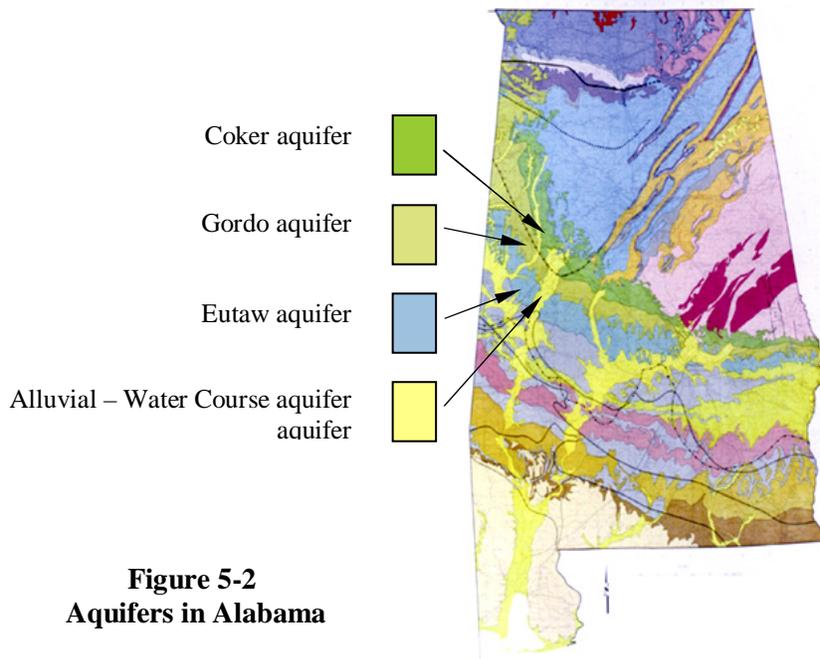


Figure 5-2
Aquifers in Alabama

AQUIFERS IN ALABAMA

H. General Statement of Ground Water Quality and Vulnerability

The source of recharge to the major aquifers in the reporting area is rainfall. Alluvial and terrace deposits along major streams overlie parts of the recharge areas for the major aquifers of this report. The various aquifers principally receive recharge from their outcrop areas within the various counties in the study area. All recharge areas for the major aquifers are susceptible to contamination from the surface. Figure 5-3 shows Alabama groundwater provinces.

I. References Cited

Bossong, C. S., Wiley F. Harris; 1987; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 1; U.S. Geological Survey, Water-Resources Investigation Report 87-4068

DeJarnette, Sidney S., Jo E. Crownover; 1987; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 6; U.S. Geological Survey, Water-Resources Investigation Report 87-4113

Gillett, Blakeney, 2001; Alabama Ground-water Sampling Program: Final Report to the Alabama Department of Environmental Management, Geological Survey of Alabama Open File Report.

Gillett, Blakeney, 2001; South Alabama Ground-water Sampling Program: Final Report to the Alabama Department of Environmental Management, Geological Survey of Alabama Open File Report.

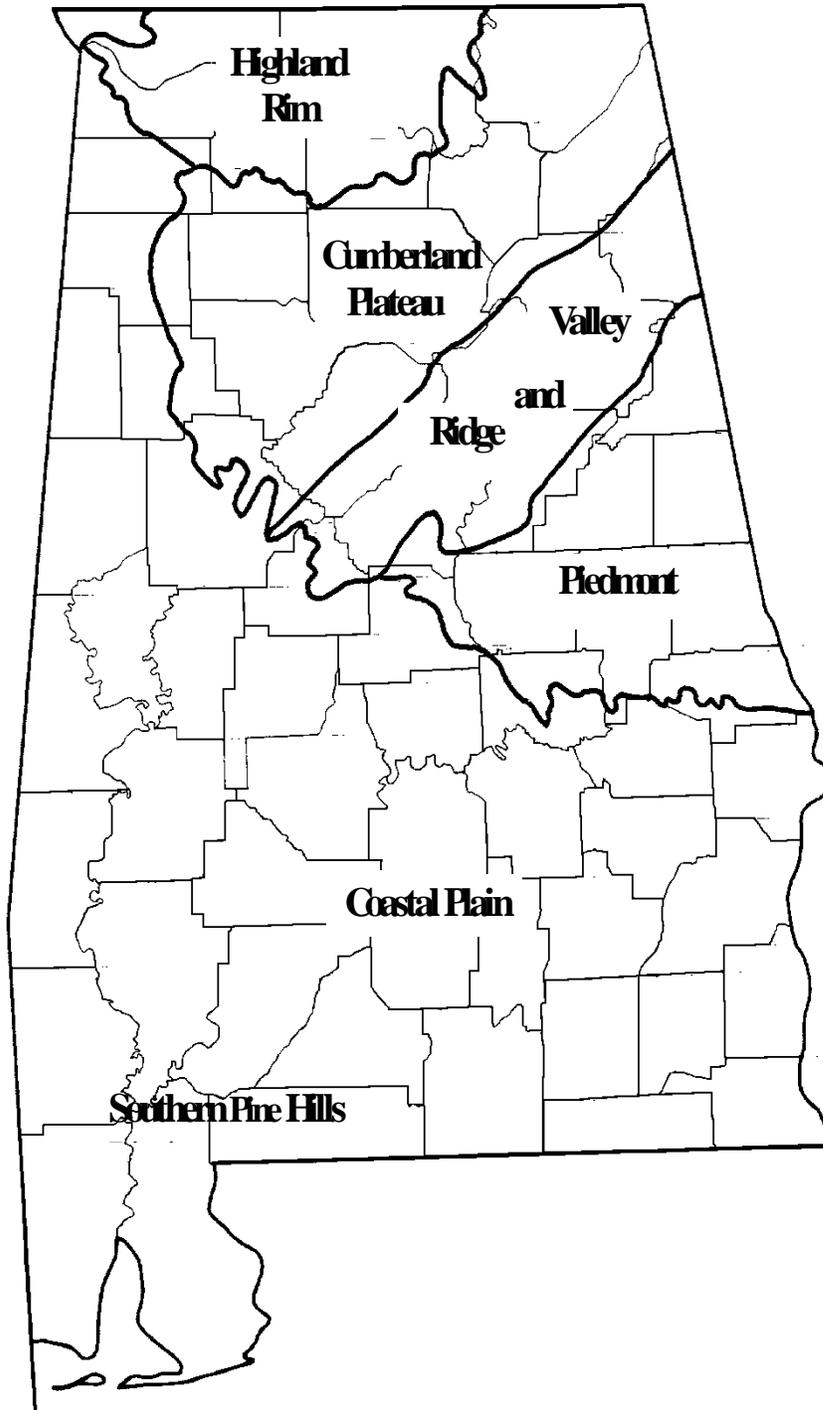
Kidd, Robert E.; 1987; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 9; U.S. Geological Survey, Water-Resources Investigation Report 87-4187

Mooty, Will S.; 1987; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 7; U.S. Geological Survey, Water-Resources Investigation Report 87-4109

Scott, John C., Riley H. Cobb, Rick D. Castleberry; 1987; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 8; U.S. Geological Survey, Water-Resources Investigation Report 86-4360

Stricklin, V. E.; 1989; Geohydrology and Susceptibility of Major Aquifers to Surface Contamination in Alabama: Area 3; U.S. Geological Survey, Water-Resources Investigation Report 88-4120

Figure 5-3
Alabama Ground Water Provinces



**Table 5-2
Ground Water Contamination Summary**

Hydrogeologic Setting: Fall Line Hills district and Black Prairie district of the East Gulf Coastal Plain Physiographic Section
Map Available: See Figure 5-2; Data reporting Period: 2002-2003.

Source Type	Number of Sites	Number of Sites that are listed and/or have confirmed releases	Number with confirmed ground water contamination	Contaminants	Number of Site Investigations (optional)	Number of sites that have been stabilized or have had the source removed	Number of sites with corrective action plans (optional)	Number of sites with active remediation (optional)	Number of sites with cleanup completed (optional)
NPL	0								
CERCLIS (non-NPL)	11	3	3	VOCs, Metals					
DOD/DOE	2	1	1	VOCs, Metals, Hydrocarbons		2			
Brownfield & VCU Sites	11	2	2	VOCs		1			
UST	4,649	1,016	914	BETX, MTBE, PAHs, Lead		1,016	100		553
RCRA Corrective Action	15	13	13	VOCs, SVOCs, RCRA Metals, Pesticides, Herbicides, Sulfate, Chloride		4	4	11	
Underground Injection	51	0	0	Hydrocarbons, Metals					
State Sites	43	35	34	VOCs, SVOCs, Metals, Herbicides, Pesticides	28	20	24	24	3
Non-point Sources	2				2				
Solid Waste	43	1	1	VOCs, SVOCs, Metals	Remainder of sites are in detection monitoring				
Totals	4,827	1,071	968		30	1,043	128	35	556

**Table 5-3a
Aquifer Monitoring Data**

Hydrogeologic Setting: Black Prairie district and Fall Line Hills district of the East Gulf Coastal Plain Physiographic Section (See Figure 1)
Reporting Period: years 2002 and 2003 (2000 and 2001 for Ambient Monitoring Network)

Number of Wells												
		No detections of parameters above MDLs or background levels			Nitrate concentrations range from background levels to less than or equal to 5 mg/l		Nitrate ranges from greater than 5 to less than or equal to 10 mg/l	Parameters are detected at concentrations exceeding the MCLs	Removed from service	Special Treatment	Background parameters exceed MCLs	
Monitoring Data Type	Total No. of Wells Used in the Assessment	Parameter Groups	No Detects above the method detection limit	Number of wells in sensitive or vulnerable areas (Optional)	Nitrate ≤ 5 mg/L	Number of Wells in Sensitive or Vulnerable Areas						Other parameters are detected at concentrations exceeding the MCLs
Ambient Monitoring Network		Manganese	31					9				
		NO ₃	55			137		3				
		Antimony	138						0			
		Chlorides	0						1			
		Iron	33						16			
		TDS	0							9		
Raw Water Quality Data from Public Water Supply Wells	NOT AVAILABLE											
Finished Water Quality Data from Public Water Supply Wells	268		178			37		0	6	0	0	

**Table 5-3b
Aquifer Monitoring Data**

Basic Tables by Category, Totals, Overall by categories, by County - Alabama, 2000																
Water withdrawals (Mgal/d)																
	Public Supply		Commercial	Domestic	Industrial		Thermoelectric		Mining		Livestock	Aquaculture		Irrigation	Total	
County	Fresh	Saline	Fresh	Fresh	Fresh	Saline	Fresh	Saline	Fresh	Saline	Fresh	Fresh	Saline	Fresh	Fresh	Saline
Autauga	5.70			2.95	28.29	0.00								0.69	37.63	0.00
Bibb	3.78			0.22	0.00	0.00								0.00	4.00	0.00
Bullock	2.50			0.09										5.20	7.79	
Chilton	3.51			1.10	0.49	0.00								0.03	5.13	0.00
Dallas	10.02			0.94	40.34	0.00						1.65		3.09	56.04	0.00
Elmore	5.43			0.54										4.73	10.70	
Fayette	1.63			0.72	0.50	0.00									2.85	0.00
Greene	0.78			0.44	0.01	0.00	337.00	0.00				0.54		1.06	339.83	0.00
Hale	2.38			0.55	0.04	0.00						2.91		5.55	11.43	0.00
Lamar	1.71			0.12	0.07	0.00								11.00	12.90	0.00
Lee	12.70			0.86	2.40	0.00								12.37	28.33	0.00
Lowndes	1.41			0.28										4.72	6.41	
Macon	3.36			0.42	0.06	0.00								7.48	11.32	0.00
Marengo	2.18			0.56	19.00	0.00						1.38		1.63	24.75	0.00
Marion	5.34			0.23											5.57	
Montgomery	44.30			1.68	0.99	0.00								3.11	50.08	0.00
Perry	2.72			0.33										0.58	3.63	
Pickens	2.70			0.11	0.12	0.00								0.16	3.09	0.00
Russell	8.14				22.91	0.00								10.00	41.05	0.00
Sumter	1.49			0.80											2.29	
Tallapoosa	10.72			0.31										3.60	14.63	
Tuscaloosa	26.57			4.32	2.31	0.00						0.75		9.38	43.33	0.00
Wilcox	0.66			0.34	23.00	0.00						0.17		0.17	24.34	0.00
Total:	159.73			17.91	140.53		337.00					7.40		84.55	747.12	

Source: Mooty, William S., United States Geological Survey

Table 5-4

Estimated Groundwater Withdrawals For Selected Counties 2001-2002							
County	Public	Non-Public*	Irrigation*	Total GW Use	% Public	% Non-Public	% Irrigation
	MGal/yr	MGal/yr	MGal/yr	MGal/yr			
Autauga	213.74	19.12	12.8	245.64	87	8	5
Bibb	40.26			40.26	100		
Bullock	23.34		.255	23.59	99		1
Chilton	301.38	2.93	33.07	337.39	89	1	10
Dallas	93.41	6.06	174.34	273.81	34	2	64
Elmore	25.94		.352	26.3	99		1
Fayette					0	0	0
Greene	5.5	.384	13.51	19.39	28	2	70
Hale	23.31	.32	12.68	36.3	64	1	35
Lamar	11.65	4.86		16.51	71	29	
Lee	9.63		.683	10.32	93		7
Lowndes	5.10			5.1	100		
Macon	13.56	.402	6.74	20.7	66	1	33
Marengo	33.12	20.0	5.58	58.68	56	34	10
Marion	4.93			4.93	100		
Montgomery	242.86	6.32	3.11	252.29	96	3	1
Perry	11.29		.73	12.02	94		6
Pickens	428.17	1.39	.624	430.18	99.5	.3	.2
Russell	4.34	.94		5.28	82	18	
Sumter	6.7			6.7	100		
Tallapoosa	.096			.1	100		
Tuscaloosa	94.65	8.92	1.17	104.74	90	9	1
Wilcox	8.39			8.39	100		
Totals	1601.37	71.65	265.64	1938.57	82	4	14

Source: Little page, Alabama Department of Economic and Community Affairs, 2004

Part 6 Coastal Waters

6.1 Alabama Coastal Nonpoint Pollution Control Program (ACNPCP)

In June 1998, the NOAA Office of Coastal and Resource Management (OCRM) and USEPA awarded conditional approval to the Alabama Coastal Nonpoint Pollution Control Program (ACNPCP). Since achieving conditional approval, ADEM has developed the ACNPCP, seeking full program approval, and to ensure that program components are implemented to the maximum extent practicable. The approved Management Area is inclusive of the sub-watersheds of the Escatawpa, Mobile-Tensaw, and Perdido Sub-Basins, that are contained within the geo-political boundaries of Baldwin and Mobile Counties.

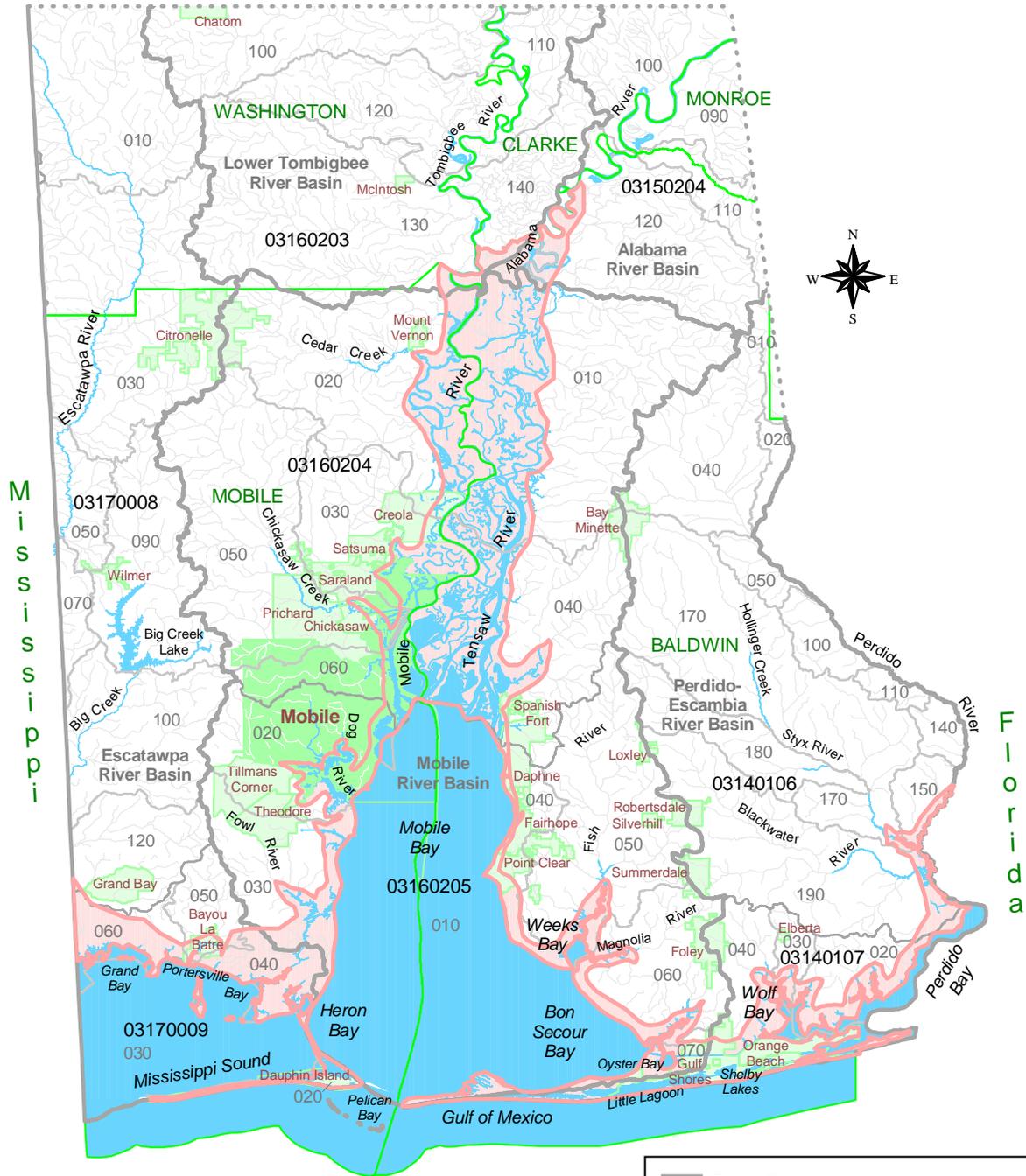
The ADEM continues to work with ADCNR-State Lands, NOAA-OCRM, USEPA and other State and federal agencies to coordinate the Alabama Coastal Nonpoint Pollution Control Program (ACNPCP). Recently, ADEM submitted the *ACNPCP: 2003 Submission Documentation; Response to NOAA/EPA Conditional Approval Items; July 31, 2003*, wherein the State described new and expanded program components that demonstrate an approvable ACNPCP. This submission included a 250 page description with over 500 supporting documents, which include statewide and coastal projects and programs that have been developed or tailored to address the ACNPCP management measures. This documentation was augmented by the submission of the *ACNPCP: Response to "Final Administrative Changes" Guidance; ACNPCP 2003 Submission Support Document; October 31, 2003*, that provided the enforcement policy, long term strategy and implementation planning documentation requested by the federal review agencies to complete their approval review process. The State awaits the federal approval decision to allow full program implementation.

The ACNPCP supports the building of partnerships with Federal, State and Local agencies, businesses, organizations and decision makers to influence the implementation of items necessary to achieve program approval and operation. The ACNPCP has facilitated the development of a broad-based Technical Advisory Committee (TAC), the Coastal Alabama Nonpoint Source Resources Matrix (Matrix) and the Coastal Alabama-Clean Water Partnership. The ACNPCP also works cooperatively with the ADEM-319 program to address nonpoint source pollution management program needs and issues. These various forums are being utilized to enhance coordination and cooperation regarding related coastal water quality resources management. Numerous meetings and teleconferences have been held with NOAA-OCRM, USEPA, ADEM-319, ADCNR-State Lands, and other agency environmental representatives to further administrative coordination and interagency cooperation.

ADEM is currently developing and engaged in many ongoing projects pertinent to the ACNPCP that monitor and promote the effectiveness of nonpoint source pollution controls, 6217 management measures and program approval criteria. ADEM developed the *Monitoring Plan for the ACNPCP; Mobile and Baldwin Counties, Alabama*. This plan incorporates monitoring activities conducted through ADEM within the ACNPCP Management Area. The ACNPCP utilizes this data to develop database and GIS information applications that support the ACNPCP.

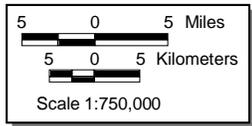
ADEM's Inspectors continue extensive field monitoring efforts to conduct inspections of construction and mining operations and targeted watershed studies within the ACNPCP Management Area. ADEM monitoring focuses on a watershed approach, addressing sub-watersheds that impact the coastal waters of Alabama. Several coastal Watershed Surveys have been completed. The current coastal sub-watershed survey being conducted for the Lower Tensaw River / Bay Minette Creek sub watershed (HUC 03160204-040) is in Baldwin County, Alabama. These watershed surveys are a key component of the ACNPCP Five-Year Implementation Plan and Strategy Plans.

Figure 6-1
Alabama's 6217 Coastal Zone Management Area



Mississippi

Florida



Mike Rief-ADEM Water Quality Branch
 Projection-Geographic/Unprojected
 Datum-NAD83

- River Basins
- USGS Cataloging Units-8 Digit
- Counties
- USDA-NRCS Subwatersheds-11 Digit
- Coastal/Mainstem Waters
- National Hydrography Dataset
- Cities and Towns
- §6217 Coastal Zone 10 Foot Contour

6.2 Surface Water Monitoring Program

Seven monitoring programs were in place during the reporting period to monitor the quality of Alabama's coastal waters. First, described in ADEM's Technical Report entitled "Water Quality and Natural Resource Monitoring Strategy For Coastal Alabama" (March 1993) is a statistically based long-term monitoring program with probabilistically chosen stations distributed throughout Mobile Bay, Mississippi Sound, Perdido Bay, Mobile River, Tensaw River and the Mobile River Delta. The monitoring program's design is based on the USEPA's Environmental Mapping and Assessment Program (EMAP) and ADEM's knowledge of its estuarine system. The strategy provides a design that allows unbiased estimates of the status of Alabama's coastal water environment as a whole or within each of seven sub-areas (regions) and will allow long-term statistical trends to be identified by once-per-year sampling during a summer index period. This program was incorporated into the Alabama's "ASSESS (ADEM's Strategy for Sampling Environmental indicators of Surface water quality Status) Program" as Coastal ALAMAP (ALAMAP-C) in October 1997. Sampling has recurred annually since 1993.

In 1998 concerns about seasonal nutrient level variation occurred. At that time ADEM developed the ALAMAP QUARTERLY program (ALAMAP-Q). ALAMAP-Q supplements ALAMAP-C efforts by collecting additional water column nutrient data with the objective of measuring nutrient stressors on a seasonal basis. Figure 6-1 shows Alabama's 6217 Coastal Zone Management Area. Table 6-1 and Figure 6-2 respectively summarizes overall use support per sampling year and depicts station locations of the Coastal ALAMAP Program. Table 6-2 and Figure 6-3 show Coastal Alamac Conventional Parameter Sampling Summaries and Stations respectively. A report similar to ALAMAP's March 1998 publication, *A Report on the Condition of the Estuaries of Alabama in 1993-1995: A Program in Progress*, summarizing additional data collections, will be published in the future.

Third, 19 fixed ambient monitoring stations were sampled ten times from January 2002 through December 2002. In addition to the State's monitoring efforts, water quality data is also gathered by the volunteers of the Baywatch Citizen's Volunteer Water Quality Monitoring Program as administered by the Alabama Coastal Foundation.

Fourth, Alabama is a partner with the U.S. EPA in its National Coastal Assessment (NCA). NCA is a multi-year partnership among EPA's Office of Research and Development (ORD), EPA's Office of water (OW), EPA's Regional Offices, all coastal states, and selected territories. As part of this effort, ORD has developed a coastal monitoring program with EPA Region 4 and the Alabama Department of Environmental management (ADEM). This joint effort will determine the condition of estuarine waters in the coastal resources of Alabama, and allow comparison to other U.S. coastal areas. The ORD National Health and Environmental effects Research Laboratory's Gulf Ecology Division in Gulf Breeze, Florida is coordinating this effort. NCA is a strategic partnership between EPA and the coastal states and other Federal Agencies. Each state uses a compatible probabilistic design and a common set of environmental indicators to survey its coastal resources and assess their condition. These estimates can then be aggregated to assess conditions at the EPA Regional, biogeographical, and national levels. All data will be made available for public access on the Internet. Fifty sampling locations in Alabama's coastal area have been determined by NCA. Each of these locations was sampled during the summers' 2000 - 2003 index periods and will continue to be sampled through 2004. NCA and ALAMAP-C programs were designed to work together so that the condition of geographical sub-areas within Alabama's coastal area can be assessed with known confidence. Additional intensive ALAMAP - C locations are sampled during the same index period. One hundred forty (140) NCA / ALAMAP-C sites were sampled during 2000, one hundred sixty-six (166) NCA / ALAMAP-C sites were sampled in 2001, one hundred twelve (112) NCA / ALAMAP-C sites were sampled in 2002, and one hundred twelve (112) NCA / ALAMAP-C sites were sampled in 2003.

The Coastal Alabama Recreational Water Quality Monitoring Program (Beach Monitoring) is the fifth monitoring program in place during the reporting period. In June of 1999, the Alabama Department of Environmental Management (ADEM), in cooperation with the Alabama Department of Public Health (ADPH), initiated a program to routinely monitor bacteria levels at five select swimming beaches on the Gulf Coast. The effort was later expanded to include six additional sites along the Gulf Coast and Mobile Bay. In October of 2000 the federal Beaches Environmental Assessment and Coastal Health (BEACH) Act was signed into law. This act mandates the monitoring and assessing of coastal recreational waters and the prompt notification of the public when applicable water quality standards are not being met. The act also authorizes EPA to award grants to help governments implement monitoring and notification programs consistent with published EPA guidance and criteria. The ADEM was designated as the State's lead agency and was awarded grant money to carry out this program. Through the BEACH Act, the ADEM and the ADPH have greatly expanded and enhanced monitoring and notification efforts for Alabama's public recreational waters. The goal of this program is to increase public awareness and provide valuable water quality information to help the public make more informed decisions concerning their recreational use of Alabama's natural coastal waters. The program now involves the routine collection of water samples from 24 high use and/or potentially high risk public recreational sites from Perdido Bay to Dauphin Island. The selection of sites and the frequency of sampling are determined using a risk based evaluation and ranking process. This process considers a number of factors for a given site, most importantly the amount of use and the amount of risk. Depending on the site, samples are collected twice per week, once per week or once every other week during the swimming season (June through September) and once per month during the cooler months. The samples are analyzed for the indicator bacteria Enterococci. These bacteria, by themselves, are not considered harmful to humans but often occur in the presence of potential human pathogens. The indicator bacteria used and the threshold concentration, which triggers an advisory, are based on recommendations provided by the EPA in the documents Ambient Water Quality Criteria for Bacteria (1986) and Water Quality Standards Handbook, second addition (1983). The Mobile Branch of ADEM conducts sampling and fecal coliform analyses while the ADPH also conducts sampling and performs Enterococcus analyses, and is responsible for issuing swimming advisories when necessary. All test results are posted on the ADEM website, www.adem.state.al.us and advisories are publicized through press releases and posted on signs at each of the 24 sampling locations. The results also appear in the Friday editions of the Mobile Press Register during the summer month. As of August 15, 2003, 2,017 samples had been collected, since the inception of the Beach Program, resulting in 32 advisories being issued by the ADPH. Approximately 800 samples were collected during fiscal year 2003 resulting in 25 advisories by ADPH.

Sixth, during May 2001, the ADEM published the Contingency Plan for Monitoring and Response of Marine Biotoxins, Pfiesteria and Other Harmful Algal Blooms. This effort, funded by a grant from EPA Region IV (cooperative agreement #CP984885-00-0), established protocol for routinely sampling Alabama's coastal area for phytoplankton and responding to HABs. Monitoring under this program allows for more timely detection of changes in phytoplanktonic populations in Alabama's Gulf waters which may lead to possible prediction of the presence, movement, and growth of HABs. One hundred thirty-four (134) samples were analyzed during the period January 2002 through March 2003. This ongoing effort is accomplished through cooperation between the ADEM, the ADPH, and the ADCNR-MRD and Dauphin Island Sea Lab.

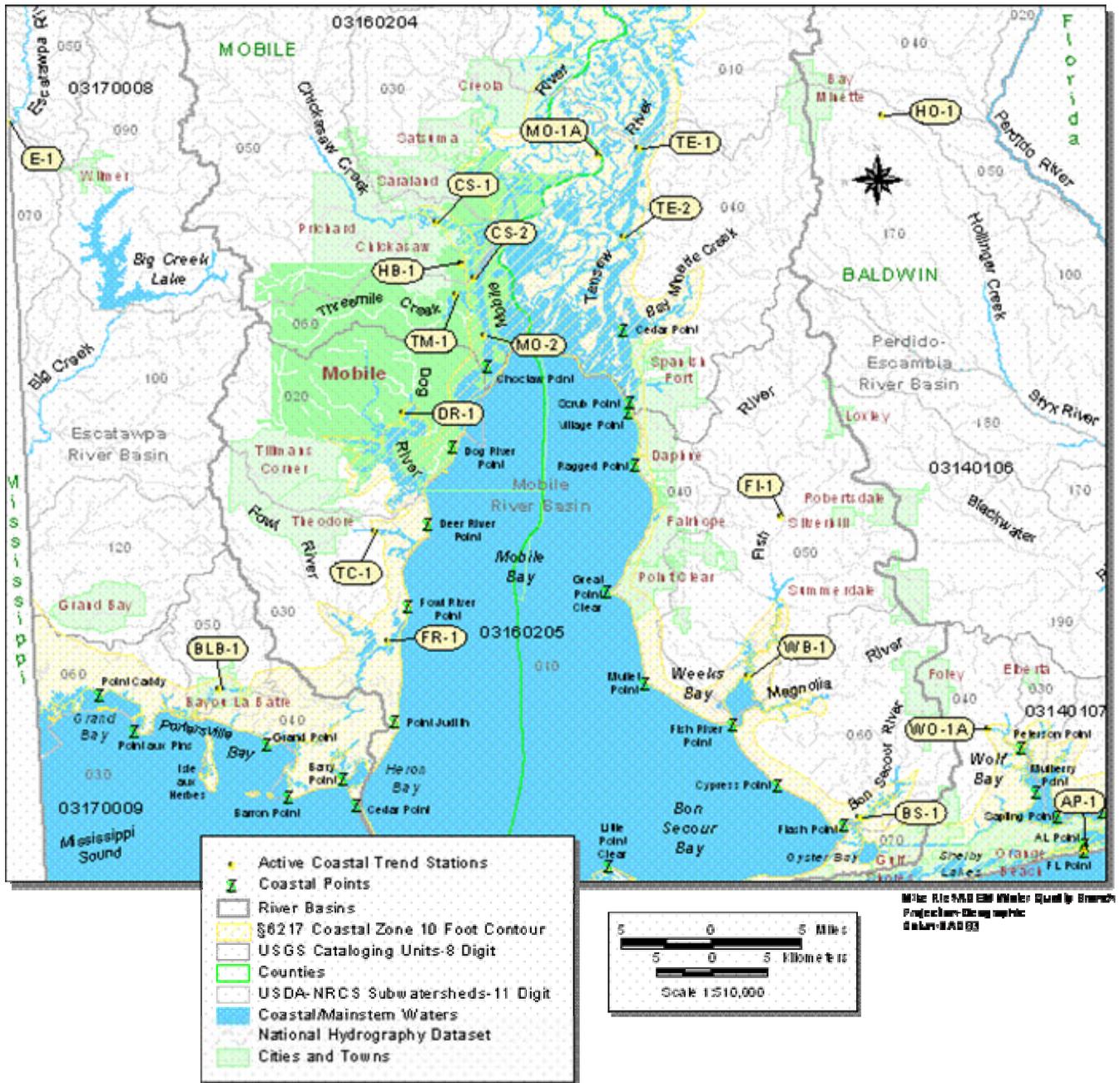
Seventh, fourteen of the State's current twenty one mercury related fish consumption advisories are in Mobile and Baldwin Counties. As a supplemental project to the State's Fish Tissue Monitoring Program, the Mobile Branch Office is in the process of analyzing fish tissue samples from five sites in Mobile Bay and one site in Little Lagoon. These fish were collected by the Marine Resources Division (MRD) of the Alabama Department of Conservation and Natural

Resources as part of an age and growth study. MRD gathered lengths, weights, and otoliths (bones used for aging) and delivered the fresh carcasses to the Mobile Office to be processed for tissue analysis. Species being analyzed include: speckled trout, white trout, flounder, redfish, spanish mackerel, striped mullet, and ground mullet. Unlike the Department's main Fish Tissue Monitoring Program, these samples will only be analyzed for mercury. Coastal watershed studies are the final component of the monitoring programs in place during the reporting period. The Mobile Branch developed a document entitled "Methodology for Coastal Watershed Assessments" in April 2001. This document presents a more comprehensive approach to the Coastal Watershed Assessment Program by providing a basic framework to ensure consistency among the different studies conducted while still remaining flexible enough to apply to all watersheds and their priority issues. The Branch completed a one-year survey of the Bay Minette Creek, Fly Creek, and Three Mile Creek subwatersheds in Mobile and Baldwin Counties during December of 2003. The survey focused on impervious surface cover for the three watersheds with an aim towards determining water quality correlation with impervious surface cover across three regimes – heavily impacted, moderately impacted, and slightly impacted. The report is currently being compiled and should be printed later this year. A two year study of the Bay Minette Creek subwatershed commenced in January of 2003 and is ongoing

**Table 6-1
Active Coastal Trend Stations**

Station	Station Location	Latitude	Longitude
BLB-1	BAYOU LA BATRE RIVER @ AL HWY 188	30.405556	-88.248056
BS-1	BON SECOUR RIVER NEAR BON SECOUR	30.301389	-87.735417
CS-1	CHICKASAW CREEK @ NORTH SIDE U.S. HWY 43 BRIDGE CROSSING	30.73258	-88.07330
CS-2	CHICKASAW CREEK @ NORTH SIDE CSX R x R CROSSING @ CONFLUENCE WITH MOBILE RIVER	30.73911	-88.04561
DR-1	DOG RIVER @ LUSCHER PARK BOAT LAUNCH NEAR I-10	30.628611	-88.101389
E-1	ESCATAWPA RIVER @ U.S. HWY 98(MOFFAT ROAD) NEAR MISSISSIPPI	30.86241	-88.41769
FI-1	FISH RIVER @ U.S. HWY 104	30.545417	-87.798611
FR-1	FOWL RIVER @ HWY 193	30.444028	-88.113333
HB-1	HOG BAYOU @ BURIED PIPELINE CROSSING	30.75188	-88.05342
HO-1	HOLLINGER CREEK @ STILL ROAD (OFF COUNTY ROAD 112)	30.868264	-87.716875
MO-1A	MOBILE RIVER @ CSX R x R CROSSING	30.836667	-87.944722
	MOBILE RIVER @ GOVERNMENT STREET (BANKHEAD TUNNEL)	30.690833	-88.035556
TC-1	THEODORE INDUSTRIAL CANAL @ HWY 193 (RANGELINE ROAD)	30.533333	-88.123889
TE-1	TENSAW RIVER @ CSX R x R CROSSING	30.8425	-87.912083
TE-2	TENSAW RIVER @ SOUTHERN TIP OF GRAVINE ISLAND	30.770833	-87.924444
TM-1	THREE MILE CREEK BETWEEN U.S. HWY 43 & R x R CROSSING	30.724028	-88.059028
WB-1	WEEKS BAY @ U.S. HWY 98 (MARINA)	30.41470	-87.82575
WO-1A	WOLF CREEK @ SWIFT CHURCH ROAD	30.373611	-87.6325
AP-1	ALABAMA POINT	30.2766	-87.55567

Figure 6-2
Active Coastal Trend Stations



6.3 Coastal Assessment

A. Eutrophication

Hypoxic and anoxic conditions are common in Alabama's coastal waters and are generally most prevalent during the summer months. Naturally occurring conditions combine to result in frequently stressed water quality conditions marked by stratification with low dissolved oxygen. These conditions include: relatively shallow water depths found in all of Alabama's open bays and sounds; low average wind and tidal energies; variable fresh water inflow; and constricted tidal passes. This persistent pattern of hypoxia manifests itself in "Jubilees", an infrequently occurring summer condition in Mobile Bay that results when winds blowing from the mainland drive surface waters from shore, causing deeper, poorly oxygenated water to move into the shallows. Fish, shrimp and crabs get caught in the poorly oxygenated water and generally rise to the surface in stress. The Jubilee phenomenon was first recorded in 1821 indicating that its underlying causes are naturally occurring. At this time it has not been determined if anthropogenic sources exacerbate those underlying causes.

B. Habitat Modification

Alabama's coastal counties are experiencing tremendous population growth. Statistics indicate that the population of Baldwin County increased from 115,266 in 1994 to 132,828 in 1998 and 140,415 in 2000. Between 1990 and 2000, the Baldwin County population increased by 42.9%. The population of Mobile County increased from 393,826 in 1994 to 399,429 in 1998 to 399,843 in 2000. Between 1990 and 2000, the Mobile County population increased by 5.6%. Much of that growth is occurring within Alabama's defined coastal area, particularly in Baldwin County where there has been explosive growth in the beach communities of Orange Beach and Gulf Shores and on the Eastern Shore of Mobile Bay. The area of west Mobile, inside and outside of the current city boundary, is undergoing rapid commercial and residential development. Sedimentation from erosion at the numerous construction sites and the increased post development storm water runoff have placed a heavy burden on the receiving streams in the area increasing the incidence of flooding and stream bank erosion. All of Alabama's estuarine waters are being affected by this population growth.

Applications to the Department for coastal permits and certifications are growing, particularly in terms of complexity. Many of these applications propose projects that would have significant adverse impacts to coastal resources if approved as proposed. Projects having direct and significant adverse wetland impacts are routinely reviewed by Department personnel pursuant to the provisions of ADEM Administrative Code R.335-8 (Coastal Program) and Section 404 of the Clean Water Act. Generally, permits are issued for projects having wetland impacts only if all of the following conditions are satisfied: the activity is related to an existing or approved water dependent use, or use of regional benefit or related to an approved beach nourishment, shoreline stabilization or marsh creation, restoration or enhancement project, elimination of dead-end canals or boat slips exhibiting poor water quality or other similar beneficial use, no other feasible alternatives exist; impacts to wetlands on the project site have been minimized by project design, and mitigation is incorporated into the project proposal.

There have been no coastal area wide surveys completed of wetland acreage for submersed aquatics, tidal emergence, or swamp forest during the reporting period. Due to the State's restrictive approval process, including mitigation requirements, it is believed that wetland losses that do occur are minimal for those wetlands regulated by the program and that other losses that may occur are due to natural erosion, unpermitted activities, and minimal losses due to Nationwide permitting by the U.S. Army Corps of Engineers.

Coastal wetland data is provided in Part IX Alabama's Wetlands Program. ADEM's Coastal/Facility Unit is working with other governmental entities to support wetland and submersed aquatic vegetation status and trend identification. At this time, both Mobile and Baldwin Counties have been flown and color infrared digital ortho-quarter quads have been produced. This imagery will be used to map wetlands and uplands in Mobile and Baldwin Counties. This mapping should be completed during FY 2005. Coast-wide photography to be used for mapping submersed aquatic vegetation has been taken and a final SAV mapping project report is scheduled to be completed by spring 2004.

Alabama's Coastal Program is compiling data on stabilized versus unstabilized shoreline miles. In general, the explosive coastal population growth has resulted in near continuous shoreline development, with certain areas developing more rapidly than others. The Gulf shoreline is unstabilized along its length in Alabama, except at the passes from interior estuarine waters to the Gulf of Mexico at Perdido Pass, Little Lagoon Pass, and on the eastern tip of Dauphin Island at the entrance to Mobile Bay.

C. Changes in Living Resources

The Alabama Department of Conservation and Natural Resources-Marine Resources Division (ADCNR-MRD) manages Alabama's marine resources. According to ADCNR-MRD personnel, populations are cyclic and vary by species. Generally, population levels are all within expected levels and there are no significant declines observed, expected, or predicted. ADCNR oversees the replanting of oyster reefs and believes that there has been an increase in reef size over time. Brown Shrimp landings were below average in 2003; this is a synergistic effect of record rain falls during peak spawning which reduced available habitat and economic hardship impacting the size of the fleet. Blue crab landings were below average for 2003 (annual averages are 3.1 million pounds).

D. Toxic Contamination

The ADEM has conducted studies to determine metals enrichment in estuarine sediments and has sampled sediments in proximity to shipyards, petroleum storage terminals, and industrial point source discharges. Beginning in 1993 the ADEM implemented ALAMAP-C to provide a statistically defensible characterization of Alabama's coastal waters. Its parametrical coverage includes metals and selected organic compounds in estuarine sediments. During 2000, ADEM began sampling Alabama's estuarine sediments for toxicity and fishes for whole-body contaminants as part of the NCA program, described above. However, no statement is being made as to the extent of areas having elevated levels of toxicants because no state or EPA criteria for toxins in sediments exist.

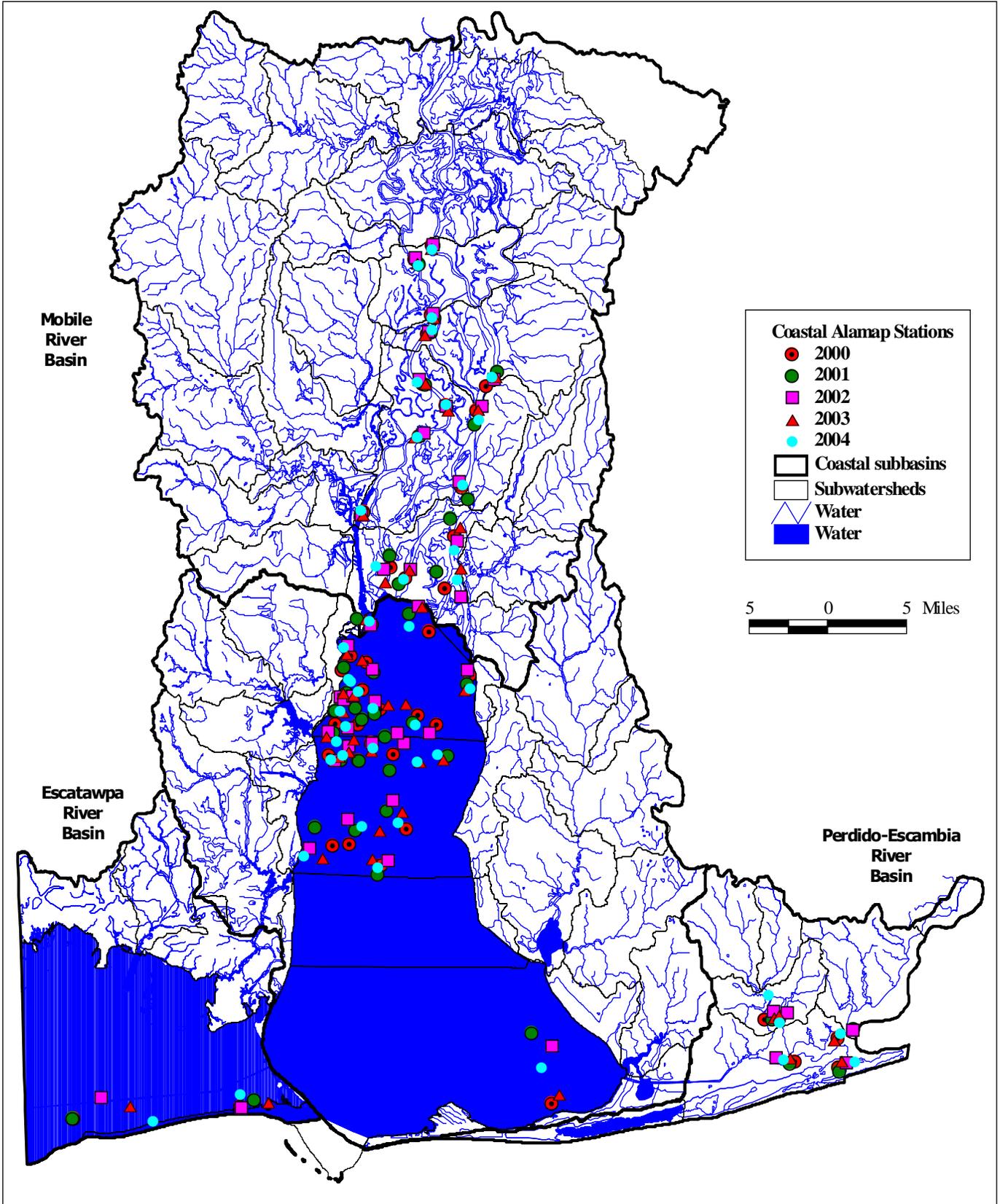
E. Pathogen Contamination

In addition to the recreational beach monitoring discussed above, Alabama's coastal shellfishing waters are monitored for pathogens and are subject to closings, advisories, or warnings. During the reporting period, all of Alabama's oyster harvest areas were closed at one time or another through closing orders issued by the State Health Officer of the Alabama Department of Public Health (ADPH). Those orders were issued when excess fresh water entered Mobile Bay from the Mobile River. Table 9-3 Shellfish Harvesting Area Closures/Reopenings, Figure 9-2 Oyster/Shellfish Harvesting Areas that are Opened or Closed by the ADPH, and a brief narrative of Oyster/Shellfish Harvesting Area Notices issued by the ADPH-MRD are included in Part VI Public Health Information. ADPH also issued several precautionary advisories for surface water bodies contaminated due to sanitary sewer collection system failures. The advisories are summarized in Table 9-4 of Part 9 Public Health.

**Table 6-2
Coastal Alamac Conventional Parameter Sampling Summaries**

2003 NCA and ALAMAP-C: DO, Ph & Temperature Summary	
Dissolved Oxygen Violations were 8.9% (10 of 112 stations) with 5.0 mg/L as criteria	Full Support
Dissolved Oxygen Violations were 6.3% (7 of 112 stations) with 4.0 mg/L as criteria	Full Support
pH violations were 0% (0 of 112 stations below 6 or above 8.5pH)	Full Support
Temperature violations were 0% (0 of 112 stations above 90°F)	Full Support
2002 NCA and ALAMAP-C: DO, Ph, &Temperature Summary	
Dissolved Oxygen Violations were 17% (19 of 112 stations) with 5.0mg/L as criteria	Partial Support
Dissolved Oxygen Violations were 3.6% (4 of 112 stations) with 4.0mg/L as criteria	Full Support
pH violations were 0.9% (1 of 112 stations)	Full Support
Temperature violations were 5.4% (6 of 112 stations)	Full Support
2001 NCA and ALAMAP-C: DO, pH & Temperature Summary	
Dissolved Oxygen Violations were 9.0% (15 of 166 Stations) with 5.0 mg/L as criteria	Full Support
Dissolved Oxygen Violations were 4.8% (8 of 166 Stations) ¹	Full Support
pH violations were 0% (0 of 166 Stations above 8.5)	Full Support
Temperature violations were 0% (0 of 166 Stations)	Full Support
2000 NCA and ALAMAP-C: DO, pH & Temperature Summary	
Dissolved Oxygen Violations were 11% (15 of 140 Stations) with 5.0 mg/L as criteria	Partial Support
Dissolved Oxygen Violations were 2.1% (3 of 140 Stations) ¹	Full Support
pH violations were 5.7% (8 of 140 Stations above 8.5)	Full Support
Temperature violations were 1% (2 of 140 Stations)	Full Support
1999 Coastal ALAMAP DO, pH & Temperature Summary	
Dissolved Oxygen Violations were 7.9% (7 of 89 Stations) with 5.0 mg/L as criteria	Full Support
Dissolved Oxygen Violations were 4.5% (4 of 89 Stations) ¹	Full Support
pH violations were 5.6% (5 of 89 Stations above 8.5)	Full Support
Temperature violations were 19% (17 of 89 Stations), {8.9% (8 of 89) were in shallow waters of the Mobile River Delta, 10.1% (9 of 89) were in the Perdido Bay system} due to drought conditions.	Partial Support
1998 Coastal ALAMAP DO, pH & Temperature Summary	
Dissolved Oxygen Violations were 8.8% (6 of 68 Stations) with 5.0 mg/L as criteria	Full Support
Dissolved Oxygen Violations were 1.5% (1 of 68 Stations) ¹	Full Support
pH violations were 2.9% (2 of 68 Stations above 8.5)	Full Support
Temperature violations were 8.8% (6 of 68 Stations)	Full Support
1997 Coastal Alamac DO, pH & Temperature Summary	
Dissolved oxygen violations were 6.1% (8 of 131 stations)	Full Support
pH violations were 4.6% (6 of 130 stations above 8.5 pH s.u.)	Full Support
Temperature violations were 1.5% (2 of 130)	Full Support
1996 Coastal Alamac DO, pH & Temperature Summary	
Dissolved oxygen violations were 0.0%	Full Support
pH violations were 2.7% (3 of 112 stations less than 6.5 pH s.u.)	Full Support
Temperature violations were 0.0%	Full Support
1995 Coastal Alamac DO, pH & Temperature Summary	
Dissolved oxygen violations were 17.2% with 5.0 mg/L as criteria (20 of 109 stations)	Partial Support
Dissolved oxygen violations were 6.0% (7 of 109 stations) ¹	Full Support
pH violations were 2.8% (2 of 109 stations less than 6.5 pH s.u. & 1 of 109 above 8.5 pH s.u.)	Full Support
Temperature violations were 0.9% (1 of 109 stations)	Full Support
1994 Coastal Alamac DO, pH & Temperature Summary	
Dissolved oxygen violations were 8.6% with 5.0 mg/L as criteria (11 of 128 stations)	Full Support
Dissolved oxygen violations were 3.9% (5 of 128 stations) ¹	Full Support
pH violations were 4.7% (5 of 128 stations less than 6.5 pH s.u. & 1 of 125 above 8.5 pH s.u.)	Full Support
Temperature violations were 0.0%	Full Support
1993 Coastal Alamac DO, pH & Temperature Summary	
Dissolved oxygen violations were 15.3% (13 of 85 using 5.0 mg/L) & 14.1% (12 of 85 using 4.0 mg/L)	Partial Support
pH violations were 5.8% (6 of 85 above 8.5 pH s.u.)	Full Support
Temperature violations were 2.4%	Full Support

Figure 6-3
Alabama's Coastal Alamp Program Stations



F. Other State Coastal Activities

1. National Estuary Program

The ADEM is an active participant in the Mobile National Estuary Program (Mobile NEP). Staff are involved on its various boards, committees, subcommittees, and workgroups.

2. Near Coastal Waters / Clean Water Partnerships

The ADEM continues to actively participate in Near Coastal Water projects and in the Coastal Alabama Clean Water Partnership.

3. Gulf of Mexico Program

The ADEM has continued its active participation in the Gulf of Mexico Program (GOMP) by participation on its various boards, committees, subcommittees, and workgroups, including the Policy Committee, Management Committee, and Focus Teams.

4. Other Related Activities

The Oil Pollution Act of 1990 has resulted in ADEM staff participation in many oil spill-planning efforts. Staff participates as co-chair and participants on committees of the United States Coast Guard's (USCG) Mississippi/Alabama Area Plan. Through its participation on the Region IV Rapid Response Team (RRT) and Response Technology Committee, ADEM has worked on dispersant use and in-situ burning plans for the RRT. Staff has gained experience from participation in both drills and real spill situations, including use of the Unified Command organizational structure.

For more information pertaining to Alabama's Coastal Monitoring Programs contact the ADEM Field Operations Mobile Office (Mr. Mark Ornelas (251) 450 - 3430 or meo@adem.state.al.us) or the ADEM Coastal Program Office (Mr. J. Scott Brown, (251) 432 - 6533 or jsb@adem.state.al.us).

Part 7 Watershed Projects

7.1 The Watershed Protection Approach

The watershed protection approach strikes the best balance among efforts to control the cumulative impacts from point and nonpoint sources of pollution and provides a focused plan for faster resolution of problems. Alabama continues to implement many watershed protection projects throughout the State. The ADEM continues to use the base Section 319(h) grant to fund management measures for NPS impaired watersheds using the 5-year rotational river basin assessment approach. Incremental Section 319 funding is primarily used to target priority Section 303(d) listed watersheds statewide, and to implement total maximum daily limits (TMDLs). Table 7-1 and Figure 7-1 list watershed projects that are in various stages of initiation or completion. The table and map are not all-inclusive since some Section 319(h) funded projects are “statewide” in scope, and may directly or indirectly impact other watersheds in addition to those listed below.

7.2 Watershed Protection Highlights

- The Duck River Watershed Project addresses significant impacts to water quality from agriculture including sediment, nutrients from fertilizers, animal waste, and pesticide runoff. This UWA Category 1 watershed (HUC 031060109 - 020 and 030) is located in east Cullman in north central Alabama. The watershed drains to Mulberry Fork and ultimately to the Black Warrior River. The watershed comprises slightly over one-third of the 118,400 acre Duck Creek-Mulberry Fork Conservation Priority Area (CPA) in east Cullman and West Blount Counties. The 1996 Section 303(d) list of priority waters identifies 6.4 miles of Duck River in Cullman County as non-supporting of water quality standards. Impairments are related to pH (low), nutrients and organic enrichment/dissolved oxygen. The Duck River Watershed Project provides land owners and land users with education, technical, planning, and financial assistance to implement best management practices such as handling, storing, and utilizing animal waste - primarily from poultry and beef cattle production. The project is proceeding according to scheduled milestones and objectives.
- All workplan best management practices (BMPs) were implemented in 2003. The BMPs included dry stacks for poultry litter, incinerators and composters for poultry mortality, conversion from cropland to grassland, and the installation of 10,000 feet of riparian zone protection (about 70 acres). Management practice implementation in the Duck River Creek Watershed are also designed to protect the City of Cullman’s drinking water source (Lake Catoma). While it is difficult to quantify the effectiveness of individual BMPs installed as a result of this project, these activities most likely contributed to the delisting of Duck River as seen in the 2002 303(d) list. And is further supported by the absence of this waterbody on the proposed 2004 listing.
- The Cotaco Creek Watershed encompasses 268.9 square miles, comprised of 176,376 acres with 84.1% in Morgan County, 13.9% in Marshall County, and 2% in Cullman County. . The Cotaco Creek system is listed as a State priority watershed in the Alabama Unified Watershed Assessment Report. It also is listed on the State’s 303(d) report (Town and Cotaco Creeks are listed as non-supporting and West Fork Cotaco Creek is listed as partially supporting). All three are listed due to organic enrichment/DO and pathogens. Agriculture has been listed as the source of these problems (ADEM 1998). The Cotaco Creek Watershed Project provides resources to reduce erosion, manage livestock waste, and provide alternate sources of drinking water for livestock. Landowners and land users are provided education and technical, planning, and financial assistance to implement best management practices to

**Table 7-1
Alabama Watershed Projects Since 1986**

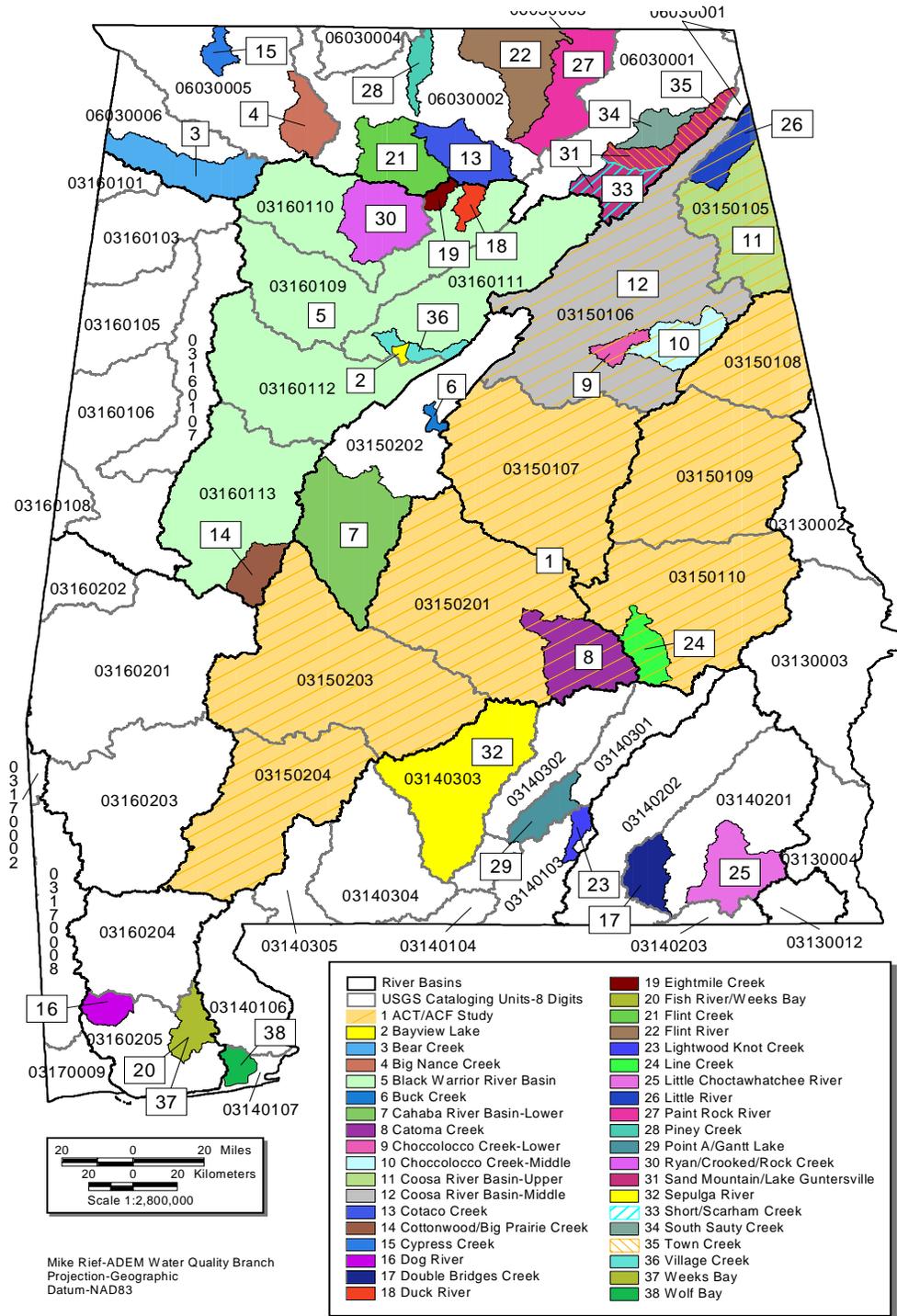
Map Index	USGS Cataloguing Unit	Watershed Project	Funding Date
1	Tri-State Region	ACT/ACE Study	1994
2	03160111	Bayview Lake	1988; 1991
3	06030006	Bear Creek	1986,1990;1991; 2000
4	06030005	Big Nance	1999
5	03160109-113	Black Warrior River Basin	1999
6	03150202	Buck Creek	1995
7	03150202	Cahaba River Basin (lower)	1999
8	03150201	Catoma Creek	1995; 2002
9	03150106	Chocolocco Creek (lower)	1998
10	03150106	Chocolocco Creek (middle)	1996
11	03150105	Coosa River (upper)	2000; 2001
12	03150106	Coosa River (middle)	2000
13	06030002	Cotaco Creek	2000
14	03140201	Cottonwood / Big Prairie Creek	1990; 1991
15	03140201	Cypress Creek	2001
16	03160205	Dog River	1993
17	03140201	Double Bridges	1990
18	03160109	Duck River	1999
19	03160109	Eight Mile	1990;2000
20	03160205	Fish River/Weeks Bay	1993
21	06030002	Flint Creek	1992 - 1995
22	06030002	Flint River	2000
23	03140103	Lightwood-Knot Creek*	1995
24	03150201	Line Creek	2002
25	03140201	Little Choctawhatchee	1991
26	03150105	Little River	1996
27	06030002	Paint Rock	1995
28	03140301	Upper Choctawhatchee	1998
29	06030002	Piney Creek	1999
30	03140301	Point A – Gantt Lake	2001
31	03160110	Ryan-Crooked-Rock Creek	1991;1996
32	06030001	Sand Mountain/Lake Guntersville	1986,1991,1992;1994;1995
33	03140303	Sepulga River	1998
34	06030001	Short - Scarham Creek	2001
35	06030001	South Sauty	2001
36	06030001	Town Creek	2001
37	03160111	Village Creek	1992
38	03160205	Weeks Bay	1994; 1995
39	03140107	Wolf Bay	2001

- protect water quality. This project also provides training and funding to establish a citizen's volunteer water quality monitoring program. The Cotaco Creek Watershed Project management measures include over 55 acres of no-till, 216 acres of filter strips, 2587 acres of nutrient management, 42,917 ft. of fencing, 2590 acres of prescribed grazing, 44 units of heavy use area protection, 64 acres of critical area planting, 10 units animal waste manage structures, 323 acres of riparian forest buffers, 332 acres of animal use exclusion, along 7.5 miles of impaired waters as of November 2003. In addition, an outdoor environmental education classroom and nature study area have been completed.
- The Paint Rock River Watershed Nonpoint Source Pollution Report was developed in cooperation with, The Nature Conservancy - Alabama Natural Heritage Program. This report will help guide threatened and endangered species identification and protection strategies as the Section 319 funded watershed project in the Tennessee River Basin continues.
- The Middle Coosa River Watershed is located in the Coosa River Basin and encompasses Etowah, Cherokee, Cleburne, Calhoun, Talladega, and St. Clair Counties in Northeast Alabama. The 1998 Section 303(d) list identifies both Neely Henry Lake and Logan Martin Lake in the Middle Coosa Basin as partially supporting water quality standards. For Neely Henry Lake, the causes cited for 303(d) listing include priority organics, nutrients, pH and organic enrichment/dissolved oxygen. Primary sources of pollution are industrial, municipal, flow regulation/modifications and upstream sources. For Logan Martin Lake, the causes cited for 303(d) listing include nutrients and organic enrichment/dissolved oxygen. Primary sources of pollution to Logan Martin Lake are urban runoff/storm sewers and flow regulation/modifications. The project provides resources to implement needed best management practices (BMPs) to protect or improve water quality. The Soil and Water Conservation Districts have begun landowner assistance sign ups to implement agricultural best management practices for the Middle Coosa River Basin Project including Logan Martin and Neely Henry Reservoirs. Other Section 319 funded efforts in the watershed include streambank restoration projects, addressing septic tank owners, small businesses and urban development.
- The following Alabama Water Watch/Section 319 grant funded basin guides were produced: "The Guide to Alabama Rivers: Tennessee (Fall 2003); The Guide to Alabama Rivers: Chattahoochee and Coastal Plains Streams," (Winter 2003); "Citizen Volunteer Water Quality Monitoring on Alabama's Streams: Tri-River Region - Montgomery Area.," (February, 2003); and the, "Citizen Volunteer Water Quality Monitoring of Alabama's Reservoirs: Lake Wedowee," (June 2003).
- "Water Smart: Think Watersheds and TMDLs," a video produced using Section 319 grant funding in cooperation with ADEM and Legacy - Partners in Environmental Education, received two awards for excellence in visual communications and creative expertise. The video won the national Aegis Award after judging by video/film production industry professionals and the international Communicator Awards Crystal Award of Distinction for, "exceeding industry standards in production or communications skills." The Water Smart video promotes common-sense approaches to the complexities of watershed protection.

7.3 The Alabama Clean Water Partnership

The Alabama Clean Water Partnership (ACWP) is a diverse and inclusive coalition of public-private interest groups and individuals working together to improve, protect and preserve water resources and aquatic ecosystems in Alabama. The ACWP seeks to meet or exceed the goals of the Clean Water Act and the Alabama Water Pollution Control Act. Achieving State water quality standards and water use classifications is a priority. A river basin protection approach is used to ensure that individual watershed or subwatershed protection efforts are in harmony with

Figure 7-1
Alabama Water shed Projects 1986-2002



one another, i.e., an upstream “cure” doesn’t become or aggravate a downstream problem. The ACWP is a non-profit 501(c) organization.

The ACWP program in Alabama:

- Promotes improved communication, information sharing, and networking among stakeholders through websites, publications, and public meetings
- Consolidates data and information through a communications and technical assistance network
- Provides an effective coordination structure to prevent duplication of efforts, preclude wasteful use of limited resources, and make available technical assistance
- Provides opportunities for stakeholder collaboration in decision-making processes and implementation of management measures

Various levels of stakeholder participation, interest, and resources are available to meet natural resource protection needs. Essential to the success of pollution management is partnering. The ACWP program strengthens new interest groups and enhances the efforts of established groups and processes already in place. The ACWP program assists watershed stakeholders with planning, developing, and implementing programs that meet multiple watershed protection needs; eliminates duplication of efforts, and allows for effective and efficient use of available funding. High priority is directed to developing and implementing watershed-based plans. These plans allow community-based groups, units of government, industry, groups, and individuals to cooperatively implement strategies that concurrently meet the needs of all watershed protection interest.

An ACWP Steering Committee coordinates and oversees statewide partnership activities for 10 major river basins. Steering committees have also been formed in each major river basin. Major river basins have been further delineated into smaller geographical areas (e.g., dam to dam; upper/middle/lower river sections, etc.) to work to solve problems at a local level. Each delineated river basin/sub-basin is represented by a local entity (government, nonprofit organization, public utility, or industry) that is eligible to receive and disburse public and/or private funding to implement CWP priorities. Committees meet at least quarterly.

Clean Water Partnership facilitators have been established in the following 10 river basins to coordinate environmentally protective and economically feasible watershed protection management measures:

1. Cahaba
2. Black Warrior
3. Tennessee
4. Alabama-Tombigbee
5. Tallapoosa
6. Coosa
7. Chattahoochee-Chipola
8. Choctawhatchee-Pea-Yellow
9. Conecuh-Sepulga
10. Coastal

7.4 Additional Watershed Protection Partnerships:

In addition to the many and varied Section 319 funded watershed projects, and resources provided by the Alabama Clean Water Partnership, protection of natural resources are often addressed through other programs. The following resources are used to advance the watershed protection program in Alabama:

- *Conservation buffers* were installed on 13,051 acres to control erosion and sedimentation, abate streambank degradation, and protect water quality. Riparian forest and filter strips make up most of these acres.
- The *Alabama Soil Survey Program* data is a significant watershed protection plan development consideration and of primary importance for implementation of on-the-ground

management measures. The NRCS has completed updating soil surveys for 36 of the 67 counties in Alabama. Twenty-one counties in Alabama are Soil Survey Geographic (SSURGO) Database certified and available in digital format. Interim reports are completed and are awaiting publication for three counties (Choctaw, Pickens, and Russell). Mapping is complete in four counties (Barbour, Hale, Macon, and Tallapoosa) and two special projects (Redstone Arsenal and Anniston Army Depot). The maps are being compiled and the manuscripts are being written and edited for those counties and projects. Field mapping is complete in one update project (Houston County). Work is continuing on the manuscript and digitizing. Field mapping continues in four on-going survey projects (Bibb, Clarke, Coosa, and Crenshaw Counties). Mapping will be completed in Clarke County and mapping will begin in Washington County in 2003. One update project, Madison County, will begin in 2003. Four counties (Lamar, Lowndes, Washington, and Winston) have not yet been mapped. Sixteen counties have out-of-date or out-of-print surveys. Macon County is in the process of being digitally map finished. Digital layers (hydrology and cultural) are being prepared and edited for Barbour and Hale Counties in preparation for digitizing.

- The *Environmental Quality Incentives Program* (EQIP) is a voluntary USDA-FSA program that addresses serious threats to soil, water, and related natural resources. There are 50 priority areas in Alabama. In FY03, 64,315 total acres of conservation systems were applied through EQIP in Alabama.
- The *USDA Forestry Incentives Program* (FIP) program involves planting trees, improving stands of forest trees, and site prepping for natural regeneration. In FY03, the FIP program in Alabama funded 98 agreements, totaling \$367,645, and covering 4,560 acres.
- The *Conservation Reserve Program* (CRP) provides a mechanism to establish permanent vegetation on environmentally sensitive land. In FY03, 20,770 total acres of conservation systems were applied through CRP in Alabama.
- The *Wetland Reserve Program* (WRP) assists landowners that want to voluntarily restore and protect wetlands on private property. In FY03, 239 acres were enrolled in the WRP Program. There are six project sites in Franklin, Colbert and Lawrence Counties.
- The *Wildlife Habitat Incentives Program* (WHIP) is a voluntary program that helps citizens to enhance fish and wildlife on private lands. *During FY2003, Alabama NRCS funded 22 contracts totaling \$111,716.*
- The *Watershed Protection and Flood Prevention Act of 1954 (PL 83-566)*, also known as the Small Watershed Program (SWP), is administered by the NRCS in cooperation with the U.S. Forest Service, Alabama Rural Development, the State Soil and Water Conservation Committee and Districts, and local sponsors. It is the primary water resources implementation program of the USDA. The SWP addresses water quality; flooding; water supplies for municipal, agricultural and recreational uses; erosion and sedimentation; wetland creation and restoration; recreational opportunities; and habitat improvement for fish and wildlife. In FY03, 51 Public Law 566 projects were completed, encompassing about 3,034,042 acres. More than 110 grade stabilization structures and 100 floodwater retarding structures have been built at a combined federal, state, and local cost of \$100,000,000. Table 7-2 shows major benefits of the Small Watershed Protection Program [(PL-566) in Alabama*].

7.5 Watershed Dams at Risk

Many of the 108 small upstream dams constructed in Alabama in the last 39 years are reaching their 50-year design life. Dam failures could result in flash flooding, loss of life, and massive property damage. At least 71 watershed dams are in need of restoration and structural repairs at a projected cost of \$24 M. At this time, there are no State funds available for repairs. Table 7-3 provides a call to action.

Table 7-2
Major Benefits of the Small Watershed Protection Program [(PL-566) in Alabama*]

Average annual flood damage reduction	\$10,100,000
Total acres benefited	\$500,000
Number of farms benefited	7,600
Annual tons of reduced erosion	2,700,000
Annual tons of reduced animal waste	255,000
Bridges benefited	375
Miles of road protected	600
Annual recreation visitor days	90,000

*Derived from: Watershed Progress Report - Alabama. USDA-NRCS. Nov. 2001. Page i. Robert N. Jones. State Conservationist

Table 7-3
Dam Repairs Needed in Alabama*

Number of dams needing repairs to protect downstream life and property	20
Number of dams needing repairs to safeguard municipal water supplies, provide flood control, and protect natural resources	51
Funding needed to protect people and natural resources	\$24 M

Derived from: "Guarding Alabama's Future: The Watershed Protection and Flood Prevention Act PL83-566" brochure Report - Alabama. USDA-NRCS.

7.6 Watershed Based Plans

Watershed based plans integrate public and private efforts to restore impaired watersheds that do not meet clean water and natural resource protection management goals. The ACWP program in Alabama is expending much resources, time, and coordination efforts to develop watershed protection plans. Plans are in various stages of development. Developing useful and practical watershed based plans and coordinating partnerships takes time - especially if there is no history of cooperation among stakeholders. The process in Alabama uses an inclusive public participatory process; considers social, economic, and environmental issues; defines the pollution problem and sources, specifies management measures to address all pollutants of concern, and provides a means to monitor progress and evaluate results.

Watershed based plans are designed to be clear enough that local citizens can "identify" with them and specific enough that citizens willfully "adopt" them (i.e., local citizens understand their roles and responsibilities in the implementation process). Although many river basin plans are being developed, they are too large in scope and areal extent to comprehensively address specific sources and causes of pollution for a particular impaired watershed/sub-watershed located in the river basin. These plans should be reviewed at least annually and revised as needed.

Long-term watershed improvements cannot be effectively realized by following a rigidly structured management plan with a tight implementation schedule, especially if the primary means of implementation is to use a citizen voluntary approach. Therefore, Alabama's watershed based plans are designed to be dynamic in order to respond to changing watershed conditions, priorities, and feedback mechanisms. Efforts are underway to revisit or develop watershed-based plans that address implementation of TMDLs for Section 303(d) listed waterbodies.

Section 319 grant funding has been/is integral to holistic management plan development and implementation. A river basin management plan has been completed for the Middle Coosa River

Basin (including Logan Martin and Neely Henry Reservoirs) and management measures to address priority (TMDL) NPS impaired watersheds are being funded by the FY03 319 base grant. The Upper Coosa River/Weiss Lake Management Plan is undergoing revision by the Clean Water Partnership in order to better address overall watershed protection. The Tennessee Valley Management Plan was finalized in 2003 and several Section 319 watershed projects have been/are being implemented. The Cahaba River Basin Management Plan is available on the Cahaba River Clean Water Partnership website, although the plan is dynamic. A Final Draft Black Warrior River Plan has been developed and a final plan is expected in January 2004. The Coastal Alabama NPS Basin Management Plan was in its Final Draft form in August 2003 with a final plan expected in January 2004. The Lake Wedowee Management Plan (Upper Tallapoosa River Basin) was completed in Sept 2003. In addition, the ADEM has contracts in-place to develop management plans for the Alabama River, Upper and Lower Tombigbee River, Middle and Lower Tallapoosa River, and the Lower Coosa River. These basin management plans are expected to be completed in 2005.

Several previously funded Section 319 watershed projects are ongoing and include development of local watershed-based plans as critical workplan components. For example, smaller HUC watershed management plans are being developed for the following FY01, FY02, and FY03 Section 319 funded watershed projects: Eight-Mile Creek; Cypress Creek; Short-Scarham Creek; South Sauty Creek; Town Creek; Mack Creek-Robinson Creek; and Second Creek/First Creek. As per Section 319 workplans, these watershed plans are on schedule - but are in various stages of finalization. These plans will incorporate, as applicable, EPA's "a-i" elements for a good watershed plan per FY04 Section 319 grant guidelines. An FY01 319-funded Draft Wolf Bay Watershed Management Plan is expected to be finalized in December 2003. Components of the Weeks Bay Watershed Protection Plan continue to be implemented even as this longtime "in-place" plan undergoes local partnership review to incorporate EPA's key "a-i" elements for a good watershed plan. The Cotaco Creek "Clean and Green" Watershed Management Plan, is in place. However, it is undergoing updating in order to better address EPA's key elements for a good watershed plan. The Catoma Creek Watershed Protection Plan, in-place for several years, was developed for the Montgomery Water Works and Sewer Board as part of an NPDES Phase I stormwater enforcement action. NPS management measures are being implemented with FY02 and FY03 Section 319 base funding.

Part 8 Nonpoint Source Management

8.1 The Nonpoint Source Management Program

Since 1989, statewide nonpoint source (NPS) program management efforts in Alabama have greatly expanded in magnitude and scope in order to respond to CWA Section 319 grant guidances, additional acquisition of data and information, as new priorities emerge, and as needs are identified. Institutionalization of the Section 319 program focuses on promoting long-term state and local stakeholder capacity to voluntarily implement management measures regardless of the availability of federal resources. Public/private partnerships are being established; resources identified; and many and varied regulatory and voluntary management measures continue to be implemented. Citizen involvement and development of holistic watershed protection plans are significant contributors to successful implementation of the NPS management program.

As Alabama's population continues to expand, societal demands on its limited water resources continues to increase. The 1989 Alabama NPS Management Program was updated in 1999 and subsequently approved by EPA in September 2000 (effective October 2000). The document is dynamic and is designed to enhance opportunities for collaboration and to effectively and efficiently restore impaired waters and prevent impairments to threatened waters. It can be used a fundamental management tool to integrate statewide interests, expertise, planning, implementation, and resources, i.e., it provides a unifying framework for all stakeholders to, "work off the same page." The document promotes a flexible, targeted, iterative, and broad-based statewide and watershed protection approach.

The CWA Section 319 Alabama Nonpoint Source Management Program (Rev. 1999) document may serve as a NPS reference for this CWA Section 305(b) Report to Congress. It provides an overview of federal, state, and local programs, resources and assistance; plans, strategies, goals, and objectives; assessment and monitoring information; and management measures. Implementation timelines, stakeholder feedback loops, and evaluation indicators are used to measure results. The management program addresses a mix of water quality and technology based programs and presents a combination of regulatory, voluntary, financial and technical assistance programs needed to protect and maintain beneficial uses of surface and groundwater as expeditiously as possible. The document also incorporates coastal NPS management program efforts relate to the *Coastal Zone Act Reauthorization Amendment (CZARA)*, the *Weeks Bay National Estuarine Program (NEP) Management Plan*. Of particular interest is implementation of the Alabama *Clean Water Partnership* program.

**Table 8-1
Section 319(h) Nonpoint Source Grant Allocations**

Section 319	1990	1991	1992	1993	1994	1995	1996 ^a	1997	1998	1999	2000	2001	2002
Incremental Funds										1.95	1.94 ^c	1.94	1.94
Federal (\$ M)	0.76	0.61	0.84	1.13	1.46	3.04 ^b	2.06	1.95	2.05	1.95	1.94 ^c	2.58	2.58
Non-Fed (\$ M)	.57	.79	.96	1.0	1.0	2.6	1.4	1.7	1.4	2.6	2.6	1.7	1.7

^aIncludes an additional appropriation of \$110 K above baseline

^bIncludes \$775K federal funds for the 7-year duration Lightwood-Knot Creek Watershed National NPS Best Management Practice Monitoring Project (Covington County)

^cReduced from FY99 due to increase in Tribal allocations nationally

Note: All numbers in Table above are rounded

Alabama has received annual CWA Section 319(h) demonstration grant appropriations since 1990 to address a plethora of NPS runoff pollution problems. Table 8-1 shows section 319(h) Nonpoint Source Grant Allocations. Since 1990, Alabama has received approximately \$19 M of

Section 319(h) federal grant funds. Alabama consistently ranks 4th in the total amount of Section 319(h) grant funds among EPA Region 4 states. Since 1990, approximately 150 cooperative agreements have been executed. Grant awards are generally used as “seed” money to “kick-start” implementation of management measures and the NPS components of holistic watershed protection plans. Stakeholders provide a minimum of 40% nonfederal match.

A. Management Program Update

The updated Alabama NPS Management Program and annual NPS River Basin Assessment Reports are used by resource agencies, interest groups, and citizens as statewide references for developing, coordinating, and implementing NPS plans and programs. It provides a focal point for discussing and resolving NPS runoff problems together. To view or download the Alabama NPS Management Program document see “Watershed Management” at: www.adem.state.al.us.

Stakeholders may direct comments to the ADEM NPS Unit at: Telephone 334-394-4354; Fax 334-271-7950; and/or E-mail Mr. Norman Blakey nb@adem.state.al.us. The document is dynamic and is expected to be updated as additional monitoring and other information is made available, as problems are identified, priorities change, or needs emerge.

B. Progress and Challenges

Much progress has been made in Alabama to protect water quality and water quality continues to be improved. However, nonpoint source pollution or “runoff pollution” is a special concern because it is often difficult to ascertain specific sources and causes; management measures are generally “voluntary,” and funding and other resources are insufficient to address problems holistically.

The nonpoint source pollution problem in Alabama is *large*. It represents the dominant fraction of surface water pollution to estuaries, lakes, streams, and rivers. The problem is *complex*. It is primarily a voluntary program involving a large number of stakeholders and important sectors of the economy. The problem is also *highly variable* in both time and space. Over time, land use patterns and shifts in population continually occur resulting in increasing and changing NPS stressors upon limited natural resources and land.

Unlike point source pollution, which may be relatively easily collected and treated, NPS pollution in Alabama is primarily addressed through citizen education and outreach and voluntary adoption of practical and cost-effective landuse management practices. Management measures are generally designed to allow for the continuation of everyday activities while reducing or preventing NPS pollutant runoff.

Many of Alabama’s NPS management measures and programs focus on “*pollution prevention*” or “*source reduction*.” Regardless of the pollution “source” (e.g., agriculture, silviculture, resource extraction, construction/urban, etc.) or cause (e.g., nutrients, pesticides, pathogens, siltation, etc.), the Alabama program supports cost-effective and environmentally protective management measures that efficiently reduces or abates runoff of the targeted pollutant. Much effort and resources are expended to develop and implement watershed protection plans with clearly stated, achievable, and measurable goals and objectives.

One challenge for resource agencies, policy makers, and citizens is how to cooperatively implement NPS management measures successfully, while concurrently finding ways to integrate new, unique, or emerging needs and programs. Water quality protection efforts could be better targeted in Alabama using inclusive stakeholder-developed plans and strategies to achieve common goals and objectives. However, development and “adoption” of well-designed river basin and watershed protection plans continue to be impediments to state and local efforts to protect water quality. Limited availability of staff and other resources to effect long-term, self-sustaining watershed protection efforts, develop watershed protection plans, and efficiently

identify and target management measures for site-specific NPS pollutant sources and causes are program constraints.

Since NPS pollution is primarily a “people problem,” the Alabama NPS program advocates building local capacity to effect changes by providing many and varied opportunities for volunteer involvement. When NPS problems do occur, it is generally because of a lack of knowledge or a perceptual problem. Although it is difficult at times to measure or quantify management program implementation “successes,” especially short-term duration (1-5 years), citizen education, outreach, and involvement is - and will remain - a primary NPS pollution management tool for all Section 319 funded endeavors.

C. Management Priorities and Categories

Nonpoint source pollution continues to threaten or impair Alabama’s land, water, air and other natural resources. No single agency possesses the authority, staffing, expertise, or funding to address all aspects of the NPS management program. These and other impediments exacerbate efforts to implement a holistic statewide NPS management program.

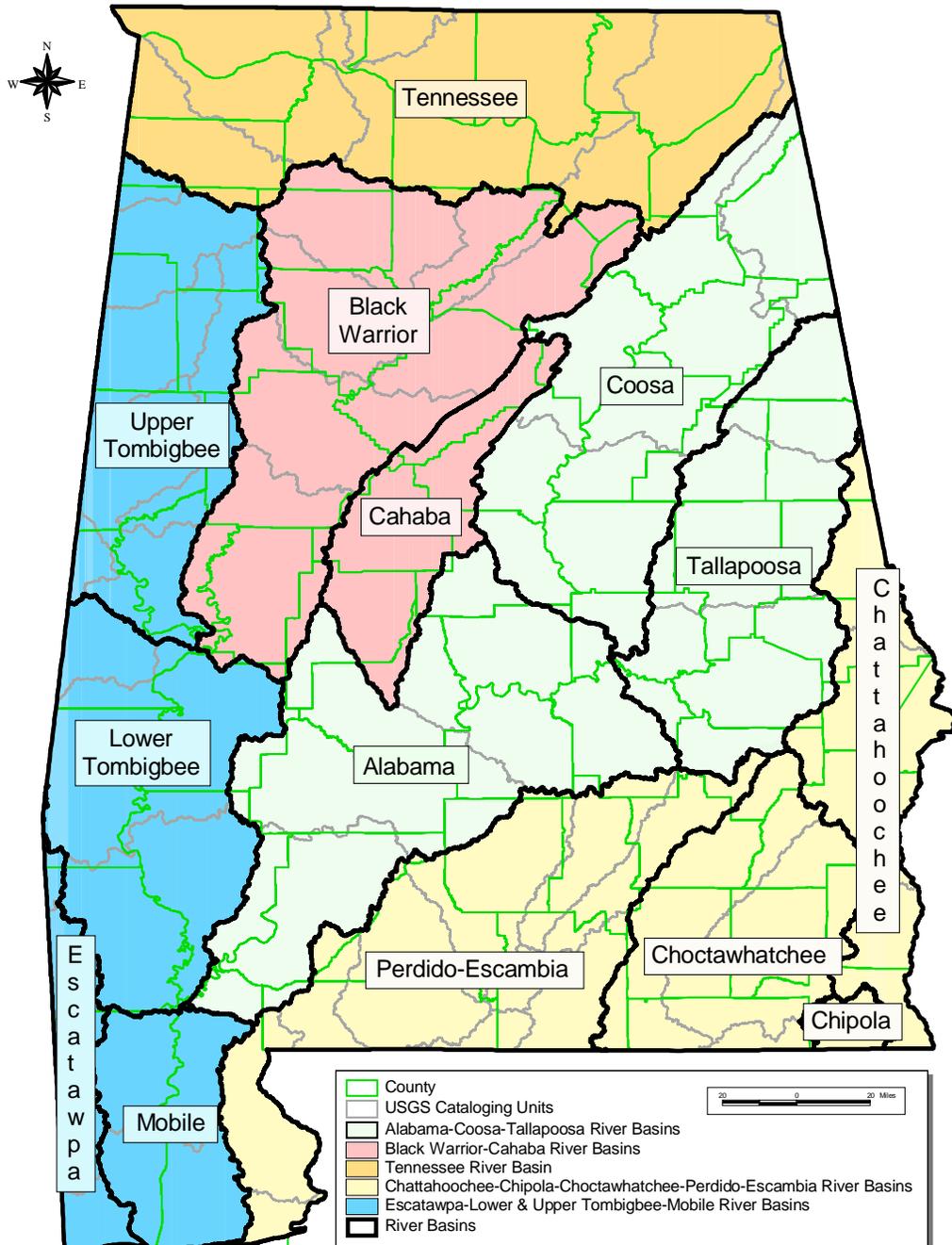
The successful Alabama Clean Water Partnership (CWP) program is striving to coordinate statewide management priorities using a river basin and local watershed protection approach. The CWP is assuming a leading role in coordinating, planning, and implementing watershed protection efforts in Alabama. In addition, the ADEM Office of Education and Outreach (OEO) is assisting stakeholders in addressing natural resource, economic, political, and social issues in the watershed. The OEO affects watershed protection by continuing to identify, motivate, and sustain partnerships; providing education and outreach; and providing plan development assistance and other resources. Implementation of total maximum daily loads (TMDL) as they are developed for the CWA Section 303(d) List of Impaired Waters is a priority consideration.

Section 319 grant funding has been/is integral to holistic management plan development and implementation. A river basin management plan has been completed for the Middle Coosa River Basin (including Logan Martin and Neely Henry Reservoirs) and management measures to address priority (TMDL) NPS impaired watersheds are being funded by the FY03 base grant. The Upper Coosa River/Weiss Lake Management Plan is undergoing revision by the Clean Water Partnership in order to better address overall watershed protection. The Tennessee Valley Management Plan was finalized in 2003 and several Section 319 watershed projects have been/are being implemented. The Cahaba River Basin Management Plan is available on the Cahaba River Clean Water Partnership website, although the plan is dynamic. A Final Draft Black Warrior River Plan has been developed and a final plan is expected in January 2004. The Coastal Alabama NPS Basin Management Plan was in its Final Draft form in August 2003 with a final plan expected in January 2004. The Lake Wedowee Management Plan (Upper Tallapoosa River Basin) was completed in Sept 2003. In addition, the ADEM has contracts in-place to develop management plans for the Alabama River, Upper and Lower Tombigbee River, Middle and Lower Tallapoosa River, and the Lower Coosa River. These basin management plans are expected to be completed in 2005. For more information about the ADEM NPS program and Designated NPS Categories see “Watershed Management” at: www.adem.state.al.us

D. Management Program Implementation Strategy

The Alabama Nonpoint Source Management Program focuses on preventing or eliminating water quality impairments related to NPS runoff pollutants and protecting unimpaired waters. It promotes a cooperative partnership concept, building local capacity for stakeholders to address local problems. The program also promotes a 5-year rotational river basin approach. The rotational approach is used to assess water quality, identify specific NPS problem sources and

Figure 8-1
Alabama's Nonpoint Source Screening Assessment Watersheds



Study Year		Nonpoint Source Screening Assessment River Basin(s)
1st	2nd	
1997	2002	Black Warrior-Cahaba
1998	2003	Tennessee
1999	2004	Chattahoochee-Chipola-Choctawhatchee-Perdido-Escambia
2000	2005	Alabama-Coosa-Tallapoosa
2001	2006	Escatawpa-Lower & Upper Tombigbee-Mobile

Mike Rief-ADEM Water Quality Branch
 Projection-Geographic
 Datum-NAD83

causes, build and support partnering, devise management strategies, coordinate and fund projects, and measure management measure implementation successes. These approaches appear to be the most appropriate mechanisms that can assure that all water quality concerns are addressed holistically and in a timely and cost effective manner using a voluntary approach.. Table 8-4 Alabama's 5 year rotational NPS river basin assessment.

Successful implementation requires much integration and coordination of programs among agencies and watershed protection interests. The Alabama NPS Management Program has a formidable but achievable task of integrating many and varied programs including the traditional NPDES permit program, surface and groundwater protection efforts, TMDLs, monitoring and assessments, etc., using very limited NPS program resources. Continuous cooperation and collaboration with all resource providers and stakeholders are a program priority. The statewide NPS management approach parallels other coastal NPS management measures, and is not in lieu of (e.g., NEP, CZARA, and the Alabama Coastal Program). The ADEM also has a good working relationship with other resource providers including the USDA-NRCS and FSA (federal cost-share programs) and the Alabama Soil and Water Conservation Committee (state agricultural cost-share program). In addition, Section 319 funded projects are cooperatively addressing wetlands protection (ADCNR), resource extraction (OSM; ADIR), failing septage systems (ADPH), silviculture (AFC); education and outreach (ACES), and many other pollutant categories and subcategories.

E. Nonpoint Source Assessments

The Alabama Soil and Water Conservation Commission and Districts, using Section 319 and state cost-share funding, assesses each county using locally-led citizen advisory groups. ADEM and other agencies utilize this information to fill in gaps that are identified by other assessment efforts and to plan for and implement management measures.

The ADEM NPS Unit initiated a 5-year rotational river basin approach beginning with an FY96 Section 319 grant. Efforts involved assessing and identifying the sources and causes of NPS impacts to water quality, and then prioritizing NPS impacted watersheds for remediation. Final assessment reports are in various stages of completion due to the lag time associated with planning, collection, analyses and identification, writing, peer review, and publishing. Water quality assessment reports will be made available on the ADEM website as time and resources allow. Figure 8-1 Shows Alabama's nonpoint source screening assessment watersheds.

As the river basin assessments identify nonpoint source impairments, management measures are targeted to address specific pollutant sources and causes at priority sites. However, numbers and types of "on-the-ground" management measures may vary because of logistics, scheduling, resource availability, or a need for additional water quality information. Unanticipated demands and priorities for limited resources may also influence the prompt targeting of management measures.

In future years, the Section 319 grant program will make a concerted effort to provide enhanced documentation of water quality improvements as a result of NPS management strategy implementation (*Management Program Goal 1*). The Alabama Nonpoint Source Program Grants Guidance, sub-recipient grant agreements, and project scope of services, specifically require cooperators to report nutrient and sediment load reductions as management practices are implemented (either actual water quality monitoring results or the use of load estimation models). In order to improve upon previous reporting of NPS program goals and objectives, some management practices installed with Section 319 and other funds (e.g., EQIP) prior to FY02 are being re-assessed, improvements in water quality modeled, and data increasingly reported (see "*Water Quality Improvements through Nonpoint Source Program Implementation*" in this annual report for current load reduction information).

Section 319 grant funded watershed projects (primarily incremental funds) target Total Maximum Daily Load (TMDL) implementation in watersheds where TMDL/watershed based plans have been developed and where stakeholder interest is evident. Implementation of best management practices will reduce the sources and causes of NPS pollutants of concern and achieve state water use classifications and water quality criteria. Again, cooperators will be required to document improvements (*Management Program Goals 2 and 8*). When the impaired water meets state water quality standards, the waterbody will be delisted from the Section 303(d) list (*Management Program Goals 1, 2, 3, and 8*). Section 319-funded TMDL implementation projects are expected to be initiated using FY03 and FY04 incremental funding. However, the state's funding crises may be a major limiting factor in targeting and prioritizing resources to the local level. Helping to find solutions for statewide and local water quality problems is a goal of the Alabama Clean Water Partnership.

In addition to annual reports and other program review mechanisms, the state will also utilize the EPA - Grants Reporting and Tracking System (GRTS) to report quantifiable NPS pollutant load reduction estimates (primarily nitrogen, phosphorus and sediment). However, *qualitative* documentation of water quality improvements is more difficult to ascertain. The importance of education and outreach, partnerships, volunteerism, technical assistance, and technology transfer in reducing pollutant load reductions cannot be dismissed or overlooked. In order to maintain an effective and balanced statewide program, these efforts will continue to be essential components of the NPS Management Program.

In keeping with the states 5-year rotational river basin approach, Section 319(h) proposals are generally requested the fiscal year following completion of the river basin's assessment. Table 8-3 provides a list of the major river basin assessment groupings.

F. NPS River Basin Approach

Development and implementation of comprehensive watershed protection plans is a priority in Alabama. Stakeholders agree on a common set of methods, processes, and measurable criteria for dealing with NPS problems on a priority basis within prescribed timelines (*stakeholders are all agencies, organizations, and citizens that are involved with or affected by resource management decisions*). Project sites and resources are prioritized to ensure that limited NPS resources are utilized effectively and wisely. Partnership input and coordination allows for efficient targeting of *local* watershed priorities in the context of overall *statewide* priorities, thus minimizing crisis management decisions and reactions. The NPS management program is achieving this approach using the rotational river basin strategy presented in Table 8-2.

The 5-year river basin approach neither replaces nor supercedes local watershed protection or assessment initiatives. Instead, it provides a long-term water quality assessment and implementation mechanism to efficiently coordinate statewide NPS management activities.

It is essential that stakeholders understand that planning and implementation of the river basin management approach will require substantial long-term commitments of time, efforts, resources, partnering and coordination, and may encompass multiple "5-year" cycles. Measurable water quality improvements and successes may be <1 year, but may be as long as 5, 10, 15, 20, or more years in the future.

The 5-year rotational NPS river basin assessment approach is summarized in Table 5-5. The assessment cycle continually rotates and repeats upon itself. Each major river basin assessed (or at least one watershed "nested" within a basin "grouping") will be "treated", as resources allow, i.e., the Lower Cahaba/Black Warrior River Basins will again be assessed in Year 6. Fiscal 2003,

with watershed/water quality protection projects or “treatments” tentatively to be implemented beginning in Fiscal 2004.

**Table 8-2
Rotational River Basin Approach Strategy**

1.	Incorporate assessment information into Section 319 project workplans; Alabama NPS Assessment Report; CWA Section 305(b) Report to Congress; CWA Section 303(d) List of Impaired Waters; as well as other reports and lists
2.	Identify impaired water quality sites, sources, and causes
3.	Form new partnerships and/or provide resources to promote and sustain on-going local watershed protection efforts
4.	Develop and revise watershed protection plans as needed to address pollutants of concern
5.	Prioritize impaired sites and determine needed management measures (types, numbers, etc)
6.	Implement management measures based on comprehensive watershed management plans
7.	Integrate all restoration and protection activities within a well-defined priority area using a combination of resources [e.g., Section (303(d)/TMDL; Alabama Clean Water Partnership; Section 319, EQIP, etc.]
8.	Measure progress and success using feedback loops. Revise plans as necessary.

**Table 8-3
Nonpoint Source River Basin Assessment**

Year	Basin	Adjacent States	Rationale
2002	Cahaba	Not Applicable	Pilot Basin (begin 1995)
	Warrior	Not Applicable	Birmingham Metropolitan Area Spans Both Basins
2003	Tennessee	GA (2000)	Basin Not Hydrologically Connected to other Alabama Basins
		TN (no date)	
		MS (no date)	
2004	Chattahoochee	GA (1999)	GA Schedule
		FL (no date)	Basin Shared with FL in the Same Year
	Chipola	FL (no date)	Basin Shared with FL in the Same Year
	Choctawhatchee	FL (no date)	Basin Shared with FL in the Same Year
	Perdido-Escambia	FL (no date)	Basin Shared with FL in the Same Year
2005	Alabama	Not Applicable	Downstream of Coosa and Tallapoosa
	Coosa	GA (2000)	GA Schedule
	Tallapoosa	GA (2000)	GA Schedule
2006	Escatawpa	MS (no date)	Shared with MS in the Same Year
	Lower Tombigbee	MS (no date)	Shared with MS in the Same Year
	Mobile	Not Applicable	Downstream of the Tombigbee Basin
	Upper Tombigbee	MS (no date)	Shared with MS in the Same Year

**Table 8-4
5-Year Rotational NPS River Basin Assessment**

Major River Basin		Assessment Schedule	
1	Cahaba; Black Warrior	(Year 1.	Complete)
2	Tennessee	(Year 2	Complete)
3	Chattahoochee; Chipola; Choctawhatchee;	(Year 3.	Complete)
4	Escambia; Perdido; Coosa; Tallapoosa; Alabama	(Year 4.	Complete)
5	Mobile; Escatawpa; Lower Tombigbee; Upper Tombigbee	(Year 5.	Complete)
6	Cahaba; Black Warrior	(Year 6.	Complete)
7	Tennessee	(Year 7.	In Progress)
8	Chattahoochee; Chipola; Choctawhatchee; Escambia; Perdido	(Year 8.	In Progress)
9	Coosa; Tallapoosa; Alabama	(Year 9.	FY 2005)
10	Mobile; Escatawpa; Lower Tombigbee; Upper Tombigbee	(Year 10.	FY 2006)

8.2 Alabama Water Watch Program/Association

The Alabama Water Watch (AWW) is a statewide program dedicated to developing citizen volunteer monitoring of Alabama's surface waters. It is funded in part by the US EPA Region 4 Clean Water Act §319 and ADEM and is coordinated through the Department of Fisheries and Allied Aquacultures of Auburn University.

Seventy-Five citizen groups submitted data during the report period and one of those groups were new to AWW. Most AWW groups monitored in the Tennessee, Coastal Plains Streams and Mobile River watersheds (20, 7 and 4 groups, respectively). Of the 3,930 chemistry data records received from October 2001 through September 2002, monitors in the Coosa, Mobile and Tennessee watersheds submitted 68% of the data (26%, 23% and 19%, respectively). Monitors also submitted a total of 893 bacteriological data records during the report period. Since the inception of the AWW program in late 1992, monitors have sampled 1,400 sites on 575 water bodies and submitted over 21,000 chemistry and over 4,000 data forms.

The Alabama Water Watch Program and Association is commended on the success of its public education and training activities in addition to its sampling efforts. Regular meetings are held between ADEM and AWW staff/volunteer monitors and provides the Department with valuable information about concerns of Alabama's citizens as well as positive interaction and dialogue. These meetings allow discussions of not only surface water concerns but involve all the programs administered by ADEM to manage Alabama's environment. The AWW Program is known as a national leader and is frequently called upon by other states for information regarding AWW activities. Figure 5-2 depicts the locations of AWW groups presently sampling Alabama's surface waters. Table 5-5 is indexed to the map and provides each group's name and AWW code.

For more information about AWW or AWW Citizen Monitoring Groups visit:
www.alabamawaterwatch.org.

Part 9 Public Health

9.1 Fish Tissue Monitoring Program

The Fish Tissue Monitoring Program (FTMP) is a cooperative effort between ADEM, the Alabama Department of Public Health (ADPH), the Alabama Department of Conservation and Natural Resources (ADCNR) and the Tennessee Valley Authority (TVA) to monitor fish tissue throughout the State for bioaccumulative contaminants that can pose a risk to human health. The ADEM FTMP was initiated in 1991 as a cooperative agreement with the ADPH, the ADCNR and the TVA to monitor fish tissue throughout the state for bioaccumulative contaminants that can pose a risk to human health. Twenty-eight (28) major reservoirs, 26 stream locations and 19 ADCNR-managed public fishing lakes are sampled on a five-year rotational basis. Additional water bodies are also monitored based on identified need. Each year's sampling locations are determined based upon information available to the ADEM and input from the cooperative agencies. Water bodies that have been identified as having elevated concentrations of bioaccumulative fish tissue contaminants, or greater potential for contamination, are more closely monitored. Figure 9-1 shows fish tissue sampling stations.

Most contaminants are stored/concentrated in the fatty tissue. Therefore, sampling is conducted in the fall of the year when fatty tissue has been accumulated for over-wintering. The results of the tissue analysis are provided to the ADPH. The role of the ADPH in the program is to evaluate the data based on the potential effects to human health and issue consumption advisories if appropriate.

At each location, a composite sample of six individuals (same species) from both the predator and the omnivore/bottom feeding groups is collected (usually six bass and six catfish). Skinless-fillet composite samples are screened for a select list of organo-chlorine pesticides, metals and PCBs. Screening results will normally dictate the need for additional sampling trips and analyses. The results of these analyses are provided to the ADPH for their consideration. If data warrants, the ADPH will issue consumption advisories as appropriate. The physical condition of important sport and/or commercial fish species collected for tissue monitoring is also determined using a "condition indicator" (relative weights) to evaluate trends in the health of a fish community.

Results from the Fiscal Year 2003 Fish Tissue Monitoring Program indicate that most fish from the river basins sampled last fall did not contain elevated levels of contaminants. A total of 389 fish were collected from 41 locations in 33 water bodies during the fall of 2002. Of the 389 fish, 353 were collected as part of ADEM's Fish Tissue Monitoring Program and 36 collected as part of ADEM's participation in the US EPA National Fish Tissue Study. Initiated in 1991, the ADEM Fish Tissue Monitoring Program is currently conducted in cooperation with the Alabama Department of Public Health (ADPH), the Alabama Department of Conservation and Natural Resources, and the Tennessee Valley Authority.

In addition to providing valuable information to the cooperating agencies mentioned above, the most important role of this monitoring program is the collection of data that the ADPH can use to inform Alabama citizens who consume their catch of fish. Citizens can use this information to make healthy, informed decisions regarding this important food source. Because of the importance of this information, ADEM has requested additional funding to maintain and expand the monitoring program on a number of occasions. Figure 9-2 and Table 9-1 show 2004 fish consumption advisories.

Utilizing the funding that is currently available, water bodies in south Alabama were targeted for the second consecutive year to determine mercury concentrations in fish. Emphasis centered on those locations that had not previously been sampled, or had not been sampled in several

years. Fish were also collected from water bodies within the Warrior River Basin and at a number of sites currently under fish consumption advisories issued by the ADPH.

Contaminant concentrations, if present, were either below measurable concentrations or did not exceed FDA guidelines in fish collected from Bankhead Reservoir, Holt Reservoir, Oliver Reservoir, Warrior Reservoir, Smith Reservoir, Tuscaloosa Reservoir, and North River of the Warrior River Basin. Similar results were recorded in samples collected from the Choctawhatchee River, Magnolia River, Heron Bay, Chickasaw Creek, Bay Minette Creek, Escatawpa River, Indian Creek, Mifflin Lake, Mitchell Reservoir, Neely Henry Reservoir, Tensaw River, Wheeler Reservoir, and Wolf Bay.

Mercury concentrations were above the FDA guideline level of 1.0 ppm in the only bass collected from the Blackwater River (Escambia County), one of six bass from the Conecuh River, one of six bass from the Middle River, one of three ladyfish from Perdido Bay, two of six bass from the Styx River, two of five bass from Little Escambia Creek, three of six bass from the Yellow River, six of six bass from Big Escambia Creek, and seven of seven bass from the Blackwater River (Baldwin County). Although it is a private water body and is not accessible to the public, fish were also collected in the Olin Basin in Washington County. Concentrations were above the FDA guidance level for mercury in bass, blue catfish, and black crappie collected from this private water body.

Polychlorinated biphenyl (PCB) concentrations were above the FDA guidance level of 2.0 ppm in one of two white bass collected in the dam forebay area of Jordan Reservoir.

As part of the monitoring program, ADEM also collected fish for dioxin analysis from three locations below bleach kraft paper mills. Bass and catfish below these discharges to the Conecuh River, Tombigbee River, and Tennessee River showed no dioxin or concentrations well below established levels of concern in fish tissue. Sampling below these mills is a continuation of monitoring initiated following changes instituted by the mills and the initiation of required testing.

All samples were analyzed by the ADEM Environmental Laboratory for contaminants with the potential to bioaccumulate (PCBs, arsenic, chlordane, toxaphene, mercury, mirex, DDT, DDD, DDE, dieldrin, dursban, endrin, heptachlor, heptachlorepoxyde, endosulfan, hexachlorobenzene, lindane, and certain heavy metals). Bioaccumulation is the process through which low levels of a contaminant in the environment are concentrated in the bodies of plants and animals. Fish are collected in the fall of each year, when their systems are preparing for winter and most pollutants of concern would be expected to be stored at the highest concentrations.

Data from the monitoring program have been forwarded to the ADPH to determine if new fish consumption advisories or changes to existing advisories will be necessary. The ADPH provides information on all current fish consumption advisories at its website www.alapubhealth.org. The site also provides information on ways to prepare fish to limit exposure to contaminants that may be present.

ADEM's monitoring program also included an evaluation of the physical condition of important sport and/or commercial fish species. The majority of the fish evaluated were found to be in good to excellent condition. Fish were also checked for external anomalies, such as lesions, tumors, parasites and deformities. Some 88 percent of the fish checked had no anomalies, a value similar to those of previous years. The most commonly observed anomalies were lesions on the body surface. The occurrence of lesions on fish during spring and fall may be the result of bacterial infections associated with changing water temperatures, spawning stress or a combination of natural occurrences. These infections are not dangerous to the consumer and the fish are edible if properly prepared.

Figure 9-1
Fish Tissue Sampling Stations

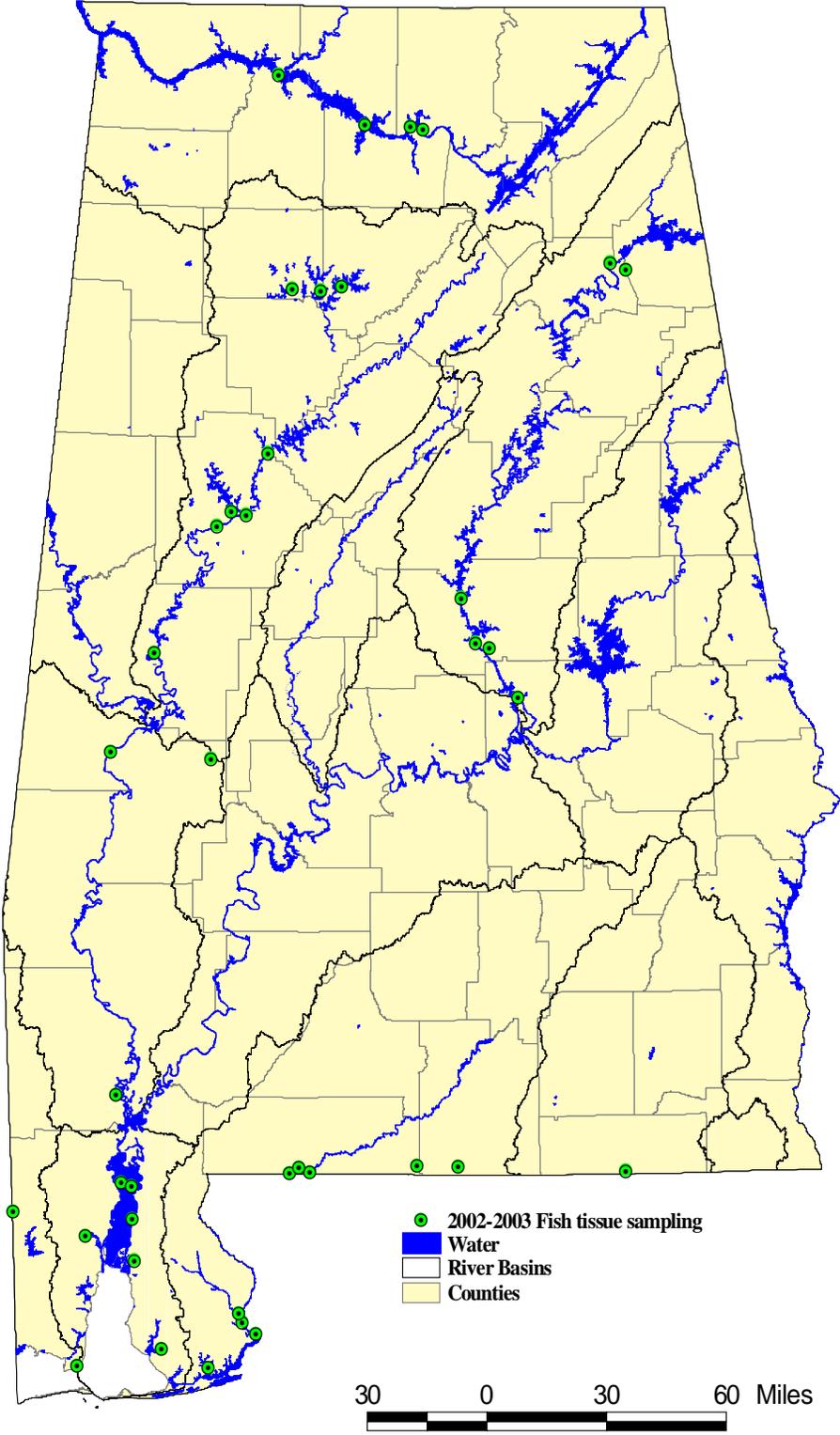


Figure 9-2
2004 Fish Consumption Advisories

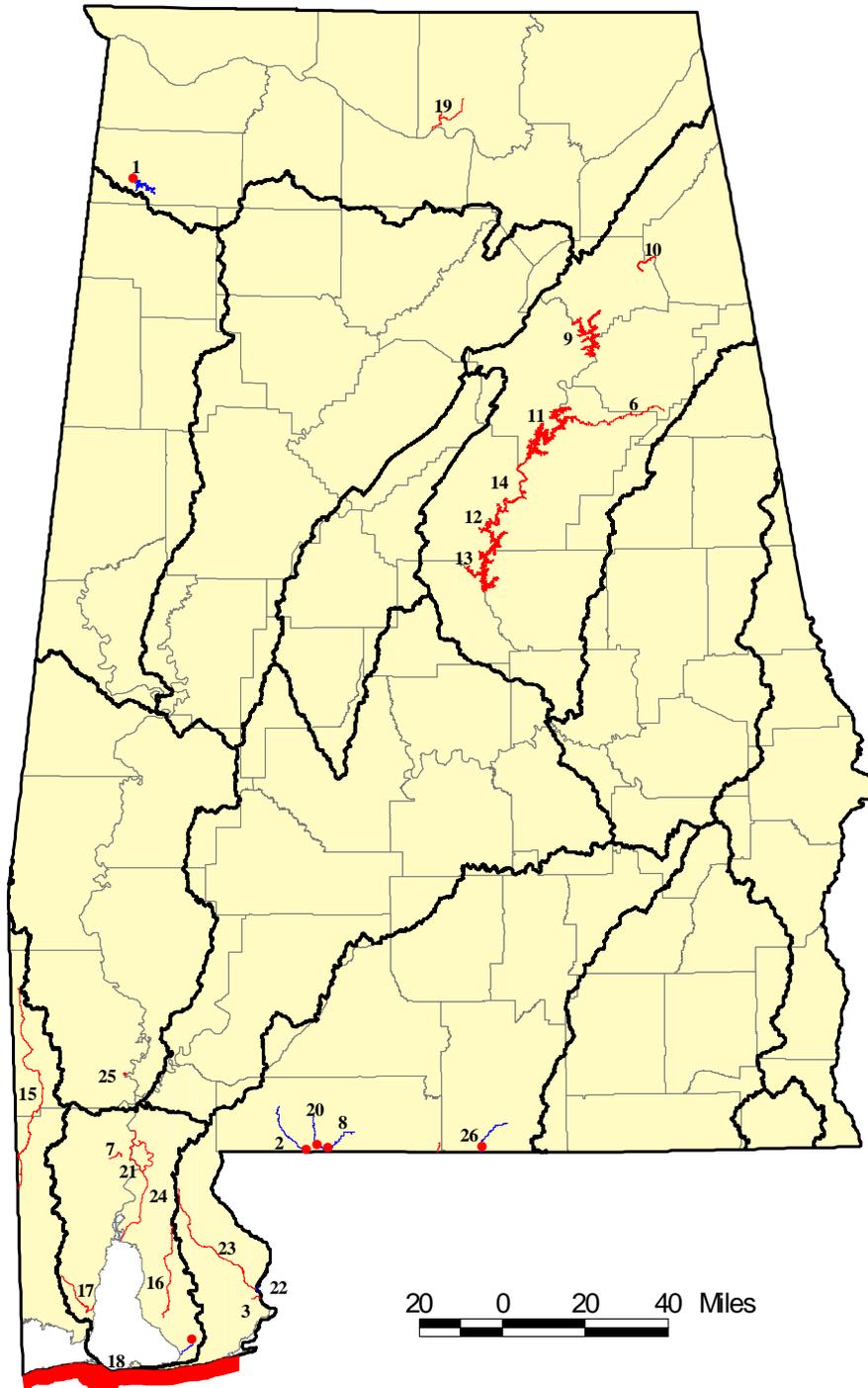


Table 9-1
2004 Fish Consumption Advisories

Map Index	Sub Basin	Waterbody	County(ies)	Fish Species	Location of Advisory	Pollutant(s)	Advisory Type
1	6030006	Bear Creek Reservoir	Franklin	Bass: Largemouth	Dam Forebay Area	Mercury ⁴	Limited Consumption ²
2	3140305	Big Escambia Creek	Escambia	Bass: Largemouth	At the Louisville and Nashville Railroad Bridge Crossing	Mercury ⁴	No Consumption ¹
3	3140106	Blackwater River	Baldwin	Bass: Largemouth	In the area between the mouth of the river and the pipeline crossing southeast of Robertsdale	Mercury ⁴	No Consumption ¹
4	3140104	Blackwater River	Escambia	Bass: Largemouth	Between the County Road 4 bridge and the Alabama/Florida state line	Mercury ⁴	No Consumption ¹
5	3160205	Bon Secour River	Baldwin	Bass: Largemouth	Vicinity of County Road 10 bridge	Mercury ⁴	No Consumption ¹
6	3150106	Choccolocco Creek	Calhoun Talladega	All Species	Entire length of creek from south of Oxford to Logan Martin Lake	PCBs ³	No Consumption ¹
7	3160204	Cold Creek Swamp	Mobile	All Species	From confluence of Cold Creek with the Mobile River west through the swamp	Mercury ⁴	No Consumption ¹
8	3140304	Conecuh River	Escambia	Bass: Largemouth	At Pollard Landing approximately 8.6 miles downstream of the paper mill	Mercury ⁴	No Consumption ¹
9	3150106	Coosa River (Neely Henry)	Etowah	Catfish over 1 pound	Between Neely Henry Dam and Riverside	PCBs ³	Limited Consumption ²
10	3150106	Coosa River (Neely Henry)	Etowah	Catfish: Channel	In the Croft Ferry area of Neely Henry Reservoir (Alabama Power Reservoir Mile 54).	PCBs ³	No Consumption ¹
11	3150106	Coosa River	St. Clair Talladega	Bass: Striped Catfish	Between Riverside and Logan Martin Dam	PCBs ³	No Consumption ¹
12	3150106	Coosa River (Lay)	St. Clair Shelby Talladega	Bass: Largemouth Bass: Striped	Between Logan Martin Dam and the railroad tracks crossing the Coosa near Vincent	PCBs ³	Limited Consumption ² No Consumption ¹
13	3150107	Coosa River (Lay)	Chilton Coosa St. Clair Shelby Talladega	Bass: Striped	Lay Lake between Logan Martin Dam and Lay Dam	PCBs ³	No Consumption ¹
14	3150107	Coosa River (Lay)	St. Clair	Bass: Striped	In upper Lay Reservoir approximately two miles downstream of Logan Martin Dam and one half mile downstream from the Kelly Creek - Coosa River Confluence in the vicinity of Ratcliff/Elliott Island.	PCBs ³	Limited Consumption ²
15	3170008	Escatawpa River	Mobile	Bass: Largemouth, Spotted	Entire River	Mercury ⁴	No Consumption ¹
16	3160205	Fish River	Baldwin	Bass: Largemouth	Entire River	Mercury ⁴	No Consumption ¹
17	3160205	Fowl River	Mobile	Bass: Largemouth	Entire River	Mercury ⁴	No Consumption ¹
18	n/a	Gulf Coast (Gulf of Mexico)	Baldwin	King Mackerel: over 39 in. King Mackerel: under 39 in.	Entire coast Entire coast	Mercury ⁴	No Consumption ¹ Limited Consumption ²
19	6030002	Huntsville Spring Branch & Indian Creek	Madison	Buffalo: Bigmouth, Smallmouth	From Redstone Arsenal to the Tennessee River	DDT ³	No Consumption ¹
20	3140304	Little Escambia Creek	Escambia	Bass: Spotted	In Escambia County at U.S. Highway 31/29 Bridge	Mercury ⁴	No Consumption ¹
21	3160204	Middle River	Baldwin Mobile	Bass: Largemouth	4.5 miles above its confluence with the Tensaw River	Mercury ⁴	No Consumption ¹
22	3140106	Perdido River	Baldwin	Bass: Largemouth	Near its confluence with the Styx River in the vicinity of U.S. Hwy 90 Bridge Crossing	Mercury ⁴	No Consumption ¹
23	3140106	Styx River	Baldwin	Bass: Largemouth Catfish: Channel	Entire River		No Consumption ¹ Limited Consumption ²
24	3160204	Tensaw River	Baldwin	Bass: Largemouth	Entire River	Mercury ⁴	Limited Consumption ²
25	3160203	Tombigbee River	Washington	Bass: Largemouth Catfish: Channel	Olin Basin at river mile 60.5	DDT ³ Mercury ⁴	No Consumption ¹
26	3140103	Yellow River	Covington	Bass: Largemouth	At County Road 4 bridge crossing approximately 1.5 miles upstream of Alabama/Florida line	Mercury ⁴	No Consumption ¹

1 No consumption advisory - Everyone should avoid eating the designated species of fish in the defined area.

2 Limited consumption advisory - Women of reproductive age and children less than 15 years old should avoid eating the designated species of fish from these areas. Other people should limit their consumption of the particular species to one meal per month.

3 The U.S. EPA regards chlordane, DDT, and PCBs as probable human carcinogens. This indicates cancer causing ability determined in laboratory animals but not in humans.

4 Mercury is non-carcinogenic. In extremely high levels, mercury affects the nervous system, kidney and fetus.

*Abbreviations: CU = Cataloging Unit, DS=Downstream, US = Upstream, RM = River Mile, RR = Railroad, APCO – Alabama Power Company

9.2 Fish Kills 2002-2003

As part of its emergency response responsibilities, the ADEM investigates all reported fish kills. These investigations are usually conducted in conjunction with the Alabama Department of Conservation and Natural Resources (ADCNR). The purpose of the investigation is to determine the cause and severity of the kill. Often an investigation is inhibited by the lapse of time between the actual time of the kill and the receipt of the report by the appropriate authorities.

Depending on the situation, a fish kill examination may include the following: laboratory analysis of soil, water, and/or fish tissue samples; on site measurements of chemical and physical water quality parameters; interviews with associated residents and fishermen; and a total count of individual fish killed and species involved. If a cause can be determined and enforcement action is deemed appropriate, the State Attorney General's Office is authorized to recover, at a minimum, the monetary value of the fish killed for the purpose of restocking the water body by the ADCNR. Table 9-2 show fish kills during 2002 and 2003.

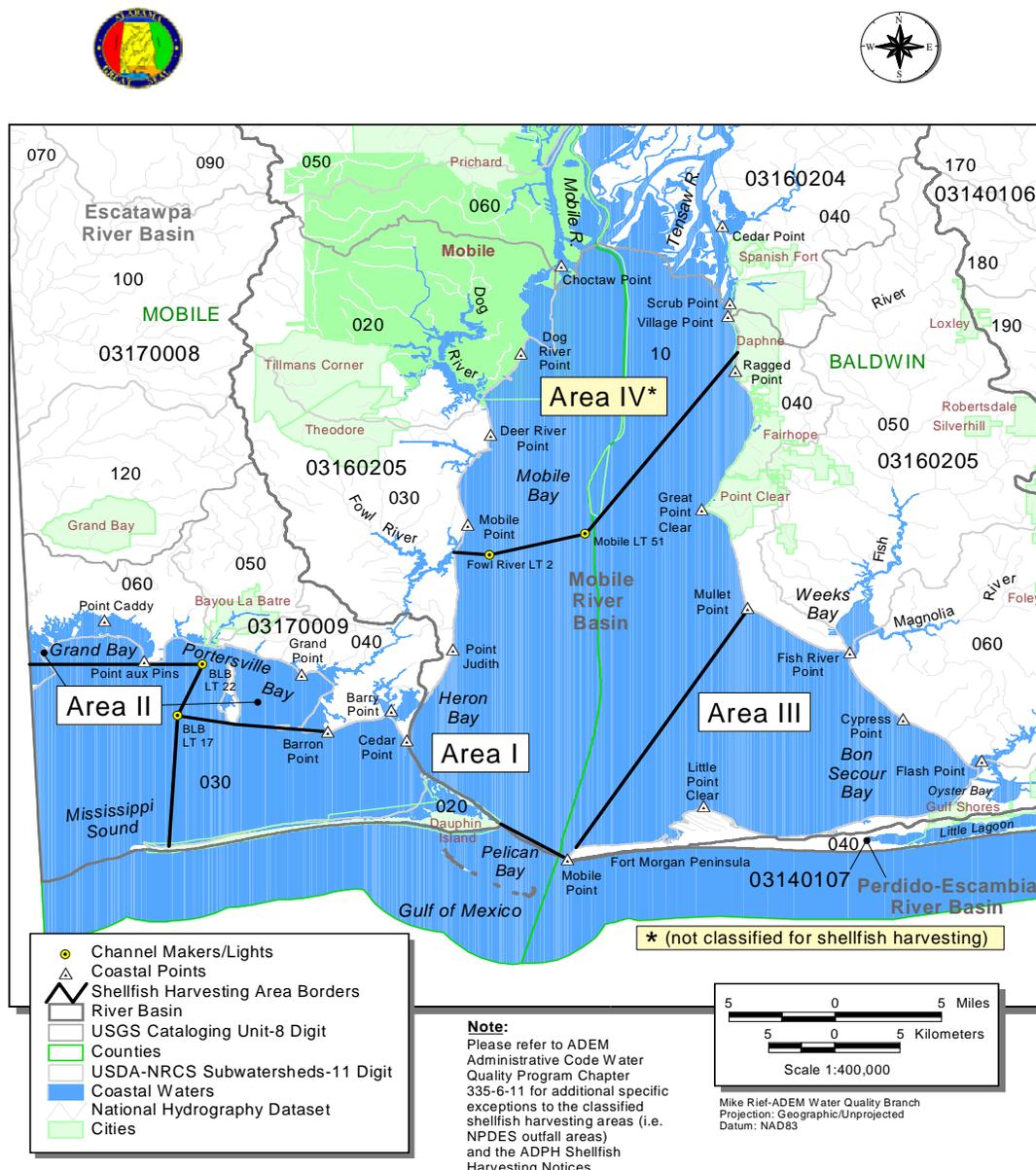
**Table 9-2
Fish Kills During 2002 and 2003**

Waterbody/County	Date	Water Body Type	Size Affected	Cause(s) of Concern	Source(s) of Pollutants	No. of Fish Killed
UT to Montlimar Creek/ Mobile Co.	2/13/2002	Stream	<0.5	Petroleum	Private co	Undetermined
Alabama River/Elmore-Montgomery Co.	3/27/2002	River	<0.5	Bridge Construction	Private co	340
Tennessee River/Lauderdale Co.	6/4/2002	River	>0.5	Undetermined	Undetermined	1138
Mud Creek/Cullman Co.	7/12/2002	Stream	<0.5	Pesticide	Private co	Undetermined
Town Creek/Cleburne Co.	7/18/2002	Stream	<0.5	Sewage Spill	Municipal	Undetermined
Demopolis Reservoir/ Marengo Co.	7/19/2002	Reservoir	>0.5	Fire Retardant runoff	Private co	9000
Hunsville Spring Branch/ Madison Co.	7/30/2002	Stream	>0.5	Undetermined	Undetermined	3682
Valley Creek/Jefferson Co.	8/15/2002	Stream	>0.5	Undetermined	Undetermined	354,888
Bengis Creek/Jackson Co.	8/16/2002	Stream	>0.5	Sewage Spill	Municipal	289
UT to Town Creek/Limestone Co.	8/19/2002	Stream	<0.5	Thermal Spike	Private Co.	300
Village Creek/Jefferson Co.	9/8/2002	Stream	>0.5	Petroleum	Private Co.	2442
Big Nance Creek/Lawrence Co.	9/18/2002	Stream	<0.5	Natural Occurrence	N/A	43
Baker Creek/ Morgan Co.	3/10/2003	Stream	<0.5	Acid Spill	Private Co.	18000
Swift Creek/Autauga Co.	3/10/2003	Stream	<0.5	Natural Occurrence	N/A	Undetermined
UT of Nelson Branch/ Morgan Co.	5/25/2003	Stream	<0.5	Undetermined	Undetermined	131
Big Prairie Creek/Hale Co.	5/9/2003	Stream	>0.5	Undetermined	Undetermined	16802
UT of Graves Creek/Blount Co.	6/27/2003	Stream	<0.5	Natural Occurrence	N/A	100
Big Prairie Creek/Hale Co.	8/7/2003	Stream	>0.5	Undetermined	Undetermined	75
Pinhook Creek/Madison Co.	10/21/2003	Stream	<0.5	Undetermined	Undetermined	Undetermined

9.3 Shellfish Harvesting Areas

Shellfish harvesting area closures are issued when the Mobile River stage rises above 8 feet at the Barry Steam Plant. For reopening the closed areas, the river stage must be below 8 feet, ambient fecal coliform counts must be below a geometric mean of 14 MPN (most probable number) in 100 milliliters of sample water, and E. coli count in oyster meat must be below 230 MPN. Figure 9-2 depicts the shellfish harvesting closure areas in Alabama's coastal waters. For exceptions to these areas such as around outfalls, marinas, or other specific waters refer to the ADEM Administrative Code Water Quality Program Volume II Chapter 335-6-11. Table 9-3 contains the notices pertaining to shellfish harvesting area closures and subsequent reopenings since the early 1990s. Table 9-4 shows public notices of sewage release for Baldwin and Mobile counties. Further recent information can be obtained from the ADPH's website, at www.alapubhealth.org/index under "News/Information."

Figure 9-3
Oyster/Shellfish Harvesting Areas (Open or Closed by the Alabama Department of Public Health)



**Table 9-3
Shellfish Harvesting Area Closures/Reopening**

Action Date of Notice	Action Time of Notice	Area I			Area II			Area III			Area IV		
		Status	Number of Days Open	Number of Days Closed	Status	Number of Days Open	Number of Days Closed	Status	Number of Days Open	Number of Days Closed	Status	Number of Days Open	Number of Days Closed
07/17/03	6:00 a.m.	Conditionally Open	168		Conditionally Closed	168		Conditionally Open	168		Conditionally Closed	0	168
07/06/03	4:00 p.m.	Conditionally Closed		11	Conditionally Closed		11	Conditionally Closed		11	Conditionally Closed	0	11
06/28/03	6:00 a.m.	Conditionally Open	8		Conditionally Open	8		Conditionally Open	8		Conditionally Closed	0	8
06/24/03	4:00 p.m.	Conditionally Closed		4	Conditionally Closed		4	Conditionally Closed		4	Conditionally Closed	0	4
06/07/03	6:00 a.m.	Conditionally Open	17		Conditionally Open	17		Conditionally Open	17		Conditionally Closed	0	17
05/14/03	4:00 p.m.	Conditionally Closed		24	Conditionally Closed		24	Conditionally Closed		24	Conditionally Closed	0	24
05/09/03	6:00 a.m.	Conditionally Open	6		Conditionally Open	6		Conditionally Open	6		Conditionally Closed	0	6
05/01/03	4:00 p.m.	Conditionally Closed		8	Conditionally Closed		8	Conditionally Closed		8	Conditionally Closed	0	8
04/22/03	6:00 a.m.	Conditionally Open	10		Conditionally Open	10		Conditionally Open	10		Conditionally Closed	0	10
04/14/03	4:00 p.m.	Conditionally Closed		8	Conditionally Closed		8	Conditionally Closed		8	Conditionally Closed	0	8
03/28/03	6:00 a.m.	Conditionally Open	15		Conditionally Open	15		Conditionally Open	15		Conditionally Closed	0	15
02/26/03	4:00 p.m.	Conditionally Closed		30	Conditionally Closed		30	Conditionally Closed		30	Conditionally Closed	0	30
01/14/03	6:00 a.m.	Conditionally Open	43		Conditionally Open	43		Conditionally Open	43		Conditionally Closed	0	43
		Conditionally Closed		13	Conditionally Closed		13	Conditionally Closed		13	Conditionally Closed	0	13
			267	98		267	98		267	98		0	365
				27.00%			27.00%			27.00%			100%
				NON			NON			NON			NON

140

*Conditionally means there are some exceptions to the open status, some parts of the area may still remain closed.

**See original notice for more detailed information.

**Table 9-4
Public Notices of Sewage Release-for Baldwin and Mobile Counties**

Overflow Date	County Name	Facility Name	Location SSO	Coastal Area Water Body
12/31/2002	Baldwin	LOXLEY WWTP	Intersection of Relham Drive and Highway 59	Corn Branch
1/7/2003	Baldwin	FAIRHOPE WWTP	NOT GIVEN	Possible stream into Mobile Bay
2/14/2003	Baldwin	ROBERTSDALE WWTP	24140 College Street	Rock Creek
2/21/2003	Baldwin	ROBERTSDALE WWTP	24140 College Street	Rock Creek
5/21/2003	Baldwin	LOXLEY WWTP	Relham Dr/U S Hwy 59	Corn Branch
6/22/2003	Baldwin	LILLIAN SEWER, LLC WWTP	28473 Hwy 98	
6/30/2003	Baldwin	LOXLEY WWTP	Relham Drive and Hickory St	corn Branch
7/1/2003	Baldwin	FAIRHOPE WWTP	see corrective actions	bid mouth gully
7/1/2003	Baldwin	BAY MINETTE LAGOON	Townson Ave/William St	Holligan Creek
7/1/2003	Baldwin	ROBERTSDALE WWTP	24140 College ST, Wilson TP	
7/11/2003	Baldwin	FAIRHOPE WWTP	Grand Hotel Lift Station	unknown
7/23/2003	Baldwin	FAIRHOPE WWTP	651 Fairhope Ave	Big Mouth Gulley
7/23/2003	Baldwin	FAIRHOPE WWTP	valley St lift station area	Big Mouth Gulley
7/23/2003	Baldwin	ROBERTSDALE WWTP	manhole overflowing 24140 college st	Rock Creek
7/23/2003	Baldwin	LOXLEY WWTP	Hickory St and Relham Dr	Corn Branch
7/28/2003	Baldwin	FAIRHOPE WWTP	North Section St. Lift Station	Ditch beside the lift station
9/22/2003	Baldwin	LOXLEY WWTP	Hickory St & Relham Dr	Corn Branch
12/9/2003	Baldwin	FAIRHOPE WWTP	unknown	
2/12/2004	Baldwin	LOXLEY WWTP	Hickory St	Corn Branch
2/26/2004	Baldwin	FAIRHOPE WWTP	419 Valley St	
2/21/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt & Cane Street	Bayou LaBatre Bayou
2/21/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt Street	Bayou LaBatre Bayou
3/17/2003	Mobile	PRICHARD CARLOS A MORRIS WWTP	Prichard and Newsome Street	gundry
3/17/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	Whistler and Patricia Street	Toleman Spring
3/17/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	Watson Ave	Gundy
3/19/2003	Mobile	MOBILE ZIEBACH WWTP	3054 Pickell Drive	
3/19/2003	Mobile	MOBILE SMITH WWTP	604 Highlandwood	Twelve Mile Creek
3/20/2003	Mobile	PRICHARD CARLOS A MORRIS WWTP		
3/31/2003	Mobile	CHICKASAW LAGOON	behind Mary's house	Unknown

**Table 9-4 (Cont.)
Public Notices of Sewage Release-for Baldwin and Mobile Counties**

Overflow Date	County Name	Facility Name	Location SSO	Coastal Area Water Body
4/8/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	whistler and patricia street	toleman spring
5/19/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	Whistler and Patricia Street	Gundry
5/19/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	Watson Ave	Gundry
6/5/2003	Mobile	SARALAND WWTP	Russell/Celesti/Dale/Northan	unknown
6/6/2003	Mobile	BAYOU LA BATRE WWTP	Cane Street	Bayou LaBatre Bayou
6/6/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	See Corrective Actions	See Corrective Actions
6/18/2003	Mobile	PRICHARD STANLEY BROOKS WWTP	see corrective actions	
6/30/2003	Mobile	CHICKASAW LAGOON	S W Blvd & Lee St	Chickasaw Creek
6/30/2003	Mobile	CHICKASAW LAGOON	Black Foot	Eight Mile Creek
6/30/2003	Mobile	SARALAND WWTP	112 Russel St	Norton Creek
6/30/2003	Mobile	SARALAND WWTP	13 Del St	
7/2/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt & Jones/ Shell Belt & Cane St	Manhole
7/2/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt/Cane & Shell Belt/Jones	Bayou La Batre
7/5/2003	Mobile	SARALAND WWTP	327 Celesti Rd/112 Russell St/Norton Ave	unknown
7/11/2003	Mobile	MOBILE WILLIAMS WWTP	550 Maryland Street	Eslava Creek
7/17/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt and Cane St	Bayou La Batre Bayou
7/17/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt and Jones St	Bayou La Batre Bayou
7/17/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt and Cane St Shell Belt and Jones	Bsyou La Batre
7/21/2003	Mobile	BAYOU LA BATRE WWTP	manhole, Shell Belt and Cane St	Bayou La Batre Bayou
7/21/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt and Jones St	Bayou La Batre
7/23/2003	Mobile	BAYOU LA BATRE WWTP	Shell Belt & Cane/ Shell Belt & Jones	Manhole
8/12/2003	Mobile	BAYOU LA BATRE WWTP	Shelbelt and Jones Street	Bayou La Batre Bayou
8/12/2003	Mobile	BAYOU LA BATRE WWTP	Shelbelt and Cane	Bayou La Batre Bayou
8/13/2003	Mobile	BAYOU LA BATRE WWTP	Manhole upstream of WWTP, Shell Belt & Cane St.	Bayou La Batre Bayou
9/11/2003	Mobile	MOBILE SMITH WWTP	Mill St @ dead end near the creek	Three Mile Creek

**Table 9-4 (Cont.)
Public Notices of Sewage Release-for Baldwin and Mobile Counties**

Overflow Date	County Name	Facility Name	Location SSO	Coastal Area Water Body
9/15/2003	Mobile	SARALAND WWTP	813 Deer Run Dr.	Bayou Sara
9/19/2003	Mobile	MOBILE WILLIAMS WWTP	River Landing Lift Station	Dog River
9/22/2003	Mobile	BAYOU LA BATRE WWTP	Shellbelt & Cane St	Bayou La Batre Bayou
9/22/2003	Mobile	BAYOU LA BATRE WWTP	Shellbelt & Jones St	Bayou La Batre Bayou
10/4/2003	Mobile	MOBILE WILLIAMS WWTP	404 Morgan St	Three Mile Creek
10/13/2003	Mobile	SARALAND WWTP	220 Gram St	Bayou Saraland
10/25/2003	Mobile	BAYOU LA BATRE WWTP	Shelbelt Rd & Jones St	Bayou La Batre
11/10/2003	Mobile	MOBILE WILLIAMS WWTP	2775 Thompson Dr S	Bolton Branch
11/10/2003	Mobile	MOBILE SMITH WWTP	St. Stephens St & Como St	Three Mile Creek
11/22/2003	Mobile	MOBILE WILLIAMS WWTP	5245 Hamilton BLVD	Rabbit Creek
11/22/2003	Mobile	MOBILE WILLIAMS WWTP	5253 Hamilton BLVD	Rabbit Creek
11/30/2003	Mobile	MOBILE WILLIAMS WWTP	4950 Government BLVD	Moore's Creek
12/4/2003	Mobile	MOBILE WILLIAMS WWTP	24 Benedict Place	Three Mile Creek
12/4/2003	Mobile	MOBILE WILLIAMS WWTP	24 Benedict PL	Eslava Creek
12/5/2003	Mobile	MOBILE WILLIAMS WWTP		
12/18/2003	Mobile	MOBILE WILLIAMS WWTP	Springdale Blvd & Emogene St	Eslava Creek
1/5/2004	Mobile	MOBILE WILLIAMS WWTP	2116 Pine Needle Drive	Milkhouse Creek
1/20/2004	Mobile	MOBILE ZIEBACH WWTP	Medows Drive	Limestone Creek
2/6/2004	Mobile	SARALAND WWTP	426 Cleveland Rd	Norton Creek
2/12/2004	Mobile	SARALAND WWTP	14 Dell St	Norton Creek
2/19/2004	Mobile	CHICKASAW LAGOON	203 1/2 Idlewood Drive	Chickasawabouge Creek
2/23/2004	Mobile	BAYOU LA BATRE WWTP	Shellbelt & Jones	Bayou Labatre
2/23/2004	Mobile	PRICHARD CARLOS A MORRIS WWTP	Watson St	Gumtree
2/23/2004	Mobile	PRICHARD CARLOS A MORRIS WWTP	Patricia & Whistler	Gumtree
2/25/2004	Mobile	PRICHARD CARLOS A MORRIS WWTP		
2/25/2004	Mobile	SARALAND WWTP	14 Del St	Norton Creek
2/25/2004	Mobile	SARALAND WWTP	327 Celest & 112 Russell St	Norton Creek
6/30/200	Mobile	BAYOU LA BATRE WWTP	Cane Street, Shell Belt Rd, Alba St and 5th Ave	

9.4 Public Water Supply/Drinking Water

Approximately 850,000,000 gallons of water are taken from ground and surface sources each day, provided with treatment, and made available to approximately four million citizens in Alabama. Six hundred and seven (607) community systems, seventy-two (72) transient non-community systems and thirty-two (32) non-transient non-community systems are permitted by the ADEM.

Approximately sixty-five (65) percent of the water used is obtained from surface sources such as lakes, rivers, and streams and provided with full treatment to include coagulation, sedimentation, filtration, and disinfection. One hundred (100) percent of these systems meet turbidity requirements, ninety-seven (97) percent meet trihalomethane standards, one hundred (100) percent meet haloacetic acid standards and one hundred (100) percent meet inorganic and radiological drinking water standards. These water treatment facilities are required to employ Grade III or Grade IV Certified Operators to ensure that proper doses of chemicals are applied and hourly tests are performed to demonstrate a satisfactory water quality.

Thirty-five (35) percent of the water is obtained from ground water sources such as wells and springs. An adequate source of ground water is generally available in this State; however, the ground water is extremely limited in the Piedmont area. Ground water sources are required to provide disinfection and monitor the draw down (water level change) in wells ensuring that a satisfactory available quantity of water remains. More than ninety-four (94) percent of the Community Systems and ninety-one (91) percent of the Non-community Systems met the bacteriological quality standard of the Department. More than ninety-eight (98) percent of the community systems and approximately eighty-three (83) percent of the non-community systems were in full compliance with the bacteriological monitoring requirements. Ninety-eight (98) percent meet trihalomethane standards and one hundred (100) percent of the groundwater public water systems were able to meet the inorganic and radiological maximum contaminant levels. These figures demonstrate that the majority of the water provided to the citizens in Alabama is excellent. Contaminants, chemicals, and byproducts that water systems monitor for are shown in Tables 9-6 through 9-10.

All water systems continue to monitor for lead and copper. One system exceeded the copper action level out of the 85 community and non-transient, non-community systems that were sampled in 2003. This system is being required to formulate a corrosion control plan, and continue sampling every six months.

All community and non-transient non-community water system sources continued to be monitored for volatile organic chemicals (VOCs) and synthetic organic chemicals (SOCs). One system incurred a tetrachloroethylene maximum contaminant level violation. More than ninety-eight (98) percent of the community systems and one hundred (100) percent of the non-transient non-community systems required to monitor in 2003 were in full compliance with the VOC and SOC monitoring requirements. Of the contaminants found, tetrachloroethylene (TCE) is the most common regulated VOC and Di(2-ethylhexyl)phthalate is the most common regulated SOC. Table 9-5 shows surface source public water systems with compliance violations.

**Table 9-5
Surface Source Public Water Systems with Compliance Violations**

Name of Facility	Municipality Served	Name of Water body	Contaminants with Percent Violations
Lafayette Water Works	Lafayette	Lafayette Reservoir	Trihalomethanes -25%
Opelika Water Works Board	Opelika	Halawakee Creek	Trihalomethanes -25%
Tuskegee Utilities Board	Tuskegee	Tallapoosa River	Trihalomethanes -50%

During the past year, Talladega has been the only public water supply ground water system with chronic contaminant detection.

**Table 9-6
Public Water Supply Elemental Contaminants**

Elemental Contaminants	MCL in mg/L
Antimony	0.006
Arsenic	0.05
Asbestos	7 million fibers*/L
Barium	2
Beryllium	0.004
Cadmium	0.005
Chromium	0.1
Cyanide	0.2
Fluoride	4
Lead	0.015
Mercury	0.002
Nickel	0.1
Nitrate (as N)	10
Nitrite (as N)	1
Total Nitrate/Nitrite (as N)	10
Selenium	0.05
Sulfate	500
Thallium	0.002

* Longer than 10 micrometers

**Table 9-7
Public Water Supply Radiological Contaminants**

Radiological Contaminants	Concentrations
Gross alpha particle	15pCi/L
Combined radium ²²⁶ and radium ²²⁸	5 pCi/L
Tritium	20,000 pCi/L
Strontium ⁹⁰	8 pCi/L
Beta particle and photon radioactivity	4 millirem/Yr

**Table 9-8
Public Water Supply Synthetic Organic Chemicals (non-volatile/SOVs)**

Synthetic Organic Chemicals (non-volatile)	MCL in mg/L
Alachlor	0.002
Atrazine	0.003
Carbofuran	0.04
Chlordane	0.002
Dibromochloropropane	0.0002
2,4-D	0.07
Endrin	0.002
Ethylene Dibromide	0.00005
Heptachlor	0.0004
Heptachlor Epoxide	0.0002
Lindane	0.0002
Methoxychlor	0.04
Polychlorinated Biphenyls	0.0005
Pentachlorophenol	0.001
Toxaphene	0.003
2,4,5-TP	0.05
Benso(a)pyrene	0.0002
Dalapon	0.2
Di (2-ethylhexyl) adipate	0.4
Di (2-ethylhexyl) phthalate	0.006
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Glyphosate	0.7
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Oxamyl (Vydate)	0.2
Picloram	0.5
Simazine	0.004
2,3,7,8-TCDD (Dioxin)	3×10^{-8}

**Table 9-9
Public Water Supply Disinfection Byproducts**

Disinfection Byproduct	MCL in mg/L
Bromate	0.010
Chlorite	1.0
Haloacetic Acids	0.060
Trihalomethanes	0.080

**Table 9-10
Public Water Supply Volatile Synthetic Organic Chemicals (VOCs)**

Volatile Synthetic Organic Chemicals (VOC)	MCL in mg/L
Benzene	0.005
Carbon Tetrachloride	0.005
1,2-Dichloroethane	0.005
Trichloroethylene	0.005
para-Dichlorobenzene	0.075
1,1-Dichloroethylene	0.007
1,1,1-Trichloroethane	0.2
Vinyl chloride	0.002
cis-1,2-Dichloroethylene	0.07
1,2-Dichloropropane	0.005
Ethylbenzene	0.7
Monochlorobenzene	0.1
o-Dichlorobenzene	0.6
Styrene	0.1
Tetrachloroethylene	0.005
Toluene	1
Trans-1,2-Dichloroethylene	0.1
Xylene (Total)	10
Dichloromethane	0.005
1,2,4-Trichlorobenzene	0.07
1,1,2-Trichloroethane	0.005

9.5 Source Water Assessment Program

As required by amendments to the Safe Drinking Water Act of 1996, Alabama developed regulations regarding the implementation of a Source Water Assessment Program (SWAP) for all public drinking water sources in the state. These regulations required all existing water supply systems that have either a surface water source or a ground water source to complete a SWAP for each of their drinking water sources no later than February 6, 2003.

Each water source SWAP must include: (1) a source water assessment area (SWAA) delineation; (2) a contaminant inventory within the SWAA; (3) a susceptibility analysis of each contaminant source in the inventory; (4) and notification of the public using specific public awareness methods. Additionally, for surface water sources, there is a requirement that the water system develop contingency plans for potential contaminant sources rated highly susceptible to entering the water intake when the contaminant source may rapidly cause a treatment difficulty. Once a SWAP is approved it must be updated by the water system before permits to furnish water are reissued.

When the SWAP was initiated the total number of water systems in Alabama with one or more water sources requiring assessment were as follows in Table 9-11.

**Table 9-11
Number of SWAP Water Systems that needed Assessments**

Surface Water Systems	88
Groundwater Community Systems	310
Groundwater Non-Transient Non-Community Systems	29
Groundwater Transient Non-Community Systems	75

Since the initiation of the SWAP program a few water systems have opted to purchase water from another water system and abandon their water source, precluding the need to complete a SWAP for their system. The total number of water systems in Alabama that have either abandoned their water source or completed all the SWAP requirements for each of their water sources are as follows in Table 9-12.

**Table 9-12
Number of SWAP Water Systems Abandoned or Completed Requirements**

Surface Water Systems	87 of 88 (98.9%)
Groundwater Community Systems	309 of 310 (99.7%)
Groundwater Non-Transient Non-Community Systems	29 of 29 (100%)
Groundwater Transient Non-Community Systems	75 of 75 (100%)

The Department has taken enforcement action against the two drinking water systems that to date have not completed the SWAP requirements. A consent order with penalties was issued for both of these water systems. The consent order for the surface water system requires the water system to abandon its source and purchase water from another public water system. The consent order for the groundwater community system requires that water system to complete its SWAP in the spring of 2004.

9.6 Wellhead Protection Program

With the adoption of Source Water Assessment Regulations by ADEM, the new regulations included most of the Wellhead Protection Program regulations for delineation and contaminant inventory. Wellhead Protection Regulations were maintained for management as a voluntary option to water systems who have completed delineations and contaminant inventories. ADEM's Ground Water Branch staff are assigned to the ADEM Public Water Supply Branch to support Source Water Assessment (SWA) and Drinking Water State Revolving Fund (DWSRF) grants and contracts, to manage the Wellhead Protection Program, and to conduct technical reviews of ground water source delineations and contaminant inventories. The SWAP ground water delineation and contaminant inventory reports were reviewed by the Ground Water Branch for accuracy and compliance with the regulations.

The DWSRF set-aside funds were used to provide financial assistance for the SWA delineation and contaminant inventory for community public water supply systems that utilize ground water. There are approximately 413 water utilities in Alabama that were required to complete a Source Water Assessment by February 2003. With the help of the set-aside funds the majority of the utilities met the deadline and 412 of the utilities completed the assessment for the systems utilizing groundwater by August 2003. Each report included delineation of the recharge area and a potential contaminant source inventory. These SWA reports were reviewed for compliance with the SWA delineation and contaminant inventory regulations. In addition, each water system completed a susceptibility analysis for each of their sources and completed public awareness requirements.

The Wellhead Protection Program supports the Source Water Assessment Program (SWAP) by providing a mechanism for communities and water systems to develop and implement drinking water protection strategies. The Ground Water Branch provided assistance and guidance to systems in developing a Wellhead Protection Plan, promoted the Ground Water Guardian program, coordinated drinking water protection sign distribution, coordinated with the Alabama Rural Water Association (ARWA) in recognizing water systems that have completed a Wellhead Protection Plan, attended meetings, conferences and workshops, and coordinated inspections and compliance issues in wellhead protection areas with ADEM Branches and other State agencies.

ADEM is working to insure that delineated source water area maps and location information are available for use within and outside of the Department. Delineation maps are in the process of being digitized for use in developing a GIS layer. The ADEM Information Systems Branch is providing the digitizing and GIS support.

ADEM personnel conducted inspections of 600 underground storage tank (UST) sites and 371 UST Corrective Action sites within the reporting period.

Twenty-two Wellhead Protection Management Plans were reviewed and certificates of recognition awarded to water utilities that completed the Wellhead Protection Program. The Department was awarded the Ground Water Guardian Affiliate designation for the seventh year by the Ground Water Foundation. Also, six water systems in Alabama were awarded the Ground Water Guardian designation: Madison County Water Department, Madison Water Works and Sewer Board, Limestone County Water Works, Town of Rehobeth, City of Eufaula, and Tusculumbia Water Works. In addition, three communities in the State have applied to the Ground Water Guardian Program for designation.

Groundwater or Water Festivals were hosted for 18 counties. Approximately 25,000 students participated in a festival during the reporting period. Funding to support the program was provided by the Alabama Department of Agriculture and Industries, a grant was received through

Legacy, Inc., and the AWEA Groundwater Festival Fund was created to assist festivals through grants of up to \$500.

The Department and the Alabama Rural Water Association (ARWA) have been working closely to redefine the wellhead protection program. Proposed items include preparing a packet of materials for the water systems to use in implementing a management or contingency plan. The packet includes a WHPP template including a contingency Plan template, educational slide shows and posters, technical information, and media materials. In addition, the ADEM and ARWA are working together to install Drinking Water Protection signs in those communities with completed Wellhead Protection Plans. The sign installations were publicized for several of the communities in both the local media as well as the ARWA journal.

9.7 Coastal Beach Monitoring

Alabama has approximately 50 miles of Gulf beaches and almost 70 miles of bay beaches, both of which are major tourist attractions and represent a significant component of the lifestyle of Alabama residents. In June 1999, ADEM, in cooperation with the ADPH, initiated a program to routinely monitor bacteria levels at five swimming beaches on the Gulf Coast and in August 2000, six additional beaches were added. Congressional passage of the Beaches Environmental Assessment and Coastal Health (BEACH) Act expanded the monitoring and assessment activities at public beaches and in the fall of 2002, ADEM and the Baldwin County Health Department conducted on-site surveys to evaluate additional public beach sites to add to the program. Figure 9-4 shows Alabama's coastal waters covered under the 200 B.E.A.C.H. Act.

During the past summer, a total of 24 public beach areas were monitored. A majority of these sites were sampled twice weekly from Memorial Day through Labor Day and for the remainder of the year sampling is conducted monthly. All sample collection and analyses are performed by qualified ADEM or ADPH staff, with analytical results made available to the public within approximately 24 hours. Figures 9-5 through 9-29 show coastal beach monitoring graphs.

The public beach locations that are sampled have signage with a color-coded bacteriological advisory status to inform the public of the potential health risk associated with swimming or other water contact activities at that site. A **GREEN** advisory means the most recent water quality test revealed bacterial levels are below recommended thresholds while a **YELLOW** advisory indicates the most recent water quality test revealed bacterial levels exceed recommended thresholds and an increased risk of illness may be associated with swimming. Once a yellow advisory status has been issued, the site is re-tested. A **RED** advisory indicates continued elevated bacterial levels at the site and the ADPH issues a public health advisory. The site is re-tested until bacterial levels return to an acceptable level.

The Department documented approximately 30 events during FY03 that required the issuance of a red advisory. These events occurred at ten of the beach sites that are monitored, with no red advisories issued at the other 14 sites. Elevated bacterial levels can be caused by heavy rainfall events that allow stormwater runoff to carry bacterial matter into the coastal waters. ADEM and the ADPH use on-site signs, the ADEM web-page, press releases, and local newspapers to notify the public of the latest monitoring results.

• Coastal Beach Monitoring Station Graphs

Figure 9-5

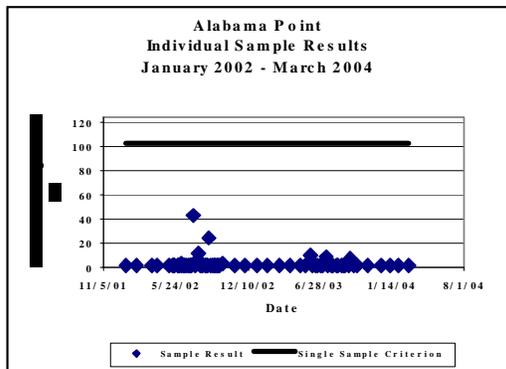


Figure 9-8

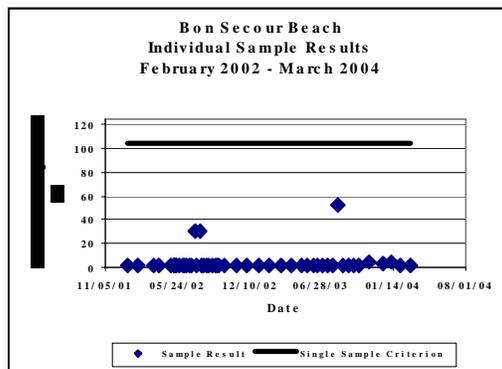


Figure 9-6

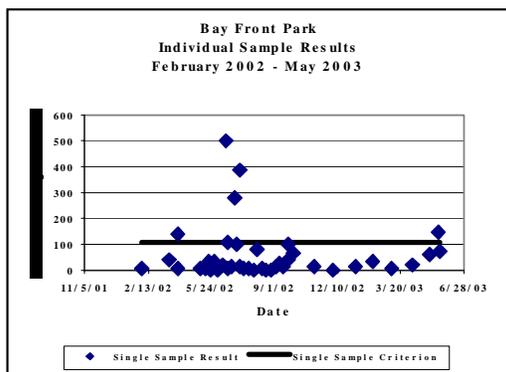


Figure 9-9

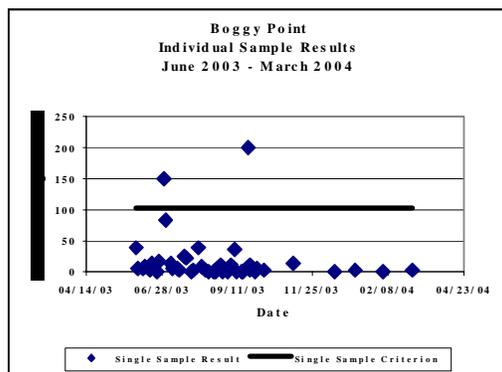


Figure 9-7

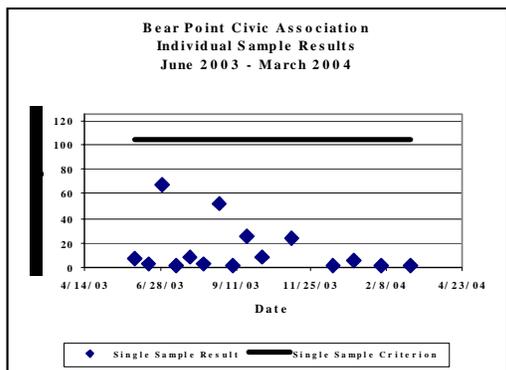


Figure 9-10

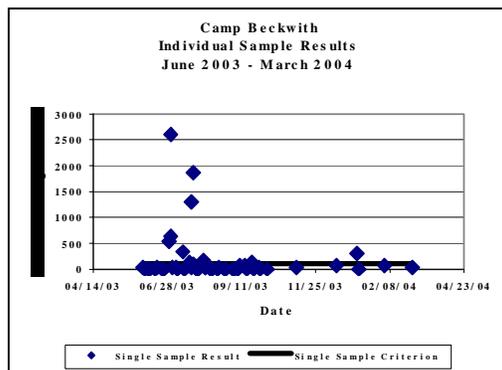


Figure 9-11

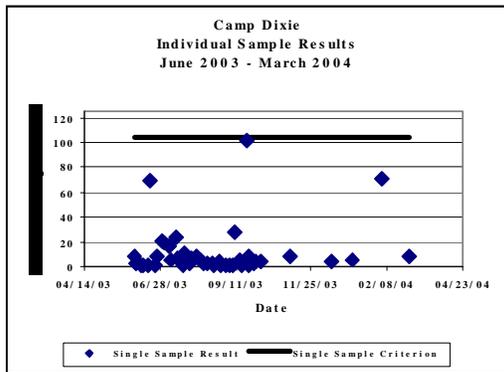


Figure 9-14

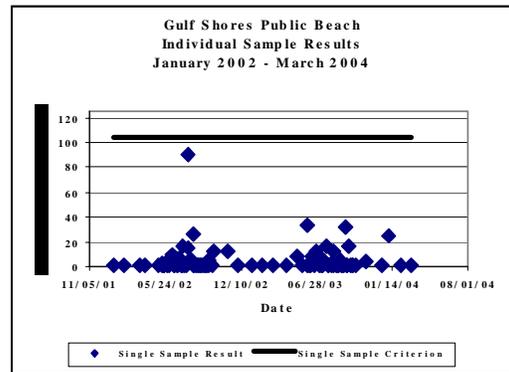


Figure 9-12

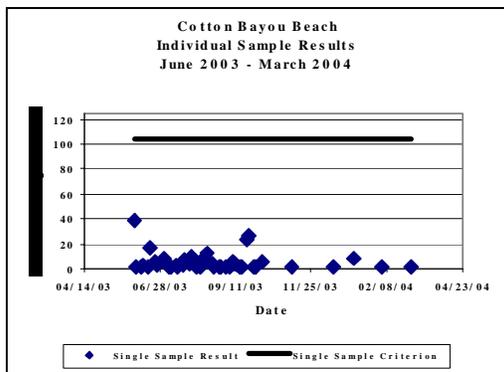


Figure 9-15

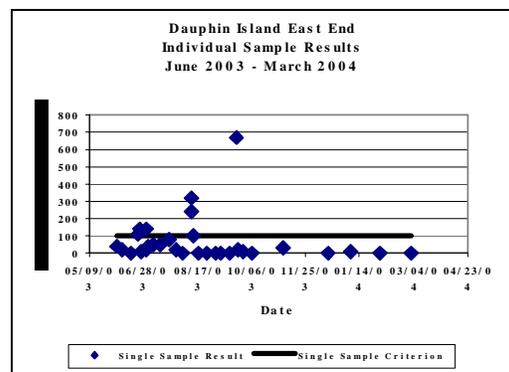


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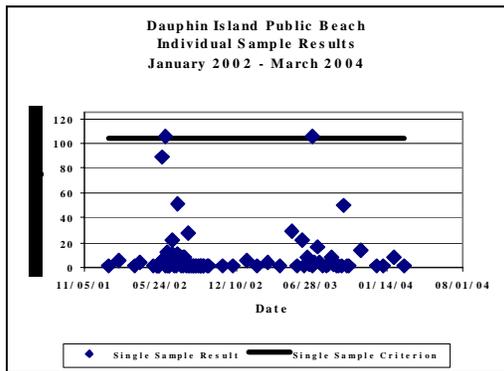


Figure 9-16

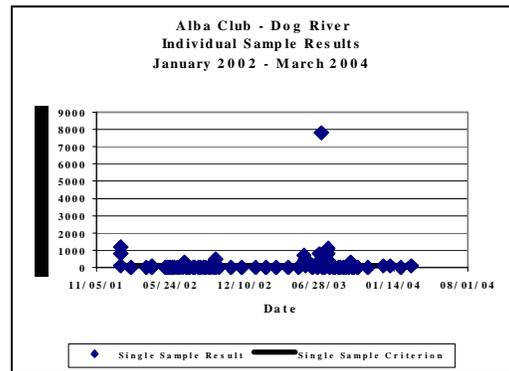


Figure 9-17

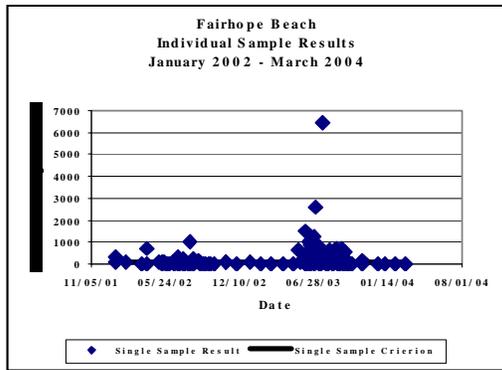


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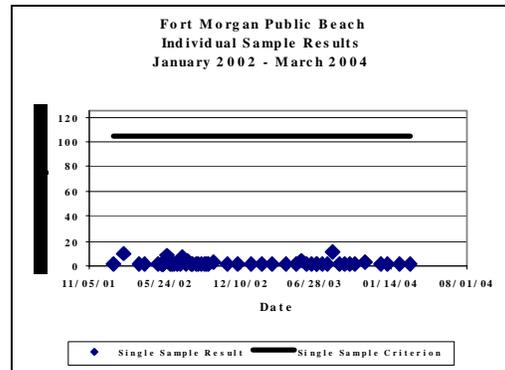


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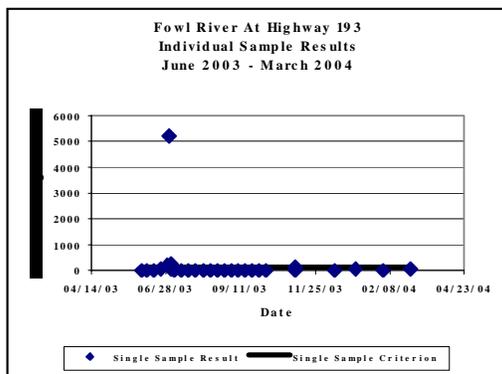


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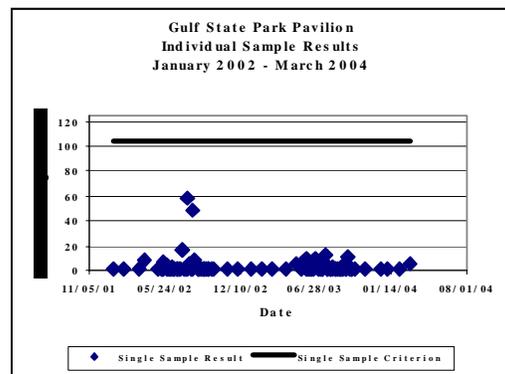


Figure 9-19

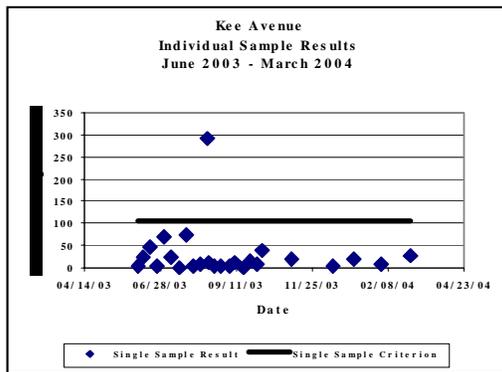


Figure 9-22

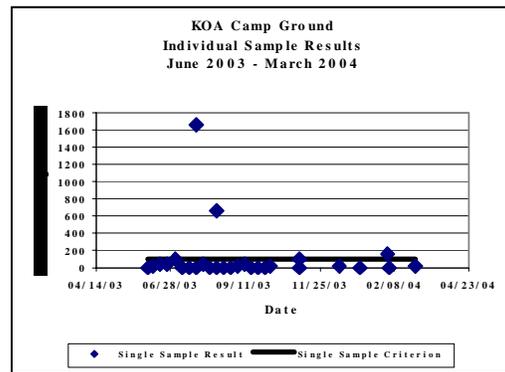


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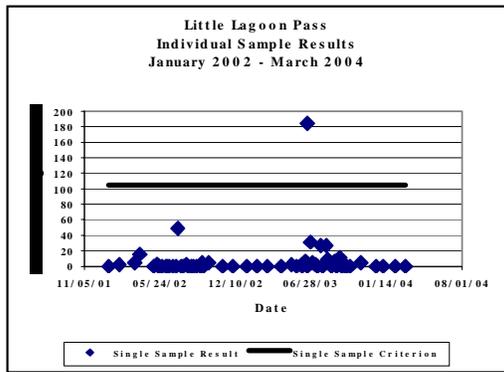


Figure 9-26

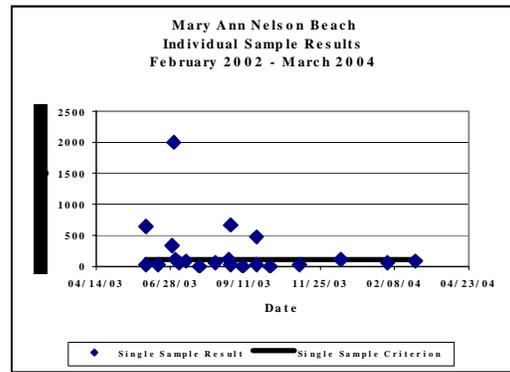


Figure 9-24

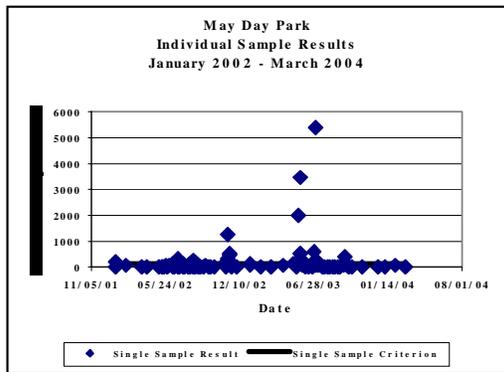


Figure 9-27

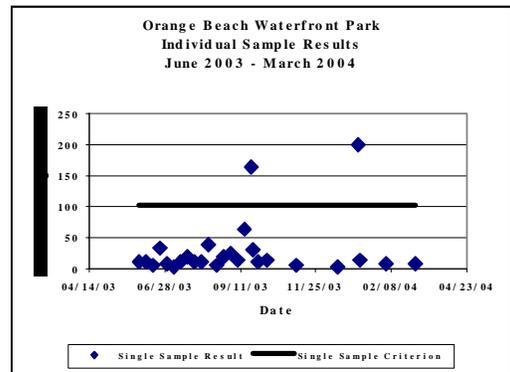


Figure 9-25

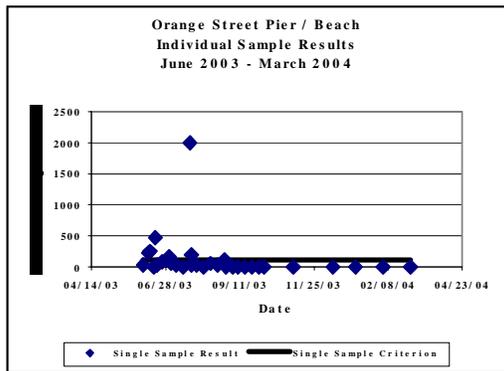


Figure 9-28

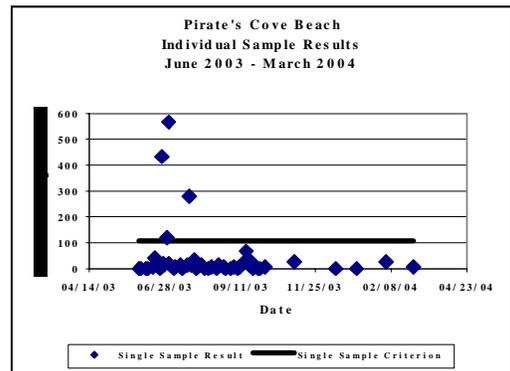
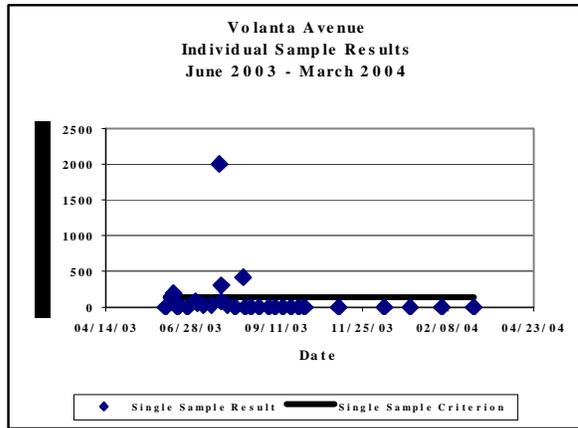


Figure 9-29



Part 10 Concerns and Recommendations

In recognition of limited resources, efforts to protect water resources must be based on credible science and coordinated management of available resources. Continued cooperation and collaboration of all partners, education, and promotion and implementation of voluntary and mandatory compliance with best management practices (BMPs) remains a priority.

A proactive approach has been implemented with agricultural stakeholders through Confined Animal Feeding Operation (CAFO) Registration by Rule to address the problem of animal waste runoff. Erosion and sedimentation continues to be a long-term concern. This problem is difficult to address in a comprehensive manner since many land-disturbance activities can and do produce water quality degradation. The Department has placed emphasis on erosion and sedimentation by decentralizing certain aspects of the State water pollution control program to the regional field offices. This has resulted in increased inspection and enforcement efficiencies. As a result, inspections of construction sites, mining operations and nonpoint sources of water pollution have significantly increased, with a commensurate increase in the number of compliance actions in this arena. The federally mandated NPDES Phase II Stormwater Program for construction and urban areas is being successfully implemented to address this issue.

Funding of the Water Quality Program and ever increasing mandates will continue to provide challenges. Likewise, the Water Quality Program has been maintained with limited personnel, yet has worked in support of new federal requirements (e.g., Clean Water Action Plan, 303(d) listing, TMDLs, antidegradation, water quality standards promulgation, wet weather issues, GIS, etc). ADEM's Water and Field Operations Divisions continue to operate an adequate NPDES permit program with these additional programs, requirements, and initiatives.

Protection of water resources must be based on credible science. Implementation of management measures must be based on sufficiently detailed watershed protection plans with measurable goals. In Alabama, the Clean Water Partnership program promotes efficient and effective implementation of technically sound, environmentally protective, and economically achievable management measures using a grass-roots approach. The partnership is composed of a diverse and inclusive coalition of public and private interest groups and individuals who are working in collaboration to improve, protect, and preserve water resources and aquatic ecosystems in Alabama. Public and private funding is needed to institutionalize this successful endeavor and to ensure permanent facilitators in each basin or subbasin to coordinate projects and programs and to enhance citizen interest and input into decision-making processes.

Watersheds provide logical geo/physical boundaries for identifying and mitigating sources and causes of pollution. Watershed management is a better way to coordinate people, resources, programs, and information more efficiently. The state has instituted rotational river basin/watershed, local community based, and citizen volunteer water quality monitoring approaches to identify nonpoint source impaired, threatened, and unimpaired waters. These approaches provide data and information that is essential to the development of holistic watershed protection plans. However, in order to plan, develop and coordinate actual implementation of these plans, additional staff, time, expertise, and other resources are needed.

Water quality assessment and resource protection efforts should emphasize shared decision-making processes, integrate diverse and inclusive partnerships, and provide a clear understanding of the many and varied problems impacting a waterbody. In Alabama, voluntary and enforceable mechanisms are in-place, complementary, and are effective in assuring long-term protection of water quality. However, as competing demands for limited resources endure, additional information becomes available, priorities change, or complex issues emerge, watershed protection plans must be designed to be iterative, particularly as related to TMDL plan implementation.

Stakeholders must be involved in the early stages of plan development, encouraged to assume ownership, and voluntarily accept responsibility for providing solutions. Certain elements and structure of the plans can be adapted to the entire watershed, or to specific sources or causes of impairment. However, it is recommended that all plans in Alabama be based on a similar format, especially if the impairments to be addressed are both point and nonpoint source related and/or the plan will serve as a TMDL implementation plan.

In addition to the traditional NPDES point source discharge permitting program and voluntary implementation of nonpoint source management measures, various innovative and alternative approaches should be considered. This will ensure that long-term watershed and natural resource protection is well integrated with economic sustainable and social goals such as initiatives that focus on human and ecoregional health, recreation, and cultural, social, or other issues. Efforts should focus on achieving clearly defined goals and objectives using the combined resources of federal, state, local and private programs. These efforts may include, but are not limited to: pollutant trading, watershed permitting, encouraging local-issue enforcement/assistance from municipalities and counties, supporting additional home-rule authorities, establishing tax value and land use incentives, providing education and outreach to decision makers and public officials, and/or focusing on other creative approaches to advance protection of the resource. The views of regulators, local governments, agricultural groups, environmental groups, industry, and citizens must be considered when developing the details of how these initiatives will be designed and implemented.

Though ADEM is designated as the repository for environmental data, some of this information is not utilized for management/reporting purposes due to personnel/information system constraints. To this end and through Section 319 and 104(b)(3) grant monies, the Department has funded the development of GIS capabilities or opportunities for cooperation within some of the organizations in Table 10-1. It is hoped that these efforts will facilitate the use of incoming data with an accompanying geographical data layer. Continued efforts towards the implementation of GIS software are an integral part of this process. The development of a statewide data clearinghouse for GIS environmental information will be vital to the multi-agency cooperative programs being initiated to study and protect Alabama's watersheds. Many states coordinate such efforts under a state "Office of GIS." Efforts to develop a new water quality database, which will allow more efficient use of data for analysis and reporting purposes as well as uploading to the new version of EPA's national water quality database, STORET X, are nearing completion. The Department has also implemented and recently upgraded ADEM's lab information management system (LIMS) used by the Department's three laboratories.

Alabama needs additional resources to enable its monitoring program to meet a growing list of the programmatic commitments. Development of EPA-mandated nutrient criteria for State waters and evaluation of TMDL implementation activities will require significant additional monitoring resources, including both personnel and laboratory facilities. Adequate data and information are required to make sound, scientifically-based decisions related to development of new water quality criteria, designated uses, and use support status for Alabama's water resources. Additional funding for State monitoring programs is being proposed at the federal level. However, the additional funds may require additional State matching funds. Careful and thorough planning is needed to insure that any additional resources for monitoring State waters are used efficiently and as effectively as possible.

Table 10-1

State Agencies Involved with Water Quality/Quantity/Natural Resources

ACES	Alabama Cooperative Extension Service
ADAI	Alabama Department of Agriculture and Industries
ADCNR	Alabama Department of Conservation and Natural Resources
ADCNR-MRD	ADCNR-Marine Resources Division
ADECA-OWR	Alabama Department of Economic and Community Affairs-Office of Water Resources
ADEM	Alabama Department of Environmental Management
ADIR	Alabama Department of Industrial Relations
ADPH	Alabama Department of Public Health
AEMA	Alabama Emergency Management Agency
AFC	Alabama Forestry Commission
	Alabama's Public Universities
ASWCC	Alabama Soil and Water Conservation Commission
ASMC	Alabama Surface Mining Commission
FSA	Farm Service Agency
GSA	Geological Survey of Alabama
MESC	Marine Environmental Sciences Consortium

Appendix A
ASSESS

A S S E S S

ADEM's Strategy for Sampling Environmental
indicators of Surface water quality Status

April, 1997
Field Operations Division
Alabama Department of Environmental Management

TABLE OF CONTENTS

I. INTRODUCTION	A-1
II. SUMMARY OF FIELD OPERATIONS DIVISION PROGRAMS	A-4
ALABAMA MONITORING AND ASSESSMENT PROGRAM (ALAMAP)	A-4
COASTAL WATERSHED SURVEY PROGRAM (CWSP).....	A-6
NONPOINT SOURCE ASSESSMENT PROGRAM (NPSAP)	A-7
POINT SOURCE ASSESSMENT PROGRAM (PSAP).....	A-7
COMPLIANCE MONITORING PROGRAM (CMP).....	A-8
RESERVOIR WATER QUALITY MONITORING PROGRAM (RWQMP)	A-9
FISH TISSUE MONITORING PROGRAM (FTMP).....	A-9
III. SUMMARY OF FOD PROGRAM COMPONENTS PROVIDING DATA IN SUPPORT OF NATIONAL ENVIRONMENTAL GOALS FOR WATER.....	A-10
GOAL NO. 1: CLEAN WATERS.....	A-11
GOAL NO. 2: SAFE DRINKING WATER.....	A-11
<i>Water Quality Objective I: Conserve and enhance public health.....</i>	<i>A-11</i>
<i>Water Quality Objective II: Conserve and Enhance Aquatic Ecosystems</i>	<i>A-11</i>
<i>Water Quality Objective III: Support Uses Designated by States in their water quality standards.....</i>	<i>A-14</i>
<i>Water Quality Objective IV: Conserve and Improve Ambient conditions.....</i>	<i>A-15</i>
<i>Water Quality Objective V: Reduce or prevent pollutant loadings and other stressors</i>	<i>A-17</i>
IV. DATA MANAGEMENT/STORAGE	A-20
V. QUALITY ASSURANCE/QUALITY CONTROL PROGRAM.....	A-20
STANDARD OPERATING PROCEDURES MANUALS.....	A-21
QA/QC FIELD PROCEDURES	A-22
QA/QC LABORATORY PROCEDURES	A-22
VI. REPORTING.....	A-23
VII. REFERENCE.....	A-35

LIST OF TABLES AND FIGURES

TABLE 1 EPA Water Quality Objectives and Indicators.....	A-25
TABLE 2 FOD Programs and Program Components Providing Data Toward EPA Environmental Indicators for EPA Water Objectives to Meet National Environmental Goals .	A-26
TABLE 3 Reports Generated by the Environmental Indicators Section Since 1990.....	A-32
FIGURE 1 EPA Environmental Objectives and FOD Programs Providing Indicator Data...	A-34

I. INTRODUCTION

Pursuant to the Clean Water Act, the Alabama Department of Environmental Management (ADEM) is charged with monitoring the status of the State's water quality. The ADEM has maintained a fixed ambient monitoring station network located on most of the State's major drainage basins since 1974. With the passage of the Clean Water Act and the implementation of surface water quality monitoring programs by state and federal agencies, the emphasis was placed on the chemical contamination of the nation's waters. (National Research Council 1992). Therefore, most ambient monitoring networks, including Alabama's, were established to monitor trends in water quality below point sources of pollution (ADEM 1994c, ADEM 1996c). These programs have been successful in controlling and reducing certain kinds of chemical pollution from point source discharges (National Research Council 1992), however, ambient water quality monitoring data from fixed stations often does not provide adequate information for watershed planning purposes. A watershed monitoring program should: 1) identify other impacts present within the watershed; 2) provide water quality data from a larger number of water bodies within each basin throughout the state; 3) reflect the overall water quality within the state; and 4) provide the management and regulatory branches of water pollution control agencies with an assessment tool for prioritizing or targeting watersheds and/or sub-watersheds most in need of remedial action.

During the 1980's, the ADEM implemented a multi-faceted approach to monitor the surface waters of the state. This approach included a fixed-station ambient monitoring network, a reservoir water quality monitoring program, intensive and/or special waterbody specific water quality studies, a fish tissue monitoring program, and the compliance monitoring of point source discharges utilizing both chemical monitoring and toxicity screening with aquatic organisms. This monitoring strategy addresses many of the EPA's expanded monitoring goals and incorporates many environmental indicators identified by the EPA as pertaining to the national water quality objectives, but still does not reflect the overall water quality within the state or provide an assessment tool for prioritizing or targeting watersheds most in need of remedial action.

ASSESS is designed to meet the goals of the EPA's Section 106 Monitoring Guidance (EPA 1994a), as well as the goals of the Intergovernmental Task Force on Monitoring Water Quality published in The Strategy for Improving Water Quality Monitoring in the United States (EPA 1995). ASSESS links monitoring data generated by the various Field Operations Division

(FOD) surface water quality monitoring programs to defined water quality objectives and their associated environmental indicators. An integral part of this strategy will be the incorporation of watershed monitoring by basin (Attachment 1). While most surface water monitoring conducted by the FOD will be focused within the targeted river basins, priority sub-watersheds identified by the regulatory branches of the ADEM will be monitored on a more frequent basis. This type of intensive monitoring is necessary to evaluate trends in water quality within these sub-basins. This “watershed” monitoring strategy will allow the synchronization of monitoring activities with inspections and permitting in order to support water quality protection activities on a geographic basis. By defining the major point and/or nonpoint source impacts within each basin, ASSESS will enable the permitting entities of the ADEM to make consistent and integrated decisions related to water resource issues within priority river basins.

The objective of ASSESS is to improve monitoring coverage within river basins, to improve spatial detail of water quality assessments, and to increase total stream miles monitored over the 5 year rotation period. Select historical ambient monitoring stations throughout the state will be monitored in June, August and October in order to provide data adequate for trend analysis. Specific objectives of ASSESS are as follows:

1. Implement a more efficient strategy to utilize and direct the water quality monitoring resources available to the ADEM by using a coordinated approach;
2. Document the water quality status of additional waterbodies within the State’s river basins, thereby increasing the cumulative percentage of Alabama waters assessed year to year;
3. Implement a monitoring strategy that can be applied to all river basins and continue on the rotational cycle;
4. Identify existing major point and non-point pollution sources within each river basin;
5. Evaluate chemical, physical, biological, and habitat conditions of waterbodies within the targeted watershed using environmental indicators identified by the EPA as an appropriate assessment tool (EPA 1996b);
6. Identify watersheds impacted or impaired by point and non-point source pollution on a statewide basis;

7. Prioritize watersheds in greatest need of management and identify major sources of pollution within these watersheds;
8. Estimate the status and trends in ecological condition of priority watersheds and historical ambient monitoring stations;
9. Establish a basis of comparison through regular monitoring of least-impacted reference stations within each watershed and ecoregion; and,
10. Provide data that will assist in the implementation of a strategy to maintain and/or improve the status of the State's water resources and their associated use classifications.

This document describes the overall Field Operations Division (FOD) water quality monitoring strategy as well as the programs and program components utilized to meet the ASSESS objectives. The following summary of the FOD programs gives a brief description of each program and the types of information provided. The summary of the FOD program components providing data in support of EPA environmental indicators ties each component of a program to specific EPA water quality objectives and indicators to determine the status of each objective. (EPA 1996b)

II. SUMMARY OF FIELD OPERATIONS DIVISION PROGRAMS

Alabama Monitoring and Assessment Program (ALAMAP)

The Alabama Monitoring and Assessment Program is a statewide monitoring effort under development to provide data that can be used to estimate the current status of all streams and coastal/estuarine waters within the state using environmental indicators. Although the objectives are the same, the strategies used to provide the data are slightly different between the Coastal and Upland region of the state.

Upland ALAMAP

The Upland ALAMAP program (ADEM 1996d) is designed to enhance the current ambient monitoring program developed during the 1970's. First, stations in the historical ambient monitoring program were generally selected to monitor trends in water quality downstream of specific existing point sources. Therefore, the data collected at each of these sites represents only the area sampled and cannot be extrapolated to predict water quality at other similar size streams with any known level of uncertainty. To augment this type of monitoring, 50 stations will be selected statewide each year by EPA-Gulf Breeze using a probabilistic (random) design (Summers and Engle 1996). The data collected at these stations will statistically represent all upland stream miles and the level of uncertainty in the water quality estimates can be quantified. (Summers and Engle 1996). This type of assessment will be used in the 305(b) Water Quality Report to Congress to address overall State water quality.

Second, the historical ambient monitoring program required collection of water quality samples on a monthly basis at each of the stations in addition to water column metals samples on a quarterly basis. Statistical analysis of historical data by FOD and EPA Gulf Breeze suggests that sampling of water quality parameters on a quarterly schedule would have shown the same trends in water quality over time (ADEM 1996e, Summers and Engle 1996). Historically, water samples have been collected and analyzed for metal content. Metals have not been detected in the water column samples at ambient monitoring locations where metals have been detected in fish tissue or sediment samples. The modification of the historical ambient monitoring sampling schedule to a June/August/October Schedule for water quality and an annual sediment sample, where appropriate, will allow additional locations to be assessed with little additional expenditure

of resources. Data from the historical ambient monitoring stations can be used to update the CWA 303(d) list and to monitor site specific trends in water quality.

Third, many of the stations in the historical ambient monitoring program were chosen in the 1970's to monitor specific pollution sources. These stations are generally concentrated in watersheds in the Birmingham area. An evaluation of each site was conducted to determine if the rationale for monitoring the site is still applicable and if the information generated is of use to the Department. After this re-evaluation of each of the historical stations, only those stations of value to the Department were retained in the historical network.

And Fourth, EPA-Gulf Breeze is statistically analyzing the parameters at each historical ambient monitoring station to evaluate and select those that are most useful in determining status and trends and the least redundant (Summers and Engle 1996). A minimum core set of environmental indicator parameters (EPA 1996b) will be collected as well as others specific to each station.

Coastal ALAMAP

The Field Operations Division-Mobile Field Office implemented a probabilistic design for the coastal ambient monitoring program in 1993. The coastal monitoring program focuses on the larger, mostly estuarine receiving water bodies within Alabama's coastal area, including Mobile Bay, Bon Secour Bay, Mississippi Sound, Wolf Bay, Bay La Launch, Perdido Bay, Bayou St. John, Little lagoon, and the Mobile-Tensaw River Delta. River stations and stations from these larger waterbodies were chosen with consideration given to sub-areas having different Water-Use-Classifications. (ADEM 1993b) The coastal assessments are conducted annually at each randomly chosen site. This data was used to assess trends in the water quality of estuarine/coastal waters and was included in the 1996 305(b) report in order to assess 100% of the coastal waters.

The existing 'core' historical ambient monitoring stations were maintained and are sampled monthly for the same parameters traditionally monitored. Several of the historical 'non-core' ambient monitoring sites were reintroduced to the program in 1996 to continue monitoring the trends at those select locations.

Coastal Watershed Survey Program

Beginning with Fiscal Year 1993, the Field Operations Division-Mobile Field Office initiated a program for assessing the condition of the small sub-basins located in Baldwin and Mobile Counties. The Coastal Watershed Survey utilizes a comprehensive, broad spectrum approach for assessing the “health” of a basin. This methodology was described in Water Quality and Natural Resource Monitoring Strategy for Coastal Alabama (ADEM 1993b) and incorporates a variety of information from multiple disciplines. Data are generated from water column and sediment samples as well as benthic macroinvertebrate fauna collections. Additional information is gathered and integrated into the survey including: land use, topography, soil characteristics, wetlands locations, and projected growth and development in the watershed.

The strategy employed for monitoring and sampling the coastal area waters follows a more varied regime than inland waters because of the high degree of seasonal variability of precipitation and water salinity. In order to accurately determine the effects of non-point sources on a watershed, it is necessary to collect samples and measure *insitu* field parameters with respect to meteorological events and seasonal conditions rather than on a routine schedule (National Research Council 1990; U.S. Environmental Protection Agency 1991; U.S. Fish and Wildlife Service 1991). Many of the problems related to non-point sources occur on an acute and irregular basis (i.e., fecal coliforms, oil sheens and turbidity) and are tied to stormwater runoff. These types of problems are often best investigated during and immediately following a storm event. Other forms of degradation manifest themselves on a more regular schedule, are often more chronic in duration (i.e., hypoxia, fish kills and phytoplankton blooms) and are best studied during times of stream low flows, salinity stratification and warm temperatures (National Research Council 1990). A sampling regime that accounts for these variations is essential (ADEM 1993b).

The tendency for estuarine water column metals to adsorb to suspended particulates and settle to the bottom sediments makes the investigation of sediment contaminants a vital part of the watershed survey (Baudau and Muntau 1990; Delfino et al. 1991; Long and Morgan 1990; National Research Council 1990; NOAA 1989; Windom et al. 1989). To date, the evaluation of sediment quality in these surveys has dealt solely with metal enrichment although analyses for organics might be included if the activities within a watershed have the potential for causing such contamination.

Nonpoint Source Assessment Program (NPSAP)

Basin Screening

Nonpoint Source Assessments are conducted at the request of the Nonpoint Source Unit of the Office of Education and Outreach as part of selected watershed projects. Intensive surveys conducted at nonpoint source priority stations are resource intensive. They are necessary, however, to assess subtle differences in water quality, to detect trends in water quality and to identify sources of impairment. Because these methods are resource intensive, an assessment tool is needed to identify sub-watersheds most impacted by point and nonpoint sources of pollution. The Department's regulating programs and the Nonpoint Source Unit can then use resources more effectively by targeting these basins for implementation of water pollution controls, total maximum daily load studies and intensive surveys. The objectives of the basin wide screening assessments developed by the FOD are to rank and prioritize sub-watersheds most in need of remedial action and to identify major pollution sources present in each sub-basin.

Intensive Watershed Assessment

Intensive nonpoint source watershed assessments generally consist of physical/chemical and bacteriological sample collection and analysis, instream community assessments (macroinvertebrate/fish/periphyton) and assessments of habitat quality. Assessments are conducted before and after implementation of Best Management Practices (BMPs) to evaluate trends in water quality and physical habitat due to BMPs implementation. This assessment method relies upon baseline data collected at reference stations to accurately assess trends in water quality.

Information generated during the basin screening and watershed assessments can be used to assess percent impaired waters within each major basin and will increase the miles monitored within each basin. This information can be used to update the CWA 303(d) list, the Alabama NPS Assessment Report and the 305(b) Report to Congress.

Point Source Assessment Program (PSAP)

Point Source Assessments, such as Water Quality Demonstration (WQD) studies are requested by the Municipal Branch of the Water Division. These studies are conducted on selected streams that receive treated waste from municipal wastewater treatment facilities that have been newly constructed or have been renovated using partial funding through the Alabama

Revolving Loan Program. A WQD study typically includes upstream and downstream monitoring during a period before construction or renovation has begun, and during a period after construction or renovation is complete. Stream monitoring of WQD studies includes collection of physical and chemical data, biological assessments, and stream flow determinations. The data is typically collected during the low flow period of the year, thereby documenting the greatest potential adverse impact attributable to discharge activity. The data collected serves to document improvement of stream water quality resulting from the implementation of improved wastewater treatment.

Intensive surveys such as Waste Load Allocation (WLA) and Total Maximum Daily Load (TMDL) studies are conducted at the request of the Water Quality Section of the Water Division. These studies are conducted to obtain the information to develop water quality models used in determining the allowable wasteload (permit limits) for each point source. These studies typically involve time-of-travel studies, flow determination, and intensive sampling of the waterbody and point sources for various water quality parameters over a three or four day period. Nonpoint sources are also considered and sampled if necessary.

In 1992, the Environmental Indicators Section and the Bioassay Unit began to integrate toxicity testing into selected stream assessment studies. These types of surveys are generally conducted when there is concern for a particular discharge and its effects on a receiving stream. In addition to chemical/physical water quality measurements and macroinvertebrate biological assessments, the potential toxicity of the effluent is surveyed. The facility discharge is tested at the permitted receiving water concentration (RWC) and the stream stations are tested at a concentration of one hundred percent (100%). Short-term (7-day) chronic toxicity tests are conducted on the samples utilizing Pimephales promelas and Ceriodaphnia dubia. At the end of the test period a statistical determination is made relative to the effluent's toxicity and whether or not that toxicity, if present, is transferred to the receiving stream.

Compliance Monitoring Program

The compliance monitoring program conducted by FOD includes a compliance monitoring inspection (CSI). During the CSI, representative samples required by the facilities' National Pollutant Discharge Elimination System (NPDES) permit are obtained. Chemical and bacteriological analyses are performed, and the results are forwarded to the appropriate

Departmental permitting entity, where they are used to verify the accuracy of the permittee's self-monitoring program and reports, determine compliance with discharge limitations, determine the quantity and quality of effluents, develop permits, and provide evidence for enforcement proceedings where appropriate.

Reservoir Water Quality Monitoring Program (RWQMP)

With the exception of reservoirs in the Tennessee River system which are assessed by the TVA, the Reservoir Water Quality Monitoring Program assesses the water quality and trophic status of all publicly accessible lakes and reservoirs in the State. Monitoring takes place during the algal growing season at least once every two years with many lakes/reservoirs being monitored every year. This routine reservoir monitoring is supplemented with information gained from more intensive studies conducted on selected reservoirs as funding becomes available. RWQMP studies typically include vertical profiles of select physical/chemical parameters, chemical and bacteriological sample collection, chlorophyll *a* and phytoplankton analysis. Objectives of the program are: a) to develop an adequate water quality database for all publicly owned lakes in the state; b) to establish trends in lake trophic status that are only established through long-term monitoring efforts; and, c) to satisfy Section 314 (a)(1) of the Water Quality act of 1987.

Fish Tissue Monitoring Program (FTMP)

The ADEM Fish Tissue Monitoring Program was initiated in 1991 as a cooperative agreement with the Alabama Department of Public Health (ADPH), the Alabama Department of Conservation and Natural Resources (ADCNR) and the Tennessee Valley Authority (TVA) to monitor fish tissue throughout the state for bioaccumulative contaminants that can pose a risk to human health. Twenty-eight (28) major reservoirs, 26 stream locations and 19 ADCNR-managed public fishing lakes are sampled on a five-year rotational basis. Additional water bodies are also monitored based on identified need. Each year's sampling locations are determined based upon information available to the ADEM and input from the cooperative agencies. Water bodies that have been identified as having elevated concentrations of bioaccumulative fish tissue contaminants, or greater potential for contamination, are more closely monitored.

At each location, a composite sample of six individuals (same species) from both the predator and the omnivore/bottom feeding groups is collected (usually six bass and six catfish). Skinless-fillet composite samples are screened for a select list of organo-chlorine pesticides, metals and PCBs. Screening results will normally dictate the need for additional sampling trips and analyses. Most contaminants are stored/concentrated primarily in fatty tissue. Therefore, sampling is conducted in the fall of the year when fatty tissue is accumulated for over-wintering. The results of these analyses are provided to the ADPH for their consideration. If data warrants, the ADPH will issue consumption advisories as appropriate.

The physical condition of important sport and/or commercial fish species collected for tissue monitoring is also evaluated using relative weights. Relative weight is a condition indicator used by fishery biologists to compare individual fish or a group of fish with a standardized norm. Using this system a fish that scores 80 to 100 would be considered in good-to-excellent condition while a fish that scores 79 or below would be considered fair-to-poor. These same fish are also examined for any external anomalies such as lesions (sores), tumors, parasites and deformities. This relative weight condition indicator is used to evaluate the trends in the health of a fish community.

III. SUMMARY OF FOD PROGRAM COMPONENTS PROVIDING DATA IN SUPPORT OF NATIONAL ENVIRONMENTAL GOALS FOR WATER

In 1996, EPA published Environmental Indicators of Water Quality in the United States (EPA 1996b). This document outlined two National Environmental Goals for Water, the objectives to meet these goals, and the environmental indicators used to measure the successful attainment of the objectives (Table 1). FOD programs and program components provide valuable data supporting at least one environmental indicator for each of the five objectives (Table 2). Figure 1 (modified from EPA 1996b) illustrates how each FOD program provides information for multiple objectives. 'These objectives are like the building blocks in a pyramid, where success in reaching the goals at the top is dependent on successful attainment of those lower in the pyramid' (EPA 1996b). The following section describes each of the FOD program components and how it provides data to support environmental indicator(s) and water objective(s).

GOAL NO. 1: CLEAN WATERS

GOAL NO. 2: SAFE DRINKING WATER

Water Quality Objective I: Conserve and enhance public health

Indicator: Fish consumption advisories -- Percentage of rivers and lakes with fish that states have determined should not be eaten, or should be eaten only in limited quantities.

FOD Program: *Fish Tissue Monitoring Program*

Program Component(s): *Fish Tissue Analysis*

Fish Tissue Analysis

At each sampling location, a composite sample of six individuals (same species) from both the predator and the omnivore/bottom feeding groups is collected (usually six bass and six catfish). Skinless-fillet composite samples are screened for a select list of organo-chlorine pesticides, metals and PCBs. Sampling is conducted in the fall of the year when contaminants, if present, would most likely be stored in fatty tissue. The results of these analyses are provided to the ADPH for their consideration. If data warrants, the ADPH will issue consumption advisories as appropriate.

Water Quality Objective II: Conserve and Enhance Aquatic Ecosystems

Indicator: Biological Integrity -- Percentage of rivers and estuaries with healthy aquatic communities

FOD Program(s): *Alabama Monitoring and Assessment Program (ALAMAP) - Upland and Coastal; Nonpoint Source Assessment Program (NPSAP); Point Source Assessment Program (PSAP); Coastal Watershed Survey Program (CWSP); Reservoir Water Quality Monitoring Program (RWQMP); Fish Tissue Monitoring Program(FTMP)*

Program Component(s): *Macroinvertebrate/Fish/Periphyton Community Bioassessments (ALAMAP, NPSAP, PSAP, CWSP); Trophic State Determinations (RWQMP); Fish Health Analysis (FTMP)*

Macroinvertebrate Community Bioassessment

The FOD benthic macroinvertebrate assessment program is an integral part of the Department's biological monitoring effort. The use of the benthic macroinvertebrate community has proven to be a cost-effective water quality monitoring tool that reflects overall ecological integrity; i.e., chemical, physical, and biological integrity of the survey sites. These results, therefore, directly assess the status of a water body relative to the primary goal of the Clean Water Act (Plafkin et al. 1989). A Multihabitat Bioassessment Protocol is currently utilized to sample wadeable and nonwadeable streams (Lenat 1988, Plafkin et al. 1989). All methods utilized are documented in the Department's Standard Operating Procedures and Quality Control Assurance Manual, Volume II (ADEM 1996a).

The Biological Condition Scoring Criteria (BCSC) as outlined in Rapid Bioassessment Protocols for Use in Streams and Rivers: Macroinvertebrates and Fish (Plafkin et al. 1989) is currently utilized to evaluate the biotic integrity of each wadeable stream sampled in relation to the ecoregional reference site determined to be most comparable. These assessments are then used to determine the Aquatic Life Use Designations. These comparisons have aided the Department in evaluating the "best attainable biotic community" within an ecoregion.

The FOD Coastal Watershed Survey Program incorporates macroinvertebrate community bioassessments. In the absence of well defined scoring criteria applicable to estuarine species, such as the protocols of Plafkin et al. (1989), communities are evaluated relative to the presence and/or absence of tolerant-intolerant taxa.

Fish Community/Periphyton Community Bioassessment

At present, the macroinvertebrate community is the only biological indicator used by the Department to assess water quality. The EPA recommends biological assessments include more than one taxonomic group (EPA 1996b).

Including more than one taxonomic group encompasses more than one trophic level, providing data that can assist investigators in evaluating the extent of impairment, the type of impairment, and degree of recovery (KDEP 1993, EPA 1996b). It is recommended that, as resources allow, fish and periphyton community collections be incorporated into the intensive biological assessments.

Trophic State Determinations

The extent of reservoir eutrophication is determined by trophic state determinations. The concern about eutrophication from a water quality standpoint is primarily due to cultural eutrophication. Cultural eutrophication negatively affects biological communities of water bodies through changes in water quality variables such as dissolved oxygen, pH, water temperature and light availability.

Chlorophyll a concentrations are used to calculate Carlson's Trophic State Index (TSI). Carlson's TSI provides limnologists and the public with a single number that serves as an indicator of a lake's trophic status. The Trophic State classification scale is used as follows:

Oligotrophic	TSI <40
Mesotrophic	TSI 40-49
Eutrophic	TSI 50-70
Hypereutrophic	TSI > 70

Fish Condition Analysis

The physical condition of important sport and/or commercial fish species collected for tissue monitoring is evaluated using relative weights. Relative weight is a condition indicator used by fishery biologists to compare individual fish or a group of fish with a standardized norm. Using this system, a fish that scores 80 to 100 would be considered in good-to-excellent condition while a fish that scores 79 or below would be considered fair-to-poor. These same fish are also examined for any external anomalies such as lesions (sores), tumors, parasites and deformities.

Water Quality Objective III: Support Uses Designated by States in their water quality standards.

Indicator: Designated uses in state and tribal water quality standards

- a) *Aquatic life designated use* -- Percentage of assessed waterbodies that can support healthy aquatic life, as designated by the states and tribes.
- b) *Drinking water supply designated use* -- Percentage of assessed waterbodies that can support safe drinking water supply use, as designated by the states and tribes.
- c) *Fish and shellfish consumption designated use* -- Percentage of assessed waterbodies that can support fish and shellfish consumption, as designated by the states and tribes.
- d) *Recreational designated use* -- Percentage of assessed waterbodies that can support safe recreation, as designated by the states and tribes.

FOD Program(s): *Point Source Assessment Program (PSAP); Nonpoint Source Assessment Program (NPSAP); Reservoir Water Quality Monitoring Program (RWQMP); Alabama Monitoring and Assessment Program (ALAMAP) - Upland and Coastal; Coastal Watershed Survey Program (CWSP).*

Program Component(s): Chlorophyll a, Fecal Coliform, Physical/Chemical (RWQMP, NPSAP, PSAP); Fecal Coliform, Physical/ Chemical (ALAMAP; CWSP); Toxicity Testing (PSAP, NPSAP)

Water quality studies of differing types are conducted each year at various locations throughout Alabama in response to identified informational needs. These studies typically include several monitoring locations and a frequency of sampling specific to the objectives of a particular study. Studies may include chemical, physical, and biological parameters.

Chlorophyll a

The RWQMP uses Carlson's trophic state index (TSI) for determination of the trophic state of Alabama lakes. Using chlorophyll *a* concentrations to determine trophic state is considered to give the best estimate of the biotic response of lakes to nutrient enrichment when phytoplankton is the dominant plant community. The TSI is a single number that serves as an indicator of trophic status of a lake but does not necessarily define it. Lakes with a TSI of 70 or greater are generally considered to be hypereutrophic and in need of regulatory

action appropriate for protection and restoration. A TSI of 50 - 70 indicates eutrophic conditions in a lake. Trophic state index values of 40 to 50 indicate mesotrophic conditions while oligotrophic conditions are indicated by TSI values less than 40.

Fecal Coliform

Bacteriological samples for Fecal Coliform analysis are routinely collected as a part of most field studies. Single samples from each station are used for screening purposes to determine if there is a potential problem. More intensive sample collection methods are used to determine if a segment warrants upgrade to a use classification of *Swimming and other whole body water-contact sports*.

Physical / Chemical

Water samples for analysis of Physical/Chemical parameters are collected as a part of most Departmental monitoring efforts. These samples are analyzed and the data made available to the Department through reports and/or storage in the EPA STORET database. The following parameters are routinely analyzed: Dissolved Oxygen, pH, Water Temperature, Conductivity, Turbidity, (Fecal Coliform - see above) as well as others that may be specific to a particular study.

Toxicity Testing

Water samples are collected from effluent sources, when appropriate, and analyzed for indications of toxic effects. At the conclusion of the tests, the results are included in any reports and forwarded to the Departmental entity responsible for regulating the effluent sources.

Water Quality Objective IV: Conserve and Improve Ambient conditions

Indicator: Surface water pollutants -- Trends of selected pollutants found in surface water

Indicator: Contaminated sediments -- Percentage of sites with sediment contamination that might pose a risk to humans and aquatic life

Indicator: Habitat Assessment (Suggested as a regional indicator and future national indicator)

FOD Program: *ALAMAP - upland and coastal, Point Source Assessment Program (PSAP); Nonpoint Source Assessment Program (NPSAP); Reservoir Water Quality Monitoring Program (RWQMP); Coastal Watershed Survey Program (CWSP).*

Program Component(s): Physical/Chemical, Fecal Coliform (ALAMAP - upland and coastal, PSAP, NPSAP, RWQMP, CWSP), Sediment Analysis (ALAMAP - upland and coastal, NPSAP, CWSP), Habitat Assessment (ALAMAP - upland, NPSAP, PSAP)

Habitat Assessment and Physical Characterization

Biological integrity and water quality are directly affected by physical habitat. In addition, the assessment of habitat quality is an important step in documenting the adverse impacts of NPS pollution. The Department utilizes the Habitat Assessment Matrices developed by EPA (Plafkin et al. 1989) and Barbour and Stribling (1994) in conjunction with physical characteristics and water quality parameters to evaluate and document habitat quality of each wadeable bioassessment sampling site.

Sediment Analysis

“Certain types of chemicals in water tend to bind to particles and collect in sediment. Chemicals often persist longer in sediment than in water because conditions might not favor natural degradation. When present at elevated concentrations in sediment, pollutants can be released back to water. Pollutants can also accumulate in bottom dwelling organisms and in fish and shellfish and move up the food chain. In both cases, excessive levels of chemicals in sediment might become hazardous to aquatic life and humans.” (EPA 1996b) Sediment samples are collected annually, where appropriate, as part of the ALAMAP historical ambient monitoring program as well as select NPSAP and CWSP assessments.

Physical / Chemical

Water samples for analysis of Physical/Chemical parameters are collected as a part of most Departmental monitoring efforts. These samples are analyzed and the data made available to the Department through reports and/or storage in the EPA STORET database. A routine suite of parameters includes those chosen by EPA and its partners (EPA 1996b) to have significant effects on our surface waters (Total Suspended Solids (TSS), Total Phosphorus, Nitrogen (and Nitrate), Total Dissolved Solids (TDS), and Dissolved Oxygen (Fecal Coliform - see below) as well as others that are specific to a particular study.

Fecal Coliform

Bacteriological samples for Fecal Coliform analysis are routinely collected as a part of most field studies. Single samples from each station are used for screening purposes to determine if there is a potential problem. More intensive sample collection methods are used to determine if a segment warrants upgrade to a use classification of *Swimming and other whole body water-contact sports*.

Water Quality Objective V: Reduce or prevent pollutant loadings and other stressors

Indicator: Selected point source loadings to (a) surface water and (b) ground water -- Trends for selected pollutants discharged from point sources into surface water, and underground injection control wells that are sources of point source loading into ground water.

FOD Program: *Point Source Assessment Program (PSAP)*

Program Component(s): Physical/Chemical, Toxicity Testing, Time-of-Travel, AGPT

Physical / Chemical

Water samples for analysis of Physical/Chemical parameters are collected as a part of most Departmental monitoring efforts. Composite samplers are used

to collect 24 hour composite samples from effluent sources. These samples are analyzed and the data made available to the Department through reports. In the future these data will be available through the Departmental Surface Water Quality Database currently under development.

EPA and its partners have chosen a suite of toxic and conventional pollutants to track as *environmental indicators* of progress toward reducing point source pollution: Cadmium, Copper, Lead, Mercury, Phenol, Total Residual Chlorine, Total Suspended Solids (TSS), Total Phosphorus, Nitrogen (and Nitrate), Pathogens, BOD and Ammonia (EPA 1996b). In order to make the Department's monitoring parameters also consistent with EPA's 'Index of Watershed Indicators' (EPA 1997), Hexavalent Chromium, Nickel, and Zinc are also collected as part of the effluent monitoring effort. These 'ASSESS' parameters will be collected, in addition to the permitted parameters, at all Industrial and Municipal point source discharges to surface waters. The usefulness of each of these parameters will be re-evaluated at regular intervals.

Toxicity Testing

Water samples are collected from effluent sources, when appropriate and analyzed for indications of toxic effects. At the conclusion of the tests, the results are included in any reports and forwarded to the Departmental entity responsible for regulating the effluent sources.

Time-of-travel

The use of fluorescent dyes and tracing techniques provides a means for measuring the time-of-travel and dispersion characteristics of steady and gradually varied flow in streams. Measurements of the dispersion and concentration of dyes give insight into the behavior of soluble contaminants that may be introduced into a stream. (Hubbard 1982) This information can be used by Departmental staff to determine NPDES permit limits.

AGPT

More specialized types of biological monitoring such as algal growth potential testing (AGPT) are also increasingly utilized in the surface water monitoring program. AGPT provides valuable information such as the estimation of limiting nutrients that is useful in waste load modeling efforts, non-point source monitoring, and reservoir trophic status determinations.

The Algal Growth Potential Test was developed 24 years ago as a standard, inexpensive, reproducible, and interpretable method to determine the potential of natural waters, wastewater effluent, and various compounds to support or inhibit algal growth. The assay is based on the premise that the maximum yield is proportional to the amount of the limiting nutrient present and biologically available with respect to the growth requirements of the alga. It is intended that the test be used: 1) to identify algal growth-limiting constituents; 2) to determine biologically the availability of algal growth-limiting nutrients; and 3) to quantify the biological response to changes in concentrations of algal growth-limiting constituents. These measurements are made by adding the test alga to the test water and determining algal growth at appropriate intervals (Raschke and Schultz 1987).

IV. DATA MANAGEMENT/STORAGE

The FOD utilizes EPA's national STORET database for the storage, analysis, and retrieval of physical, chemical, and some biological surface water data collected throughout the State.

The Environmental Indicators Section of FOD has several databases housed on the Department's mini-mainframe computer: The macroinvertebrate database created in 1991 and updated in 1995, the fish tissue database created in 1993, and the toxicity testing database added to the mainframe computer system in 1995. All data entered into the mainframe databases are checked for accuracy. The macroinvertebrate database facilitates the management and analysis of data by both calculating the biometrics and creating the standardized reports used in macroinvertebrate studies. Accuracy of the biometric results is hand verified for 10% of the sampling events each year. The toxicity testing database is used in evaluation of toxicity effects of wastewater discharges and allows users to view facility test results in a standardized and accessible format. Historical toxicity data are currently being incorporated into this database. The fish tissue database is used in evaluation of fish health as related to human fish tissue consumption. The database allows compilation of data for reports and easy access to almost twenty years of data. Manuals for the use of these databases regarding data entry and analysis are currently being developed.

V. QUALITY ASSURANCE/QUALITY CONTROL PROGRAM

Laboratory Analytical Support for the Department is provided by the ADEM Central Laboratory in Montgomery, the Birmingham Branch Laboratory, and the Mobile Branch Laboratory. These laboratories are responsible for organic, inorganic, and radiochemical analyses for the Department's Surface Water Monitoring Program. Analyses are performed utilizing the protocols found in the Standard Methods for the Examination of Water and Wastewater, 18th edition (APHA 1992), and the EPA's Methods for Chemical Analysis of Water and Wastes (EPA 1983) manuals. In addition, the Central Laboratory is fully certified by EPA Region IV for the analysis of Phase II and Phase V drinking water parameters.

As a regulatory agency, it is necessary to document the methodologies used in the monitoring programs conducted by the FOD to ensure the accuracy, comparability, and representativeness of the data collected (Plafkin et al. 1989). Quality assurance and quality control programs have therefore been established as an integral part of each of the monitoring

programs conducted by FOD. Each program is fully documented in one of the FOD Standard Operating Procedures Manuals. As recommended by the EPA (Plafkin et al. 1989, EPA 1993, EPA 1994b), these programs include the development of standard operating procedures manuals, quality assurance of both field and laboratory procedures, as well as the management and analysis of data.

Standard Operating Procedures Manuals

Written protocols of methodologies utilized by the FOD have been developed and updated in conjunction with each of the monitoring programs.

The Field Operations Division Standard Operating Procedures and Quality Control Assurance Manual, Volume I - Physical Chemical (SOP) (ADEM 1994a) is a comprehensive document covering safety, sample collection and field measurements, microbiological analysis, QA/QC, and other information necessary to conduct quality field and laboratory work.

The Field Operations Division Standard Operating Procedures and Quality Control Assurance Manual, Volume II - Freshwater Macroinvertebrate Biological Assessment (SOP) (ADEM 1996a) documents all methodologies currently utilized by the Department to collect and analyze freshwater macroinvertebrate samples and to conduct site assessments of habitat quality and characterization of the physical attributes.

The Field Operations Division also has in effect a Fish Tissue Monitoring SOP (Standard Operating Procedures and Quality Control Assurance Manual, Volume III - Fish Sampling and Tissue Preparation for Bioaccumulative Contaminants) (ADEM 1996b). This latest revision includes many of the most recent changes recommended by EPA.

In 1994, a comprehensive standard operating procedures manual documenting all methodologies used by the Bioassay Unit was developed (Standard Operating Procedures and Quality Control Assurance Manual, Volume IV - Toxicity Testing Procedures) (ADEM 1994b). A standardized effluent toxicity test report format was also created for the submission of self-monitoring test results.

A manual, developed in 1993 and finalized in 1997, documents the procedures used in the Algal Growth Potential bioassay currently used by the Field Operations Division (Standard Operating Procedures and Quality Control Assurance Manual, Volume V - Algal Growth Potential Bioassay Methods) (ADEM 1997).

QA/QC Field Procedures

Duplicate water samples and field parameters are collected at 10 percent of the sampling events during each study.

Every individual that will be involved in stream bioassessments during the year participates in a joint bioassessment conducted prior to the sampling season. Crews of two conduct simultaneous intensive multihabitat bioassessments (MB-I) of the site, including the physical characterization and habitat assessment to ensure comparability of macroinvertebrate bioassessment techniques between sampling events and collectors. In addition, during the sampling year duplicate macroinvertebrate samples are taken at 10% of the stations to ensure that results obtained can be duplicated and are representative of the stream site.

Reservoir monitoring completed as part of the Clean Lakes Program also incorporates duplicate and “blank” samples. Field duplicate samples are obtained by completely duplicating the collection process of both field parameters and each sample type at 10% of the sampling sites. Blank samples are also collected at the same frequency as duplicates by processing distilled water through the collection and filtration equipment in the same manner as regular samples. This procedure documents that the procedures used to rinse equipment prevent contamination between samples and stations.

QA/QC Laboratory Procedures

The laboratory QA procedures for the bioassay program encompass all activities that affect the quality of effluent toxicity data. Quality control in the bioassay laboratory is a day-to-day routine that incorporates every aspect of organism culturing, general lab maintenance, and toxicity testing. Quality control is also measured with monthly bioassay reference tests to ensure comparability of test organisms. New procedures are currently being developed to integrate chronic toxicity tests to the QA/QC program.

The Environmental Indicators Section assesses comparability of macroinvertebrate identifications between investigators for 10% of the sampling stations. In addition, a specimen of each macroinvertebrate taxon identified is maintained in a reference collection.

VI. REPORTING

All data collected by the FOD are provided to the requesting Division or incorporated into reports by FOD for circulation. Table 3 lists all of the reports generated by the various organizational units of the FOD since 1989. The following are a list of reports routinely generated by FOD or that FOD provides a substantial amount of data.

Biennial Water Quality Report to Congress (305B)

ADEM Fish Tissue Monitoring Report

ADEM Reservoir Water Quality Monitoring Report

ALAMAP (Coastal) - Annual Data Summary

Coastal Watershed Survey Reports

Various special studies reports as projects are completed

Table 1. EPA Water Quality Objectives and Indicators (EPA 1996b)

Objective I: Conserve and Enhance Public Health

1. *Population served by community drinking water systems violating health-based requirements*---Population served by drinking water systems with one or more violations of health-based requirements.
2. *Population served by unfiltered surface water systems at risk from microbiological pollution*---Population served by, and number of, systems that have not met the requirements to filter their water to remove microbiological contaminants.
3. *Population served by drinking water systems exceeding lead action levels*---Population served by, and number of, systems with lead levels in drinking water exceeding the regulatory threshold.
4. *Source water protection*---Number of community drinking water systems using ground water that have programs to protect them from pollution.
5. *Fish Consumption advisories*---Percentage of rivers and lakes with fish that states have determined should not be eaten, or should be eaten in only limited quantities.
6. *Shellfish growing water classification*---Percentage of estuarine and coastal shellfish growing waters approved for harvest for human consumption.

Objective II: Conserve and Enhance Aquatic Ecosystems

7. *Biological integrity*---Percentage of rivers and estuaries with healthy aquatic communities.
8. *Species at risk*---Percentage of aquatic and wetland species currently at risk of extinction.
9. *Wetland acreage*---Rate of wetland acreage loss.

Objective III: Support Uses Designated by the States and Tribes in Their Water Quality Standards

10. *Designated uses in state and tribal water quality standards*
 - a. *Drinking water supply designated use*---Percentage of assessed waterbodies that can support safe drinking water supply use, as designated by the states and tribes.
 - b. *Fish and shellfish consumption designated use*---Percentage of assessed waterbodies that can support fish and shellfish consumption, as designated by the states and tribes.
 - c. *Recreational designated use*---Percentage of assessed waterbodies that can support safe recreation, as designated by the states and tribes.
 - d. *Aquatic life designated use*---Percentage of assessed waterbodies that can support healthy aquatic life, as designated by the states and tribes.

Objective IV: Conserve and Improve Ambient Conditions

11. *Ground water pollutants*---Population exposed to nitrate in drinking water. In the future, the indicator will report the presence of other chemical pollutants in ground water.
12. *Surface water pollutants*---Trends of selected pollutants found in surface water.
13. *Selected coastal surface water pollutants in shellfish*---The concentration levels of selected pollutants in oysters and mussels.
14. *Estuarine eutrophication conditions*---Trends in estuarine eutrophication conditions.
15. *Contaminated sediments*---Percentage of sites with sediment contamination that might pose a risk to humans and aquatic life.

Objective V: Reduce or Prevent Pollutant Loadings and Other Stressors

16. *Selected point source loadings to (a) surface water and (b) ground water*---Trends for selected pollutants discharged from point sources into surface water, and underground injection control wells that are sources of point source loadings into ground water.
17. *Nonpoint source loadings to surface water*---Amount of soil eroded from cropland that could run into surface waters. Future reports will include additional nonpoint source surface water pollutants as well as sources of nonpoint source ground water pollution.
18. *Marine debris*---Trends and sources of debris monitored in the marine environment.

Table 2. Field Operations Division Programs and Program Components providing Data toward EPA Environmental Indicators for EPA Water Objectives to Meet National Environmental Goals (EPA 230-D-96-002).

<i>EPA Environmental Objective</i>	<i>EPA Environmental Indicator</i>	<i>FOD Program Component</i>	<i>FOD Program</i>
I. Conserve and Enhance Public Health	Fish consumption advisories	Fish Tissue Analysis	Fish Tissue Monitoring Program (FTMP)
II. Conserve and Enhance Aquatic Ecosystems	Biological integrity	Macroinvertebrate / Fish / Periphyton Community Bioassessment	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Biological integrity	Macroinvertebrate / Fish Community Bioassessment	Alabama Monitoring and Assessment Program (ALAMAP) - Coastal
	Biological integrity	Macroinvertebrate Community Bioassessment	Coastal Watershed Survey Program (CWSP)
	Biological integrity	Macroinvertebrate / Fish / Periphyton Community Bioassessment	Nonpoint Source Assessment Program (NPSAP)
	Biological integrity	Macroinvertebrate / Fish / Periphyton Community Bioassessment	Point Source Assessment Program (PSAP)
	Biological integrity	Trophic State Determination	Reservoir Water Quality Monitoring Program (RWQMP)

Table 2 (cont.)

<i>EPA Environmental Objective</i>	<i>EPA Environmental Indicator</i>	<i>FOD Program Component</i>	<i>FOD Program</i>
	Biological integrity	Fish Health Analysis	Fish Tissue Monitoring Program (FTMP)
III. Support Uses Designated by the States and Tribes in their Water Quality Standards	Designated uses in state and tribal water quality standards	Chlorophyll <i>a</i>	Nonpoint Source Assessment Program (NPSAP)
	Designated uses in state and tribal water quality standards	Chlorophyll <i>a</i>	Point Source Assessment Program (PSAP)
	Designated uses in state and tribal water quality standards	Chlorophyll <i>a</i>	Reservoir Water Quality Monitoring Program (RWQMP)
	Designated uses in state and tribal water quality standards	Fecal coliform	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Designated uses in state and tribal water quality standards	Fecal coliform	Coastal Watershed Survey Program (CWSP)
	Designated uses in state and tribal water quality standards	Fecal coliform	Point Source Assessment Program (PSAP)
	Designated uses in state and tribal water quality standards	Fecal coliform	Nonpoint Source Assessment Program (NPSAP)
	Designated uses in state and tribal water quality standards	Fecal coliform	Reservoir Water Quality Monitoring Program (RWQMP)

Table 2 (cont.)

EPA Environmental Objective	EPA Environmental Indicator	FOD Program Component	FOD Program
	Designated uses in state and tribal water quality standards	Physical / Chemical	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Designated uses in state and tribal water quality standards	Physical / Chemical	Alabama Monitoring and Assessment Program (ALAMAP) - Coastal
	Designated uses in state and tribal water quality standards	Physical / Chemical	Coastal Watershed Survey Program (CWSP)
	Designated uses in state and tribal water quality standards	Physical / Chemical	Reservoir Water Quality Monitoring Program (RWQMP)
	Designated uses in state and tribal water quality standards	Physical / Chemical	Nonpoint Source Assessment Program (NPSAP)
	Designated uses in state and tribal water quality standards	Physical / Chemical	Point Source Assessment Program (PSAP)
	Designated uses in state and tribal water quality standards	Toxicity Testing	Nonpoint Source Assessment Program (NPSAP)
	Designated uses in state and tribal water quality standards	Toxicity Testing	Point Source Assessment Program (PSAP)
IV. Conserve and Improve Ambient Conditions	Habitat quality (suggested as a regional indicator and future national indicator)	Habitat Assessment	Alabama Monitoring and Assessment Program (ALAMAP) - upland

Table 2 (cont.)

<i>EPA Environmental Objective</i>	<i>EPA Environmental Indicator</i>	<i>FOD Program Component</i>	<i>FOD Program</i>
	Habitat quality (suggested as a regional indicator and future national indicator)	Habitat Assessment	Nonpoint Source Assessment Program (NPSAP)
	Habitat quality (suggested as a regional indicator and future national indicator)	Habitat Assessment	Point Source Assessment Program (PSAP)
	Surface water pollutants	Physical / Chemical	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Surface water pollutants	Physical / Chemical	Alabama Monitoring and Assessment Program (ALAMAP) - coastal
	Surface water pollutants	Physical / Chemical	Coastal Watershed Survey Program (CWSP)
	Surface water pollutants	Physical / Chemical	Point Source Assessment Program (PSAP)
	Surface water pollutants	Physical / Chemical	Nonpoint Source Assessment Program (NPSAP)
	Surface water pollutants	Physical / Chemical	Reservoir Water Quality Monitoring Program (RWQMP)
	Surface water pollutants	Fecal Coliform	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Surface water pollutants	Fecal Coliform	Alabama Monitoring and Assessment Program (ALAMAP) - coastal

Table 2 (cont.)

<i>EPA Environmental Objective</i>	<i>EPA Environmental Indicator</i>	<i>FOD Program Component</i>	<i>FOD Program</i>
	Surface water pollutants	Fecal Coliform	Coastal Watershed Survey Program (CWSP)
	Surface water pollutants	Fecal Coliform	Point Source Assessment Program (PSAP)
	Surface water pollutants	Fecal Coliform	Nonpoint Source Assessment Program (NPSAP)
	Surface water pollutants	Fecal Coliform	Reservoir Water Quality Monitoring Program (RWQMP)
	Contaminated sediments	Sediment Analysis	Alabama Monitoring and Assessment Program (ALAMAP) - upland
	Contaminated sediments	Sediment Analysis	Alabama Monitoring and Assessment Program (ALAMAP) - coastal
	Contaminated sediments	Sediment Analysis	Coastal Watershed Survey Program (CWSP)
V. Reduce or Prevent Pollutant Loadings and other stressors	Selected point source loadings to surface water	Physical / Chemical	Point Source Assessment Program (PSAP)
	Selected point source loadings to surface water	Toxicity Testing - Ceriodaphnia / Fathead Minnows	Point Source Assessment Program (PSAP)
	Selected point source loadings to surface water	Time of Travel	Point Source Assessment Program (PSAP)

Table 2 (cont.)

<i>EPA Environmental Objective</i>	<i>EPA Environmental Indicator</i>	<i>FOD Program Component</i>	<i>FOD Program</i>
	Selected point source loadings to surface water	AGPT	Point Source Assessment Program (PSAP)

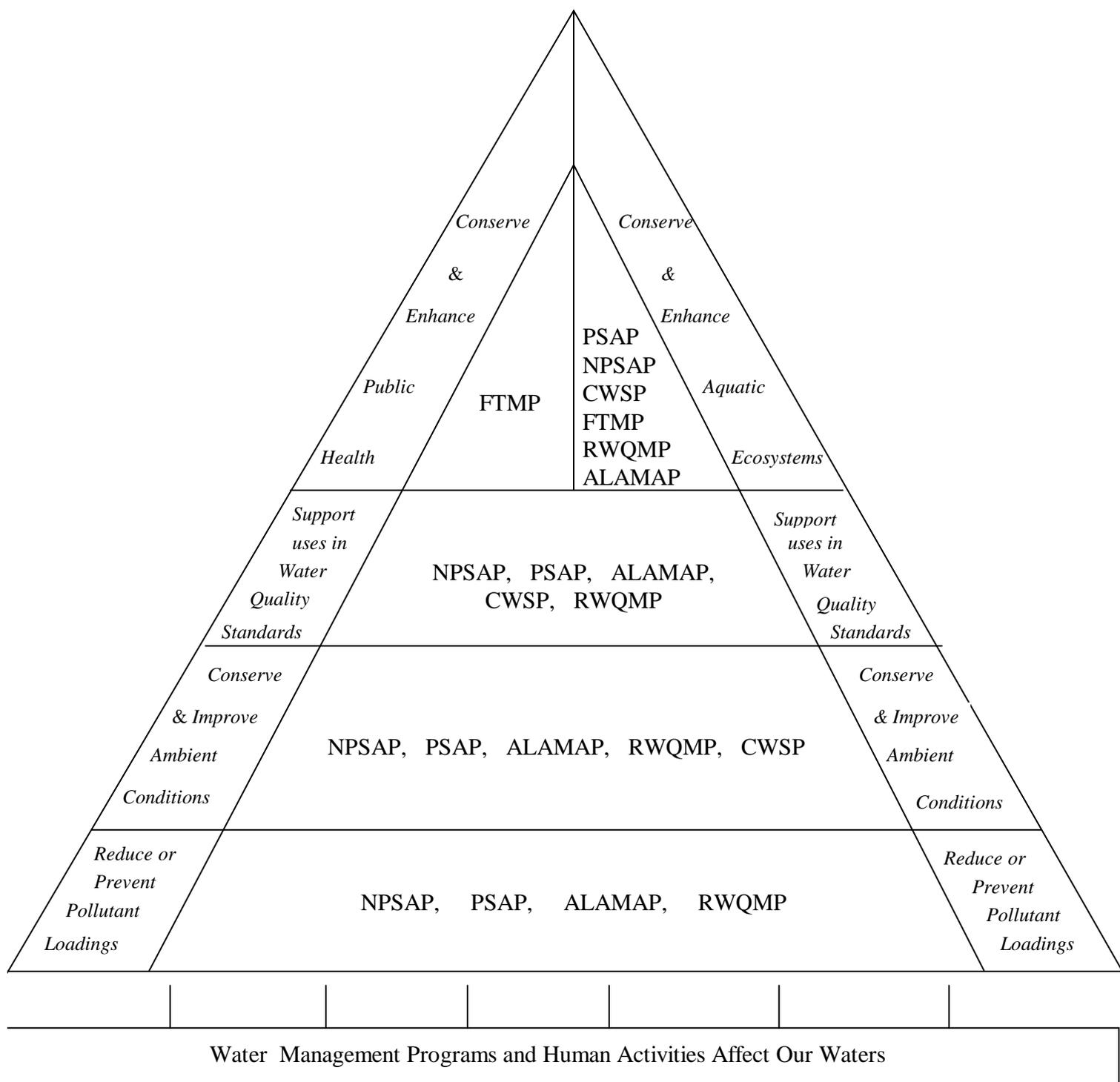
Table 3. Reports Generated by Field Operations Division Since 1990

FY Report Completed	Title	
1990	A Comparison of Direct and Indirect Analyses of Nutrient Concentrations in the Particulate Fraction of Water Samples	Coastal
1990	Choccolocco Creek WQDS- Anniston	
1990	Coastal Program Water Quality Trend Report FY90	Coastal
1990	Mud Creek WQDS - Hanceville	
1990	Town Creek and Swan Creek WQDS - Athens	
1990	Waxahatchee Creek WQDS - Columbiana	
1991	A Sediment Chemistry Baseline Study of Coastal Alabama	Coastal
1991	Alabama Reservoirs - Water Quality Monitoring Program Annual Report: 1990	
1991	Aldridge Creek WQDS -Huntsville	
1991	An Investigation of the Fish Kills Occurring in Lower Fish River, Baldwin County, Alabama	Coastal
1991	Huntsville Spring Branch WQDS- Huntsville	
1991	Moore Creek WQDS- Haleyville	
1991	Patsaliga Creek WQDS - Luverne	
1990 - 1991	Portersville Bay WQDS	Coastal
1991	Riley Maze Creek WQDS - Arab	
1991	Talladega Creek WQDS - Talladega	
1992	A Survey of the Water Quality and Sediment Chemistry of Selected Sites in the Mobile Delta System	Coastal
1992	A Survey of the Water Quality and Sediment Chemistry of Shipyards in Coastal Alabama	Coastal
1992	Alabama Reservoirs - Water Quality Monitoring Program Annual Report: 1991	
1992	Big Wills Creek WQDS - Fort Payne	
1992	Puppy Creek WQDS - Citronelle	
1993	Klondike Creek WQDS - Ozark	
1993	Limestone Creek WQDS - Monroeville	
1993	Pigeon Creek WQDS - Fort Deposit	
1993	Sand Mountain Lake Guntersville Watershed Project: Macroinvertebrate Bioassessment - June 1992	
1993	Sandy Creek WQDS - Camp Hill	
1994	A Survey of the Dog River Watershed: 1st Year's Study. An Overview of Land- Use Practices and the Effects of Development on the Basin.	Coastal
1994	ADEM Reservoir Water Quality and Fish Tissue Monitoring Program Report: 1992 - 1993	
1994	Choccolocco Creek Watershed Study	
1994	Omussee Creek WQDS - Dothan	
1994	Sand Mountain Lake Guntersville Watershed Project: Macroinvertebrate Bioassessment - June 1993	
1994	Water Quality Trends of Selected Ambient Monitoring Stations in Alabama Utilizing Aquatic Macroinvertebrate Assessments: 1974-1992	
1994	West Point Lake Phase I Diagnostic / Feasibility Study: Final Report (Joint report with Georgia Environmental Protection Division)	
1995	A Survey of the Dog River Watershed: 2nd Year's Study. Ongoing Development and Assessment of the Effects of Urban Nonpoint Sources on the Aquatic Resources of the Basin. Macroinvertebrate Community and Sediments.	Coastal
1995	Alabama/Mississippi Pilot Reference Site Project: 1990-1994	

Table 3 (cont.)

FY Report Completed	Title	
1990 - 1995	Black Warrior River Water Quality Study 1989 - 1994	
1995	Sand Mountain Lake Guntersville Watershed Project: Macroinvertebrate Bioassessment - June 1994	
1995	Sugar Creek Water Quality Demonstration Report - Phase I	
1996	A Survey of the Bon Secour River Watershed: An Overview of Land Use Practices and an Examination of the Effects of Development on the Aquatic Resources of the Basin.	Coastal
1996	ADEM Fish Tissue Monitoring Program Report 1991-95	
1996	ADEM Reservoir Water Quality and Fish Tissue Monitoring Program Report: 1994 - 1995	
1996	ADEM Reservoir Water Quality Monitoring Program Report 1990-95	
1996	Alabama Regional Environmental Monitoring and Assessment Program, Data Report for 1993 and 1994 (Coastal)	Coastal
1996	Flint Creek Watershed Project: Macroinvertebrate Bioassessment, 1992 and 1995	
1996	Sand Mountain Lake Guntersville Watershed Project: Macroinvertebrate Bioassessment - May 1995	
1996	Trends in Water Quality of Ambient Monitoring Stations of the Coosa and Tallapoosa Watersheds: Aquatic Macroinvertebrate Bioassessments, 1980-1995	

Fig. 1. EPA Environmental Objectives and FOD Programs providing indicator data.



- FTMP - FISH TISSUE MONITORING PROGRAM
- NPSAP - NONPOINT SOURCE ASSESSMENT PROGRAM
- PSAP - POINT SOURCE ASSESSMENT PROGRAM
- RWQMP - RESERVOIR WATER QUALITY MONITORING PROGRAM
- ALAMAP - ALABAMA MONITORING AND ASSESSMENT PROGRAM
- CWSP - COASTAL WATERSHED SURVEY PROGRAM

VII. REFERENCES

- Alabama Department of Environmental Management (ADEM). 1993b. Water quality and natural resource monitoring strategy for coastal Alabama. Alabama Department of Environmental Management, Montgomery, Alabama. 18pp.
- Alabama Department of Environmental Management (ADEM). 1994a. Field Operations Division standard operating procedures and quality control assurance manual, Vol. I: physical/chemical. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1994b. Field Operations Division standard operating procedures and quality control assurance manual, Vol. IV: toxicity testing procedures. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1994c. Water quality trends of selected ambient monitoring stations in Alabama utilizing aquatic macroinvertebrate assessments. Alabama Department of Environmental Management, Montgomery, Alabama. 113pp.
- Alabama Department of Environmental Management (ADEM). 1996a. Field Operations Division Standard operating procedures and quality control assurance manual, Vol. II: freshwater macroinvertebrate biological monitoring. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1996b Field Operations Division Standard operating procedures and quality control assurance manual, Vol. III: fish sampling and tissue preparation for bioaccumulative contaminants. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1996c. Water Quality Report to Congress for Calendar Years 1994 and 1995. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1996d. Alabama monitoring and assessment plan (ALAMAP): assessment of water quality upland regions. Alabama Department of Environmental Management, Montgomery, Alabama.
- Alabama Department of Environmental Management (ADEM). 1996e. Freshwater ambient water quality monitoring stations: biological and chemical assessments, proposal. Alabama Department of Environmental Management, Montgomery, Alabama. 6 pp.
- Alabama Department of Environmental Management (ADEM). 1996f. Alabama regional environmental monitoring and assessment program (coastal ALAMAP). Alabama Department of Environmental Management, Montgomery, Alabama. 15pp.

- Alabama Department of Environmental Management (ADEM). 1997. Field Operations Division standard operating procedures and quality control assurance manual, Vol. V: algal growth potential testing. Alabama Department of Environmental Management, Montgomery, Alabama.
- American Public Health Association (APHA). 1989. Standard methods for the examination of water and wastewater. 17th ed. American Public Health Association. Washington, D.C. 10:90-113
- Barbour, M. T. and J. B. Stribling. 1994. A technique for assessing stream habitat structure. in: Proceedings of the conference "Riparian ecosystems of the humid United States: function, values and management." National Association of Conservation Districts, Washington, D.C. pp. 156-178.
- Baudau, R. and H. Muntau. 1990. Lesser known pollutants and diffuse source problems. Pages 1-14 in R. Baudau, J. Giesy and H. Muntau, eds. Sediments: Chemistry and Toxicity of In-place Pollutants. Lewis Publishers, Inc., Chelsea, Michigan.
- Delfino, J.J., J.A. Coates, W.M. Davis, K.L. Garcia, M.W. Jacobs, K.J. Marincic and L.L. Signorella. 1991. Toxic Pollutants in Discharges , Ambient Waters and Bottom Sediments. Vols. I & II. Florida Department of Environmental Protection. Tallahassee, Florida. 732pp.
- Hubbard, E.F., F.A. Kilpatrick, L.A. Martens, and J.F. Wilson, Jr. 1982. Measurement of time of travel and dispersion in streams by dye tracing: United States Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A9, 44p.
- Kentucky Department for Environmental Protection (KDEP). 1993. Methods for assessing biological integrity of surface waters. 139pp.
- Lenat, D. R. 1988. Water quality assessment of streams using a qualitative collection method for benthic macroinvertebrates. J. N. Am. Benthol. Soc., 7(3):222-233.
- Long, E.R. and L.G. Morgan. 1990. The Potential for Biological Effects of Sediment-Sorbed Contaminants Tested in the National Status and Trends Program. NOAA Technical Memorandum NOS OMA 52. National Oceanic and Atmospheric Administration. Seattle, Washington. 77pp.
- National Oceanic and Atmospheric Administration (NOAA). 1989. Agricultural Pesticide Use in Estuarine Drainage Areas. A Preliminary Summary for Selected Pesticides. The national coastal pollutant discharge inventory program, Strategic Assessment Branch, Ocean Assessment Division, National Ocean Service, Rockville, Maryland. 134pp.

- National Research Council (U.S.). 1990. *Managing Troubled Waters. The Role of Marine Environmental Monitoring*. National Academy Press, Washington, D.C. 125pp.
- National Research Council (U.S.). 1992. *Restoration of aquatic ecosystems: science, technology, and public policy*. National Academy Press, Washington, D.C. pp44-47.
- Plafkin, J. L., M. T. Barbour, K. D. Porter, S. K. Gross, R. M. Hughes. 1989. *Rapid bioassessment protocols for use in streams and rivers: benthic macroinvertebrates and fish*. U.S. Environmental Protection Agency. Office of Water. Washington, D.C. EPA/444/4-89-001.
- Raschke, R.L. and D.A. Schultz. 1987. *The use of the algal growth potential test for data assessment*. *Journal Water Pollution control Federation*. 59(4)222-227.
- Summers, K. and V. Engle. 1996. *Alternative designs for Alabama surface water monitoring for 305(b) reporting*. USEPA/ORD/NHEERL/GED and USDOJ/USGS/NWRC, Gulf Breeze, Florida (Oral presentation).
- U.S. Environmental Protection Agency (EPA). 1983. *Methods for the chemical analysis of water and wastes*. EPA/600/4-79-020. Environmental Monitoring and Support laboratory. Cincinnati, Ohio.
- U.S. Environmental Protection Agency (EPA). 1991. *The watershed protection approach: an overview*. EPA/503/9-92/002. Office of Water, Washington, D.C. 8pp.
- U.S. Environmental Protection Agency (EPA). 1993. *Methods for measuring the acute toxicity of effluents and receiving water to freshwater and marine organisms*. 4th Edit. EPA/600/4-90/027F Environmental Monitoring and Support laboratory. Cincinnati, Ohio
- U.S. Environmental Protection Agency (EPA). 1994a. *Section 106 monitoring guidance (Memorandum)*. Assessment and Watershed Protection Division. Washington, D.C.
- U.S. Environmental Protection Agency (EPA). 1994b. *Short-term methods for estimating the chronic toxicity of effluents and receiving water to freshwater organisms*. 3rd Edit. EPA/600/4-91/002 Environmental Monitoring and Support Laboratory. Cincinnati, Ohio.
- U.S. Environmental Protection Agency (EPA). 1995. *The Strategy for improving water quality monitoring in the United States*.
- U.S. Environmental Protection Agency (EPA). 1996a. *A regional environmental strategic plan (RESP) for U.S. EPA and the states of Region IV, final review draft*. Atlanta, Georgia.
- U.S. Environmental Protection Agency (EPA). 1996b. *Environmental indicators of water quality in the United States*. EPA-841-R-96-002. Office of Water, Washington, D.C.

U.S. Environmental Protection Agency (EPA). 1997. The Index of Watershed Indicators. EPA-841-R-97-010. Office of Water, Washington, D.C.

U.S. Fish and Wildlife Service. 1991. Land use characterization report: Perdido River and Bay. F W S Field Office, Panama City, Florida. 65pp.

Windom, H.L., S.J. Schropp, F.D. Calder, J.D. Ryan, R.G. Smith Jr., L.C. Burney, F.G. Lewis and C.H. Rawlinson. 1989. Natural metal concentrations in estuarine and coastal marine sediments of the Southeastern United States. Environ. Sci. Technol. 23(3) 314-320.

Appendix B
Alabama' Water Quality Assessment Methodology

Alabama' Water Quality Assessment Methodology

Surface water quality data and information collected by the Alabama Department of Environmental Management (ADEM) and others is used for many purposes. One of the principal purposes of this information is assessment of beneficial use support. Surface waters in Alabama are assigned various use classifications based on existing utilization, uses reasonably expected in the future, and those uses that could be possible after the effects of pollution are controlled or eliminated. Alabama's use classification system contains the following use classifications:

1. Public Water Supply
2. Swimming and Other Whole Body Water-Contact Sports
3. Shellfish Harvesting
4. Fish and Wildlife
5. Limited Warmwater Fishery
6. Agricultural and Industrial Water Supply
7. Outstanding Alabama Water

For each of the uses listed above, water quality criteria are applied for determining how the waters may be best utilized, for determining waste treatment requirements, and for standards of quality for State waters. The following methodology will set forth the manner in which ADEM uses surface water quality data and related information for determining whether a water body meets the minimum standards for its designated use. The methodology will also describe the procedure used for establishing the size or extent of assessed water bodies.

A. Water body Assessments – Monitored versus Evaluated

Water quality data and information can take many forms, from anecdotal or casual observations to intensive water chemistry, biological, and physical characterization. When use support assessments are made it is important to understand the basis for the assessment. When information such as observed conditions, limited water quality data, water quality data older than five years, or estimated impacts from observed or suspected activities are used as the basis for the assessment, the assessment is generally referred to as an evaluated assessment. Evaluated assessments usually require the use of some degree of professional judgment 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. The following criteria are used to determine if information and /or data can be considered monitored or if it should be considered evaluated. See Table B-1.

**Table B-1
Assessment Level Criteria**

Monitored Data	Evaluated Data
<ul style="list-style-type: none"> • At least one measurement of chemical, physical, and biological conditions obtained between April and October. The biological conditions must be characterized by at least one biological indicator, i.e. macroinvertebrate community, pollutant levels in fish tissue, chl-a, toxicity to aquatic organisms. 	<ul style="list-style-type: none"> • Data and information obtained during reconnaissance visits, complaint investigations, screening level assessments, and once per year sampling of randomly selected sites (ALAMAP).
<ul style="list-style-type: none"> • At least five measurements of chemical and physical conditions obtained between April and October or over a time period considered critical for the particular pollutant of interest. 	<ul style="list-style-type: none"> • Alabama Soil Conservation Service watershed assessments
<ul style="list-style-type: none"> • All data must be collected by personnel utilizing EPA approved QA/QC, an EPA approved SOP, and EPA approved analysis methods. 	<ul style="list-style-type: none"> • Data and information older than five years or otherwise not meeting the criteria for monitored data.

B. Water body Assessments – Estimating the Size of the Assessed Water body

The United States Environmental Protection Agency's (EPA) published guidelines for preparation of the 1998 §305(b) reports provide only general guidance on estimating the extent or size of a water body represented by a given monitoring station. The general guidance suggests that a station represent no more than five to 10 miles on a wadeable stream and no more than 25 miles for large rivers. Because of the complexity of monitoring lakes and estuaries, no general guidance is given on estimating the size assessed by individual stations in those water bodies. Geographic information systems are proving very useful in making these determinations but site specific knowledge of the water body is needed.

The following guidelines are intended to provide consistency in estimates of the size or extent of water bodies assessed by individual sampling points. However, water quality and biological conditions may vary naturally from water body to water body or from sampling location to sampling location and are affected by numerous factors such as stream flow and velocity, stream bed composition, riparian and upstream land uses and land cover, geology, stream canopy, and seasonal changes. Some degree of knowledge of the water body being assessed will be necessary to make appropriate use of these guidelines. Different guidelines have been developed for the following different types of water bodies. See Table B-2 for estimating size of:

- Wadeable streams and rivers
- Flowing and non-wadeable streams and rivers
- Impounded rivers (reservoirs)
- Natural lakes and public fishing or water supply lakes
- Tidal rivers and streams
- Estuaries

C. Determining a Water body's Use Support Status

A variety of water quality data and related information can be used to determine the use support status of a water body. In most cases chemical water quality data will serve as the basis for the use support determination. However, biological data such as macroinvertebrate community indices, fish community indices, trophic status, bioassay results, or bacteriological indicators are often used in addition to chemical data to provide a more comprehensive use support determination. Fish consumption advisories and shellfish harvesting closures can also serve as the basis for a water body's use support determination.

1. Conventional Water Quality Parameters

The EPA guidelines for preparation of the 1998 §305(b) Water Quality Report to Congress offer the following guidance regarding use support determinations using conventional water quality parameters (i.e. dissolved oxygen, temperature, pH).

- Fully Supporting – For any one pollutant or stressor the criteria is exceeded in < 10 percent of the measurements.
- Partially Supporting – For any one pollutant or stressor the criteria is exceeded in 11 to 25 percent of the measurements.
- Not Supporting – For any one pollutant or stressor the criteria is exceeded in > 25 percent of the measurements.

2. Toxicants

For toxicants (i.e. priority pollutants, metals, chlorine, and ammonia) the guidelines suggest the following criteria.

- Fully Supporting – For any one pollutant, no more than 1 exceedance of acute or chronic criteria in a 3-year period based on 10 or more samples.

**Table B-2
Guidelines for Estimating Size or Extent of Assessed Water bodies**

Water body Type	Size or Extent Assessed
Wadeable stream / river	Use the lesser of the distances to the following points but not to exceed a total distance of 15 miles per sampling point: <ul style="list-style-type: none"> ▪ Upstream and downstream to the first point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the main stem of the water body ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Any combination of the above points
Flowing and non-wadeable stream / river	Use the lesser of the distances to the following points but not to exceed a total distance of 25 miles per sampling point: <ul style="list-style-type: none"> ▪ Upstream and downstream to the first significant point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the main stem of the water body ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Any combination of the above points
Impounded rivers (reservoirs)	The network of reservoir sampling stations assesses all main stem reservoirs in Alabama on a rotating basis. Embayments will not be considered assessed unless specifically sampled.
Embayments of Impounded rivers (reservoirs)	Embayments must have at least one sampling station to determine use support.
Natural lakes and public fishing or water supply lakes	Areas considered assessed should not exceed 200 acres per sampling point.
Tidal rivers and streams	Use the lesser of the distances to the following points but not to exceed a total distance of 5 miles per sampling point: <ul style="list-style-type: none"> ▪ Upstream and downstream to the first point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the main stem of the water body ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Upstream to the extent of the tidal influence Any combination of the above points
Estuaries	Areas considered assessed should not exceed 5 square miles per sampling point.

- Partially Supporting – For any one pollutant, acute or chronic criteria exceeded more than once in a 3-year period but in < 10 percent of the samples based on 10 or more samples.
- Not Supporting – For any one pollutant, acute or chronic criteria exceeded in > 10 percent of the samples based on 10 or more samples.

In those cases where the applicable water quality criteria is less than the method detection limit for a particular pollutant the water body will be considered unassessed for that pollutant. When the number of samples collected in a 3-year period is between 5 and 10 the use support status will be based on best professional judgment using the available information and applying the same guidelines as for conventional parameters.

3. Biological Assessments

Biological assessments compare data from biological surveys and other direct measurements of resident biota in surface waters to established biological criteria and assess the water body's degree of use support. Alabama has not established numeric biological criteria and, as a result, biological data are used as a means of applying narrative criteria contained in Alabama's water quality criteria document (ADEM Admin. Code R. 335-6-10). Although EPA has not made specific recommendations concerning the interpretation of biological data it has offered the following technical considerations when using biological data to make use support determinations.

1. A water body's use support should be based on a comparison of site-specific biological data to a reference condition established for the ecoregion in which the water body is located.
2. A multimetric approach to bioassessment is recommended.
3. The biosurvey should include an assessment of habitat structure or condition.
4. The use of a standardized index or sampling period is recommended.
5. Standard operating procedures and a quality assurance program should be established.
6. A determination of the performance characteristics of the bioassessment methodology is suggested.
7. An identification of the appropriate number of sampling sites that are representative of the water body is also recommended.

Biological assessment data will generally be used in combination with other surface water quality data or information to arrive at an overall use support determination. However, EPA recommends that biological data should be weighted more heavily than other types of data when integrating information to make use support determinations since biological data provide a more direct indication of the condition of the aquatic community. For the purpose of making use support determinations for Alabama's §305(b) report and §303(d) list the following guidelines regarding interpretation of biological data will be used.

- Fully Supporting – Macroinvertebrates determined to be Excellent (Unimpaired), Good (Slightly Impaired) or Fair (Moderately Impaired) rating if Chemical /Physical/Field data indicates compliance.
- Partial Support - Macroinvertebrates determined to be Fair (Moderately Impaired) and Chemical/Physical/Field data indicates impairment.
- Not Supporting – Macroinvertebrates determined to be Poor (Severely Impaired) and Chemical/Physical/Field data indicates impairment.

Appendix C
Alabama's Water Quality Categorization Methodology

Alabama's Water Quality Categorization Methodology

A. Which waters belong in Category 1?

Waters belong in Category 1 if they are attaining all designated uses. Segments should be listed in this category if there are data and information that are consistent with the State's listing and assessment methodology and support a determination that all WQSs are attained. These waters will generally be waters that have both chemical/physical data and macroinvertebrate assessments. The same minimum data requirements shown in ADEM's Water Quality Assessment Methodology for listing a water as impaired apply to this category.

B. Which waters belong in Category 2?

Waters should be placed in Category 2 if there are some data and information available for the waterbody but the information is insufficient to make a determination that the water does or does not support all of its designated uses. Waters in this category will generally contain only limited water quality data (< 5 samples), limited parameter coverage (i.e. only temperature and conductivity), or only macroinvertebrate/habitat assessments. These waters have not met the minimum data requirements shown in ADEM's Water Quality Assessment Methodology for listing a water as impaired.

C. Which waters belong in Category 3?

Waters belong in Category 3 if there are no data and information to determine, consistent with the State's listing methodology, if any designated use is attained. To assess the attainment status of these waters, States should schedule monitoring on a priority basis to obtain data and should also make efforts obtain information necessary to move these waters into Categories 1, 2, 4b, 4c, or 5. Waters in this category will generally not have chemical/physical/biological data collected within the last 5 - 10 years upon which to make a use support determination.

D. Which waters belong in Category 4?

Waters belong in Category 4 if one or more designated uses are impaired or threatened but establishment of a TMDL is not required. States may place an impaired water that does not require a TMDL in one of the following three subcategories: a TMDL has been completed for the water-pollutant combination (Category 4A), other required control measures are expected to result in the attainment of WQSs in a reasonable period of time (Category 4B); and the impairment is not caused by a pollutant (Category 4C).

1. Which waters belong in Category 4A?

Waters should only be placed in Category 4A when all TMDLs needed to result in attainment of all applicable WQSs have been approved or established by EPA. Once the TMDLs have been approved or established, the State should implement the TMDL as soon as practicable. Additionally, EPA encourages States to provide monitoring schedules for these waters to ensure that sufficient data are obtained to document progress of the implementation actions toward the attainment of WQSs, and that progress is reasonably consistent with the projected time of attainment included in the TMDL.

2. Which waters belong in Category 4B?

Current regulations do not require TMDLs for all waters. Some waters may be excluded from Category 5, and placed into Category 4B. In order to meet the requirements to place these waters into Category 4B, the State must demonstrate that "other pollution control requirements (e.g., best management practices) required by local, State or Federal authority" (see 40 CFR 130.7(b)(1)(iii)) are expected to address all water-pollutant combinations and attain all WQSs in a reasonable period of time. EPA

expects that States will provide adequate documentation that the required control TMDL-01-03 necessary reductions in pollutant loading from point sources, such reductions are achieved through restrictions set out in the NPDES permit or state permit for each point source. 33 U.S.C. 1311(a), 1362(12) and (14); 40 C.F.R. 122.44(d)(1)(vii)(B). But when a TMDL identifies necessary reductions in pollutant loadings from nonpoint sources, such reductions maybe implemented only under state law, because the CWA does not have a permit program for, or otherwise regulate pollutant loadings from, nonpoint sources. See *NRDC v. EPA*, 915 F.2d 1314, 1316 (9th Cir. 1990). EPA has no authority to enforce TMDL pollutant-loading reductions against nonpoint sources or to require a State to do so. EPA may, however, disburse funds to the States to assist their implementation of nonpoint source management programs, including the development of best management practices to control non-point source pollution. See 33 U.S.C.

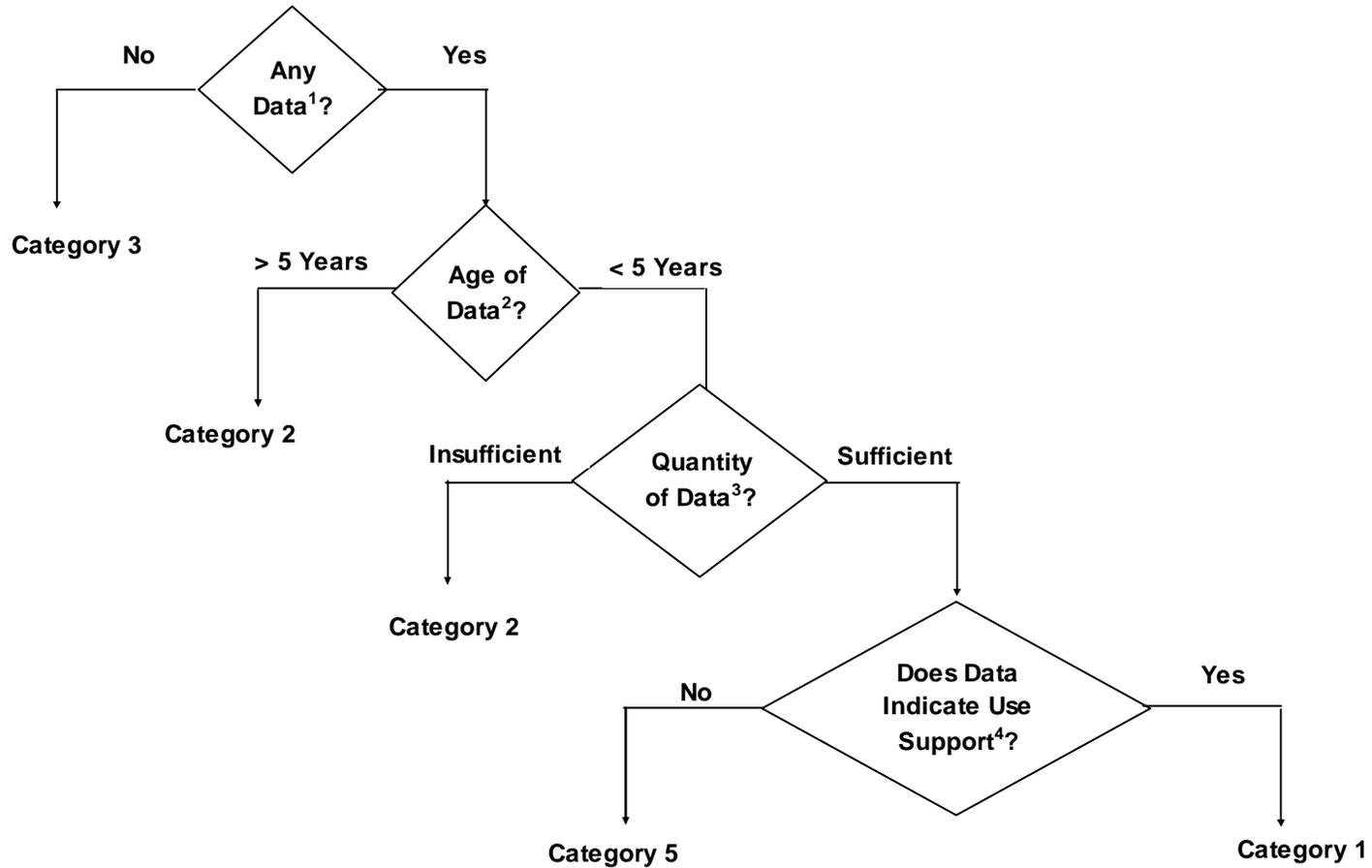
3. Which waters belong in Category 4C?

Waters should be listed in this subcategory when an impairment is not caused by a pollutant. States should schedule these segments for monitoring to confirm that there continues to be no pollutant-caused impairment and to support water quality management actions necessary to address the cause(s) of the impairment. Pollution, as defined by the CWA, is “the man-made or man-induced alteration of the chemical, physical, biological, and radiological integrity of water” (Section 502(19)). In some cases, the pollution is caused by the presence of a pollutant and a TMDL is required. In other cases, pollution does not result from a pollutant and a TMDL is not required. Elevated temperature that results from man-made thermal discharges does require a temperature TMDL based on the protection or propagation of a balanced indigenous population of shellfish, fish, and wildlife. The following are two examples of pollution caused by pollutants. The discharge of copper from an NPDES regulated facility is the introduction of a pollutant into a water. To the extent that this pollutant alters the chemical or biological integrity of the water, it is also an example of pollution. (Copper is not likely to cause an alteration to the water’s physical integrity). Similarly, actions that modify the landscape and may result in the introduction of sediment into a water constitute pollution when sediment (which is a pollutant) results in an alteration of the chemical, physical, biological or radiological integrity of the water. TMDLs would have to be established for each of these waters. EPA does not believe that flow, or lack of flow, is a pollutant as defined by CWA Section 502(6). Low flow can be a man-induced condition of a water (i.e., a reduced volume of water) which fits the definition of pollution. Lack of flow sometimes leads to the increase of the concentration of a pollutant (e.g., sediment) in a water. In the situation where a pollutant is present a TMDL, which may consider variations in flow, is required for that pollutant.

E. Which waters belong in Category 5?

This category constitutes the Section 303(d) list that EPA will approve or disapprove under the CWA. Waters should be placed in Category 5 when it is determined, in accordance with the State's assessment and listing methodology, that a pollutant has caused, is suspected of causing, or is projected to cause an impairment or threat. If that impairment or threat is due to a pollutant, the water should be placed in Category 5 and the pollutant causing the impairment identified. A water is considered impaired when one or more designated uses are not attained. Where more than one pollutant is causing the impairment, the water should remain in Category 5 until all pollutants are addressed in a completed/EPA-approved TMDL or by one of the delisting factors mentioned in the answer to question 2.a. below in this section.

**Figure C-1
Category Assessment Flowchart for 305(b) Report**



C-3

Footnotes:

- ¹ Data is defined as physical/chemical measurements, macroinvertebrate assessments, habitat assessments, and fish assessments.
- ² Data older than 5 years may be used provided watershed conditions has remained relatively constant. Data older than 10 years should not be used.
- ³ Data sufficiency is defined by the State's Assessment Methodology.
- ⁴ Use support is determined using the State's Assessment Methodology.

Appendix D
Categorization of Alabama's Waters

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150201-0203-102	Autauga Creek	Western boundary of Prattville	Its source	S/F&W	Alabama	1		2004	Autauga/Chilton
AL03150201-0407-100	Pintlalla Creek	Alabama River	Its source	S/F&W	Alabama	1		2004	Crenshaw/Lowndes/Montgomery
AL03150201-1003-100	Mulberry Creek	Plantersville	Its source	F&W	Alabama	1		2004	Autauga/Chilton/Dallas
AL03150201-1004-100	Buck Creek	Mulberry Creek	Its source	F&W	Alabama	1		2004	Autauga/Chilton
AL03150201-1102-101	Valley Creek	Alabama River	Selma-Summerfield Road	S/F&W	Alabama	1		2004	Dallas
AL03150201-1102-102	Valley Creek	Selma-Summerfield Road	Its source	F&W	Alabama	1		2004	Dallas/Chilton
AL03150201-1203-100	Soapstone Creek	Alabama River	Its source	F&W	Alabama	1		2004	Dallas/Lowndes
AL03150203-0506-100	Pine Barren Creek	Alabama River	Its source	S/F&W	Alabama	1		2004	Butler/Dallas/Wilcox
AL03150203-0604-200	Cub Creek	Beaver Creek	Its source	F&W	Alabama	1		2004	Clarke/Marengo/Wilcox
AL03150203-0801-100	Gravel Creek	Pursley Creek	Its source	F&W	Alabama	1		2004	Wilcox
AL03150203-0802-100	Pursley Creek	Alabama River	Its source	F&W	Alabama	1		2004	Wilcox
AL03150204-0104-100	Silver Creek	Alabama River	Its source	F&W	Alabama	1		2004	Clarke
AL03160109-0206-500	Rice Creek	Mulberry Fork	Its source	F&W	Black Warrior	1		2004	Cullman
AL03160109-0309-100	Blackwater Creek	Mulberry Fork	Its source	F&W	Black Warrior	1		2004	Walker/Winston
AL03160109-0401-100	Mill Creek	Lost Creek	Its source	F&W	Black Warrior	1		2004	Walker
AL03160109-0602-101	Cane Creek (Jasper)	Mulberry Fork	Town Creek	LWF	Black Warrior	1	10.6	2004	Walker
AL03160109-0602-801	Town Creek	Cane Creek	100 yards upstream of Southern Railway Crossing	LWF	Black Warrior	1	1.1	2004	Walker
AL03160110-0101-110	Parker Branch	Hubbard Creek	Its source	F&W (ONRW)	Black Warrior	1	3.8	2004	Lawrence
AL03160110-0101-120	Whitman Creek	Hubbard Creek	Its source	F&W (ONRW)	Black Warrior	1	3.7	2004	Lawrence
AL03160110-0101-130	Maxwell Creek	Hubbard Creek	Its source	F&W (ONRW)	Black Warrior	1	2.0	2004	Lawrence
AL03160110-0101-140	Basin Creek	Hubbard Creek	Its source	F&W (ONRW)	Black Warrior	1	2.8	2004	Lawrence
AL03160110-0101-150	Dunn Branch	Maxwell Creek	Its source	F&W (ONRW)	Black Warrior	1	1.3	2004	Winston
AL03160110-0101-160	Natural Well Branch	Maxwell Creek	Its source	F&W (ONRW)	Black Warrior	1	1.5	2004	Winston
AL03160110-0101-200	Fall Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	2.1	2004	Lawrence/Winston
AL03160110-0101-300	Bee Branch	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	2.1	2004	Lawrence
AL03160110-0101-400	Thompson Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	8.6	2004	Lawrence
AL03160110-0101-500	Hubbard Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	6.6	2004	Lawrence/Winston
AL03160110-0101-600	Tedford Creek	Thompson Creek	Its source	F&W (ONRW)	Black Warrior	1	3.7	2004	Lawrence
AL03160110-0101-700	Mattox Creek	Thompson Creek	Its source	F&W (ONRW)	Black Warrior	1	3.3	2004	Lawrence
AL03160110-0101-800	Ross Branch	Tedford Creek	Its source	F&W (ONRW)	Black Warrior	1	2.1	2004	Lawrence
AL03160110-0101-900	Quillan Creek	Hubbard Creek	Its source	F&W (ONRW)	Black Warrior	1	3.8	2004	Lawrence
AL03160110-0102-100	Borden Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	16.6	2004	Lawrence/Winston
AL03160110-0102-200	Braziel Creek	Borden Creek	Its source	F&W (ONRW)	Black Warrior	1	5.7	2004	Lawrence
AL03160110-0102-300	Flannagin Creek	Borden Creek	Its source	F&W (ONRW)	Black Warrior	1	10.0	2004	Lawrence
AL03160110-0102-400	Horse Creek	Borden Creek	Its source	F&W (ONRW)	Black Warrior	1	1.8	2004	Lawrence
AL03160110-0102-500	Montgomery Creek	Borden Creek	Its source	F&W (ONRW)	Black Warrior	1	4.0	2004	Lawrence

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160110-0102-600	Hagood Creek	Braziel Creek	Its source	F&W (ONRW)	Black Warrior	1	4.2	2004	Lawrence
AL03160110-0102-700	Dry Creek	Flannagin Creek	Its source	F&W (ONRW)	Black Warrior	1	2.2	2004	Lawrence
AL03160110-0103-200	Payne Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	3.9	2004	Winston
AL03160110-0103-300	Caney Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	4.7	2004	Winston
AL03160110-0103-400	Hurricane Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	2.3	2004	Winston
AL03160110-0103-500	Davis Creek	Sipsey Fork	Its source	F&W (ONRW)	Black Warrior	1	2.8	2004	Lawrence/Winston
AL03160110-0103-600	North Fork Caney Creek	Caney Creek	Its source	F&W (ONRW)	Black Warrior	1	6.4	2004	Winston
AL03160110-0103-700	South Fork Caney Creek	Caney Creek	Its source	F&W (ONRW)	Black Warrior	1	5.1	2004	Winston
AL03160110-0104-102	Sipsey Fork	Sandy Creek	Its source	F&W (ONRW)	Black Warrior	1	21.2	2004	Lawrence/Winston
AL03160110-0104-200	Cane Creek	Sipsey Fork	Its source	F&W	Black Warrior	1		2004	Winston
AL03160110-0104-500	Sandy Creek	Sipsey Fork	Its source	F&W	Black Warrior	1		2004	Winston
AL03160110-0201-200	Rush Creek	Brushy Creek	Its source	F&W	Black Warrior	1		2004	Lawrence/Winston
AL03160110-0202-200	Capsey Creek	Brushy Creek	Its source	F&W	Black Warrior	1		2004	Lawrence/Winston
AL03160110-0203-101	Brushy Creek	Sipsey Fork	US Highway 278	PWS/F&W	Black Warrior	1	14.3	2004	Winston
AL03160110-0203-102	Brushy Creek	US Highway 278	Its source	F&W	Black Warrior	1		2004	Lawrence/Winston
AL03160110-0203-110	Inman Creek	Brushy Creek	Its source	F&W	Black Warrior	1		2004	Winston
AL03160110-0401-100	Blevens Creek	Rock Creek	Its source	F&W	Black Warrior	1		2004	Cullman/Winston
AL03160110-0402-100	Rock Creek	Blevens Creek	Its source	F&W	Black Warrior	1		2004	Cullman/Winston
AL03160110-0407-100	White Oak Creek	Rock Creek	Its source	F&W	Black Warrior	1		2004	Cullman/Winston
AL03160110-0502-100	Ryan Creek	Lake Lewis Smith	Its source	F&W	Black Warrior	1		2004	Cullman
AL03160110-0504-100	Sipsey Fork	Mulberry Fork	Lewis Smith Dam	PWS/F&W	Black Warrior	1	13.9	2004	Cullman/Walker
AL03160110-0506-101	Sipsey Fork (Lake Lewis Smith)	Lewis Smith dam	3 miles upstream from Lewis Smith Dam	PWS/S/F&W	Black Warrior	1	2.8	2004	Cullman/Walker
AL03160111-0207-100	Blackburn Fork	Inland Lake Dam	Its source	PWS/S	Black Warrior	1	20.4	2004	Blount
AL03160111-0208-100	Little Warrior River	Locust Fork	Its source	F&W	Black Warrior	1		2004	Blount
AL03160111-0208-300	Blackburn Fork	Little Warrior River	Inland Lake Dam	F&W	Black Warrior	1		2004	Blount
AL03160111-0208-800	Hendrick Mill Branch	Blackburn Fork	Its source	F&W	Black Warrior	1		2004	Blount
AL03160111-0405-400	Tarrant Spring Branch	Fivemile Creek	Its source	F&W	Black Warrior	1		2004	Jefferson
AL03160111-0408-103	Village Creek	Woodlawn Bridge	Its source	LWF	Black Warrior	1	4.0	2004	Jefferson
AL03160112-0301-100	Blue Creek	Black Warrior River	Its source	F&W	Black Warrior	1		2004	Tuscaloosa
AL03160112-0301-400	Jock Creek	Blue Creek	Its source	F&W	Black Warrior	1		2004	Tuscaloosa
AL03160112-0303-100	Pegues Creek	Black Warrior River	Its source	F&W	Black Warrior	1		2004	Tuscaloosa
AL03160112-0304-100	Daniel Creek	Black Warrior River	Its source	F&W	Black Warrior	1		2004	Tuscaloosa
AL03160112-0403-100	Binion Creek	North River	Its source	F&W	Black Warrior	1		2004	Fayette/Tuscaloosa
AL03160112-0403-600	Barbee Creek	Binion Creek	Its source	F&W	Black Warrior	1		2004	Fayette/Tuscaloosa
AL03160112-0404-700	Tyro Creek	North River	Its source	F&W	Black Warrior	1		2004	Fayette/Tuscaloosa
AL03150202-0101-103	Cahaba River	I-59	Its source	OAW/F&W	Cahaba	1	8.8	2004	Jefferson/St. Clair
AL03150202-0103-101	Little Cahaba River	Cahaba River	Head of Lake Purdy	PWS	Cahaba	1	10.7	2004	Jefferson/Shelby
AL03150202-0401-200	Mayberry Creek	Shoal Creek	Its source	F&W	Cahaba	1	8.5	2004	Bibb/Shelby
AL03150202-0403-100	Sixmile Creek	Little Cahaba River	Its source	S	Cahaba	1	27.3	2004	Bibb/Chilton
AL03150202-0404-100	Little Cahaba River	Cahaba River	Its source	OAW/F&W	Cahaba	1	16.5	2004	Bibb

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150202-0404-300	Fourmile Creek	Little Cahaba River	Its source	F&W	Cahaba	1	5.6	2004	Bibb/Shelby
AL03150202-0405-300	Caffee Creek	Cahaba River	Its source	F&W	Cahaba	1	17.8	2004	Bibb/Tuscaloosa
AL03150202-0702-400	Silver Creek	Cahaba River	Its source	F&W	Cahaba	1	3.8	2004	Perry
AL03150202-0804-100	Little Oakmulgee Creek	Oakmulgee Creek	Its source	S	Cahaba	1	18.7	2004	Chilton/Dallas/ Perry
AL03150202-0902-100	Cahaba River	Alabama River	Alabama Highway 82	OAW/S	Cahaba	1	89.4	2004	Bibb/Dallas/Perry
AL03130002-0806-100	Wehadkee Creek	AL-GA state line	Its source	F&W	Chattahoochee	1		2004	Chambers/Randolph
AL03130002-0903-200	Barrow Creek	Oseligee Creek	Its source	F&W	Chattahoochee	1		2004	Chambers
AL03130002-0908-102	Chattahoochee River	West Point Manufacturing Co. water supply intake	West Point Dam	PWS	Chattahoochee	1	4.3	2004	Chambers
AL03130002-1106-100	Osanippa Creek	Chattahoochee River	Its source	F&W	Chattahoochee	1		2004	Chambers/Lee
AL03130002-1303-100	Chattahoochee River	Oliver Dam	Osanippa Creek	PWS/S/F&W	Chattahoochee	1	18.6	2004	Lee
AL03130003-0101-102	Chattahoochee River	14th St. Bridge between Columbus and Phenix City	Oliver Dam	PWS/S/F&W	Chattahoochee	1	3.1	2004	Lee/Russell
AL03130003-0504-101	Uchee Creek	Chattahoochee River	Russell County Road 39	S/F&W	Chattahoochee	1		2004	Russell
AL03130003-0504-102	Uchee Creek	Russell County Road 39	Alabama Highway 169	PWS/S/F&W	Chattahoochee	1	11.0	2004	Russell
AL03130003-0504-103	Uchee Creek	Alabama Highway 169	Its source	S/F&W	Chattahoochee	1		2004	Lee/Russell
AL03130003-0605-100	Ihagee Creek	Chattahoochee River	Its source	S/F&W	Chattahoochee	1		2004	Russell
AL03130003-0802-102	Hatchechubbee Creek	Russell County Highway 4	Its source	F&W	Chattahoochee	1		2004	Russell
AL03130003-0804-100	Hatchechubbee Creek	Chattahoochee River	Russell County Highway 4	S/F&W	Chattahoochee	1		2004	Russell
AL03130003-1103-100	Middle Fork of Cowikee Creek	North Fork of Cowikee Creek	Its source	S/F&W	Chattahoochee	1		2004	Barbour/Bullock/ Russell
AL03130003-1109-100	Halawakee Creek	Chattahoochee River	three miles upstream of County Road 79	PWS/F&W	Chattahoochee	1	17.0	2004	Lee
AL03130003-1204-100	South Fork of Cowikee Creek	Cowikee Creek	Its source	S/F&W	Chattahoochee	1		2004	Barbour/Bullock
AL03130003-1205-200	North Fork of Cowikee Creek	Cowikee Creek	Its source	F&W	Chattahoochee	1		2004	Barbour/Russell
AL03130004-0101-300	McRae Mill Creek	Chattahoochee River	Its source	F&W	Chattahoochee	1		2004	Henry
AL03130004-0604-100	Spivey Mill Creek	Omusee Creek	Its source	F&W	Chattahoochee	1		2004	Henry
AL03130004-0702-100	Cedar Creek	Chattahoochee River	Its source	F&W	Chattahoochee	1		2004	Houston
AL03130004-0702-100	Bennett Mill Creek	Chattahoochee River	Its source	F&W	Chattahoochee	1		2004	Henry
AL03140201-0208-100	East Fork of Choctawhatchee River	Choctawhatchee River	Blackwood Creek	F&W	Choctawhatchee	1		2004	Dale
AL03140201-0208-200	Seabes Creek	East Fork of Choctawhatchee River	Its source	F&W	Choctawhatchee	1		2004	Dale
AL03140201-0404-100	Clearwater Creek	Pea River	Its source	F&W	Choctawhatchee	1		2004	Coffee/Pike
AL03140202-0905-100	Pea River	Choctawhatchee River	Its source	F&W	Choctawhatchee	1		2004	Barbour/Bullock/ Coffee/Dale/Geneva/ Pike
AL03150105-0702-101	Middle Fork of Little River	East Fork of Little River	AL-GA state line	PWS/S/F&W (ONRW)	Coosa	1	2.4	2004	DeKalb

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150105-0702-200	Brush Creek	Middle Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	3.3	2004	DeKalb
AL03150105-0702-300	Anna Branch	Middle Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	2.2	2004	DeKalb
AL03150105-0702-400	Blalock Branch	Anna Branch	Its source	PWS/S/F&W (ONRW)	Coosa	1	3.3	2004	DeKalb
AL03150105-0702-500	Stillhouse Branch	Blalock Branch	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.1	2004	DeKalb
AL03150105-0703-100	East Fork of Little River	Little River	AL-GA state line	PWS/S/F&W (ONRW)	Coosa	1	9.3	2004	Cherokee/DeKalb
AL03150105-0703-200	Laurel Creek	East Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	3.9	2004	DeKalb
AL03150105-0703-300	Gilbert Branch	East Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.9	2004	DeKalb
AL03150105-0703-400	Shrader Branch	Laurel Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.8	2004	DeKalb
AL03150105-0703-500	Armstrong Branch	Laurel Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.8	2004	DeKalb
AL03150105-0704-201	East Fork West Fork of Little River	West Fork of Little River	AL-GA state line	PWS/S/F&W (ONRW)	Coosa	1	0.4	2004	DeKalb
AL03150105-0705-100	West Fork of Little River	Little River	AL-GA state line	PWS/S/F&W (ONRW)	Coosa	1	18.7	2004	DeKalb
AL03150105-0705-200	Straight Creek	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	4.1	2004	DeKalb
AL03150105-0705-300	Sharp Branch	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.4	2004	DeKalb
AL03150105-0705-400	Seymour Branch	West Fork of Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	2.4	2004	DeKalb
AL03150105-0801-200	Hurricane Creek	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	6.3	2004	DeKalb
AL03150105-0802-100	Yellow Creek	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	5.8	2004	DeKalb
AL03150105-0802-200	Straight Creek	Yellow Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	2.7	2004	DeKalb
AL03150105-0803-100	Bear Creek	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	8.2	2004	DeKalb
AL03150105-0803-200	Falls Branch	Bear Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	2.1	2004	DeKalb
AL03150105-0803-300	Hicks Creek	Bear Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	3.0	2004	DeKalb
AL03150105-0804-100	Johnnies Creek	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	11.5	2004	Cherokee/DeKalb
AL03150105-0804-200	Camprock Creek	Johnnies Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	3.3	2004	DeKalb
AL03150105-0804-300	Dry Creek	Johnnies Creek	Its source	PWS/S/F&W (ONRW)	Coosa	1	2.3	2004	DeKalb
AL03150105-0805-100	Wolf Creek	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	8.9	2004	Cherokee/DeKalb
AL03150105-0806-100	Little River	Coosa River	Its source	PWS/S/F&W (ONRW)	Coosa	1	22.2	2004	Cherokee/DeKalb
AL03150105-0806-200	Brooks Branch	Little River	Its source	PWS/S/F&W (ONRW)	Coosa	1	1.5	2004	DeKalb
AL03150106-0602-102	Sweetwater Lake	within Talladega National Forest		PWS/S/F&W	Coosa	1	1.1	2004	Cleburne
AL03150106-0604-102	Hillabee Lake	within Talladega National Forest		PWS/S/F&W	Coosa	1	2.5	2004	Calhoun
AL03150107-0801-300	East Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W	Coosa	1	5.3	2004	Clay
AL03150107-0801-400	West Fork Hatchet Creek	Hatchet Creek	Its source	OAW/F&W	Coosa	1	7.7	2004	Clay
AL03150107-0802-102	Hatchet Creek	Norfolk Southern Railway	Its source	OAW/PWS/S/F&W	Coosa	1	17.7	2004	Clay/Coosa
AL03150107-0807-100	Hatchet Creek	Coosa River	Norfolk Southern Railway	OAW/S/F&W	Coosa	1	44.4	2004	Coosa
AL03170008-0501-200	Pasture Creek	Big Creek	Its source	F&W	Escatawpa	1		2004	Mobile
AL03170008-0502-300	Deakle Creek	Miller Creek	Its source	F&W	Escatawpa	1		2004	Mobile
AL03170008-0601-100	Jackson Creek	AL-MS state line	Its source	F&W	Escatawpa	1	12.9	2004	Mobile
AL03170009-0102-400	Hammar Creek	Carls Creek	Its source	F&W	Escatawpa	1		2004	Mobile
AL03160201-0102-400	Poplar Creek	Chickasaw Bogue	Its source	F&W	Lower Tombigbee	1		2004	Marengo
AL03160201-0202-100	Kinterbish Creek	Tombigbee River	Its source	S/F&W	Lower Tombigbee	1		2004	Choctaw/Sumter

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160202-0303-102	Sucarnoochee River	US Highway 11	Five miles upstream from Livingston city limits	PWS/S/F&W	Lower Tombigbee	1	11.7	2004	Sumter
AL03160202-0703-100	Sucarnoochee River	Tombigbee River	US Highway 11	F&W	Lower Tombigbee	1		2004	Sumter
AL03160203-0201-100	Ulcanish Creek	Tombigbee River	Its source	F&W	Lower Tombigbee	1		2004	Clarke
AL03160203-0602-200	James Creek	Bassett Creek	Its source	F&W	Lower Tombigbee	1		2004	Clarke
AL03160204-0105-700	Briar Lake	Junction of Tensaw River	Junction of Tensaw Lake	OAW/F&W	Mobile	1	3.6	2004	Baldwin
AL03160204-0105-801	Tensaw Lake	Junction of Tensaw River	Bryant Landing	OAW/F&W	Mobile	1	5.2	2004	Baldwin
AL03160204-0501-200	Halls Creek	Tensaw Lake	Its source	F&W	Mobile	1		2004	Baldwin
AL03150110-0301-102	Chewacla Creek	Chewacla State Park (Moore's Mill Creek)	Its source	PWS/F&W	Tallapoosa	1	14.9	2004	Lee
AL03150201-0103-100	Mortar Creek	Alabama River	Its source	F&W	Alabama	2	24.0	2004	Elmore
AL03150201-0105-400	Pierce Creek	Mill Creek	Its source	F&W	Alabama	2	2.9	2004	Autauga
AL03150201-0203-101	Autauga Creek	Alabama River	Western boundary of Prattville	F&W	Alabama	2			
AL03150201-0304-100	Catoma Creek	Ramer Creek	Its source	F&W	Alabama	2			
AL03150201-0603-100	Swift Creek	Alabama River	Its source	S/F&W	Alabama	2	41.3	2004	Autauga/Chilton
AL03150201-0706-100	Alabama River	Jones Bluff Lock and Dam	Pintlalla Creek	S/F&W	Alabama	2			
AL03150201-1002-300	Morgan Creek	Little Mulberry Creek	Its source	F&W	Alabama	2	6.6	2004	Chilton
AL03150201-1005-100	Mulberry Creek	Alabama River	Plantersville	S/F&W	Alabama	2			
AL03150203-0308-100	Bogue Chitto Creek	Alabama River	Its source	F&W	Alabama	2			
AL03150203-0402-200	Chilatchee Creek	Alabama River	Its source	S/F&W	Alabama	2			
AL03150203-0604-100	Beaver Creek	Alabama River	Its source	F&W	Alabama	2			
AL03150204-0404-100	Randons Creek	Alabama River	Its source	F&W	Alabama	2			
AL03150204-0404-300	Bear Creek	Randons Creek	Its source	F&W	Alabama	2			
AL03150204-0603-100	Little River	Alabama River	Its source	S/F&W	Alabama	2			
AL03160111-0305-101	Self Creek	Locust Fork	Town of Bradford's water supply intake	F&W	Black Warrior	2	11.0	2004	Jefferson
AL03160111-0305-102	Self Creek	Town of Bradford's water supply intake	Its source	PWS	Black Warrior	2	3.8	2004	Jefferson
AL03160111-0413-101	Locust Fork	Junction of Locust and Mulberry Forks	Jefferson County Highway 61	PWS/S/F&W	Black Warrior	2	6.8	2004	Jefferson
AL03160111-0413-102	Locust Fork	Jefferson County Highway 61	Jefferson County Road 77	F&W	Black Warrior	2	36.2	2004	Jefferson
AL03160112-0101-102	Valley Creek	Opossum Creek	Its source	LWF	Black Warrior	2	13.7	2004	Jefferson
AL03160112-0102-100	Valley Creek	Blue Creek	19 th Street North (Bessemer)	LWF	Black Warrior	2	10.8	2004	Jefferson
AL03160112-0401-202	Clear Creek	Bugs Lake Dam	Its source	PWS	Black Warrior	2	8.6	2004	Fayette
AL03160112-0501-102	Yellow Creek	City of Tuscaloos'a water supply reservoir dam	Its source	PWS	Black Warrior	2	14.3	2004	Tuscaloosa
AL03150202-0103-102	Little Cahaba River	Head of Lake Purdy	Its source	F&W	Cahaba	2	13.7	2004	Jefferson
AL03150202-0202-102	Buck Creek	Cahaba Valley Creek	Shelby County Road 44	LWF	Cahaba	2	6.0	2004	Shelby
AL03150202-0202-103	Buck Creek	Shelby County Road 44	Its source	F&W	Cahaba	2	8.3	2004	Shelby
AL03150202-0202-402	Cahaba Valley Creek	US Highway 31	Its source	F&W	Cahaba	2	10.9	2004	Shelby
AL03150202-0302-110	Little Shades Creek	Shades Creek	Its source	F&W	Cahaba	2	9.0	2004	Jefferson

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150202-0504-100	Haysop Creek	Cahaba River	Its source	F&W	Cahaba	2	26.9	2004	Bibb
AL03150202-0505-100	Affonee Creek	Cahaba River	Its source	S	Cahaba	2	18.5	2004	Bibb
AL03150202-0506-100	Blue Girth Creek	Cahaba River	Its source	S	Cahaba	2	15.1	2004	Bibb/Perry
AL03150202-0602-200	Old Town Creek	Cahaba River	Its source	S	Cahaba	2	12.2	2004	Perry
AL03150202-0701-200	Rice Creek	Cahaba River	Its source	F&W	Cahaba	2	14.8	2004	Perry
AL03150202-0701-300	Waters Creek	Cahaba River	Its source	S	Cahaba	2	9.9	2004	Perry
AL03150202-0805-100	Oakmulgee Creek	Cahaba River	Its source	S	Cahaba	2	56.7	2004	Bibb/Chilton/Dallas/Perry
AL03150202-0901-100	Childers Creek	Cahaba River	Its source	F&W	Cahaba	2	18.8	2004	Dallas
AL03150202-0902-501	Dry Creek	Cahaba River	Dallas County Road 201	F&W	Cahaba	2	4.7	2004	Dallas
AL03130003-1002-100	Hurtsboro Creek	North Fork of Cowikee Creek	Its source	A&I	Chattahoochee	2	18.2	2004	Macon/Russell
AL03130003-0403-100	Little Uchee Creek	Uchee Creek	Its source	F&W	Chattahoochee	2		2004	Lee/Russell
AL03130012-0205-100	Buck Creek	AL-FL state line	Its source	F&W	Chipola	2	11.1	2004	Houston
AL03150106-0103-102	Black Creek	Neely Henry Lake	U.S. Highway 431	A&I	Coosa	2	2.2	2004	Etowah
AL03160202-0502-101	Toomsba Creek	Alamuchee Creek	AT&N Railroad	F&W	Lower Tombigbee	2	1.1	2004	Sumter
AL03160202-0502-102	Toomsba Creek	AT&N Railroad	AL-MS state line	PWS/F&W	Lower Tombigbee	2	9.3	2004	Sumter
AL03160203-0502-200	UT to Toomsba Creek (Lake Louise)	Toomsba Creek	Its source	PWS	Lower Tombigbee	2	2.4	2004	Sumter
AL03160204-0504-200	Industrial Canal	Threemile Creek	Its source	A&I	Mobile	2	2.3	2004	Mobile
AL03150109-0201-102	High Pine Creek	Highway 431 crossing	Its source	PWS	Tallapoosa	2	9.3	2004	Randolph
AL03150109-0404-101	Hillabee Creek	Junction of Oaktassi and Town Creeks	County road bridge 3 miles east of Hackneyville	PWS/F&W	Tallapoosa	2	5.9	2004	Tallapoosa
AL03150109-0404-500	Hackney Creek	Town Creek	Its source	PWS/F&W	Tallapoosa	2	6.8	2004	Tallapoosa
AL03150109-0502-101	Tallapoosa River	US Highway 280	Hillabee Creek	PWS/S/F&W	Tallapoosa	2	6.4	2004	Tallapoosa
AL03150109-0505-100	Tallapoosa River	Martin Dam	US Highway 280	S/F&W	Tallapoosa	2	20.4	2004	Elmore/Tallapoosa
AL03150110-0103-102	Tallapoosa River	Thurlow Dam	Yates Dam	PWS/S/F&W	Tallapoosa	2	2.7	2004	Elmore/Tallapoosa
AL03150110-0103-103	Tallapoosa River	Yates Dam	Martin Dam	PWS/S/F&W	Tallapoosa	2	8.6	2004	Elmore/Tallapoosa
AL03150110-0201-102	Sougahatchee Creek	Sougahatchee Lake Dam	Its source	PWS/F&W	Tallapoosa	2	8.1	2004	Chambers/Lee
AL03160110-0605-102	Tallapoosa River	US Highway 231	Thurlow Dam	PWS/F&W	Tallapoosa	2	40.3	2004	Elmore/Macon/Montgomery/Tallapoosa
AL06030002-0902-100	Tennessee River (Wheeler Lake)	Flint River	Guntersville Dam	S/F&W	Tennessee	2	10.0	2004	Madison/Marshall
AL06030002-0904-102	Tennessee River (Wheeler Lake)	Indian Creek	Flint River	PWS/F&W	Tennessee	2	20.8	2004	Madison/Marshall/Morgan
AL06030005-0101-100	Muddy Fork	Big Nance Creek	Crow Branch	A&I	Tennessee	2	10.9	2004	Lawrence
AL06030005-0101-700	Crow Branch	Muddy Fork	Its source	A&I	Tennessee	2	5.0	2004	Lawrence
AL03160103-0202-102	Buttahatchee River	US Highway 278	US Highway 278	PWS/F&W	Upper Tombigbee	2	8.7	2004	Marion
AL03160103-0204-102	Beaver Creek	US Highway 78	Its source	PWS/F&W	Upper Tombigbee	2	6.6	2004	Marion
AL03160105-0101-102	Luxapallila Creek	US Highway 78	Its source	PWS/F&W	Upper Tombigbee	2	9.5	2004	Marion
AL03160105-0101-200	East Branch Luxapallila Creek	Luxapallila Creek	Its source	PWS/F&W	Upper Tombigbee	2	10.8	2004	Marion

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160105-0201-102	Luxapallila Creek	Fayette County Road 37	county road crossing 6 miles upstream from Alabama	PWS/F&W	Upper Tombigbee	2	8.2	2004	Fayette
AL03150201-0101-100	Callaway Creek	Alabama River	Its source	F&W	Alabama	3	14.2	2004	Elmore
AL03150201-0101-200	Hurricane Branch	Callaway Creek	Its source	F&W	Alabama	3	5.3	2004	Elmore
AL03150201-0102-200	South Mortar Creek	Mortar Creek	Its source	F&W	Alabama	3	4.5	2004	Autauga
AL03150201-0103-200	Cottonford Creek	Mortar Creek	Its source	F&W	Alabama	3	4.9	2004	Elmore
AL03150201-0103-300	Middle Creek	Cottonford Creek	Its source	F&W	Alabama	3	7.2	2004	Elmore
AL03150201-0103-400	Kenner Creek	Cottonford Creek	Its source	F&W	Alabama	3	5.2	2004	Autauga/Elmore
AL03150201-0103-500	Pine Level Branch	Kenner Creek	Its source	F&W	Alabama	3	3.5	2004	Autauga
AL03150201-0104-100	Galbraith Mill Creek	Alabama River	Its source	F&W	Alabama	3	12.1	2004	Montgomery
AL03150201-0104-200	Sevenmile Creek	Galbraith Mill Creek	Its source	F&W	Alabama	3	5.1	2004	Montgomery
AL03150201-0104-301	Three Mile Branch	Galbraith Mill Creek	Lower Wetumpka Road	F&W	Alabama	3	0.2	2004	Montgomery
AL03150201-0105-100	Mill Creek	Crescent Lake	Its source	F&W	Alabama	3	8.1	2004	Autauga/Elmore
AL03150201-0105-200	Still Creek	Mill Creek	Its source	F&W	Alabama	3	5.6	2004	Elmore
AL03150201-0105-300	Hudson Creek	Mill Creek	Its source	F&W	Alabama	3	1.8	2004	Autauga
AL03150201-0105-500	Grandview Branch	Still Creek	Its source	F&W	Alabama	3	3.6	2004	Autauga/Elmore
AL03150201-0501-100	Alabama River	Pintlalla Creek	Its source	F&W	Alabama	3			
AL03150201-1207-101	Alabama River	Cahaba River	Blackwell Bend (Six Mile Creek)	S/F&W	Alabama	3			
AL03150201-1207-102	Alabama River	Blackwell Bend (Six Mile Creek)	Jones Bluff Lock and Dam	F&W	Alabama	3			
AL03150203-0301-200	Sand Creek	Bogue Chitto Creek	Its source	F&W	Alabama	3			
AL03150203-0601-100	Turkey Creek	Beaver Creek	Its source	F&W	Alabama	3			
AL03150203-0701-100	Alabama River	Millers Ferry Lock and Dam	Cahaba River	S/F&W	Alabama	3			
AL03150203-0703-102	Alabama River	Rockwest Creek	Millers Ferry Lock and Dam	PWS	Alabama	3	4.4	2004	Wilcox
AL03150203-0703-200	Rockwest Creek	Alabama River	Its source	F&W	Alabama	3			
AL03150204-0105-100	Alabama River	Claiborne Lock and Dam	Bear Creek	S/F&W	Alabama	3			
AL03150204-0205-200	Big Flat Creek	Alabama River	Its source	S/F&W	Alabama	3			
AL03150204-0303-100	Limestone Creek	Alabama River	Its source	F&W	Alabama	3			
AL03150204-0701-100	Alabama River	Mobile River	Claiborne Lock and Dam	F&W	Alabama	3			
AL03160109-0106-900	Pope Creek	Bridge Creek	Its source	PWS	Black Warrior	3	2.8	2004	Cullman
AL03160109-0405-102	Lost Creek	2 miles upstream from Wolf Creek	Cane Creek	PWS/F&W	Black Warrior	3	5.3	2004	Walker
AL03160109-0603-101	Mulberry Fork	Burnt Cane Creek	Frog Ague Creek	PWS/F&W	Black Warrior	3	8.6	2004	Walker
AL03160109-0603-102	Mulberry Fork	Frog Ague Creek	Sipsey Fork	PWS/F&W	Black Warrior	3	13.5	2004	Walker
AL03160109-0604-100	Mulberry Fork	Locust Fork	Burnt Cane Creek	PWS/S/F&W	Black Warrior	3	21.8	2004	Jefferson/Walker
AL03160110-0104-122	Curtis Mill Creek	Town of Double Springs water supply reservoir dam	Its source	PWS	Black Warrior	3	1.8	2004	Winston

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160110-0301-102	Clear Creek	City of Haleyville water supply reservoir dam	Its source	PWS	Black Warrior	3	1.2	2004	Winston
AL03160111-0205-102	Calvert Prong	City of Oneonta's water supply intake	Its source	PWS	Black Warrior	3	13.2	2004	Blount
AL03160112-0203-100	Black Warrior River	Bankhead Lock and Dam	Its source	PWS/S/F&W	Black Warrior	3	19.4	2004	Jefferson/Tuscaloosa/Walker
AL03160112-0406-102	North River	City of Tuscaloosa's water supply reservoir dam	Binnion Creek	PWS/S	Black Warrior	3	16.8	2004	Tuscaloosa
AL03160113-0804-102	Black Warrior River	five miles upstream from Big Prarie Creek	eight miles upstream from Big Prarie Creek	PWS/S/F&W	Black Warrior	3	3.1	2004	Greene/Hale
AL03150202-0201-500	Little Shades Creek	Cahaba River	Its source	F&W	Cahaba	3	7.4	2004	Jefferson
AL03150202-0202-112	Oak Mountain State Park Lakes			PWS	Cahaba	3	1.8	2004	Shelby
AL03150202-0202-500	Peavine Creek	Buck Creek	Its source	F&W	Cahaba	3	9.9	2004	Shelby
AL03150202-0401-100	Shoal Creek	Little Cahaba River	Its source	F&W	Cahaba	3	19.1	2004	Bibb/Shelby
AL03150202-0402-100	Mahan Creek	Little Cahaba River	Its source	F&W	Cahaba	3	15.5	2004	Bibb/Chilton
AL03150202-0502-100	Schultz Creek	Cahaba River	Its source	S	Cahaba	3	16.4	2004	Bibb
AL03130012-0102-100	Rocky Creek	Cowarts Creek	Its source	F&W	Chipola	3	11.5	2004	Houston
AL03130012-0103-100	Cowarts Creek	AL-FL state line	Its source	F&W	Chipola	3	21.7	2004	Houston
AL03130012-0201-400	Limestone Creek	Big Creek	Its source	F&W	Chipola	3	10.8	2004	Houston
AL03130012-0204-100	Big Creek	AL-FL state line	Its source	F&W	Chipola	3	16.3	2004	Geneva/Houston
AL03150105-0906-102	Terrapin Creek	US Highway 278	Calhoun County Road 70 east of Vigo	PWS/F&W	Coosa	3	3.6	2004	Calhoun
AL03150105-0906-103	Terrapin Creek	Calhoun County Road 70 east of Vigo	AL-GA state line	F&W	Coosa	3	20.6	2004	Calhoun/Cleburne
AL03150105-0906-200	Ladiga Creek	Terrapin Creek	Terrapin Creek	PWS	Coosa	3	2.7	2004	Calhoun
AL03150105-0909-100	Terrapin Creek	Coosa River	US Highway 278	F&W	Coosa	3	25.7	2004	Calhoun/Cherokee
AL03150106-0201-102	Big Wills Creek	100 yards below Allen Branch	Its source	PWS/F&W	Coosa	3	8.6	2004	DeKalb
AL03150106-0201-401	Allen Branch	Big Wills Creek	Fort Payne public water supply dam	F&W	Coosa	3	0.3	2004	DeKalb
AL03150106-0201-402	Allen Branch	Fort Payne public water supply dam	Its source	PWS/F&W	Coosa	3	2.5	2004	DeKalb
AL03150106-0605-500	Coldwater Spring			PWS/F&W	Coosa	3	0.3	2004	Calhoun
AL03150106-0701-202	Mump Creek	City of Talladega's water supply reservoir dam	Its source	PWS/F&W	Coosa	3	5.3	2004	Talladega
AL03150106-0702-102	Talladega Creek	Talladega County Road 303	Alabama Highway 77	PWS/F&W	Coosa	3	6.1	2004	Talladega
AL03150107-0201-102	Tallasseehatchee Creek	City of Sylacauga's water supply reservoir dam	Its source	PWS/F&W	Coosa	3	12.4	2004	Clay/Talladega

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150201-0101-200	Coosa River	Bouldin Dam	Alabama Highway 111	PWS/S/F&W	Coosa	3	2.0	2004	Elmore
AL03170008-0205-101	Puppy Creek	Escatawpa River	Alabama Highway 217	F&W	Escatawpa	3	5.4	2004	Mobile
AL03170008-0402-100	Big Creek	Big Creek Reservoir	Its source	PWS/F&W	Escatawpa	3	21.7	2004	Mobile
AL03170008-0503-100	Big Creek	AL-MS state line	Its source	F&W	Escatawpa	3	14.0	2004	Mobile
AL03160201-0408-102	Tombigbee River	One-half mile downstream of Alabama Highway 114	Three miles upstream of Alabama Highway 114	PWS/F&W	Lower Tombigbee	3	3.4	2004	Choctaw/Marengo
AL03160203-0901-102	Tombigbee River	One-half mile downstream from Southern Railway Cro	Five miles upstream from US Highway 43	PWS/S/F&W	Lower Tombigbee	3	8.1	2004	Clarke/Washington
AL03160204-0105-101	Mobile River	Cold Creek	Barry Steam Plant	F&W	Mobile	3	2.3	2004	Mobile
AL03160204-0105-102	Mobile River	Barry Steam Plant	Tensaw River	PWS/F&W	Mobile	3	10.3	2004	Mobile
AL03160204-0106-102	Cold Creek	Dam 1 1/2 miles west of US Highway 43	Its source	PWS/F&W	Mobile	3	5.1	2004	Mobile
AL03160204-0403-101	Eightmile Creek	Chickasaw Creek	City of Prichard's water supply intake	F&W	Mobile	3	1.8	2004	Mobile
AL03160204-0403-102	Eightmile Creek	City of Prichard's water supply intake	US Highway 45	PWS/F&W	Mobile	3	1.6	2004	Mobile
AL03150108-0405-102	Cahulga Creek	US Highway 78	Its source	PWS/F&W	Tallapoosa	3	5.0	2004	Cleburne
AL03150108-1004-102	Little Tallapoosa River (R.L. Harris Lake)	US Highway 431	Five miles upstream of US Highway 431	PWS/F&W	Tallapoosa	3	7.2	2004	Randolph
AL03150109-0102-102	Crooked Creek	Alabama Highway 9	Its source	PWS/F&W	Tallapoosa	3	2.2	2004	Clay
AL03150109-0201-200	Jones Creek	High Pine Creek	Its source	PWS	Tallapoosa	3	8.6	2004	Randolph
AL03150109-0201-500	UT to Jones Creek northwest of Roanoke	Jones Creek	Its source	PWS	Tallapoosa	3	5.0	2004	Randolph
AL03150109-0301-500	Finley Creek	Mill Creek	Its source	PWS/F&W	Tallapoosa	3	6.0	2004	Chambers
AL03150109-0503-102	Elkahatchee Creek	Alabama Highway 63	Alabama Highway 22	PWS/F&W	Tallapoosa	3	4.4	2004	Coosa/Tallapoosa
AL03150109-0504-301	Manoy Creek (Lake Martin)	Tallapoosa River (Lake Martin)	Reservoir Limits	PWS/S/F&W	Tallapoosa	3	5.9	2004	Tallapoosa
AL03150109-0601-202	Little Sandy Creek	Central Georgia RR	Its source	PWS/F&W	Tallapoosa	3	18.1	2004	Chambers/Tallapoosa
AL03150109-0702-201	Little Kowaliga Creek (Lake Martin)	Big Kowaliga Creek (Lake Martin)	Reservoir Limits	PWS/S/F&W	Tallapoosa	3	7.1	2004	Elmore
AL03150110-0403-400	Bulger Creek	Uphapee Creek	Its source	PWS/F&W	Tallapoosa	3	7.8	2004	Macon
AL06030001-0203-101	Long Island Creek	Tennessee River	Long Creek	PWS/S/F&W	Tennessee	3	4.8	2004	Jackson
AL06030001-0504-100	North Sauty Creek	Tennessee River	Its source	PWS	Tennessee	3	19.0	2004	Jackson
AL06030001-0505-102	Tennessee River (Guntersville Lake)	Roseberry Creek	AL-TN state line	PWS/S/F&W	Tennessee	3	38.1	2004	Jackson
AL06030001-0805-101	Short Creek	Tennessee River	Scarham Creek	PWS/F&W	Tennessee	3	5.0	2004	Marshall

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL06030001-0901-102	Tennessee River (Guntersville Lake)	upper end of Buck's Island	Roseberry Creek	S/F&W	Tennessee	3	19.3	2004	Jackson/Marshall
AL06030001-0905-100	Tennessee River (Guntersville Lake)	Guntersville Dam	upper end of Buck's Island	PWS/S/F&W	Tennessee	3	16.0	2004	Marshall
AL06030002-0904-101	Tennessee River (Wheeler Lake)	Cotaco Creek	Indian Creek	PWS/S/F&W	Tennessee	3	1.8	2004	Madison/Morgan
AL06030002-1102-102	Tennessee River (Wheeler Lake)	US Highway 31	Flint Creek	PWS/S/F&W	Tennessee	3	3.3	2004	Limestone/Morgan
AL06030002-1102-103	Tennessee River (Wheeler Lake)	Flint Creek	Cotaco Creek	S/F&W	Tennessee	3	10.7	2004	Limestone/Madison/Morgan
AL06030002-1108-102	Tennessee River (Wheeler Lake)	Five miles upstream of Elk River (RM 289.3)	US Highway 31	S/F&W	Tennessee	3	18.2	2004	Lawrence/Limestone/Morgan
AL06030002-1205-100	Tennessee River (Wheeler Lake)	Wheeler Dam	Five miles upstream of Elk River (RM 289.3)	PWS/S/F&W	Tennessee	3	14.3	2004	Lauderdale/Lawrence/Limestone
AL06030004-0103-102	Elk River	Alabama Highway 99	AL-TN state line	PWS/F&W	Tennessee	3	13.0	2004	Limestone
AL06030005-0102-400	Sinking Creek	Clear Fork	Its source	PWS/F&W	Tennessee	3	5.4	2004	Lawrence
AL06030005-0102-500	Turkey Creek	Clear Fork	Its source	PWS/F&W	Tennessee	3	8.2	2004	Lawrence
AL06030005-0505-102	Cypress Creek	City of Florence water treatment plant	Little Cypress Creek	PWS/F&W	Tennessee	3	1.9	2004	Lauderdale
AL06030005-0701-100	Tennessee River (Wilson Lake)	Wilson Dam	Wheeler Dam	PWS/S/F&W	Tennessee	3	25.0	2004	Colbert/Lauderdale/Lawrence
AL06030005-0708-102	Tennessee River (Pickwick Lake)	lower end of Seven Mile Island	Sheffield water intake	F&W	Tennessee	3	6.4	2004	Colbert/Lauderdale
AL06030005-0708-103	Tennessee River (Pickwick Lake)	Sheffield water intake	Wilson Dam	PWS/F&W	Tennessee	3	7.0	2004	Colbert/Lauderdale
AL06030005-1103-100	Tennessee River (Pickwick Lake)	AL-TN state line	lower end of Seven Mile Island	PWS/S/F&W	Tennessee	3	33.3	2004	Colbert/Lauderdale
AL06030006-0102-100	Little Bear Creek	Bear Creek	Its source	PWS/S/F&W	Tennessee	3	20.4	2004	Franklin/Marion
AL06030006-0103-101	Bear Creek (Bear Creek Lake)	Bear Creek Lake Dam	Alabama Highway 187	PWS/S/F&W	Tennessee	3	14.3	2004	Franklin
AL06030006-0103-104	Bear Creek (Upper Bear Creek Lake)	Upper Bear Creek Lake Dam	Alabama Highway 243	PWS/S/F&W	Tennessee	3	15.4	2004	Franklin/Marion/Winston
AL06030006-0201-200	Dunkin Creek	Cedar Creek	Its source	PWS	Tennessee	3	6.7	2004	Franklin
AL06030006-0202-100	Cedar Creek (Cedar Creek Lake)	Cedar Creek Lake Dam	Alabama Highway 24	PWS/S/F&W	Tennessee	3	13.3	2004	Franklin
AL06030006-0204-102	Little Bear Creek (Little Bear Creek Lake)	Little Bear Creek Lake Dam	Alabama Highway 187	PWS/S/F&W	Tennessee	3	14.4	2004	Franklin
AL03160109-0103-150	Long Branch	Wolf Creek	Its source	F&W	Black Warrior	4A	2.85	2003	Cullman
AL03160109-0103-900	Duck Creek	Duck River	Its source	F&W	Black Warrior	4A	6.59	2002	Cullman

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160109-0106-102	Eightmile Creek	Cullman water supply reservoir dam	Its source	PWS	Black Warrior	4A	15.70	1997	Cullman
AL03160109-0107-100	Broglen River	Mulberry Fork	Its source	F&W	Black Warrior	4A	12.39	1997	Cullman
AL03160109-0107-500	Eightmile Creek	Broglen River	Cullman water supply reservoir dam	F&W	Black Warrior	4A	8.14	1997	Cullman
AL03160109-0202-100	Thacker Creek	Mulberry Fork	Its source	F&W	Black Warrior	4A	9.97	2003	Cullman
AL03160110-0403-102	Rock Creek	Smith Lake	Blevens Creek	F&W	Black Warrior	4A	8.82	2003	Winston
AL03160110-0406-102	Crooked Creek	Smith Lake	Its source	F&W	Black Warrior	4A	28.84	2003	Cullman
AL03160111-0202-200	Graves Creek	Locust Fork	Its source	F&W	Black Warrior	4A	10.26	2002	Blount
AL03150202-0302-202	Mud Creek	Tannehill Iron Works	Its source	F&W	Cahaba	4A	4.08	2003	Tuscaloosa
AL03150202-0302-800	Mill Creek	Mud Creek	Its source	F&W	Cahaba	4A	6.82	2003	Jefferson/Tuscaloosa
AL03150202-0302-900	Cooley Creek	Mill Creek	Its source	F&W	Cahaba	4A	2.82	2003	Jefferson/Tuscaloosa
AL03150202-0902-502	Dry Creek	Dallas County Road 201	Its source	F&W	Cahaba	4A	4.96	2003	Dallas/Perry
AL03130012-0205-201	Boggy Creek	Buck Creek	Cottondale WWTP	F&W	Chipola	4A	3.48	1997	Houston
AL03150106-0202-300	Little Wills Creek	Big Wills Creek	Its source	F&W	Coosa	4A	6.07	1997	DeKalb
AL03160204-0302-102	Bayou Sara/Norton Creek	Gunnison Creek	Saraland WWTP	S/F&W	Mobile	4A	3.77	1997	Mobile
AL03150108-0504-104	Tallapoosa River	Dam at Cleburne County Road 36	Cleburne County Road19	PWS/F&W	Tallapoosa	4A	4.35	2002	Cleburne
AL03150109-0107-102	Tallapoosa River	Hutton Creek	R.L. Harris Dam	F&W	Tallapoosa	4C	14.04	2002	Randolph
AL06030001-0705-102	Town Creek	Lake Guntersville	Its source	F&W	Tennessee	4A	59.62	2003	DeKalb/Marshall
AL06030001-0804-200	Scarham Creek	Short Creek	Its source	F&W	Tennessee	4A	22.80	1997	BeKalb/Marshall
AL06030002-0201-202	Cole Spring Branch	Bridge at Jones Farm	Jeep Trail Crossing	F&W	Tennessee	4A	1.80	2003	Jackson
AL06030002-0204-202	Little Paint Rock Creek	Merrill Road Bridge	Jeep Trail Crossing	F&W	Tennessee	4A	1.89	2003	Marshall
AL06030002-0401-202	Chase Creek	Acuff Spring	U.S. Highway 72	F&W	Tennessee	4A	2.17	2003	Madison
AL06030002-0504-100	Indian Creek	U.S. Highway 72	Its source	F&W	Tennessee	4A	6.46	2003	Madison
AL06030002-0703-102	Limestone Creek	U.S. Highway 72	Leslie Creek	F&W	Tennessee	4A	9.70	2003	Limestone
AL06030002-0902-100	Cane Creek	Tennessee River	Its source	F&W	Tennessee	4A	8.65	2003	Marshall/Morgan
AL06030002-0903-100	Aldridge Creek	Tennessee River	Its source	F&W	Tennessee	4A	12.55	2003	Madison
AL06030002-1001-200	Robinson Creek	Flint Creek	Its source	F&W	Tennessee	4A	6.75	2003	Morgan
AL06030002-1001-500	Indian Creek	Flint Creek	Its source	F&W	Tennessee	4A	4.22	2002	Cullman/Morgan
AL06030002-1001-800	East Fork Flint Creek	Flint Creek	Its source	F&W	Tennessee	4A	15.31	2003	Cullman/Morgan
AL06030002-1002-100	Crowabout Creek	Flint Creek	Its source	F&W	Tennessee	4A	16.23	2003	Cullman/Morgan
AL06030002-1003-102	Flint Creek	Shoal Creek	Its source	F&W	Tennessee	4A	13.36	2003	Cullman/Morgan
AL06030002-1003-500	Mack Creek	Flint Creek	Its source	F&W	Tennessee	4A	6.29	2003	Morgan
AL06030002-1003-600	Shoal Creek	Flint Creek	Its source	F&W	Tennessee	4A	12.57	2003	Morgan
AL06030002-1003-700	Cedar Creek	Flint Creek	Its source	F&W	Tennessee	4A	9.56	2003	Morgan
AL06030002-1003-900	Town Branch	Shoal Creek	Its source	F&W	Tennessee	4A	1.90	2003	Morgan
AL06030002-1004-101	No Business Creek	Flint Creek	Jones Chapel Creek	F&W	Tennessee	4A	7.76	2003	Morgan
AL06030002-1005-900	Elam Creek	Rocky Branch	Its source	F&W	Tennessee	4A	12.08	2003	Lawrence
AL06030002-1006-201	McDaniel Creek	West Flint Creek	Alabama Highway 36	F&W	Tennessee	4A	4.15	2003	Lawrence
AL06030002-1007-100	Big Shoal Creek	West Flint Creek	Its source	F&W	Tennessee	4A	14.44	2003	Lawrence

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL06030002-1008-100	West Fork Flint Creek	Flint Creek	McDaniel Creek	F&W	Tennessee	4A	22.24	2003	Lawrence/Morgan
AL06030002-1009-102	Flint Creek	Alabama Highway 67	L&N Railroad	F&W	Tennessee	4A	5.06	2003	Morgan
AL06030002-1009-103	Flint Creek	L&N Railroad	Alabama Highway 36	PWS/F&W	Tennessee	4A	9.09	2003	Morgan
AL06030002-1009-104	Flint Creek	Alabama Highway 36	Shoal Creek	LWF	Tennessee	4A	10.01	2003	Morgan
AL06030002-1009-402	Village Branch	Moss Spring Branch	Its source	F&W	Tennessee	4A	6.46	2003	Morgan
AL06030002-1101-101	Swan Creek	Wheeler Lake	Alabama Highway 24	F&W	Tennessee	4A	6.01	2002	Limestone
AL06030002-1101-102	Swan Creek	Alabama Highway 24	Town Creek	A&I	Tennessee	4A	2.78	2003	Limestone
AL06030002-1103-202	Round Island Creek	Browns Ferry Road	Beauchamp Branch	F&W	Tennessee	4A	3.50	2003	Limestone
AL06030002-1106-102	Mallard Creek	Wheeler Lake	Its source	F&W	Tennessee	4A	11.23	2003	Lawrence
AL06030005-0104-100	Big Nance Creek	Wilson Lake	Its source	F&W	Tennessee	4A	26.42	2003	Lawrence
AL06030006-0201-900	Harris Creek	Mud Creek	Its source	F&W	Tennessee	4A	5.99	2003	Franklin
AL03150201-0104-302	Three Mile Branch	Lower Wetumpka Road	Its source	F&W	Alabama	5	7.6	2002	Montgomery
AL03150201-0309-101	Catoma Creek	Alabama River	Ramer Creek	F&W	Alabama	5	23.2	1998	Montgomery
AL03150203-0703-101	Alabama River	Beaver Creek	Rockwest Creek	F&W	Alabama	5	5.0	1996	Wilcox
AL03150203-0805-102	Alabama River	Bear Creek	Frisco Railroad Crossing	S/F&W	Alabama	5	5.0	1996	Wilcox
AL03150203-0805-103	Alabama River	Frisco Railroad Crossing	Pursley Creek	F&W	Alabama	5	7.6	1996	Wilcox
AL03150203-0805-104	Alabama River	Pursley Creek	River Mile 131	F&W	Alabama	5	8.7	2000	Wilcox
AL03150203-0805-105	Alabama River	River Mile 131	Beaver Creek	PWS	Alabama	5	1.5	2000	Wilcox
AL03160109-0102-101	Mulberry Fork	Broglen River	Blount County Road 6	F&W	Black Warrior	5	18.2	1998	Blount/Cullman
AL03160109-0105-101	Brindley Creek	Broglen River	State Highway 69	PWS	Black Warrior	5	7.2	1998	Cullman
AL03160109-0105-102	Brindley Creek	State Highway 69	Its source	PWS	Black Warrior	5	9.9	1998	Cullman
AL03160109-0201-102	Mud Creek	Alabama Highway 31	Its source	F&W	Black Warrior	5	4.7	1998	Cullman
AL03160109-0204-101	Mulberry Fork	Marriott Creek	Mill Creek	F&W	Black Warrior	5	2.5	1998	Blount/Cullman
AL03160109-0204-102	Mulberry Fork	Mill Creek	Broglen River	F&W	Black Warrior	5	17.3	1998	Blount/Cullman
AL03160109-0403-103	Lost Creek	US Highway 78 at Carbon Hill	US Highway 78 North of Cedrum	F&W	Black Warrior	5	6.5	1998	Walker
AL03160109-0404-101	Cane Creek (Oakman)	Lost Creek	Dixie Springs Road	F&W	Black Warrior	5	7.1	1998	Walker
AL03160109-0404-102	Cane Creek (Oakman)	Dixie Springs Road	Alabama Highway 69	LWF	Black Warrior	5	3.5	1998	Walker
AL03160109-0404-103	Cane Creek (Oakman)	Alabama Highway 69	Its source	F&W	Black Warrior	5	7.4	1998	Walker
AL03160109-0404-500	Black Branch	Cane Creek	Its source	F&W	Black Warrior	5	3.2	1998	Walker
AL03160109-0405-102	Lost Creek	Mill dam at Cedrum	Alabama Highway 69 at Oakman	F&W	Black Warrior	5	17.3	1998	Walker
AL03160109-0503-101	Wolf Creek	Lost Creek	Alabama Highway 102	F&W	Black Warrior	5	38.4	1998	Walker
AL03160111-0203-100	Dry Creek	Locust Fork	Its source	F&W	Black Warrior	5	11.4	1998	Blount
AL03160111-0204-101	Locust Fork	Little Warrior River	Blount County Road 30	F&W	Black Warrior	5	26.9	1998	Blount
AL03160111-0303-102	Locust Fork	County Road between Hayden and County Line	Little Warrior River	F&W	Black Warrior	5	18.6	1998	Blount
AL03160111-0306-102	Locust Fork	US Highway 31	County Road between Hayden and County Line	PWS/F&W	Black Warrior	5	14.8	1998	Blount/Jefferson
AL03160111-0404-102	Locust Fork	Jefferson County Road 77	US Highway 31	F&W	Black Warrior	5	14.3	1998	Jefferson
AL03160111-0406-101	Newfound Creek	Fivemile Creek	Impoundment	F&W	Black Warrior	5	2.7	1998	Jefferson

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160111-0408-101	Village Creek (Bayview Lake)	Bayview Lake Dam	Second Creek	LWF	Black Warrior	5	6.0	1996	Jefferson
AL03160111-0408-102	Village Creek	Second Creek	Woodlawn Bridge	LWF	Black Warrior	5	12.6	1996	Jefferson
AL03160111-0408-300	Camp Branch	Bayview Lake	Its source	F&W	Black Warrior	5	4.1	1996	Jefferson
AL03160112-0101-101	Valley Creek	19th Street North (Bessemer)	Opossum Creek	LWF	Black Warrior	5	0.9	2000	Jefferson
AL03160112-0101-200	Opossum Creek	Valley Creek	Its source	A&I	Black Warrior	5	7.1	1998	Jefferson
AL03160112-0105-101	Mud Creek	Valley Creek	Big Branch	F&W	Black Warrior	5	14.0	1998	Jefferson
AL03160112-0201-101	Big Yellow Creek	Bankhead Lake	Its source	S/F&W	Black Warrior	5	14.0	1998	Tuscaloosa
AL03160112-0404-102	North River	Lake Tuscaloosa	Ellis Creek	F&W	Black Warrior	5	38.0	1998	Fayette/Tuscaloosa
AL03160112-0502-200	Little Hurricane Creek	Hurricane Creek	Its source	F&W	Black Warrior	5	10.1	1998	Tuscaloosa
AL03160112-0502-300	North Fork of Hurricane Creek	Hurricane Creek	Its source	F&W	Black Warrior	5	6.5	1998	Tuscaloosa
AL03160112-0503-100	Hurricane Creek	Black Warrior River	Its source	F&W	Black Warrior	5	31.4	1996	Tuscaloosa
AL03150202-0101-102	Cahaba River	US Highway 11	I-59	OAW/F&W	Cahaba	5	3.1	1998	Jefferson
AL03150202-0103-300	Lee Branch	Lake Purdy	Its source	F&W	Cahaba	5	1.6	2000	Shelby
AL03150202-0104-102	Cahaba River	Grant's Mill Road	US Highway 11	F&W	Cahaba	5	21.1	1998	Jefferson/St. Clair
AL03150202-0201-101	Cahaba River	Buck Creek	dam near US Highway 280	F&W	Cahaba	5	17.3	2000	Jefferson/Shelby
AL03150202-0201-102	Cahaba River	dam near U.S. Highway 280	Grant's Mill Road	OAW/PWS	Cahaba	5	13.3	1998	Jefferson
AL03150202-0201-300	Patton Creek	Cahaba River	Its source	F&W	Cahaba	5	8.3	1996	Jefferson/Shelby
AL03150202-0202-101	Buck Creek	Cahaba River	Cahaba Valley Creek	F&W	Cahaba	5	2.9	2004	Shelby
AL03150202-0202-401	Cahaba Valley Creek	Buck Creek	US Highway 31	F&W	Cahaba	5	7.6	2004	Shelby
AL03150202-0203-101	Cahaba River	Shades Creek	Shelby County Road 52	OAW/F&W	Cahaba	5	23.6	1996	Shelby
AL03150202-0203-102	Cahaba River	Shelby County Road 52	Buck Creek	F&W	Cahaba	5	3.6	1996	Shelby
AL03150202-0302-100	Shades Creek	Cahaba River	Its source	F&W	Cahaba	5	56.3	1996	Bibb/Jefferson/Shelby
AL03150202-0405-100	Cahaba River	lower Little Cahaba River	Shades Creek	OAW/F&W	Cahaba	5	13.5	1998	Bibb
AL03150202-0503-102	Cahaba River	Alabama Highway 82	lower Little Cahaba River	OAW/S	Cahaba	5	10.5	1998	Bibb
AL03130003-1307-100	Barbour Creek	Chattahoochee River	Its source	F&W	Chattahoochee	5	25.1	1998	Barbour
AL03130004-0601-201	Popular Spring Branch	Omussee Creek	Ross Clark Circle	F&W	Chattahoochee	5	2.1	1998	Houston
AL03130012-0201-400	Cypress Creek	Limestone Creek	Its source	F&W	Chipola	5	8.1	1998	Houston
AL03140201-0502-100	Hurricane Creek	Choctawhatchee River	Its source	F&W	Choctawhatchee	5	8.5	1998	Dale
AL03140201-0602-201	Beaver Creek	Newton Creek	Dothan WWTP	F&W	Choctawhatchee	5	2.0	1998	Houston
AL03140201-0704-600	Dowling Branch	Cox Mill Creek	Its source	F&W	Choctawhatchee	5	2.1	1998	Geneva
AL03140201-1001-700	UT to Harrand Creek	Harrand Creek	Its source	F&W	Choctawhatchee	5	3.5	1998	Coffee
AL03140202-0502-102	Walnut Creek	Troy WWTP	downstream of Pike County Road 59	F&W	Choctawhatchee	5	3.1	1998	Pike
AL03150105-0807-102	Spring Creek	Weiss Lake	Mud Creek	F&W	Coosa	5	5.1	2004	Cherokee
AL03150105-0807-200	Mud Creek	Spring Creek	Its source	F&W	Coosa	5	5.1	2004	Cherokee
AL03150105-1001-102	Weiss Lake	Spring Creek	AL-GA state line	S/F&W	Coosa	5	11.5	1996	Cherokee
AL03150105-1003-102	Weiss Lake	Weiss Dam	Spring Creek	PWS/S/F&W	Coosa	5	13.3	1996	Cherokee
AL03150106-0104-101	Lake Neely Henry	Big Wills Creek	City of Gadsden's water supply intake	F&W	Coosa	5	2.9	1996	Etowah

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150106-0104-102	Lake Neely Henry	City of Gadsden's water supply intake	Weiss Dam powerhouse	PWS/F&W	Coosa	5	30.6	1996	Cherokee/Etowah
AL03150106-0309-101	Lake Neely Henry	Neely Henry Dam	McCardney's Ferry	S/F&W	Coosa	5	9.9	1996	Calhoun/Etowah/ St. Clair
AL03150106-0309-102	Lake Neely Henry	McCardney's Ferry	Big Wills Creek	F&W	Coosa	5	13.8	1996	Etowah
AL03150106-0501-101	Lake Logan Martin	Broken Arrow Creek	Trout Creek	PWS/S/F&W	Coosa	5	10.9	1996	Calhoun/St. Clair/Talladega
AL03150106-0501-102	Lake Logan Martin	Trout Creek	Neely Henry Dam	S/F&W	Coosa	5	8.8	1996	Calhoun/St. Clair
AL03150106-0612-102	Choccolocco Creek	Lake Logan Martin	Hillabee Creek	F&W	Coosa	5	35.4	1996	Calhoun/Talladega
AL03150106-0801-100	Lake Logan Martin	Logan Martin Dam	Broken Arrow Creek	S/F&W	Coosa	5	28.8	1996	St. Clair/Talladega
AL03150106-0808-102	Lay Lake	River Mile 89	Logan Martin Dam	PWS/S/F&W	Coosa	5	10.3	1996	Shelby/St. Clair/Talladega
AL03150107-0101-102	Lay Lake	Southern RR Bridge	River Mile 89	S/F&W	Coosa	5	10.2	1996	Shelby/Talladega
AL03150107-0102-700	UT to Dry Branch	Dry Branch	Its source	F&W	Coosa	5	1.5	1996	Shelby
AL03150107-0401-100	Lay Lake	Lay Dam	Southern RR Bridge	PWS/S/F&W	Coosa	5	28.1	1996	Chilton/Coosa/Shelby/ Talladega
AL03150107-0502-100	Buxahatchee Creek	Waxahatchee Creek	Its source	F&W	Coosa	5	14.0	1996	Chilton/Shelby
AL03150107-0601-100	Lake Mitchell	Mitchell Dam	Lay Dam	PWS/S/F&W	Coosa	5	14.8	1996	Chilton/Coosa
AL03170008-0205-102	Puppy Creek	Alabama Highway 217	Its source	F&W	Escatawpa	5	11.0	1996	Mobile
AL03170008-0302-100	Escatawpa River	AL-MS state line	Its source	S/F&W	Escatawpa	5	68.3	2002	Mobile
AL03170008-0401-200	Juniper Creek	Big Creek	Its source	F&W	Escatawpa	5	6.6	1998	Mobile
AL03170008-0402-400	Boggy Branch	Big Creek Lake	Its source	F&W	Escatawpa	5	3.6	1998	Mobile
AL03170008-0402-700	Collins Creek	Big Creek	Its source	F&W	Escatawpa	5	4.9	2000	Mobile
AL03170009-0102-100	Bayou la Batre	Portersville Bay	Its source	F&W	Escatawpa	5	5.2	1996	Mobile
AL03170009-0201-100	Mississippi Sound	Segment classified for shellfish harvesting		SH/S/F&W	Escatawpa	5	146.5 mi ²	2004	Mobile
AL03170009-0201-200	Portersville Bay	1000 feet west of outfall	Bayou La Batre Utilities outfall	SH/S/F&W	Escatawpa	5	23.2 mi ²	2004	Mobile
AL03160203-0601-100	Bassett Creek	Little Bassett Creek	Its source	F&W	Lower Tombigbee	5	12.8	2004	Clarke
AL03160203-1103-102	Tombigbee River	the upper end of Bilbo Island	Olin Basin	F&W	Lower Tombigbee	5	3.8	2004	Clarke/Washington
AL03160203-1103-700	Bilbo Creek	Tombigbee River	Its source	S/F&W	Lower Tombigbee	5	29.3	2004	Washington
AL03160203-1103-800	Olin Basin	All of Olin Basin		F&W	Lower Tombigbee	5	65 acres	1996	Washington
AL03160204-0105-302	Tensaw River	Junction of Briar Lake	Junction of Tensaw Lake	OAW/F&W	Mobile	5	2.9	2002	Baldwin
AL03160204-0105-303	Tensaw River	Junction of Tensaw Lake	Mobile River	F&W	Mobile	5	11.0	2002	Baldwin/Mobile
AL03160204-0106-101	Cold Creek Swamp	Cold Creek with Mobile River	West through swamp	F&W	Mobile	5	5.1	1996	Mobile
AL03160204-0201-200	Middle River	Tensaw River	Tensaw River	F&W	Mobile	5	9.7	2004	Baldwin/Mobile
AL03160204-0303-102	Mobile River	Spanish River	Cold Creek	F&W	Mobile	5	20.7	2002	Baldwin/Mobile
AL03160204-0402-100	Chickasaw Creek	Mobile College	Its source	S/F&W	Mobile	5	25.4	2000	Mobile
AL03160204-0403-103	Eightmile Creek	US Highway 45	Highpoint Boulevard	F&W	Mobile	5	3.2	1998	Mobile
AL03160204-0403-200	Gum Tree Branch	Eightmile Creek	Its source	F&W	Mobile	5	2.2	1998	Mobile
AL03160204-0404-101	Chickasaw Creek	Mobile River	limit of tidal effects (US Highway 43)	LWF	Mobile	5	4.5	2000	Mobile

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03160204-0404-102	Chickasaw Creek	US Highway 43	Mobile College	F&W	Mobile	5	6.5	2000	Mobile
AL03160204-0503-102	Bay Minette Creek	Bay Minette	Its source	F&W	Mobile	5	17.9	2000	Baldwin
AL03160204-0504-101	Threemile Creek	Mobile River	Toulmins Spring Branch	A&I	Mobile	5	2.1	1998	Mobile
AL03160204-0504-102	Threemile Creek	Toulmins Spring Branch	Mobile Street	A&I	Mobile	5	4.2	1996	Mobile
AL03160204-0504-103	Threemile Creek	Mobile Street	Its source	A&I	Mobile	5	8.7	1996	Mobile
AL03160204-0504-300	Toulmins Spring Branch	Threemile Creek	Its source	F&W	Mobile	5	3.2	2004	Mobile
AL03160204-0504-500	UT to Threemile Creek	Threemile Creek	Its source	F&W	Mobile	5	1.0	2004	Mobile
AL03160204-0505-100	Mobile River	Mobile Bay	Spanish River	LWF	Mobile	5	8.0	2000	Mobile
AL03160204-0505-201	Tensaw River	Mobile Bay	Junction of Tensaw and Apalachee Rivers	F&W	Mobile	5	6.3	2000	Baldwin
AL03160204-0505-202	Tensaw River	Junction of Tensaw and Apalachee Rivers	Junction of Briar Lake	OAW/S/F&W	Mobile	5	21.8	2002	Baldwin
AL03160205-0104-100	Mobile Bay	Segment classified for shellfish harvesting		SH/F&W	Mobile	5	198.5 mi ²	2004	Baldwin/Mobile
AL03160205-0104-200	Bon Secour Bay	Segment classified for shellfish harvesting		SH/S/F&W	Mobile	5	121.3 mi ²	2004	Baldwin/Mobile
AL03160205-0202-300	Bolton Branch	Dog River	Its source	F&W	Mobile	5	5.6	2004	Mobile
AL03160205-0202-400	Eslava Creek	Dog River	Its source	F&W	Mobile	5	3.1	2004	Mobile
AL03160205-0204-101	Dog River	Mobile Bay	Halls Mill Creek	S/F&W	Mobile	5	2.8	1996	Mobile
AL03160205-0204-102	Dog River	Halls Mill Creek	Moore Creek	F&W	Mobile	5	1.3	1996	Mobile
AL03160205-0204-301	Rabbit Creek	Dog River	Alabama Highway 163	F&W	Mobile	5	2.4	1996	Mobile
AL03160205-0206-100	Fowl River	Mobile Bay	Its source	S/F&W	Mobile	5	16.9	2002	Mobile
AL03160205-0307-102	Fish River	Weeks Bay	Its source	S/F&W	Mobile	5	28.8	1998	Baldwin
AL03160205-0310-702	UT to Bon Secour River	Baldwin County Road 65	Its source	F&W	Mobile	5	1.5	1998	Baldwin
AL-Gulf of Mexico	Gulf of Mexico	Mississippi	Florida	SH/S/F&W	Mobile	5	238 mi ²	2004	Baldwin/Mobile
AL03140103-0102-700	UT to Jackson Lake 2-S	W.F. Jackson Lake	Its source	F&W	Perdido-Escambia	5	1.1	1998	Covington
AL03140103-0402-100	Yellow River	AL-FL state line	North Creek	F&W	Perdido-Escambia	5	14.8	2004	Covington
AL03140104-0102-800	UT to Jackson Lake 3-C	W.F. Jackson Lake	Its source	F&W	Perdido-Escambia	5	1.8	1998	Covington
AL03140104-0104-100	Blackwater River	AL-FL state line	Blackwater Creek	F&W	Perdido-Escambia	5	2.7	1998	Escambia
AL03140106-0302-101	Brushy Creek	AL-FL state line	Boggy Branch	F&W	Perdido-Escambia	5	0.2	2000	Escambia
AL03140106-0302-202	Boggy Branch	Atmore WWTP	Masland Carpets WWTP	F&W	Perdido-Escambia	5	0.2	1998	Escambia
AL03140106-0502-100	Styx River	Hollinger Creek	Its source	S/F&W	Perdido-Escambia	5	22.7	2004	Baldwin
AL03140106-0506-100	Styx River	Perdido River	Hollinger Creek	F&W	Perdido-Escambia	5	18.5	2004	Baldwin
AL03140106-0603-101	Blackwater River	Perdido River	Narrow Gap Creek	F&W	Perdido-Escambia	5	3.1	1998	Baldwin
AL03140301-0302-102	Conecuh River	Broadhead Creek	Mannings Creek	F&W	Perdido-Escambia	5	24.5	1996	Pike
AL03140301-0403-102	Conecuh River	Head of Gantt Lake	Hornet Creek	F&W	Perdido-Escambia	5	4.6	1996	Covington/Crenshaw
AL03140301-0404-100	Conecuh River	Point A Dam	Head of Gantt Lake	S/F&W	Perdido-Escambia	5	13.6	1996	Covington
AL03140303-0302-101	Rocky Creek	Persimmon Creek	County Road north of Chapman	F&W	Perdido-Escambia	5	8.0	1998	Butler
AL03140304-0106-100	Conecuh River	AL-FL state line	Mantle Branch	F&W	Perdido-Escambia	5	12.7	2002	Escambia
AL03140304-0605-100	Little Escambia Creek	AL-FL State Line	Wild Fork Creek	F&W	Perdido-Escambia	5	12.2	2004	Escambia
AL03140305-0301-100	Big Escambia Creek	AL-FL state line	Big Spring Creek	F&W	Perdido-Escambia	5	17.0	2004	Escambia
AL03150108-1004-300	Wolf Creek	Little Tallapoosa River	Its source	F&W	Tallapoosa	5	5.4	1996	Randolph

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL03150109-0503-401	Sugar Creek	Elkahatchee Creek	Sugar Creek Alexander City	F&W	Tallapoosa	5	3.6	1998	Tallapoosa
AL03150110-0201-700	Pepperell Branch	Sougahatchee Creek	Its source	F&W	Tallapoosa	5	6.7	1996	Lee
AL03150110-0204-101	Yates Reservoir (Sougahatchee Creek Embayment)	Sougahatchee Creek Embayment	NW1/4-S21-T19N-R22E	PWS/S/F&W	Tallapoosa	5	3.4	1996	Tallapoosa
AL03150110-0301-400	Moores Mill Creek	Chewacla Creek	Its source	S/F&W	Tallapoosa	5	10.2	2000	Lee
AL03150110-0504-101	Calebee Creek	Tallapoosa River	Macon County Road 9	F&W	Tallapoosa	5	10.3	1998	Macon
AL03150110-0703-100	Cubahatchee Creek	Tallapoosa River	Its source	S/F&W	Tallapoosa	5	44.4	1998	Bullock/Macon
AL03150110-0903-101	Line Creek	Tallapoosa River	Johnsons Creek	F&W	Tallapoosa	5	10.3	1998	Macon/Montgomery
AL03150110-0903-102	Line Creek	Johnsons Creek	Panther Creek	F&W	Tallapoosa	5	5.5	1998	Macon/Montgomery
AL06030001-0402-401	Warren Smith Creek	Dry Creek	Ross Branch	F&W	Tennessee	5	1.9	2000	Jackson
AL06030002-0105-101	Guess Creek	Paint Rock River	Bee Branch	F&W	Tennessee	5	11.1	1998	Jackson
AL06030002-0304-100	Mountain Fork	Flint River	Its source	F&W	Tennessee	5	15.3	1998	Madison
AL06030002-0304-200	Hester Creek	Mountain Fork	AL-TN state line	F&W	Tennessee	5	7.2	1998	Madison
AL06030002-0306-100	Beaverdam Creek	Brier Fork	Its source	F&W	Tennessee	5	22.1	1998	Madison
AL06030002-0307-100	Brier Fork	Flint River	AL-TN state line	F&W	Tennessee	5	22.5	1998	Madison
AL06030002-0401-102	Flint River	Alabama Highway 72	Mountain Fork	F&W	Tennessee	5	15.3	1998	Madison
AL06030002-0403-101	Hurricane Creek	Flint River	Gurley Pike Road	F&W	Tennessee	5	7.3	1998	Madison
AL06030002-0404-102	Flint River	Big Cove Creek	Hurricane Creek	PWS/F&W	Tennessee	5	6.9	1998	Madison
AL06030002-0404-200	Goose Creek	Flint River	Its source	F&W	Tennessee	5	8.9	1998	Madison
AL06030002-0405-100	Flint River	Tennessee River	Big Cove Creek	F&W	Tennessee	5	21.0	1998	Madison
AL06030002-0405-700	Yellow Bank Creek	Flint River	Its source	F&W	Tennessee	5	5.6	1998	Madison
AL06030002-0502-101	Huntsville Spring Branch	Indian Creek	Johnson Road (Huntsville Field)	F&W	Tennessee	5	11.1	1996	Madison
AL06030002-0505-101	Indian Creek	Tennessee River	Martin Road (Redstone Arsenal)	F&W	Tennessee	5	7.7	1996	Madison
AL06030002-0601-300	Hughes Creek	Cotaco Creek	Its source	F&W	Tennessee	5	5.5	1998	Marshall/Morgan
AL06030002-0601-700	Mill Pond Creek	Hog Jaw Creek	Its source	F&W	Tennessee	5	1.3	1998	Marshall
AL06030002-0602-102	West Fork Cotaco Creek	Alabama Highway 67	Frost Creek	F&W	Tennessee	5	7.9	1998	Morgan
AL06030002-0603-102	Cotaco Creek	Guyer Branch	West Fork Cotaco Creek	S/F&W	Tennessee	5	5.4	1998	Morgan
AL06030002-0604-100	Town Creek	Cotaco Creek	Its source	F&W	Tennessee	5	8.7	1998	Morgan
AL06030002-0802-201	French Mill Creek	Piney Creek	UT in Pine Swamp	F&W	Tennessee	5	5.2	1998	Limestone
AL06030002-1002-300	Herrin Creek	Crowdabout Creek	Its source	F&W	Tennessee	5	6.3	1998	Morgan
AL06030002-1008-200	Flat Creek	West Flint Creek	Its source	F&W	Tennessee	5	7.8	1998	Lawrence
AL06030002-1204-102	Second Creek	Lauderdale County Road 76	AL-TN state line	F&W	Tennessee	5	13.0	1998	Lauderdale
AL06030004-0102-100	Shoal Creek	Elk River	AL-TN state line	F&W	Tennessee	5	7.2	1998	Limestone
AL06030004-0104-102	Anderson Creek	Snake Road Bridge	Its source	F&W	Tennessee	5	9.0	1998	Lauderdale
AL06030004-0105-101	Elk River	Wheeler Lake	Anderson Creek	S/F&W	Tennessee	5	6.4	1996	Lauderdale/Limestone
AL06030005-0701-201	McKiernan Creek	Tennessee River	Shegog Creek	PWS/S/F&W	Tennessee	5	2.7	1998	Colbert
AL06030005-0702-100	Pond Creek	Tennessee River	Its source	A&I	Tennessee	5	12.5	1998	Colbert
AL06030006-0101-700	Little Dice Branch	Bear Creek	Its source	F&W	Tennessee	5	3.8	1998	Franklin

Appendix D

Categorization of Alabama's Waters

Assessment Unit	Name	From	To	Use Classification	Basin	Category	Length (miles)	Year	Counties
AL06030006-0103-103	Bear Creek	Mill Creek	Upper Bear Creek Dam	S/F&W	Tennessee	5	3.0	1998	Marion
AL03160103-0204-202	Purgatory Creek	Wickett Creek	US Highway 278	F&W	Upper Tombigbee	5	1.8	1998	Marion
AL03160103-0204-203	Purgatory Creek	US Highway 278	Its source	PWS/F&W	Upper Tombigbee	5	1.2	1998	Marion
AL03160106-0402-102	Tombigbee River	Beville Dam	AL-MS state line	S/F&W	Upper Tombigbee	5	5.7	1996	Pickens
AL03160106-0504-202	Little Bear Creek	Pickens County Road 8	Its source	F&W	Upper Tombigbee	5	3.9	1998	Pickens
AL03160106-0606-101	Factory Creek	Tombigbee River	End of Embayment	F&W	Upper Tombigbee	5	1.3	2004	Sumter
AL03160107-0306-100	Sipsey River	Tombigbee River	Tuscaloosa County line	F&W	Upper Tombigbee	5	43.1	1998	Greene/Pickens

Appendix E

Alabama's Final 2004 Section 303(d) List Fact Sheet

Alabama's Final 2004 Section 303(d) List Fact Sheet

Background

Section 303(d) of the Clean Water Act requires that each state identify those waters that do not currently support designated uses, and to establish a priority ranking of these waters by taking into account the severity of the pollution and the designated uses of such waters. For each waterbody on the list, the state is required to establish a total maximum daily load (TMDL) for the pollutant or pollutants of concern at a level necessary to implement the applicable water quality standards. Guidance issued in August 1997 by the Environmental Protection Agency (EPA) suggested that states also include a schedule for TMDL development. The TMDL schedule included as part of Alabama's Final 2004 List provides the expected date the specific TMDL will be drafted and submitted for public notice and comment. TMDL dates range from one to ten years following EPA approval of the Final 2004 303(d) List. For some waterbody/pollutant combinations the Draft TMDL date is historical (i.e. 2002), which signifies a Draft TMDL has been established but remains to be finalized and approved for various reasons.

Alabama's Final 2004 Section 303(d) List

Alabama's 2004 Section 303(d) List includes segments of rivers, streams, lakes, reservoirs, and estuaries that either do not support or partially support their currently designated use or uses. Most of the waterbodies on the 2004 Section 303(d) List also appeared on Alabama's 2002 Section 303(d) List. The Department has attempted to obtain and evaluate all existing and readily available water quality-related data and information. The notice soliciting this information is included in **Supplement A**. The notice was published in Alabama's four major daily newspapers, appeared on the Department's web page, and was mailed to the Department's general mailing list. The Final 2004 §303(d) List has been developed using the Final 2002 §303(d) List approved by EPA on July 14, 2003 as the starting point. Data in the Department's multiple databases, information from §319 nonpoint assessments, special watershed studies, other federal and state agencies, industries, and watershed initiatives were evaluated as the Final 2004 §303(d) List was compiled. Any individual or organization may submit additional data or information during the advertised comment period relative to water quality impairment in waterbodies in Alabama. Chemical, physical, and biological data collected primarily during the previous five years have been considered in the preparation of the 2004 §303(d) List. Data older than five years was generally not considered suitable for adding new segments to the list, except when the data may be used to demonstrate water quality trends. Data sources include the Alabama Department of Environmental Management, the Alabama Department of Public Health, the Geological Survey of Alabama, the United States Geological Survey, the Tennessee Valley Authority, other public agencies, universities, county and municipal governments, and industries.

The list contains information such as the waterbody name, county(s) in which the listed segment is located, dates when the data on which the listing is based were collected, cause(s) for the use impairment, the source(s) of the pollutant(s) causing the impairment, the size of the impaired segment, and the location of the listed waterbody. Also included on the list is the segment's priority ranking (high, low, medium), which was developed using the prioritization strategy included in **Supplement B**.

Use-support status for waterbodies was determined in several ways. In cases where the monitored data was primarily chemical data from the water column, use-support status was based on the percentage of measurements not meeting applicable water quality criteria. More specifically, when 10 percent or fewer measurements exceeded a water quality criterion, the waterbody was considered to be fully supporting its designated use. When less than 25 percent but more than 10 percent of the measurements exceeded a water quality criterion, the waterbody was considered to be partially supporting its designated use. When more than 25 percent of the measurements exceeded a water quality criterion, the waterbody was considered to not be supporting its designated use. In other waterbodies, use-support status was assigned based on fish consumption or shellfish harvesting advisories issued by the Alabama Department of Public Health. When available, biological assessment data were used in combination with other surface water quality data or information to arrive at an overall use support determination. Alabama's water quality assessment methodology is included as **Supplement C**.

Changes Since the Final 2002 Section 303(d) List

A number of differences exist between the Final 2002 Section 303(d) List and the Final 2004 303(d) List. Many of the changes were to correct errors or omissions in the 2002 List and to provide additional or updated information about waterbodies on the list. Other significant changes since 2002 include the addition and deletion of waterbodies. **Table E-1** shows the waterbody/pollutant combinations that were added to Alabama's §303(d) List and the justification for the additions. **Table E-2** provides the waterbody/pollutant combinations that were removed from the list and the corresponding justification for each removal.

Changes have also been made to the TMDL completion schedule included on the Final 2004 Section 303(d) List. The changes reflect the pace of TMDL development that can reasonably be expected given ADEM's current funding and staffing levels. The TMDL schedule provides the expected date the specific TMDL will be drafted and submitted for public notice and comment. TMDL dates range from one to seven years following EPA approval of the Final 2004 303(d) List. Where more than one TMDL is required for a segment, TMDLs for specific pollutants may be developed in advance of the expected date shown on the list. A notice of availability will be published on the Department's web page as draft TMDLs are completed and offered for public review and comment.

Table E-3 provides a listing of other changes appearing on the Final 2004 303(d) List that were not on the Final 2002 List. Most of these changes result from the use of the revised hydrological unit codes for Alabama which are the basis for the assessment unit number assigned to each listed segment. Many previously listed segments have been subdivided to coincide with the new hydrological unit codes and to more closely reflect the designated uses shown in ADEM Administrative Rules 335-6-11-.02. Segment lengths for some previously listed segments may be slightly different due to the use of the available high resolution National Hydrography Database (NHD) for delineation of listed segments.

Table E-4 provides revisions made between the Draft 2004 List and the Final 2004 List. These revisions were made to the list as a result of additional minor errors or omissions identified by ADEM staff since the Draft 2004 303(d) List was public noticed.

Table E-1
Alabama's Final 2004 §303(d) List
Waterbody/Pollutant Combinations Added to the List

The waterbody/pollutant combinations listed in the following table were added to Alabama's Final 2004 §303(d) List for the reasons presented in the table.

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03160112-0101-200	Opossum Creek	Black Warrior	Jefferson	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03160112-0101-101	Valley Creek	Black Warrior	Jefferson	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03150202-0202-101	Buck Creek	Cahaba	Shelby	Pathogens	Geometric mean of 5 samples collected during 2003 exceeded the summer geometric mean criterion of 200 col/100 mL.	ADEM / 2003
AL03150202-0202-401	Cahaba Valley Creek	Cahaba	Shelby	Pathogens	Eleven of 36 samples exceeded the single sample maximum criterion.	USGS / 1999-2000

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03140201-1001-700	UT to Harrand Creek	Choctawahatchee	Coffee	Siltation	Habitat and Macroinvertebrate Assessment conducted in 1999 by ADEM indicated poor habitat and EPT communities due to siltation. This segment is currently listed for nutrients.	ADEM / 1999
AL03150105-0807-200	Mud Creek	Coosa	Cherokee	Pathogens	Geometric mean of 5 samples collected during 2002 exceeded 200 col/100 ml criterion.	ADEM / 2002
AL03150105-0807-102	Spring Creek	Coosa	Cherokee	Pathogens	Geometric mean of 5 samples collected during 2002 exceeded 200 col/100 ml criterion.	ADEM / 2002
AL03160205-0202-300	Bolton Branch	Mobile	Mobile	Pathogens	Five of 40 fecal coliform samples collected by the MAWSS during 2003 exceeded the single sample maximum criterion.	Mobile Area Water and Sewer Service (MAWSS) /2003
AL03160205-0202-400	Eslava Creek	Mobile	Mobile	Pathogens	Seven of 40 fecal coliform samples collected by the MAWSS during 2003 exceeded the single sample maximum criterion.	Mobile Area Water and Sewer Service (MAWSS) /2003
AL03160204-0201-200	Middle River	Mobile	Mobile Baldwin	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	March 2003 ADPH Fish Consumption Advisory

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03160204-0504-102	Threemile Creek	Mobile	Mobile	Pathogens	Three of seven fecal coliform samples collect by USGS in 2000 – 2001 exceeded the single sample maximum criterion. Threemile Creek is currently listed for OE/DO and chlordanes.	USGS / 2000
AL03160204-0504-300	Toulmins Spring Branch	Mobile	Mobile	Pathogens	Four of seven fecal coliform samples collected by USGS in 2000 – 2001 exceeded the single sample maximum criterion.	USGS / 2000
AL03160204-0504-500	Unnamed Tributary to Threemile Creek	Mobile	Mobile	Pathogens	Five of seven fecal coliform samples collected by USGS in 2000 – 2001 exceeded the single sample maximum criterion.	USGS / 2000
AL03140305-0301-100	Big Escambia Creek	Perdido-Escambia	Escambia	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising “No Consumption” of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03140304-0605-100	Little Escambia Creek	Perdido-Escambia	Escambia	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising “No Consumption” of spotted bass.	ADPH Fish Consumption Advisory / March 2003

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL03140304-0106-100	Conecuh River	Perdido-Escambia	Escambia	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03140106-0603-101	Blackwater River	Perdido-Escambia	Baldwin	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03140104-0104-100	Blackwater River	Perdido-Escambia	Escambia	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003
AL03140103-0402-100	Yellow River	Perdido-Escambia	Covington	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass.	ADPH Fish Consumption Advisory / March 2003

Assessment Unit	Waterbody Name	River Basin	County	Causes	Basis for Addition to the List	Source / Date of Data
AL06030004-0105-101	Elk River	Tennessee	Limestone	Nutrients	The growing season average chlorophyll-a concentration is 2 times the average of other tributary embayments on Wheeler Reservoir. The growing season average total phosphorus for Elk River is also over 2 times the average for other tributary embayments.	TVA / 1999-2002
AL03160203-1103-102	Tombigbee River	Lower Tombigbee	Mobile	Mercury	Alabama Fish Consumption Advisory issued by the Alabama Department of Public Health in March 2003 advising "No Consumption" of largemouth bass and channel catfish.	ADPH Fish Consumption Advisory / March 2003
AL03160203-0601-100	Bassett Creek	Lower Tombigbee	Clarke	Pathogens	One of eight fecal coliform measurements was greater than 2000 at two different stations on Bassett Creek.	ADEM / 2001-02
AL03160203-1103-700	Bilbo Creek	Lower Tombigbee	Washington	OE/DO	Five of 13 dissolved oxygen measurements were less than 5.0 mg/L.	ADEM / 2001-02
AL03160106-0606-101	Factory Creek	Upper Tombigbee	Sumter	OE/DO Nutrients	Four of 7 dissolved oxygen measurements were less than 5.0 mg/L. The average chlorophyll-a concentration was over 3 times the average of the other embayment stations on Lake Demopolis.	ADEM / 2001

Table E-2
Alabama's Final 2004 §303(d) List
Waterbody/Pollutants Removed from the 2002 List

The waterbody/pollutant combinations listed in the following table are proposed for removal from Alabama's 2002 §303(d) List and will not be included on Alabama's Final 2004 §303(d) List for the reasons presented.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/Alabama R_01	Alabama River (Claiborne Lake)	Alabama	Wilcox	Nutrients	Data collected by ADEM since 1990 indicate chlorophyll- <u>a</u> levels are in compliance with a chlorophyll- <u>a</u> criterion of 15 ug/L being proposed for the dam forebay of Claiborne Lake.
AL/Alabama R_03	Alabama River (Claiborne Lake)	Alabama	Wilcox	Nutrients	Data collected by ADEM since 1990 indicate chlorophyll- <u>a</u> levels are in compliance with a chlorophyll- <u>a</u> criterion of 15 ug/L being proposed for the dam forebay of Claiborne Lake.
AL/Alabama R_02	Alabama River (Claiborne Lake)	Alabama	Wilcox	Nutrients	Data collected by ADEM since 1990 indicate chlorophyll- <u>a</u> levels are in compliance with a chlorophyll- <u>a</u> criterion of 15 ug/L being proposed for the dam forebay of Claiborne Lake.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/03160109-030_01	Brindley Creek	Black Warrior	Cullman	OE/DO	ADEM performed an intensive survey in 2001 where no dissolved oxygen concentrations below 5.0 mg/l were measured. A combination of the DO data from the 2001-2003 303(d) sampling program yielded a total of seventy-eight samples at four stations. Of these seventy-eight samples collected, no dissolved oxygen values less than 5.0 mg/l were measured. Therefore, more recent and accurate data shows that Brindley Creek is fully supporting its use classification with respect to dissolved oxygen.
AL/03160109-030_01	Brindley Creek (lower segment)	Black Warrior	Cullman	Pathogens	Data collected by ADEM from 1997 to 2002 showed that 6 stations located on the lower portion of Brindley Creek did not report any exceedances of the single sample maximum for the fecal coliform criterion. Thus, the lower portion of Brindley Creek for 8.93 miles will be removed from the 303(d) list as the data shows it is fully supporting its use classification with respect to pathogens.
AL/03160109-050_01	Broglen River	Black Warrior	Cullman	Pathogens	Data collected by ADEM between 1997 and 2002 indicated an exceedance of the single sample maximum criterion of 2,000 col/100 ml to be less than 10%. One of sixteen samples exceeded the single sample maximum criterion.
AL/03160110-090_01	Crooked Creek	Black Warrior	Cullman	Pathogens	EPA Finalized TMDL on January 30, 2003.
AL/03160109-040_01	Eightmile Creek	Black Warrior	Cullman	Pathogens	Data collected by ADEM in 2001 indicated no exceedances of the fecal coliform criterion. This data consisted of 20 samples. Out of 4 geometric means all were below the summer geometric mean criterion of 200 col/100 ml.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/03160111-150_02	Locust Fork	Black Warrior	Jefferson	OE/DO	Of 60 samples collected in the past five years, two measured less than 5.0 mg/L, resulting in an exceedance of only 3%. In 2003, ADEM also collected diurnal DO measurements which revealed no exceedances of ADEM's DO criterion. This data demonstrates that Locust Fork is fully supporting its use classification with respect to OE/DO.
AL/03160109-020_02	Long Branch	Black Warrior	Cullman	Pathogens	EPA Finalized TMDL on January 30, 2003.
AL/03160110-080_01	Rock Creek	Black Warrior	Winston	Pathogens	EPA Finalized TMDL on January 30, 2003.
AL/03160109-080_01	Thacker Creek	Black Warrior	Cullman	Pathogens	EPA Finalized TMDL on January 30, 2003.
AL/03150202-060_02	Mill Creek	Cahaba	Jefferson	Pathogens	EPA Finalized TMDL on October 29, 2003.
AL/03150202-060_04	Cooley Creek	Cahaba	Jefferson	Pathogens	EPA Finalized TMDL on October 29, 2003.
AL/03150202-170_01	Dry Creek	Cahaba	Dallas	Pathogens	EPA Finalized TMDL on October 29, 2003.
AL/03150202-060_03	Mud Creek	Cahaba	Jefferson	Pathogens	EPA Finalized TMDL on October 29, 2003.
AL/03150202-060_01	Shades Creek	Cahaba	Jefferson	Pathogens	EPA Finalized TMDL on October 29, 2003.
AL/03150105-180_01	UT to Weiss Lake	Coosa	Cherokee	Ammonia	Data collected by ADEM in 2002 indicated no exceedances of EPA's recommended ammonia criterion.
AL/03150105-180_01	UT to Weiss Lake	Coosa	Cherokee	Nutrients	Data collected by ADEM in 2002 did not show any indication of nutrient enrichment. A habitat assessment was also conducted which resulted in a habitat score of "excellent."
AL/03150105-180_01	UT to Weiss Lake	Coosa	Cherokee	OE/DO	Data collected by ADEM in 2002 indicated no exceedances of the dissolved oxygen criterion of 5.0 mg/l. Six samples were analyzed with a minimum of 5.69 mg/l and a maximum of 10.95 mg/l.
AL/03150105-180_01	UT to Weiss Lake	Coosa	Cherokee	Pathogens	Data collected by ADEM in 2002 indicated no exceedances of the fecal coliform criterion. Twelve samples were analyzed.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/03150106-080_01	Black Creek	Coosa	Etowah	OE/DO	Of 21 samples collected, from 2 stations located on the listed segment collected during 2002 and 2003, none were measured below the allowable water quality criteria. In addition, a major point source is no longer discharging to Black Creek.
AL/03150106-080_01	Black Creek	Coosa	Etowah	Ammonia	Data collected during 2002 and 2003 indicated exceedances of EPA's recommended water quality criteria for ammonia. In addition, a major point source is no longer discharging to Black Creek.
AL/Mitchell Res_01	Lake Mitchell	Coosa	Coosa	OE/DO	Based on the analysis of 99 DO samples collected at five different stations between 1995 and 2000, no station exceeds the dissolved oxygen criterion of 5 mg/l in more than 10% of the samples.
AL/03150106-050_01	Little Wills Creek	Coosa	DeKalb	Nutrients	Recent ADEM habitat and macroinvertebrate assessments of Little Wills Creek revealed "good" ratings when compared to composite scores from four ecoregional reference sites.
AL/03160204-030_01	Bayou Sara/Norton Creek	Mobile	Mobile	Nutrients	Data collected by ADEM in 2001 and 2002 indicate nutrient levels are at or below the 90 th percentile concentrations of TP and TN from the three ecological reference streams (sites) used in the analysis. The median TP concentration for the three stations was below the ecological reference stream value. The median TN concentration for the three stations were 0.899 mg/L, 0.615 mg/L, and 0.876 mg/L and the ecological reference stream was 0.885 mg/L.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/03160205-070_01	Intracoastal Waterway	Mobile	Baldwin	OE/DO	Of 41 Samples collected from both listed Intracoastal waterway segments none were less than the water quality criterion for dissolved oxygen.
AL/03160205-010_01	Mobile Bay	Mobile	Mobile	OE/DO	Of 39 samples collected by ADEM from 2000 though 2003, no exceedances of water quality criteria for dissolved oxygen were indicated.
AL/03140107-040_01	Intracoastal Waterway	Perdido-Escambia	Baldwin	OE/DO	Of 41 Samples collected from both listed Intracoastal waterway segments none exceeded the water quality criteria for dissolved oxygen.
AL/03150109-190_01	Sugar Creek	Tallapoosa	Tallapoosa	Metals (Cu)	Of 13 samples collected by ADEM in 2003, none exceeded the water quality criteria for metals. A benthic macroinvertebrate and habitat assessment conducted by ADEM in 2003 showed fair and good ratings, respectively. In addition, the point source previously contributing to Copper impairments has been removed.
AL/03150109-190_01	Sugar Creek	Tallapoosa	Tallapoosa	Color	A benthic macroinvertebrate and habitat assessment conducted by ADEM in 2003 showed fair and good ratings respectively. In addition, the point source previously contributing to color impairments has been removed.
AL/06030002-230_01	Aldridge Creek	Tennessee	Madison	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030004-080_01	Big Creek	Tennessee	Limestone	OE/DO	Data collected in 1997 by TVA and in 1998 and 2003 by ADEM indicated no exceedances of the dissolved oxygen criterion.
AL/06030005-010_01	Big Nance Creek	Tennessee	Lawrence	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-360_01	Big Shoal Creek	Tennessee	Lawrence	OE/DO	EPA Finalized TMDL on September 30, 2003.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/06030002-180_01	Brier Fork	Tennessee	Madison	Unknown Toxicity	Data collected in 1997-1999 and 2001-2003 did not reveal any pollutant that might be causing or contributing to instream toxicity in Brier Fork. The dissolved oxygen criterion of 5.0 mg/L was not met in two of seventy samples and the pH exceeded 8.5 s.u. only once. In addition, there were no indicated exceedances of dissolved metals, organics, or pesticide/herbicide criteria from the aforementioned sampling events. The only NPDES discharges in the Brier Fork watershed are small domestic WWTP's that are not typically associated with discharging toxic materials.
AL/06030002-220_01	Cane Creek	Tennessee	Marshall	Nutrients	Data collected in 1998 and 2003 indicate nutrient levels are less than 90 th percentile values for the reference sites for the ecoregion. The median total phosphorus concentration for Cane Creek was 0.031 mg/L and the reference value was 0.051 mg/L.
AL/06030002-220_01	Cane Creek	Tennessee	Marshall	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_06	Cedar Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_06	Cedar Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030002-190_01	Chase Creek	Tennessee	Madison	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-070_01	Cole Spring Branch	Tennessee	Jackson	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-340_01	Crowdabout Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-340_01	Crowdabout Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030002-340_01	Crowdabout Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_07	East Fork Flint Creek	Tennessee	Cullman	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_07	East Fork Flint Creek	Tennessee	Cullman	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030002-360_04	Elam Creek	Tennessee	Lawrence	OE/DO	EPA Finalized TMDL on September 30, 2003.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/Wheeler Res_02	Elk River	Tennessee	Limestone	OE/DO	Data has been collected by TVA, International Paper Company, and ADEM from 1988 -2003. There were no dissolved oxygen concentrations less than the criterion from samples taken by ADEM and International Paper Company. In all, 2 of 278 (0.7%) measurements were less than 5.0 mg/L.
AL/06030002-440_02	First Creek	Tennessee	Lauderdale	Pathogens	Data collected by ADEM in 1998 and 2003 indicated no exceedances of the single sample maximum criterion.
AL/06030002-360_03	Flat Creek	Tennessee	Lawrence	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-360_03	Flat Creek	Tennessee	Lawrence	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_01	Flint Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_01	Flint Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_01	Flint Creek	Tennessee	Morgan	Nutrients	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_01	Flint Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030006-040_02	Harris Creek	Tennessee	Franklin	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-340_02	Herrin Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-340_02	Herrin Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-240_02	Huntsville Spring Branch	Tennessee	Madison	Metals	Concentrations of dissolved arsenic and dissolved mercury exceeded criteria in 2 of 23 samples. These exceedances are considered to be due to natural conditions. Additionally concentrations in fish collected downstream on Indian Creek did not exceed FDA action levels.
AL/06030002-250_02	Indian Creek	Tennessee	Madison	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_09	Indian Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-100_01	L. Paint Rock Creek	Tennessee	Marshall	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-300_01	Limestone Creek	Tennessee	Limestone	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_04	Mack Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_04	Mack Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/06030002-410_01	Mallard Creek	Tennessee	Lawrence	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-360_02	McDaniel Creek	Tennessee	Lawrence	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-360_02	McDaniel Creek	Tennessee	Lawrence	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-270_04	Mill Pond Creek	Tennessee	Marshall	Pathogens	ADEM pathogen data from June and August 2003 for Mill Pond Creek revealed no exceedances of ADEM's single sample criterion of 2,000 colonies/100 ml or summer geometric mean criterion of 200 colonies/100 ml.
AL/06030001-170_01	Mud Creek	Tennessee	Jackson	OE/DO	In 2003, ADEM sampled Mud Creek from March through October as part of the 303(d) sampling program. Of the 39 samples collected, none were less than the 5 mg/l criterion.
AL/06030002-350_01	No Business Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-350_01	No Business Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030005-160_01	Pond Creek	Tennessee	Colbert	Metals	Pond Creek was originally listed for copper and cyanide. Over 100 samples were collected by ADEM in 2000-2003 and CH2M Hill in 2003, and no exceedances were indicated for copper or cyanide. Three arsenic exceedances were found to be above the applicable water quality criteria, however these were determined to be below background levels, thus attributable to natural conditions.
AL/06030002-330_05	Robinson Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_05	Robinson Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-400_01	Round Island Creek	Tennessee	Limestone	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030001-270_01	Scarham Creek	Tennessee	Marshall	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_02	Shoal Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-330_02	Shoal Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.

Waterbody ID	Waterbody Name	River Basin	County	Pollutant	Good Cause Justification for Removal
AL/06030001-220_01	South Sauty Creek	Tennessee	DeKalb	pH	ADEM data from January to June 2003 revealed no exceedances out of 24 pH samples and AWW data from July 1997 to June 1999 revealed no exceedances out of 17 pH samples.
AL/06030002-390_01	Swan Creek	Tennessee	Limestone	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-330_03	Town Branch	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030001-250_01	Town Creek	Tennessee	DeKalb	pH	ADEM data from January to June 2003, for Town Creek revealed 1 exceedance out of 24 pH samples and AWW data from May 1996 to September 2002 revealed no pH exceedances out of 44 samples.
AL/06030002-350_03	Village Branch	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-350_03	Village Branch	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.
AL/06030002-350_02	West Flint Creek	Tennessee	Morgan	Siltation	EPA Approved TMDL on October 20, 2003.
AL/06030002-350_02	West Flint Creek	Tennessee	Morgan	Pathogens	EPA Finalized TMDL on September 30, 2003.
AL/06030002-350_02	West Flint Creek	Tennessee	Morgan	OE/DO	EPA Finalized TMDL on September 30, 2003.

Table E-3
List of Other Changes Appearing on the Final 2004 303(d) List

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03150201-0104-302	Three Mile Branch	Alabama	Montgomery	The length of this segment was corrected to 7.6 miles.
AL03160109-0105-101	Brindley Creek	Black Warrior	Cullman	The length of this segment was corrected to 7.1 miles.
AL03160109-0105-102	Brindley Creek	Black Warrior	Cullman	The length of this segment was corrected to 9.9 miles
AL03160109-0404-101	Cane Creek	Black Warrior	Walker	This segment was created from the 2002 303(d) list Cane Creek segment to better match designated use classifications.
AL03160109-0404-102	Cane Creek	Black Warrior	Walker	This segment was created from the 2002 303(d) list Cane Creek segment to better match designated use classifications.
AL03160109-0404-103	Cane Creek	Black Warrior	Walker	This segment was created from the 2002 303(d) list Cane Creek segment to better match designated use classifications.
AL03160111-0408-300	Camp Branch	Black Warrior	Jefferson	The length of this segment was corrected to 4.2 miles.
AL03160112-0105-101	Mud Creek	Black Warrior	Jefferson	The length of this segment was corrected to 14.1 miles.
AL03160112-0201-101	Big Yellow Creek	Black Warrior	Jefferson	The length of this segment was corrected to 14 miles.
AL03150202-0103-300	Lee Branch	Cahaba	Shelby	The length of this segment was corrected to 1.6 miles.
AL03150202-0201-300	Patton Creek	Cahaba	Shelby	The length of this segment was corrected to 8.3 miles.
AL03150202-0503-102	Cahaba River	Cahaba	Bibb	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0405-100	Cahaba River	Cahaba	Bibb	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0203-101	Cahaba River	Cahaba	Shelby	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0203-102	Cahaba River	Cahaba	Shelby	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0201-101	Cahaba River	Cahaba	Jefferson Shelby	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0201-102	Cahaba River	Cahaba	Jefferson	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0104-102	Cahaba River	Cahaba	Jefferson St. Clair	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.
AL03150202-0101-102	Cahaba River	Cahaba	Jefferson	This segment was created from the 2002 303(d) list Cahaba River segment to better match designated use classifications.

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03150202-0302-100	Shades Creek	Cahaba	Jefferson Bibb Shelby	The length of this segment was corrected to 56.3 miles.
AL03130003-1307-100	Barbour Creek	Chattahoochee	Barbour	The length of this segment was corrected to 25.1 miles.
AL03150105-1003-102	Weiss Lake	Coosa	Cherokee	This segment was created from the 2002 303(d) list Weiss Lake segment to better match designated use classifications.
AL03150105-1001-102	Weiss Lake	Coosa	Cherokee	This segment was created from the 2002 303(d) list Weiss Lake segment to better match designated use classifications.
AL03150106-0612-102	Choccolocco Creek	Coosa	Talladega Calhoun	Calhoun County was added as a location to this segment.
AL03150106-0801-100	Lake Logan Martin	Coosa	St. Clair Talladega	This segment was created from the 2002 303(d) list Lake Logan Martin segment to better match designated use classifications.
AL03150106-0501-101	Lake Logan Martin	Coosa	St. Clair Talladega Calhoun	This segment was created from the 2002 303(d) list Lake Logan Martin segment to better match designated use classifications.
AL03150106-0501-102	Lake Logan Martin	Coosa	St. Clair Calhoun	This segment was created from the 2002 303(d) list Lake Logan Martin segment to better match designated use classifications.
AL03150106-0309-101	Lake Neely Henry	Coosa	Etowah St. Clair Calhoun	This segment was created from the 2002 303(d) list Lake Neely Henry segment to better match designated use classifications.
AL03150106-0309-102	Lake Neely Henry	Coosa	Etowah	This segment was created from the 2002 303(d) list Lake Neely Henry segment to better match designated use classifications.
AL03150106-0104-101	Lake Neely Henry	Coosa	Etowah	This segment was created from the 2002 303(d) list Lake Neely Henry segment to better match designated use classifications.
AL03150106-0104-102	Lake Neely Henry	Coosa	Etowah Cherokee	This segment was created from the 2002 303(d) list Lake Neely Henry segment to better match designated use classifications.
AL03150107-0401-100	Lay Lake	Coosa	Talladega Chilton Coosa Shelby	This segment was created from the 2002 303(d) list Lay Lake segment to better match designated use classifications.
AL03150107-0101-102	Lay Lake	Coosa	Talladega Shelby	This segment was created from the 2002 303(d) list Lay Lake segment to better match designated use classifications.
AL03150107-0808-102	Lay Lake	Coosa	Talladega Shelby St. Clair	This segment was created from the 2002 303(d) list Lay Lake segment to better match designated use classifications.
AL03170008-0302-100	Escatawpa River	Escatawpa	Mobile	Swimming was added as a designated use to this segment.

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03170008-0402-700	Collins Creek	Escatawpa	Mobile	The length of this segment was corrected to 4.9 miles.
AL03170009-0102-100	Bayou la Batre	Escatawpa	Mobile	The length of this segment was corrected to 5.2 miles.
AL03160204-0403-103	Eightmile Creek	Mobile	Mobile	Public Water Supply was removed as a designated use for this segment. Also, the downstream location was corrected to US Highway 45.
AL03160204-0504-101	Threemile Creek	Mobile	Mobile	This segment was created from the 2002 303(d) list Threemile Creek segment to better match designated use classifications. Also, the downstream location was corrected to the Mobile River.
AL03160204-0504-102	Threemile Creek	Mobile	Mobile	This segment was created from the 2002 303(d) list Threemile Creek segment to better match designated use classifications.
AL03160204-0404-101	Chickasaw Creek	Mobile	Mobile	This segment was created from the 2002 303(d) list Chickasaw Creek segment to better match designated use classifications.
AL03160204-0404-102	Chickasaw Creek	Mobile	Mobile	This segment was created from the 2002 303(d) list Chickasaw Creek segment to better match designated use classifications.
AL03160204-0402-100	Chickasaw Creek	Mobile	Mobile	This segment was created from the 2002 303(d) list Chickasaw Creek segment to better match designated use classifications.
AL03160204-0505-201	Bay Minette Creek	Mobile	Mobile	The length of this segment was corrected to 17.9 miles.
AL03160204-0505-201	Tensaw River	Mobile	Baldwin	This segment was created from the 2002 303(d) list Tensaw River segment to better match designated use classifications.
AL03160204-0505-202	Tensaw River	Mobile	Baldwin	This segment was created from the 2002 303(d) list Tensaw River segment to better match designated use classifications.
AL03160204-0105-302	Tensaw River	Mobile	Baldwin	This segment was created from the 2002 303(d) list Tensaw River segment to better match designated use classifications.
AL03160204-0505-303	Tensaw River	Mobile	Mobile Baldwin	This segment was created from the 2002 303(d) list Tensaw River segment to better match designated use classifications.
AL03160204-0505-100	Mobile River	Mobile	Mobile	This segment was created from the 2002 303(d) list Mobile River segment to better match designated use classifications.
AL03160204-0303-102	Mobile River	Mobile	Mobile	This segment was created from the 2002 303(d) list Mobile River segment to better match designated use classifications.
AL03160205-0204-101	Dog River	Mobile	Mobile	This segment was created from the 2002 303(d) list Dog River segment to better match designated use classifications.
AL03160205-0204-102	Dog River	Mobile	Mobile	This segment was created from the 2002 303(d) list Dog River segment to better match designated use classifications.
AL03140106-0506-100	Styx River	Perdido- Escambia	Baldwin	This segment was created from the 2002 303(d) list Styx River segment to better match designated use classifications.

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03140106-0502-100	Styx River	Perdido-Escambia	Baldwin	This segment was created from the 2002 303(d) list Styx River segment to better match designated use classifications.
AL03140301-0404-100	Conecuh River	Perdido-Escambia	Covington	This segment was created from the 2002 303(d) list Conecuh River segment to better match designated use classifications.
AL03140301-0403-102	Conecuh River	Perdido-Escambia	Covington Crenshaw	This segment was created from the 2002 303(d) list Conecuh River segment to better match designated use classifications.
AL03150110-0703-100	Cubahatchee Creek	Tallahpoosa	Macon Bullock	Bullock County was added as a location to this segment.
AL03150110-0903-101	Line Creek	Tallahpoosa	Macon Montgomery	Montgomery County was added as a location to this segment.
AL03150110-0903-102	Line Creek	Tallahpoosa	Macon Montgomery	Montgomery County was added as a location to this segment.
AL06030002-0405-100	Flint River	Tennessee	Madison	This segment was created from the 2002 303(d) list Flint River segment to better match designated use classifications.
AL06030002-0404-102	Flint River	Tennessee	Madison	This segment was created from the 2002 303(d) list Flint River segment to better match designated use classifications.
AL06030002-0604-100	Town Creek	Tennessee	Morgan	The length of this segment was corrected to 5.5 miles.
AL06030002-0603-102	Cotaco Creek	Tennessee	Morgan	Swimming was added as a designated use to this segment.
AL06030002-0601-300	Hughes Creek	Tennessee	Morgan Marshall	Marshall County was added as a location to this segment.
AL06030004-0105-101	Elk River	Tennessee	Limestone Lauderdale	Lauderdale County was added as a location to this segment.
AL06030005-0701-201	McKiernan Creek	Tennessee	Colbert	Public Water Supply and Swimming were added as designated uses to this segment.
AL3160103-0204-202	Purgatory Creek	Upper Tombigbee	Marion	This segment was created from the 2002 303(d) list Purgatory Creek segment to better match designated use classifications.
AL3160103-0204-203	Purgatory Creek	Upper Tombigbee	Marion	This segment was created from the 2002 303(d) list Purgatory Creek segment to better match designated use classifications.

Table E-4**Additional Revisions made between the Draft 2004 List and the Final 2004 List**

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03150203-0805-102	Alabama River	Alabama	Wilcox	This segment was created from the draft 2004 303(d) list Alabama River segment to better match designated use classifications from ADEM regulations 335-6-11.
AL03150203-0805-103	Alabama River	Alabama	Wilcox	This segment was created from the draft 2004 303(d) list Alabama River segment to better match designated use classifications from ADEM regulations 335-6-11.
AL03150203-0805-104	Alabama River	Alabama	Wilcox	The Assessment Unit ID for this segment was renumbered from AL03150203-0805-103 to match the previous segment changes.
AL03150203-0805-105	Alabama River	Alabama	Wilcox	This segment was created from the draft 2004 303(d) list Alabama River segment to better match designated use classifications from ADEM regulations 335-6-11.
AL03150201-0309-100	Catoma Creek	Alabama	Montgomery	The Assessment Unit ID for this segment was corrected from AL03150203-0309-101.
AL03160109-0404-500	Black Branch	Black Warrior	Walker	The length of this segment was corrected to 3.2 miles.
AL03160109-0503-101	Wolf Creek	Black Warrior	Walker	The length of this segment was corrected to 38.4 miles.
AL03160109-0404-101	Cane Creek (Oakman)	Black Warrior	Walker	This segment was renamed to match its listing in chapter 335-6-11.
AL03160109-0404-102	Cane Creek (Oakman)	Black Warrior	Walker	This segment was renamed to match its listing in chapter 335-6-11.
AL03160109-0404-103	Cane Creek (Oakman)	Black Warrior	Walker	This segment was renamed to match its listing in chapter 335-6-11.
AL03160111-0408-101	Village Creek (Bayview Lake)	Black Warrior	Jefferson	This segment was renamed to match its listing in chapter 335-6-11.
AL03160111-0408-102	Village Creek	Black Warrior	Jefferson	This segment was corrected from AL03160111-0408-103.
AL03160111-0404-102	Locust Fork	Black Warrior	Blount, Jefferson	This segment was created from the original AL03160111-0404-102 Locust Fork segment from the draft 2004 303(d) list to better match designated use classifications from ADEM regulations 335-6-11.

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL03160111-0306-102	Locust Fork	Black Warrior	Blount, Jefferson	This segment was created from the original AL03160111-0404-102 Locust Fork segment from the draft 2004 303(d) list to better match designated use classifications from ADEM regulations 335-6-11.
AL03160111-0303-102	Locust Fork	Black Warrior	Blount, Jefferson	This segment was created from the original AL03160111-0404-102 Locust Fork segment from the draft 2004 303(d) list to better match designated use classification changes.
AL03140201-0602-201	Beaver Creek	Choctawhatchee	Houston	The length of this segment was corrected to 2.0 miles.
AL03140201-1001-700	UT to Harrand Creek	Choctawhatchee	Coffee	The length of this segment was corrected to 3.5 miles.
AL03150107-0502-100	Buxahatchee Creek	Coosa	Chilton, Shelby	The length of this segment was corrected to 14 miles.
AL03160204-0505-100	Mobile River	Mobile	Mobile	The length of this segment was corrected to 8.0 miles.
AL03160204-0303-102	Mobile River	Mobile	Mobile	The length of this segment was corrected to 20.7 miles.
AL03160205-0310-702	UT to Bon Secour River	Mobile	Baldwin	The length of this segment was corrected to 1.5 miles.
AL03160205-0204-102	Dog River	Mobile	Mobile	The upstream location of this segment was changed to Moore Creek to more accurately delineate this segment.
AL03160204-0504-101	Threemile Creek	Mobile	Mobile	This segment was created from the original AL03160204-0504-101 Threemile Creek draft 2004 303(d) List segment to more accurately delineate this segment.
AL03160204-0504-102	Threemile Creek	Mobile	Mobile	This segment was created from the original AL03160204-0504-102 Threemile Creek draft 2004 303(d) List segment to better match designated use classifications from ADEM regulations 335-6-11.
AL03160204-0504-103	Threemile Creek	Mobile	Mobile	This segment was created from the original AL03160204-0504-102 Threemile Creek draft 2004 303(d) List segment to better match designated use classifications from ADEM regulations 335-6-11.
AL03140103-0102-800	UT to Jackson Lake 3-C	Perdido-Escambia	Covington	The length of this segment was corrected to 1.8 miles.
AL03150108-1004-300	Wolf Creek	Tallapoosa	Randolph	The length of this segment was corrected to 5.4 miles.
AL03150109-0503-401	Sugar Creek	Tallapoosa	Tallapoosa	The length of this segment was corrected to 3.6 miles.
AL03150110-0703-100	Cubahatchee Creek	Tallapoosa	Macon, Bullock	The length of this segment was corrected to 44.4 miles.
AL06030001-0402-401	Warren Smith Creek	Tennessee	Jackson	The length of this segment was corrected to 1.9 miles.
AL06030002-0105-101	Guess Creek	Tennessee	Jackson	The length of this segment was corrected to 11.1 miles.
AL06030002-0304-100	Mountain Fork	Tennessee	Madison	The length of this segment was corrected to 15.3 miles.
AL06030002-0307-100	Brier Fork	Tennessee	Madison	The length of this segment was corrected to 22.5 miles.

Assessment Unit ID	Waterbody Name	River Basin	County	Revision
AL06030002-0306-100	Beaverdam Creek	Tennessee	Madison	The length of this segment was corrected to 22.1 miles.
AL06030002-0404-200	Goose Creek	Tennessee	Madison	The length of this segment was corrected to 8.9 miles.
AL06030002-0401-102	Flint River	Tennessee	Madison	The length of this segment was corrected to 15.3 miles.
AL06030002-0403-101	Hurricane Creek	Tennessee	Madison	The length of this segment was corrected to 7.3 miles.
AL06030002-0502-101	Huntsville Spring Branch	Tennessee	Madison	The length of this segment was corrected to 11.1 miles.
AL06030002-0505-101	Indian Creek	Tennessee	Madison	The Assessment Unit ID for this segment was corrected from AL06030002-0503-101.
AL06030002-0604-100	Town Creek	Tennessee	Morgan	The length of this segment was corrected to 8.7 miles.
AL06030002-0603-102	Cotaco Creek	Tennessee	Morgan	The length of this segment was corrected to 5.4 miles.
AL06030002-0602-102	West Fork Cotaco Creek	Tennessee	Morgan	The length of this segment was corrected to 7.9 miles.
AL06030002-0601-300	Hughes Creek	Tennessee	Morgan, Marshall	The length of this segment was corrected to 5.5 miles.
AL06030002-0802-201	French Mill Creek	Tennessee	Limestone	The length of this segment was corrected to 5.2 miles.
AL06030002-1008-200	Flat Creek	Tennessee	Lawrence	The length of this segment was corrected to 7.8 miles.
AL06030002-1204-102	Second Creek	Tennessee	Lauderdale	The length of this segment was corrected to 13 miles.
AL06030004-0102-100	Shoal Creek	Tennessee	Limestone	The length of this segment was corrected to 7.2 miles.
AL06030005-0702-100	Pond Creek	Tennessee	Colbert	The length of this segment was corrected to 12.5 miles.
AL06030005-0701-201	McKiernan Creek	Tennessee	Colbert	The length of this segment was corrected to 2.7 miles.
AL03160106-0402-102	Tombigbee River	Upper Tombigbee	Pickens	The length of this segment was corrected to 5.7 miles.
AL03160107-0306-100	Sipsey River	Upper Tombigbee	Pickens, Greene	The length of this segment was corrected to 43.1 miles.

Footnote: While the Department has used various methods to calculate 303(d) stream lengths in the past, we have standardized on using segment lengths from the National Hydrography Dataset (NHD) for this cycle of reporting. This will provide a consistency with our GIS layers for the Assessment Units project for the 305(b) report as mandated by EPA. Some of the segment lengths have changed due to the availability of new, high resolution NHD coverages being available. These GIS layers are derived from the 1:24,000 USGS quad sheets and are much more detailed than before.

Supplement A

**Public Notice Soliciting Available Data and
Information for Preparation of the 2004 303(d) List**

**NOTICE REQUESTING DATA AND INFORMATION FOR PREPARATION OF
ALABAMA'S DRAFT 2004 SECTION 303(d) LIST OF IMPAIRED WATERS**

Section 303(d) of the Clean Water Act requires that each state identify those waters that do not currently support designated uses, and establish a priority ranking of the waters taking into account the severity of the pollution and the uses to be made of the waters. For each water on the list, the state is required to establish the total maximum daily load (TMDL) at a level necessary to implement the applicable water quality standards.

The Alabama Department of Environmental Management (ADEM) has begun development of the draft 2004 Section 303(d) list and is soliciting data and information for consideration during preparation of the list. In order to be fully considered in this process, the data should be submitted to ADEM by October 31, 2003. If possible, the data should be submitted in electronic format.

While the Department will consider all data submitted, we reserve the right to incorporate only those data that meet minimum quality standards. In addition, the Department is not bound by interpretations provided by data submitters. It should also be noted that the Department is unable to pay a fee for the use of data. Data and information should be submitted to the following contact person:

Joseph Roy
ADEM – Water Division
P.O. Box 301463
Montgomery, Alabama 36130-1463

Mr. Roy's phone number is 334-270-5635. His e-mail address is jtr@adem.state.al.us.

Copies of Alabama's Final 2002 Section 303(d) list can be viewed at <http://adem.state.al.us/WaterDivision/WQuality/303d/WQ303d.htm>

This notice is hereby given this **September 15, 2003**, by authorization of the Alabama Department of Environmental Management.

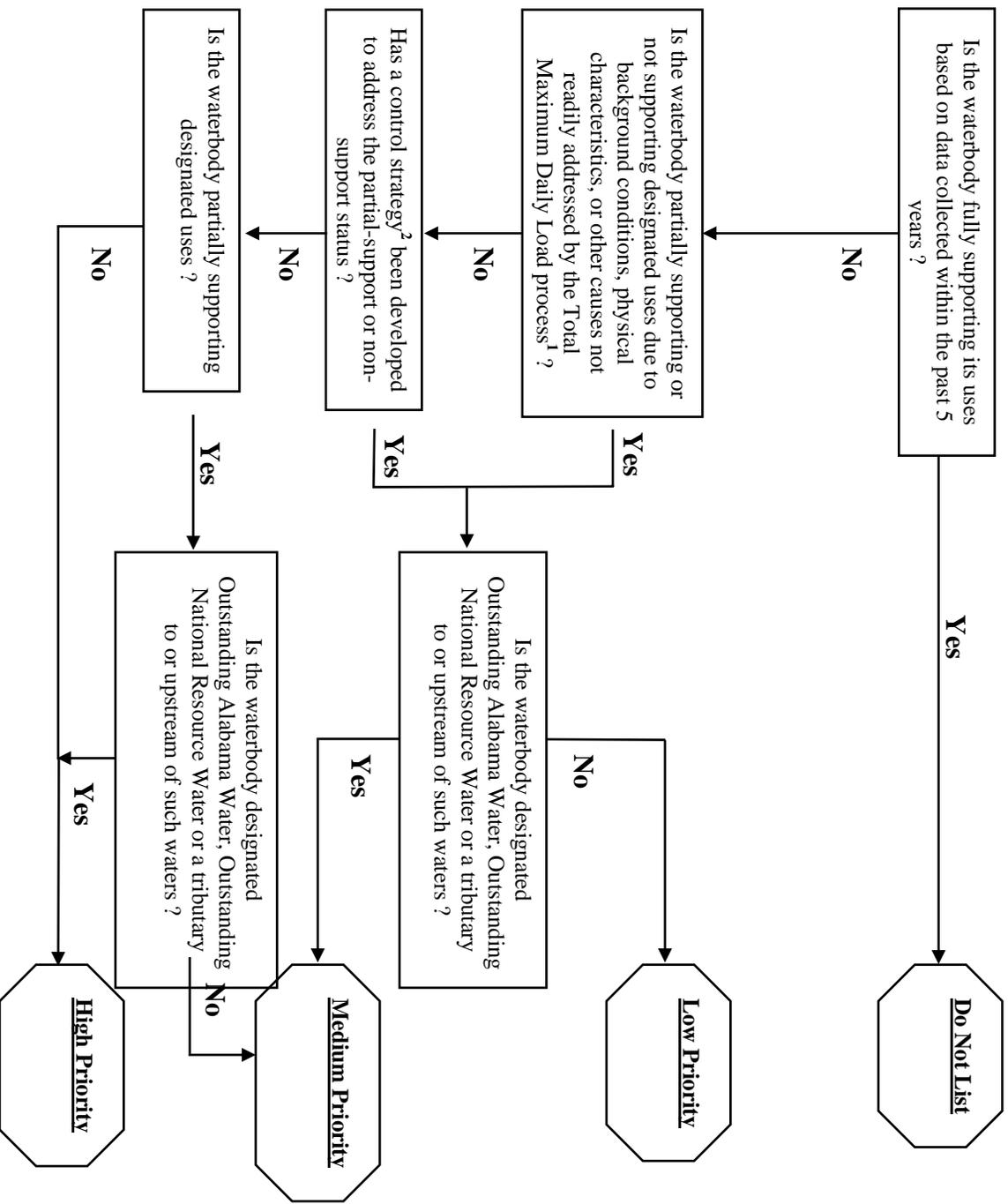
Original signed by

James W. Warr, Director

Supplement B

Prioritization Strategy

2004 §303(d) List - Prioritization Strategy



¹ Examples of other causes not readily addressed by the TMDL process include in place contaminants, flow regulation/modification, unknown sources, and atmospheric deposition.

² Examples of control strategies include wastewater treatment upgrades or removal, best management practice implementation, and permit modifications.

Supplement C

Alabama's Water Quality Assessment Methodology

Alabama Department of Environmental Management

Water Quality Assessment Methodology

Introduction

Surface water quality data and information collected by the Alabama Department of Environmental Management (ADEM) and others is used for many purposes. One of the principal purposes of this information is assessment of beneficial use support. Surface waters in Alabama are assigned various use classifications based on existing utilization, uses reasonably expected in the future, and those uses that could be possible after the effects of pollution are controlled or eliminated. Alabama's use classification system contains the following use classifications:

1. Public Water Supply
2. Swimming and Other Whole Body Water-Contact Sports
3. Shellfish Harvesting
4. Fish and Wildlife
5. Limited Warmwater Fishery
6. Agricultural and Industrial Water Supply

For each of the uses listed above, water quality criteria are applied for determining how the waters may be best utilized, for determining waste treatment requirements, and for standards of quality for State waters. The following methodology will set forth the manner in which ADEM uses surface water quality data and related information for determining whether a waterbody meets the minimum standards for its designated use. The methodology will also describe the procedure used for establishing the size or extent of assessed waterbodies.

Waterbody Assessments – Monitored versus Evaluated

Water quality data and information can take many forms, from anecdotal or casual observations to intensive water chemistry, biological, and physical characterization. When use support assessments are made it is important to understand the basis for the assessment. When information such as observed conditions, limited water quality data, water quality data older than five years, or estimated impacts from observed or suspected activities are used as the basis for the assessment, the assessment is generally referred to as an evaluated assessment. Evaluated assessments usually require the use of some degree of professional judgment 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. The following criteria are used to determine if information and /or data can be considered monitored or if it should be considered evaluated. See Table 1.

Table 1 - Assessment Level Criteria

Monitored Data	Evaluated Data
<ul style="list-style-type: none"> At least one measurement of chemical, physical, and biological conditions obtained between April and October. The biological conditions must be characterized by at least one biological indicator, i.e. macroinvertebrate community, pollutant levels in fish tissue, chl-a, toxicity to aquatic organisms. 	<ul style="list-style-type: none"> Data and information obtained during reconnaissance visits, complaint investigations, screening level assessments, and once per year sampling of randomly selected sites (ALAMAP).
<ul style="list-style-type: none"> At least five measurements of chemical and physical conditions obtained between April and October or over a time period considered critical for the particular pollutant of interest. 	<ul style="list-style-type: none"> Alabama Soil Conservation Service watershed assessments.
<ul style="list-style-type: none"> All data must be collected by personnel utilizing EPA approved QA/QC, an EPA approved SOP, and EPA approved analysis methods. 	<ul style="list-style-type: none"> Data and information older than five years or otherwise not meeting the criteria for monitored data.

Waterbody Assessments – Estimating the Size of the Assessed Waterbody

The United States Environmental Protection Agency’s (EPA) published guidelines for preparation of the 1998 §305(b) reports provide only general guidance on estimating the extent or size of a waterbody represented by a given monitoring station. The general guidance suggests that a station represent no more than five to 10 miles on a wadeable stream and no more than 25 miles for large rivers. Because of the complexity of monitoring lakes and estuaries, no general guidance is given on estimating the size assessed by individual stations in those waterbodies. Geographic information systems are proving very useful in making these determinations but site specific knowledge of the waterbody is needed.

The following guidelines are intended to provide consistency in estimates of the size or extent of waterbodies assessed by individual sampling points. However, water quality and biological conditions may vary naturally from waterbody to waterbody or from sampling location to sampling location and are affected by numerous factors such as stream flow and velocity, stream bed composition, riparian and upstream land uses and land cover, geology, stream canopy, and seasonal changes. Some degree of knowledge of the waterbody being assessed will be necessary to make appropriate use of these guidelines. Different guidelines have been developed for the following different types of waterbodies. See Table 2.

- Wadeable streams and rivers
- Flowing and non-wadeable streams and rivers
- Impounded rivers (reservoirs)
- Natural lakes and public fishing or water supply lakes
- Tidal rivers and streams
- Estuaries

Table 2 – Guidelines for Estimating Size or Extent of Assessed Waterbodies

Waterbody Type	Size or Extent Assessed
Wadeable stream / river	<p>Use the lessor of the distances to the following points but not to exceed a total distance of 15 miles per sampling point:</p> <ul style="list-style-type: none"> ▪ Upstream and downstream to the first point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the mainstem of the waterbody ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Any combination of the above points
Flowing and non-wadeable stream / river	<p>Use the lessor of the distances to the following points but not to exceed a total distance of 25 miles per sampling point:</p> <ul style="list-style-type: none"> ▪ Upstream and downstream to the first significant point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the mainstem of the waterbody ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Any combination of the above points
Impounded rivers (reservoirs)	<p>The network of reservoir sampling stations assesses all mainstem reservoirs in Alabama on a rotating basis. Embayments will not be considered assessed unless specifically sampled.</p>
Embayments of Impounded rivers (reservoirs)	<p>Embayments must have at least one sampling station to determine use support.</p>
Natural lakes and public fishing or water supply lakes	<p>Areas considered assessed should not exceed 200 acres per sampling point.</p>
Tidal rivers and streams	<p>Use the lessor of the distances to the following points but not to exceed a total distance of 5 miles per sampling point:</p>

	<ul style="list-style-type: none"> ▪ Upstream and downstream to the first point source ▪ Upstream and downstream to the next sampling location ▪ Upstream and downstream to the first tributary contributing 20% or more of the drainage area at the confluence of the tributary with the mainstem of the waterbody ▪ Upstream and downstream to the first significant change in land use or land disturbance activity ▪ Upstream to the extent of the tidal influence <p>Any combination of the above points</p> <p>Areas considered assessed should not exceed 5 square miles per sampling point.</p>
Estuaries	

Determining a Waterbody’s Use Support Status

A variety of water quality data and related information can be used to determine the use support status of a waterbody. In most cases chemical water quality data will serve as the basis for the use support determination. However, biological data such as macroinvertebrate community indices, fish community indices, trophic status, bioassay results, or bacteriological indicators are often used in addition to chemical data to provide a more comprehensive use support determination. Fish consumption advisories and shellfish harvesting closures can also serve as the basis for a waterbody’s use support determination.

The EPA guidelines for preparation of the 1998 §305(b) Water Quality Report to Congress offer the following guidance regarding use support determinations using conventional water quality parameters (i.e. dissolved oxygen, temperature, pH).

- Fully Supporting – For any one pollutant or stressor the criteria is exceeded in \leq 10 percent of the measurements.
- Partially Supporting – For any one pollutant or stressor the criteria is exceeded in 11 to 25 percent of the measurements.
- Not Supporting – For any one pollutant or stressor the criteria is exceeded in $>$ 25 percent of the measurements.

For toxicants (i.e. priority pollutants, metals, chlorine, and ammonia) the guidelines suggest the following criteria.

- Fully Supporting – For any one pollutant, no more than 1 exceedance of acute or chronic criteria in a 3-year period based on 10 or more samples.
- Partially Supporting – For any one pollutant, acute or chronic criteria exceeded more than once in a 3-year period but in \leq 10 percent of the samples based on 10 or more samples.

- Not Supporting – For any one pollutant, acute or chronic criteria exceeded in > 10 percent of the samples based on 10 or more samples.

In those cases where the applicable water quality criteria is less than the method detection limit for a particular pollutant the waterbody will be considered unassessed for that pollutant. When the number of samples collected in a 3-year period is between 5 and 10 the use support status will be based on best professional judgement using the available information and applying the same guidelines as for conventional parameters.

Biological assessments compare data from biological surveys and other direct measurements of resident biota in surface waters to established biological criteria and assess the waterbody's degree of use support. Alabama has not established numeric biological criteria and, as a result, biological data are used as a means of applying narrative criteria contained in Alabama's water quality criteria document (ADEM Admin. Code R. 335-6-10). Although EPA has not made specific recommendations concerning the interpretation of biological data it has offered the following technical considerations when using biological data to make use support determinations.

- A waterbody's use support should be based on a comparison of site-specific biological data to a reference condition established for the ecoregion in which the waterbody is located.
 - A multimetric approach to bioassessment is recommended.
 - The biosurvey should include an assessment of habitat structure or condition.
 - The use of a standardized index or sampling period is recommended.
 - Standard operating procedures and a quality assurance program should be established.
 - A determination of the performance characteristics of the bioassessment methodology is suggested.
 - An identification of the appropriate number of sampling sites that are representative of the waterbody is also recommended.

Biological assessment data will generally be used in combination with other surface water quality data or information to arrive at an overall use support determination. However, EPA recommends that biological data should be weighted more heavily than other types of data when integrating information to make use support determinations since biological data provide a more direct indication of the condition of the aquatic community. For the purpose of making use support determinations for Alabama's §305(b) report and §303(d) list the following guidelines regarding interpretation of biological data will be used.

- Fully Supporting – Macroinvertebrates determined to be Excellent (Unimpaired), Good (Slightly Impaired) or Fair (Moderately Impaired) rating if Chemical/Physical/Field data indicates compliance.
- Partial Support - Macroinvertebrates determined to be Fair (Moderately Impaired) and Chemical/Physical/Field data indicates impairment.
- Not Supporting – Macroinvertebrates determined to be Poor (Severely Impaired) and Chemical/Physical/Field data indicates impairment.

Appendix F
2004 303(d) List

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03150201-0104-302	Three Mile Branch	Non	R	M	Alabama	Montgomery	Fish & Wildlife	Pesticides (Dieldrin)	Unknown source	1999	7.6 miles	Lower Wetumpka Rd / Its source	No	2007
AL03150201-0309-100	Catoma Creek	Partial	R	M	Alabama	Montgomery	Fish & Wildlife	Organic Enrichment/DO	Pasture grazing Urban runoff/storm sewers	1990-91 1996-97	23.2 miles	Alabama River / Ramer Creek	Yes	2002
AL03150201-0309-100	Catoma Creek	Partial	R	M	Alabama	Montgomery	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Agriculture	1999	23.2 miles	Alabama River / Ramer Creek	No	2007
AL03150203-0703-101	Alabama River	Partial	R	L	Alabama	Wilcox	Public Water Supply	Organic Enrichment/DO	Dam construction Flow regulation/modification	1991	5.0 miles	Beaver Creek / Rockwest Creek	Yes	2003
AL03150203-0805-102	Alabama River	Partial	R	L	Alabama	Wilcox	Swimming Fish & Wildlife	Organic Enrichment/DO	Industrial	1991 1995-99	7.6 miles	Bear Creek / Frisco Railroad Crossing	Yes	2003
AL03150203-0805-103	Alabama River	Partial	R	L	Alabama	Wilcox	Fish & Wildlife	Organic Enrichment/DO	Industrial	1991 1995-99	5.0 miles	Frisco Railroad Crossing / Pursley Creek	Yes	2003
AL03150203-0805-104	Alabama River	Partial	R	L	Alabama	Wilcox	Fish & Wildlife	Organic Enrichment/DO	Dam construction Flow regulation/modification	1995-99	8.7 miles	Pursley Creek / River Mile 131	No	2003
AL03150203-0805-105	Alabama River	Partial	R	L	Alabama	Wilcox	Public Water Supply	Organic Enrichment/DO	Dam construction Flow regulation/modification	1995-99	1.5 miles	River Mile 131 / Beaver Creek	No	2003
AL03160109-0105-101	Brindley Creek	Non	R	H	Black Warrior	Cullman	Public Water Supply	Ammonia Nutrients	Agriculture Urban runoff/storm sewers	1996	7.1 miles	Broglen River / State Highway 69	No	2004
AL03160109-0105-102	Brindley Creek	Non	R	H	Black Warrior	Cullman	Public Water Supply	Ammonia Nutrients	Agriculture Urban runoff/storm sewers	1996	9.9 miles	State Highway 69 / Its source	No	2004
AL03160109-0105-102	Brindley Creek	Non	R	H	Black Warrior	Cullman	Public Water Supply	Pathogens	Agriculture	1996	9.9 miles	State Highway 69 / Its source	No	2003
AL03160109-0102-101	Mulberry Fork	Non	R	H	Black Warrior	Blount Cullman	Fish & Wildlife	Siltation Other habitat alterations	Agriculture	1974-83	18.4 miles	Broglen River / Blount County Road 6	No	2009
AL03160109-0201-102	Mud Creek	Non	R	H	Black Warrior	Cullman	Fish & Wildlife	Organic Enrichment/DO	Urban runoff/storm sewers	1996	4.7 miles	Alabama Highway 31 / Its source	No	2009
AL03160109-0204-101	Mulberry Fork	Non	R	H	Black Warrior	Blount Cullman	Fish & Wildlife	Nutrients	Agriculture Industrial Municipal	1972-83 1988 1996	2.5 miles	Marriott Creek / Mill Creek	No	2009
AL03160109-0204-102	Mulberry Fork	Non	R	H	Black Warrior	Blount Cullman	Fish & Wildlife	Nutrients Siltation Other habitat alterations	Agriculture Industrial Municipal	1972-83 1988 1996	17.3 miles	Mill Creek / Broglen River	No	2009
AL03160109-0404-101	Cane Creek (Oakman)	Partial	R	M	Black Warrior	Walker	Fish & Wildlife	Metals Nutrients pH Organic Enrichment/DO Siltation	Municipal Surface mining-abandoned	1988 1993	7.1 miles	Lost Creek / Dixie Springs Road	No	2009
AL03160109-0404-102	Cane Creek (Oakman)	Partial	R	M	Black Warrior	Walker	Limited Warmwater Fishery	Metals Nutrients pH Organic Enrichment/DO Siltation	Municipal Surface mining-abandoned	1988 1993	3.5 miles	Dixie Springs Road / Alabama Highway 69	No	2009

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03160109-0404-103	Cane Creek (Oakman)	Partial	R	M	Black Warrior	Walker	Fish & Wildlife	Metals Nutrients pH Organic Enrichment/DO Siltation	Municipal Surface mining-abandoned	1988 1993	7.4 miles	Alabama Highway 69 / Its source	No	2009
AL03160109-0404-500	Black Branch	Non	R	H	Black Warrior	Walker	Fish & Wildlife	Metals pH Siltation Other habitat alterations	Surface mining-abandoned	1996-97	3.2 miles	Cane Creek / Its source	No	2009
AL03160109-0403-103	Lost Creek	Partial	R	H	Black Warrior	Walker	Fish & Wildlife	Siltation Other habitat alterations	Surface mining-abandoned	1987	6.5 miles	US Highway 78 at Carbon Hill / US Highway 78 north of Cedrum	No	2009
AL03160109-0405-102	Lost Creek	Partial	R	H	Black Warrior	Walker	Fish & Wildlife	Siltation Other habitat alterations	Surface mining-abandoned	1987	17.3 miles	Mill dam at Cedrum / Alabama Highway 69 at Oakman	No	2009
AL03160109-0503-101	Wolf Creek	Partial	R	H	Black Warrior	Walker	Fish & Wildlife	Siltation Other habitat alterations	Surface mining-abandoned	1996	38.4 miles	Lost Creek / Alabama Highway 102	No	2009
AL03160111-0203-100	Dry Creek	Partial	R	M	Black Warrior	Blount	Fish & Wildlife	Nutrients Ammonia Organic Enrichment/DO Pathogens	Pasture grazing	1988 1991	11.2 miles	Locust Fork / Its source	No	2009
AL03160111-0204-101	Locust Fork	Partial	R	H	Black Warrior	Blount	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining-abandoned	1987 1998	27 miles	Little Warrior River / Blount County Road 30	No	2009
AL03160111-0404-102	Locust Fork	Partial	R	H	Black Warrior	Blount Jefferson	Fish & Wildlife	Nutrients Siltation Other habitat alterations	Agriculture Surface mining-abandoned	1998	14.3 miles	Jefferson County Road 77 / US Highway 31	No	2009
AL03160111-0306-102	Locust Fork	Partial	R	H	Black Warrior	Blount Jefferson	Public Water Supply Fish & Wildlife	Nutrients Siltation Other habitat alterations	Agriculture Surface mining-abandoned	1998	14.8 miles	US Highway 31 / county road between Hayden and County Line	No	2009
AL03160111-0303-102	Locust Fork	Partial	R	H	Black Warrior	Blount Jefferson	Fish & Wildlife	Nutrients Siltation Other habitat alterations	Agriculture Surface mining-abandoned	1998	18.6 miles	county road between Hayden and County Line / Little Warrior River	No	2009
AL03160111-0406-101	Newfound Creek	Partial	R	M	Black Warrior	Jefferson	Fish & Wildlife	Biology	Urban runoff/storm sewers	1986	3.0 miles	Fivemile Creek / Impoundment	No	2009
AL03160111-0408-300	Camp Branch	Non	R	L	Black Warrior	Jefferson	Fish & Wildlife	pH Siltation Other habitat alterations	Surface mining-abandoned Subsurface mining-abandoned Mill tailings-abandoned Mine tailings-abandoned Landfills	1991	4.2 miles	Bayview Lake / Its source	Yes	2002

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03160111-0408-102	Village Creek	Non	R	L	Black Warrior	Jefferson	Limited Warmwater Fishery	Metals pH Siltation	Industrial Municipal Urban runoff/storm sewers Surface mining-abandoned Subsurface mining-abandoned Mill tailings-abandoned Mine tailings-abandoned	1990-91 1997	12.6 miles	Second Creek / Woodlawn Bridge	Yes	2002
AL03160111-0408-101	Village Creek (Bayview Lake)	Non	L	L	Black Warrior	Jefferson	Limited Warmwater Fishery	Siltation	Municipal Urban runoff/storm sewers Industrial Spills Surface mining-abandoned	1991 1997	440 acres	Bayview Lake Dam / Second Creek	Yes	2003
AL03160112-0101-101	Valley Creek	Non	R	L	Black Warrior	Jefferson	Limited Warmwater Fishery	Metals (Mercury)	Unknown source	2003	0.9 miles	19th Street North (Bessemer) / Opossum Creek	No	2009
AL03160112-0101-200	Opossum Creek	Non	R	H	Black Warrior	Jefferson	Agricultural & Industrial	Organic Enrichment/DO	Industrial Urban runoff/storm sewers	1996	7.1 miles	Valley Creek / Its source	No	2004
AL03160112-0101-200	Opossum Creek	Non	R	H	Black Warrior	Jefferson	Agricultural & Industrial	Metals (Mercury)	Unknown source	2003	7.1 miles	Valley Creek / Its source	No	2009
AL03160112-0105-101	Mud Creek	Non	R	H	Black Warrior	Jefferson	Fish & Wildlife	pH Siltation	Unknown source	1974-83	14.1 miles	Valley Creek / Big Branch	No	2009
AL03160112-0201-101	Big Yellow Creek	Non	R	H	Black Warrior	Tuscaloosa	Swimming Fish & Wildlife	Metals	Surface mining-abandoned	1979-85 1988	14 miles	Bankhead Lake / Its source	No	2009
AL03160112-0404-102	North River	Partial	R	H	Black Warrior	Fayette Tuscaloosa	Fish & Wildlife	Nutrients Siltation Other habitat alterations	Surface mining-abandoned	1987	38 miles	Lake Tuscaloosa / Ellis Creek	No	2009
AL03160112-0503-100	Hurricane Creek	Non	R	H	Black Warrior	Tuscaloosa	Fish & Wildlife	Metals (Al, Fe) Pathogens Turbidity	Surface mining-abandoned Land development	1996	31.4 miles	Black Warrior River / Its source	Yes	2003
AL03160112-0502-200	Little Hurricane Creek	Non	R	H	Black Warrior	Tuscaloosa	Fish & Wildlife	Metals (Al, As, Cu, CrT, Fe) Pathogens	Surface mining-abandoned	1996	10 miles	Hurricane Creek / Its source	No	2003
AL03160112-0502-300	North Fork of Hurricane Creek	Non	R	H	Black Warrior	Tuscaloosa	Fish & Wildlife	Metals (Al)	Surface mining-abandoned	1996	6.4 miles	Hurricane Creek / Its source	No	2003
AL03150202-0103-300	Lee Branch	Non	R	H	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1996-99	1.6 miles	Lake Purdy / Its source	No	2004
AL03150202-0201-300	Patton Creek	Partial	R	L	Cahaba	Jefferson Shelby	Fish & Wildlife	Organic Enrichment/DO	Urban runoff/storm sewers	1995 1997	8.3 miles	Cahaba River / Its source	Yes	2003
AL03150202-0503-102	Cahaba River	Partial	R	H	Cahaba	Bibb	Outstanding Alabama Water Swimming	Nutrients	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	9.4 miles	Alabama Highway 82 / lower Little Cahaba River	No	2004

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03150202-0503-102	Cahaba River	Partial	R	H	Cahaba	Bibb	Outstanding Alabama Water Swimming	Siltation Other habitat alterations	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	9.4 miles	Alabama Highway 82 / lower Little Cahaba River	No	2003
AL03150202-0405-100	Cahaba River	Partial	R	H	Cahaba	Bibb	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1990 1992 1993	13.5 miles	lower Little Cahaba River / Shades Creek	No	2004
AL03150202-0405-100	Cahaba River	Partial	R	H	Cahaba	Bibb	Outstanding Alabama Water Fish & Wildlife	Siltation Other habitat alterations	Municipal Urban runoff/storm sewer Land development	1990 1992 1993	13.5 miles	lower Little Cahaba River / Shades Creek	No	2003
AL03150202-0203-101	Cahaba River	Partial	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1993-97	23.6 miles	Shades Creek / Shelby County Road 52	Yes	2004
AL03150202-0203-101	Cahaba River	Partial	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Siltation Pathogens Other habitat alterations	Municipal Urban runoff/storm sewers Land development	1993-97	23.6 miles	Shades Creek / Shelby County Road 52	Yes	2003
AL03150202-0203-102	Cahaba River	Partial	R	H	Cahaba	Shelby	Outstanding Alabama Water Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers Land development	1993-97	3.6 miles	Shelby County Road 52 / Buck Creek	Yes	2004
AL03150202-0203-102	Cahaba River	Partial	R	H	Cahaba	Shelby	Fish & Wildlife	Siltation Pathogens Other habitat alterations	Municipal Urban runoff/storm sewers Land development	1993-97	3.6 miles	Shelby County Road 52 / Buck Creek	Yes	2003
AL03150202-0201-101	Cahaba River	Partial	R	H	Cahaba	Jefferson Shelby	Fish & Wildlife	Nutrients	Urban runoff/storm sewers Municipal	1993	17.4 miles	Buck Creek / Dam near US Highway 280	No	2004
AL03150202-0201-101	Cahaba River	Partial	R	H	Cahaba	Jefferson Shelby	Fish & Wildlife	Siltation	Urban runoff/storm sewers Municipal	1993	17.4 miles	Buck Creek / Dam near US Highway 280	No	2003
AL03150202-0201-102	Cahaba River	Partial	R	H	Cahaba	Jefferson	Outstanding Alabama Water Public Water Supply	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	13.3 miles	Dam near US Highway 280 / Grant's Mill Road	No	2003
AL03150202-0104-102	Cahaba River	Partial	R	H	Cahaba	Jefferson St. Clair	Fish & Wildlife	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	21.1 miles	Grant's Mill Road / US Highway 11	No	2003
AL03150202-0101-102	Cahaba River	Partial	R	H	Cahaba	Jefferson	Outstanding Alabama Water Fish & Wildlife	Siltation Other habitat alterations	Urban runoff/storm sewers	1993	3.1 miles	US Highway 11 / I-59	No	2003
AL03150202-0202-101	Buck Creek	Non	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	2.9 miles	Cahaba River / Cahaba Valley Creek	No	2009
AL03150202-0202-401	Cahaba Valley Creek	Non	R	L	Cahaba	Shelby	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1999-00	7.6 miles	Buck Creek / US Highway 31	No	2009
AL03150202-0302-100	Shades Creek	Non	R	H	Cahaba	Jefferson Bibb Shelby	Fish & Wildlife	Siltation Other habitat alterations Turbidity	Highway/road/bridge Land development Urban runoff/storm sewers Removal of riparian vegetation Streambank modification	1990-93 1997	56.3 miles	Cahaba River / Its source	Yes	2003

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03130003-1307-100	Barbour Creek	Non	R	H	Chattahoochee	Barbour	Fish & Wildlife	Siltation	Agriculture	1987	25.1 miles	Chattahoochee River / Its source	No	2005
AL03130004-0601-201	Poplar Spring Branch	Non	R	H	Chattahoochee	Houston	Fish & Wildlife	pH	Industrial	1984	2.0 miles	Omussee Creek / Ross Clark Circle	No	2005
AL03130012-0201-400	Cypress Creek	Partial	R	M	Chipola	Houston	Fish & Wildlife	Nutrients Organic Enrichment/DO	Municipal Urban runoff/storm sewers	1984 1986	8.1 miles	Limestone Creek / Its source	No	2005
AL03140201-0502-100	Hurricane Creek	Non	R	H	Choctawhatchee	Dale	Fish & Wildlife	Pathogens	Agriculture	1991	8.5 miles	Choctawhatchee River / Its source	No	2005
AL03140201-0704-600	Dowling Branch	Non	R	H	Choctawhatchee	Geneva	Fish & Wildlife	Organic Enrichment/DO Pathogens	Municipal Urban runoff/storm sewers	1991	2.1 miles	Cox Mill Creek / Its source	No	2005
AL03140201-0602-201	Beaver Creek	Non	R	H	Choctawhatchee	Houston	Fish & Wildlife	Nutrients Organic Enrichment/DO	Municipal Urban runoff/storm sewers	1977-86	2.0 miles	Newton Creek / Dothan WWTP	No	2005
AL03140201-1001-700	UT to Harrand Creek	Partial	R	M	Choctawhatchee	Coffee	Fish & Wildlife	Nutrients	Urban runoff/storm sewers	1985 1986	3.5 miles	Harrand Creek / Its source	No	2005
AL03140201-1001-700	UT to Harrand Creek	Partial	R	M	Choctawhatchee	Coffee	Fish & Wildlife	Siltation	Urban runoff/storm sewers Land development	1999	3.5 miles	Harrand Creek / Its source	No	2006
AL03140202-0502-102	Walnut Creek	Partial	R	M	Choctawhatchee	Pike	Fish & Wildlife	Unknown toxicity	Municipal	1997	3.0 miles	Troy WWTP / downstream of Pike County Road 59	No	2005
AL03150105-1003-102	Weiss Lake	Partial	L	M	Coosa	Cherokee	Public Water Supply Swimming Fish & Wildlife	Priority Organics Nutrients	Upstream sources Flow regulation/modification	1992-94	12591 acres	Weiss Dam / Spring Creek	Yes	2003
AL03150105-1001-102	Weiss Lake	Partial	L	M	Coosa	Cherokee	Swimming Fish & Wildlife	Priority Organics Nutrients	Upstream sources Flow regulation/modification	1992-94	10184 acres	Spring Creek / AL-GA state line	Yes	2003
AL03150105-0807-102	Spring Creek	Non	R	H	Coosa	Cherokee	Fish & Wildlife	Pathogens	Unknown source	2002	5.1 miles	Weiss Lake / Mud Creek	No	2007
AL03150105-0807-200	Mud Creek	Non	R	H	Coosa	Cherokee	Fish & Wildlife	Pathogens	Unknown source	2002	5.1 miles	Spring Creek / Its source	No	2007
AL03150106-0612-102	Choccolocco Creek	Non	R	L	Coosa	Talladega Calhoun	Fish & Wildlife	Priority Organics	Contaminated sediments	1994	35.4 miles	Lake Logan Martin / Hillabee Creek	Yes	N/A
AL03150106-0801-100	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Talladega	Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	12363 acres	Logan Martin Dam / Broken Arrow Creek	Yes	2003
AL03150106-0801-100	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Talladega	Swimming Fish & Wildlife	Priority Organics(PCBs)	Contaminated sediments	1996	12363 acres	Logan Martin Dam / Broken Arrow Creek	No	2007
AL03150106-0501-101	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Talladega Calhoun	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	1397 acres	Broken Arrow Creek / Trout Creek	Yes	2003
AL03150106-0501-101	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Talladega Calhoun	Public Water Supply Swimming Fish & Wildlife	Priority Organics(PCBs)	Contaminated sediments	1996	1397 acres	Broken Arrow Creek / Trout Creek	No	2007

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03150106-0501-102	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Calhoun	Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97 1995-97	825 acres	Trout Creek / Neely Henry Dam	Yes	2003
AL03150106-0501-102	Lake Logan Martin	Partial	L	L	Coosa	St. Clair Calhoun	Swimming Fish & Wildlife	Priority Organics(PCBs)	Contaminated sediments	1996	825 acres	Trout Creek / Neely Henry Dam	No	2007
AL03150106-0309-101	Lake Neely Henry	Partial	L	M	Coosa	Etowah St. Clair Calhoun	Swimming Fish & Wildlife	Nutrients pH Organic Enrichment/DO	Industrial Municipal Flow regulation/modification Upstream sources	1992-95 1994-97	3577 acres	Neely Henry Dam / McCordney's Ferry	Yes	2003
AL03150106-0309-102	Lake Neely Henry	Partial	L	M	Coosa	Etowah	Fish & Wildlife	Nutrients pH Organic Enrichment/DO	Industrial Municipal Flow regulation/modification Upstream sources	1992-95 1994-97	2595 acres	McCordney's Ferry / Big Wills Creek	Yes	2003
AL03150106-0104-101	Lake Neely Henry	Partial	L	M	Coosa	Etowah	Fish & Wildlife	Nutrients pH Organic Enrichment/DO	Industrial Municipal Flow regulation/modification Upstream sources	1992-95 1994-97	1170 acres	Big Wills Creek / City of Gadsden water supply intake	Yes	2003
AL03150106-0104-101	Lake Neely Henry	Partial	L	M	Coosa	Etowah	Fish & Wildlife	Priority Organics (PCBs)	Contaminated sediments	2001-02	1170 acres	Big Wills Creek / City of Gadsden water supply intake	No	2007
AL03150106-0104-102	Lake Neely Henry	Partial	L	M	Coosa	Etowah Cherokee	Public Water Supply Fish & Wildlife	Nutrients pH Organic Enrichment/DO	Industrial Municipal Flow regulation/modification Upstream sources	1992-95 1994-97	1729 acres	Gadsden water supply intake / Weiss Dam Powerhouse	Yes	2003
AL03150106-0104-102	Lake Neely Henry	Partial	L	M	Coosa	Etowah Cherokee	Public Water Supply Fish & Wildlife	Priority Organics (PCBs)	Contaminated sediments	2001-02	1729 acres	City of Gadsden water supply intake / Weiss Dam Powerhouse	No	2007
AL03150107-0102-700	UT to Dry Branch	Partial	R	H	Coosa	Shelby	Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers	1991	1.5 miles	Dry Branch / Its source	Yes	2007
AL03150107-0502-100	Buxahatchee Creek	Partial	R	H	Coosa	Chilton Shelby	Fish & Wildlife	Nutrients	Municipal Urban runoff/storm sewers	1988 1996	14 miles	Waxahatchee Creek / Its source	Yes	2003
AL03150107-0401-100	Lay Lake	Partial	L	L	Coosa	Talladega Chilton Coosa Shelby	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO Priority Organics(PCBs)*	Flow regulation/modification Contaminated sediments Upstream sources	1990-91 1992-97	11765 acres	Lay Dam / Southern RR Bridge	Yes	2003 N/A*
AL03150107-0101-102	Lay Lake	Partial	L	L	Coosa	Talladega Shelby	Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO Priority Organics(PCBs)*	Flow regulation/modification Contaminated sediments Upstream sources	1990-91 1992-97	875 acres	Southern RR Bridge / River Mile 89	Yes	2003 N/A*
AL03150106-0808-102	Lay Lake	Partial	L	L	Coosa	Talladega Shelby St. Clair	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO Priority Organics(PCBs)*	Flow regulation/modification Contaminated sediments Upstream sources	1990-91 1992-97	675 acres	River Mile 89 / Logan Martin Dam	Yes	2003 N/A*

**Appendix F
2004 303(d) List**

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AL03150107-0601-100	Lake Mitchell	Partial	L	L	Coosa	Coosa Chilton	Public Water Supply Swimming Fish & Wildlife	Nutrients	Urban runoff/storm sewers Flow regulation/modification	1991-93 1994-97	5850 acres	Mitchell Dam / Lay Dam	Yes	2003
AL03170008-0205-102	Puppy Creek	Non	R	L	Escatawpa	Mobile	Fish & Wildlife	Pathogens Nutrients	Urban runoff/storm sewers	1991	10.0 miles	Alabama Highway 217 / Its source	Yes	2002
AL03170008-0302-100	Escatawpa River	Non	R	H	Escatawpa	Mobile	Swimming Fish & Wildlife	Metals (Mercury)	Unknown source	2002	68.3 miles	AL-MS state line / Its source	No	2008
AL03170008-0402-400	Boggy Branch	Partial	R	M	Escatawpa	Mobile	Fish & Wildlife	Metals (Fe)	Natural	1996-99	3.6 miles	Big Creek Lake / Its source	No	2008
AL03170008-0401-200	Juniper Creek	Non	R	H	Escatawpa	Mobile	Fish & Wildlife	Pathogens	Pasture grazing	1996-99	6.6 miles	Big Creek / Its source	No	2002
AL03170008-0402-700	Collins Creek	Partial	R	H	Escatawpa	Mobile	Fish & Wildlife	Pathogens	Pasture grazing On-site wastewater systems	1996-99	4.9 miles	Big Creek / Its source	No	2008
AL03170009-0201-100	Mississippi Sound	Partial	E	M	Escatawpa	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1994-97	146.5 mi2	Segment classified for shellfish harvesting	No	2008
AL03170009-0201-200	Portersville Bay	Non	E	L	Escatawpa	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Municipal	1996	23.2 mi2	1000 feet west of outfall / Bayou la Batre Utilities outfall	No	2008
AL03170009-0102-100	Bayou La Batre	Non	R	L	Escatawpa	Mobile	Fish & Wildlife	Organic Enrichment/DO	Urban runoff/storm sewers	1990-91	5.2 miles	Portersville Bay / Its source	Yes	2003
AL03170009-0102-100	Bayou La Batre	Non	R	L	Escatawpa	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1997	5.2 miles	Portersville Bay / Its source	No	2008
AL03160204-0106-102	Cold Creek Swamp	Partial	E	L	Mobile	Mobile	Fish & Wildlife	Metals (Hg)	Contaminated sediments Flow regulation/modification	1993	1.0 mi2	Cold Creek with Mobile River / West through swamp	Yes	N/A
AL03160204-0403-103	Eightmile Creek	Partial	R	M	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Collection system failures	1996-97	3.2 miles	US Highway 45 / Highpoint Boulevard	No	2002
AL03160204-0403-200	Gum Tree Branch	Non	R	H	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Collection system failures	1998	2.2 miles	Eightmile Creek / Its source	No	2002
AL03160204-0504-101	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Pesticides (Chlordane)	Unknown source	2000	2.0 miles	Mobile River / Toulmins Spring Branch	Yes	2008
AL03160204-0504-101	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Organic Enrichment/DO	Municipal Collection system failure Highway/road/bridge Land development	1990-95 1997 1998	2.0 miles	Mobile River / Toulmins Spring Branch	Yes	2003
AL03160204-0504-101	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	2.0 miles	Mobile River / Toulmins Spring Branch	No	2008

**Appendix F
2004 303(d) List**

Assessment Unit ID	Waterbody Name	Support Status	Type	Rank	River Basin	County	Uses	Causes	Sources	Date of Data	Size	Downstream / Upstream Locations	1996 303(d)?	Draft TMDL Date
AL03160204-0504-102	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Organic Enrichment/DO	Municipal Collection system failure Highway/road/bridge Land development Urban runoff/storm sewers	1990-95 1997 1998	3.4 miles	Toulmins Spring Branch / Mobile Street	Yes	2003
AL03160204-0504-102	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	3.4 miles	Toulmins Spring Branch / Mobile Street	No	2008
AL03160204-0504-103	Threemile Creek	Non	R	L	Mobile	Mobile	Fish & Wildlife	Organic Enrichment/DO	Municipal Collection system failure Highway/road/bridge Land development Urban runoff/storm sewers	1990-95 1997 1998	9.5 miles	Mobile Street / Its source	Yes	2003
AL03160204-0504-103	Threemile Creek	Non	R	L	Mobile	Mobile	Agricultural & Industrial	Pathogens	Municipal Collection system failure Urban runoff/storm sewers	2000-01	9.5 miles	Mobile Street / Its source	No	2003
AL03160204-0504-300	Toulmins Spring Branch	Non	R	H	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2000-01	3.2 miles	Threemile Creek / Its source	No	2008
AL03160204-0504-500	UT to Threemile Creek	Non	R	H	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2000-01	1.0 miles	Threemile Creek / Its source	No	2008
AL3160204-0404-101	Chickasaw Creek	Non	R	H	Mobile	Mobile	Limited Warmwater Fishery	Metals (Mercury)	Unknown source	2000	4.5 miles	Mobile River / US Highway 43	No	2008
AL3160204-0404-102	Chickasaw Creek	Non	R	H	Mobile	Mobile	Fish & Wildlife	Metals (Mercury)	Unknown source	2000	6.2 miles	US Highway 43 / Mobile College	No	2008
AL3160204-0402-100	Chickasaw Creek	Non	R	H	Mobile	Mobile	Swimming Fish & Wildlife	Metals (Mercury)	Unknown source	2000	25.4 miles	Mobile College / Its source	No	2008
AL03160204-0503-102	Bay Minette Creek	Non	R	H	Mobile	Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2000	17.9 miles	Bay Minette / Its source	No	2008
AL03160204-0505-201	Tensaw River	Partial	R	H	Mobile	Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	6.3 miles	Mobile Bay / Junction of Tensaw and Apalachee Rivers	No	2008
AL03160204-0505-202	Tensaw River	Partial	R	H	Mobile	Baldwin	Outstanding Alabama Water Swimming Fish & Wildlife	Metals (Mercury)	Unknown source	2002	21.8 miles	Junction of Tensaw and Apalachee Rivers / Junction of Briar Lake	No	2008
AL03160204-0105-302	Tensaw River	Partial	R	H	Mobile	Baldwin	Outstanding Alabama Water Fish & Wildlife	Metals (Mercury)	Unknown source	2002	2.9 miles	Junction of Briar Lake / Junction of Tensaw Lake	No	2008
AL03160204-0105-303	Tensaw River	Partial	R	H	Mobile	Baldwin Mobile	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	10.9 miles	Junction of Tensaw Lake / Mobile River	No	2008
AL03160204-0201-200	Middle River	Non	R	H	Mobile	Mobile Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	9.7 miles	Tensaw River(RM 20.6) / Tensaw River(RM 37.7)	No	2008

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2004 303(d) List**

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AL03160204-0505-100	Mobile River	Partial	R	L	Mobile	Mobile	Limited Warmwater Fishery	Metals (Mercury)	Unknown source	2000	8.0 miles	Mobile Bay / Spanish River	No	2008
AL03160204-0303-102	Mobile River	Partial	R	L	Mobile	Baldwin Mobile	Fish & Wildlife	Metals (Mercury)	Unknown source	2000	20.7 miles	Spanish River / Cold Creek	No	2008
AL03160205-0206-100	Fowl River	Non	R	H	Mobile	Mobile	Swimming Fish & Wildlife	Metals (Mercury)	Unknown source	2000	16.9 miles	Mobile Bay / Its source	No	2008
AL03160205-0104-100	Mobile Bay	Partial	E	M	Mobile	Mobile	Shellfish Harvesting Fish & Wildlife	Pathogens	Urban runoff/storm sewers	1994-97	198.5 mi2	Segment classified for shellfish harvesting	No	2008
AL03160205-0204-301	Rabbit Creek	Non	R	L	Mobile	Mobile	Fish & Wildlife	Organic Enrichment/DO Pathogens	Urban runoff/storm sewers Onsite wastewater systems	1991	3.0 miles	Dog River / Alabama Highway 163	Yes	2002
AL03160205-0204-101	Dog River	Non	R	L	Mobile	Mobile	Swimming Fish & Wildlife	Organic Enrichment/DO Pathogens	Land development Urban runoff/storm sewers Onsite wastewater systems	1990-91 1993-95	2.8 miles	Mobile Bay / Halls Mill Creek	Yes	2002
AL03160205-0204-102	Dog River	Non	R	L	Mobile	Mobile	Swimming Fish & Wildlife	Organic Enrichment/DO Pathogens	Land development Urban runoff/storm sewers Onsite wastewater systems	1990-91 1993-95	1.5 miles	Halls Mill Creek / Moore Creek	Yes	2002
AL03160205-0202-300	Bolton Branch	Partial	R	M	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	5.6 miles	Dog River / Its source	No	2008
AL03160205-0202-400	Eslava Creek	Partial	R	M	Mobile	Mobile	Fish & Wildlife	Pathogens	Urban runoff/storm sewers	2003	3.1 miles	Dog River / Its source	No	2008
AL03160205-0307-102	Fish River	Non	R	L	Mobile	Baldwin	Swimming Fish & Wildlife	Metals (Mercury) Pathogens	Unknown source Pasture grazing	1996	28.7 miles	Weeks Bay / Its source	No	2008
AL03160205-0310-702	UT to Bon Secour River	Non	R	H	Mobile	Baldwin	Fish & Wildlife	Pathogens	Urban runoff/storm sewers Pasture grazing	1995	1.5 miles	Baldwin County Road 65 / Its source	No	2008
AL03160205-0104-200	Bon Secour Bay	Partial	E	M	Mobile	Baldwin	Shellfish Harvesting Swimming Fish & Wildlife	Pathogens	Urban runoff/storm sewers Onsite wastewater systems	1994-97	121.3 mi2	Segment classified for shellfish harvesting	No	2008
AL-Gulf of Mexico	Gulf of Mexico	Non	E	L	Mobile	Mobile	Shellfish Harvesting Swimming Fish & Wildlife	Metals (Mercury)	Unknown source	1996-97	238 mi2	Mississippi / Florida	No	2008
AL03140103-0102-700	UT to Jackson Lake 2-S	Non	R	H	Perdido-Escambia	Covington	Fish & Wildlife	Organic Enrichment/DO Pathogens	Pasture grazing Feedlots	1996-97	1.3 miles	W.F. Jackson Lake / Its source	No	2005
AL03140103-0102-800	UT to Jackson Lake 3-C	Non	R	H	Perdido-Escambia	Covington	Fish & Wildlife	Organic Enrichment/DO Pathogens	Pasture grazing Feedlots	1996-97	1.8 miles	W.F. Jackson Lake / Its source	No	2005
AL03140103-0402-100	Yellow River	Non	R	L	Perdido-Escambia	Covington	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	14.8 miles	AL-FL state line / North Creek	No	2011
AL03140104-0104-100	Blackwater River	Non	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	2.7 miles	AL-FL state line / Blackwater Creek	No	2011
AL03140106-0302-202	Boggy Branch	Partial	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Organic Enrichment/DO Metals (Zinc) Chlorine	Industrial	1996,97	0.2 miles	Atmore WWTP / Masland Carpets WWTP	No	2005

**Appendix F
2004 303(d) List**

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AL03140106-0302-101	Brushy Creek	Non	R	H	Perdido-Escambia	Escambia	Fish & Wildlife	Organic Enrichment/DO	Industrial Municipal Urban runoff/storm sewers	1999	0.2 miles	AL-FL state line / Bogy Branch	No	2005
AL03140106-0506-100	Styx River	Partial	R	M	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	18.5 miles	Perdido River / Hollinger Creek	No	2011
AL03140106-0502-100	Styx River	Partial	R	M	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	22.7 miles	Hollinger Creek / Its source	No	2011
AL03140106-0603-101	Blackwater River	Non	R	L	Perdido-Escambia	Baldwin	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	3.1 miles	Perdido River / Narrow Gap Creek	No	2011
AL03140301-0302-102	Conecuh River	Non	R	L	Perdido-Escambia	Pike	Fish & Wildlife	Siltation Organic Enrichment/DO	Non-irrigated crop production	1991	24.7 miles	Broadhead Creek / Mannings Creek	Yes	2002
AL03140301-0404-100	Conecuh River	Non	R	L	Perdido-Escambia	Covington	Swimming Fish & Wildlife	Siltation	Non-irrigated crop production	1991	13.0 miles	Point A Dam / Head of Gantt Lake	Yes	2002
AL03140301-0403-102	Conecuh River	Non	R	L	Perdido-Escambia	Covington Crenshaw	Fish & Wildlife	Siltation	Non-irrigated crop production	1991	4.6 miles	Head of Gantt Lake / Hornet Creek	Yes	2002
AL03140303-0302-101	Rocky Creek	Non	R	H	Perdido-Escambia	Butler	Fish & Wildlife	Unknown toxicity	Unknown source	1986 1990	8.0 miles	Persimmon Creek / County Road north of Chapman	No	2005
AL-03140304-0106-100	Conecuh River	Non	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	12.7 miles	AL-FL state line / Mantle Branch	No	2011
AL03040304-0605-100	Little Escambia Creek	Non	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	12.2 miles	AL-FL state line / Wild Fork Creek	No	2011
AL03140305-0301-100	Big Escambia Creek	Non	R	L	Perdido-Escambia	Escambia	Fish & Wildlife	Metals (Mercury)	Unknown source	2002	17 miles	AL-FL state line / Big Spring Creek	No	2011
AL03150108-1004-300	Wolf Creek	Partial	R	M	Tallapoosa	Randolph	Fish & Wildlife	Pathogens	Feedlots	1990	5.4 miles	Little Tallapoosa River / Its source	Yes	2002
AL03150109-0503-401	Sugar Creek	Non	R	H	Tallapoosa	Tallapoosa	Fish & Wildlife	Chlorine Nutrients	Municipal	1990-96	3.6 miles	Elkahatchee Creek / Sugar Creek Alexander City	No	2004
AL03150110-0204-101	Yates Reservoir (Sougahatchee Creek Embayment)	Non	L	H	Tallapoosa	Tallapoosa	Public Water Supply Swimming Fish & Wildlife	Nutrients Organic Enrichment/DO	Industrial Municipal Non-irrigated crop production Pasture grazing	1994-97	224 acres	Sougahatchee Creek Embayment / NW1/4-S21-T19N-R22E	Yes	2003
AL03150110-0201-700	Pepperell Branch	Non	R	H	Tallapoosa	Lee	Fish & Wildlife	Nutrients	Industrial	1988	6.5 miles	Sougahatchee Creek / Its source	Yes	2003
AL03150110-0504-101	Calebee Creek	Non	R	H	Tallapoosa	Macon	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10 miles	Tallapoosa River / Macon County Road 9	No	2002
AL03150110-0703-100	Cubahatchee Creek	Non	R	H	Tallapoosa	Macon Bullock	Swimming Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	44.4 miles	Tallapoosa River / Its source	No	2002
AL03150110-0903-101	Line Creek	Partial	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation Other habitat alterations	Agriculture Surface mining	1996	10.0 miles	Tallapoosa River / Johnsons Creek	No	2002
AL03150110-0903-102	Line Creek	Partial	R	M	Tallapoosa	Macon Montgomery	Fish & Wildlife	Siltation	Agriculture Surface mining	1996	5.1 miles	Johnsons Creek / Panther Creek	No	2002

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2004 303(d) List**

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AL03150110-0301-400	Moore's Mill Creek	Non	R	L	Tallapoosa	Lee	Swimming Fish & Wildlife	Siltation	Land development Urban runoff/storm sewers	1998	10.1 miles	Chewacla Creek / Its source	No	2002
AL06030001-0402-401	Warren Smith Creek	Non	R	H	Tennessee	Jackson	Fish & Wildlife	Siltation	Surface mining-abandoned	1986 1987	1.9 miles	Dry Creek / Ross Branch	No	2004
AL06030002-0105-101	Guess Creek	Non	R	H	Tennessee	Jackson	Fish & Wildlife	Unknown toxicity Organic Enrichment/DO Pathogens	Unknown source Pasture grazing	1997	11.1 miles	Paint Rock River / Bee Branch	No	2010
AL06030002-0304-100	Mountain Fork	Non	R	H	Tennessee	Madison	Fish & Wildlife	Pathogens	Pasture grazing On-site wastewater systems	1994-95 1997	15.3 miles	Flint River / Its source	No	2004
AL06030002-0304-200	Hester Creek	Partial	R	M	Tennessee	Madison	Fish & Wildlife	Nutrients Pathogens	Pasture grazing	1994-95	7.2 miles	Mountain Fork / AL-TN state line	No	2004
AL06030002-0307-100	Brier Fork	Partial	R	L	Tennessee	Madison	Fish & Wildlife	Siltation	Non-irrigated crop production Land development	1994-95	21.5 miles	Flint River / AL-TN state line	No	2010
AL06030002-0306-100	Beaverdam Creek	Partial	R	M	Tennessee	Madison	Fish & Wildlife	Siltation	Non-irrigated crop production Land development	1994-95	22.5 miles	Brier Fork / Its source	No	2010
AL06030002-0404-200	Goose Creek	Non	R	H	Tennessee	Madison	Fish & Wildlife	Organic Enrichment/DO	Agriculture	1997	8.9 miles	Flint River / Its source	No	2002
AL06030002-0404-200	Goose Creek	Non	R	H	Tennessee	Madison	Fish & Wildlife	Unknown Toxicity	Agriculture	1997	8.9 miles	Flint River / Its source	No	2010
AL06030002-0405-700	Yellow Bank Creek	Partial	R	M	Tennessee	Madison	Fish & Wildlife	Organic Enrichment/DO	Agriculture Urban runoff/storm sewers	1994-95	5.6 miles	Flint River / Its source	No	2002
AL06030002-0405-100	Flint River	Partial	R	M	Tennessee	Madison	Fish & Wildlife	Organic Enrichment/DO	Agriculture Urban runoff/storm sewers	1994-95	20.9 miles	Tennessee River / Big Cove Creek	No	2004
AL06030002-0404-102	Flint River	Partial	R	M	Tennessee	Madison	Public Water Supply Fish & Wildlife	Organic Enrichment/DO	Agriculture Urban runoff/storm sewers	1994-95	6.9 miles	Big Cove Creek / Hurricane Creek	No	2004
AL06030002-0401-102	Flint River	Partial	R	M	Tennessee	Madison	Fish & Wildlife	Pathogens	Pasture grazing	1999	15.3 miles	Alabama Highway 72 / Mountain Fork	No	2004
AL06030002-0403-101	Hurricane Creek	Non	R	H	Tennessee	Madison	Fish & Wildlife	Pathogens	Pasture grazing	1997	7.3 miles	Flint River / Gurley Pike Road	No	2004
AL06030002-0502-101	Huntsville Spring Branch	Non	R	L	Tennessee	Madison	Fish & Wildlife	Priority Organics	Contaminated sediments	1993	11.1 miles	Indian Creek / Johnson Road (Huntsville Field)	Yes	N/A
AL06030002-0505-101	Indian Creek	Non	R	L	Tennessee	Madison	Fish & Wildlife	Priority Organics	Contaminated sediments	1991-91 1993	7.2 miles	Tennessee River / Martin Road (Redstone Arsenal)	Yes	N/A
AL06030002-0604-100	Town Creek	Non	R	H	Tennessee	Morgan	Fish & Wildlife	Organic Enrichment/DO	Agriculture	1997	5.4 miles	Cotaco Creek / Its source	No	2004
AL06030002-0603-102	Cotaco Creek	Non	R	H	Tennessee	Morgan	Swimming Fish & Wildlife	Pathogens	Agriculture	1997	5.4 miles	Guyer Branch / West Fork Cotaco Creek	No	2004
AL06030002-0602-102	West Fork Cotaco Creek	Partial	R	M	Tennessee	Morgan	Fish & Wildlife	Pathogens Siltation	Agriculture	1997	7.9 miles	Alabama Highway 67 / Frost Creek	No	2004

**Appendix F
2004 303(d) List**

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AL06030002-0601-700	Mill Pond Creek	Non	R	H	Tennessee	Marshall	Fish & Wildlife	Siltation	Agriculture	1994-95	1.3 miles	Hog Jaw Creek / Its source	No	2004
AL06030002-0601-300	Hughes Creek	Partial	R	M	Tennessee	Morgan Marshall	Fish & Wildlife	Siltation	Agriculture	1995	5.5 miles	Cotaco Creek / Its source	No	2004
AL06030002-0802-201	French Mill Creek	Non	R	H	Tennessee	Limestone	Fish & Wildlife	Pathogens	Pasture grazing	1997	5.2 miles	Piney Creek / UT in Pine Swamp	No	2004
AL06030002-1002-300	Herrin Creek	Non	R	M	Tennessee	Morgan	Fish & Wildlife	Ammonia Nutrients	Pasture grazing	1994-95	6.3 miles	Crowdabout Creek / Its source	No	2010
AL06030002-1008-200	Flat Creek	Non	R	H	Tennessee	Lawrence	Fish & Wildlife	Ammonia Nutrients	Pasture grazing	1997	7.8 miles	West Flint Creek / Its source	No	2010
AL06030002-1204-102	Second Creek	Non	R	H	Tennessee	Lauderdale	Fish & Wildlife	Pathogens	Pasture grazing	1997	13 miles	Lauderdale County Road 76 / AL-TN state line	No	2004
AL06030004-0102-100	Shoal Creek	Non	R	H	Tennessee	Limestone	Fish & Wildlife	Pathogens	Pasture grazing	1997	7.2 miles	Elk River / AL-TN state line	No	2004
AL06030004-0105-101	Elk River	Partial	R	L	Tennessee	Limestone Lauderdale	Swimming Fish & Wildlife	pH	Pasture grazing Non-irrigated crop production	1990-91	6.0 miles	Wheeler Lake / Anderson Creek	Yes	2003
AL06030004-0105-101	Elk River	Partial	R	L	Tennessee	Limestone Lauderdale	Swimming Fish & Wildlife	Nutrients	Pasture grazing Non-irrigated crop production	1999-02	6.0 miles	Wheeler Lake / Anderson Creek	No	2006
AL06030004-0104-102	Anderson Creek	Partial	R	M	Tennessee	Lauderdale	Fish & Wildlife	Siltation	Pasture grazing Non-irrigated crop production	1994-95	9.0 miles	Snake Road bridge / Its source	No	2010
AL06030005-0702-100	Pond Creek	Non	R	L	Tennessee	Colbert	Agricultural & Industrial	Organic Enrichment/DO	Non-irrigated crop production Urban runoff/storm sewers Natural	1991	12.5 miles	Tennessee River / Its source	Yes	2004
AL06030005-0701-201	McKiernan Creek	Non	R	H	Tennessee	Colbert	Public Water Supply Swimming Fish & Wildlife	Ammonia Nutrients Siltation Organic Enrichment/DO	Agriculture	1988	2.7 miles	Tennessee River / Shegog Creek	No	2010
AL06030006-0103-103	Bear Creek	Non	R	H	Tennessee	Marion	Swimming Fish & Wildlife	Metals (Al)	Surface mining-abandoned	1992-96	3.0 miles	Mill Creek / Upper Bear Creek Dam	No	2010
AL06030006-0101-700	Little Dice Branch	Partial	R	M	Tennessee	Franklin	Fish & Wildlife	Siltation	Surface mining-abandoned	1982	3.6 miles	Bear Creek / Its source	No	2010
AL03160103-0204-202	Purgatory Creek	Partial	R	H	Upper Tombigbee	Marion	Fish & Wildlife	pH	Surface mining-abandoned	1988	1.8 miles	Wickett Creek / US Highway 278	No	2007
AL03160103-0204-203	Purgatory Creek	Partial	R	H	Upper Tombigbee	Marion	Public Water Supply Fish & Wildlife	pH	Surface mining-abandoned	1988	1.2 miles	US Highway 278 / Its source	No	2007
AL03160106-0504-202	Little Bear Creek	Partial	R	L	Upper Tombigbee	Pickens	Fish & Wildlife	Organic Enrichment/DO	Urban runoff/storm sewers	1996	3.9 miles	Pickens County Road 4 / Its source	No	2002
AL03160106-0402-102	Tombigbee River	Partial	R	L	Upper Tombigbee	Pickens	Swimming Fish & Wildlife	Organic Enrichment/DO	Dam construction Flow regulation/modification	1991	5.7 miles	Beville Dam / AL-MS state line	Yes	2002
AL03160107-0306-100	Sipsey River	Partial	R	M	Upper Tombigbee	Pickens Greene	Fish & Wildlife	Metals (Fe)	Surface mining	1991-93	43.1 miles	Tombigbee River / Tuscaloosa County line	No	2007

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AL03160106-0606-101	Factory Creek	Non	R	M	Upper Tombigbee	Sumter	Fish & Wildlife	Organic Enrichment/DO Nutrients	Agriculture	2001	1.3 miles	Tombigbee River / End of embayment	No	2008
AL03160203-0601-100	Bassett Creek	Partial	R	M	Lower Tombigbee	Clarke	Fish & Wildlife	Pathogens	Municipal Urban runoff	2001-02	12.8 miles	Little Bassett Creek / Its source	No	2008
AL03160203-1103-102	Tombigbee River	Non	R	L	Lower Tombigbee	Clarke Washington	Fish & Wildlife	Metals (Mercury)	In place contaminants	2001-02	3.8 miles	Upper end of Bilbo Island / Olin Basin	No	2008
AL03160203-1103-700	Bilbo Creek	Non	R	L	Lower Tombigbee	Washington	Swimming Fish & Wildlife	Organic Enrichment/DO	Unknown source	2001-02	29.3 miles	Tombigbee River / Its source	No	2008
AL03160203-1103-800	Olin Basin	Non	L	L	Lower Tombigbee	Washington	Fish & Wildlife	Pesticides Metals (Hg)	Contaminated sediments	1993	65 acres	All of Olin Basin	Yes	N/A

