



Alabama River Basin Management Plan

DRAFT

Alabama Clean Water Partnership
Montgomery, Alabama

February 4, 2005

REVISED June 2005

Prepared by:

Kleinschmidt
Energy & Water Resource Consultants

Alabama River Basin Management Plan

DRAFT

Alabama Clean Water Partnership
Montgomery, Alabama

February 4, 2005

REVISED June 2005

Prepared by:

Kleinschmidt
Energy & Water Resource Consultants

ALABAMA RIVER BASIN MANAGEMENT PLAN

TABLE OF CONTENTS

| | |
|---|-------|
| EXECUTIVE SUMMARY | vii |
| COMMONLY USED ACRONYMS AND ABBREVIATIONS..... | xviii |
| 1.0 INTRODUCTION | 1-1 |
| 2.0 BASIN MANAGEMENT PLAN FOR THE ALABAMA RIVER | 2-5 |
| 2.1 Alabama Clean Water Partnership (ACWP)..... | 2-6 |
| 2.2 Alabama-Tombigbee CWP Steering Committee..... | 2-7 |
| 2.3 Sub-basin Stakeholder Groups in the Alabama and Tombigbee River Basins..... | 2-8 |
| 2.3.1 Catoma Watershed Advisory Committee | 2-15 |
| 3.0 PHYSICAL GEOGRAPHY OF THE ALABAMA RIVER BASIN | 3-1 |
| 3.1 Basins and Watersheds of the Alabama River..... | 3-2 |
| 3.2 Dams and their Impoundments in the Alabama River Basin..... | 3-2 |
| 3.3 Climate..... | 3-3 |
| 3.4 Geology..... | 3-3 |
| 3.5 Soils..... | 3-5 |
| 3.6 Hydrogeology | 3-6 |
| 3.7 Ground Water Resources | 3-6 |
| 3.8 Ecological Components of the Alabama River Basins..... | 3-7 |
| 3.8.1 Habitats of the Alabama River Basin..... | 3-8 |
| 3.8.2 Biodiversity in the Alabama River Basin | 3-10 |
| 3.8.3 Threatened and Endangered Aquatic Species in the Alabama River Basin | 3-11 |
| 3.8.4 Conservation Efforts | 3-16 |
| 4.0 PEOPLE AND THE ALABAMA RIVER BASIN | 4-1 |
| 4.1 Population in the Basin | 4-1 |
| 4.2 The Economy of the Alabama River Basin | 4-3 |
| 4.2.1 Employment..... | 4-3 |
| 4.2.2 Major Natural-Resource-based Industries | 4-3 |
| 4.2.3 The “Black Belt” Region | 4-6 |
| 4.3 Political jurisdictions and Governmental Agencies in the Alabama River Basin | 4-7 |
| 4.3.1 Regional Authorities..... | 4-8 |
| 4.3.2 State and Federal Organizations | 4-9 |
| 5.0 WATER QUALITY IN THE ALABAMA RIVER BASIN | 5-1 |
| 5.1 Water Quality Monitoring and Data Sources..... | 5-1 |
| 5.1.1 Nonpoint Source Pollution Assessments | 5-3 |
| 5.1.2 Alabama Water Watch..... | 5-3 |
| 5.1.3 National Water-Quality Assessment Program (NAWQA)..... | 5-4 |
| 5.1.4 United States Army Corps of Engineers..... | 5-6 |

Table of Contents (Cont'd)

| | | |
|-------|---|------|
| 5.1.5 | Draft Environmental Impact Statement - Water Allocation for the Alabama-Coosa-Tallapoosa River Basin..... | 5-7 |
| 5.2 | The Status of Monitoring in the Alabama River Basin..... | 5-9 |
| 5.3 | Setting Limits to Nonpoint Source Pollution – TMDLs..... | 5-10 |
| 5.3.1 | TMDLs in the Alabama River Basin | 5-12 |
| 6.0 | BASIN MANAGEMENT NEEDS..... | 6-1 |
| 6.1 | Stakeholder Concerns..... | 6-2 |
| 6.2 | Nonpoint Source Pollution Impairment Potential for Subwatersheds..... | 6-4 |
| 6.3 | Resource Concerns for Subwatersheds:..... | 6-8 |
| 6.4 | Sediment Loading Estimates..... | 6-9 |
| 6.5 | Summary of Management Needs..... | 6-14 |
| 6.6 | Targeted Subwatersheds | 6-15 |
| 6.7 | Sediment Load Modeling of Targeted Subwatersheds | 6-18 |
| 6.8 | BMP Load Reductions for Targeted Subwatersheds..... | 6-21 |
| 7.0 | RIVER BASIN MANAGEMENT RECOMMENDATIONS..... | 7-1 |
| 7.1 | Basin Management Goals and the Concerns / Issues they Address..... | 7-1 |
| | GOAL: Reduce nonpoint source pollution from agricultural activities – cropland, pastureland, and animal husbandry..... | 7-3 |
| | GOAL: Reduce nonpoint source pollution from forestry activities - | 7-16 |
| | GOAL: Reduce nonpoint source pollution from aquaculture operations..... | 7-24 |
| | GOAL: Reduce nonpoint source pollution from roads, roadbanks, and new road construction..... | 7-27 |
| | GOAL: Reduce pollution from urban and residential areas..... | 7-30 |
| | GOAL: Reduce nonpoint source pollution from mining activities..... | 7-36 |
| | GOAL: Protect and restore wetlands and fish and wildlife habitat..... | 7-38 |
| | GOAL: Decrease water quality impacts such as bank erosion, littering, and chemical pollution by increasing boater awareness and improving river recreation management..... | 7-40 |
| | GOAL: Promote resource education and outreach, and watershed awareness of issues in the river basin. Promote volunteer activities throughout the watershed. Promote watershed management technology transfer..... | 7-41 |
| | GOAL: Continue to track resource trends in the river basin to measure progress in restoration and protection efforts, and identify new resource concerns and issues..... | 7-43 |
| | GOAL: Develop a framework in the river basin to implement the projects and tasks in this plan..... | 7-45 |
| 8.0 | IMPLEMENTATION..... | 8-1 |
| 8.1 | Strategic Next Steps for Basin Management Plan Implementation..... | 8-2 |
| 8.2 | Sources of Funding | 8-4 |
| 9.0 | REFERENCES | 9-1 |

LIST OF TABLES

| | | |
|--------------|--|------|
| Table 1.1. | Summary of Water Quality Regulations and Management Authorities | 1-3 |
| Table 3.2. | U.S. Army Corps of Engineers Dams in the Alabama River Basin | 3-3 |
| Table 3.4. | The geology of the Alabama River basin. | 3-4 |
| Table 3.4a. | Major production of minerals by county in the Alabama River basin (GSA, 2002; USGS, 2002)..... | 3-4 |
| Table 3.8. | Physical Characteristics of the Level IV Ecoregions of the Alabama River Basin—Southeastern Plains Level III Ecoregion (EPA, 2001). | 3-9 |
| Table 3.8a. | Threatened and Endangered Aquatic Species in the Alabama River Basin (U.S. Fish and Wildlife Service 2000)..... | 3-11 |
| Table 3.8b. | Eleven Species of Imperiled Freshwater Mussels (Family: <i>Unionidae</i>) with Designated Critical Habitat in the Mobile River Basin | 3-18 |
| Table 3.8c. | Summary of Critical Habitats for 11 Threatened and Endangered Species of Freshwater Mussels within the Alabama River Basin..... | 3-19 |
| Table 4.1. | Population Data and Median Income for the Alabama River Basin..... | 4-1 |
| Table 4.3a – | Summary Forest Statistics for the Alabama River Basin..... | 4-4 |
| Table 4.3b – | Summary Agricultural Statistics for Selected Counties within the Alabama River Basin..... | 4-5 |
| Table 4.2. | Proportion of the Alabama River Basin in each County..... | 4-8 |
| Table 5.1. | Important Sources of Water Quality Data for the Alabama River Basin | 5-2 |
| Table 5.1.2. | Summary of Alabama Water Watch Monitoring Activity in the Alabama River Basin, 1998 – 2005..... | 5-4 |
| Table 5.1.3. | Major USGS Publications pertinent to the Alabama River Basin | 5-5 |
| Table 5.2. | Water Quality Categorization for the State of Alabama..... | 5-9 |
| Table 5.2a. | Summary of Categorized Waters in the Alabama River Basin..... | 5-10 |
| Table 5.3. | Waterbodies in the Alabama River Basin listed on the 2004 303(d) List | 5-11 |
| Table 6.1. | Nonpoint source pollution potential in the Alabama River Basin and its three sub-basins. Percentages reflect the proportion of the total NPS impairment score for the basin attributable to each of the seven rural land use impairment sources. The top five subwatersheds were ordered within similar rating groups by subwatershed size. ¹ | 6-7 |
| Table 6.2. | Resource concerns in the Alabama River Basin and its three basin segments. Percentages reflect the number of subwatersheds in the basin in which the resource concern was considered significant. Source of data: ADEM (2002). | 6-9 |
| Table 6.3. | Sediment loading from various sources in the Alabama River Basin and its three sub-basins ¹ | 6-12 |
| Table 6.4. | Subwatersheds in the Alabama River Basin with the highest total sediment loading estimates from all erosion sources. Sediment loading estimates are in tons per year. Source of data: Alabama Soil and Water Conservation Districts, published by the SWCC..... | 6-13 |
| Table 6.5. | Target subwatersheds in the Alabama River Basin. These subwatersheds were identified as either having a high NPS Impairment Potential, being an ADEM Priority Subwatershed, or having a 303(d) impaired water in the subwatershed. Source of data: ADEM (2002). | 6-17 |
| Table 6.6. | Sediment load estimates for targeted subwatersheds in the Alabama River Basin for cropland, pastureland, and forested land Comparison of load | |

| | | |
|-------------|---|------|
| | estimates are made between those made by the Soil and Water Conservation Districts in 1998 and those derived from STEPL modeling as part of this plan. | 6-19 |
| Table 6.6. | Sediment load estimates for targeted subwatersheds in the Alabama River Basin for cropland, pastureland, and forested land Comparison of load estimates are made between those made by the Soil and Water Conservation Districts in 1998 and those derived from STEPL modeling as part of this plan (cont'd). | 6-20 |
| Table 7.1a. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Filter Strips" agricultural BMPs for cropland. The subwatersheds with the highest sediment loading from cropland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G. | 7-10 |
| Table 7.1b. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Reduced Tillage" agricultural BMPs for cropland. The subwatersheds with the highest sediment loading from cropland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G. | 7-11 |
| Table 7.1c. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Streambank Stabilization and Fencing" agricultural BMPs for cropland. The subwatersheds with the highest sediment loading from cropland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G | 7-12 |
| Table 7.1d. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Terraces" agricultural BMPs for cropland. The subwatersheds with the highest sediment loading from cropland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G | 7-13 |
| Table 7.1e. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Streambank Stabilization and Fencing" agricultural BMPs for pastureland. The subwatersheds with the highest sediment loading from pastureland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G | 7-14 |
| Table 7.1f. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Terraces" agricultural BMPs for pastureland. The subwatersheds with the highest sediment loading from pastureland are listed below. Other subwatershed load reduction modeling results are provided in Appendix G | 7-15 |
| Table 7.1g. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Site Preparation/Steep Slope Seeder/Transplant" forestry BMPs for forested land. The subwatersheds with the highest sediment loading from forested land are listed below. Other subwatershed load reduction modeling results are provided in Appendix G | 7-21 |
| Table 7.1h. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Site Preparation/Straw/Crimp Seed/Fertilizer/Transplant" forestry BMPs for forested land. The subwatersheds with the highest sediment loading from forested land are listed below. | |

| | | |
|-------------|---|------|
| | Other subwatershed load reduction modeling results are provided in Appendix G | 7-22 |
| Table 7.1i. | Expected reductions in sediment, nitrogen, and phosphorus loading with implementation of "Site Preparation/Straw/Net/Seed/Fertilizer/Transplant" forestry BMPs for forested land. The subwatersheds with the highest sediment loading from forested land are listed below. Other subwatershed load reduction modeling results are provided in Appendix G..... | 7-23 |
| Table 8.2 | Watershed Management Funding Organizations and Opportunities; adapted from: CH2MHILL (2005) | 8-5 |
| Table G-1. | Load reduction efficiencies for the nine BMPs utilized in STEPL for this basin management plan..... | G-5 |

LIST OF FIGURES

| | | |
|---------------|--|------|
| Figure 2.3. | Stakeholder Input Opportunities for the Basin Management Plans..... | 2-13 |
| Figure 4.3 | Regional Planning Councils of Alabama (Image credit to AARC, 2005)..... | 4-8 |
| Figure 6.1-a. | Nonpoint source pollution potential in the Alabama River Basin. Percentages reflect the proportion of the total impairment score for the Alabama River Basin that is attributed to each rural land use impairment source. | 6-5 |
| Figure 6.1-b. | Nonpoint source pollution potential in the Upper Alabama River Basin. Percentages reflect the proportion of the total impairment score for the Upper Basin that is attributed to each rural land use impairment source. | 6-5 |
| Figure 6.1-c. | Nonpoint source pollution potential in the Middle Alabama River Basin. Percentages reflect the proportion of the total impairment score for the Middle Basin that is attributed to each rural land use impairment source. | 6-5 |
| Figure 6.1-d. | Nonpoint source pollution potential in the Lower Alabama River Basin. Percentages reflect the proportion of the total impairment score for the Lower Basin that is attributed to each rural land use impairment source. | 6-5 |
| Figure 6.2-a. | Sediment loading estimates for the Alabama River Basin. Percentages reflect the proportion of the total sediment loading for the Alabama River Basin that is attributed to each source of sediment erosion..... | 6-10 |
| Figure 6.2-b. | Sediment loading estimates for the Upper Alabama River Basin. Percentages reflect the proportion of the total sediment loading for the Upper Alabama River Basin that is attributed to each source of sediment erosion..... | 6-10 |
| Figure 6.2-c. | Sediment loading estimates for the Middle Alabama River Basin. Percentages reflect the proportion of the total sediment loading for the Middle Alabama River Basin that is attributed to each source of sediment erosion..... | 6-10 |
| Figure 6.2-d. | Sediment loading estimates for the Lower Alabama River Basin. Percentages reflect the proportion of the total sediment loading for the Lower Alabama River Basin that is attributed to each source of sediment erosion..... | 6-10 |

LIST OF APPENDICES

| |
|---|
| Appendix A – Sub-Watersheds (HUC 11) of the Alabama River |
|---|

Table of Contents (Cont'd)

Appendix B – Employment in the Counties of the Alabama River Basin, 2000 U.S. Census

Appendix C – Categorized Waters in the Alabama River Basin

Appendix D – Potential for nonpoint source pollution impairment of streams in the Alabama River Basin. Only rural land use sources of nonpoint pollution are considered here

Appendix E – Table 1 - Resource concerns related to agricultural land use practices in the Alabama River Basin.

Appendix F – Sediment Loading Estimates for Subwatersheds in the Alabama River Basin

Appendix G – Loading and BMP Load Reduction Modeling Results for the Targeted Subwatersheds