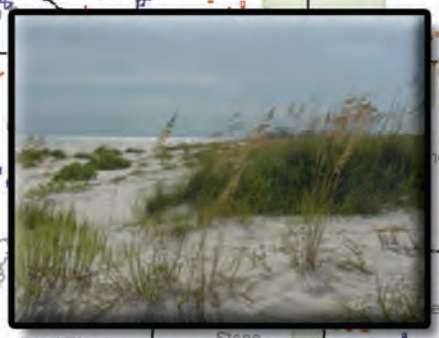
Alabama and Mississippi Proposed Resource Management Plan and Final Environmental Impact Statement

August 2008



BLM

Eastern States, Jackson Field Office

Mission Statement

It is the mission of the Bureau of Land Management to sustain the health, diversity, and productivity of the public lands for the use and enjoyment of present and future generations.

BLM/ES/PL-08/001+1610

Cover Photos: Top Left – Point Clear Island, Hancock County, Mississippi; Top Right – Hanging Moss at Big Rock Island, Mitchell Lake Alabama; Middle Right – Fowl River Tract, Mobile County, Alabama; Bottom Left – Fort Morgan Beach Tract, Baldwin County, Alabama; and Bottom Right – Oil rig on Federal lease.

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Eastern States
Jackson Field Office
411 Briarwood Drive, Suite 404
Jackson, Mississippi 39206
http://www.es.blm.gov/AL_MS_RMP

In reply refer to: 1610 (020)

August 22, 2008

Dear Reader:

Enclosed is the Alabama and Mississippi Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) for the Eastern States, Jackson Field Office (JFO). The Bureau of Land Management (BLM) prepared the Proposed RMP-FEIS in consultation with cooperating agencies, taking into account public comments received during this planning effort. The Proposed RMP provides a framework for the future management direction and appropriate use of BLM-administered lands and mineral resources located in the states of Alabama and Mississippi. The document contains land use planning decisions to guide the BLM's management of public lands and mineral resources administered by the JFO.

This Proposed RMP-FEIS have been developed in accordance with the National Environmental Policy Act of 1969 (NEPA) and the Federal Land Policy and Management Act of 1976. The PRMP is largely based on Alternative 3, the preferred alternative in the Draft Resource Management Plan-Environmental Impact Statement (RMP-EIS), which was released on August 31, 2007. The Proposed RMP-FEIS contains the Proposed Plan, a summary of changes made between the Draft RMP-EIS and Proposed RMP-FEIS, predictable impacts of the Proposed Plan, a summary of the written and verbal comments received during the public review period for the Draft RMP-EIS, and responses to the comments.

Pursuant to BLM's planning regulations at 43 CFR 1610.5-2, any person who participated in the planning process for this PRMP and has an interest which is or may be adversely affected by the planning decisions may protest approval of the planning decisions within 30 days from date the Environmental Protection Agency publishes the Notice of Availability in the *Federal Register*. For further information on filing a protest, please see the accompanying protest regulations in the pages that follow (labeled as Attachment 1). The regulations specify the required elements of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents or available planning records (e.g., meeting minutes or summaries, correspondence, etc.). To aid in ensuring the completeness of your protest, a protest check list is attached to this letter (labeled as Attachment 2).

E-mailed and faxed protests will not be accepted as valid protests unless the protesting party also provides the original letter by either regular or overnight mail postmarked by the close of the protest period. Under these conditions, the BLM will consider the e-mailed or faxed protest as an advance copy and will afford it full consideration. If you wish to provide the BLM with such advance notification, please direct faxed protests to the attention of Brenda Hudgens-Williams- BLM protest coordinator at 202-452-5112, and e-mailed protests to: Brenda_Hudgens-Williams@blm.gov.

All protests, including the follow-up letter (if e-mailing or faxing) must be in writing and mailed to the following address:

Regular Mail:	Overnight Mail:
Director (210) Attention: Brenda Williams P.O. Box 66538 Washington, D.C. 20035	Director (210) Attention: Brenda Williams 1620 L Street, N.W., Suite 1075 Washington, D.C. 20036

Before including your address, phone number, e-mail address, or other personal identifying information in your protest, be advised that your entire protest – including your personal identifying information – may be made publicly available at any time. While you can ask us in your protest to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so.

The BLM Director will make every attempt to promptly render a decision on each protest. The decision will be in writing and will be sent to the protesting party by certified mail, return receipt requested. The decision of the BLM Director shall be the final decision of the Department of the Interior.

Upon resolution of all land use plan protests, the BLM will issue an Approved RMP and Record of Decision (ROD). The Approved RMP and ROD will be mailed or made available electronically to all who participated in the planning process and will be available to all parties through the "Planning" page of the BLM national website (*http://www.blm.gov/planning*), or by mail upon request.

Unlike land use planning decisions, implementation decisions are not subject to protest under the BLM planning regulations, but are subject to an administrative review process, through appeals to the Office of Hearings and Appeals (OHA), Interior Board of Land Appeals (IBLA) pursuant to 43 CFR, Part 4 Subpart E. Implementation decisions generally constitute the BLM's final approval allowing on-the ground actions to proceed. Where implementation decisions are made as part of the land use planning process, they are still subject to the appeals process or other administrative review as prescribed by specific resource program regulations once the BLM resolves the protests to land use planning decisions and issues an Approved RMP and ROD. The Approved RMP and ROD will therefore identify the implementation decisions made in the plan that may be appealed to the Office of Hearing and Appeals.

Sincerely,

Juan Palma

Juan Palma
State Director

Attachments (2)

Attachment 1

[Code of Federal Regulations]
[Title 43, Volume 2]
[Revised as of October 1, 2002]
From the U.S. Government Printing Office via GPO Access
[CITE: 43CFR1610.5-2]

TITLE 43--PUBLIC LANDS: INTERIOR

CHAPTER II--BUREAU OF LAND MANAGEMENT, DEPARTMENT OF THE INTERIOR

PART 1600--PLANNING, PROGRAMMING, BUDGETING--Table of Contents

Subpart 1610--Resource Management Planning

Sec. 1610.5-2 Protest procedures.

(a) Any person who participated in the planning process and has an interest which is or may be adversely affected by the approval or amendment of a resource management plan may protest such approval or amendment. A protest may raise only those issues which were submitted for the record during the planning process.

(1) The protest shall be in writing and shall be filed with the Director. The protest shall be filed within 30 days of the date the Environmental Protection Agency published the notice of receipt of the final environmental impact statement containing the plan or amendment in the Federal Register. For an amendment not requiring the preparation of an environmental impact statement, the protest shall be filed within 30 days of the publication of the notice of its effective date.

(2) The protest shall contain:

(i) The name, mailing address, telephone number and interest of the person filing the protest;

(ii) A statement of the issue or issues being protested;

(iii) A statement of the part or parts of the plan or amendment being protested;

(iv) A copy of all documents addressing the issue or issues that were submitted during the planning process by the protesting party or an indication of the date the issue or issues were discussed for the record; and

(v) A concise statement explaining why the State Director's decision is believed to be wrong.

(3) The Director shall promptly render a decision on the protest. The decision shall be in writing and shall set forth the reasons for the decision. The decision shall be sent to the protesting party by certified mail, return receipt requested.

(b) The decision of the Director shall be the final decision of the Department of the Interior.

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Attachment 2

Resource Management Plan Protest
Critical Item Checklist

The following items *must* be included to constitute a valid protest whether using this optional format, or a narrative letter.
(43 CFR 1610.5-2)

Before including your address, phone number, e-mail address, or other personal identifying information in your **protest**, be advised that your entire **protest**--including your personal identifying information--may be made publicly available at any time. While you can ask us in your **protest** to withhold from public review your personal identifying information, we cannot guarantee that we will be able to do so. All submissions from organizations and businesses, and from individuals identifying themselves as representatives or officials of organizations and businesses, will be available for public inspection in their entirety.

Resource Management Plan (RMP) or Amendment (RMPA) being protested:

Name:
Address:
Phone Number: ( )

Your interest in filing this protest (how will you be adversely affected by the approval or amendment of this plan?):

Issue or issues being protested:

Statement of the part or parts of the plan being protested:

Chapter:
Section:
Page:
(or) Map:

Attach copies of all documents addressing the issue(s) that were submitted during the planning process by the protesting party, <u>OR an indication of the date the issue(s) were discussed for the record</u>.
Date(s):

A concise statement explaining why the State Director's decisions is believed to be wrong:

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Alabama and Mississippi Proposed Resource Management Plan and Final Environmental Impact Statement

for

Public Lands and Minerals Administered

by the

Bureau of Land Management
Eastern States
Jackson Field Office

Prepared by

United States Department of the Interior
Bureau of Land Management
Eastern States
Jackson Field Office

In cooperation with

The State of Mississippi

August 2008

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ALABAMA AND MISSISSIPPI PROPOSED RESOURCE MANAGEMENT PLAN AND FINAL ENVIRONMENTAL IMPACT STATEMENT

Lead Agency: U.S. Department of the Interior, Bureau of Land Management

Type of Action: Administrative

Jurisdiction: Portions of the States of Mississippi and Alabama

Abstract: This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) describes and analyzes a reasonable range of management alternatives for the public lands and minerals administered by the Bureau of Land Management (BLM) in the States of Alabama and Mississippi. Within the two States combined, the BLM administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. The BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U.S. Forest Service [USFS]). For the purposes of this document, RMP mineral leasing decisions will apply to "BLM-administered, non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS. The BLM has responsibility for lease issuance and post-lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies.

The purpose of the Alabama and Mississippi RMP is to prepare a single land use plan for the two (2) States so that the BLM will be able to respond to mineral leasing proposals and deal efficiently with the long-term management of its scattered land. There is a need for this RMP because, until now, BLM resource management in the States of Alabama and Mississippi has been governed by project-specific planning analyses and environmental assessments (EA). Four alternatives are analyzed in detail, including the Proposed Alternative. The management prescriptions of the four alternatives would guide management of BLM-administered lands (referred to as surface tracts) and non-USFS FMO in Alabama and Mississippi. The management alternatives evaluated in this RMP-FEIS were developed to meet management goals and objectives and to minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies. The Proposed RMP is a refinement of the Preferred Alternative presented in the Draft RMP-EIS.

Further information regarding this Proposed RMP and FEIS can be obtained from:

Gary Taylor
BLM Planning Coordinator
411 Briarwood Drive, Suite 404
Jackson, Mississippi 39206

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TABLE OF CONTENTS

LIST OF APPENDICES

LIST OF TABLES

CHAPTER 1 — PURPOSE AND NEED

CHAPTER 2 — ALTERNATIVES

CHAPTER 3 — AFFECTED ENVIRONMENT

LIST OF FIGURES

CHAPTER 1 — PURPOSE AND NEED

LIST OF MAPS

CHAPTER 1 — PURPOSE AND NEED

CHAPTER 2 — ALTERNATIVES

CHAPTER 3 — AFFECTED ENVIRONMENT

EXECUTIVE SUMMARY

INTRODUCTION

This Proposed Resource Management Plan (RMP) and Final Environmental Impact Statement (FEIS) describes and analyzes a reasonable range of management alternatives for the public lands and resources administered by the Bureau of Land Management (BLM) in the States of Alabama and Mississippi. Within the two States combined, the BLM Jackson Field Office (JFO) administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. The BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U.S. Forest Service [USFS]). On these lands, oil and gas leasing of Federal minerals is subject to management as directed by the surface managing agency, and the decisions of this RMP will pertain only to BLM's role in administering the minerals. The BLM has the responsibility for lease issuance and post-lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies. For the purposes of this document, RMP decisions will apply to "BLM-administered, non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Within the two States, there are also 8,077 acres of lands with uncertain title. These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make management decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act. The above categories of BLM-administered land ownership that will be covered by this RMP are listed and described in Table 1-1 for Alabama and Table 1-2 for Mississippi.

PURPOSE AND NEED FOR THE PLAN

The purpose of the Alabama and Mississippi RMP is to prepare a single land use plan for the two (2) States so that the BLM will be able to respond to mineral leasing proposals and deal efficiently with the long-term management of its scattered land. In addition, the RMP includes decisions on a wide range of other resource management concerns, including air quality, soil resources, water resources, vegetative communities, fish and wildlife habitat, special status species, wildland fire ecology and management, cultural resources, visual resources, recreation and travel management, social and economic resources, and hazardous materials. The Alabama and Mississippi RMP will provide the JFO with a comprehensive framework for managing BLM-administered land and minerals within these States. Completion of the RMP will meet the mandate of the Federal Land Policy and Management Act of 1976 (FLPMA; 43 U.S.C. §1701 *et seq*.) that public lands be managed for multiple use and sustained yield under an approved RMP. Preparation of the RMP will also fulfill BLM's responsibilities for public involvement and environmental impact analysis under the National Environmental Policy Act (NEPA; 42 U.S.C. § 4321 *et seq*.). NEPA requires Federal agencies to prepare an Environmental Impact Statement (EIS) for any Federal action that could significantly affect the human environment. Preparation and adoption of an RMP constitutes such an action. The FEIS prepared in conjunction with this Proposed RMP serves to analyze proposed actions and decisions affecting BLM-administered land in the planning area.

A primary goal of the RMP is to develop management practices, including stipulations, to ensure long-term sustainability of a healthy and productive landscape. An RMP is a set of comprehensive, long-range decisions concerning the use and management of resources administered by BLM. In general, the RMP will serve two purposes: (1) provide an overview of goals, resource condition objectives, and needs associated with public lands management and (2) resolve multiple use conflicts or issues. When the RMP is approved, its management decisions will remain in effect until the RMP is amended, revised, or replaced by a new plan.

There is a need for this RMP because, until now, BLM resource management in the States of Alabama and Mississippi has been governed by project-specific planning analyses and environmental assessments (EA). Preparing separate project-specific documents whenever BLM receives external proposals has been inefficient, costly, and has delayed decisionmaking on industry-driven requests to lease Federal minerals and land tenure adjustments where BLM retains surface management responsibilities. In responding to this need, the planning criteria, identified in Section 1.5, sets out BLM's primary responsibilities in Alabama and Mississippi, which is to make minerals available for leasing, where appropriate, and to make land tenure adjustments according to the criteria set forth in the FLPMA.

DESCRIPTION OF THE PROPOSED RMP-FEIS ALTERNATIVES

Four alternatives were analyzed in detail in the Draft RMP-EIS. An interdisciplinary team developed the alternatives to present a reasonable range of management options for guiding resource management and activities on BLM-administered lands (referred to as surface tracts) and non-U.S. Forest Service Federal mineral ownership (non-USFS FMO) in Alabama and Mississippi. The management alternatives were developed to meet management goals and objectives and to minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies.

The BLM has the discretion to select an alternative in its entirety or to combine aspects of the various alternatives presented in the draft to develop the Proposed RMP and FEIS. Alternative 3 was chosen as the Proposed RMP after considering the public and agency comments received on the Draft RMP-EIS. The Proposed RMP is presented as Alternative 3 in Chapter 2 of this document.

Management themes represented in each alternative include the following—

- **Alternative 1 (No Action).** Alternative 1 represents the No Action Alternative (i.e., continuation of current management). The BLM would continue the current management approach by retaining all BLM-administered surface tracts and employing custodial management. BLM management actions would occur in response to an application for use presented by another entity or compliance actions required by regulation and policy (as described in Section 2.3, Standard Management Common to All Alternatives). Potential impacts and mitigation would be identified and assessed when application is made for activity on a specific piece of BLM-administered land.

  There would be 760,570 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,183 acres of BLM-administered, non-USFS FMO would be closed to leasing. Management of oil and gas leasing, exploration, and development would be subject to the standard lease terms and conditions that are included on the lease form.

- **Alternative 2.** Alternative 2 proposes that the BLM would retain specific BLM-administered surface tracts. The BLM would investigate opportunities to manage the tracts in partnership with

other agencies or organizations. Use of the tracts would be consistent with management objectives and other land use decisions. Tract-specific constraints for resource uses, such as right-of-way (ROW) access, would be based on the presence of sensitive resources (e.g., special status species habitat). In addition to the resource management outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural resources. Management actions for specific tracts, as needed, could include installing walk-overs and sand fencing on actively used tracts to protect special status species habitat, vegetation treatments to enhance or improve native landscapes on actively used tracts, and habitat management to achieve objectives in established fish and wildlife conservation strategies.

There would be 760,452 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,301 acres of BLM-administered, non-USFS FMO would be closed to leasing, which includes an additional 365 acres would be closed to protect habitat of the Federally listed Alabama beach mouse. In addition to standard terms and conditions, conservation measures would be applied as stipulations to oil and gas leases and Best Management Practices (BMP) would be used to reduce adverse effects caused by surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered, non-USFS FMO. Conservation measures, including no surface occupancy (NSO), controlled surface use (CSU), and seasonal stipulations, and BMPs are presented in Appendix D. Under this alternative, lease stipulations would include a 1,000-foot NSO buffer from aquatic habitats and Alabama beach mouse habitat would not be available for lease. The stipulations in Appendix D would be applied in addition to the standard lease terms and conditions on the lease form. For each stipulation there are provisions for waiver, modification, and exception provided in Appendix D, which could be applied as appropriate. The BMPs would be considered mandatory to reduce adverse impacts to specific resources and would be applied to oil and gas operations on new and existing leases. There would be some flexibility in implementation of each BMP, depending on site-specific conditions. Where there is potential to affect Federally listed, proposed, or candidate species or designated critical habitat, application of BMPs and/or waiver, modification, and exception to stipulations would normally require coordination and possible formal consultation with the U.S. Fish and Wildlife Service (USFWS).

- **Alternative 3 (Proposed RMP).** All of the BLM-administered surface tracts would be available for transfer or disposal except the Hancock County tract in Mississippi. For some of the surface tracts, there would be conditions placed on the disposal that development and use of the tract would be consistent with the resource management objectives and allowable uses established for the tract. Restrictions on use after disposal would be provided in the patent transferring ownership. Valid existing rights and other valid authorizations would be protected if disposal occurred.

  Until the surface tracts are disposed, management would apply tract-specific constraints for resource uses, such as ROW access, based on the presence of sensitive resources (e.g., special status species). Resource management would be the same as outlined in Alternative 2. Proactive management would occur on specific tracts to protect important natural resources. Management actions for specific tracts, as needed, could include vegetation treatments to enhance or improve native landscapes on actively used tracts and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,570 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,183 acres of BLM-administered, non-USFS FMO would be closed to leasing. Similar to Alternative 2, Alternative 3 uses conservation measures that would be applied as lease stipulations and BMPs to reduce adverse effects caused by surface-disturbing

or disruptive activities associated with oil and gas operations on BLM-administered, non-USFS FMO. The stipulations in Alternative 3 are different from Alternative 2 in two ways. First, Alabama beach mouse habitat would be available for lease, but subject to an NSO stipulation. Second, the buffer from aquatic habitats would be reduced to 250 feet.

- **Alternative 4.** Alternative 4 proposes that all BLM-administered surface tracts would be made available for disposal from Federal ownership with no specific condition on use after disposal. Valid existing rights and other valid authorizations would be protected in the event of disposal. Under this alternative, management of BLM-administered, non-USFS FMO would be the same as Alternative 3.

ENVIRONMENTAL CONSEQUENCES

The environmental consequences that could result from the management prescriptions of the four alternatives are described in Chapter 4 and are summarized and compared in Table 2-13, Comparison of Impacts for Alabama and Table 2-14, Comparison of Impacts for Mississippi. These potential consequences are discussed for each resource program, providing an analysis of environmental effects resulting from management of all resources and resource uses. This includes an analysis of cumulative effects, which are defined as the impacts that result from the incremental impact of an action when added to other past, present, or reasonably foreseeable future actions.

CONSULTATION AND COORDINATION

Consultation, coordination, and public involvement were undertaken by the BLM throughout the development and preparation of this Proposed RMP-FEIS through public and informal meetings, individual contacts, bulletins, news releases, and *Federal Register* notices.

The BLM consulted and coordinated with Federal and State agencies and Native American tribes in developing this Proposed RMP-FEIS. Specifically, the BLM has coordinated with the USFWS to obtain a species list and to develop BMPs and oil and gas leasing stipulations for the alternatives. The BLM coordinated on the State level by contacting Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the RMP planning process. In addition, the BLM contacted appropriate Native American tribes, inviting them to participate in the Alabama and Mississippi RMP-EIS development process, and offered to meet with tribal leaders or representatives in person to discuss issues, concerns, and questions they might have.

Cooperating Agencies

The primary role of cooperating agencies (also referred to as cooperators) is to provide special expertise and/or assistance to the lead agency throughout the RMP-EIS process. Cooperator roles include participation in the scoping process, provision of information and assistance to the lead agency, review of draft information, and provision of overall advice during the planning process.

Letters were sent to the States of Alabama and Mississippi requesting their involvement in the planning process as cooperating agencies. The State of Mississippi accepted the invitation to become an official cooperating agency through a Memorandum of Understanding signed on December 13, 2002. Multiple state agencies were consulted during the RMP-EIS process, including the Department of Environmental Quality, State Heritage groups, and the State Historic Preservation Office.

PUBLIC INVOLVEMENT

Public participation in the RMP-FEIS process includes a variety of efforts to identify and address public concerns and needs. The public involvement process assists the agencies in broadening the information base for decisionmaking, informing the public about the Proposed RMP-FEIS and the potential impacts associated with various management decisions, and ensuring that public needs and viewpoints are understood by the agency.

Public Workshop During Alternatives Development

A public workshop (with an emphasis on the BLM tracts in Baldwin County, Alabama) was held in Gulf Shores, Alabama, on September 2, 2004, to solicit additional comments for developing alternatives. The workshop was conducted in an open house format, with resource stations and BLM staff available for individual discussions. Eight participants attended the workshop, including representatives from the Alabama State Lands Division. Information meetings with Baldwin County also took place during this period. Although the BLM provided a deadline of November 30, 2004, to receive information and input via mail, e-mail, or the project website, none were submitted; however, the BLM accepted input from the public and interested agencies throughout the planning process. Comment letters that were submitted after the November deadline dealt primarily with the Baldwin County land tracts and how they should be managed by the BLM. All comments were collected, analyzed, and included in the project administrative record.

Public Meetings on the Draft RMP and EIS

Three public meetings were held in October 2007 to provide an opportunity to comment on the Alabama and Mississippi Draft RMP-EIS. During the three meetings, nine people registered their attendance. These public meetings were structured in an open house format with BLM specialists available to provide information. The public was also provided information on how to submit comments on the Draft RMP-EIS.

Open Comment Period on the Draft RMP and EIS

The BLM provided the public with 90 days from the date of publication of BLM's Notice of Availability (NOA) for the Alabama and Mississippi Draft RMP-EIS to review and submit comments. The EPA filed the NOA in the *Federal Register* on August 31, 2007. The 90-day public comment period officially ended on November 29, 2007. The BLM received comments on the Draft RMP-EIS from members of the public; Federal, State, and local agencies; and private and public organizations. These comments were sent by mail, e-mail, or submitted at the public meetings.

A total of 24 letters were received: 14 were sent by e-mail and 10 were submitted in hardcopy or sent by mail. Of the 24 letters received, 6 of them were identified as being form letters, while the remaining 18 were considered unique letters. Form letters are described as letters containing identical text submitted by more than five individuals. From the 24 letters received, 97 unique comments were identified, of which 32 were considered non-substantive and 65 were considered substantive.

CHANGES AND UPDATES FROM THE DRAFT EIS (DEIS) TO THE FEIS

This section is intended to help the reader differentiate changes between the Draft RMP-EIS and Proposed RMP-FEIS. Changes were made to the Draft RMP-EIS resulting from public comments

received during the 90-day public comment period, as noted below. Additional cosmetic changes (i.e., formatting, grammatical corrections, and clarifications) are not listed. The document was also updated to reflect the transition between Draft RMP-EIS and Proposed RMP-FEIS, such as:

- The Executive Summary was revised to include a description of public participation during the 90-day public comment period and to describe the changes and updates from the DEIS to the FEIS.
- Section 5.6 of the Proposed RMP-FEIS was revised to describe public participation during the 90-day public comment period, the public comment process and methodology, and the responses to public comments.
- Appendix K—Proposed Resource Management Plan has been added to the FEIS.

In response to public comments received during the 90-day public comment period, the following specific changes and updates have been made:

- **Chapter 2, Common to All Alternatives, All Resources.** Goals and objectives have been clarified for each resource in this section.
- **Chapter 2, Common to All Alternatives, Water Resources.** A statement has been added that acknowledges BLM's intent to comply with State Coastal Zone Management Programs.
- **Chapter 2, Common to All Alternatives, Cultural Resources.** The following paragraph was added to the end of the section: "Cultural resource surveys conducted prior to 1996, when the Alabama Historical Commission (AHC) cultural resource assessment standards were established, will have to be resurveyed. Because of this, consultation with the Alabama SHPO will occur prior to any property disposal or mineral leasing to determine if a cultural resource survey was conducted prior to 1996."
- **Chapter 2, Alternatives Analyzed in Detail, Alternatives 1, 2, and 3.** The amount of BLM-administered, non-USFS FMO that would be closed under each alternative was clarified.
- **Chapter 2, Alternatives Analyzed in Detail, Alternative 3 (Proposed RMP).** Text in the second paragraph was changed to read: "Resource management would be the same as outlined in Alternative 2."
- **Chapter 2, Tables 2-3 and 2-4, Leasing Stipulations in Alabama and Mississippi by Alternative.** The table format was modified to improve readability.
- **Chapter 2, Tables 2-7 and 2-8, Alternatives for the Fort Morgan Beach Tracts and Fort Morgan Highway Tracts, Alternative 3 (Proposed RMP), Lands and Realty.** Language added to the text: "...if the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts."
- **Chapter 3, Alabama and Mississippi Statewide Perspectives, Air Quality.** Information on climate change was added.
- **Chapter 3, Alabama Statewide Perspective, Special Status Species, Species Accounts, Reptiles, Green Sea Turtle (*Chelonia Mydas*).** Section removed.
- **Chapter 3, Alabama Statewide Perspective, Special Status Species, Species Accounts, Reptiles, Kemp's Ridley Sea Turtle (*Lepidochelys Kempii*).** Final sentence change to read: "…at least three nests have been documented in Alabama (2001, 2006, and 2007). Based on USFWS records, juvenile Kemp's Ridleys are the most common marine turtle in Alabama bays and estuaries."
- **Chapter 3, Alabama Surface Tract Description, Fort Morgan Beach Tracts, Lands, and Realty.** Added the following text to the second paragraph, second sentence: "…and some of these are partially on the Fort Morgan Beach tracts."
- **Chapter 3, Alabama Surface Tract Description, Fort Morgan Highway Tracts, Lands, and Realty.** Changed second and third sentences to read: "Dixie Graves Parkway (Highway 180). These lots are referred to in this document as the Fort Morgan Highway tracts and were exempted

from disposal by the small tract classification orders. In addition to Highway 180, there are also some utilities and driveways on the lots."

- **Chapter 4, Direct, Indirect, and Cumulative Impacts From BLM Management Actions in Alabama and Mississippi, Air Quality.** A qualitative analysis of contribution of BLM's management actions to greenhouse gas emissions in relation to climate change was added.
- **Chapter 4, Direct and Indirect Impacts from BLM Management Actions in Alabama, Alternative 1 (No Action), Water Resources, Impacts from Minerals Management Actions**. Added the following language: "In order to reinject produced water, an oil and gas operator must obtain a permit as required by the Onshore Oil and Gas Order No. 7. The EPA has granted the State of Alabama primacy over the permitting of underground injection wells. The underground injection regulations address the siting, construction, operation, monitoring, and closing of an injection well. These requirements are designed to prevent contamination of surface and underground drinking water sources."
- **Chapter 4, Direct and Indirect Impacts from BLM Management Actions in Alabama, Alternative 1 (No Action), Cultural Resources, Impacts from Lands and Realty Management Actions.** Added language to the first paragraph regarding survey requirements for approved activities: "…or in areas surveyed prior to 1996, …"
- **Chapter 4, Cumulative Impacts, Cumulative Impacts from BLM Management Actions in Alabama and Mississippi, Water Resources.** Added a qualitative analysis on the cumulative impact of brine waster reinjection and the following language after the third paragraph: "In order to reinject produced water, an oil and gas operator must obtain a permit as required by the Onshore Oil and Gas Order No. 7. The EPA has granted the State of Alabama primacy over the permitting of underground injection wells. The underground injection regulations address the siting, construction, operation, monitoring, and closing of an injection well. These requirements are designed to prevent contamination of surface and underground drinking water sources and would reduce cumulative impacts."
- **Appendix D—Proposed Conservation Measures and Best Management Practices, Best Management Practices, Disposal of Produced Water.** Added the following language: "In Alabama, the injection of produced water is regulated by the Alabama State Oil and Gas Board. In Mississippi, the injection of produced water is regulated by the Mississippi Department of Environmental Quality and the Mississippi Oil and Gas Board" and provided information regarding permitted injection wells and surface water discharge for each state UIC Program.
- **Appendix D—Proposed Conservation Measures and Best Management Practices, Best Management Practices, Migratory Birds and Federally Listed Wildlife.** A new best management practice was added to minimize or avoid the unintentional take of migratory birds during periods of concentrated nesting activity.

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CHAPTER 1—PURPOSE AND NEED

1.1 INTRODUCTION

The Bureau of Land Management (BLM) Eastern States, Jackson Field Office (JFO) has initiated the planning process to develop a Resource Management Plan (RMP) for public lands and mineral estate dispersed across the States of Alabama and Mississippi. A Final Environmental Impact Statement (FEIS) is being prepared as part of this project. The State of Mississippi is a cooperating agency, as defined by the Council on Environmental Quality's (CEQ) regulations implementing the National Environmental Policy Act of 1969 (NEPA), for this RMP.

1.2 PURPOSE AND NEED FOR THE PLAN

The purpose of the Alabama and Mississippi RMP is to prepare a single land use plan for the two (2) States so that the BLM will be able to respond to mineral leasing proposals and deal efficiently with the long-term management of its scattered land. In addition, the RMP includes decisions on a wide range of other resource management concerns, including air quality, soil resources, water resources, vegetative communities, fish and wildlife habitat, special status species, wildland fire ecology and management, cultural resources, visual resources, recreation and travel management, social and economic resources, and hazardous materials. The Alabama and Mississippi RMP will provide the JFO with a comprehensive framework for managing BLM-administered land and minerals within these States. Completion of the RMP will meet the mandate of the Federal Land Policy and Management Act of 1976 (FLPMA; 43 U.S.C. §1701 *et seq*.) that public lands be managed for multiple use and sustained yield under an approved RMP. Preparation of the RMP will also fulfill BLM's responsibilities for public involvement and environmental impact analysis under the National Environmental Policy Act (NEPA; 42 U.S.C. § 4321 *et seq*.). NEPA requires Federal agencies to prepare an Environmental Impact Statement (EIS) for any Federal action that could significantly affect the human environment. Preparation and adoption of an RMP constitutes such an action. The FEIS prepared in conjunction with this Proposed RMP serves to analyze proposed actions and decisions affecting BLM-administered land in the planning area.

A primary goal of the RMP is to develop management practices, including stipulations, to ensure long-term sustainability of a healthy and productive landscape. An RMP is a set of comprehensive, long-range decisions concerning the use and management of resources administered by BLM. In general, the RMP will serve two purposes: (1) provide an overview of goals, resource condition objectives, and needs associated with public lands management and (2) resolve multiple use conflicts or issues. When the RMP is approved, its management decisions will remain in effect until the RMP is amended, revised, or replaced by a new plan.

There is a need for this RMP because, until now, BLM resource management in the States of Alabama and Mississippi has been governed by project-specific planning analyses and environmental assessments (EA). Preparing separate project-specific documents whenever BLM receives external proposals has been inefficient, costly, and has delayed decisionmaking on industry-driven requests to lease Federal minerals and land tenure adjustments where BLM retains surface management responsibilities. In responding to this need, the planning criteria, identified in Section 1.5, sets out BLM's primary responsibilities in Alabama and Mississippi, which is to make minerals available for leasing, where appropriate, and to make land tenure adjustments according to the criteria set forth in the FLPMA.

1.3 DESCRIPTION OF THE PLANNING AREA

This Proposed RMP-FEIS covers all the public lands resources administered by the BLM in the States of Alabama and Mississippi. Within the two States combined, the BLM administers approximately 333 acres of public land surface and mineral estate (referred to as "surface tracts") and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. The BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding BLM and U.S. Forest Service [USFS]). On these lands, leasing of Federal minerals is subject to management as directed by the surface management agency, and the decisions of this RMP will pertain only to the BLM's role in administering the minerals. The BLM has the responsibility of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because, by regulation, USFS is responsible for land use planning decisions on oil and gas leasing. For the purposes of this document, RMP mineral leasing decisions will apply to "BLM-administered, non-USFS Federal mineral ownership (FMO)," which refers to BLM-administered, Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Within the two States, there are also 8,077 acres of lands with uncertain title. These are public domain lands, according to General Land Office records, but may have private claims of ownership. The RMP will not make management decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act. The above categories of BLM-administered land ownership that will be covered by this RMP are listed and described in Table 1-1 for Alabama and Table 1-2 for Mississippi.

Table 1-1. Land and Mineral Ownership and Administrative Jurisdictions within the RMP Planning Area in Alabama

Jurisdiction	Acreage[1]
Areas in Alabama covered by the Alabama and Mississippi RMP-FEIS	
A. BLM surface land—Federal minerals[2]	159
B. Non-Federal surface land—Federal minerals[3]	303,440
C. Federal agency (other than BLM or USFS) surface land—Federal minerals[4]	10,220
Total BLM-administered Federal land surface to be covered by RMP decisions	**159**
Total BLM-administered Federal mineral estate to be covered by RMP decisions	**313,819**
D. Lands of uncertain title[5]	3,057
Areas in Alabama *not* covered by the Alabama and Mississippi RMP-FEIS	
E. USFS land—Federal minerals[6]	585,394

1 Where one or more mineral resource categories are Federally owned, the acreage is listed as if all minerals are Federally owned. Where mixed minerals ownership occurs (for example, privately owned coal interest overlapping with Federally owned oil and gas interest), minerals planning and management decisions in the RMP will pertain only to the Federally owned mineral interests. Federal mineral acreage is derived from BLM data of current and former oil and gas leases. Data includes lands described by aliquot parts, metes and bounds, or lot number. In the case of metes and bounds and lot number descriptions, the acreage reflects that of the entire section associated with the description, otherwise known as "nominal acreage."

2 In those areas where the Federal land surface and Federal mineral estate are both administered by the BLM, the RMP decisions will cover both the land surface and the mineral estate.

3 In those areas where (1) the land surface is privately owned or owned by a non-Federal government jurisdiction and (2) the minerals are Federally owned, the RMP decisions will cover only the BLM-administered Federal mineral estate. Although the land and resource uses and values on the non-Federal surface will be taken into account and will affect development of the Federal mineral management decisions, these decisions will pertain only to the Federally owned minerals.

4 In those areas where (1) the Federal land surface is administered by a Federal agency other than the BLM or USFS,

including the Department of Defense and U.S. Army Corp of Engineers and (2) the Federal mineral estate is administered by the BLM, the land surface planning and management decisions are the responsibility of the other Federal surface management agency, lease of the Federal minerals is subject to management as directed by the surface management agency. These are lands that were either acquired by a Federal agency, or were withdrawn from the public domain; withdrawn lands are listed in Appendix I. RMP decisions for these lands will pertain only to the BLM's role in administering the Federal minerals.

5 These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP will not make decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act.

6 In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) the BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and the BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

Table 1-2. Land and Mineral Ownership and Administrative Jurisdictions within the RMP Planning Area in Mississippi

Jurisdiction	Acreage[1]
Areas in Mississippi covered by the Alabama and Mississippi RMP-FEIS	
A. BLM surface land-Federal minerals[2]	174
B. Non-Federal land-Federal minerals[3]	401,410
C. Federal agency (other than BLM or USFS) surface land / Federal minerals[4]	116,350
Total BLM-administered Federal land surface to be covered by RMP decisions	**174**
Total BLM-administered Federal mineral estate to be covered by RMP decisions	**517,934**
D. Lands of uncertain title[5]	5,020
Areas in Mississippi *not* covered by the Alabama and Mississippi RMP-FEIS	
E. USFS land-Federal minerals[6]	1,055,227

1 Where one or more mineral resource categories are Federally owned, the acreage is listed as if all minerals are Federally owned. Where mixed mineral ownership occurs (for example, privately owned coal interest overlapping with Federally owned oil and gas interest), minerals planning and management decisions in the RMP will pertain only to the Federally owned mineral interest. Federal mineral acreage is derived from BLM data of current and former oil and gas leases. Data includes lands described by aliquot parts, metes and bounds, or lot number. In the case of metes and bounds and lot number descriptions, the acreage reflects that of the entire section associated with the description, otherwise known as "nominal acreage."

2 This is a tract of land in Hancock County where the mineral estate is Federally owned and the surface is currently owned by the University of Mississippi. The tract was conveyed to the University in 1961, under the authority of the Recreation and Public Purposes Act of 1926, for recreational and research site purposes. The patent contains a clause stating that ownership of the surface estate shall revert to the United States if the land is devoted to a use other than that for which the land was conveyed. It is expected that the University will relinquish this tract and that title will revert to the United States. In anticipation of the title transfer, this tract will be considered BLM-managed surface estate for land use planning purposes; therefore, the RMP decisions will cover both the land surface and the mineral estate.

3 In those areas where (1) the land surface is privately owned or owned by a non-Federal government jurisdiction and (2) the minerals are Federally owned, the RMP decisions will cover only the BLM-administered Federal mineral estate. Although the land and resource uses and values on the non-Federal surface will be taken into account and will affect development of the Federal mineral management decisions, these decisions will pertain only to the Federally owned minerals.

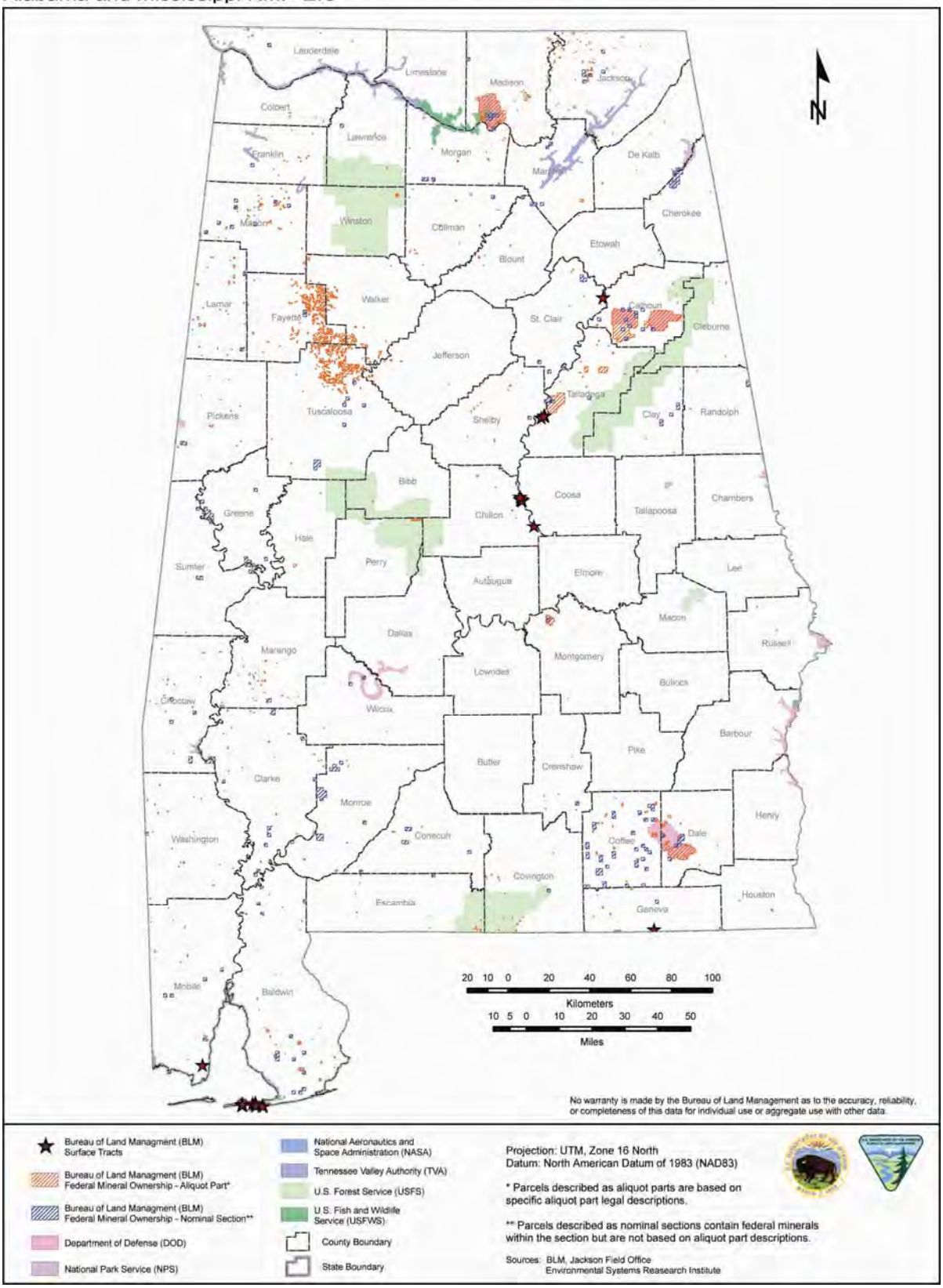
4 In those areas where (1) the Federal land surface is administered by a Federal agency other than the BLM or USFS, including the Department of Defense and U.S. Army Corp of Engineers and (2) the Federal mineral estate is administered by the BLM, the land surface planning and management decisions are the responsibility of the other Federal surface management agency, and lease of the Federal minerals is subject to management as directed by the surface management agency. These are lands that were either acquired by a Federal agency or were withdrawn from the public domain. Withdrawn lands are listed in Appendix I. RMP decisions for these lands will pertain only to the BLM's role in administering the Federal minerals.

5 These are public domain lands, according to General Land Office records, but may have private claims of ownership. The RMP will not make decisions on these lands per se; however, these lands, which are listed in Appendix B, will be available for disposal to qualified applicants under the Color-of-Title Act.

6	In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) the BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and the BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

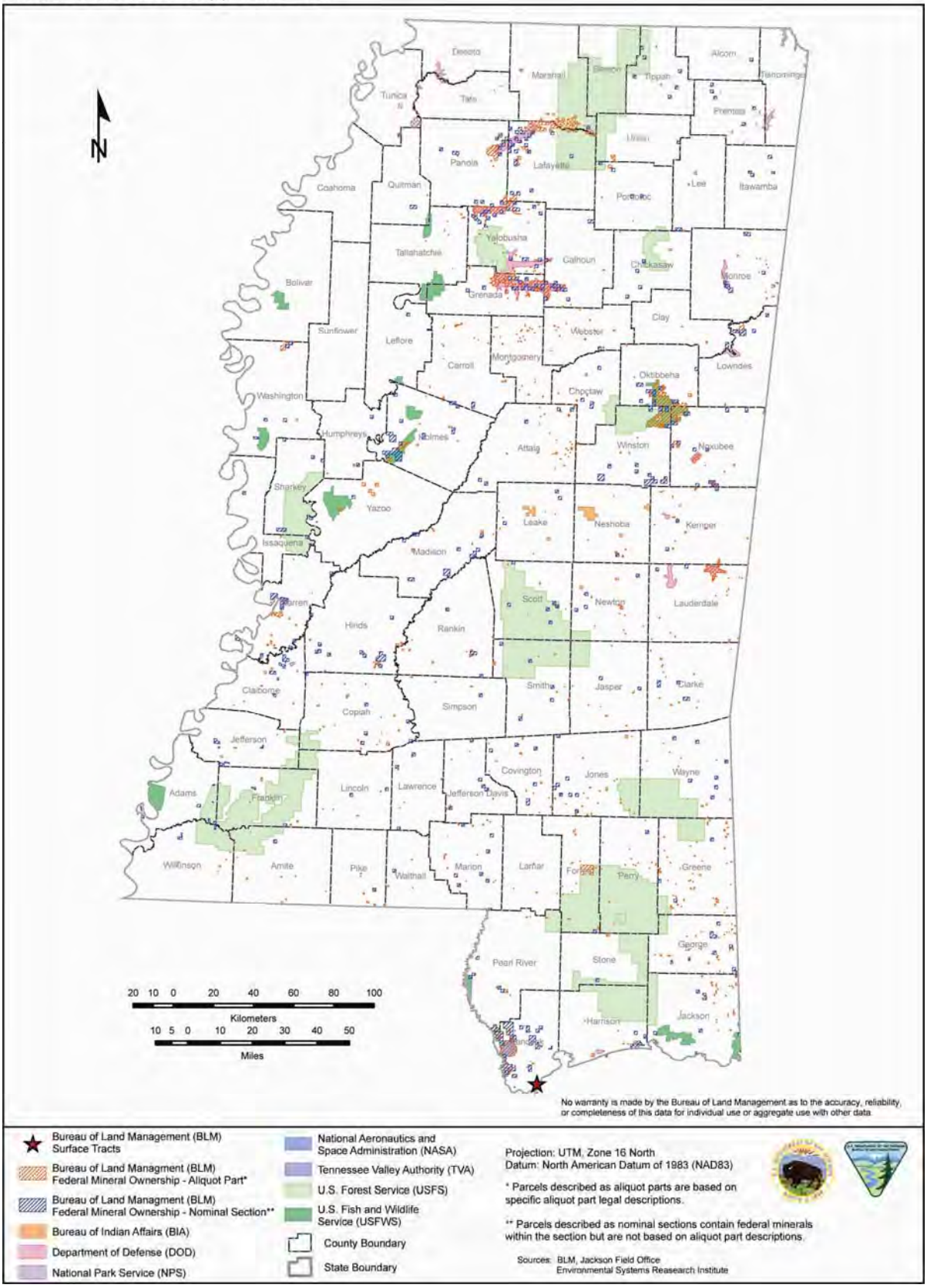
Map 1-1: Federal Lands and Mineral Ownership in Alabama

Alabama and Mississippi RMP-EIS



Map 1-2: Federal Lands and Mineral Ownership in Mississippi

Alabama and Mississippi RMP-EIS



1.4 PLANNING ISSUES

In addition to the planning issues identified below, the Proposed RMP-FEIS includes decisions on a wide range of other resource management concerns as identified in the July 12, 2002 *Federal Register* notice, including air quality, soil resources, water resources, vegetative communities, fish and wildlife habitat, special status species, wildland fire ecology and management, cultural resources, visual resources, recreation and travel management, social and economic resources, and hazardous materials.

1.4.1 Mineral (Oil, Gas, and Coal) Leasing

There is a potential for continued mineral development of BLM-administered FMO in both Alabama and Mississippi. In some cases, there could be potential for impacts on sensitive resources or conflicts with other uses. These impacts and conflicts need to be considered when making decisions on the availability of non-USFS FMO for development. The RMP addresses mineral leasing by offering a variety of alternative solutions, as described in Chapter 2.

1.4.2 Land Ownership Adjustments

BLM-administered lands in both Alabama and Mississippi are relatively small, isolated parcels. Some of the parcels could have natural resources of significant value to the public and could be suitable for management by the BLM or other agencies. Other parcels could be suitable for disposal. The RMP addresses land ownership adjustments by offering a variety of alternative solutions, as described in Chapter 2.

1.5 PLANNING CRITERIA

Planning criteria are constraints or ground rules that guide development of BLM land use plans. These criteria ensure that the planning team focuses on relevant uses and collects applicable data for analysis, and the criteria include applicable Federal laws, regulations, executive orders, and policies. As identified in the *Federal Register* on July 12, 2002, the following criteria were developed to guide the preparation of the RMP—

1. Land use planning and environmental analysis will be conducted in accordance with laws, regulations, executive orders, and manuals. Planning will be conducted for BLM-administered lands (tracts) and minerals (BLM-administered, non-USFS FMO).
2. Surface tracts will be mapped and identified by legal description. Land use policy will be established for BLM-administered lands identified after the RMP is completed.
3. A reasonably foreseeable development scenario (RFDS) will be prepared for the future leasing (and development) of fluid minerals under split-estate lands (e.g., non-BLM surface and BLM minerals). The RFDS will be developed on a regional (county) basis. Areas of high, moderate, and low oil and gas potential will be identified (mapped) for each State.
4. Areas with the potential for non-energy solid mineral leasing (e.g., phosphates, sodium) will be evaluated for inclusion in the RMP.
5. Resource data needed to evaluate the impacts of future (foreseeable) mineral development will be collected on a regional basis.
6. The planning team will work cooperatively with Federal, State, county, and local governments and agencies; tribal governments; groups and organizations; and individuals.

Based on further analysis, these criteria have been revised as follows:

1. Land use planning and environmental analysis will be conducted in accordance with laws, regulations, executive orders, and manuals. Planning will be conducted for BLM-administered lands (tracts) and minerals (BLM-administered, non-USFS FMO).
2. Surface tracts will be mapped and identified by legal description. Lands of uncertain title will be listed. These lands could potentially be available for disposal under the Color-of-Title Act.
3. An RFDS will be prepared for the future leasing (and development) of oil and gas. The RFDS will be developed on a statewide basis. Areas of high, moderate, and low oil and gas potential will be identified (mapped) for each State.
4. The evaluation of lands based on their suitability for further coal leasing consideration will be limited to underground mining of non-USFS FMO in the Warrior Basin in Alabama.
5. Areas with the potential for non-energy solid mineral leasing (e.g., phosphates, sodium) were evaluated for inclusion in the RMP. No potential was identified for development of these minerals on non-USFS FMO; therefore, non-energy solid mineral leasing is not addressed.
6. Resource data needed to evaluate the impacts of future (foreseeable) mineral development will be collected on a statewide basis.
7. The planning team will work cooperatively with Federal, State, county, and local governments and agencies; tribal governments; groups and organizations; and individuals.

1.6 OVERVIEW OF THE PLANNING PROCESS

The BLM planning process is detailed in the *BLM Land Use Planning Handbook* (H-1601-1), which provides guidance to BLM employees for implementing the BLM land use planning requirements established by Section 202 of the FLPMA and the regulations in 43 Code of Federal Regulations (CFR) 1610. The process for preparing an EIS is determined by Federal regulations implementing NEPA (40 CFR 1500-1508). The major steps in the BLM planning process are shown in Figure 1-1 and are further described below.

- **Preparation Plan.** The BLM developed a preparation plan to outline anticipated planning issues and management concerns, preliminary planning criteria, data needs, process participants, plan format, schedule, and public involvement.

- **Notice of Intent.** The BLM published a Notice of Intent (NOI) in the *Federal Register* on July 12, 2002, to announce its intention to prepare an RMP and EIS. The NOI also solicited coal information for BLM-administered coal in Alabama and Mississippi and identified planning criteria to guide the preparation of the RMP.

- **Scoping Period.** Public scoping was conducted from June through September 2002. The objectives of scoping were to involve the public in the planning process and to comply with FLPMA and NEPA. Scoping is a process of soliciting public input and identifying concerns regarding management of public lands and BLM-administered, non-USFS FMO in the planning area. Scoping consisted of public notification through the *Federal Register* (i.e., publication of the NOI) and by letter and e-mail. Letters of invitation to participate as cooperating agencies were sent to government agencies in Alabama and Mississippi. The BLM also notified local, State, and Federal agencies and Native American tribes during this period.

- **Analysis of Management Situation.** As part of preparing the RMP-EIS, the BLM analyzed the resource conditions, capabilities, and effects of current management for use as a reference throughout the planning process. As contained in Chapter 3 of the RMP-EIS, this analysis

included a description of the physical and biological characteristics and condition of the resources within the planning area and how they are being used and/or protected.

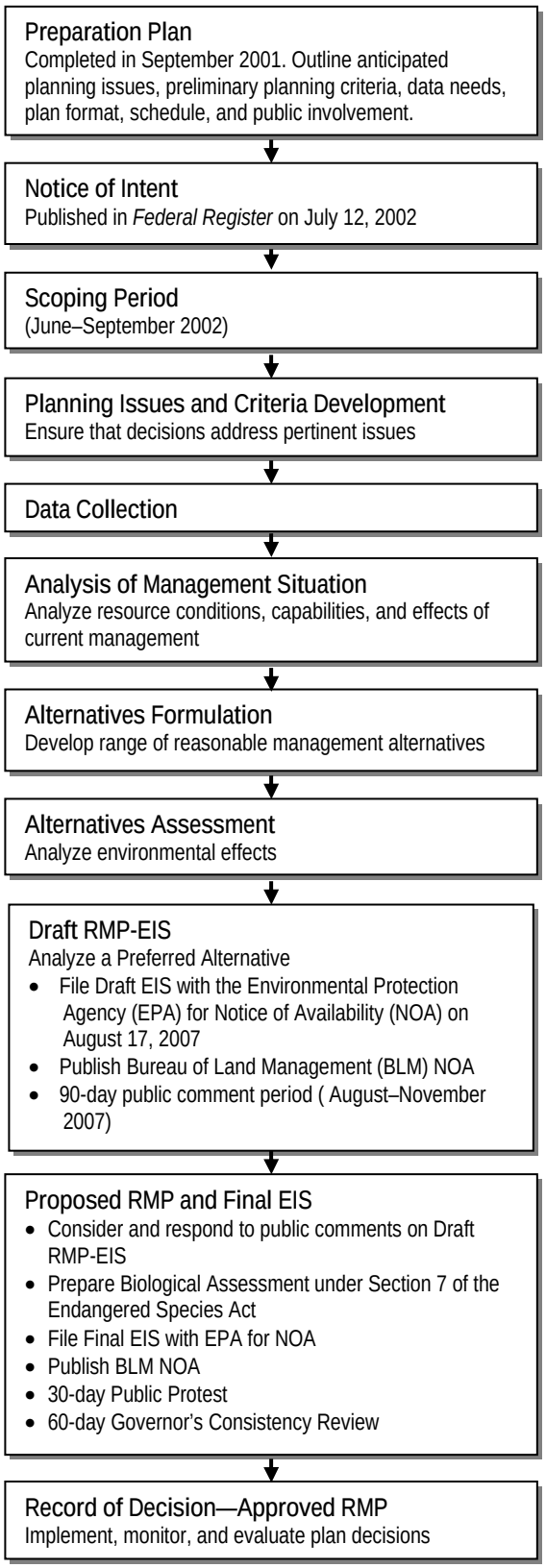
- **Draft RMP-EIS.** This Draft RMP-EIS considers public and agency comments received during the scoping period, includes a description of alternatives and the affected environment, and offers an assessment of potential impacts from implementing the alternatives. A Notice of Availability (NOA) for the Draft RMP-EIS was published in the *Federal Register* on August 17, 2007.

- **Comment Period and Public Meetings.** The public and local, State, and Federal agencies and Native American tribes had an opportunity to review and comment on the Draft RMP-EIS during a 90-day comment period, beginning the date the Environmental Protection Agency (EPA) published their NOA in the *Federal Register* on August 17, 2007 and ended on November 29, 2007. The BLM held three public meetings in October 2007 to receive comments from the public. Opportunities for public involvement are further described in Chapter 5, Consultation and Coordination.

- **Proposed RMP and Final EIS.** The purpose of the Proposed RMP and Final EIS is for the BLM to assess, consider, and respond to public and agency comments received on the Draft RMP-EIS. An NOA will be published in the *Federal Register* by the BLM when the Proposed RMP-FEIS becomes available. A 30-day public protest period, beginning the date the EPA publishes their NOA in the *Federal Register*, will follow the release of the Proposed RMP-FEIS. A 60-day Governor's consistency review will also occur at this time.

- **Biological Assessment (BA).** Section 7 of the Endangered Species Act (ESA; 16 U.S.C. Section 1536(a)(2)) requires all Federal agencies to determine whether their actions may affect listed or proposed species and designated and proposed critical habitat. A BA was prepared for each state to analyze the potential effects of the project on Federally listed species and critical habitat in order to establish and justify an "effect determination." The BAs were reviewed by the

Figure 1-1. RMP-EIS Process



U.S. Fish and Wildlife Service (USFWS) under the ESA Section 7 consultation requirements.

- **Record of Decision.** The Record of Decision (ROD) is a separate and concise public record that clearly identifies and describes the approved RMP and links the BLM's decision to the analysis presented in the EIS. The ROD addresses how environmental impacts and other factors were considered in the decisionmaking process.

This Proposed RMP-FEIS provides a comprehensive evaluation of the BLM's potential management and land tenure adjustment actions for public lands in Alabama and Mississippi and their natural resources. A comprehensive RMP-EIS that includes all of the BLM's management programs is needed to address potential conflict among interrelated management actions. This FEIS also allows for tiering (40 CFR 1505.28) subsequent activity or project-specific EISs or EAs conducted on public lands within Alabama and Mississippi. Subsequent lower-level EISs or EAs will reference and adopt relevant information and goals from this broader, two-State RMP-EIS as formal NEPA documentation, thereby avoiding duplication of effort and reducing costs associated with completing future NEPA analyses.

1.7 RELEVANT STATUTES, LIMITATIONS, AND GUIDELINES

This section provides a listing of the authorities that apply to the selection and implementation of management actions in the RMP.

1.7.1 Environmental Policy

National Environmental Policy Act of 1969

NEPA (42 USC 4321 et seq.) requires the preparation of EISs for Federal projects that may have a significant effect on the environment. It requires systematic, interdisciplinary planning to ensure the integrated use of the natural and social sciences and the environmental design arts in making decisions about major Federal actions that may have a significant effect on the environment. The procedures required under NEPA are implemented through the CEQ regulations at 40 CFR §1500.

Federal Compliance with Pollution Control Standards (EO 12088)

Federal Compliance with Pollution Control Standards (EO 12088) states that Federal agencies must comply with applicable pollution control standards.

Protection and Enhancement of Environmental Quality (EO 11514)

Protection and Enhancement of Environmental Quality (EO 11514, as amended by EO 11991) establishes the policy for Federal agencies to provide leadership in environmental protection and enhancement.

1.7.2 Land Use and Natural Resources Management

Federal Land Policy and Management Act of 1976

FLPMA, as amended (43 USC 1701, et seq.), provides for public lands to be generally retained in Federal ownership for periodic and systematic inventory of the public lands and their resources; for a review of existing withdrawals and classifications; for establishment of comprehensive rules and regulations for administering public lands statutes; for multiple-use management on a sustained yield basis; for protection of scientific, scenic, historical, ecological, environmental, air and atmospheric, water resource,

and archeological values; for receiving fair market value for the use of the public lands and their resources; for establishment of uniform procedures for any disposal, acquisition, or exchange; for identification and protection of Areas of Critical Environmental Concern (ACECs); for recognition of the nation's need for domestic sources of minerals, food, timber, and fiber from the public lands, including implementation of the Mining and Mineral Policy Act of 1970; and for payments to compensate States and local governments for burdens created as a result of the immunity of Federal lands from State and local taxation. The general land management regulations are provided in 43 CFR §2000, Subchapter B.

General Mining Law of 1872

The General Mining Law of 1872, as amended (30 USC 22, et seq.), provides for locating and patenting mining claims where a discovery has been made for locatable minerals on public lands in specified States. Regulations for staking and maintenance of claims on BLM-administered lands are listed in 43 CFR §3800.

Mineral Leasing Act of 1920

The Mineral Leasing Act of 1920, as amended (30 USC 181, et seq.), provides for the leasing of deposits of coal, phosphate, sodium, potassium, oil, oil shale, native asphalt, solid and semisolid bitumen, bituminous rock or gas, and lands containing such deposits owned by the United States, including those in national forests but excluding those acquired under other acts subsequent to February 25, 1920, and those lands within the national petroleum and oil shale reserves. Regulations for onshore oil and gas leasing are provided in 43 CFR §3100.

Federal Coal Leasing Amendments Act of 1976

The Federal Coal Leasing Amendments Act of 1976 (30 USC 201, et seq.) requires competitive leasing of coal on public lands and mandates a broad spectrum of coal operations requirements for lease management. Coal leasing regulations for BLM-administered lands are provided in 43 CFR §3400.

Materials Act of 1947

The Materials Act of 1947, as amended (30 USC 601–604, et seq.), provides for the sale of common variety materials for personal, commercial, or industrial uses and for free use for local, State, and Federal governmental entities. The sales of mineral materials are controlled by the regulations listed in 43 CFR §3600.

Federal Noxious Weed Act of 1974

The Federal Noxious Weed Act of 1974, as amended (7 USC 2814), provides for the designation of a lead office and a person trained in the management of undesirable plants, establishment and funding of an undesirable plant management program, completion and implementation of cooperative agreements with State agencies, and establishment of integrated management systems to control undesirable plant species.

Healthy Forests Restoration Act of 2003

The Healthy Forests Restoration Act serves to further the Healthy Forests Initiative to reduce the threat of destructive wildfires while upholding environmental standards and encouraging early public input during review and planning processes. The Act strengthens public participation in developing high-priority forest health projects; reduces the complexity of environmental analysis, allowing Federal land agencies to use the best science available to actively manage land under their protection; provides a more effective

appeals process, encouraging early public participation in project planning; and issues clear guidance for court action against forest health projects.

Federal Land Exchange Facilitation Act of 1988

The Federal Land Exchange Facilitation Act amended FLPMA with respect to BLM land exchanges. It was designed to streamline land exchange procedures.

Federal Land Transaction Facilitation Act of 2000

The Federal Land Transaction Facilitation Act (FLTFA) provides for the use of revenues from the sale or exchange of public lands identified for disposal under land use plans in effect as of the date of the FLTFA.

Recreation and Public Purposes Act of 1926

In 1954, the Congress enacted the Recreation and Public Purposes Act (43 U.S.C 869 et. seq.) as a complete revision of the Recreation Act of 1926 in response to the public need for a nationwide system of parks and other recreational and public purposes areas. This law is administered by the BLM. The Act authorizes the sale or lease of public lands for recreational or public purposes to State and local governments and to qualified nonprofit organizations. Examples of typical uses under the Act are historic monument sites, campgrounds, schools, fire houses, law enforcement facilities, municipal facilities, landfills, hospitals, parks, and fairgrounds.

Bureau of Land Management Energy and Non-Energy Mineral Policy

This statement sets forth BLM policy for the management of energy and non-energy mineral resources (mineral resources) on public lands. It reflects the provisions of five important acts of Congress relating to mineral resources: the Domestic Minerals Program Extension Act of 1953, the Mining and Minerals Policy Act of 1970, the Federal Land Policy and Management Act of 1976, the National Materials and Minerals Policy, Research and Development Act of 1980, and the Energy Policy Act of 2005. This policy represents a commitment by the BLM to implement the requirements of these statutes consistent with the BLM's other statutory obligations, as follows:

The Domestic Minerals Program Extension Act of 1953 states that each department and agency of the Federal Government charged with responsibilities concerning the discovery, development, production, and acquisition of strategic or critical minerals and metals shall undertake to decrease further, and to eliminate where possible, the dependency of the United States on overseas sources of supply of each such material.

The Mining and Minerals Policy Act of 1970 declares that it is the continuing policy of the Federal Government to foster and encourage private enterprise in the development of a stable domestic minerals industry and the orderly and economic development of domestic mineral resources. This act includes all minerals, including sand and gravel, geothermal, coal, and oil and gas.

The Federal Land Policy and Management Act of 1976 reiterates that the 1970 Mining and Minerals Policy Act shall be implemented and directs that public lands be managed in a manner which recognizes the Nation's need for domestic sources of minerals and other resources.

The National Materials and Minerals Policy, Research and Development Act of 1980 requires the Secretary of the Interior to improve the quality of minerals data in Federal land use decision-making.

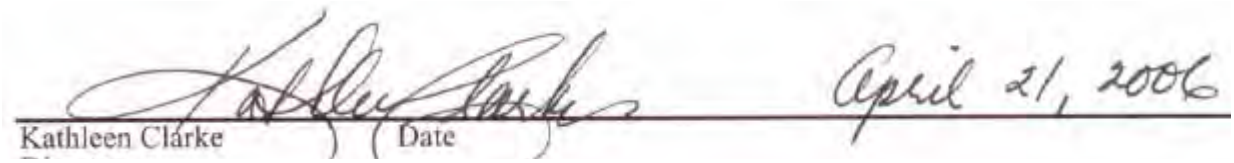
The Energy Policy Act of 2005 encourages energy efficiency and conservation; promotes alternative and renewable energy sources; reduces dependence on foreign sources of energy; increases domestic production; modernizes the electrical grid; and encourages the expansion of nuclear energy.

The BLM recognizes that public lands are an important source of the Nation's energy and non-energy mineral resources, some of which are critical and strategic. The BLM is responsible for making public lands available for orderly and efficient development of these resources under principles of multiple use management, and the concept of sustainable development as was defined at the World Summit on Sustainable Development in 2002, in Johannesburg, South Africa.

The following principles will guide the BLM in managing mineral resources on public lands:

1. Except for Congressional withdrawals, public lands shall remain open and available for mineral exploration and development unless withdrawal or other administrative actions are clearly justified in the national interest in accordance with the Department of the Interior Land Withdrawal Manual 603 DM 1, and the BLM regulations at 43 CFR §2310. Petitions to the Secretary of the Interior for revocation of land withdrawals for mineral exploration and development will be evaluated through the land use planning process.
2. The BLM endorses the Sustainable Development Plan of Implementation applicable to mineral resources signed by 193 countries, including the United States; in Johannesburg in 2002. This plan encourages social, environmental, and economic considerations before decisions are made on mineral operations. The BLM actively encourages development by private industry of public land mineral resources, and promotes practices and technology that least impact natural and human resources.
3. The BLM will adjudicate and process mineral patent applications, permits, operating plans, mineral exchanges, leases, and other mineral use authorizations for public lands in a manner to prevent unnecessary and undue degradation, and in a timely and efficient manner, and will require financial assurances to provide for reclamation of the land and for other purposes authorized by law. Mine closure and reclamation considerations include alternative forms of use such as for landfills, wind farms, biomass facilities and other industrial uses, to attract partnerships to utilize the existing mine infrastructure for a future economic opportunity.
4. The BLM land use planning and multiple-use management decisions will recognize that, with few exceptions, mineral exploration and development can occur concurrently or sequentially with other resource uses. The least restrictive stipulations that effectively accomplish the resource objectives or uses will be used. The BLM will coordinate with surface owners when the Federal minerals estate under their surface ownership is proposed for development.
5. Land use plans will reflect geological assessments and mineral potential on public lands through existing geology and mineral resource data, and to the extent feasible, through new mineral assessments to determine mineral potential. Partnerships with State Geologists and the U.S. Geological Survey for obtaining existing and new data should be considered.
6. The BLM will work closely with Federal, State and Tribal governments to reduce duplication of effort while processing mineral related permit applications.
7. The BLM will monitor locatable, salable and leasable mineral operations to ensure proper resource recovery and evaluation, production verification, diligence and enforcement of terms and conditions. The BLM will ensure receipt of fair market value for mineral materials, and appropriate royalty rates for leasable commodities unless otherwise provided for by statute.
8. The BLM will continue to develop e-Government solutions that will provide for electronic submission and tracking of applications for exploration and development of mineral resources. The BLM will continue to provide public access to mineral records, including spatial display of all types of authorizations and mineral resource data.

9. The BLM will maintain and enhance the understanding, skills, and abilities of effective professional, technical, and managerial personnel knowledgeable in adjudication, geology, mineral exploration and development.
10. To the extent provided by law, regulation, secretarial order, and written agreement with the Bureau of Indian Affairs, the BLM will apply the above principles to the management of mineral resources and operations on Indian Trust lands in order to comply with its Trust Responsibilities.



1.7.3 Air Quality

The Clean Air Act of 1990

The Clean Air Act of 1990, as amended (42 USC 7401, 7642), requires the BLM to protect air quality, maintain Federal- and State-designated air quality standards, and abide by the requirements of the State implementation plans.

State Air Quality Standards and Regulations

The State air quality standards and regulations specify the requirements for air permitting and monitoring to implement Clean Air Act and State ambient air quality standards.

1.7.4 Water Quality

The Clean Water Act of 1987

The Clean Water Act of 1987, as amended (33 USC 1251), establishes objectives to restore and maintain the chemical, physical, and biological integrity of the nation's water. The Act also requires permits for point source discharges to navigable waters of the United States and the protection of wetlands and includes monitoring and research provisions for protection of ambient water quality.

The Safe Drinking Water Act

The Safe Drinking Water Act (SDWA) was originally passed by the Congress in 1974 to protect public health by regulating the nation's public drinking water supply. The law was amended in 1986 and 1996 and requires many actions to protect drinking water and its sources: rivers, lakes, reservoirs, springs, and ground water wells. SDWA authorizes the U.S. Environmental Protection Agency (EPA) to set national health-based standards for drinking water to protect against both naturally occurring and manmade contaminants that may be found in drinking water. The EPA, States, and water systems then work together to ensure that these standards are met.

State Water Quality Standards and Regulations

State water quality standards and regulations implement permitting and monitoring requirements for the National Pollutant Discharge Elimination System, operation of injection wells, groundwater protection requirements, and prevention and response requirements for spills.

1.7.5 Protection of Wetlands (EO 11990)

Protection of Wetlands (EO 11990) requires Federal agencies to take action to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

Floodplain Management (EO 11988)

Floodplain Management (EO 11988) provides for the restoration and preservation of national and beneficial floodplain values, and enhancement of the natural and beneficial values of wetlands in carrying out programs affecting land use.

1.7.6 Cultural Resources

Historic Sites Act of 1935

The Historic Sites Act (16 USC 461) declares national policy to identify and preserve historic sites, buildings, objects, and antiquities of national significance, thereby providing a foundation for the National Register of Historic Places (NRHP).

National Historic Preservation Act of 1966

The National Historic Preservation Act of 1966 (NHPA), as amended (16 USC 470), expands protection of historic and archeological properties to include those of national, State, and local significance. The NHPA (in Section 106) requires Federal agencies to take into account the potential effects of agency actions on properties listed on or eligible for the NRHP. Agencies are also required to consult with the State Historic Preservation Office (SHPO), and sometimes with the Advisory Council on Historic Preservation, concerning those effects. The SHPO is also sometimes consulted concerning applicable methods for determining whether or not there are NRHP-eligible properties in the area of potential effect of an agency undertaking, whether properties are eligible, and appropriate mitigation measures. The NHPA (in Section 110) also requires Federal agencies to identify properties that may qualify for listing on the NRHP, to evaluate and nominate such places to the register, and to develop plans for their management. Both Section 110 and the Archeological Resources Protection Act of 1979 require Federal agencies to develop proactive programs to interpret archeological resources for the benefit of the public. The 1992 amendments to the NHPA call for Federal agencies to conduct Native American consultation on projects that may affect sites or resources that tribal representatives consider sensitive, sacred, or culturally important.

Archeological Resources Protection Act of 1979

The Archeological Resource Protection Act, as amended (16 USC 470a, 470cc, 470ee), requires permits for the excavation or removal of Federally administered archeological resources, encourages increased cooperation among Federal agencies and private individuals, provides stringent criminal and civil penalties for violations, and requires Federal agencies to identify important resources vulnerable to looting and to develop a tracking system for violations.

The Antiquities Act of 1906

The Antiquities Act of 1906 protects objects of historic and scientific interest on public lands. It authorizes the President to designate historic landmarks and structures as national monuments and

provides penalties for people who damage these historic sites. The Act has two main components: (1) a criminal enforcement component, which provides for the prosecution of persons who appropriate, excavate, injure, or destroy any historic or prehistoric ruin or monument, or any object of antiquity on lands owned or controlled by the United States, and (2) a component that authorizes a permit for the examination of ruins and archeological sites and the gathering of objects of antiquity on lands owned or controlled by the United States.

Protection and Enhancement of the Cultural Environment of 1971

Protection and Enhancement of the Cultural Environment (EO 11593) directs Federal agencies to locate, inventory, nominate, and protect Federally owned cultural resources eligible for the NRHP and to ensure that their plans and programs contribute to preservation and enhancement of non-Federally owned resources.

Preserve America (EO 13287)

EO 13287, signed in 2003, requires the Federal Government to lead the preservation of America's heritage by actively advancing the protection, enhancement, and contemporary use of the historic properties owned by the government and by promoting intergovernmental cooperation and partnerships for the preservation and use of historic properties.

1.7.7 Hazardous Materials

Comprehensive Environmental Response, Compensation, and Liability Act of 1980

The Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (42 USC 9601–9673), provides for liability, risk assessment, compensation, emergency response, and cleanup (including the cleanup of inactive sites) for hazardous substances. The Act requires Federal agencies to report sites where hazardous wastes are or have been stored, treated, or disposed of, and requires responsible parties, including Federal agencies, to clean up releases of hazardous substances.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act (RCRA), as amended by the Federal Facility Compliance Act of 1992 (42 USC 6901–6992), authorizes the US EPA to manage, by regulation, hazardous wastes on active disposal operations. The Act waives sovereign immunity for Federal agencies with respect to all Federal, State, and local solid and hazardous waste laws and regulations. Federal agencies are subject to civil and administrative penalties for violations and to cost assessments for the administration of the enforcement.

Emergency Planning and Community Right-to-Know Act of 1986

The Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA; 42 USC 11001–11050) requires the private sector to inventory chemicals and chemical products, to report those in excess of threshold planning quantities, to inventory emergency response equipment, to provide annual reports and support to local and State emergency response organizations, and to maintain a liaison with the local and State emergency response organizations and the public.

1.7.8 Wildlife

Endangered Species Act of 1973

The purpose of the Endangered Species Act (ESA) is to protect and recover imperiled species and the ecosystems upon which they depend. It is administered by the Department of the Interior's USFWS and the Department of Commerce's National Marine Fisheries Service (NMFS). The USFWS has primary responsibility for terrestrial and freshwater organisms, while the responsibilities of NMFS are mainly marine species such as salmon and whales.

Bald and Golden Eagle Protection Act

The Bald Eagle Protection Act (16 USC 668) prohibits the take, possession, sale, purchase, barter, offer to sell, purchase, transport, export or import, of any bald eagle, alive or dead, or any part, nest, or egg thereof. "Take" includes pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, or molest, or disturb (50 CFR §22.3).

Fish and Wildlife Coordination Act of 1958

The Act of March 10, 1934, (16 USC 661 et seq.) as amended, authorizes the Secretaries of Agriculture and Commerce to provide assistance to and cooperate with Federal and State agencies to protect, rear, stock, and increase the supply of game and fur-bearing animals, as well as to study the effects of domestic sewage, trade wastes, and other polluting substances on wildlife. The Act also directs the Bureau of Fisheries to use impounded waters for fish-culture stations and migratory-bird resting and nesting areas and requires consultation with the Bureau of Fisheries before the construction of any new dams to provide for fish migration. In addition, the Act authorizes the preparation of plans to protect wildlife resources, the completion of wildlife surveys on public lands, and the acceptance by the Federal agencies of funds or lands for related purposes provided that land donations received the consent of the State in which they are located.

The amendments enacted in 1946 require consultation with the USFWS and the fish and wildlife agencies of States where the "waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted…or otherwise controlled or modified" by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of "preventing loss of and damage to wildlife resources."

Fish and Wildlife Improvement Act of 1978

The Fish and Wildlife Improvement Act of 1978 (16 USC 7421; 92 Stat. 3110), Public Law 95-616, authorizes the Secretaries of the Interior and Commerce to establish, conduct, and assist with national training programs for State fish and wildlife law enforcement personnel. It also authorized funding for research and development of new or improved methods to support fish and wildlife law enforcement. The law provides authority to the Secretaries to enter into law enforcement cooperative agreements with State or other Federal agencies and authorizes the disposal of abandoned or forfeited items under the fish, wildlife, and plant jurisdictions of these Secretaries. Public Law 105-328, signed October 30, 1998, amended the Act to allow the USFWS to use the proceeds from the disposal of abandoned items derived from fish, wildlife, and plants to cover the costs of shipping, storing, and disposing of those items.

Fish and Wildlife Conservation Act of 1980

The Fish and Wildlife Conservation Act (USC 2901–2911), commonly known as the Nongame Act, encourages States to develop conservation plans for nongame fish and wildlife of ecological, educational, aesthetic, cultural, recreational, economic, or scientific value. The States may be reimbursed for a percentage of the costs of developing, revising, or implementing conservation plans approved by the Secretary of the Interior. Amendments adopted in 1988 and 1989 directed the Secretary to undertake research and conservation activities for migratory nongame birds.

Migratory Bird Treaty Act of 1918

Taking, killing, or possessing migratory birds is unlawful (16 USC 703-712. § 703). Take is defined (50 CFR §10.12); it shall be unlawful at any time, by any means or in any manner, to pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export, any migratory bird, any part, nest, or eggs of any such bird, or any product, whether or not manufactured, which consists, or is composed in whole or part, of any such bird or any part, nest, or egg thereof, included in the terms of the conventions between the United States and Great Britain for the protection of migratory birds concluded August 16, 1916 (39 Stat. 1702), the United States and the United Mexican States for the protection of migratory birds and game mammals concluded February 7, 1936, the United States and the Government of Japan for the protection of migratory birds and birds in danger of extinction, and their environment concluded March 4, 1972 [1] and the convention between the United States and the Union of Soviet Socialist Republics for the conservation of migratory birds and their environments concluded November 19, 1976.

Sikes Act of 1960

The Sikes Act (16 USC 670a-670o, 74 Stat. 1052), as amended, Public Law 86-797, approved September 15, 1960, provides for cooperation by the Departments of the Interior and Defense with State agencies in planning, development, and maintenance of fish and wildlife resources on military reservations throughout the United States. Key amendments to the Act that affect this EIS are highlighted below:

- An amendment enacted August 8, 1968 (P.L. 90-465, 82 Stat. 661), authorized a program for development of outdoor recreation facilities.
- Public Law 93-452, signed October 18, 1974 (88 Stat. 1369), authorized conservation and rehabilitation programs on Department of Energy (DOE), National Aeronautics and Space Administration (NASA), Forest Service, and BLM lands. These programs are carried out in cooperation with the States by the Secretary of the Interior and on Forest Service lands by the Secretary of Agriculture.
- Public Law 97-396, approved December 31, 1982 (96 Stat. 2005), provided for the inclusion of endangered plants in conservation programs developed for the BLM, Forest Service, NASA, and DOE lands.
- Public Law 105-85, approved November 18, 1997 (11 Stat. 2017,2018,2020,2022), added that each integrated natural resources management plan (INRMP) prepared under this act should provide for the sustainable use by the public of natural resources, to the extent that the use is not inconsistent with the needs of fish and wildlife resources. PL 105-85 also requires that the Secretary of the Interior, in consultation with State fish and wildlife agencies, submit a report annually on the amounts expended by the Department of the Interior and State fish and wildlife agencies on activities conducted pursuant to INRMPs to respective congressional committees with oversight responsibilities.

Federal Cave Resources Protection Act of 1988

The purposes of the Federal Cave Resources Protection Act (16 USC 63) are to secure, protect, and preserve significant caves on Federal lands for the perpetual use, enjoyment, and benefit of all people and to foster increased cooperation and exchange of information between governmental authorities and those who use caves located on Federal lands for scientific, education, or recreational purposes.

1.8 RELATIONSHIP WITH OTHER PLANS

BLM land use plans and amendments must be consistent with officially approved or adopted resource related plans, and the policies and programs contained therein, of other Federal agencies, State and local governments and Indian tribes, so long as the guidance and RMPs are also consistent with the purposes, policies, and programs of Federal laws and regulations applicable to public lands, including Federal and State pollution control laws as implemented by applicable Federal and State air, water, noise, and other pollution standards or implementation plans.

There are multiple State plans and programs that address land and resources common to this RMP. In accordance with BLM policy, the RMP will be consistent to the extent practical with officially approved or adopted plans for the following:

- Alabama Coastal Zone Management Program
- Mississippi Coastal Zone Management Program
- Alabama Comprehensive Wildlife Conservation Strategy
- Mississippi Comprehensive Wildlife Conservation Strategy
- Upper Coosa Basin Watershed Management Plan
- Coosa River Recreation Plan
- Hancock Marshes Coastal Preserve

There are 313,819 acres of non-USFS FMO in Alabama and 517,934 in Mississippi that underlie various surface ownership. Surface owners include the BLM, the Department of Defense (DoD), USFWS, National Park Service (NPS), and other Federal agencies. In accordance with BLM policy, the RMP will be consistent to the extent practical with officially approved or adopted plans for the following areas:

- USFWS
  - Bon Secour NWR
  - Wheeler NWR Complex
  - Grand Bay NWR
  - Mississippi Sandhill Crane NWR
  - Bogue Chitto NWR
  - Panther Swamp NWR
  - Hillside NWR
  - Noxubee NWR
- DoD
  - Barin Field (Navy)
  - Summerdale Outlying Landing Field (Navy)
  - Silverhill Outlying Landing Field (Navy)
  - Fort Rucker Military Reservation (Army)
  - Fort Rucker Military Reservation (Army)
  - Fort McClellan Military Reservation (Army, Closed)
  - Anniston Army Depot (Army)

  - Redstone Arsenal (Army)
  - Lake Tholocco (Army Corps of Engineers)
  - Coffeeville Lake (Army Corps of Engineers)
  - William Dannelly Reservoir (Army Corps of Engineers)
  - Maxwell Air Force Base (Air Force)
  - Meridian Naval Air Station (Navy)
  - Alpha Naval Auxiliary Station (Navy)
  - Multipurpose Target Range (Navy)
  - Aliceville Lake (Army Corps of Engineers)
  - Columbus Lake (Army Corps of Engineers)
  - Aberdeen Lake (Army Corps of Engineers)
  - Grenada Lake (Army Corps of Engineers)
  - Enid Lake (Army Corps of Engineers)
  - Sardis Lake (Army Corps of Engineers)
- NPS
  - Little River Canyon Preserve
  - Vicksburg National Military Park
  - Natchez-Trace National Parkway
  - Gulf Island National Seashore

In addition, there are Recovery Plans for multiple species that occur on lands and mineral estate administered by the BLM in Alabama and Mississippi. In accordance with BLM policy, the RMP will be consistent to the extent practical with officially approved or adopted plans for Federally listed species and habitats, including the following:

- Recovery Plan for U.S. Population of Loggerhead Turtle (NMFS)
- Recovery Plan for Chotawhatchee, Perdido Key and Alabama Beach Mouse (USFWS 1987)
- Recovery Plan for *Adios oriceana* (USFWS 1993)
- Louisiana Black Bear Recovery Plan (USFWS 1995)
- Gulf Sturgeon Recovery Plan (USFWS 1995)
- Blue Shiver Recovery Plan (USFWS 1995)
- Indiana Bat (*Myotis sodalist*) Revised Recovery Plan (USFWS 1999)
- Mobile River Basin Aquatic Ecosystem Recovery Plan (USFWS 2000)
- Recovery plan for the red-cockaded woodpecker (*Picoides borealis*) (USFWS 2003).

1.9 TOPICS NOT ADDRESSED IN THIS RESOURCE MANAGEMENT PLAN

Laws, regulations, policies, and executive orders require specific resource topics to be examined during the NEPA process. In some instances, initial evaluation reveals topics that are not relevant to the planning area or do not require further analysis. These topics that are not addressed in this RMP are listed below.

Native American Concerns. Sites of concern to Native Americans are not known to occur on BLM administered surface lands or FMO in Alabama and Mississippi. Known sites, such as Nanih Waya in Mississippi and Hickory Ground in Alabama, would not be affected by any of the alternatives considered in this plan. Therefore, Native American concerns are not analyzed in detail.

The BLM will continue consultation and coordination to identify and consider Native American concerns where future actions might affect cultural or religious values. Consultation with Federally recognized tribes would take place in accordance with Executive Order 13175 *Consultation and Coordination with*

Indian Tribal Governments and would occur before planned excavations or undertakings on BLM-administered lands and FMO in compliance with the Native American Graves Protection and Repatriation Act (NAGPRA). The BLM would protect and preserve Native American religious and cultural rights and practices on Federal lands in accordance with the American Indian Religious Freedom Act of 1978 (AIRFA).

Areas of Critical Environmental Concern (ACEC). There are no designated ACECs within the scope of this plan, and no ACECs were proposed internally or externally for designation.

Wilderness, Wilderness Study Areas, and Land with Wilderness Characteristics. There are no designated or proposed wilderness areas, wilderness study areas, or lands with wilderness characteristics on lands administered by the BLM in the planning area.

Minerals Underlying USFS Lands. The BLM has the responsibility for lease issuance and post-lease administration of 1,640,621 acres of mineral estate where the surface is managed by USFS. However, the RMP will not make decisions on oil and gas leasing of national forest acreage because the Federal Onshore Oil and Gas Reform Act of 1987 requires the USFS to conduct a leasing analysis to make land use planning decisions on oil and gas leasing. This legal requirement does not apply to other Federal surface management agencies. For the purposes of this document, RMP decisions will apply to "BLM-administered, non-USFS FMO," which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS.

Locatable and Salable Minerals. There is no reasonable foreseeable development for locatable and salable resources; therefore, such resources in Alabama and Mississippi are not discussed herein. Types of locatable minerals include gold, silver, and copper. Examples of salable minerals include stone, sand, and gravel.

1.10 READER'S GUIDE TO THIS DOCUMENT

This Proposed RMP-FEIS is organized according to BLM's land use planning guidance (H-1610-1 and 43 CFR 1601 *et seq*.), the *BLM NEPA Handbook* (H-1790-1), CEQ guidelines, and Federal regulations implementing NEPA (40 CFR Parts 1500–1508). This Proposed RMP-FEIS has been developed to address issues, concerns, and conflicts within the planning area and to provide guidance for management of BLM-administered lands in both States. It contains the following major chapter headings and information:

Chapter 1—Purpose and Need. Contains background and introductory material such as the purpose and need for the Proposed RMP-FEIS and the BLM planning process.

Chapter 2—Alternatives. Identifies BLM-administered surface tracts and non-USFS FMO and describes alternative development and management guidance common to all alternatives. This chapter presents specific management actions proposed under the alternatives and a comparative summary of the impacts of the alternatives that have been analyzed in detail. It also identifies the Proposed RMP.

Chapter 3—Affected Environment. Describes the affected environment, focusing on the existing environmental conditions that would be affected by implementation of the alternatives.

Chapter 4—Environmental Consequences. Describes the impacts of the alternatives. This section forms the scientific and analytic basis for the comparison of impacts presented in Chapter 2.

Chapter 5—Consultation and Coordination. Describes the overall EIS scoping process and other agency consultation and public involvement activities. Responses to public comments received on the Draft RMP-EIS and a list of agencies, organizations, and individuals who were sent the Proposed RMP-FEIS is also presented.

List of Abbreviations and Acronyms. Provides an alphabetized list of abbreviations and acronyms used in this Proposed RMP-FEIS.

Glossary. Provides definitions of terms used in this Proposed RMP-FEIS.

References. Provides information for all references cited, most of which are available to the public at libraries or on the Internet. Many of the documents cited are available for public review at JFO.

Appendices. Provide additional supporting information as follows—

- Appendix A—Recreation and Public Purposes Act Lands
- Appendix B—Lands of Uncertain Title
- Appendix C—Relevant Statutes, Regulations, Orders, and Guidelines
- Appendix D—Proposed Conservation Measures and Best Management Practices
- Appendix E—Special Status Species in Alabama and Mississippi
- Appendix F—Soils
- Appendix G—Socioeconomic Figures
- Appendix H—Water Resources
- Appendix I—Withdrawn Lands
- Appendix J—Summary of the Reasonably Foreseeable Development Scenario
- Appendix K—Proposed Resource Management Plan.

CHAPTER 2—ALTERNATIVES

2.1 INTRODUCTION

Chapter 2 describes the alternatives for a Resource Management Plan (RMP), including the Proposed RMP, that would guide management of Bureau of Land Management (BLM)-administered lands (referred to as surface tracts) and non-U.S. Forest Service Federal mineral ownership (non-USFS FMO) in Alabama and Mississippi identified in Chapter 1 (Table 1-1 and Table 1-2). An interdisciplinary team developed the alternatives to present a reasonable range of management options for guiding resource management and activities. The management alternatives evaluated in this Proposed RMP-Final Environmental Impact Statement (FEIS) were developed to meet resource condition objectives and to minimize adverse impacts to cultural and natural resources while providing for compatible resource use and development opportunities consistent with current laws, regulations, and policies.

The National Environmental Policy Act of 1969 (NEPA) requires development and consideration of a reasonable range of management alternatives, including a No Action Alternative. Alternatives must be viable and reasonable; meet the stated purpose and need for the plan; provide a mix of resource protections, management use, and development; be responsive to issues identified during scoping; and meet established planning criteria (outlined in Chapter 1), as well as Federal laws, regulations, and BLM policies. Each management alternative evaluated in the Proposed RMP-FEIS represents a reasonable approach to managing resources and activities. The BLM has the discretion to select an alternative in its entirety or to combine aspects of the various alternatives presented in the draft to develop the Proposed RMP and Final EIS. Alternative 3 was chosen as the Proposed RMP after considering the public and agency comments received on the Draft RMP-EIS. The Proposed RMP is presented as Alternative 3 in this chapter.

2.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 2.1).** This section presents an overview of the development and consideration of management alternatives and provides direction on How to Read This Chapter (Section 2.1.1).
- **Alternative Components (Section 2.2).** This section presents the alternative structure and describes components that are considered for each alternative.
- **Standard Management Common to All Alternatives (Section 2.3).** This section describes management actions that are applicable or common to all alternatives.
- **Alternatives Analyzed in Detail (Section 2.4).** This section presents four alternatives for management of BLM-administered, non-USFS FMO and surface tracts.

2.2 ALTERNATIVE COMPONENTS

Decisions in RMPs guide future land management actions and subsequent site-specific implementation decisions. The RMP alternatives described in this chapter represent approaches to addressing key planning issues (presented in Chapter 1) and to managing resources and resource uses in the planning area. Each alternative is composed of two categories of land use planning decisions, including (1) desired outcomes for resource management (goals and objectives) and (2) the measures needed to achieve these goals and objectives (allowable uses and management actions). These two categories are discussed below.

- **Desired Outcomes (Goals and Objectives).** Land use plans must identify desired outcomes expressed in terms of specific goals and objectives. Goals and objectives direct the BLM's actions in most effectively meeting legal mandates, numerous regulatory responsibilities, national policy, and other resource or social needs. Desired outcomes should be identified for and pertain to resources (such as natural, biological, and cultural), resource uses (such as minerals development and lands and realty actions), and other factors (such as social and economic conditions). Goals are broad statements of desired outcomes (e.g., maintain ecosystem health and productivity, promote community stability, ensure sustainable development) that usually are not quantifiable. Objectives identify specific desired outcomes for resources. Objectives may be quantifiable and measurable and may have established time frames for achievement (as appropriate).

- **Allowable Uses and Management Actions.** After establishing desired outcomes, the BLM identifies allowable uses and management actions for different alternatives that are anticipated to achieve the goals and objectives. Land use plans must identify uses, or allocations, that are allowable, restricted, or prohibited on the public lands and mineral estate. These allocations identify surface lands and/or mineral interests where uses are allowed, including any restrictions that may be needed to meet goals and objectives. Land use plans also identify lands where specific uses are excluded to protect resource values. Certain lands may be open or closed to specific uses based on legislative, regulatory, or policy requirements or criteria to protect sensitive resource values. Land use plans must identify the actions anticipated to achieve desired outcomes, including actions to maintain, restore, or improve land health. These actions include proactive measures (e.g., measures that will be taken to enhance watershed function and condition), as well as measures or criteria that will be applied to guide day-to-day activities occurring on public land. Land use plans also establish administrative designations such as areas of critical environmental concern (ACEC), recommend proposed withdrawals, land tenure zones, and recommend or make findings of suitability for congressional designations (such as components of the National Wild and Scenic River System).

Goals and objectives developed for each resource and resource use are presented in Section 2.3 and by alternative for each surface tract in Section 2.4. Two types of management actions are included in the alternatives in this RMP. The first is standard management common to all alternatives (Section 2.3), which will apply regardless of which alternative is selected. The second is management actions and allowable uses by alternative (Section 2.4), which represent the choice(s) considered across alternatives. Management actions and allowable uses included in this chapter would apply to all BLM-administered surface tracts and non-USFS FMO in the planning area. It is important to note that the RMP is strategic in nature, and, while it provides an overarching vision for managing resources in the planning area, it must also be flexible to changing priorities, information, and circumstances.

2.3 STANDARD MANAGEMENT COMMON TO ALL ALTERNATIVES

The following standard management would apply regardless of which alternative is selected. These management actions are a result of specific limitations on management of resources and land use programs defined in various laws and regulations that govern BLM management decisions.

2.3.1 Air Quality

The goals and objectives for air quality are to comply with local, State, and Federal air quality regulations, requirements, and implementation plans.

Actions authorized on BLM-administered lands and non-USFS FMO would need to be conducted so as to comply with Clean Air Act requirements, including the applicable National Ambient Air Quality Standards (NAAQS) (Section 109); the State Air Quality Implementation Plan (SIP) (Section 110); control of pollution from Federal facilities (Section 118); prevention of significant deterioration (PSD), including visibility impacts to mandatory Federal Class I areas (Section 160 et seq.); and conformity analyses and determinations (Section 176(c)). Section 118 of the Clean Air Act requires Federal agencies to comply with all Federal, State, and local air pollution requirements. Section 176(c) prohibits Federal agencies from taking any actions that contribute to a new violation of Ambient Air Quality Standards, increase the frequency or severity of an existing violation, or delay the attainment of a Standard. It also requires Federal agencies to conform to SIPs. BLM policy provides requirements to minimize air quality impacts. For example, prescribed burns must comply with BLM Manual 9214 for air quality maintenance requirements, to minimize air quality impacts from particulates such as smoke.

2.3.2 Soil Resources

The goals and objectives for soil resources are to maintain or improve soil conditions and prevent or minimize accelerated soil erosion.

Standards and goals under the Clean Water Act (CWA) require measures to minimize non-point source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of best management practices (BMP). Examples of soil BMPs can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book (BLM 2006)* and at http://www.blm.gov/bmp.

2.3.3 Unique and Prime Farmland

The goals and objectives for unique and prime farmland are to minimize the impact of BLM-authorized activities on the unnecessary and irreversible conversion of farmland to nonagricultural uses and comply with State and local government policies to protect farmland.

Before any decision authorizing surface disturbance, a determination would be made as to if prime or unique farmland as defined by the Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) is in an area that may be affected by a proposed action. If prime or unique farmland is present, then an appropriate level of analysis would be prepared to determine if the proposed action may have an adverse effect and identify appropriate mitigation measures to minimize any unnecessary and irreversible conversion of farmland to nonagricultural uses.

2.3.4 Water Resources

The goals and objectives for water resources are to maintain water quality where it presently meets Environmental Protection Agency (EPA)-approved State water quality standards and improve water quality on public lands where it does not meet standards as defined by Section 303(d) of the CWA.

Standards and goals under the CWA and water quality management objectives developed by the States, as required by the 1987 Water Quality Act Amendments to the Federal Water Pollution Control Act, were created to protect the quality of States' waters and to prevent, abate, and control water pollution. Any water discharged on the surface by industry is controlled through National Pollutant Discharge Elimination System (NPDES) permits. Actions authorized on BLM lands must also comply with the mitigation requirements defined by the Office of Surface Mining regulations for coal leasing and by the

U.S. Army Corps of Engineers Section 404 permit requirements. Management actions would be conducted in conformance with the various regulations in the CWA, the State regulations, and the Federal Lands Policy and Management Act of 1976 (FLPMA) to achieve the water quality classifications and standards for surface and ground waters developed by the States. Management actions would be conducted in a manner conforming to water quality management objectives developed by the States. Standards and goals under the CWA require measures to minimize non-point source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of BMPs. Examples of soil BMPs can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book* (BLM 2006) and at http:// www.blm.gov/bmp.

The Coastal Zone Management Act of 1972 established a national policy of protecting, and, where possible, restoring and enhancing coastal areas. The National Coastal Zone Management Program fosters an effective partnership among federal, state, and local governments. For proposed actions on tracts that are within coastal areas, the BLM would recognize and comply with the requirements of the state coastal area management program.

2.3.5 Vegetative Communities

The goals and objectives for vegetative communities are to manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities and control noxious and invasive plant species.

The BLM's role in the management of vegetative communities is to provide habitats that support desired plants and animals. The BLM would manage for desired outcomes of vegetative communities, including control of noxious and invasive species, that incorporate the conservation actions identified in the approved State comprehensive conservation strategies. Unless otherwise specified in an alternative, vegetation manipulation (e.g., prescribed burning, mechanical alteration, chemical treatment, manual, biological) would be allowed if needed to meet resource management objectives.

2.3.6 Fish and Wildlife

The goals and objectives for fish and wildlife are to manage vegetative communities to protect, preserve, or enhance habitat for fish and wildlife species.

The BLM's role in the management of fish and wildlife is to provide habitats that support desired animal species. The BLM would support and coordinate with the State and other partners on habitat improvements and protection in compliance with approved comprehensive State fish and wildlife conservation strategies. This may include actions such as control of invasive plant species, use of prescribed fire, and wetland enhancements. Hunting regulations and game management are under the authority of the State fish and wildlife agency.

2.3.7 Special Status Species

The goals and objectives for special status species are to protect, preserve, or enhance Federally listed and other special status species and their habitat.

Special status species include all Federal and State-listed species, proposed or candidates for Federal or State listing, and those species identified by the BLM as sensitive species. BLM Eastern States policy

designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs.

The BLM would avoid jeopardizing the continued existence of any Federally listed, State listed, or proposed species; actively promote species recovery; and work to improve the status of candidate and sensitive species. If a Federally listed species may be affected by a proposed management action, there would be consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [USC] 1531 *et seq*.). If a proposed management action might impact a State-listed species, there would be consultation with the appropriate State game and fish agency. Harvesting of any sensitive species would be prohibited, except when explicitly authorized for scientific purposes by an appropriate State and/or Federal agency.

If a proposed activity could affect candidate or sensitive species or their habitat, the BLM would avoid activities that would contribute to a need to list such species or their habitat. Thus, the BLM could require modifications to or reject a proposed activity that could jeopardize the continued existence of a proposed or listed threatened or endangered species or that could result in destruction or adverse modification of a designated or proposed critical habitat. The BLM would not approve any surface-disturbing activity that may affect any such species or critical habitat until obligations are met under applicable requirements of ESA, as amended, including completion of any required procedure for conference or formal consultation.

2.3.8 Wildland Fire Ecology and Management

The goals and objectives for wildland fire ecology and management are to manage fire and fuels to protect life, firefighter safety, property, and critical resource values.

Unless a separate, site-specific plan is in place, wildfires would be suppressed. Agreements, as needed, would be pursued with Federal, State, and local government fire protection agencies for fire suppression. Prescribed burning would be allowed on a case-by-case basis if needed to meet vegetative communities or fish and wildlife habitat management objectives.

2.3.9 Cultural Resources

The goals and objectives for cultural resources are to identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations (FLPMA, Section 103 (c), 201(a) and (c); National Historic Preservation Act (NHPA), as amended (16 USC 470), Section 110(a); Archaeological Resources Protection Act (ARPA), Section 14(a)). In addition, to seek to reduce imminent threats and resolve potential conflicts from natural or human-caused deterioration, or potential conflict with other resource uses (FLPMA Sec. 103(c), NHPA 106, 110 (a) (2)) by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.

Management actions would comply with the NHPA, which provides protection for significant cultural resources. An appropriate level of inventory would be conducted for all actions with a potential to affect these resources, in compliance with the requirements of Section 110 of the NHPA. Actions would require additional consultation with the State Historic Preservation Officer (SHPO), in compliance with Section 106 of NHPA, and/or the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800).

Cultural resources would be identified and protected on a case-by-case basis, according to site-specific needs. Any significant sites discovered would be available for scientific, conservation, traditional, or interpretation uses. A site that is not significant (as determined by the BLM with SHPO consultation) would be released from management concerns.

Cultural resource surveys conducted prior to 1996, when the Alabama Historical Commission (AHC) cultural resource assessment standards were established, will have to be resurveyed. Because of this, consultation with the Alabama SHPO will occur prior to any property disposal or mineral leasing to determine if a cultural resource survey was conducted prior to 1996.

2.3.10 Paleontological Resources

The goals and objectives for paleontological resources are to protect their important scientific values.

Significant paleontological sites are protected under FLPMA. FLPMA charges the BLM to (1) manage public land so as to protect the quality of scientific and other values and (2) see that land and resources are periodically and systematically inventoried. Known paleontological resources would be managed according to the BLM 8270 *Handbook* and the BLM *Manual for the Management of Paleontological Resources*.

If discovered, paleontological resources would be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values would be determined on a case-by-case basis. Collecting of scientifically significant vertebrate and invertebrate fossils by qualified paleontologists would be allowed by permit only.

2.3.11 Visual Resources

The goals and objectives for visual resources are to protect scenic values while providing for overall multiple use and quality of life for local communities and visitors to public lands.

Because of their small size, the surface tracts are a relatively small component of the visual landscape. Consequently, they have not been the subject of a traditional BLM visual resource management (VRM) inventory and are not assigned VRM classes (defined in Section 3.2.9). Case-by-case processing of land use and mineral development proposals would consider impacts to visual resources where these have been identified as public concerns. Interim visual management classes would be assigned in accordance with VRM Manual 8400 and Visual Resource Inventory Handbook H-8410-1. All surface tracts would be managed as VRM Class III, except for the Coosa River tracts in Alabama and the Hancock County tract in Mississippi, which would be managed as VRM Class II.

2.3.12 Minerals

The goals and objectives for minerals are to provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.

Federal mineral estate would be available for conveyance to owners of the surface estate as provided in Section 209 of FLPMA. Section 209 provides for this conveyance if there are no known mineral values in the land or if reservation of the mineral rights to the United States is interfering with or precluding appropriate surface development of the land and such development is a more beneficial use of the land. The BLM would retain the FMO with known mineral value.

As discussed in Section 1.3, BLM-administered, non-USFS FMO in the planning area includes Federal mineral estate underlying lands of BLM or other Federal surface management agencies (excluding USFS) and split-estate whereby the Federal Government owns all or a portion of the mineral estate, but the surface estate is State-owned or privately owned (i.e., non-Federal). BLM-administered, non-USFS FMO under the jurisdiction of another Federal surface managing agency would be available for exploration and

development as directed by the surface managing agency. Split-estate (i.e., non-USFS FMO underlying private or State-owned surface lands) would be subject to stipulations deemed necessary to protect existing surface improvements or use. The BLM would apply stipulations to oil and gas leases as determined through this plan; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease-approval process.

After this plan is approved, it is expected that additional FMO tracts will be identified or acquired through mineral leasing applications. If these tracts are similar in resource values and within the environmental issues analyzed in this plan, the new FMO tracts will be managed according to the guidance of this plan and incorporated into the plan through plan maintenance.

Coal leasing potential within the planning area is limited to the Warrior Basin[1] in Alabama because of the distinctive presence of the appropriate geological conditions (e.g., continuity of coalbeds, thickness of coal, quality of coal seams) and existing infrastructure (e.g., existing subsurface mining operations and access roads) for development of coal resources. BLM-administered, non-USFS FMO available for coal leasing is located in Walker, Fayette, Jefferson, and Tuscaloosa Counties. Coal is also present to a lesser degree in Marion and Winston Counties, but the development of Federal coal in these counties is unlikely. Non-USFS FMO in the Warrior Basin would be available for further coal leasing consideration and limited to underground mining methods. BMPs would be applied as appropriate when processing a Lease by Application (LBA).

2.3.13 Recreation

The goals and objectives for recreation are to allow recreation use and travel compatible with other resource management objectives.

The BLM surface tracts are open to dispersed recreational use, including hunting, fishing, hiking, and nature study. Case-by-case processing of land use and mineral development proposals would consider impacts to recreation where it has been identified as a public concern. Due to the scattered nature of the small surface tracts and lacking recreation interest, special recreation management areas (SRMA) would not be designated within this RMP, and all surface tracts would be managed as extensive recreation management areas (ERMA).

2.3.14 Lands and Realty

The goals and objectives for lands and realty are to manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values. In addition, to make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

All land use proposals would be evaluated for conformance with plan objectives and land use decisions. Case-by-case processing would include analysis of environmental impacts through the NEPA compliance process. Land disposals would be conducted to meet the requirements identified under applicable authorities. To be considered suitable for disposal through sale, lands must meet the following criteria outlined in Section 203 of the FLPMA:

> (1) Such tract, because of its location or other characteristics, is difficult and uneconomic to manage as part of the public lands and is not suitable for management by another Federal department or agency

[1] *The term "Warrior Basin" is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.*

(2) Such tract was acquired for a specific purpose, and the tract is no longer required for that or any other Federal purpose

(3) Disposal of such tract will serve important public objectives, including, but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

Lands may be exchanged as authorized by Section 206 of the FLPMA when the exchange would serve the national interest and benefit BLM programs or the programs of other Federal agencies. Lands may be conveyed to State and local government agencies and other qualified organizations under the Recreation and Public Purposes Act of 1926 (R&PP), as amended. Under R&PP, lands may be conveyed or leased only for an established or proposed project for which there are development and management plans, as well as adequate funding by the R&PP applicant to complete the development and a reasonable timetable of development.

Specific surface tracts identified for disposal under the various management alternatives would be evaluated for the presence of significant resource values before such action. Resources to be evaluated would include minerals, recreation, cultural resources, wetlands, and special status species. This evaluation would also be applied before disposal of any additional BLM-administered surface tracts that are identified or verified after approval of the RMP.

Some tracts may have uncertain titles. These are cases in which the tracts are claimed by private owners but government land records show that they were not transferred from Federal ownership. Tracts with uncertain titles would be handled on a case-by-case basis in accordance with the Color-of-Title Act, under which claimants may apply for transfer of these tracts and, if qualified, purchase the tracts to obtain title. Appendix B provides a list of lands of uncertain title occurring within the planning area.

Existing withdrawals (listed in Appendix I) would be subject to review to determine if they are serving their intended purpose. The BLM has the authority to revoke, modify, extend, or change withdrawals in accordance with the provisions and limitations of Section 204 of FLPMA.

After this plan is approved, it is expected that some additional surface tracts may return to BLM administration after revocation of withdrawals, reversion of R&PP lands, and resolution of title. These additional surface tracts will be managed according to applicable guidance of this plan.

This plan does not identify specific utility corridors because of fragmented BLM surface land ownership within the planning area and uncertainties in demand. Right-of-way (ROW) avoidance areas, established for protection of sensitive resources and tracts that may be suitable for corridors, are identified in the management alternatives presented in Section 2.4. Tracts identified as available for disposal through sale or exchange would be managed as avoidance areas if granting of an ROW might adversely affect tract marketability, unless otherwise specified in the alternatives.

Resolution of unauthorized use would be pursued on a case-by-case basis. Resolution would include termination of use and payment of damages, including reclamation of disturbed land, if needed. In some cases, use may be authorized through ROWs, permits, leases, or land disposal. Valid authorizations would be protected if the land undergoes disposal.

2.3.15 Hazardous Materials

The goals and objectives for hazardous materials are to minimize or eliminate the potential for intentional or accidental releases of hazardous materials or wastes from BLM-authorized actions.

Proposed activities on BLM-administered surface tracts and non-USFS FMO would be evaluated for their potential to release hazardous materials into the environment. Authorized use of hazardous materials must comply with the Resource Conservation and Recovery Act (RCRA). Disposal of hazardous materials is prohibited. Discovery of hazardous materials that have not been permitted would be handled in accordance with the reporting, removal, and remediation requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

2.4 ALTERNATIVES ANALYZED IN DETAIL

This section presents four alternatives for BLM-administered surface tracts and non-USFS FMO. Each alternative represents a direction to guide future management of BLM-administered public lands and resources in Alabama and Mississippi. Alternative 3 was chosen as the Proposed RMP after considering the public and Agency comments received on the Draft RMP-EIS. No other alternatives were considered other than the four alternatives analyzed in this RMP-EIS.

Management themes represented in each alternative include the following—

- **Alternative 1 (No Action).** Alternative 1 represents the No Action Alternative (i.e., continuation of current management). The BLM would continue the current management approach by retaining all BLM-administered surface tracts and employing custodial management. The BLM management actions would occur in response to an application for use presented by another entity or compliance actions required by regulation and policy (as described in Section 2.3, Standard Management Common to All Alternatives). Potential impacts and mitigation would be identified and assessed when application is made for activity on a specific piece of BLM-administered land.

  There would be 760,570 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,183 acres of BLM-administered, non-USFS FMO would be closed to leasing. Management of oil and gas leasing, exploration, and development would be subject to the standard lease terms and conditions that are included on the lease form.

- **Alternative 2.** Alternative 2 proposes that the BLM would retain specific BLM-administered surface tracts. The BLM would investigate opportunities to manage the tracts in partnership with other agencies or organizations. Use of the tracts would be consistent with management objectives and other land use decisions. Tract-specific constraints for resource uses, such as ROW access, would be based on the presence of sensitive resources (e.g., special status species habitat). In addition to the resource management outlined in Alternative 1, more proactive management would occur on specific tracts to protect important natural resources. Management actions for specific tracts, as needed, could include installing walkovers and sand fencing on actively used tracts to protect special status species habitat, vegetation treatments to enhance or improve native landscapes on actively used tracts, and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,452 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,301 acres of BLM-administered, non-USFS FMO would be closed to leasing, which includes an additional 365 acres would be closed to protect habitat of the

Federally listed Alabama beach mouse. In addition to standard terms and conditions, conservation measures would be applied as stipulations to oil and gas leases and BMPs would be used to reduce adverse effects caused by surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered, non-USFS FMO. Conservation measures, including no surface occupancy (NSO), controlled surface use (CSU), seasonal stipulations, and BMPs are presented in Appendix D. Under this alternative, lease stipulations would include a 1,000-foot NSO buffer from aquatic habitats, and Alabama beach mouse habitat would not be available for lease. The stipulations in Appendix D would be applied in addition to the standard lease terms and conditions on the lease form. For each stipulation, there are provisions for waiver, modification, and exception provided in Appendix D, which could be applied as appropriate. The BMPs would be considered mandatory to reduce adverse impacts to specific resources and would be applied to oil and gas operations on new and existing leases. There would be some flexibility in implementation of each BMP, depending on site-specific conditions. Where there is potential to affect Federally listed, proposed, or candidate species or designated critical habitat, application of BMPs and/or waiver, modification, and exception to stipulations would normally require coordination and possible formal consultation with USFWS.

- **Alternative 3 (Proposed RMP).** Under Alternative 3, all of the BLM-administered surface tracts would be available for transfer or disposal, except the Hancock County tract in Mississippi. For some of the surface tracts, there would be conditions placed on the disposal that development and use of the tract would be consistent with the resource management objectives and allowable uses established for the tract. Restrictions on use after disposal would be provided in the patent transferring ownership. Valid existing rights and other valid authorizations would be protected if disposal occurred.

  Until the surface tracts are disposed, management would apply tract-specific constraints for resource uses, such as ROW access, based on the presence of sensitive resources (e.g., special status species and important cultural resources). Resource management would be the same as outlined in Alternative 2. Proactive management would occur on specific tracts to protect important natural resources. Management actions for specific tracts, as needed, could include vegetation treatments to enhance or improve native landscapes on actively used tracts and habitat management to achieve objectives in established fish and wildlife conservation strategies.

  There would be 760,570 acres of BLM-administered, non-USFS FMO that would be open to oil and gas leasing. An estimated 71,183 acres of BLM-administered, non-USFS FMO would be closed to leasing. Similar to Alternative 2, Alternative 3 uses conservation measures that would be applied as lease stipulations and BMPs to reduce adverse effects caused by surface-disturbing or disruptive activities associated with oil and gas operations on BLM-administered, non-USFS FMO. The stipulations in Alternative 3 are different from Alternative 2 in two ways. First, Alabama beach mouse habitat would be available for lease, subject to an NSO stipulation. Second, the buffer from aquatic habitats would be reduced to 250 feet.

- **Alternative 4.** Alternative 4 proposes that all BLM-administered surface tracts would be made available for disposal from Federal ownership with no specific condition on use after disposal. Valid existing rights and other valid authorizations would be protected in the event of disposal. Under this alternative, management of BLM-administered, non-USFS FMO would be the same as Alternative 3.

2.4.1 Management of Non-Forest Service Federal Mineral Ownership

The discussion of proposed management of mineral leasing and development of BLM-administered, non-USFS FMO presented in this section is limited to oil and gas leasing. Non-USFS FMO includes mineral ownership underlying BLM-administered surface tracts. Proposed management for coal leasing is presented in Section 2.3, Standard Management Common to All Alternatives. Where non-USFS FMO is concerned, decisions of this RMP will pertain only to the BLM's role in administering the minerals.

Alternatives 1 through 4 were developed to present a reasonable range of options for where leasing can occur to guide decisionmaking for managing mineral leasing and development. There are four oil and gas leasing categories:

- **Open to leasing, subject to standard lease terms and conditions.** This category includes areas in which standard lease terms and conditions are determined to be sufficient to protect other land uses or resource values.
- **Open to leasing, subject to minor constraints.** This category comprises areas in which moderately restrictive lease stipulations, such as timing limitations or distance setbacks, are required to mitigate impacts to other land uses or resource values. Such constraints are often referred to as CSU.
- **Open to leasing, subject to major constraints.** This category encompasses areas in which highly restrictive lease stipulations, such as NSO, are required to mitigate impacts to other land uses or resource values.
- **Closed to leasing.** This category is designated for areas where other land uses or resource values cannot be adequately protected with even the most restrictive lease stipulations. Appropriate protection can be ensured only by closing the lands to leasing.

The acreage of BLM-administered, non-USFS FMO available for oil and gas leasing in Alabama and Mississippi by alternative is shown in Table 2-1 and Table 2-2. Federal oil and gas leases contain standard lease terms that are included on the lease form, many of which are designed to protect natural resources. As described above, special stipulations can be attached to a lease to respond to specific environmental or resource concerns for a particular lease area. Special stipulations are developed during the land use planning process, such as this RMP. Stipulations are attached to and made part of the lease and modify standard lease terms or the manner in which operations may be conducted. The variation of acreage by alternative for leasing stipulations associated with oil and gas potential in Alabama and Mississippi is shown in Table 2-3 and Table 2-4. Conservation measures, including stipulations and BMPs, are provided in Appendix D.

Reasonably Foreseeable Development Scenario for Minerals

Alabama and Mississippi have been classified as having high-occurrence potential for oil and gas resources, based on the reasonably foreseeable development scenario (RFDS) prepared by the BLM. It is estimated that 20 wells would be drilled on non-USFS FMO in Alabama and 10 wells would be drilled on non-USFS FMO in Mississippi over the next 20 years (BLM 2004b). These actions are expected to disturb a total of 105 acres in Alabama and 55 acres in Mississippi.

Table 2-1. Oil and Gas Leasing Categories in Alabama by Alternative

Oil and Gas Leasing Category	Alternative 1 (No Action) (Acres)	Alternative 2 (Acres)	Alternative 3 (Proposed) (Acres)	Alternative 4 (Acres)
Open to leasing, subject to standard lease terms and conditions	305,640	119,231	144,895	144,895
Open to leasing, subject to minor constraints	0	91,702	117,506	117,506
Open to leasing, subject to major constraints	0	94,589	43,239	43,239
Closed to leasing	8,179	8,297	8,179	8,179
TOTAL	**313,819** [a]	**313,819** [a]	**313,819** [a]	**313,819** [a]

Notes:
a Represents all BLM-administered, non-USFS FMO within the State of Alabama.

Table 2-2. Oil and Gas Leasing Categories in Mississippi by Alternative

Oil and Gas Leasing Category	Alternative 1 (No Action) (Acres)	Alternative 2 (Acres)	Alternative 3 (Proposed) (Acres)	Alternative 4 (Acres)
Open to leasing, subject to standard lease terms and conditions	454,930	270,615	359,640	359,640
Open to leasing, subject to minor constraints	0	123	3,021	3,021
Open to leasing, subject to major constraints	0	184,192	92,269	92,269
Closed to leasing	63,004	63,004	63,004	63,004
TOTAL	**517,934** [a]	**517,934** [a]	**517,934** [a]	**517,934** [a]

Notes:
a Represents all BLM-administered, non-USFS FMO within the State of Mississippi.

Table 2-3. Leasing Stipulations in Alabama by Alternative [a]

Area	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3 (PROPOSED RMP) AND ALTERNATIVE 4
	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]		
NO LEASE			
Other Surface Managing Agency Lands:	8,179	8,179	8,179
USFWS	*3,384*	*3,384*	*3,384*
Department of Defense (DoD) (Maxwell Air Force Base)	*1,495*	*1,495*	*1,495*
National Park Service (NPS)	*3,300*	*3,300*	*3,300*
Alabama beach mouse suitable habitat or Federally designated critical habitat	0	365	0
Total Affected Area (in acres) [b]	**8,179**	**8,544**	**8,179**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE			
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	0	30	30
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	0	888	888
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	0	513	513
Gray bat, Indiana bat, Alabama cave shrimp, Alabama cave fish (600-ft. buffer around caves, fractures, large sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	0	12,898	12,898
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	0	3,044	3,044
Freshwater aquatic species (1,000-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams)	0	90,930	0
Freshwater aquatic species (250-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 ft. if slope exceeds 10%)	0	0	38,111
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	0	2,131	2,200
Alabama beach mouse suitable habitat or Federally designated critical habitat	0	0	365
Total Affected Area (in acres) [b]	**0**	**110,434**	**58,049**

Area	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3 (PROPOSED RMP) AND ALTERNATIVE 4
	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]		
CONTROLLED SURFACE USE			
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	0	848	1,000
Gopher tortoise burrow (600-ft. buffer)	0	ND	ND
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	0	7,944	11,573
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	0	88,001	112,368
Sensitive plant species habitat	0	78	103
Total Affected Area (in acres) [b]	**0**	**96,871**	**125,044**
SEASONAL LIMITATIONS			
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	0	1,299	1,299
Total Affected Area (in acres) [b]	**0**	**1,299**	**1,299**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS			
Total Affected Area (in acres) [b]	**305,640**	**119,231**	**144,895**

Notes:
a All Federal mineral estate in Alabama has high potential for oil and gas resources.
b Total acres under each alternative do not represent accurate totals shown in Table 2-1 because of the overlap of land resources and land use restrictions.
ND No habitat data available to estimate affected area.

Table 2-4. Leasing Stipulations in Mississippi by Alternative [a]

Area	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3 (PROPOSED RMP) AND ALTERNATIVE 4
	Total non-Forest Service Federal Mineral Ownership (Acres) [a, b]		
NO LEASE			
Other Surface Managing Agency Lands	63,004	63,004	63,004
USFWS	*60,207*	*60,207*	*60,207*
NPS	*2,797*	*2,797*	*2,797*
Total Affected Area (in acres) [b]	**63,004**	**63,004**	**63,004**

	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3 (PROPOSED RMP) AND ALTERNATIVE 4
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE			
Hancock County Marsh	0	1,810	1,810
Bald eagle nests (1,500-ft. buffer around active or inactive nests and communal roost sites)	0	1,089	1,089
Red-cockaded woodpecker (0.5 mile of a cluster plus a 200-ft. buffer zone surrounding that area)	0	11,710	11,710
Sea turtle suitable nesting habitat (100-ft. buffer from the mean high tide line of coastal beaches)	0	997	997
Gray bat, Indiana bat (600-ft. buffer around caves, fractures, sinkholes or 250-ft. buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	0	2,564	2,564
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	0	7,073	7,073
Freshwater aquatic species (1,000-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams)	0	168,383	0
Freshwater aquatic species (250-ft. buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 ft. if slope exceeds 10%)	0	0	68,656
Louisiana black bear (1,500-ft. buffer around den trees in occupied bottomland hardwood and floodplain forest habitats) [c]	0	ND	ND
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	0	4,237	4,237
Total Affected Area (in acres) [b]	**0**	**197,863**	**98,136**
CONTROLLED SURFACE USE			
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	0	8,917	8,917
Gopher tortoise burrow (600-ft. buffer)	0	122	122
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	0	1	1
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	0	ND	ND

	ALTERNATIVE 1 (NO ACTION)	ALTERNATIVE 2	ALTERNATIVE 3 (PROPOSED RMP) AND ALTERNATIVE 4
Sensitive plant species habitat	0	ND	ND
Total Affected Area (in acres) [b]	**0**	**9,040**	**9,040**
SEASONAL LIMITATIONS			
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	0	13,742	13,742
Total Affected Area (in acres) [b]	**0**	**13,742**	**13,742**
OPEN TO LEASING SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS			
Total Affected Area (in acres) [b]	**454,930**	**270,615**	**359,640**

Notes:
a All Federal mineral estate in Mississippi has high potential for oil and gas resources.
b Total acres under each alternative do not represent accurate totals shown in Table 2-2 because of the overlap of land resources and land use restrictions.
c No habitat data available to estimate affected area. No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.
ND No habitat data available to estimate affected area.

2.4.2 Management of Surface Tracts

For the purposes of this plan, the surface tracts were grouped on the basis of geographic proximity and similar management needs. The surface tract groups to be discussed in this section include the Coosa River Tracts, Fort Morgan Beach Tracts, Fort Morgan Highway Tracts, Fowl River Tract, Geneva Tract, and Jordan Lake Tract in Alabama and the Hancock County Tract in Mississippi. These surface tracts and their associated acreage, county, and legal description are listed in Table 2-5. Proposed planning decisions for each surface tract grouping, by alternative, are detailed in Table 2-6 through Table 2-12. These tables are accompanied by maps depicting the tract locations (Map 2-1 through Map 2-7).

Table 2-5. Surface Tracts in Alabama and Mississippi

Name of Tract Group	Acres	County	Legal Description [a]
Alabama			
Coosa River Tracts			
			St. Stephens Meridian
Foshee Islands	9.58	Coosa	T. 22N, R. 16E, Sec. 5, Lots 1, 2, & 5
	3.25	Coosa	T. 22N, R. 16E, Sec. 8, Lot 1
Little Rock Island	0.45	Coosa	T. 22N, R. 16E, Sec. 5, Lot 3
Big Rock Island	6.09	Coosa	T. 22N, R. 16E, Sec. 5, Lot 4
Gilchrist Island	4.38	Coosa	T. 23N, R. 16E, Sec. 32, Lot C
			Huntsville Meridian
Unnamed Island	0.07	Calhoun	T. 14S, R. 5E, Sec. 24, Lot 2
Smith Island	5.58	Shelby	T. 20S, R. 2E, Sec. 24, Lot 1

Name of Tract Group	Acres	County	Legal Description [a]
Prince Island	12.74	Talladega	T. 20S, R. 2E, Sec. 24, Lot 2
			T. 20S, R. 2E, Sec. 13, Lot 1
			T. 20S, R. 3E, Sec. 18, Lot 1
Total Acreage of Tract Group	**42.14**		
Fort Morgan Beach Tracts			
			St. Stephens Meridian
Fort Morgan Beach Tract	0.84	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 24
Fort Morgan Beach Tract	5.32	Baldwin	T. 9S, R. 1E, Sec. 26, Lots 13 &14
Fort Morgan Beach Tract	10.60	Baldwin	T. 9S, R. 2E, Sec. 27, Lots 54 & 55
Fort Morgan Beach Tract	11.94	Baldwin	T. 9S, R. 2E, Sec. 25, Lots 73 & 74
Total Acreage of Tract Group	**28.70**		
Fort Morgan Highway Tracts			
			St. Stephens Meridian
Fort Morgan Highway Tract	20.16	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 5
			T. 9S, R. 1E, Sec. 26, Lot 15
Fort Morgan Highway Tract	8.88	Baldwin	T. 9S, R. 2E, Sec. 28, Lot 43
Fort Morgan Highway Tract	12.24	Baldwin	T. 9S, R. 2E, Sec. 27, Lot 56
			T. 9S, R. 2E, Sec. 28, Lot 44
Total Acreage of Tract Group	41.28		
Fowl River Tract			
			St. Stephens Meridian
Fowl River Tract	41.73	Mobile	T. 7S, R. 2W, Sec. 25, Lots 2–5
Geneva County Tract			
			Tallahassee Meridian
East Fork Choctawhatchee River Tract	0.95	Geneva	T. 7N, R. 16W, Sec. 22, Lot 4
Jordan Lake Tract			
			St. Stephens Meridian
Jordan Lake Tract	4.3	Chilton	T. 21N, R. 16E, Sec. 14, Lot 1
Total Surface Estate in Alabama	**159.10**		
Mississippi			
Hancock County Tract			
			St. Stephens Meridian
Hancock County	174.25	Hancock	T. 9S, R. 15W, Sec. 25, Lots 2, 3, 4, 5, SESE

Name of Tract Group	Acres	County	Legal Description [a]
Total Surface Estate in Mississippi	**174.25**		

a The legal description is abbreviated according to a rectangular survey system in which T. 22N, R. 16E, Sec. 5, Lot 1 means that the area is located at Lot 1 of Section 5 in Township 22 North, Range 16 East, in the meridian specified above. Townships are divided into 36 numbered sections. A standard section comprises 1 square mile or 640 acres of land and consists of aliquot parts of sections (e.g., half section of 320 acres, quarter section of 160 acres, 16th section of 40 acres). The township number indicates how far in a given direction (north or south) of a surveyed parallel the township is located. The range number indicates how far in a given direction (east or west) of a surveyed meridian the township is located.

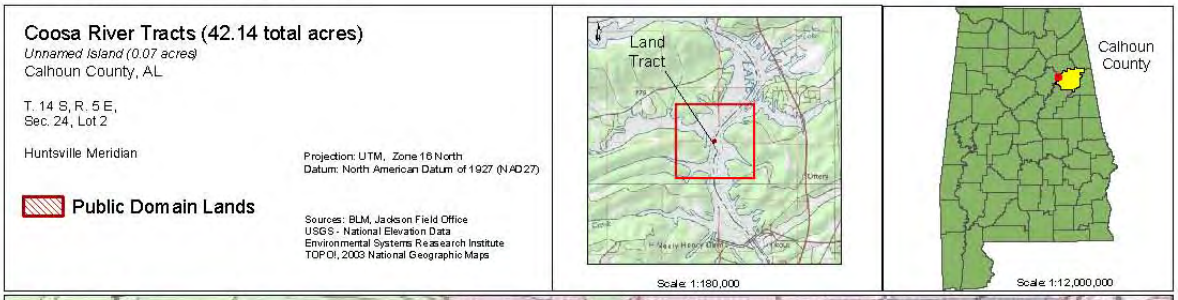
Table 2-6. Alternatives for Coosa River Tracts (Maps 2-1a, 2-1b, 2-1c)

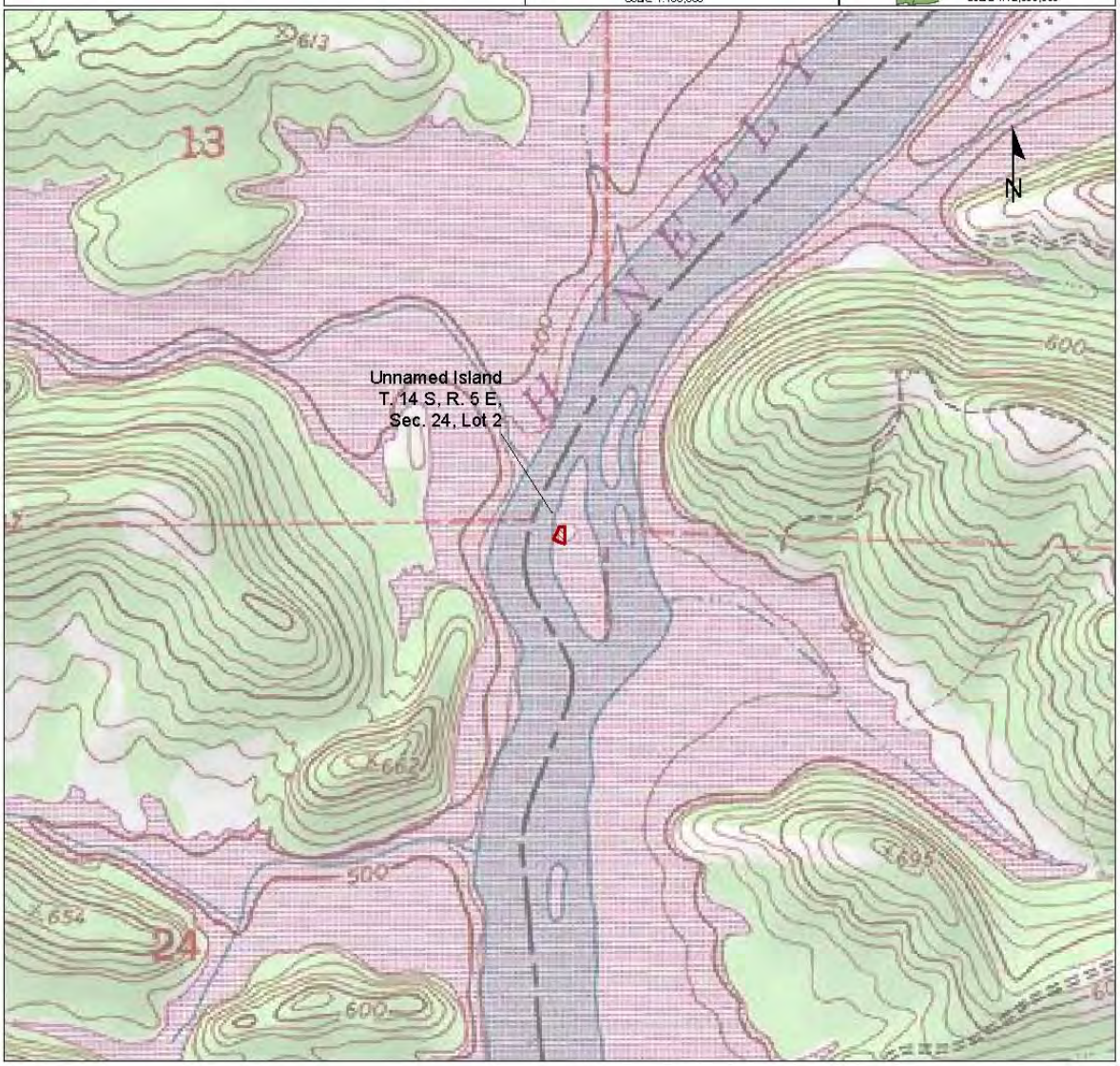
Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
No specific management goals and objectives are proposed.	Protect mature stands of mixed hardwood/pine overstory and a diversity of understory species.		No specific management goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Remove invasive species, such as mimosa (*Albizia julibrissin Durazz L.*) by hand and with selective, hand application of herbicide.		No specific actions are proposed.
	Conduct baseline inventories for special status plants.		
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor fledgling success of active bald eagle nests.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tracts would be open to leasing, subject to standard lease terms and conditions.	The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 1,000-ft. buffer from aquatic habitats, and stipulations to protect bald eagle nesting and roosting	The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-ft. buffer from aquatic habitats, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.	

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
	habitat, as described in Appendix D.		
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			
Support water-based recreation opportunities consistent with the Coosa River Recreation Plan (Federal Energy Regulatory Commission [FERC] Project Nos. 2146, 082, and 618).			
Allowable Uses and Management Actions			
The tracts would remain open to recreation use.	The tracts would be open to recreation use, including fishing, picnicking, rest stops of boaters and canoeists, and wildlife observation.		
The tracts would remain open to motorized vehicle use.	The tracts would be designated as closed.		
Lands and Realty			
Management Goals and Objectives			
Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.			
Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.			
Allowable Uses and Management Actions			
The tracts would be retained by the BLM.	The tracts would be retained by the BLM. The BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.	The tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.	The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if it would jeopardize Federally listed species. Land exchanges to benefit Federally listed species would be permitted.
The tracts would remain open to ROW applications.	These island tracts would be avoidance areas for ROWs to protect native vegetative communities and adjacent aquatic habitat.		

Map 2-1a

Mississppi - Alabama RMP-EIS





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Miles

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Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Map 2-1b

Alabama and Mississippi RMP-EIS

Coosa River Tracts (42.14 total acres)
Coosa County, AL

Big Rock Island (6.09 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 4

Foshee Islands (12.83 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 1
T. 22 N, R. 16 E, Sec. 5, Lot 2
T. 22 N, R. 16 E, Sec. 5, Lot 5
T. 22 N, R. 16 E, Sec. 8, Lot 1

Gilchrist Island (4.38 acres)
T. 23 N, R. 16 E, Sec. 32, Lot C

Little Rock Island (0.45 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 3

St. Stephens Meridian

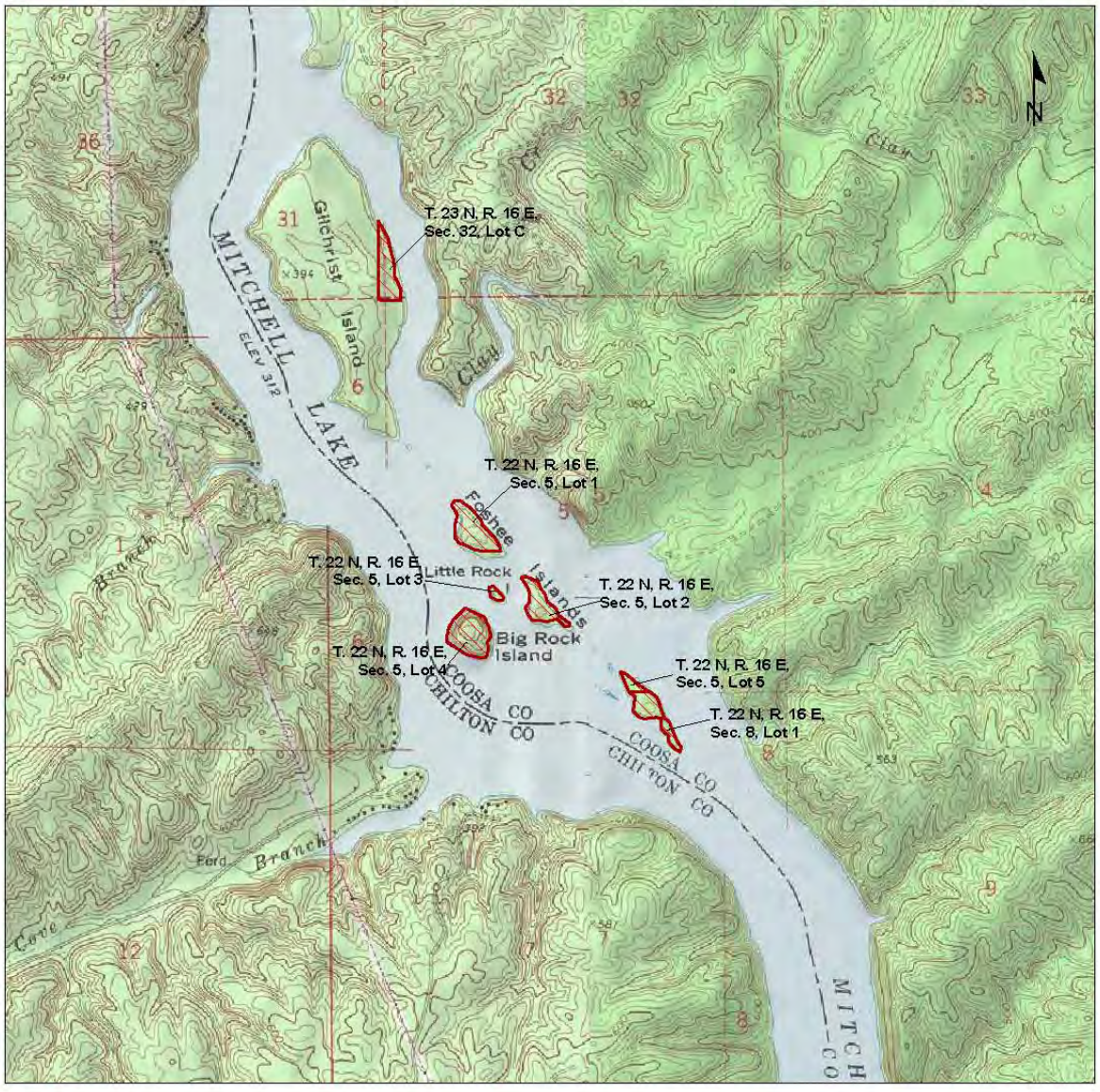
Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Scale 1:360,000

Scale 1:12,000,000



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Miles

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Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Map 2-1c

Alabama and Mississippi RMP-EIS

Coosa River Tracts (42.14 total acres)

Shelby County, AL
Smith Island (5.58 acres)
T. 20 S, R. 2 E, Sec. 24, Lot 1

Talladega County, AL
Prince Island (12.74 acres)
T. 20 S, R. 2 E, Sec. 13, Lot 1
T. 20 S, R. 2 E, Sec. 24, Lot 2
T. 20 S, R. 3 E, Sec. 18, Lot 1

Huntsville Meridian

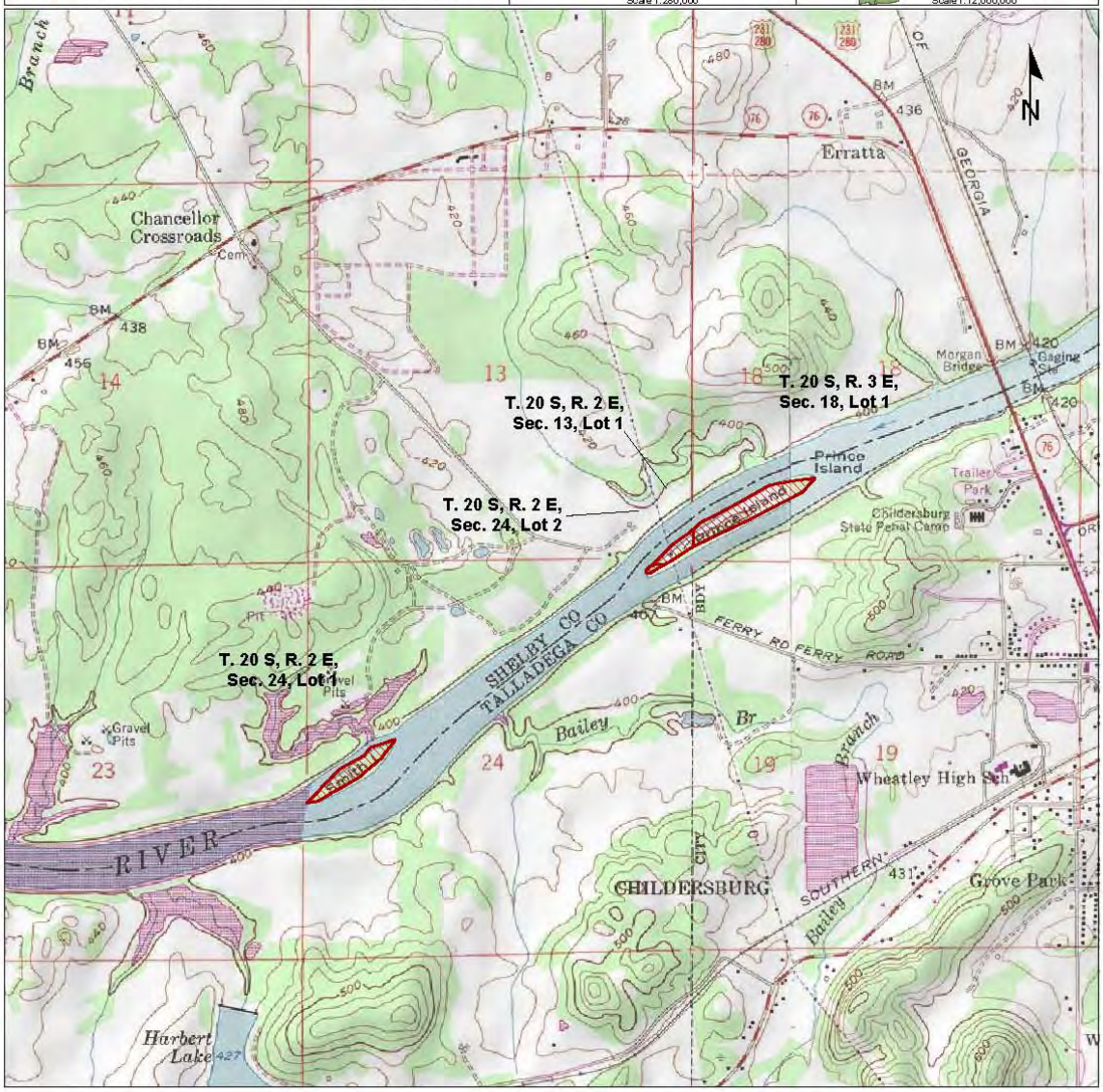
Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Scale 1:280,000

Scale 1:12,000,000



Scale 1:24,000

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Miles

0 500 1,000 2,000 3,000 4,000
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-7. Alternatives for Fort Morgan Beach Tracts (Map 2-2)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Promote establishment and retention of native coastal dune vegetative communities by planting native species and installing sand fence to protect existing dune habitat.		No specific actions are proposed.
	Control invasive species through hand pulling, as needed.		
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
No specific management goals and objectives are proposed.	Maintain existing Fish and Wildlife Habitat diversity. Actively promote the recovery of Federally listed species such as Alabama beach mouse, piping plover/ least turn, nesting sea turtles, and other special status species.		No specific management goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Construct two protective dune walkover structures (approx. 300 feet each) and install sand fence to enhance and protect existing dune habitat.		No specific actions are proposed.
	Reintroduce Alabama beach mice in suitable unoccupied habitat.		
	Monitor sea turtle nesting and mark active nests for protection to maximize nestling survivorship.		
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tracts would be open to leasing, subject to standard lease terms and conditions.	The tracts would be closed to leasing to protect designated critical habitat for Alabama beach mouse.	The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse, piping plover/least tern, and sea turtle nesting habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use, beach access, and travel compatible with other resource management objectives.			

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would remain open to recreation use.</td><td colspan="3">The tracts would be open to recreation compatible with habitat management, including use of the beach and saltwater fishing.</td></tr>
<tr><td>The tracts would remain open to motorized vehicle use.</td><td colspan="3">The tracts would be designated as closed.</td></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be retained by the BLM.</td><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be retained by the BLM. The BLM would pursue opportunities to manage the tracts in partnership with USFWS and other agencies and organizations.</td><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 2-1 and Map 2-2) would be available for transfer to the Bon Secour National Wildlife Refuge (NWR).
If the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts.</td><td>The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if it would jeopardize Federally listed species or designated critical habitat. Land exchanges to benefit Federally listed species would be permitted.</td></tr>
<tr><td>Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) would remain open to ROW applications.</td><td colspan="3">Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) would be avoidance areas for ROWs because of the presence of listed species and designated critical habitat.</td></tr>
<tr><td colspan="4">Lots 73 and 74 would be transferred to the USFWS as part of the Bon Secour NWR because they occur within the boundaries of the refuge.</td></tr>
</table>

Map 2-2

Alabama and Mississippi RMP-EIS

Ft. Morgan - Beach Tracts (28.70 total acres)

Baldwin County, AL

T. 9 S, R. 1 E, Sec. 25, Lot 24
T. 9 S, R. 1 E, Sec. 26, Lot 13
T. 9 S, R. 1 E, Sec. 26, Lot 14
T. 9 S, R. 2 E, Sec. 25, Lot 73
T. 9 S, R. 2 E, Sec. 25, Lot 74
T. 9 S, R. 2 E, Sec. 27, Lot 54
T. 9 S, R. 2 E, Sec. 27, Lot 55

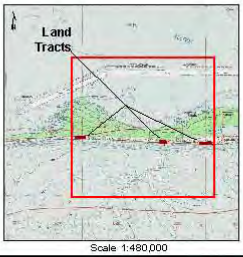
St. Stephens Meridian

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

Public Domain Lands

Bon Secur National Wildlife Refuge



Scale 1:480,000

Scale 1:12,000,000

Scale 1:60,000

0 0.25 0.5 1 1.5 2 2.5
Miles

0 1,250 2,500 5,000 7,500 10,000
Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-8. Alternatives for Fort Morgan Highway Tracts (Map 2-3)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Remove invasive species, such as cogon grass and Chinese tallow, using an integrated program of hand removal and selective, hand application of herbicide. Establish baseline inventories of special status plant species.		No specific actions are proposed.
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
No specific management goals and objectives are proposed.	Maintain existing fish and wildlife habitat diversity. Actively promote the recovery of the Federally listed Alabama beach mouse and other endemic species, particularly migratory songbirds and raptors, using the flatwood, scrub, and wetland habitats occurring on these tracts.		No specific management goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Incorporate Lots 5 and 15 (29 acres) into future prescribed burns conducted on adjacent Bon Secour NWR land to improve habitat values for migratory birds and scrub endemics as needed, depending on resource conditions, and in cooperation with the USFWS.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tracts would be open to leasing and subject to standard lease terms and conditions.	The tracts would be closed to leasing to protect designated critical habitat for Alabama beach mouse.	The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse and a 250-ft. buffer from wetlands and aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would remain open to recreation use.</td><td colspan="3">The tracts would be open to recreation compatible with habitat management, including sightseeing and hiking.</td></tr>
<tr><td>The tracts would remain open to motorized vehicle use.</td><td colspan="3">The tracts would be designated as closed.</td></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tracts would be retained by the BLM.</td><td>The tracts would be retained by the BLM. The BLM would pursue opportunities to manage the tracts in partnership with USFWS and other agencies and organizations.</td><td>The tracts would be available for transfer to the Bon Secour NWR.
If the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts.</td><td>The tracts would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if it would jeopardize Federally listed species or designated critical habitat. Land exchanges to benefit Federally listed species would be permitted.</td></tr>
<tr><td>The tracts would remain open to ROW applications.</td><td colspan="3">Existing facilities within the highway ROW corridor would be allowed. New disturbance would be avoided because of the presence of Federally listed species and designated critical habitat.</td></tr>
</table>

Map 2-3

Alabama and Mississippi RMP-EIS

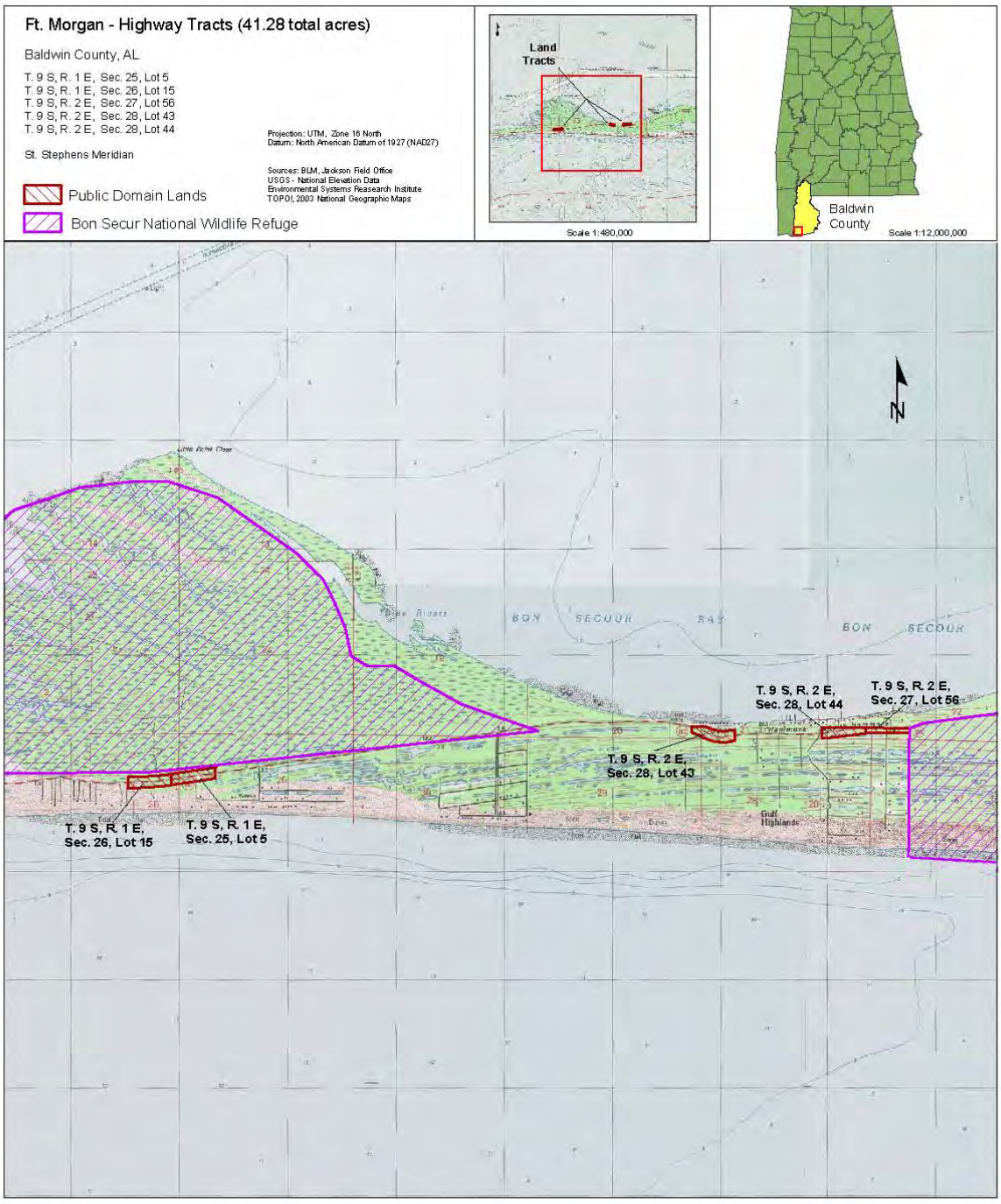


Table 2-9. Alternatives for Fowl River Tract (Map 2-4)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
No specific goals and objectives are proposed.	Promote establishment and retention of native wetland and flatwood plant communities.		No specific goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions proposed.	Remove invasive species such as mimosa (*Albizia julibrissin Durazz L*.) by hand and with selective, hand application of herbicide. Establish baseline inventories to monitor plant communities.		No specific actions are proposed.
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor fledgling success of active bald eagle nests.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 1,000-ft. buffer from wetlands and aquatic habitat, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-ft. buffer from wetlands and aquatic habitat, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use, including access for fishing, canoeing, and kayaking.		

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>The tract would remain open to motorized vehicle use.</td><td colspan="3">The tract would be designated as closed.</td></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tract would be retained by the BLM.</td><td>The tract would be retained by the BLM. The BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.</td><td>The tract would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative.
In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.</td><td>The tract would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if it would jeopardize Federally listed species, associated with adjacent wetland/aquatic habitat. Land exchanges to benefit Federally listed species would be permitted.</td></tr>
<tr><td>The tract would remain open to ROW applications.</td><td colspan="3">The tract would be an avoidance area for ROWs to protect native vegetative communities and adjacent wetland/aquatic habitat.</td></tr>
</table>

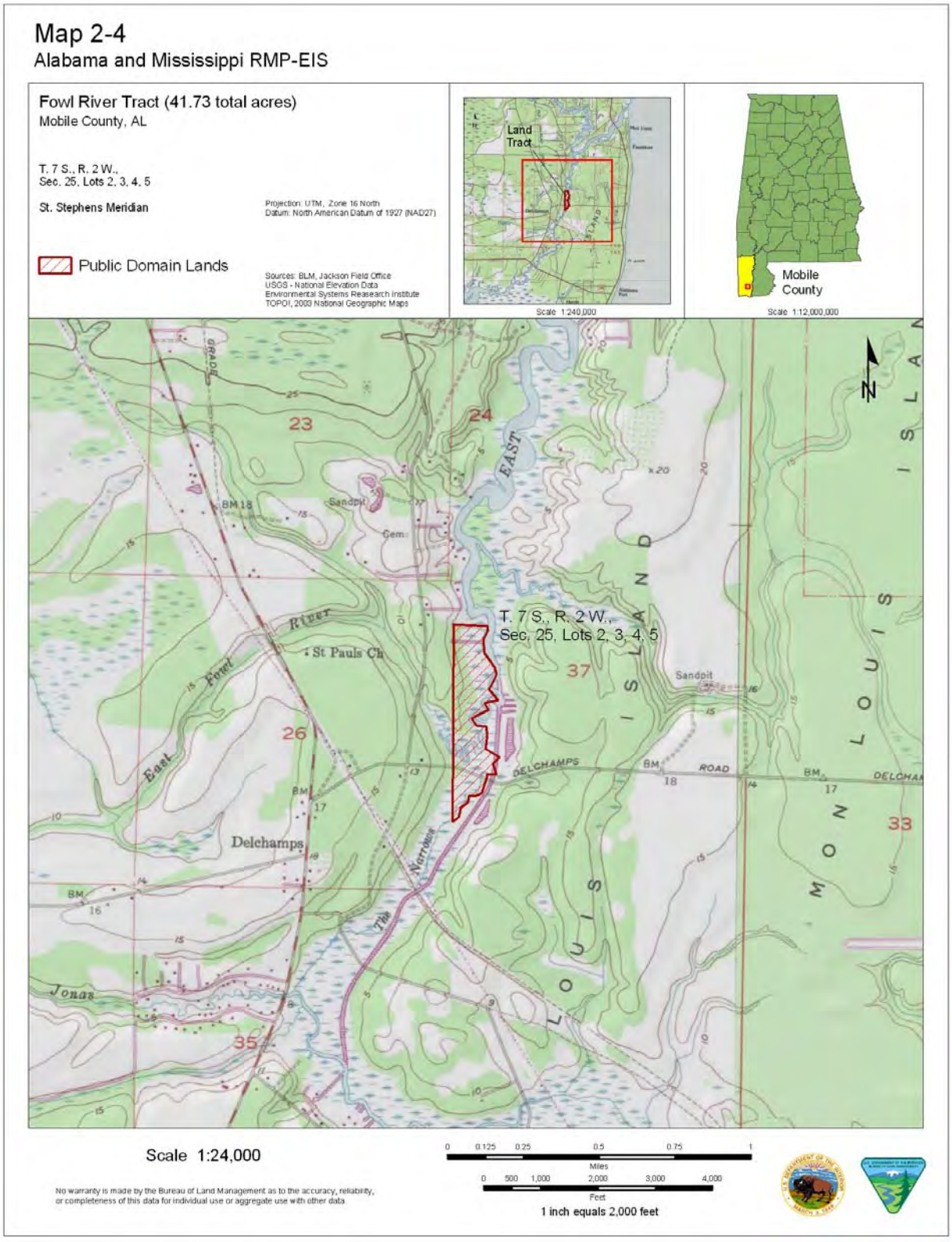

Map 2-4
Alabama and Mississippi RMP-EIS
Fowl River Tract (41.73 total acres)
Mobile County, AL
T. 7 S., R. 2 W.,
Sec. 25, Lots 2, 3, 4, 5
St. Stephens Meridian
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Public Domain Lands
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2000 National Geographic Maps
Land Tract
Scale 1:240,000
Mobile County
Scale 1:12,000,000
T. 7 S., R. 2 W.,
Sec. 25, Lots 2, 3, 4, 5
Scale 1:24,000
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.
Miles
Feet
1 inch equals 2,000 feet

Table 2-10. Alternatives for Geneva Tract (Map 2-5)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Monitor and remove invasive species, as needed.	No specific actions are proposed.	
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor changes in the tract that could affect fish and wildlife habitat utilization.	No specific actions are proposed.	
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 1,000-ft. buffer from aquatic habitat.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-ft. buffer from aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use including canoeing, kayaking, and fishing.		
The tract would remain open to motorized vehicle use.	The tract would be designated as closed.		

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td>The tract would be retained by the BLM.</td><td colspan="2">The tract would be retained by the BLM. The BLM would pursue opportunities to manage the tracts in partnership with other agencies and organizations.</td><td>The tract would be available for disposal from Federal ownership.</td></tr>
<tr><td>The tract would remain open to ROW applications.</td><td colspan="3">The tract would be an ROW avoidance area because it is in a floodplain and critical habitat for Gulf sturgeon.</td></tr>
</table>

Map 2-5
Alabama and Mississippi RMP-EIS

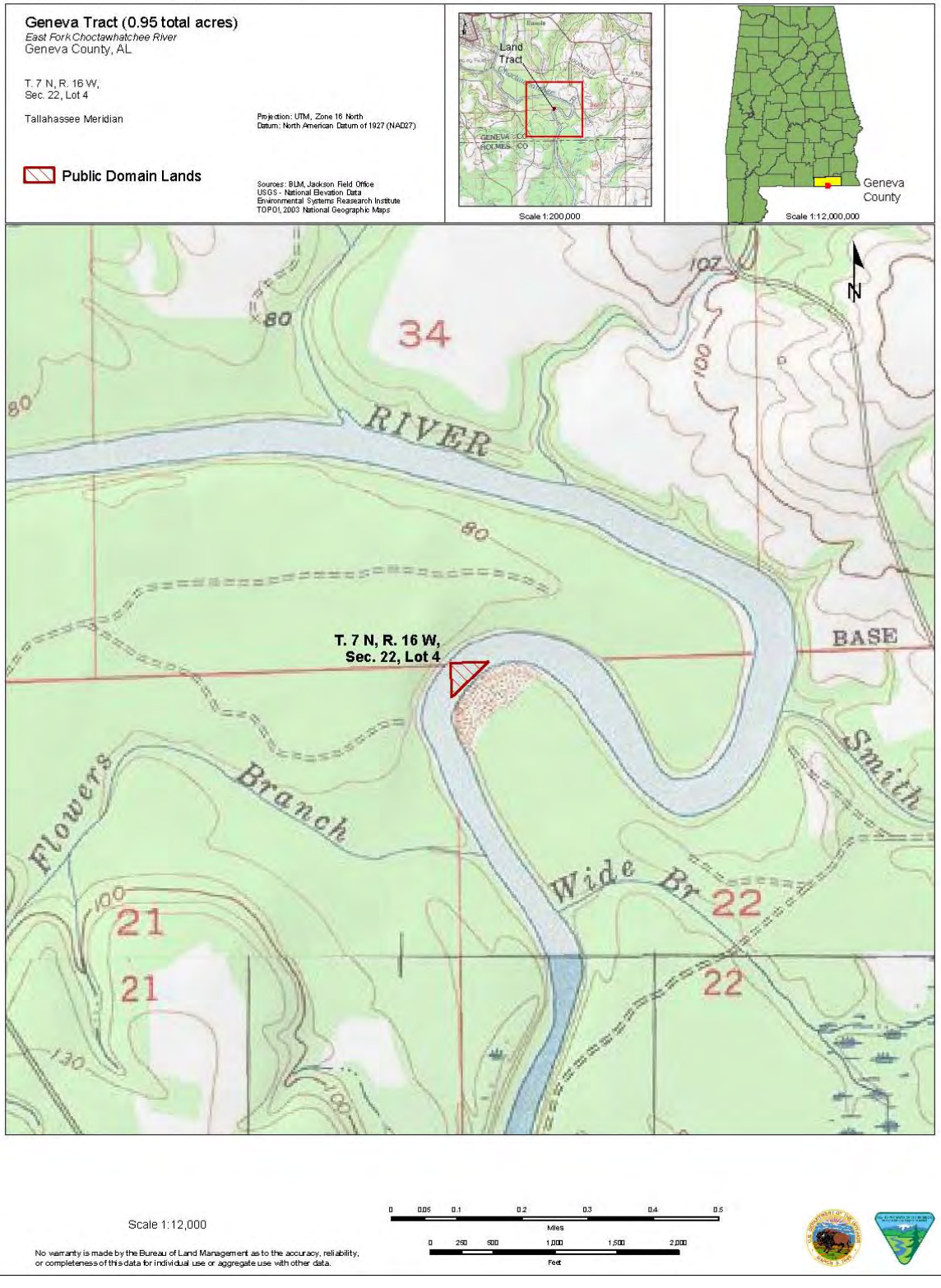


Table 2-11. Alternatives for Jordan Lake Tract (Map 2-6)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions proposed.	Monitor and remove invasive species, such as mimosa, Chinese tallow, and cogon grass, as needed, by hand and with selective, hand application of herbicide.	No specific actions are proposed.	
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Conduct inventory of fish and wildlife and special status species to establish baseline diversity.	No specific actions are proposed.	
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 1,000-ft. buffer from aquatic habitat.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-ft. buffer from aquatic habitat.	
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to recreation use.	The tract would be open to recreation use, including access to Jordan Lake for swimming and fishing.		

<table>
<tr><th>Alternative 1
(No Action)</th><th colspan="2">Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>The tract would remain open to motorized vehicle use.</td><td colspan="4">The tract would be designated as limited. Motorized vehicle use would be limited to State- or county-maintained roads or other transportation routes specifically designated by a BLM-issued ROW. Other motorized vehicle access would be limited to administrative use and emergency response.</td></tr>
<tr><td colspan="5">Lands and Realty</td></tr>
<tr><td colspan="5">Management Goals and Objectives</td></tr>
<tr><td colspan="5">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="5">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="5">Allowable Uses and Management Actions</td></tr>
<tr><td>The tract would be retained by the BLM.</td><td colspan="2">The tract would be retained by the BLM. The BLM would pursue opportunities to manage the tract in partnership with other agencies and organizations.</td><td colspan="2">The tract would be available for disposal from Federal ownership.</td></tr>
<tr><td>The tract would remain open to ROW applications.</td><td colspan="4">The tract would be open for ROWs due to adjacent development and uses. ROWs would be collocated if possible.</td></tr>
</table>

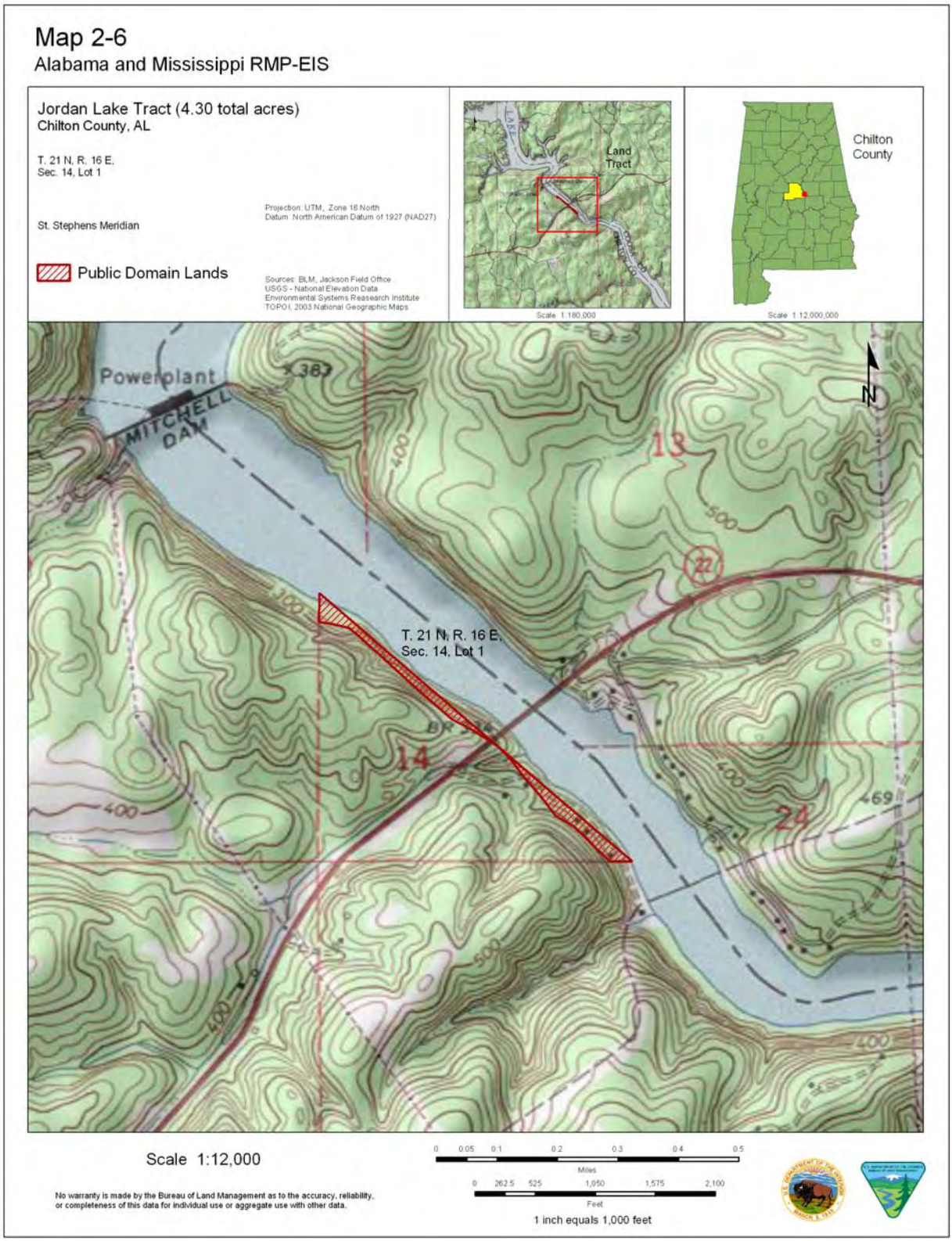

Map 2-6
Alabama and Mississippi RMP-EIS
Jordan Lake Tract (4.30 total acres)
Chilton County, AL
T. 21 N, R. 16 E.
Sec. 14, Lot 1
St. Stephens Meridian
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Public Domain Lands
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tract
Scale 1:180,000
Chilton County
Scale 1:12,000,000
Powerplant
MITCHELL DAM
T. 21 N, R. 16 E,
Sec. 14, Lot 1
N
Scale 1:12,000
0 0.05 0.1 0.2 0.3 0.4 0.5
Miles
0 262.5 525 1,050 1,575 2,100
Feet
1 inch equals 1,000 feet
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

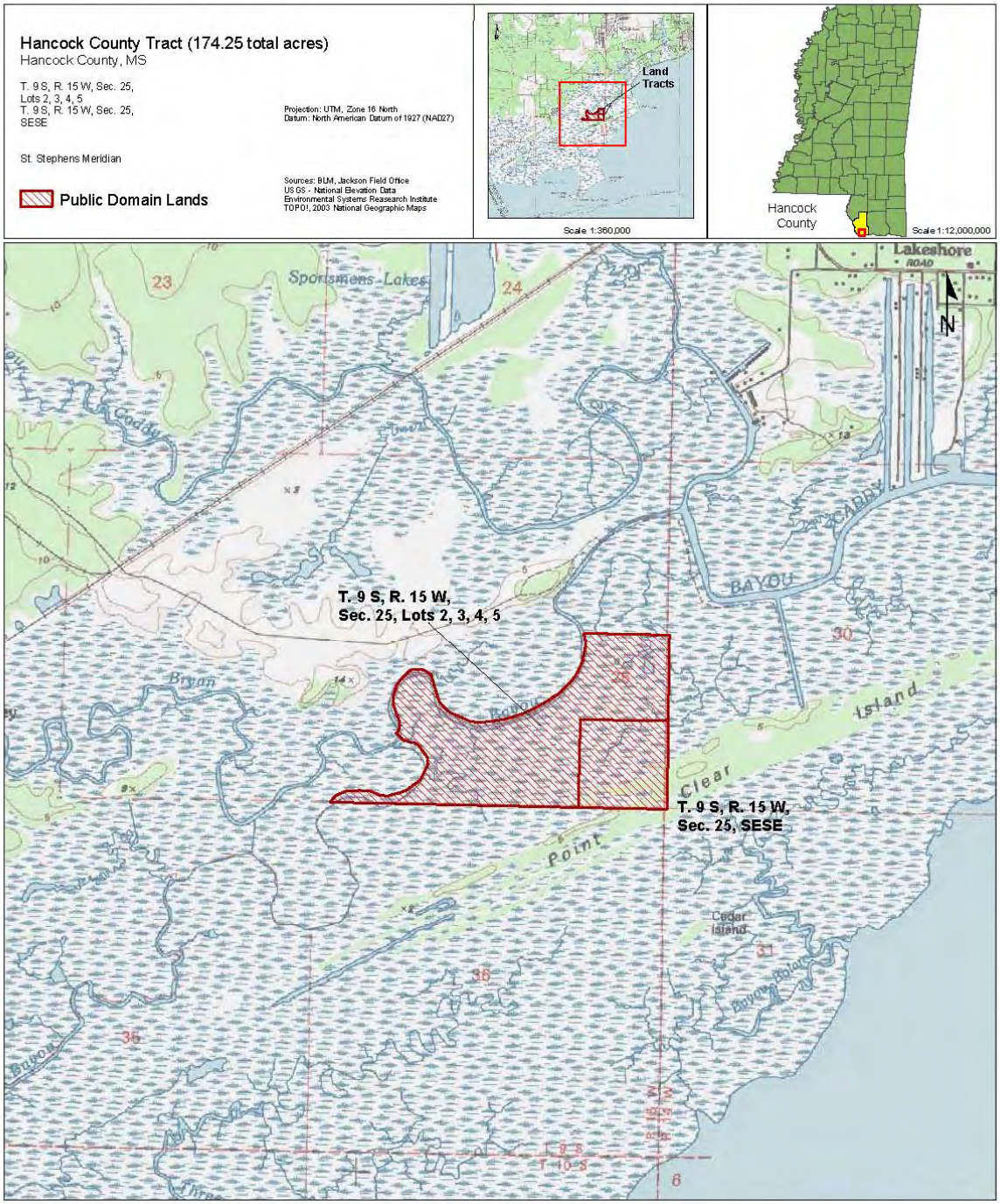
Table 2-12. Alternatives for Hancock County, Mississippi, Tract [1] (Map 2-7)

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Vegetative Communities			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.			
Control noxious and invasive plant species.			
Allowable Uses and Management Actions			
No specific actions are proposed.	Monitor for early detection of invasive plant species, such as cogon grass and Chinese tallow. If detected, invasive species would be removed by hand or through selective, hand application of herbicide.		No specific actions are proposed.
Fish and Wildlife Habitat			
Management Goals and Objectives			
Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.			
No specific goals and objectives are proposed.	Protect and enhance the estuarine coastal wetland marshes in support of the Mississippi Coastal Preserve System.		No specific goals and objectives are proposed.
Allowable Uses and Management Actions			
No specific actions are proposed.	Prescribed burns would be used, as needed, depending on resource conditions, and in cooperation with the State of Mississippi to promote marsh health.		No specific actions are proposed.
Minerals			
Management Goals and Objectives			
Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.			
Allowable Uses and Management Actions			
The tract would be open to leasing and subject to standard lease terms and conditions.	The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) for protection of Hancock County Marshes.		
Recreation and Travel Management			
Management Goals and Objectives			
Allow recreation use and travel compatible with other resource management objectives.			
Allowable Uses and Management Actions			
The tract would remain open to motorized vehicle use.	The tract would be open to recreation use, including fishing and waterfowl hunting.		
The tract would remain open to recreation use, including motorized vehicle use.	The tract would be designated as limited to motorized boats in areas of open water. Other motorized vehicle use would be limited to administrative use and emergency response.		

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Lands and Realty</td></tr>
<tr><td colspan="4">Management Goals and Objectives</td></tr>
<tr><td colspan="4">Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.</td></tr>
<tr><td colspan="4">Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.</td></tr>
<tr><td colspan="4">Allowable Uses and Management Actions</td></tr>
<tr><td colspan="2">The tract would be retained by the BLM.</td><td colspan="1">The tract would be retained by the BLM. The BLM would pursue opportunities to manage the tract in partnership with other agencies and organizations.</td><td>The tract would be available for disposal from Federal ownership with no restrictive covenants. Disposal may not be allowed if it would jeopardize Federally listed species associated with wetland/aquatic habitat. Land exchanges to benefit Federally listed species would be permitted.</td></tr>
<tr><td>The tract would remain open to ROW applications.</td><td colspan="3">The tract would be an avoidance area for ROWs to protect wetland habitat.</td></tr>
<tr><td colspan="4">1 These allowable uses and management actions would not occur unless the R&PP patent were to revert to the BLM.</td></tr>
</table>

Map 2-7

Alabama and Mississppi RMP-EIS



No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Table 2-13. Comparison of Impacts For Alabama

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Air Quality			
Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be greenhouse gases (GHG), particularly carbon dioxide (CO_2). However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".			
Wildfire could lead to air emissions. Suppression of all fires would result in short-term localized impacts, but is not anticipated to deteriorate air quality conditions.			
Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, would not be anticipated to deteriorate air quality conditions.	Although more management actions are proposed for the surface tracts (159 acres), including vegetation and fish and wildlife habitat treatments, these actions would not be anticipated to deteriorate air quality conditions. Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for emissions associated with ROW development compared to Alternative 1.		Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for emissions associated with ROW development compared to Alternative 1.
Estimated emissions from development of 20 oil and gas wells on non-USFS FMO would be responsible for less than one percent of emissions from the mineral development across Alabama for Nitrogen Oxides (NO_x), Sulfur Dioxide (SO_2), Particulate Matter (PM_{10}), Carbon Monoxide (CO), and Volatile Organic Compounds (VOCs). Those emissions would likely occur over a dispersed area and would not cause any noticeable or measurable effect. Potential oil and gas development on some non-USFS FMO tracts would be in close proximity to the Sipsey Wilderness and the Birmingham nonattainment area. Oil and gas emissions in those tracts could impact wilderness air quality values and jeopardize attainment of ambient air quality. Based on expected emissions, air quality impacts would not be anticipated.			
Estimated emissions from 1.9 million tons of Federal coal produced annually over the next 20 years would be responsible for less than one percent of emissions from other mineral development in the Black Warrior Coal Basin for NO_x, SO_2, PM_{10}, CO, and VOCs.			
Soil Resources			
Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, could impact soils through vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in	Management actions proposed for the surface tracts (159 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion in the short term. Sand deposition would be facilitated by planting native coastal dune vegetation as part of dune	Impacts from management actions proposed for the surface tracts (159 acres) would be the same as Alternative 2, except disposing the surface tracts from Federal ownership could increase the chances for subsequent development and associated impacts on soils.	Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for soil impacts

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.	restoration activities after damage by major storms. Over the long term, improving vegetation communities and fish and wildlife habitat would reduce erosion and overland flows. Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1.	However, following disposal, development and use of the tract would be consistent with RMP objectives, which would prevent disposal-related impacts from occurring.	associated with ROW development compared to Alternative 1. Disposal of the surface tracts from Federal ownership without conditions could increase chances for subsequent development and associated impacts on the tracts. Subsequent development of the tracts could result in impacts to soils from vegetation-clearing activities and construction ground disturbance, which could increase surface runoff and erosion.
Oil and gas development could result in both a slight decline in soil productivity and an increase in surface runoff. Cut and fill areas to support wellpads and access routes can contribute to local soil erosion. Except for 8,179 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on soils. Operation of the oil and gas wells could also impact the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials	Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which reduces disturbance to soils within the protected areas.	Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would reduce protections to soils within these areas. In most cases, this buffer is expected to prevent construction activities from increasing erosion to the point that sedimentation of local drainages and wetlands increases. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils.	

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>or waste; however, Federal, State, and local regulations would require site characterization and corrective action to restore soil integrity and productivity.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="4">Future coal development is not anticipated to disturb the surface; therefore, impacts to soils are not anticipated.</td></tr>
<tr><td colspan="4">Water Resources</td></tr>
<tr><td>Management actions on the surface tracts (159 acres), including potential ROW development and recreation and travel use, could result in short-term and site-specific increases in erosion and surface runoff, which increases nutrient levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.</td><td colspan="2">Management actions proposed for the surface tracts (159 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.
Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1. No coastal wetland habitats or water bodies occur on or adjacent to the Fort Morgan Highway tracts. Development of additional transportation routes and ROW on the Jordan Lake tract could contribute to the already degrading water quality of the Coosa River.</td><td>Impacts would be the same as Alternative 1, except managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as avoidance areas would result in a decreased potential for impacts to water resources associated with ROW development compared to Alternative 1.</td></tr>
<tr><td>Except for 8,179 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on water resources.
Oil and gas development could result in surface runoff, which increases nutrient levels and turbidity and</td><td>Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from</td><td colspan="2">Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250-feet, which would allow development to occur in close proximity to water resources and the potential for impacts to occur. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats to the point that they are not impacted by increased sedimentation.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
decreases water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Additionally, access roads and wellpads can alter the local hydrology, reducing surface flow to mesic areas and diverting or degrading surface water. Because surface discharge of produced water would be a permitted activity requiring standards of water quality, direct impacts to water quality from the disposal of water produced from oil and gas production on non-USFS FMO would be minimized.	increasing the sedimentation of local drainages and wetlands.		
Coal development in the Warrior Basin would involve mining of existing underground coal mines, which would further increase the potential for ground water contamination. Migration of contaminants into the surrounding soils and aquifers could degrade ground water quality and thereby affect wells and springs that may serve household and domestic uses.			
Vegetative Communities			
Management actions on the surface tracts (159 acres) could result in surface-disturbing activities that would impact vegetative communities. These actions would result in vegetation-clearing and disturbance associated with construction, which could alter vegetation communities. Wind and water erosion in disturbed areas could impede the regrowth of vegetation, allow noxious weeds to grow, and potentially deteriorate aquatic habitats. Retaining surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and Agency policies that would provide adequate	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for native vegetation and habitat, and managing the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Geneva tracts as avoidance areas for ROW. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit vegetation by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 2. Impacts from disposing surface tracts out of Federal ownership consistent with resource management objectives would be the same as Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 1. Disposing surface tracts out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation. Such development could eliminate and fragment vegetation communities, leaving small, isolated populations that are more vulnerable to habitat modification and degradation.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
protection of vegetation.			
The estimated 20 wells to be developed in Alabama over the life of this plan would disturb approximately 105 non-USFS FMO acres. Although 305,640 acres are open to leasing, the potential is low for impacts to sensitive vegetation communities because leasing stipulations would be developed as appropriate to protect vegetation.	Impacts from fluid mineral leasing management actions on split-estate would be the same as Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO. Additional protections would be applied to 91,702 acres managed as CSU, 94,589 acres as NSO, and 8,297 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except buffers for aquatic species and protections of Alabama beach mouse habitat would be reduced. Stipulations would be applied to 117,506 acres managed as CSU, 43,239 acres as NSO, and 8,179 acres closed to leasing.	
Future coal development is not anticipated to disturb the surface; therefore, impacts to vegetative communities are not anticipated.			
Fish and Wildlife			
Management actions on the surface tracts (159 acres) could result in surface-disturbing activities. These actions would result in vegetation-clearing activities and disturbance associated with construction, which could displace wildlife and alter vegetation, habitat, and forage components important to wildlife in localized areas. This could impair species viability and reduce habitat quality for a variety of species. Wind and water erosion in disturbed areas could impede the regrowth of vegetation, allow noxious weeds to grow, and potentially deteriorate aquatic habitats. Retaining surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and Agency policies that would provide adequate protection of wildlife habitat.	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for existing wildlife diversity and undertaking actions to manage for sensitive wildlife species, and managing the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Geneva tracts as avoidance areas for transportation project ROWs. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit wildlife by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 2. Impacts from disposing surface tracts out of Federal ownership consistent with resource management objectives would be the same as Alternative 1.	Impacts from surface-disturbing activities would be the same as Alternative 1. Disposing surface tracts out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation. Such development could eliminate and fragment wildlife habitat, leaving small, isolated populations that are more vulnerable to habitat modification and degradation.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
The estimated 20 wells to be developed in Alabama over the life of this plan would disturb approximately 105 non-USFS FMO acres. Although 305,640 acres are open to leasing, the potential is low for impacts to sensitive wildlife because leasing stipulations would be developed as appropriate to protect wildlife.	Impacts from mineral leasing management actions on split-estate would be the same as Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through Agency direction. Additional protections would be applied to 91,702 acres managed as CSU, 94,589 acres as NSO, and 8,297 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except buffers for aquatic species and protections of Alabama beach mouse habitat would be reduced. Stipulations would be applied to 117,506 acres managed as CSU, 43,239 acres as NSO, and 8,179 acres closed to leasing.	
Special Status Species			
Lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity. The coastal dune habitat associated with the Fort Morgan beach tracts would continue to be trampled at traditional beach access points damaging habitat for Alabama beach mouse. Dispersed recreation use of the Coosa River tracts has the potential to cause bald eagles to abandon nest sites. Retaining the surface tracts in Federal ownership would continue the application of protective measures provided by Federal law and Agency policies that would	Alabama beach mouse and nesting shore birds would benefit from plantings of native coastal dune vegetation on the Fort Morgan beach tracts after damaging storms. These plantings promote sand deposition and help to reestablish the dunes more quickly. On the Fowl River, Coosa River, and Fort Morgan Highway tracts, woody exotic, invasive species, such as Chinese tallow and Chinese privet, would be removed by hand and stumps treated with approved herbicides. Alabama beach mouse and nesting shore birds at the Fort Morgan Beach tracts would benefit from the installation of two dune walkovers, which would eliminate damaging foot traffic and allow dunes and vegetation to recover at traditional public access areas at Veterans Road and Mobile Road. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management	Impacts from surface tract management, including vegetative communities and fish and wildlife habitat, would be the same as Alternative 2. Under this alternative, the Geneva and Jordon Lake tracts would be transferred out of Federal ownership without conditions. These tracts are adjacent to Gulf sturgeon critical habitat, but no changes of use are anticipated if it were transferred to private ownership that would affect critical habitat.	Impacts from surface tract management, including vegetative communities and fish and wildlife habitat, would be the same as Alternative 1. The transfer of the BLM surface tracts to private ownership are likely to result in loss of habitat for the Alabama beach mouse, piping plover, snowy plover, and bald eagle, as well as potential habitat for Alabama red-belly turtle. Any development of the beach tracts would result in the direct loss of occupied critical habitat for the Alabama beach mouse. Development of the Fort Morgan Highway tracts is likely to result in the loss of important scrub habitats designated as critical habitat. Because the Fort Morgan Beach and Highway tracts are designated critical habitat, USFWS would have to authorize a taking permit through the Section 7 process of the ESA before such transfers could be approved.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
provide adequate protection of special status species.	would more directly benefit special status species by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.		
Oil and gas development on non-USFS FMO in Alabama is expected to result in the disturbance of 105 acres of habitat, any of which could occur in areas supporting special status species. Impacts to special status species could include the direct loss of habitat and/or degradation of aquatic or wetland habitats for the Alabama beach mouse, loggerhead sea turtle, piping plover, snowy plover, Wilson's plover, gopher tortoise, red-cockaded woodpecker, bald eagle, and special status fish species. Section 7 consultations with the USFWS would be required prior to the BLM permitting any action that could adversely affect these Federally listed species or designated habitat, and subsequent actions would comply with the conditions established by any subsequent biological opinions (BO).	Although the number of wells (20) and acres disturbed (105) would remain the same under this alternative, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. The coastline and all critical habitat for the Alabama beach mouse, including upland scrub sites, would be excluded from leasing. This would avoid potential impacts to Alabama beach mouse, nesting sea turtles, piping plover, and other coastal special status species, including least tern, American oystercatcher, and Wilson's plover.	Impacts from mineral development would be the same as Alternative 2, except the aquatic and wetland buffer would be reduced to 250 feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600 feet to provide adequate protection. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. The coastal no-lease areas would be replaced with a 600-foot NSO buffer. This change could affect nesting sea turtles, piping plover, and all critical habitat for Alabama beach mouse, including adjacent upland scrub habitats. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts, offsite directional drilling to target these Federal minerals would be permitted under this alternative.	
Wildland Fire and Ecology			
Fire response and fuels treatments would apply to the 159 acres of BLM-administered surface land. Wildland fire management would minimize damage to life, public safety, and developments in the wildland-urban interface (WUI) and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving the ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted.			

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>Allowing vegetation manipulation to meet resources objectives and habitat improvements under standard management common to all alternatives would maintain natural fuel conditions across the surface tracts. This would maintain natural disturbance regimes and decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled.
Dispersed recreation use would introduce additional ignition sources through human use of natural environments, which could increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.
While ROW actions could increase suppression costs, the aspects of ROW related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management actions, such as removing invasive species and conducting prescribed fire, on the surface tracts would reduce the potential for changes in the vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.
The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the surface tracts would be designated as closed or limited to motorized travel.
Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as avoidance areas (a total of 114 acres or 71 percent BLM surface ownership in Alabama), there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
If tracts were transferred from Federal ownership, the responsibility for suppression of wildfires would be eliminated, decreasing suppression costs in wildland fire events.</td></tr>
<tr><td>Development of 20 oil and gas wells introduces additional ignitions sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence and introducing infrastructure that requires protection in wildland fire events. Disturbance associated with development could provide increased accessibility for fire suppression equipment and provide fuel breaks. These impacts would not occur on the 8,179 acres closed to oil and gas development.</td><td>Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres).</td><td colspan="2">Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres).</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Cultural Resources			
The BLM would continue to protect cultural resources from disturbance, damage, or loss from authorized uses through project avoidance or mitigation, including data recovery if necessary. As inventories are conducted, more cultural sites would be identified. Inventories and adherence to law, regulation and policy would protect most cultural sites; however, inadvertent damage of undiscovered sites would remain a possibility.			
Dispersed recreation and standard vegetation treatments could result in inadvertent damage to cultural resources. Ground-disturbing activities associated with ROW construction and maintenance could impact cultural resources. Retaining surface tracts in Federal ownership (whether BLM administered or USFWS administered) would provide protection of cultural resource sites and preserve the setting of sites.	Vegetative communities and fish and wildlife habitat management would increase impacts to cultural resources due to implementing vegetation treatments to reduce invasive species and improve habitat. Limiting or closing motorized vehicle use on the surface tracts would increase protection of cultural sites. Impacts from retaining surface tracts in Federal ownership (BLM or USFWS) would be the same as Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for transportation and ROW would reduce the potential for impacts to cultural sites in these areas.	Impacts from surface tract management—including vegetative communities, fish and wildlife habitat, recreation, and ROW management actions—would be the same as Alternative 2. Making surface tracts available for disposal from Federal ownership could result in the removal of cultural properties from Federal ownership and the associated protections by laws, regulations, and policies. However, applying conditions and restrictive covenants on management and use after disposal, damage to previously undetected cultural resources could be mitigated.	Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could result in the removal of cultural properties from Federal ownership and the associated protections by laws, regulations, and policies. Disposing the tracts without any specified management would increase the potential for damage or loss of previously undetected cultural resources after the transfer.
Minerals management actions could impact cultural resources. An appropriate level of cultural resource survey would need to be conducted prior to disturbance. Cultural resources on 8,179 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development.	Cultural resources on 8,297 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 94,589 non-USFS FMO acres managed for NSO.	Cultural resources on 8,179 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 43,239 non-USFS FMO acres managed for NSO.	
Based on the RFD, production of 37.6 million tons of coal from pre-existing underground mines over 20 years would not result in new surface disturbance; therefore, no impacts to cultural resources would be anticipated from coal development.			

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Visual Resources			
Allowing recreation activities, including motorized vehicle use, on the surface tracts could result in decreased visual quality over time. If existing utility and road ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, visual quality would be diminished through increased use of these ROWs.	Actions to improve vegetation communities and wildlife habitat would temporarily diminish visual quality; however, visual quality would be improved in the long term. Limiting motorized vehicle use on the surface tracts could diminish impacts described in Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for ROWs would help to retain the visual quality of the area by reducing the potential for development activities to occur in these areas. Managing the Fort Morgan Highway and Jordan Lake tracts as available for ROW corridors could diminish the visual quality of these areas.	Impacts from limiting motorized vehicle use and actions to improve vegetative communities and fish and wildlife habitat would be the same as Alternative 2. Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, visual quality would be protected.	Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could diminish visual quality, if the tracts were subsequently developed.
Mineral leasing and subsequent development could result in the removal of vegetation; construction of access roads, wellpads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area.	Mineral leasing and subsequent development could result in the removal of vegetation; construction of access roads, wellpads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area. Closed and NSO stipulations on 33 percent of the non-USFS FMO would prevent these impacts.	Mineral leasing and subsequent development could result in the removal of vegetation; construction of access roads, wellpads, and other infrastructure; introduction of drilling equipment; and associated dust emissions. These effects would all diminish the visual quality of the area. Closed and NSO stipulations on 16 percent of the non-USFS FMO would prevent these impacts. Other areas where project activities would be proposed would be evaluated for compliance with the VRM Management Classes using the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating. Projects and activities found out of compliance with VRM Class objectives would be required to mitigate visual impacts.	
Minerals			
No impacts to oil and gas development would be anticipated from management of surface tracts.			
This alternative would have the least restrictions on oil and gas exploration and development, with more than 96 percent (305,6640 acres) of non-USFS FMO open to leasing, subject	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. This alternative would be the most	Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. Compared to Alternative 2, lease stipulations would be less stringent under this alternative, with approximately 14 percent (43,239 acres) of non-USFS FMO open to leasing, subject to major constraints and less than 3 percent	

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
to the standard lease terms and conditions. The remaining 8,179 acres (approximately 4 percent) would be closed to leasing due to restrictions placed by other Federal surface management agencies. Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	restrictive on oil and gas exploration and development, with 30 percent (94,589 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 3 percent (8,297 acres) closed to leasing. The remaining 208,841 acres would be open to leasing, subject to the standard lease terms and conditions (37 percent of non-USFS FMO) or open to leasing, subject to minor constraints (29 percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	(8,179 acres) closed to leasing. The remaining 260,083 acres would be open to leasing, subject to the standard lease terms and conditions (45 percent of non-USFS FMO) or open to leasing, subject to minor constraints (37 percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 20 wells on non-USFS FMO over the next 20 years.	
Recreation and Travel Management			
Although Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to USFWS, these lots would remain within the boundaries of the Bon Secour NWR (where they are currently, but they are not managed by the USFWS).			
Allowing motorized travel uses on all surface tracts could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience. If existing ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, the recreation experience would be diminished. Retaining the surface tracts in Federal ownership would maintain access to recreational activity.	Actions to improve vegetative communities and fish and wildlife habitat would temporarily diminish the recreation experience. The recreation experience would be improved in the long term. Continuing to allow recreation use on the surface tracts would result in impacts similar to those described under Alternative 1. However, since motorized vehicle use would be limited or closed, more non-motorized recreation opportunities would be increased while there could be a loss of motorized recreation opportunities. Impacts from retaining the surface tracts in Federal ownership would be the same as Alternative 1.	Impacts from surface tract management—including vegetative communities, fish and wildlife habitat, recreation, and ROW management actions—would be the same as Alternative 2. Impacts from retaining the surface tracts in Federal ownership would be similar to Alternative 1. Although the Coosa River, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, recreational settings would be protected, although access could be reduced if not specifically included in the conditions for use or restrictive covenants.	Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership could reduce access for recreational opportunities.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
	Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts as avoidance areas for ROWs would help retain recreational opportunities. Making the Fort Morgan Highway and Jordan Lake tracts available for utility and road ROW corridors could diminish the quality of the recreation experience.		
Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO, there could be a decrease in nature-based recreational opportunities due to conflicts with the developments. However, stipulations could indirectly protect the recreational resources in areas where development would be precluded (8,179 acres).	Impacts from minerals management would be the same as Alternative 1, except stipulations could indirectly protect the recreational resources on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres).	Impacts from minerals management would be the same as Alternative 1, except stipulations could indirectly protect the recreational and visual resources on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres).	
Lands and Realty			
Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots.			
Keeping the 159 acres of the surface tracts open to ROW applications would not impact the lands and realty program. Retaining the surface tracts under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.	Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (114 acres or 71 percent BLM surface ownership) as avoidance areas for ROWs could impose design and siting requirements and associated costs on new ROW or amended or renewed ROW at existing sites. There would be an increased potential for requests for new or amended and renewed ROW at existing sites to be denied. Making the Fort Morgan Highway and Jordan Lake tracts available for ROW would accommodate access and efficient	ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The Coosa River and Fowl River tracts would be available for disposal with conditions. This would allow opportunities for other Federal agency or non-Federal ownership, but would restrict future use of the tracts. All of the Fort Morgan Beach and Fort Morgan Highway tracts would be available for transfer to the USFWS as part of the Bon Secour NWR. This would facilitate Federal management of the tracts, but would	ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The Coosa River, Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts; however, disposal would not be allowed if it would jeopardize Federally listed species or

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
	energy supply and minimize additional costs. Retaining the surface tracts under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities.	not allow opportunities for other Federal agency or non-Federal ownership. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.	designated critical habitat, which could limit some disposals. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.
Social and Economic			
Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes). BLM lands would remain in Federal ownership. Lands and realty actions would not cause changes in the socioeconomic characteristics.	This alternative includes active invasive species management on three BLM land tracts. Impacts from these actions on the economic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value the protection of native vegetation and habitats will likely prefer this alternative over the other alternatives. Socioeconomic impacts from recreation and travel, lands and realty, and fish and wildlife management actions would be the same as those under Alternative 1 since minimal changes are anticipated.	Impacts from surface tract management—including vegetative communities, fish and wildlife habitat, and recreation and travel management actions—would be the same as Alternative 2. Under Alternative 3, a portion of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership with specified conditions on management and use after disposal to meet prescribed resource objectives. Since the types of activities on these lands are not likely to change considerably, there would be minimum impact to socioeconomic characteristics under this alternative. However, stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values might be negatively impacted by this alternative.	Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes). Under Alternative 4, a portion of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership without conditions on management and use after disposal. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting the counties and the State. It is possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living, are not expected to be influenced by

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
			the minimal development. Stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values will likely be negatively impacted by this alternative. Those stakeholders who feel the development of these lands is a better use of these surface tracts would likely prefer this alternative.
Since only 20 fluid mineral wells would likely be drilled with standard lease terms and conditions over the 20-year planning period, there would be minimal economic impacts from these activities. There would be minimal changes—a potential slight increase in employment or income as compared with the current situation. Social indicators, such as housing, education, and cost of living, would not be anticipated to change under this alternative. Attitudes and values of some stakeholders are likely to be impacted by this alternative.	The same number of wells and acres of surface disturbance are anticipated under this alternative. This alternative provides for the most environmental stipulations on oil and gas leasing of these minerals. Economic and social indicators are likely to be similar to those under Alternative 1. There will be some impacts to stakeholders: stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would prefer this alternative to other alternatives; and the oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will least prefer this alternative.	Socioeconomic impacts from minerals management will be similar to those of Alternative 2. However, lease conditions are less restrictive than those under Alternative 2, but more restrictive than the standard lease terms under Alternative 1. Therefore, stakeholders that believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would likely prefer this alternative to Alternative 1. Since industry costs and availability for wellpad locations will likely decrease under this alternative, oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will prefer Alternative 1 over this alternative.	
The anticipated amount of coal to be produced under this alternative for the next 20 years (1.9 millions tons per year) is consistent with coal development over the last 10 years. Employment and compensation from BLM-administered mining provides for 677 employees with total mining employee compensation of $48,236,100. The average annual employee compensation is $71,218, compared with average annual compensation from all industries in the State of $34,877 (Bureau of Economic Analysis [BEA] 2005). Mining in the four-county study area likely provides fiscal revenues to local and State governments, supporting community and emergency services, school and infrastructure. Some stakeholders will support these mining activities due to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.			
No impacts to Environmental Justice (EJ) populations are anticipated to occur.			

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Hazardous Materials			
BLM-authorized activities on surface tracts and non-USFS FMO could include hazardous materials, substances, and waste (including storage, transportation, and spills). These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, Superfund Amendment Reauthorization Act (SARA), Toxic Substances Control Act (TSCA), and the CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed in accordance with regulation.			

Table 2-14. Comparison of Impacts For Mississippi

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
Air Quality			
Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".			
Wildfire could lead to air emissions. Suppression of all fires would result in short-term localized impacts, but is not anticipated to deteriorate air quality conditions.			
Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, would not be anticipated to deteriorate air quality conditions.	Although more management actions are proposed for the surface tract (174 acres), including vegetation and fish and wildlife habitat treatments, these actions would not be anticipated to deteriorate air quality conditions. Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for emissions associated with ROW development compared to Alternative 1.		Impacts would be the same as Alternative 1, except managing the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) as an avoidance area would reduce the potential for emissions associated with ROW development compared to Alternative 1.
Estimated emissions from development of 10 oil and gas wells on non-USFS FMO would be responsible for less than one-tenth of one percent of emissions from the mineral development across Mississippi for NO_x, SO_2, PM_{10}, CO, and VOCs. Those emissions would likely occur over a dispersed geographic area and would, therefore, not cause any noticeable or measurable effect. Potential oil and gas leasing on some non-USFS FMO tracts would be in close proximity to the Sipsey Wilderness in Alabama and the Breton NWR in Louisiana. Oil and gas emissions in those tracts could impact wilderness air quality values and ambient air quality attainment. Based on expected emissions air quality impacts would not be anticipated.			
Soil Resources			
Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, could impact soils through vegetation clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or	Management actions proposed for the surface tract (174 acres), such as removing invasive species and conducting prescribed fire, could increase site-specific erosion in the short term. Over the long term, improving vegetation communities and fish and wildlife habitat would reduce erosion and overland flows. Because the Hancock County tract would be retained in Federal ownership and management actions would afford more protections, such as NSO and avoidance areas for transportation and ROWs, no impacts would be anticipated.		Impacts would be the same as Alternative 1, except disposing the Hancock County tract to private or non-Federal ownership could result in potential development that could affect soils.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.			
Oil and gas development activities could result in decreased soil productivity, disturb topsoils and surface soil characteristics, and increased surface runoff. Cut and fill areas to support wellpads and access routes can contribute to local soil erosion. The estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Required reclamation and the minimal surface that might be disturbed would produce only localized effects on soils.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. In addition to the stipulations in Appendix D, areas within 1,000 feet of aquatic habitats would be managed with an NSO stipulation, which would eliminate impacts to soils in these areas.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would reduce protections to soils within these areas.	
Water Resources			
Management actions on the surface tract (174 acres), including potential ROW development and recreation and travel use, could increase soil erosion and surface runoff, which increase nutrients levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts. The hydric soils associated with the wetlands that encompass most of the tract could be affected by development or construction activities that would dredge or fill the wetlands, compacting soils and hindering natural flow through the wetlands and	Management actions proposed for the surface tract (174 acres), such as removing invasive species and conducting prescribed fire, could increase nutrient levels and turbidity and decrease water quality in the short term. Over the long term, these actions would maintain the emergent wetlands, water quality, and ground water recharge. Because the Hancock County tract would be retained in Federal ownership and management actions would afford more protections, such as NSO and avoidance areas for transportation and ROWs, no impacts would be anticipated.		Impacts would be the same as Alternative 1, except disposing the Hancock County tract to private or non-Federal ownership could increase chances for subsequent development and associated impacts to water resources.

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
potentially resulting in the loss of these emergent wetlands.			
Except for 63,004 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated development of 10 wells on non-USFS FMO in Mississippi over the next 20 years would disturb approximately 55 acres. Required reclamation by Federal and State laws and the minimal surface that might be disturbed would produce only localized effects on water resources. Oil and gas development could result in surface runoff, which increases nutrient levels and turbidity and decreases water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Additionally, access roads and wellpads can alter the local hydrology reducing surface flow to mesic areas and diverting or degrading surface water.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented. This would reduce the level of impact to water resources within the protected areas.	Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the 1,000-foot NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would allow development to occur in close proximity to water resources and the potential for impacts to water resources to occur.	
Vegetative Communities			
Surface-disturbing activities would result in vegetation-clearing activities and disturbance could affect plants in the sensitive wetland ecosystem, resulting in alteration of vegetation communities in the wetland ecosystem. Wind and water erosion in disturbed areas could impede the regrowth of wetland vegetation, allow noxious weeds to grow, and	Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for enhancing and protecting coastal estuarine marsh ecosystem in support of the Mississippi Coastal Preserve System, and managing the tract as an avoidance area for transportation project ROWs. Impacts from retaining the tract in Federal ownership and pursuing partnerships to provide management would be the same as Alternative 1.		Impacts from surface-disturbing activities would be the same as Alternative 2. Disposing the surface tract out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation.

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>potentially impact water quality and species dependent on wetland habitat by changing the composition of habitat.
Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and Agency policies that would protect wetland emergent vegetation communities.</td><td colspan="2"></td><td></td></tr>
<tr><td>An estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Approximately 454,930 acres of non-USFS FMO estate in Mississippi would be open to leasing subject to standard lease terms and conditions, which could disturb, damage, demolish, or impact vegetation.</td><td>Impacts from fluid mineral leasing management actions on split-estate would be the same as for Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through Agency direction. Additional protections would be applied to 123 acres managed as CSU, 184,192 acres as NSO, and 63,004 acres closed to leasing.</td><td colspan="2">Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except protections would be applied to 3,021 acres managed as CSU, 92,269 acres as NSO, and 63,004 acres closed to leasing.</td></tr>
<tr><td colspan="4">Fish and Wildlife</td></tr>
<tr><td>Surface-disturbing activities would result in vegetation-clearing activities and disturbance could affect plants and species in the sensitive wetland ecosystem, resulting in the displacement of species and alteration of vegetation, habitat, and forage components important to wildlife, impairing species viability and reducing habitat quality for mussels, clams, and fish species in the wetland ecosystem. Wind and water erosion in disturbed areas could impede the regrowth of wetland vegetation, allow noxious weeds to grow, and potentially impact water</td><td colspan="2">Impacts from surface-disturbing activities would be reduced under this alternative compared to Alternative 1 due to limitation on motorized recreation, managing for enhancing and protecting coastal estuarine marsh ecosystem in support of the Mississippi Coastal Preserve System, and managing the tract as an avoidance area for ROW.
Impacts from retaining the tract in Federal ownership and pursuing partnerships to provide management would be the same as Alternative 1.</td><td>Impacts from surface-disturbing activities would be the same as Alternative 2.
Disposing surface tract out of Federal ownership without conditions for management and use after disposal could increase the potential for subsequent development and associated impacts to vegetation and wildlife.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
quality and species dependent on wetland habitat by changing the composition of forage and habitat. Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and Agency policies that would protect wetland emergent vegetation communities and associated habitat for various turtle species, fish, crab, and native and migratory birds, as well as many mammal species.			
An estimated 10 wells to be developed in Mississippi over the life of this plan would disturb approximately 55 non-USFS FMO acres. Approximately 454,930 acres of non-USFS FMO estate in Mississippi would be open to leasing subject to standard lease terms and conditions, which could disturb, damage, demolish, or impact wildlife.	Impacts from minerals management actions on split-estate would be the same as for Alternative 1. However, Alternative 2 uses more stringent leasing stipulations in managing all non-USFS FMO with exception, waiver, and modification criteria applied as determined through Agency direction. Additional protections would be applied to 123 acres managed as CSU, 184,192 acres as NSO, and 63,004 acres closed to leasing.	Impacts under Alternatives 3 and 4 would be similar to those of Alternative 2 except protections would be applied to 3,021 acres managed as CSU, 92,269 acres as NSO, and 63,004 acres closed to leasing.	
Special Status Species			
The lack of vegetation management actions could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and, if uncontrolled, could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn.	Removing exotic invasive plant species, particularly cogon grass, could improve habitat conditions for the tiny-leaved buckthorn and Mississippi diamondback terrapin. Prescribed burns could be used to remove wood debris and flotsam left from Hurricane Katrina that create hazards for wildlife and degrade marshes. Limiting motorized use on the Hancock County tract to boating would avoid damaging of sensitive coastal habitats for tiny-leaved buckthorn and Mississippi diamondback terrapin. Impacts from retaining surface tracts in Federal ownership and pursuing partnerships to provide management would more directly benefit wildlife by restoring and maintaining continuity and composition of habitat than anticipated under Alternative 1.		Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from recreation and travel and ROW management actions would be the same as Alternative 2. Under this alternative, the Hancock County tract would be available for disposal from Federal ownership. The affect this has on special status species is not known. Its location at

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
No recreation management actions are planned. Because this tract is not accessible by road, few impacts are anticipated by designating the tract open to vehicles. However, use of four-wheelers on remote upland areas, such as Point Clear Island, could damage sensitive maritime forests and scrubs. Retaining the tract in Federal ownership would continue the application of protective measures by Federal law and Agency policies that would protect special status species.			the center of the Hancock County Marsh Preserve and the presence of extensive wetlands would make development of the tract difficult. It is likely that special status species would continue to benefit from the tract being managed in coordination with the Mississippi Coastal Preserve System.
Oil and gas development on non-USFS FMO in Mississippi is expected to result in the direct loss of 55 acres. Based on previous oil and gas activity, the Federally listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, and bald eagles associated with reservoirs and rivers in the northern portion of the State. Drilling in coastal areas would affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi diamondback terrapin, and saltmarsh topminnow. Section 7 consultations with the USFWS would be required prior to the BLM permitting any action that could adversely affect these Federally listed species or designated habitat, and subsequent actions would comply with the conditions established by any subsequent BOs.	Although the number of wells (10) and acres disturbed (55) would remain the same under this alternative, lease stipulations would shift surface disturbing activities away from sensitive habitats with potential to support special status species. In most cases, this is accomplished with NSO buffers or seasonal restrictions. These stipulations could be applied to 184,192 acres or about 36 percent of the non-USFS FMO in Mississippi.	The number of wells (10) and acres disturbed (55) would remain the same under this alternative and impacts would be the same as Alternative 2, except the aquatic and wetland buffer would be reduced to 250 feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600 feet to provide adequate protection. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. The 600-foot no lease area along the coast, would be replaced with an NSO buffer. Although no surface disturbance would occur on non-USFS FMO or BLM surface tracts within this buffer, offsite directional drilling to target these Federal minerals would be permitted.	

<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Wildland Fire and Ecology</td></tr>
<tr><td colspan="4">Fire response and fuel treatments would apply to the 174 acres of BLM-administered surface land. Suppressing all wildland fires, unless an in-place site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the WUI and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving the ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted.</td></tr>
<tr><td>Allowing vegetation manipulation to meet resources objectives and habitat improvements under standard management common to all alternatives would maintain natural fuel conditions across the surface tract. This would maintain natural disturbance regimes and decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled.
Dispersed recreation use would introduce additional ignition sources through human use of natural environments, which could increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.
While ROW actions could increase suppression costs, the aspects of ROW related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management actions, such as removing invasive species and conducting prescribed fire, on the surface tract would reduce the potential for changes in the marsh vegetation communities. The natural fire regimes would be maintained.
The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the Hancock County tract would be limited to boating, decreasing accessibility to these areas and reducing the potential for additional ignition sources through increased human use.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
If tracts were transferred from Federal ownership, the responsibility for suppression of wildfires would be eliminated, decreasing suppression costs in wildland fire events.</td></tr>
<tr><td>Development of 10 oil and gas wells introduces additional ignitions sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence and introducing infrastructure that requires protection in wildland fire events. Disturbance associated with development could provide increased accessibility for fire suppression and</td><td>Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td><td colspan="2">Impacts from minerals management would be the same as Alternative 1, except impacts would not occur on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td></tr>
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<table>
<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td>provide fuel breaks. These impacts would not occur on the 63,004 acres closed to oil and gas development.</td><td></td><td colspan="2"></td></tr>
<tr><td colspan="4">Cultural Resources</td></tr>
<tr><td colspan="4">The BLM would continue to protect cultural resources from disturbance, damage, or loss from authorized uses through project avoidance or mitigation, including data recovery if necessary. As inventories are conducted, more cultural sites would be identified. Inventories and adherence to law, regulation, and policy would protect most cultural sites; however, inadvertent damage of undiscovered sites would remain a possibility.</td></tr>
<tr><td>Dispersed recreation and standard vegetation treatments could result in inadvertent damage to cultural resources.
Ground-disturbing activities associated with ROW construction and maintenance could inadvertently damage cultural resources.
Retaining surface tract in Federal ownership (whether BLM administered or USFWS administered) would provide protection of cultural resource sites and preserve the setting of sites.</td><td colspan="2">Vegetative communities and fish and wildlife habitat management would increase impacts to cultural resources due to implementing vegetation treatments to reduce invasive species and improve habitat.
Limiting motorized vehicle use on the surface tract to boating would increase protection of cultural sites.
Impacts from retaining surface tract in Federal ownership and pursuing partnerships would be the same as Alternative 1.
Managing the Hancock County tract as an avoidance area for ROW would reduce the potential for impacts to cultural sites.</td><td>Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1.
Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could have impacts if the property contained previously undetected, potentially eligible National Register of Historic Places (NRHP) cultural sites. Disposing the property from Federal ownership would remove the protection of any cultural resources under Federal law, and not applying management or use conditions would increase the potential for damage of previously undetected cultural resources.</td></tr>
<tr><td>Cultural resources on 63,004 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development.</td><td>Cultural resources on 63,004 non-USFS FMO acres closed to oil and gas leasing would be protected from oil and gas development, as would cultural sites on 184,192 non-USFS FMO acres managed for NSO.</td><td colspan="2">Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 359,640 acres would be managed as open to leasing subject to standard lease terms and conditions, 3,021 acres as CSU, 92,269 acres as NSO, and 63,004 acres as closed.</td></tr>
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<tr><th>Alternative 1
(No Action)</th><th>Alternative 2</th><th>Alternative 3
(Proposed)</th><th>Alternative 4</th></tr>
<tr><td colspan="4">Visual Resources</td></tr>
<tr><td>Allowing recreation activities, including motorized vehicle use, on the surface tract could result in decreased visual quality over time.
If new ROW were approved on the Hancock County tract, visual quality would be diminished.</td><td colspan="2">Actions to improve vegetation communities and wildlife habitat would temporarily diminish visual quality; however, visual quality would be improved in the long term through mitigation strategies developed from the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating.
Limiting motorized vehicle use on the surface tract to boating could diminish impacts described in Alternative 1.
Managing the Hancock County tract as an avoidance area for ROW would help to retain visual quality within the area by reducing the potential for development activities to occur in these areas.</td><td>Impacts from ROW and recreation and travel management actions would be the same as Alternative 2.
Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could diminish visual quality, if the tract was subsequently developed.</td></tr>
<tr><td>Mineral exploration and development on non-USFS FMO tracts (517,934 acres) would result in impacts to visual resources on 55 acres from 10 wells. Removal of vegetation and construction of wells and wellpads and introduction of other equipment would decrease visual quality. Impacts from these activities would not be anticipated on 63,004 acres closed to leasing.</td><td>Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect visual resources on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td><td colspan="2">Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could preclude oil and gas development, thereby, protecting visual resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).</td></tr>
<tr><td colspan="4">Minerals</td></tr>
<tr><td colspan="4">No impacts to oil and gas development would be anticipated from management of surface tract.</td></tr>
<tr><td>This alternative would have the least restrictions on oil and gas exploration and development, with approximately 88 percent (454,930 acres) of non-USFS FMO open to leasing, subject to the standard lease terms and conditions. The remaining 63,004 acres (approximately 12 percent) would be closed to leasing due to restrictions placed by other Federal surface management agencies. Oil and gas leasing stipulations would support development of the</td><td>Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs.
This alternative would be the most restrictive on oil and gas exploration and development, with approximately 37 percent (184,192 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 12 percent (63,004 acres) closed to leasing. The remaining 270,615 acres would be</td><td colspan="2">Applying the conservation measures as lease stipulations and BMPs (Appendix D) could also increase exploration and development costs. Compared to Alternative 2, lease stipulations would be less stringent under this alternative, with approximately 18 percent (92,269 acres) of non-USFS FMO open to leasing, subject to major constraints and approximately 12 percent (63,004 acres) closed to leasing. The remaining 359,640 acres would be open to leasing, subject to the standard lease terms and conditions (69 percent of non-USFS FMO) or open to leasing, subject to minor constraints (less than one percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 10 wells on non-USFS FMO over the next 20 years.</td></tr>
</table>

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
anticipated 10 wells on non-USFS FMO over the next 20 years.	open to leasing, subject to the standard lease terms and conditions (51 percent of non-USFS FMO) or open to leasing, subject to minor constraints (less than one percent of non-USFS FMO). Oil and gas leasing stipulations would support development of the anticipated 10 wells on non-USFS FMO over the next 20 years.		
Recreation and Travel Management			
Allowing recreation activities, including motorized vehicle use, on the Hancock County tract would maintain existing recreation and travel opportunities. However, allowing motorized travel could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience. The Hancock County tract would continue to be owned and managed by the University of Mississippi under an R&PP patent for the purposes of the R&PP patent, which would maintain access to recreational activity. If a new road or utility ROW were authorized on the Hancock County tract, the largely natural recreational experiences available would be diminished.	Actions to improve vegetation communities and wildlife habitat would temporarily diminish or eliminate the recreation experience. The recreation experience would be improved in the long term. Continuing to allow recreation use on the surface tract would result in impacts similar to those described under Alternative 1. However, since motorized vehicle use would be limited to boating, more non-motorized recreation opportunities would be increased while there could be a loss of motorized recreation opportunities. Impacts from retaining the Hancock County tract in Federal ownership would be the same as in Alternative 1. Managing the Hancock County tract as an avoidance area for ROW would retain the recreation experience in the undeveloped wetland setting.		Impacts from vegetative communities and fish and wildlife habitat management actions would be the same as Alternative 1. Impacts from ROW and recreation and travel management actions would be the same as Alternative 2. Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions could result in reduced access for recreational opportunities. Following disposal, the tract could be made unavailable for public recreation.
Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells on non-USFS FMO, there could be a decrease in nature-based recreational opportunities due to	Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this	Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres).	

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
conflicts with the developments. However, stipulations could indirectly protect the recreational resources in areas where development would be precluded (63,004 acres).	alternative could protect the recreational resources on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).		
Lands and Realty			
The 174-acre Hancock County tract would remain open to ROW applications; therefore, no impacts would be anticipated. Retaining the Hancock County tract under BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.	The 174-acre Hancock County tract would be managed as an avoidance area for ROW. This could impose design and siting requirements and associated costs on new ROW. There would be an increased potential for requests for new ROW to be denied. Retaining the Hancock County tract under BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations, but would not allow for non-Federal ownership opportunities.		ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. The 174-acre Hancock County tract would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tract; however, disposal would not be allowed if it would jeopardize Federally listed species or designated critical habitat, which could limit some disposals.
Social and Economic			
Recreation and travel, fish and wildlife habitat, and vegetative communities management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes). Under this alternative, the Hancock County tract would remain in Federal ownership. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this	This alternative includes the removal of invasive species on the Hancock County tract. Impacts from these actions on the socioeconomic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value the protection of native vegetation and habitats will likely prefer this alternative over the other alternatives. Impacts to social and economic conditions would not be anticipated from recreation and wildlife management actions as there are very little anticipated changes in these actions. Impacts from lands and realty would be the same as those under Alternative 1.		Recreation, wildlife, and vegetative management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes). Under Alternative 4, the Hancock County tract would be available for disposal from Federal ownership without conditions on management and use after disposal. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
alternative. Quality of social assets (demographics, housing, cost of living, education) in Hancock County is not likely to be affected by retaining these lands in Federal ownership. Some stakeholders would be impacted by these decisions.			the Federal Payments in Lieu of Taxes, economically benefiting Hancock County and the State. It is also possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living, are not expected to be influenced by the minimal development. Stakeholders who feel that the retention of Federal ownership is important to maintain preservationist and open space values will likely be negatively impacted by this alternative. Those stakeholders who feel the development of these lands is a better use of the Hancock County tract would likely prefer this alternative.
Since only 10 fluid mineral wells would likely be drilled with standard lease terms and conditions over the 20-year planning period, there would be minimal economic impact from these activities. Social characteristics, such as housing, education, and cost of living, would not be anticipated to change as a result of this activity. Stakeholders who believe that oil and gas activity should be constrained to protect wetlands and aquatic habitat would likely feel that this alternative does not do enough to ensure protection of these types of resources. Additionally, oil and gas industry stakeholders as well as others who value maintaining access to Federal minerals for oil and gas development	The same number of wells and acres of surface disturbance is anticipated under this alternative. Therefore, similar socioeconomic impacts will be experienced as those identified under Alternative 1. However, this alternative provides for the greatest number of lease constraints and conditions, including stipulations for wellpad distance to wetland and aquatic resources at the Hancock County tract. Therefore, stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would prefer this alternative to other alternatives. Since industry costs and availability for wellpad locations will likely decrease under this alternative,	The same number of wells and acres of surface disturbance is anticipated under this alternative. Therefore, similar socioeconomic impacts will be experienced as those identified under Alternative 1. However, this alternative provides conditions on oil and gas leasing of these minerals, including stipulations for wellpad distance to wetland and aquatic resources. These conditions are less restrictive than those under Alternative 2, but more restrictive than the standard lease terms under Alternative 1. Therefore, stakeholders who believe that oil and gas leasing conditions should be imposed on development and production to mitigate environmental impacts would likely prefer this alternative to Alternative 1. Since industry costs and availability for wellpad locations will likely decrease under this alternative, oil and gas industry and other stakeholders who believe in unconstrained Federal access to mineral development will prefer Alternative 1 over this alternative.	

Alternative 1 (No Action)	Alternative 2	Alternative 3 (Proposed)	Alternative 4
will likely prefer this alternative over the other alternatives.	the oil and gas industry and other stakeholders who believe in Federal access to mineral development will least prefer this alternative.		
No impacts to EJ populations are anticipated to occur; further evaluation is warranted at project implementation.			
Hazardous Materials			
BLM-authorized activities on surface tracts and non-USFS FMO could include hazardous materials, substances, and waste (including storage, transportation, and spills). These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100-185, 40 CFR 100-400, CERCLA, RCRA, SARA, TSCA, and CWA and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any releases were to occur, it would be immediately addressed in accordance with regulation.			

CHAPTER 3—AFFECTED ENVIRONMENT

3.1 INTRODUCTION

This chapter describes the existing physical, biological, cultural, social, and economic characteristics within the Bureau of Land Management's (BLM) planning area in the States of Alabama and Mississippi. Management of resources and resource uses on public lands and minerals administered by the BLM is directed by a variety of laws, regulations, policies, and other requirements (as specified in Appendix C). By describing existing conditions for resource programs in the planning area, this chapter serves as the baseline against which the impacts of the different alternatives are analyzed and compared.

3.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 3.1).** This section presents an overview of the chapter and provides direction on How to Read This Chapter (Section 3.1.1).
- **Alabama Statewide Perspective (Section 3.2).** Oil and gas leasing of BLM-administered, non-United States Forest Service (USFS) Federal mineral ownership (FMO) could occur anywhere in the State; therefore, a statewide perspective is needed to cover the full geographic range for the environmental baseline. This statewide discussion is organized by resource according to the *BLM Land Use Planning Handbook* (H-1601-1).
- **Alabama Surface Tract Description (Section 3.3).** This section provides available information specific to each of the surface tracts in Alabama: the Coosa River tracts, Fort Morgan Beach tracts, Fort Morgan Highway tracts, Fowl River tract, Geneva tract, and Jordan Lake tract (as described in Chapter 2).
- **Mississippi Statewide Perspective (Section 3.4).** Oil and gas leasing of BLM-administered, non-USFS FMO could occur anywhere in the State; therefore, a statewide perspective is needed to cover the full geographic range for the environmental baseline. This statewide discussion is organized by resource according to the *BLM Land Use Planning Handbook* (H-1601-1).
- **Mississippi Surface Tract Description (Section 3.5).** This section provides available information specific to the Hancock County tract in Mississippi (as described in Chapter 2).

3.2 ALABAMA STATEWIDE PERSPECTIVE

3.2.1 Air Quality

Alabama is located in a humid, subtropical climatic region characterized by temperate winters; long, hot summers; and an evenly distributed annual rainfall. The region, however, is subject to periods of drought and flood—its climatic conditions are rarely average. A feast-or-famine situation attributed to weather conditions is typically expected as the climate delivers energy and moisture in subtropical latitudes between a large landmass to the north and the Gulf of Mexico to the south (Southeastern Regional Climate Center 2005).

Typical mean annual temperatures range from 60°F in the north to 70°F along the coast. Temperatures regularly exceed 100°F at many places in Alabama and drop to zero or lower about once a year. Freezing temperatures reach the Gulf Coast almost every winter. Normal precipitation ranges from 50 to 65 inches across the State (NOAA 2007a).

Air Quality Meteorology

Surface wind speeds are variable depending on terrain and proximity to the coast. Average wind speeds vary from 6 to 10 miles per hour in most locations and follow water drainage features of the land or are driven by sea breezes. Dispersion can also be related to the National Oceanic and Atmospheric Administration (NOAA) Stagnation Index, which primarily focuses on ozone (NOAA 2005). On the basis of this index, Alabama was prone to air stagnation for 25 to 50 percent of the days from May through September of 2002 through 2004. This dispersion index compares moderately to other areas in the country.

Baseline Air Quality

Ambient Air Quality. The Environmental Protection Agency (EPA) has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment. The ambient air quality measurements in Alabama for sulfur dioxide (SO_2), nitrogen dioxide (NO_2), carbon monoxide (CO), ozone (O_3), and particulate matter (PM_{10} and $PM_{2.5}$) are shown in Table 3-1. Ambient air quality measurements made by the Alabama Department of Environmental Management (ADEM) indicate that ambient air quality is within the standards, except for carbon monoxide, particulates, and ozone in Birmingham, Alabama, (Shelby and Jefferson Counties), and particulates in Russell County (near Columbus, Georgia). These areas are in nonattainment. Ozone is formed from the chemical reactions of nitrogen oxides, volatile organic compounds (VOCs), and sunlight. Several Alabama locations exceed the ambient air quality standards.

Table 3-1. Recent Highest Ambient Air Quality Measurements in Alabama[1, 2]

Pollutant	Averaging Time	Highest Measured Value (ppm^3)	Location	National Ambient Air Quality Standard (ppm^3)
SO_2	1 year	0.004	Jefferson County	0.03
	24 hours	0.020	Jefferson County	0.14
	3 hours	0.046	Jefferson County	0.50
NO_2	1 year	0.008	Helena	0.053
CO	8 hours	25.1	North Birmingham	9
	1 hour	36.9	North Birmingham	35
O_3	8 hours	0.102	Shelby County	0.080
	1 hour	0.140	Arrant City	0.120
PM_{10}	1 year	38 $\mu g/m^3$	Birmingham	50 $\mu g/m^3$
	24 hours	185 $\mu g/m^3$	Birmingham	150 $\mu g/m^3$
$PM_{2.5}$	1 year	21.5 $\mu g/m^3$	Jefferson County	15 $\mu g/m^3$
	24 hours	57 $\mu g/m^3$	Wylam	65 $\mu g/m^3$

1 ADEM Annual Air Quality Report 2001 (ADEM 2002).
2 Three-year averages for 1999 through 2003 found at www.adem.state.us/AirDivision/AirDivision.htm (ADEM 2005).
3 ppm = parts per million

Visibility and Atmospheric Deposition. Visibility and atmospheric deposition measurements are not available for Alabama.

Area Air Quality Designations

Prevention of significant deterioration (PSD) of areas meeting the ambient air quality standards are divided into the following three categories: Class I for areas of restricted growth, Class II for areas of moderate growth, and Class III for industrialized areas (Clean Air Act of 1977, as amended). All of Alabama is designated as PSD Class II, except for the Sipsey Wilderness in northwest Alabama, which is Class I, and the areas listed previously that did not meet National Ambient Air Quality Standards (NAAQS) and are unclassified. Other Class I areas (within 100 kilometers of the potential development activities) include the Breton National Wildlife Refuge (NWR) off the coast of Louisiana, St. Marks NWR in the Florida Panhandle (each managed by the U.S. Fish and Wildlife Service [USFWS]), Cohutta Wilderness Area in northern Georgia, and Bradwell Bay Wilderness Area in the Florida Panhandle (each managed by USFS).

Climate Change

Ongoing scientific research has identified the potential effects of pollutants considered to be greenhouse gas (GHG) emissions (including carbon dioxide, CO_2; methane, CH_4; nitrous oxide, N_2O; water vapor; and several trace gasses) on global climate. Through complex interactions on a regional and global scale, these pollutants cause a net warming effect of the atmosphere, making surface temperatures suitable for life on earth, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, with corresponding variations in climatic conditions, recent industrialization and burning of fossil carbon sources have caused CO_2 concentrations to increase dramatically, and have been shown to contribute to overall climatic changes, typically referred to as global warming or climate change. Increasing CO_2 concentrations also lead to preferential fertilization and growth of specific plant species.

Some pollutants considered to be GHGs, such as CO_2, occur naturally and are emitted to the atmosphere through both natural processes and human activities, while others are created and emitted solely through human activities. The principal pollutants considered to be GHGs that enter the atmosphere because of human activities include CO_2, emitted through the burning of fossil fuels, solid waste, trees and wood products; CH_4 emitted during the production and transport of coal, natural gas, oil extraction, livestock production, deforestation, and other agricultural practices; N_2O emitted during agricultural and industrial activities and during the combustion of fossil fuels and solid waste; and fluorinated gases that are emitted from a variety of industrial processes (EPA 2008).

The assessment of GHG emissions and climate change is in its formative phase, and it is not yet possible to know with confidence the net impact to climate. Observed climatic changes may be caused by GHG emissions, or may reflect natural fluctuations (U.S. GAO 2007). It is known that in the past, the earth has gone through a number of ice ages with periods of warming and droughts between the periods. The most recent Ice Age ended around 13,000 years ago and the climate has warmed and dried since then. The warming and drying has not been continuous. However, the rate at which atmospheric CO_2 concentrations have risen in the past 100 years is unprecedented, and corresponds with observed temperature changes. The Intergovernmental Panel on Climate Change (IPCC 2007) concluded that "Warming of the climate

system is unequivocal" and "Most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations."

Global mean surface temperatures have increased nearly 1.8°F (1.0°C) from 1890 to 2006 (Goddard Institute for Space Studies 2007). However, both observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. The Goddard Institute for Space Studies (2007) data indicated that northern latitudes (above 24° N) have exhibited temperature increases of nearly 2.1°F (1.2°C) since 1900, with nearly a 1.8°F (1.0°C) increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHG are likely to accelerate the rate of climate change. In 2001, the IPCC indicated that by the year 2100, global average surface temperatures will rise 2.5 to 10.4°F (1.4 to 5.8°C) above 1990 levels. The National Academy of Sciences (2006) has confirmed these findings, but also indicated there are uncertainties how climate change will affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be higher than during the summer.

According to the *EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks* (2008), the total U.S. GHGs were estimated at 7,054.2 teragrams of CO_2 equivalent[1] (Tg CO_2 Eq.) in 2006. Overall, total U.S. emissions have risen by 14.7 percent from 1990 to 2006. The primary GHG emitted by human activities in the U.S. was CO_2, representing approximately 84.8 percent of total GHG emissions. The largest source of CO_2, and of overall GHG emissions, was fossil fuel combustion. Conversely, U.S. GHG emissions were partly offset by carbon sequestration in forests, trees in urban areas, and agricultural soils, which, in aggregate, offset 12.5 percent of total emissions in 2006 (EPA 2008).

In the Southeast and Gulf Coast, potential impacts on the resources and environment from climate change could occur from sea level rise and a warmer climate, resulting in higher summer heat and reduced winter cold stress. The IPCC suggests that a two foot rise in sea level would eliminate approximately 10,000 square miles of land nationwide and, by 2080, sea level rise could convert as much as 33 percent of the world's coastal wetlands to open water (IPCC 2007). Some of the BLM-administered surface and mineral estate may become completely submerged. Coastal erosion, loss of barrier islands and wetlands, flooding, storm surge, and extreme precipitation events could greatly affect the biological resources within the planning area. For example, wildlife species could move northward and to higher elevations and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Additionally, the character of vegetation resources that provide wildlife habitat could change as disturbances (e.g., fire and insect outbreaks) increase (IPCC 2007). In the future, as tools for predicting climate changes in the planning area improve and/or changes in climate affect resources and necessitate changes in how resources are managed, BLM may be able to re-evaluate decisions made as part of this planning process and adjust management accordingly.

Certain BLM-authorized activities within the planning area would produce pollutants considered to be GHGs, particularly CO_2. For example, oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation generate CO_2 and CH_4. These activities would impact the same resources in the planning area that could also be affected by climate change. Other activities may help sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks". BLM recognizes the importance of climate change and the potential effects it may have on the

[1] Carbon comprises 12/44ths of carbon dioxide by weight. One teragram is equal to 10^{12} grams or one million metric tons.

natural environment. However, BLM does not have an established mechanism to accurately predict the effect of resource management-level decisions from this planning effort on global climate change. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. A general discussion on the types of actions that would potentially impact climate change is presented in Chapter 4.

3.2.2 Soil Resources

Physiographic Regions and Soil Types

Alabama can be divided into four major physiographic regions: Coastal Plain, Piedmont, Valley and Ridge, and Appalachian Plateau (Highland Rim and Cumberland Plateau). Each physiographic region is described in Appendix F.

Soil formation and character are all determined by parent material, surface slope, climate, biological activity, and time. Because Alabama is located within the humid subtropics, its soils are transitional between the cool climatic regions and the tropics. Podzolization, a soil-forming process of humid cool climates, and laterization, a soil-forming process of lowland tropics, are represented by the red and yellow podzolic soils and reddish-brown lateritic soils in Alabama. The State has seven major soil areas, including limestone valleys and uplands, Appalachian Plateau, Piedmont Plateau, prairies, coastal plains, major flood plains and terraces, coastal marshes, and beaches (Mitchell 2004). A brief description of the major parent soil units and their locations in Alabama is provided in Appendix F.

The characteristics of soils in BLM-administered, non-USFS FMO areas are described in Appendix F.

Prime and Unique Farmlands

The Farmland Protection Policy Act requires the identification of proposed actions that would affect any lands classified as prime and unique farmlands. The U.S. Natural Resources Conservation Service (NRCS) administers this act to preserve farmland.

Prime farmland is defined as having the availability and best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Its soil quality, growing season, and moisture supply can produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. The land is permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they neither flood nor require protection from flooding.

Prime farmlands occur in dispersed areas across Alabama. Counties in Alabama with areas having high potential for oil and gas or coal development likely include soil units that have been identified as prime farmland by NRCS. Appendix F includes prime farmland classification information that is available for soils within non-USFS FMO.

3.2.3 Water Resources

Surface Water

Alabama is divided into 14 major river basins containing 77,272 miles of rivers and streams (47,072 miles of perennial rivers and streams and approximately 30,200 miles of intermittent streams). These 14

basins are the Tennessee, Upper Tombigbee, Lower Tombigbee, Black Warrior, Coosa, Cahaba, Tallapoosa, Chattahoochee, Choctawhatchee, Chipola, Perdido-Escambia, Alabama, Mobile, and Escatawpa River Basins (ADEM 2004) (Map 3-1). Appendix H briefly describes each major river basin. Alabama has ponds, lakes, and reservoirs in excess of 490,472 acres. Freshwater wetlands occupy an estimated 3.6 million acres (ADEM 2004).

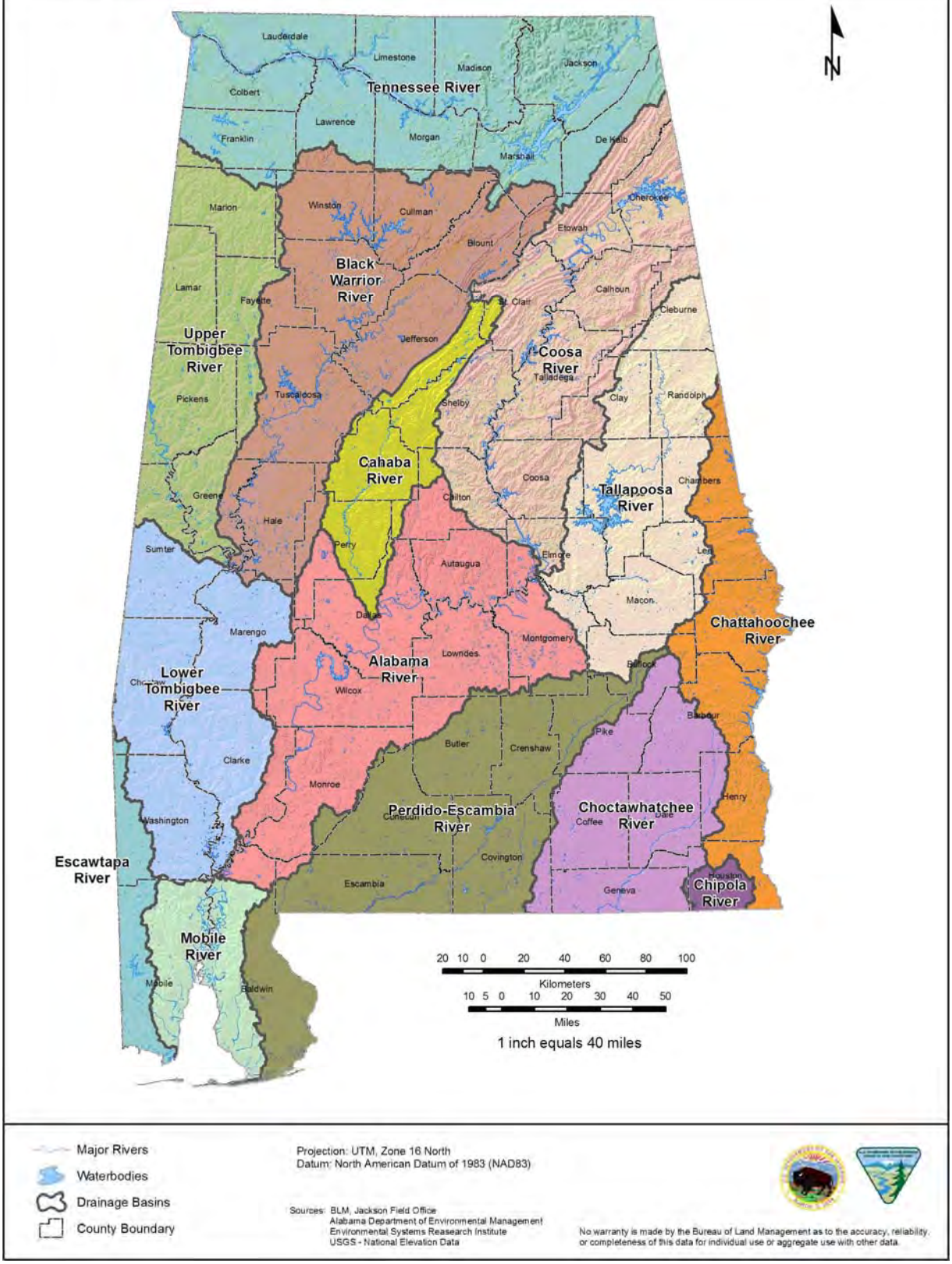
Alabama's surface water is generally of high quality. An indication of full-use support (i.e., meeting established water quality criteria for its designated use classification) of rivers and streams can be found in Alabama's Final 2004 §303(d) List, as presented in ADEM 2004. As of 2004, Alabama has a high percentage of full-use support for rivers and streams.

Similarly, Alabama's publicly accessible lakes and reservoirs have 82.6 percent full-support status. However, much of the nonsupport acreage is related to historical, as well as recent, polychlorinated biphenyl (PCB) contamination (primarily from industrial point sources in the Upper Coosa River) and eutrophic conditions in the Coosa River Basin reservoirs. Naturally higher nutrients in Coosa River Basin soils largely dictate the eutrophic conditions of the basin's reservoirs (ADEM 2004). Several lakes and reservoirs are considered to be degrading in the Coosa River Basin, including the Neely Henry, Logan Martin, Lay, Mitchell, and Jordan. These reservoirs are characterized by increases in nutrient concentrations; implementation of fish tissue consumption advisories; increases in undesirable algal species; and violations of water quality standards; or a combination thereof (ADEM 2003). Several of the BLM's Coosa River tracts (Foshee Island, Little Rock Island, Big Rock Island, and Gilchrist Island) are within Mitchell Lake. One of the BLM's Coosa River (Jordan Lake) surface tracts is located approximately 10 river miles upstream from Jordan Lake and about 5.5 miles downstream from Mitchell Lake. The Coosa River tract at Smith Island is located about 10 miles upstream from Lay Lake. The Coosa River tract at Prince Island is located approximately 11 river miles upstream from Lay Lake.

About 25 river miles in Alabama are within BLM-administered, non-USFS FMO areas. Eight river miles flow over areas with potentially high mineral development prospects. Oil and gas leases exist on a total of about 0.6 river miles. The Cahaba River Basin is of particular interest, as there are nine leases in this area and there is renewed interest in coalbed methane natural gas production. Approximately 2,060 lake acres occur within non-USFS FMO areas. National Wetland Inventory (NWI) data are limited for Alabama. Because of the lack of available digital data for freshwater wetlands in Alabama, non-USFS FMO acreage within freshwater wetland areas in the State could not be estimated.

Map 3-1: Major Drainage Basins of Alabama

Alabama-Mississippi RMP-EIS



Ground Water

Alabama has 19 major aquifers and aquifer systems that supply drinking water to about 44 percent of the State's total population using a public water supply (an additional 6 percent use private wells) (ADEM 2003). The lack of chronic pollutants in public water supply ground water sources is a good indication of Alabama's high-quality ground water and effective resource management (ADEM 2004).

Precipitation is the sole source of water for the ground water system, but only a small part of the annual precipitation actually recharges the ground water system. Because the recharge of aquifers entirely depends on precipitation, natural ground water levels in Alabama follow the same pattern of seasonal fluctuation as precipitation (USGS 2003). Information on major ground water recharge zones in Alabama was not available for evaluation relative to non-USFS FMO.

Coastal Zone

The National Coastal Zone Management (CZM) Program is a voluntary partnership between the Federal Government and U.S. coastal states and territories authorized by the Coastal Zone Management Act of 1972. The Coastal Programs Division, within NOAA's Office of Ocean and Coastal Resource Management, administers the program at the Federal level and works with State CZM partners. Alabama's Coastal Area Management Program (ACAMP) was approved and has been in effect since 1979. The program regulates various activities on coastal lands and waters seaward of the continuous 10-foot contour in Baldwin and Mobile Counties of Alabama. The Fort Morgan Beach and Highway tracts in Baldwin County in addition to BLM-administered, non-USFS FMO fall within the ACAMP.

Alabama's coastal wetlands are estimated at 27,600 acres (NWI estimates, as presented in ADEM 2004). Coastal Alabama also has an estimated 610 square miles of estuaries and a coastal shoreline that is 337 miles long (including Mobile Bay and island shorelines) (ADEM 2004).

EPA has identified the Mobile Bay coastal drainage as a wetland restoration priority area. EPA's Gulf of Mexico program has also identified the Mobile Bay area as a priority for water quality and habitat improvement projects (ADEM 2004). In 2000, ADEM's coastal programs received a wetlands restoration grant to implement restoration strategies and address State lands within ADEM's Alabama Coastal Nonpoint Source Pollution Control Program's (ACNPCP) management area, which includes all of Mobile and Baldwin Counties. The project has targeted restoration and protection of priority tracts in the approximately 5,000 acres of wetlands in Baldwin County. ADEM identified the Bon Secour Bay and Fort Morgan Peninsula as priority candidate wetlands restoration sites (ADEM 2004). USFWS is the technical adviser to projects conducted under the wetlands restoration grant.

Wetland types in Baldwin County 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 (ponds, interdunal swales) (ADEM 2004). On the basis of a rough geospatial analysis, about 5,850 acres of BLM-administered, non-USFS FMO are within coastal wetland areas in Alabama.

3.2.4 Vegetative Communities

For this planning effort, Gap Analysis Program (GAP) was used to delineate land cover types on non-USFS FMO in Alabama. This land cover map is based on Landsat-7 satellite imagery using the National Land Cover Data (NLCD), which includes 21 very broad land cover classifications. The decision to use this data set was based on its statewide application and availability in a geographical information system format at the time this planning effort was initiated. Analysis of the GAP land cover map resulted in the

identification of seven dominant cover types on non-USFS FMO lands in Alabama. These cover types include deciduous (25 percent), mixed (23 percent), evergreen (19 percent), wetland forest/shrub land (10 percent), pasture/hay (8 percent), row/crops (5 percent), and open water (2 percent). Less dominant cover types (approximately 8 percent) are not discussed further. The following brief discussions provide an overview of the cover types found on non-USFS FMO in Alabama.

- **Deciduous (25 percent).** This classification is dominated by trees, of which 75 percent or more are hardwoods. Common trees in these areas include a wide variety of oak (*Quercus spp.*) and hickory (*Carya spp.*) species, red maple (*Acer rubrum*), ash (*Fraxinus spp.*), hackberry (*Celtis laevigata*), yellow poplar (*Liriodendron tulipifera*), beech (*Fagus grandifolia*), elm (*Ulmus spp.*), sweetgum (*Liquidambar styraciflua*), persimmon (*Diospyros virginiana*), and black cherry (*Prunus serotina*).

- **Mixed (23 percent).** This classification delineates areas where neither hardwood nor pine species represent more than 75 percent of the cover. These mixed hardwood/pine areas are typically dominated by loblolly (*Pinus taeda*), longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), or shortleaf pine (*Pinus echinata*), with a wide variety of oak and hickory species, plus hackberry, elm, sweetgum, common persimmon, and yellow poplar.

- **Evergreen (19 percent).** This classification delineates areas where 75 percent or more of the tree species are evergreen. In Alabama, the dominant pine species are loblolly, longleaf pine, slash pine, and shortleaf pine. This classification includes commercial pine plantations, which according to the Alabama Comprehensive Wildlife Conservation Strategy (CWCS) comprised 24 percent of the forested acreage in Alabama in 2000. Loblolly is the most commonly planted pine species. An additional species, sand pine (*Pinus clausa*) dominates a narrow band of scrub habitats behind the coastal dune systems along the Gulf of Mexico.

- **Wetland Forest/Shrub Land (10 percent).** This classification comprises areas in which forest or shrub land vegetation accounts for 25 to 100 percent of the cover and the soil or substrate is periodically saturated or covered with water. These encompass diverse communities ranging from forested wetlands and bald cypress (*Taxodium distichum*) swamps, to bogs and coastal marshes. Dominant species in seasonally flooded forests are sweet bay (*Magnolia virginiana*), sweetgum, wax myrtle (*Myrica cerifera*), various oaks, and titi (*Cyrilla racemiflora*). Typical wetland or bog species include pitcher plants, various rushes, sedges, arrowhead, and St. John's wort (*Hypericum spp.*). Typical species of coastal wetlands and marshes include sawgrass (*Cladium spp.*), black needlerush (*Juncus roemerianus*), and bulrush (*Scirpus spp.).*

- **Pasture/Hay (8 percent).** Vegetation in this community is composed of introduced grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of hay crops.

- **Row/Crops (5 percent).** This classification includes areas being actively cultivated.

- **Open Water (2 percent).** This classification includes areas with less than 25 percent cover of vegetation/land cover.

Alabama Invasive/Exotic Species

The Alabama Invasive Plant Council lists 45 invasive plants as occurring in the State. The top ten include Chinese tallow (Triadica sebifera), Chinese privet (Ligustrum sinense), multiflora rose (Rosa multiflora), tropical soda apple (Solanum viarum), Japanese climbing fern (Lygodium japonicum), kudzu (Pueraria montana var. lobata), cogon grass (Imperata cylindrica), hydrilla (Hydrilla verticillata), alligator weed (Alternanthera philoxeroides), and Eurasian milfoil (Myriophyllum spictum). The most likely to be encountered on non-USFS FMO are Chinese tallow, Chinese privet, and cogon grass. Cogon grass, in

particular, has the potential to affect future land use practices because of its ability to alter natural fire regimes, its thick growth habit that excludes other vegetation, and the difficulty to control it. Chinese privet is a common invasive plant that occurs along edges and disturbed sites. Chinese tallow tree is often found near or in wetlands, and along fence rows and roads.

3.2.5 Fish and Wildlife

Game Species

Alabama's major game species include whitetail deer (Odocoileus virginianus), eastern turkey (Meleagris gallapavo silvestris), mourning dove, northern bobwhite quail, squirrel, and waterfowl species. Alabama held its first alligator hunt since the recovery of the species in 2006. The whitetail deer population in Alabama was estimated at 1.75 million in 2000, up from an estimated 2,000 in the early 1900s, due in part to major restocking efforts during the 1950s and 1960s. The Alabama Wildlife and Freshwater Fisheries Division estimates the current population of eastern wild turkey at 350,000. Turkey prefer hardwood and mixed pine-hardwood forestlands interspersed with open areas in both upland and bottomland regions. Mourning doves are common throughout the State on farms, and in towns, woodlots, agricultural fields, and grasslands. Quail occurrence is incidental across the State, generally associated with abandoned weedy fields and open pinelands or savanna with extensive groundcover of forbs, native grasses, and scattered brush thickets. Gray squirrel (Sciurus carolinensis) and fox squirrel are both found statewide. The gray squirrel is common in hardwood forests, mixed forests, and urban areas. The less common fox squirrel favors mature deciduous and pine-oak woodlands, but also occurs at forest edges and in riparian woodlands. Twenty-six species of ducks are found in the coastal and inland waters of Alabama. The wood duck (Aix sponsa) and the hooded merganser (Mergus cucullatus) occur statewide throughout the year and breed extensively in Alabama. As part of the Mississippi Flyway, Alabama provides important winter habitat for waterfowl that are produced in the Prairie Pothole Region and Great Lakes States. Alabama provides varied and abundant sport fishery with 26 game species. Reservoirs, ponds, lakes, and swamps throughout the State provide important habitats for sport fishes.

Neotropical Migratory Birds

The Alabama Ornithological Society State list includes 420 species of birds known to occur in the State. A total of 178 species are known to breed in Alabama, including 158 species that regularly breed in the State. Additionally, 174 species regularly winter in and 80 species migrate through Alabama. This list also contains 38 accidental, 3 extinct, 2 extirpated (no longer occurring in Alabama, but may occur in other States), and 4 exotic (non-native) species. Maritime forests and shrub lands along coastal Alabama provide important staging areas for migrating songbirds and hawks and are critical when weather is inclement or when exhausted birds make landfall.

3.2.6 Special Status Species

For the purposes of this document, special status species are defined as all Federally and State-listed, species proposed or candidates for Federal or State listing, and those species identified by the BLM as sensitive species. The BLM Eastern States policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs, as well as potentially affected bird species included on the USFWS Birds of Conservation Concern and Game Birds Below Desired Condition lists. The USFWS currently lists 132 Federally listed species which historically or currently occur in Alabama. The Alabama Natural Heritage Program (ANHP) inventory lists 712 species ranked as either critically imperiled (S-1) or imperiled (S-2) being tracked in the State in 2006. A complete list of S-1 and S-2 species being tracked by ANHP is included in

Appendix E. Much of the following discussions are based on the Alabama CWCS (2005), which includes a complete list of the wildlife species of conservation concern in the State.

This discussion of special status species takes a statewide perspective, even though management of the BLM's scattered surface acreage and oil and gas development would probably directly affect less than 264 acres in total. Oil and gas leasing of non-USFS FMO in particular could occur anywhere in the State, and future oil and gas development has the potential to affect aquatic systems downstream from locations, substantially increasing the area potentially affected. Therefore, a statewide perspective is needed to cover the full geographic range of potential impacts.

Overview

The high number of special status species in Alabama is a factor of the State's exceptional biodiversity, high rate of endemism, and a history of impacting land uses in the State. Physiographically, the State crosses five provinces (Interior Plateau, Southwestern Appalachians, Ridge and Valley, Piedmont, and East Gulf Coastal Plain) and is situated at the periphery of many species' ranges (see Section 0). It is also a well-known global hotspot for aquatic biodiversity. Alabama surpasses all eastern States in plant and animal diversity, ranking fifth in the nation after California, Texas, Arizona, and New Mexico (ANHP 2003). Alabama ranks first in the nation in freshwater species diversity. Of the 307 species of freshwater mussels recorded in the nation, 180 have been recorded in Alabama. The Nature Conservancy has ranked the Tennessee River and the Mobile River, including its major tributaries, as the first and second most biologically diverse rivers in the country.

This diverse fauna is affected by a history of impacting land uses. Most of Alabama's larger rivers are impounded for navigation, hydropower, and flood control, resulting in the loss of many aquatic species during this century. The Black Warrior River Basin is the largest coal-producing area in the South and coalbed methane production is among the highest in the nation (Alabama Oil and Gas Board), and the river system has been degraded by past coal mining, gas development, and other uses. Throughout the State, aquatic systems have been adversely affected by intensive silviculture and urbanization. Longleaf pine, once the State's most abundant tree (Harper 1928), was reduced to 732,800 acres by 2000 (Hartsell and Brown 2002). In the Southeast, longleaf pine forests now exist on only 3 percent of their previous range (Frost 1993). Throughout much of its range, these longleaf sites have been converted to loblolly pine or slash pine for commercial production and/or degraded by the absence of fire, to the detriment of many terrestrial species associated with this once widespread habitat. These factors have contributed to Alabama having more wildlife species at risk than any State east of the Colorado River. Only Hawaii, California, and Nevada have more imperiled species, and only Hawaii has lost more species to extinction (Stein 2002). At least 108 animal species (47 mussels, 44 aquatic snails, 11 fishes, 5 birds, and 4 mammals) have been extirpated in the State (Alabama CWCS 2005). Of the 117 Federally listed species in Alabama, 70 percent are associated with freshwater aquatic or wetland habitats.

There is non-USFS FMO in both major oil and gas producing regions of Alabama (the Black Warrior River Basin Region and the Southwest Alabama Region) and both of these regions have substantial special status species issues. The Black Warrior River Region includes the Black Warrior and Tombigbee Rivers and the upper portions of the Cahaba River, all part of the Mobile River Basin. Forty-two fish species have been identified as endemic to the basin, and according to the Alabama Natural Heritage 2006 Tracking List, there are now 35 aquatic species either Federally listed or considered imperiled or critically imperiled in the Black Warrior Basin alone. The Southwest Alabama Region includes the Conecuh, Mobile, Escatawpa, Perdido, and Blackwater River Basins. These basins support 26 special status aquatic animal species, including the Federally listed Alabama sturgeon and Gulf sturgeon. Uplands in this area contain almost 90 percent of the longleaf pine acreage, both natural and planted, remaining in the State (Hartsell and Brown 2002). Eighteen special status species are associated with this once widespread

habitat (Alabama CWCS 2005), including keystone species such as the red-cockaded woodpecker and gopher tortoise. Coastal areas in Mobile and Baldwin Counties support 10 special status species, including critical habitat for the Alabama beach mouse, nesting habitat for the loggerhead sea turtle, and critical habitat for wintering piping plover.

Outside of these oil and gas producing regions, there is non-USFS FMO in all but 10 southeastern counties in Alabama. Future development in these areas could occur in response to new finds or new technology that make recovery of the oil/gas more economical. For instance, recently there have been new wells drilled on private minerals in St. Clair and Etowah Counties. These counties are located in the Coosa River Basin, the largest and most biologically diverse portion of the Mobile River Basin, with 39 special status species. Nine of these are considered to be extirpated from this river basin and an additional four are considered to be extirpated from the State.

On non-USFS FMO across the State, there are a number of small, often isolated high-value habitats that support special status species. These include many wetland communities such as bogs, seeps, swamps, prairie and glade openings, and karst habitats. BLM-administered, non-USFS FMO has been estimated to include 38,898 acres of shrub and forested wetlands at least periodically inundated. There are 12 special status amphibians found in the State that utilize these habitats. There are also a number of plant species restricted to these habitats, including the green pitcher plant and white fringeless orchid, both candidates for Federal listing. Glades, in the northeastern half of the State and prairies in the "Black Belt" areas are scarce in this forest-dominated State and tend to support rare assemblages of plants. Karst areas in the northeastern portion of the State support a high number of endemic species. In Jackson County, caves support 24 species found nowhere else, and caves in Morgan and Madison Counties are designated as National Natural Landmarks.

Species Accounts

The following Federally listed or candidate species are known to occur or to have potential to occur on BLM-administered non-USFS FMO. There are currently no species proposed for Federal listing in Alabama (Natureserve 2006). A list of species ranked by ANHP as critically imperiled (S-1) or imperiled (S-2) is provided in Appendix E.

Mammals

Gray myotis (Myotis grisescens), Federally listed as endangered

Gray myotis roost almost exclusively in caves, generally utilizing different caves for summer and winter hibernaculum. Bats may migrate hundreds of kilometers between summer and winter caves. Only a very limited number of caves meet the thresholds for temperature, humidity, and isolation. Most records in Alabama are from near the Tennessee River, and there are small populations in the central and southern parts of the State. Water courses and associated forested riparian corridors are important foraging areas for gray myotis.

Indiana bat (Myotis sodalis), Federally listed as endangered

The Indiana bat hibernates in caves, typically limestone with pools where the mean midwinter temperature is 4–8 degrees Celsius. In Alabama, suitable caves are utilized by bats migrating hundreds of kilometers from breeding grounds in more northern States. Indiana bat records are primarily from the northern third of the State, particularly the Bankhead National Forest, and in the karst region of the extreme south-central portion of the State in Jackson County.

Alabama beach mouse (Peromyscus polionotus ammobates), Federally listed as endangered and ranked

The Alabama beach mouse is restricted to coastal dunes and scrub/shrub habitats along the Fort Morgan Peninsula in Baldwin County. Although the highest population numbers occur in primary dunes, higher secondary dunes and scrub habitats, which are less likely to be inundated, provide crucial habitat from which mice can recolonize after major storm events. All of the BLM-administered beach tracts in Baldwin County are within the designated critical habitat. On January 30, 2007, the Alabama beach mouse critical habitat was revised to include additional areas north of the coastal dunes. All of the BLM-administered highway tracts are now within areas designated as critical habitat for Alabama beach mouse. Approximately 365 acres of non-USFS FMO are within designated critical habitat.

West Indian manatee (Trichechus manatus), Federally listed as endangered

Manatee may utilize coastal areas near the BLM surface tracts, particularly Fowl River, during the summer months.

Birds

Piping plover (Charadrius alexandrinus), Atlantic Coast and Great Plains populations listed as Federally threatened, and Great Lakes populations listed as Federally endangered

All three populations of piping plover winter along the southern Atlantic and Gulf Coasts, where they are classified as threatened. On July 3, 2001, USFWS designated 165,211 acres along 1,798 miles of coastline in eight southern States as critical habitat for the wintering population of piping plover. This included several barrier islands and the western tip of the Fort Morgan Peninsula. Piping plover can be present in Alabama from August to May, but numbers peak during the winter months.

Wood stork (Mycteria americana), Federally listed as endangered

The wetlands of the Coastal Plain of Alabama provide important foraging habitat for wood storks that disperse from breeding areas in Florida, Georgia, and South Carolina in late summer and early fall. There are no recent breeding records in Alabama, although wood storks may breed in remote swamps of the State (Imhof 1976). Primarily, habitats are marshes, swamps, lagoons, ponds, and flooded fields and ditches. During extended drought, depressions in marshes and brackish wetlands have increased in importance.

Red-cockaded woodpecker (Picoides borealis), Federally listed as endangered

Red-cockaded woodpeckers are found in open, mature, old-growth pine woodlands and savannahs. Cavity trees are pines generally over 60 years old, located in open stands with little or no hardwood midstory and few or no overstory hardwoods. Hardwood encroachment resulting from fire suppression can result in cluster abandonment. Potentially suitable foraging habitat is located within 0.5 mile of nesting habitat and contains at least 50 percent pines that are 30 years or older.

Bald eagle (Haliaeetus leucocephalus), Federally listed as threatened, proposed for delisting

Bald eagles are found throughout the State primarily along rivers and large bodies of water. Alabama supports an influx of wintering eagles. A January survey of bald eagles in Alabama has averaged about 100–150 birds in recent years. Concentrations occur on Pickwick Lake near Waterloo and Guntersville Lake near Guntersville State Park. A breeding population of bald eagles has been reestablished in the State. The Alabama Restoration Project tracked 91 juvenile bald eagles in the State from 1985–1991. In 2006, 100 nests were being monitored in the State.

Reptiles

Flattened musk turtle (Sternotherus depressus), Federally listed as threatened

The flattened musk turtle is endemic to Alabama and restricted to Black Warrior River watershed, where it is found in medium-size creeks to larger streams and even impoundments. Optimal stream habitat consists of a drainage at least 80.5 square kilometers (50 square miles); alternating pools and riffles, with pools at least 3–4.5 feet deep; an abundance of submerged boulders and rocks, with crevices; an abundant molluscan and benthic invertebrate fauna; a low silt load; and clean water (Mount 1981a). Streams with a predominant sandy substrate are also suitable as long as adequate boulder and crevice refugia are present (Ernst et al. 1989).

Alabama red-belly turtle (Pseudemys alabamensis), Federally listed as endangered

The Alabama red-belly turtle is restricted to the Mobile-Tensaw River Delta in Mobile and Baldwin Counties adjacent to Mobile Bay. They are rarely found north of Interstate 65. Systematic sampling of major tributaries in coastal Alabama have shown them to be present in major rivers and tributaries of the Mobile Bay, Bayou La Batre, Fowl, Dog, Fish, Magnolia, and Bon Secour Rivers. Specimens have also been recorded from Daphne and Point Clear, Alabama. Alabama red-belly turtles are found in shallow vegetated backwaters of freshwater streams, rivers, bays, and bayous in or adjacent to Mobile Bay.

Gopher tortoise (Gopherus polyphemus), population west of the Mobile and Tombigbee Rivers is Federally listed as threatened

In Alabama, gopher tortoise populations usually occur below the Fall Line in the Southern Pine Plains and Buhrstone/Lime Hills ecoregions. Small populations are found along alluvial sandy ridges that occur along southern Alabama waterways. In Alabama, gopher tortoises are protected by Federal and State laws and found in the following counties: Choctaw, Washington, Mobile, Baldwin, Barbour, Bullock, Butler, Clarke, Crenshaw, Coffee, Conecuh, Covington, Dale, Escambia, Geneva, Henry, Houston, Monroe, Montgomery, Pike, and Wilcox. Small populations occur in Autauga and Macon Counties, where they were introduced by man. The largest populations occur in dry, deep sandy soils where the overhead canopy is open. The best populations in Alabama are found in longleaf pine-scrub oak-wiregrass sand hills that are frequently burned. The more loamy soils found in the longleaf-wiregrass flatwoods support small scattered populations. Clear cuts created by timber operations where gophers occur will support the tortoise for the first few years, but will be abandoned as the canopy closes, usually causing the tortoises to move to the edges of the woodland roads. Pine plantations that are managed for open canopy by thinning and burning will provide the minimum requirements to support a tortoise population. Dense hardwood and unburned pine/hardwood habitats are unsuitable for tortoise populations. Agricultural fields and wildlife food plots will support some individuals but are considered marginal habitat. Tortoises found in these habitats are usually found on the field edges and fence lines where they are not disturbed by annual plantings. Loss of habitat and historic overhunting have caused a large statewide decline of tortoise populations. There are very few public places that have tortoise populations in Alabama, and only the Conecuh National Forest and Fort Rucker Military Base have more than 100 individuals. Research has shown that gopher tortoises move up to 600 feet between burrows for breeding purposes, and two or more burrows within 600 feet of each other can be defined as a population (McDearman personal communication).

Eastern indigo snake (Drymarchon couperi), Federally listed as threatened

The historical range of the eastern indigo snake was from the east coast of South Carolina through southern Georgia, Florida, into southern Alabama, and southwest Mississippi, and is often associated with gopher tortoises. Particularly outside of southern Florida, gopher tortoise burrows provide important refugia from temperature extremes. Naturally occurring populations are now found only in southern Georgia and Florida. Indigo snakes were historically found in the lower coastal plain along with the

burrowing gopher tortoise. In the 1980s, the indigo snake was reintroduced in its historical range within the State, including releases in Autuaga, Baldwin, Bullock, Covington, Escambia, Mobile, and Washington Counties. There have been subsequent sightings.

Black pine snake (Pituophis melanoleucus lodingi), Candidate for Federal listing

Black pine snakes are endemic to the upland longleaf pine forests that once covered the southeastern United States. Habitat consists of sandy, well-drained soils with an overstory of longleaf pine, a fire-suppressed midstory, and dense herbaceous ground cover. In Alabama, there are recorded sightings in Mobile County.

Loggerhead sea turtle (Caretta caretta), Federally listed as threatened

The most common nesting sea turtle in Alabama, loggerheads nest on open sandy beaches above the high-tide mark, seaward of well-developed dunes from the Florida border to Dauphin Island, with the majority nesting between Fort Morgan and Gulf Shores. Nesting normally occurs from early May through August, with the majority of nests being laid during June and July. Females lay three to five nests, and sometimes more, during a single nesting season. The eggs incubate approximately 2 months before hatching sometime between late June and mid-November.

Kemp's Ridley sea turtle (Lepidochelys kempii), Federally listed as endangered

Kemp's Ridley sea turtle is an occasional visitor to Alabama waters, where it is sometimes caught in shrimp nets. Although virtually the entire population nests in Mexico and southern Texas, at least three nests have been documented in Alabama (2001, 2006, and 2007). Based on USFWS records, juvenile Kemp's Ridleys are the most common marine turtle in Alabama bays and estuaries.

Amphibians

Mississippi gopher frog (Rana sevosa), Federally listed as endangered

This species is currently known from four locations in Mississippi, but it has also been recorded from Gulf Coast Flatwoods of Alabama (at the mouth of Dog River). It is highly terrestrial. Breeding occurs late January to March in open temporary ponds. Habitat includes both upland sandy habitats historically forested with longleaf pine and isolated temporary wetland breeding sites imbedded within this forested landscape.

Flatwoods salamander (Ambystoma cingulatum), Federally listed as threatened

Flatwoods salamander's historic distribution in Alabama was confined to the southernmost tier of counties (Mobile, Baldwin, Escambia, Covington, Geneva, and Houston). The most recent records are from Covington and Houston Counties, 1980 and 1981, respectively. The species has not been recorded in over two decades, despite surveys from 1992 to 1995. Characteristic habitat is pine flatwoods, where larvae utilize shallow pondcypress or blackgum ponds, marshy pasture ponds, roadside ditches, or small, shallow borrow pits.

Red Hills salamander (Phaeognathus hubrichti), Federally listed as threatened

This salamander is irregularly distributed within a narrow belt of two geological formations (Tallahatta and Hatchetigbee) in parts of five counties (Crenshaw, Butler, Covington, Conecuh, and Monroe) in the Red Hills (Schwaner and Mount 1970, Mount 1975). Its characteristic habitat is on steep slopes (especially north-facing) of ravines and bluffs dominated by hardwood trees such as magnolias, American beech, tuliptree, oaks, and hickories. Older-growth timber is preferred. Complete removal of forest canopy in most cases results in extirpation of a resident population.

Black Warrior waterdog (Necturus alabamensis), Candidate for Federal listing

The Black Warrior waterdog inhabits streams above the Fall Line within the Black Warrior River Basin in Alabama. Currently, the species is known from 14 sites in 5 counties: Blount, Marshall, Tuscaloosa, Walker, and Winston. Within these counties, occupied river systems, including the North River, Locust Fork, and Mulberry Fork, are all on the EPA's list of impaired waters. Black Warrior waterdogs are associated with clay substrates lacking silt. Stream depths range from 3.3 to 13.1 feet and contain large leaf packs supporting mayfly and caddis fly larvae.

Fish

Gulf sturgeon (Acipenser oxyrinchus dosotoi), Federally listed as threatened

Adult Gulf sturgeons migrate into large river systems between late March and early April to spawn, sometimes moving as much as 140 miles upstream. Adults and subadults return to the Gulf of Mexico in late fall. The young generally stay in the river mouth through winter and spring. Critical habitat has been designated in Alabama and includes reaches of the Escambia/Conecuh River system in Escambia, Conecuh, and Covington Counties, and the Choctawhatchee River in Geneva County.

Alabama sturgeon (Scaphirhynchus suttkusi), Federally listed as endangered

The Alabama sturgeon is now restricted to a 130-mile reach of the Alabama River below Miller's Ferry Lock and Dam. The Alabama sturgeon currently inhabits only about 15 percent of its historic range, which originally included about 1,000 miles of the Mobile River system in Alabama (Black Warrior, Tombigbee, Alabama, Coosa, Tallapoosa, Mobile, Tensaw, and Cahaba Rivers) and Mississippi (Tombigbee River).

Blue shiner (Cyprinella caerulea), Federally listed as threatened

In Alabama, the blue shiner occurs in Weogufka Creek in Coosa County; Choccolocco Creek, and the lower reach of Shoal Creek in Calhoun County; and Little River in Cherokee County. The blue shiner prefers a sand or sand-and-gravel substrate sometimes with cobble, low to moderate velocity current, and a depth of about 0.15 to 1 meter.

Palezone shiner (Notropis albizonatus), Federally listed as endangered

Palezone shiner habitat is described as upland large creeks and small rivers with permanent flow, in runs and flowing upper portions of pools over clean substrates of bedrock, cobble, and gravel mixed with clean sand. The currently documented range includes two widely disjunct populations, one of which is a 25-km reach of the Paint Rock River in Jackson County, Alabama. The other population is found in portions of the Cumberland and Tennessee River systems in Kentucky and Tennessee.

Cahaba shiner (Notropis cahabae), Federally listed as endangered

The stronghold for the species is limited to about 15 river miles between the Fall Line and Piper Bridge in Bibb County, Alabama. The species occurs in large shoal areas of the main channel of the Cahaba River, particularly in the quieter water less than 1.64 feet deep just below swift riffle areas. The species prefers patches of sandy substrate at the edge of or scattered throughout gravel beds or downstream of larger rocks and boulders. This shiner probably requires a river with sufficient small crustaceans, insect larvae, and algae for food, similar to its close relative, the mimic shiner.

Alabama cavefish (Speoplatyrhinus poulsoni), Federally listed as endangered

The Alabama cavefish is known only from the type locality, Key Cave in Lauderdale County, Alabama.

Pygmy sculpin (Cottus paulus), Federally listed as threatened

The pygmy sculpin is an Alabama endemic known from Coldwater Spring and its adjacent downstream spring run, a tributary to Choccolocco Creek in Calhoun County.

Slackwater darter (Etheostoma boschungi), Federally listed as threatened

The slackwater darter is know from disjunct populations in the Cypress Creek, Swan Creek, upper Shoal Creek, and Flint River systems in north Alabama and south-central Tennessee, and from the headwaters of the Buffalo River in Tennessee.

Vermilion darter (Etheostoma chermocki), Federally listed as endangered

The vermilion darter is limited in distribution to upper Turkey Creek, a tributary to the Locust Fork of the Black Warrior River system in Jefferson County, Alabama. The vermilion darter occurs in moderate-to-swift currents in streams of alternating riffles and pools.

Watercress darter (Etheostoma nuchale), Federally listed as endangered

The watercress darter is only known to occur in three springs in Jefferson County. A new population has been successfully established by transplanting individuals from Roebuck Springs to Tapawingo Springs, a tributary of Turkey Creek.

Boulder darter (Etheostoma wapiti), Federally listed as endangered

Boulder darters currently occur in the Elk River system in Giles and Lincoln Counties, Tennessee, and Limestone County, Alabama. In 1993, in an effort to reestablish the species within its historic range, boulder darters were released at three locations in the Elk River, all upstream of Alabama Highway 127 in Limestone County.

Rush darter (Etheostoma phytophilum), Candidate for Federal listing

The rush darter is endemic to upland portions of the Black Warrior River system in Alabama where it occurs in shallow headwater streams. This species is uncommon and sporadic within its range, as it favors shallow, flowing water in spring runs and spring-associated streams with emergent vegetation. Only three disjunct populations are known: one in the Clear Creek system in Winston County, one in spring-fed tributaries of Turkey Creek in Jefferson County, and one population in Little Cove Creek in Etowah County.

Goldline darter (Percina aurolineata), Federally listed as threatened

The goldline darter continues to exist in fragmented populations in the Coosawattee River, Georgia, in about 7 miles of the Little Cahaba River and in 27 miles of the 49 miles of historic range in the Cahaba River, Alabama. This species prefers moderate-to-swift currents and water depths greater than 2 feet. It is found over sand or gravel substrata interspersed among cobble and small boulders.

Snail darter (Percina tanasi), Federally listed as threatened

The snail darter is presently known from only six Tennessee River tributaries and from the main stem of the Tennessee River near the mouth of three tributaries. In Alabama, the snail darter is restricted to the Paint Rock River in Jackson and Madison Counties. This species prefers two types of habitat: relatively shallow gravel shoal areas with moderate to swift current, and deep slackwater pools in large streams and rivers.

Spotfin chub (Erimonax monachus), Federally listed as threatened and experimental, non-essential

Although naturally occuring populations are considered extirpated in Alabama, there is a non-essential, experimental population recently established in Shoal Creek in Lauderdale County, Alabama.

Mussels

The following mussel species in Alabama are Federally listed as endangered, threatened, or are candidates for Federal listing. Most of these species require flowing water, over clean, stable sand and gravel. Pollution; construction of dams and impounding of major rivers, such as the Tennessee, Coosa, Black Warrior, and Alabama; and dredging and channelization have resulted in the declines and extirpation of many mussel species in Alabama. The occurrence records below were based on historic and current records from Nature Serve (2006).

Table 3-2. Federally Listed Mussel Species in Alabama

Federally Listed Mussel Species in Alabama	Federal Status*	Critical Habitat Designated	County Occurrence Records
Acornshell, southern (Epioblasma othcaloogensis) **probably extirpated**	E*	Yes	Bibb, Cherokee, Etowah, St. Clair, and Shelby Counties
Bean, Choctaw (Villosa choctawensis)	C	No	Barbour, Bullock, Coffee, Covington, Dale, Geneva, Henry, Houston, and Pike Counties
Blossom, turgid (pearlymussel) *(Epioblasma turgidula)* **probably extinct**	E	No	Colbert, Franklin, and Lauderdale Counties
Blossom, yellow (pearlymussel) (*Epioblasma florentina* florentina) **probably extirpated**	E	No	Lauderdale and Colbert Counties
Catspaw (Epioblasma *obliquata obliquata*) **probably extirpated**	E	No	NA (Muscle Shoals)
Clubshell, black (=Curtus' mussel) *(Pleurobema curtum)* **probably extirpated**	E	No	NA (Tombigbee River)
Clubshell, ovate (Pleurobema perovatum)	E*	Yes	Blount, Greene, Fayette, Lee, Lamar, Lee, Etowah, Macon, Pickens, St. Clair, Sumter, Tuscaloosa, Walker, and Winston Counties
Clubshell, southern (*Pleurobema decisum*)	E*	Yes	Cherokee, Dallas, Etowah, Fayette, Greene, Lamar, Pickens, St. Clair, and Tuscaloosa Counties
Combshell, Cumberlandian (*Epioblasma brevidens)*	E*	Yes	Colbert and Etowah Counties
Combshell, southern (=penitent mussel) *(Epioblasma penita)*	E	No	Etowah, Lamar, and Marion Counties

Federally Listed Mussel Species in Alabama	Federal Status*	Critical Habitat Designated	County Occurrence Records
Combshell, upland (Epioblasma metastriata) **probably extirpated**	E*	Yes	Bibb, Shelby, and Jefferson Counties
Fanshell (Cyprogenia stegaria)	E	No	Colbert, Lauderdale, and Marshall Counties
Heelsplitter, Alabama (=inflated) *(Potamilus inflatus)*	T	No	Baldwin, Bibb, Choctaw, Clarke, Greene, Hale, Marengo, Pickens, Sumter, Tuscaloosa, and Washington Counties
Kidneyshell, triangular (*Ptychobranchus greenii*)	E*	Yes	Blount, Cherokee, Cullman, Etowah, Jefferson, Lawrence, St. Clair, Walker, and Winston Counties
Kidneyshell, Southern (*Ptychobranchus jonesi*)	C	No	Barbour and Coffee Counties
Lampmussel, Alabama (*Lampsilis virescens*)	E	No	Jackson County
Lilliput, pale (pearlymussel) *(Toxolasma cylindrellus)*	E	No	Jackson County
Moccasinshell, Alabama (*Medionidus acutissimus*)	T*	Yes	Cherokee, Etowah, Greene, Lamar, Lawrence, Pickens, St. Clair, Shelby, and Winston Counties
Moccasinshell, Coosa (*Medionidus parvulus*)	E*	Yes	Cherokee, Talladega, and Winston Counties
Moccasinshell, Gulf (Medionidus penicillatus) **Probably extirpated**	E	No	NA (Chattahoochee River drainage)
Monkeyface, Cumberland (pearlymussel) (*Quadrula intermedia*)	E	Yes	Limestone County
Mucket, orange-nacre (Hamiota (Lampsilis) perovalis)	T*	Yes	Bibb, Fayette, Greene, Jefferson, Lamar, Lawrence, Pickens, Shelby, Tuscaloosa, and Winston Counties
Mucket, pink (pearlymussel) (*Lampsilis abrupta*)	E	No	Colbert, Jackson, Madison, Morgan, Marshall, Lauderdale, Lawrence, and Limestone Counties
Oyster mussel, (Epioblasma capsaeformis)	E*	No	NA (Tennessee and Cumberland river drainages)
Pearlshell, Alabama (Margaritifera marrianae)	C	No	Conecuh and Crenshaw Counties
Pearlymussel, cracking (*Hemistena lata*)	E	No	Colbert and Lauderdale Counties
Pearlymussel, dromedary (*Dromus dromas*) **probably extirpated, possible reintroduction**	E	No	Colbert and Lauderdale Counties
Pearlymussel, littlewing (*Pegias fabula*) **probably extirpated**	E	No	Lauderdale County

Federally Listed Mussel Species in Alabama	Federal Status*	Critical Habitat Designated	County Occurrence Records
Pearlymussel, slabside (*Lexingtonia dolabelloides*)	C	No	Colbert, Jackson, Madison, and Marshall Counties
Pigtoe, dark (Pleurobema furvum)	E*	Yes	Fayette, Lawrence, Tuscaloosa, Winston, and Jefferson Counties
Pigtoe, fine-rayed (*Fusconaia cuneolus*)	E	No	Jackson, Marshall, and Madison Counties
Pigtoe, flat (=Marshall's mussel) (*Pleurobema marshalli*) **probably extirpated**	E	No	Greene and Sumter Counties
Pigtoe, fuzzy (Pleurobema strodeanum)	C	No	Barbour, Bullock, Coffee, Conecuh, Dale, Escambia, Geneva, Henry, and Pike Counties
Pigtoe, oval (Pleurobema pyriforme)	E	No	Houston County
Pigtoe, heavy (=Judge Tait's mussel) (*Pleurobema taitianum*)	E	No	Baldwin, Clarke, Dallas, Greene, Monroe, Sumter, Pickens, and Wilcox Counties
Pigtoe, rough (Pleurobema plenum)	E	No	Colbert, Lauderdale, Madison, Morgan, Marshall, Lawrence, and Limestone Counties
Pigtoe, shiny (Fusconaia cor (=edgariana))	E	No	Jackson, Marshall, and Madison Counties
Pigtoe, southern (Pleurobema georgianum)	E*	Yes	Cleburne County
Pimpleback, orangefoot (pearlymussel) (*Plethobasus cooperianus*)	E	No	Madison and Marshall Counties
Pink, ring (mussel) (*Obovaria retusa*)	E	No	Colbert and Lauderdale Counties
Pocketbook, finelined (Hamiota (=Lampsilis) altilis)	T*	Yes	Blount, Calhoun, Cherokee, Elmore, Etowah, Macon, Shelby, St. Clair, Talladega, Lawrence, Walker, Winston, Dekalb, Lee, Dallas, Clay, Bibb, Jefferson, Tuscaloosa, Fayette, Tallapoosa, and Cullman Counties
Pocketbook, shinyrayed (Hamiota (Lampsilis) subangulata)	E	No	Russell County
Purple bankclimber (Plectomerus (=Elliptoideus) sloatianus)	T	No	NA (Chattahoochee River)
Sandshell, southern (*Lampsilis australis*)	C	No	Barbour, Coffee, Covington, Dale, Geneva, Henry, and Pike Counties
Stirrupshell (*Quadrula stapes*) **probably extinct**	E	No	Pickens County
Wartyback, white (pearlymussel) (*Plethobasus cicatricosus*)	E	No	Colbert and Lauderdale Counties

Note: E=Endangered, C=Candidate, and T=Threatened
*Denotes species with designated critical habitat in Alabama

Aquatic Snails

The following Federally listed snails utilize many of the same riverine habitats discussed above under "Mussels" and have been affected by many of the same land use practices, including impoundments and the general deterioration of water quality from siltation and other pollutants contributed by past mining activities, poor land-use practices, and waste discharges. Seven of these aquatic snails are endemic to the Mobile River Basin, where they inhabit shoals, rapids, and riffles of large streams and rivers above the Fall Line. All have disappeared from more than 90 percent of their historic ranges.

Table 3-3. Federally Listed Aquatic Snail Species in Alabama

Federally Listed Aquatic Snail Species in Alabama	Federal Status	Critical Habitat Designated	County Occurrence Records
Armored snail (*Pyrgulopsis pachyta*), Federally listed as endangered	E	No	Limestone County
Cylindrical lioplax (*Lioplax cyclostomaformis*), Federally listed as endangered	E	No	Bibb and Shelby Counties
Flat pebblesnail (*Lepyrium showalteri*)	E	No	Bibb and Shelby Counties
Lacy elimia (Elimia renetella)	T	No	Talladega County
Black mudalia (Elimia melanoides)	C	No	Blount
Painted rocksnail (*Leptoxis taeniata*)	T	No	Calhoun, Chilton, Shelby, and Talladega Counties
Plicate rocksnail (*Leptoxis plicata*)	E	No	Blount and Jefferson Counties.
Round rocksnail (*Leptoxis ampla*), Federally listed as threatened	T	No	Bibb and Shelby Counties
Interrupted rocksnail (Leptoxis foremani)	C	No	Elmore
Slender campeloma (*Campeloma decampi*)	E	No	Limestone County
Tulotoma snail (*Tulotoma magnifica*), Federally listed as endangered	E	No	Calhoun, Coosa, Elmore, Shelby, St. Clair, and Talladega Counties
Rough hornsnail (*Pleurocera formani*)	C	No	Elmore, Shelby
Note: E=Endangered, C=Candidate, and T=Threatened			

Crayfish

Although there are no Federally listed crayfish in Alabama, the State is home to 83 species of crayfish, more species than any other State. Twenty are listed as critically imperiled (S-1) or imperiled (S-2) by ANHP.

Cave Shrimp

Alabama cave shrimp (Palaemonia alabamae), Federally listed as endangered

This freshwater shrimp is known from only two caves in Madison County.

Insects

Mitchell's satyr butterfly (Neonympha mitchellii mitchellii), Federally listed as endangered

There are recent isolated records of this butterfly in calcareous wetlands dominated by sedges and eastern redcedar.

Plants

Alabama canebrake pitcher plant (Sarracenia rubra ssp. alabamensi), Federally listed as endangered

This pitcher plant is found in sand hills, swamps, and sloping bogs along the Fall Line Hills in saturated, deep peaty sands or clay soils. This species is now restricted to three counties: Autauga, Chilton, and Elmore in Alabama. One of the largest populations is located in the Roberta Case Pine Hills Preserve in Autauga County managed by The Nature Conservancy.

Price's potato bean (Apios priceana), Federally listed as threatened

Price's potato bean is an herbaceous twining perennial vine typically located under mixed hardwoods or in associated forest clearings, often where bluffs or ravine slopes meet creek or river bottoms. Soils are generally well drained and loamy, formed on alluvium or over calcareous boulders. Several populations extend onto road or powerline rights-of-way (ROW). Three extant populations are known from Alabama in Madison, Autsuga, and Marshall Counties. Two of the populations are located along the floodplain of the Alabama River.

American chaffseed (Schwalbea americana), Federally listed as endangered

American chaffseed is a perennial member of the figwort family found in acidic, sandy, or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass- and sedge-dominated plant communities. It frequently grows in ecotonal areas between peaty wetlands and xeric sandy soils. In these situations, individuals sometimes extend well into the drier communities but seldom into the areas that support species characteristic of wetter soils. Surrounding plant communities are typically species-rich. There are historic records in Baldwin and Geneva Counties in Alabama.

Panhandle lily (Lillium iridollae), Candidate for Federal listing

In the Gulf Coastal Plain of Florida and Alabama, this species inhabits baygalls, wet flatwoods, seepage slopes, and the edges of bottomland forests. It is typically found in sandy peat or loamy soils which are saturated for at least part of the year and include soils classified as Bibb-Kinston-Johns complex, Dorovan-Pamlico complex, Lynchburg fine sandy loam, and Rutledge loamy sand. The sites are open to full sun or filtered light. This species often occurs in the ecotone between the more open pine/wiregrass uplands or along the stream corridor itself. In Alabama, there are records from Baldwin, Covington, and Escambia Counties.

Mohr's Barbara buttons (Marshallia mohrii), Federally listed as threatened

This aster is found in moist-to-wet prairie-like openings in pine woodlands, along shale-bedded streams, and in meadows. Other populations are located in swales on roadside ROW and in Ketona dolomite glades. It prefers full sunlight or partial shade. The soils are sandy clays, which are alkaline, high in organic matter, and seasonally wet. Common associates include various grasses, sedges, and prairie species. In Alabama, there are records in Bibb, Calhoun, Cherokee, and Walker Counties.

Tennessee yellow-eyed grass (Xyris tennesseensis), Federally listed as endangered

Although Xyris species are usually found on acidic soils, X. tennesseensis is restricted to basic or neutral soils that thinly cover calcareous substrates with year-round seepage or mineral-rich water flow. This species is found in open or thin canopy woods in gravelly seep-slopes or gravelly bars and banks of small streams, springs, and ditches. In Alabama, there are records from Bibb, Calhoun, Franklin, and Shelby Counties.

Georgia rockcress (Arabis georgiana), Candidate for Federal listing

Georgia rockcress is typically found in shallow soil accumulations on rocky bluffs, ecotones of gently sloping rock outcrops, outcrops along rivers, and sandy loam along eroding riverbanks. It is occasionally found in adjacent mesic woods, but it will not persist in heavily shaded conditions. In Alabama, there are records from Bibb, Elmore, and Wilcox Counties.

Georgia aster (Symphyotrichum georgiana), Candidate for Federal listing

This aster prefers dry open woods, roadsides, and other openings. In Alabama, there are records in Bibb, Blount, Etowah, Shelby, St. Clair, and Tuscaloosa Counties.

White fringeless orchid (Platanthera integrilabia), Candidate for Federal listing

White fringeless orchid is generally found in wet, flat, boggy areas at the head of streams or seepage slopes. The species is often found in acidic muck or sand, and in partially but not fully shaded areas. In Alabama, there are records in Calhoun, Cleburne, Jackson, Marion, Tuscaloosa, and Winston Counties.

Alabama leather flower (Clematis socialis), Federally listed as endangered

The Alabama leather flower is an erect, non-viney perennial herb known from only five sites in northeast Alabama and one in northwest Georgia. One population is protected on The Nature Conservancy's Dry Creek Preserve in St. Clair County. Locations are described as having silt and clay of alluvial, grass-sedge openings extending into the adjacent hardwood edge.

Kral's water plantain (Sagittaria secundifolia), Federally listed as threatened

Kral's water plantain typically occurs on frequently exposed shoals or rooted among loose boulders in quiet pools up to 3.2 feet or 1 meter in depth. In Alabama, this aquatic perennial is known to occur in only 12 sites scattered along 25 miles of the Little River drainage system in Dekalb and Cherokee Counties.

Whorled sunflower (Helianthus verticullatus), Candidate for Federal listing

The whorled sunflower is restricted to remnant prairie habitat. In Alabama, there are records in Cherokee County.

Leafy prairie-clover (Dalea foliosa), Federally listed as endangered

Leafy prairie-clover is a perennial herb found in open, thin-soiled limestone glades and limestone barrens. In Alabama, there are records in Colbert, Franklin, Lawrence, and Morgan Counties.

Louisiana quillwort (Isoetes louisianensis), Federally listed as threatened

Louisiana quillwort appears to be restricted to shallow blackwater streams in riparian woodland and bayhead forest areas of pine flatwoods. The plants are found on stable sand and gravel bars, moist overflow channels with silty sand substrates, and on low, sloping banks near and below water level. In Alabama, there are records from Conecuh and Monroe Counties.

Pondberry (Lindera melissifolia), Federally listed as endangered

Pondberry habitat is characterized as seasonally flooded wetlands, such as floodplain hardwood forests and forested swales, usually in shade, but tolerates full sun. In Alabama, there are 2,004 records in Covington County.

Harperella (Ptillimnium nodosum), Federally listed as endangered

Harperella is an annual that typically occurs in two habitat types: rocky or gravelly shoals of clear, swift-flowing streams, usually in microsites that are sheltered from rapidly moving water; and the edges of intermittent pineland ponds or low, wet savannah meadows on the Coastal Plain. In Alabama, there are records from Cherokee and Dekalb Counties. On non-USFS FMO, there are 642 acres of potential habitat within 200 meters of known occurrences.

Lyrate bladder-pod (Lesquerella lyrata), Federally listed as threatened

Lyrate bladder-pod is found in red soils, limestone outcroppings, disturbed cedar glades and glade-like areas, including open pastures, cultivated fields, and roadsides in calcareous areas. In Alabama, there are records in Colbert, Franklin, and, Lawrence Counties.

Gentian pinkroot (Spigelia gentianoides var. entianoides), Federally listed as endangered

Gentian pinkroot is an herbaceous perennial found in sandy or dry-mesic pine-oak woods or in longleaf pine-oak woods with a sparse herbaceous element, including wiregrass (*Aristida stricta*). It is known only from Bibb County.

Relict trillium (Trillium reliquum), Federally listed as endangered

Relict trillium is a species of mesic hardwood forests. The forests can be on slopes of various aspects and inclinations or on bottomlands and floodplains. Soils and subsoils range from rocky clays to alluvial sands; all soils have high organic matter content in the top level. In Alabama, there are records from Bullock, Henry, and Lee Counties.

Morefield's leather-flower (Clematis morefieldii), Federally listed as endangered

Morefield's leather flower is a perennial vine found in basic clay-loam soils in rocky limestone woods on the south- and southwest-facing slopes of mountains. It is currently known from only five locations in Madison County.

American hart's-tongue fern (Phyllitis scolopendrium var. americana), Federally listed as threatened

This species is typically found in areas with shady, moist areas and in dolomitic limestone. The two populations known in Alabama are associated with caves. One population occurs in a Jackson County sinkhole on lands managed as an NWR. The other population is in Morgan County, in the privately owned pit entrance to a limestone cave.

Fleshyfruit gladecress (Leavenworthia crassa), Candidate for Federal listing

The fleshyfruit gladecress occurs in limestone cedar glades, as well as disturbed roadsides, pastures, cultivated fields, and old fields. In Alabama, there are records from Lauderdale, Lawrence, and Morgan Counties.

Green pitcher plant (Sarracenia oreophila), Federally listed as endangered

Green pitcher plants are found in seepage bogs, sandstone streambanks, and mixed oak or pine flatwoods, where soils are sandy and highly acidic. In Alabama, records are from the northeastern counties of

Jackson, Marshall, Dekalb, Cherokee, and Etowah. There are confirmed records of green pitcher plant on 635 acres of non-USFS FMO in Cherokee, DeKalb, and Etowah Counties and an additional 646 acres of non-USFS FMO within 200 meters of known occurrences.

3.2.7 Wildland Fire Ecology and Management

There are two wildfire seasons each year in southeastern States. The first wildfire season usually begins in late October with the first frost and hardwood leaf drop and runs through December. The second wildfire season usually begins in February and runs to mid-April or until spring green-up. These seasons vary from year to year, depending on rainfall, wind, and other weather factors. Wildfires in the South are normally not as large as those that occur in the West because of aggressive initial fire control. However, wildfires in the South cause extensive damage and can be an avenue for decay in individual trees, weakening them and making them susceptible to insect disease and infestation (Southern Group of State Foresters 2004).

Alabama's forests and associated species are adapted to regular wildland fire. However, changing land use practices, urban sprawl, land fragmentation, natural disasters such as hurricanes, increasing land values, population increases, and the transition from urban to rural populations results in a build up of fuels and a need to increase fuels management and wildland fire activities (Southern Group of State Foresters 2004). Through the course of an average year in Alabama, there are 4,000 individual wildland fires that burn 40,000 acres (Southern Group of State Foresters 2004). The average wildfire size is approximately 12 acres per fire (AFC 2004). Escaped fires from debris burning and arson are major causes of wildland fire, though lightening accounts for approximately 7 percent of wildfires (Southern Group of State Foresters 2004). "Each year Alabama wildfires damage or destroy 46 homes, 114 structures, and 1,100 vehicles" (Southern Group of State Foresters 2004). A rapidly expanding population has led to large and expanding areas of wildland-urban interface (WUI) across the State, with an estimated 1,350 WUI communities with potential wildland fire damage risk (Southern Group of State Foresters 2004).

The Alabama Forestry Commission (AFC) is responsible for suppression of all wildland fires in the State, except on lands under Federal ownership (Southern Group of State Foresters 2004). This includes suppression of wildland fires on nearly 28 million of the 32 million acres in Alabama and 23 million acres of forestland. These suppression activities apply to State and private forested acres plus other vegetated areas, such as farms and pastures. On Federally managed lands (5 percent of the forestland base), the AFC has mutual aid agreements to support Federal wildland fire suppression efforts.

Since forestlands and species in Alabama are adapted to regular disturbance by wildland fires to maintain forest health, but suppression activities limit the role of natural wildland fires, managed fuel treatments are needed to maintain forest health. Table 3-4 shows the fuels treatments completed in Alabama by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Alabama over these 4 years. More than 98 percent of these treatments were completed by the USFS using prescribed fires approximately 90 percent of the time. More than 97 percent of Federal fuels treatments were applied in WUI areas.

Table 3-4. DOI and USDA Fuels Treatment Accomplishments for Alabama (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	69,112	3,602	72,714	3,529	5,190	8,719	81,433
2005	84,804	12,313	97,117	157	282	439	97,556

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2004	82,391	6,336	88,727	0	0	0	88,727
2003	76,884	16	76,900	0	0	0	76,900
Source: http://www.fireplan.gov/overview/States/al.html, accessed March 2, 2007							

Fuels treatments, including prescribed fire, are also implemented by the AFC on the private and State-owned forests. In addition, the AFC provides training and permitting to ensure that fuels treatments in these areas, and prescribed fire in particular, are completed in a manner that protects firefighter and public safety, as well as capital improvements and natural resources.

3.2.8 Cultural Resources

The Alabama surface and non-USFS FMO tracts have not been fully surveyed for cultural resources. Surveys that have been conducted are usually initiated by project proponents on a project-specific basis, such as for oil and gas, coal mining, transportation, or water projects, to comply with the requirements of Section 106 of the National Historic Preservation Act (NHPA), outlined in 36 Code of Federal Regulations (CFR) Part 800. Section 106 requires Federal agencies to identify prehistoric and historic properties potentially affected by an undertaking; assess the effects of the undertaking; consult with appropriate entities; and seek ways to avoid, minimize, or mitigate any adverse effects to the property.

A cultural resources literature and records search was conducted for the BLM surface and non-USFS FMO tracts in the State of Alabama. The results of the research are presented in an overview (Panamerican Consultants, Inc. 2005a) on file at the BLM office in Jackson. The following cultural resource information was taken from Panamerican Consultants, Inc. (2005a), unless otherwise noted.

Prehistory

A variety of cultural resource site types attributed to a range of culturally distinct chronological periods ranging from more than 10,000 years ago to the present day have been recorded in the southeastern United States. The cultural time periods represented include Paleoindian, Archaic, Gulf Formational, Woodland, Mississippian, and Protohistoric. Descriptions of the prehistoric periods and general types of cultural materials associated with each one are provided in Table 3-5 below. Cultural resources from any of these time periods may be present on BLM-administered surface and non-USFS FMO tracts.

Table 3-5. Prehistoric Periods Present in Southeastern United States

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
PALEOINDIAN	12,500–10,000	Specialized nomadic hunters of now-extinct megafauna
Early Paleoindian	12,500–10,900	Fluted lanceolate points resembling western Clovis forms
Middle Paleoindian	10,900–10,500	Fluted and unfluted points with broad blades and constricted hafts, such as Cumberland, Suwannee, Simpson, Quad, and Beaver Lake
Late Paleoindian	10,500–10,000	Resharpened lanceolate corner- and side-notched forms, such as Dalton, San Patrice, and Bolen

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
ARCHAIC	10,000–3,000	Marked by a shift in lifeways indicated by development of a more complex material culture, nomadism giving way to more sedentism, localized habitat exploitation, and dramatic population increase; many tool forms appeared for the first time during this stage
Early Archaic	10,000–8,000	A directional shift from highly curated tool forms associated with Paleoindian sites to highly expedient forms linked to Early Archaic corner-notched assemblages; an increase in residential mobility, as indicated by greater numbers of expedient tools in Early Archaic assemblages
Middle Archaic	8,000–5,000	Demarcated by the appearance of stemmed bifaces
Late Archaic	5,000–3,050	Increased sedentism and a practice of a dichotomous pattern of resource exploitation that shifted between riverine and uplands locations
GULF FORMATIONAL	4,000–1,850	Primarily recognized as an intermediate stage of social and economic change; the rise and development of baked clay ceramic technology during which Archaic peoples learned the manufacture of stone and ceramic vessels
Middle Gulf Formational	3,200–2,500	Characterized by fiber-tempered plain and punctate wares
Late Gulf Formational	2,500–2,100	Represented by disappearance of fiber-tempered ceramics and the rise of more decorative ceramic series
WOODLAND	2,600–850	Marked by the advent of cord-marked, fabric-impressed, and stamped pottery, construction of burial mounds, and increased reliance on domesticated cultigens; the bow and arrow was introduced
Early Woodland	2,950–2,050	Three phases, including the Kellog phase (sand-tempering fabric-impressed pottery types), Dry Branch phase (sand-tempered incised, punctated, and pinch pottery types), and Cedar Bluff phase (limestone-tempered fabric-impressed pottery)
Middle Woodland	2,150–1,550	Diversity in style and manufacture of pottery increased markedly; there was also an increase in burial mound construction, shared artifacts, and iconography, suggesting that a wide trade interaction continued across the United States
Late Woodland	1,550–950	A period of cultural decline related to turmoil across much of the East; however, this was not the case in every region of the Southeast; some diffusion of exotic and decorative motifs on pottery, and mound construction continued to play a crucial role in some regions of the eastern United States; population growth exploded early in this period; consequently, small communities and households were widely scattered across the landscape; the increase in population stress, particularly over food resources, and increased use of the bow and arrow, heightened warfare

Cultural Time Period	Time Frame (Years Before Present [B.P.])	Characteristics
MISSISSIPPIAN	1,050–450	Complex sociopolitical organizations (chiefdoms) marked by the development of institutional inequality; large fortified settlements and civic-ceremonial centers distinguished by elaborate temple mounds were widespread phenomena during the Mississippian period
Early Mississippian	1,050–750	A very complex society and diversity varied greatly throughout the Southeast
Mature Mississippian	750–450	A very complex society and diversity varied greatly throughout the Southeast
PROTOHISTORIC	400–235	Defined in the southeastern United States as the era of transition from occupation of the region by preliterate societies to occupation by literate societies; widespread destruction of Indian villages and fields and introduction of previously absent Euro-Asian diseases caused massive demographic upheaval; trade and political networks were altered or broken down, and whole populations relocated or were devastated by illness
Source: Panamerican Consultants, Inc. 2005a, 2005b.		

History

A wealth of Alabama history is associated with American Indian inhabitants, European exploration, multiple battles, and the evolution of Southern culture. The events discussed below provide the context and relative importance of the cultural site types that may be encountered on BLM-administered surface and non-USFS FMO tracts.

From the 16th to the 19th century, Spain, France, and England fought for domination and possession of the territories and resources in the southeastern United States. Led by Hernando De Soto, Spanish explorers in search of gold were the first Europeans to reach this territory in 1539. During the Pontotoc Battle of 1541, many members of De Soto's expedition were killed in an attack by the Chickasaw Indians. An initial settlement in the Mobile Bay area by Spanish colonists from Mexico was abandoned in 1559, and Spain made no further effort to settle the area. The French were the first to successfully colonize Alabama. Early settlements were fortified trading posts along major rivers. French influence waned as the American Indians began to favor British traders from the Carolinas and Georgia. Great Britain and France fought a series of wars, climaxing with the French and Indian War (1754–1763). By the terms of the treaty ending the war, France ceded its North American lands to England. Britain created Reservation Lands for the American Indians in portions of the southeastern States.

American Indians had low immunity to new diseases brought by Europeans. By the 18th century, their numbers had been reduced and many tribes approached extinction (Dobyns 1983; Milner 1980; Ramenofsky 1987). Most of the survivors in present-day Alabama were members of four major Indian nations—the Creek, the Cherokee, the Chickasaw, and the Choctaw. The Cherokee Indians inhabited the northeastern corner, and the Chickasaw Indians claimed the northwestern corner of the State. The Choctaw Indians lived in the west-central portion, and the Creek Indians occupied the east-central and southern portions of the State.

In the language of the local Creek Indians, the word Alabama means "tribal town." The American Revolution (1775–1783) had a profound effect on Alabama and American Indians, as did the Louisiana

Purchase, the War of 1812, and the Creek War. Until 1817, Alabama was a part of the Mississippi Territory, but in 1819, it became the 22nd State to enter the Union. From 1829–1837, the remaining Indian nations were forced to give up their lands and were moved west of the Mississippi. From the early 19th century, Alabama's economy was dominated by cotton. The highly productive regions of the State, namely the Black Belt region and the Tennessee Valley, soon brought a shift from independent, small farms to large plantations. Slavery was vital to the growth and production of cotton and became a contentious issue in Alabama and the other States. The pro-slavery States began to move toward secession from the Union, and in 1861, Alabama also voted to secede (Butterworth 1959). The people of Alabama played a major role in the Civil War; multiple battles were fought on State soil; and Montgomery was the first capital of the Confederacy, which was later moved to Virginia. In 1865, the Civil War ended and slaves were emancipated. Sharecropping and tenant farming became the common mode of farming.

In the late 1870s, railroads were built and cities that focused on the steel and iron industry emerged in north and north-central Alabama. Boll weevil damage to cotton crops in 1915 and exorbitant shipping charges caused farmers to concentrate on raising livestock and crops other than cotton. Coal mining also increased and brought new industry and economic opportunities to relatively poor regions of the State. In the 1930s, low-cost power provided by the Tennessee Valley Authority (TVA) encouraged industrial development and provided some rural residents with electricity for the first time. Alabama industry and farming further prospered under the demands of World War II (Rogers 1994). Alabama retained segregation as a policy until the civil rights movement from the 1950s through 1960s. Many of the major events and court cases that defined the modern civil rights movement in the United States took place in Alabama, including equal access for Black Americans to public and private transportation, schools, voting booths, economic opportunities, and housing. Manufacturing remained the dominant economic sector through the 1990s. Alabama's gross product also received significant contributions from the Government and service sectors.

Cultural Resource Sites

Prehistoric or historic cultural resource sites, structures, or objects listed on or eligible for listing on the National Register of Historic Places (NRHP) are protected and managed as directed by 36 CFR 800. A resource is considered eligible for listing in NRHP if it is at least 50 years old, unless of exceptional historical significance; retains integrity of location, design, setting, materials, workmanship, feeling, and association; and has one or more of the following characteristics:

- Associated with events that have made a significant contribution to the broad patterns of history
- Associated with the lives of persons significant in its past
- Embodies the distinctive characteristics of a type, period, or method of construction
- Represents the work of a master, has high artistic values, or represents a significant and distinguishable entity whose components may lack individual distinction
- Yielded, or may be likely to yield, information important in prehistory or history (36 CFR 60.4).

Cultural resources found ineligible for the NRHP require no further archaeological work and are not protected by law. Sites identified as undetermined or unknown need additional work to determine the site's eligibility.

Under the Archaeological Resources Protection Act (ARPA; 16 United States Code [USC] Section 470hh), the nature and location of any archaeological resource cannot be disclosed to the public unless the Federal land manager determines that such disclosure would provide further protection and there is no risk of harm to the site. To adequately address the existing condition of these resources while protecting their importance, only the general types of resources are discussed herein.

Records were searched for 2,847 non-USFS FMO tracts in Alabama. The records revealed 1,348 cultural sites within the BLM-administered, non-USFS FMO tracts, of which 315 were considered eligible for NRHP. Components of these sites ranged from Paleoindian to 20th-century historic. Most of the tracts have never been surveyed. There is a high potential for finding additional archaeological sites.

Records were searched for scattered BLM surface tracts in Alabama. None of the BLM surface tracts contain previously recorded NRHP properties. Thirteen sites were recorded within one-half mile of the BLM surface tracts and could provide information on the potential for occurrence sites on adjacent BLM surface tracts; however, these sites are not and will not be affected by BLM activities and management. Identified cultural sites are summarized in Table 3-6.

Table 3-6. Cultural Sites on BLM Surface and non-USFS FMO Tracts in Alabama

Tract Type	Total Sites	NRHP Status		
		Potentially Eligible/ Eligible	Ineligible	Undetermined/ Unknown
Non-USFS FMO Tracts	1,348	315	669	364
Surface Tracts[1]	0	0	0	0
Areas Adjacent to Surface Tracts[2]	13	0	13	0

1 Sites located on surface, belong to surface owner.
2 Reflects sites within one-half mile of the surface tract boundaries.

3.2.9 Visual Resources

Visual resources consist of the natural and manmade features that contribute to a particular environment's aesthetics. These features may be natural (e.g., canyon views) or manmade (e.g., city skyline). Together, they form the overall impression of an area referred to as the landscape character. Visual resources also have a social setting, which includes public values, awareness, and concern about visual quality. Visual Resource Management (VRM) classifications are established for public lands so that visual resource values can be maintained through informed management decisions. Current conditions of visual character on the BLM-administered surface tracts are discussed in Section 3.3.

The visual resource inventory process contained in BLM Handbook H-8410-1 provides the BLM managers guidance for determining visual values. The inventory consists of scenic quality evaluation, sensitivity-level analysis, and delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resource: Classes I and II are the most valued, Class III represents a moderate value, and Class IV has the least value. Management objectives have been assigned to each class. An area may be inventoried as VRM Class III, but a decision may be made to manage it to VRM Class IV, or vice versa. Cultural modifications may detract from the scenery, complement it, or improve the overall scenic quality of an area. Cultural modifications in landform/water and vegetation values and addition of structures will be considered in examining proposed resource management actions.

The following VRM Class objectives from BLM Handbook H-8410-1 have been amended for the purpose of developing and implementing this resource management plan (RMP). Amendments incorporate the visual resource values provided by existing cultural features that are significant to the character of the landscape in Alabama and Mississippi.

- **VRM Class I Objective.** The objective of this class is to preserve the existing natural and cultural character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not detract from the existing landscape character.
- **VRM Class II Objective.** The objective of this class is to retain the existing natural and cultural character of the landscape. The level of change to the characteristic should be low. Management activities may be visible but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural and/or cultural features of the characteristic landscape.
- **VRM Class III Objective.** The objective of this class is to partially retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may be visible but should not dominate the view of the casual observer. Changes should blend with the natural environment.
- **VRM Class IV Objective.** The objective of this class is to provide for management activities that require significant modification of the existing landscape or the existing character of the natural and cultural landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the casual observer's attention; however, every attempt should be made to minimize the impact of these activities through selective location, minimal disturbance, and repetition of basic elements.

3.2.10 Minerals

There are 313,819 acres of non-USFS FMO in Alabama that underlie various surface ownership. Surface owners include the BLM, the Department of Defense (DoD), USFWS, National Park Service (NPS), and other Federal agencies. Table 3-7 shows BLM-administered FMO by surface ownership in Alabama.

Table 3-7. BLM-administered Federal Mineral Ownership by Surface Ownership in Alabama

Surface Owners	Federal Mineral Ownership (Acres)
BLM	159
DoD	1,495
NPS	3,300
USFWS	3,384
Other Federal Agencies	2,041
Non-Federal surface	303,440
TOTAL non-USFS FMO	**313,819**
USFS	585,394
TOTAL FMO (included USFS FMO)	**899,213**

Minerals—Oil and Gas

Oil and gas exploration began in Alabama in 1884 with the drilling of the Trowbridge #1 well near Bladen Springs in Choctaw County. This first well was a dry hole with a depth of 1,345 feet. Eighteen

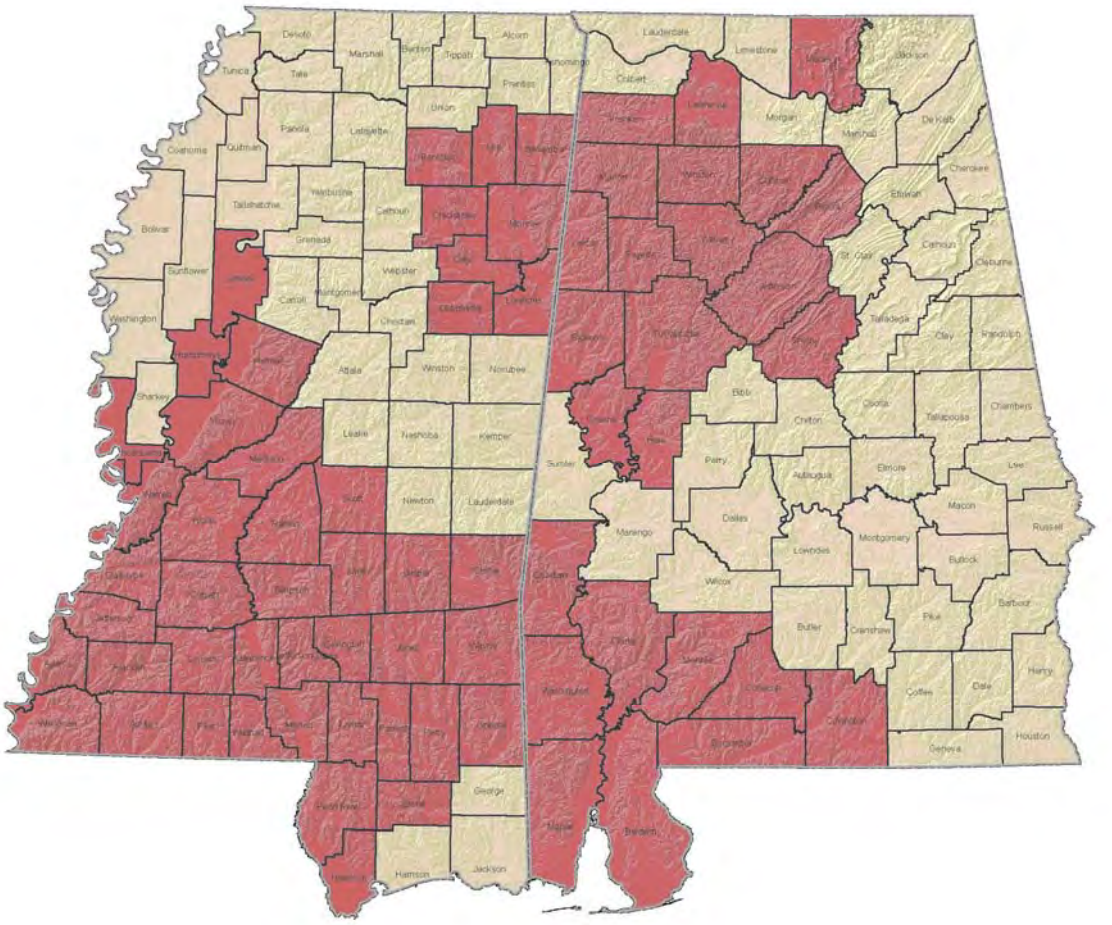
years later (1902), the New York–Alabama Oil Company discovered the Huntsville Gas Field, which started the commercial extraction of oil and gas in the southeastern States. As of April 2005, there were 31 active oil and gas wells on BLM-administered, non-USFS FMO according to data from the Automated Fluid Mineral Management System.

According to available data from the Alabama Oil and Gas Board on Alabama oil and gas production from 1992 to 2002, oil production steadily decreased from 19,328,444 barrels to 8,631,227 barrels. During the same period, gas production increased from 336,129,406 thousand cubic feet (mcf) in 1992 to 388,631,710 mcf in 2002. Gas production peaked in 1995 at 438,838,497 mcf. As of April 2005, 136 Federal leases are authorized in Alabama. There area 30 existing leases on non-USFS FMO and 106 existing leases on USFS FMO.

Map 3-2 shows counties in Alabama with historical oil and gas production. Reasonable foreseeable development is anticipated in the areas of historical oil and gas production (BLM 2004b). The areas of historical production are the Warrior Basin and the southern Alabama Basin. The BLM projects that 20 wells accessing non-USFS FMO in Alabama would be drilled over the next 20 years (BLM 2004b).

Map 3-2: Oil and Gas Production

Alabama-Mississippi RMP-EIS



Oil and Gas Production

- Counties Where Production Has Occurred
- Counties Where Production Has Not Occurred
- County Boundary
- State Boundary

Both states are considered high potential for oil and gas

Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)

Sources: BLM, Jackson Field Office
Environmental Systems Reasearch Institute
USGS - National Elevation Data

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Warrior Basin[2]

The roughly triangle-shaped Warrior Basin covers approximately 35,000 square miles in parts of Alabama, Arkansas, Georgia, Mississippi, and Tennessee. The northern boundary of the Warrior Basin is formed by the Ozark Uplift to the northwest and the Nashville Dome to the northeast. To the east and southeast, the basin is bound by the Appalachian system, and the Ouachita Fold and thrust belt bound the basin on the west and southwest.

Most of the oil and gas production is from the Mississippian and Pennsylvanian strata. The basin has a variety of trapping mechanisms with possibilities for multiple pay zones, which has led to a success rate of more than 50 percent. The Carter Sandstone of the Parkwood Formation is the most prolific oil- and gas-producing reservoir; however, a considerable amount of petroleum is produced from the Chandler and Nason Sandstones of the Pottsville Formation.

The major targets for coalbed natural gas production are the major coal groups in the Warrior Coal Field. These groups are the Black Creek, Mary Lee, and Pratt coal groups. However, all the coals can be potential sources of coalbed natural gas (BLM 2004b). Most of the coalbed natural gas wells in this area are producing from coals between 15 to 25 feet thick and at depths between 500 and 3,000 feet. The median product per well is 82 mcf per day.

Southern Alabama Basin

These lands are in an area dominated by the Gulf Coast geosyncline. This large basin was formed in the Jurassic period with a southward downwarping. The basin has accumulated sedimentary deposits as much as 30,000 feet thick. Zones of faults parallel the basin hinge line and can trap hydrocarbons (Murray 1964). Other structural features, such as small basement highs, also trap hydrocarbons.

The deposits in the major geologic units of southern Alabama mainly consist of alternating layers of sand and clay, with occasional beds of carbonates and anhydrite. Permeable horizons exist in all formations, and oil and gas are produced from each horizon in the region, with the Haynesville, Smackover, and Norphlet Formations having more importance (Cate 1982; Poe 1979; May 1974; Moore 1971; Dinkins 1968).

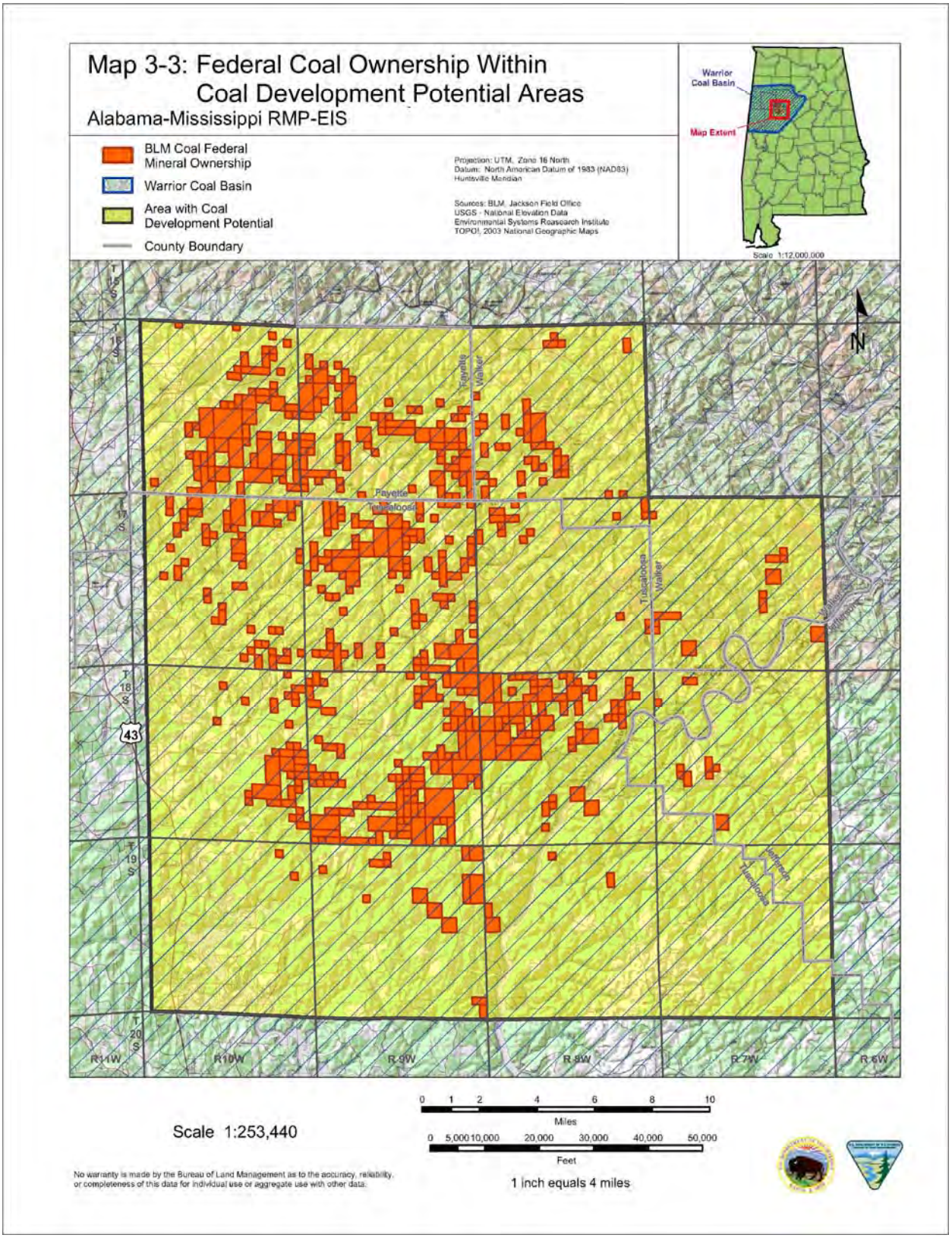
Leasable Minerals—Coal

There are three major coal fields in Alabama: the Coosa Coal Field, Cahaba Coal Field, and Warrior Coal Field. Farthest to the southeast, the Coosa Coal Field covers approximately 134,400 acres in Jefferson, Shelby, and St. Clair Counties in an elongated syncline along the trend of the Appalachian Mountains. Southwest of the Coosa Field and separated by the Cahaba Valley, the Cahaba Field includes approximately 230,400 acres of Bibb, Shelby, St. Clair, and Jefferson Counties. The largest of the three coal fields in Alabama, the Warrior Coal Field, includes approximately 2,324,470 acres in Walker, Fayette, Jefferson, and Tuscaloosa Counties.

Consideration of Alabama coal leasing in this RMP is limited to the Warrior Coal Field. Coal leasing potential within the planning area is limited to the Warrior Basin in Alabama because of the distinctive presence of the appropriate geological conditions (e.g., continuity of coal beds, thickness of coal, quality of coal seams) and existing infrastructure (e.g., existing subsurface mining operations and access roads) for development of coal resources. Non-USFS FMO available for coal leasing is located in Walker, Fayette, Jefferson, and Tuscaloosa Counties.

[2] The term "Warrior Basin" is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.

Within the Warrior Coal Field, the BLM retains 70,610 acres of coal mineral rights, 45,950 acres of which have been identified as high potential for development in the reasonably foreseeable development scenario (RFDS). It is anticipated that 9,000 acres of new Federal coal leases and 18.8 million tons of Federal coal would be produced (an average of 1.9 million tons per year) as part of existing underground mines with no new surface disturbance. This field includes two regions, the Plateau coal region and the Warrior coal basin (Map 3-3). The Plateau coal region is composed of several coal-bearing areas in the upland regions of northeastern Alabama. Federal coal ownership in the Plateau coal region is limited to the Talladega National Forest. The Plateau coal region is the largest of the Alabama coal fields, covering an area greater than all the other coal fields combined (2,880,0000 acres). The Warrior Basin is the most productive and covers 2,240,000 acres in Tuscaloosa, Jefferson, Lamar, Marion, Winston, Fayette, Cullman, Blount, and Walker Counties. These coalbeds in the Plateau coal region and the Warrior coal basin are the major targets for the recovery of coalbed natural gas in the area, but all the coals can be sources of potential coalbed natural gas reserves (BLM 2004b). There is no BLM-administered surface in the Warrior coal basin. The Warrior coal basin contains more than 20 coalbeds, some of which are known to extend into the BLM-administered, non-USFS FMO of Mississippi. Most coal in the Warrior Basin is high-volatile "A" bituminous. Coal thickness generally varies from a few inches to about 75 inches, with ash content ranging between 3 and 15 percent and the sulfur from 1.1 to 3 percent. The thickest and most economically valuable coals within the Warrior coal basin are located in Tuscaloosa, Walker, Fayette, and Jefferson Counties. Coal is also present to a lesser degree in Marion and Winston Counties, but the development of Federal coal in these counties is unlikely. However, because of the depth of the mines and the availability of other easily obtainable resources such as oil and gas, much of the coal resources within the Warrior coal field have yet to be developed (Tew and Mancini 1986). On the basis of current information on and availability of other fuel resources, coal development will likely continue at the current rate.


Map 3-3: Federal Coal Ownership Within
Coal Development Potential Areas
Alabama-Mississippi RMP-EIS
BLM Coal Federal Mineral Ownership
Warrior Coal Basin
Area with Coal Development Potential
County Boundary
Projection: UTM, Zone 16 North
Datum: North American Datum of 1983 (NAD83)
Huntsville Meridian
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Research Institute
TOPO!, 2003 National Geographic Maps
Warrior Coal Basin
Map Extent
Scale 1:12,000,000
N
Fayette
Walker
Tuscaloosa
Jefferson
T 15 S
T 16 S
T 17 S
T 18 S
T 19 S
T 20 S
43
R 11W
R 10W
R 9W
R 8W
R 7W
R 6W
Scale 1:253,440
0 1 2 4 6 8 10
Miles
0 5,000 10,000 20,000 30,000 40,000 50,000
Feet
1 inch equals 4 miles
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

3.2.11 Recreation and Travel Management

Recreation encompasses various human activities that affect and are affected by resources and other resource uses. Dispersed recreation is characterized by unstructured activities that are not confined to specific locations (such as developed recreation sites). Dispersed recreation can involve various activities, which on the Alabama surface tracts can include the following:

- Saltwater beach activities
- Hunting
- Fishing
- Bicycle riding
- Horseback riding
- Nature study
- Boating
- Picnicking
- Freshwater swimming
- Hiking
- Rock climbing.

The BLM-administered, non-USFS FMO includes the mineral estate where the surface is managed by another Federal surface managing agency. These properties and installations managed by other Federal agencies as well as non-Federal agencies, such as private, State, or county, are summarized in Table 3-8 and shown on Map 1-1 and Map 1-2.

For those tracts where the surface is managed by other surface management agencies and where public access for recreation and oil and gas leasing are permitted, recreation experiences and resulting benefits could be affected by the BLM-allowable uses and management actions proposed in this RMP. Information on public recreation and minerals leasing on other Federal surface management agencies is shown in Table 3-8.

Table 3-8. BLM-administered, non-USFS Federal Mineral Ownership[1] by Surface Managing Agency in Alabama

Surface Managing Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
USFWS	Bon Secour NWR	Yes	Closed
	Wheeler NWR	Yes	Closed
DoD	Barin Field (Navy)	ND	Open
	Summerdale Outlying Landing Field (Navy)	ND	Open
	Silverhill Outlying Landing Field (Navy)	ND	Open
	Fort Rucker Military Reservation (Army)	Yes	Open
	Fort McClellan Military Reservation (Army, Closed)	Yes	Open
	Anniston Army Depot (Army)	No	Open
	Redstone Arsenal (Army)	No	Open
	Lake Tholocco (Army Corps of Engineers)	Yes	Open

Surface Managing Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
	Coffeeville Lake (Army Corps of Engineers)	Yes	Open
	William Dannelly Reservoir (Army Corps of Engineers)	Yes	Open
	Maxwell Air Force Base (Air Force)	No	Closed
NPS	Little River Canyon Preserve	Yes	Closed
Other	Areas managed by other Federal agencies	No	Varies

ND means no information was available from the surface managing agency.
1 Does not reflect BLM FMO for BLM surface tracts (159 acres).
2 Closed means closed to new leases. Existing leases could be present on areas currently closed.

The BLM administration of travel resources in Alabama is limited to access routes and associated access/maintenance routes for ROW such as transmission lines. Public travel routes are administered and maintained by other Federal, State, and local agencies. Some surface tracts are adjacent to these travel routes. Information on tract-specific travel resources are contained in Section 3.3.

3.2.12 Lands and Realty

The goals of the lands and realty program are to manage the public lands to support the goals and objectives of other resource programs, provide for uses of public lands in accordance with regulations and compatibility with other resources, and improve management of the public lands through land tenure adjustments. The lands and realty program is a support program to all other resources to help ensure that BLM-administered lands are managed to benefit the public. Current conditions of lands and realty on the BLM-administered surface tracts are discussed in Section 3.3.

3.2.13 Social and Economic

The affected environment in Alabama centers on the counties in the coal region where energy minerals development could occur. Over the last 10 to 20 years, oil and gas development has occurred primarily in the counties with high potential for coal (BLM 2004b). Therefore, the socioeconomic description is limited to the counties with high potential for coal: Tuscaloosa, Walker, Fayette, and Jefferson Counties.

Demographic, economic, and service data were collected from the U.S. Census, Bureau of Economic Analysis (BEA) and Bureau of Labor Statistics (BLS) from 1990 to 2002.

Economic Characteristics

Household and Personal Income

Median household income information for the four-county study area was obtained from the U.S. Census Bureau. In 2003, Jefferson County's median household income of $38,558 is slightly higher than the median household income estimated for Alabama, which is $36,131. The median household incomes for Fayette, Walker, and Tuscaloosa Counties ($30,133, $31,201, and $35,192, respectively) are slightly lower than Jefferson County and the State in 2003.

Information on per capita income was obtained from BEA. Jefferson and Tuscaloosa Counties reported higher per capita incomes ($36,041 and $28,833, respectively) than Walker and Fayette Counties

($24,734 and $22,073, respectively) for 2004. Jefferson and Tuscaloosa Counties' per capita incomes are higher than those of the State ($27,695) for 2004. Trend information on per capita income was also obtained from BEA and adjusted for inflation (Figure G-5, Appendix G). Jefferson County's per capita income averaged $33,065 over the 15-year period and has been consistently higher than the State average ($26,594). Over this same time period, the average per capita income for Tuscaloosa County ($27,136) has been similar to the State average, while Walker and Fayette Counties have had lower average per capita income ($24,221 and $21,902, respectively) than the State average.

Employment and Compensation

Information on employment by industry for the study area was obtained from BEA and U.S. Census County Business Patterns.[3] There were 610,890 estimated jobs in the study area in 2004, which represent 24.9 percent of the Alabama labor force. The 610,890 jobs were distributed among the industries shown in Figure G-7 (Appendix G). Government and government enterprises (15.1 percent) composed the largest percentage of jobs. Retail trade (12.0 percent), health care (9.7 percent), and manufacturing (7.5 percent) were the next largest employers.

Unemployment trends information for the non-USFS FMO study area and the State of Alabama was obtained from BLS and are summarized in Figure G-4 (Appendix G). The unemployment rates in Tuscaloosa and Jefferson Counties have remained below the State unemployment rate from 1990 to 2005. Walker and Fayette Counties' unemployment rates were generally higher than the State's rate for the same time period. Overall, the unemployment trends of the four counties generally mirror the trend of the State, although Fayette County unemployment trends have greater magnitude in their movements.

In the four-county study area, the BLM administers the leasing of coal resources, allowing for the production of 1.9 millions tons of coal per year from these BLM minerals. In Alabama, mining (non oil and gas) accounts for approximately 6,773 employees and employee compensation of $482,361,000 (BEA 2005). Currently coal produced from BLM-administered minerals accounts for approximately 10 percent of the total amount of coal produced in the State, 19.5 million tons of coal (Energy Information Agency 1999). If 10 percent of this employment and employee compensation can be attributed to BLM-administered minerals, this activity provides for 677 employees in mining, with total mining employee compensation of $48,236,100. The average annual employee compensation for these workers is $71,218, compared with average annual compensation from all industries in the State of $34,877 (BEA 2005). Mining in the four-county study area likely provides fiscal revenues to local and State governments, supporting community and emergency services, schools, and infrastructure.

Oil and gas also provides employment and income within the four-county study area. However, over the past 20 years, the BLM has permitted 17 wells of a total of 8,068 wells permitted within the State. Therefore, although these BLM-administered oil and gas resources do contribute to employment and earnings in this area, it is a fairly small amount.

Social Characteristics

Demographics

Population trend data were obtained from BEA. Data for the non-USFS FMO study area between 1990 and 2004 are summarized in Figure G-1 (Appendix G). Total population in the combined study area in 2004 was 913,707 and comprised 20.2 percent of the population of Alabama. Jefferson County's

[3] *U.S. Census County Business Patterns data was used to estimate employment by industry data that were not disclosed by the BEA.*

population was the largest in 2004 with 658,468 residents. For the same year, Tuscaloosa County (167,178), Walker County (69,876), and Fayette County (18,185) populations were considerably smaller. All four counties experienced small population growth over the 15-year period. The total population in the combined study area increased by 2.8 percent from 888,982 in 1990 to 913,707 in 2002. The median age of the combined study area population in 2000 was estimated to be 35.6—slightly lower than the State median of 35.8 (U.S. Census 2000).

Housing

The average number of people per household in Walker County (2.46), Jefferson County (2.45), Fayette County (2.42), and Tuscaloosa County (2.42) are similar. The average number of people per family in Jefferson County (3.04), Tuscaloosa County (3.00), Walker County (2.93), and Fayette County (2.92) are also similar (BEA 2000). In the study area, 91 percent of the 363,639 housing units were occupied in 2000. Homeowners occupied 67 percent of the total housing units.

All four counties in the study area have low homeowner vacancy rates: 1.9 percent in Jefferson County, 1.8 percent in Walker County, and 1.7 percent in Fayette and Tuscaloosa Counties. Rental vacancy rates are somewhat higher: 14.1 percent in Walker County, 12.3 percent in Tuscaloosa County, 11.1 percent in Fayette County, and 10.2 percent in Jefferson County (U.S. Census 2000). The median value of owner-occupied housing units for Tuscaloosa and Jefferson Counties ($106,600 and $90,700, respectively) were higher than the State median ($85,100). Walker and Fayette Counties' median value of owner-occupied housing units ($66,700 and $64,100, respectively) were lower than the State's median (U.S. Census 2000).

Educational Attainment

Educational attainment of the population that is 25 years of age and older varies between the four counties in the study area. In Jefferson County, 80.9 percent of the population has graduated high school or higher and 24.6 percent hold a bachelor's degree or higher (U.S. Census 2000). Tuscaloosa County has a similar populace, with 78.8 percent graduating high school or higher and 24.0 percent with a bachelor's degree or higher. The percentage of the population graduating from high school or higher for Walker and Fayette Counties is 67.2 percent and 66.1 percent, respectively, and those having a bachelor's degree or higher is 9.1 percent and 9.2 percent, respectively. The educational attainment in figures in Walker and Fayette Counties are lower than those in Jefferson and Tuscaloosa Counties.

Attitudes and Beliefs of Alabama Stakeholders

In Alabama, the BLM has responsibility for a number of issues and decisions that could be important to stakeholders and their beliefs, including Federal land disposal, mineral development, including coal and oil and gas. This section will briefly describe stakeholders' attitudes and beliefs related to these specific issues to provide a social context for these decisions.

Public lands are important in providing a natural resource base for economic activities. Oil and gas, as well as coal, development will be supported by some stakeholders and not by others. Stakeholders who support mineral development believe that domestic production of resources provides products on which the public relies heavily, generating economic and social benefits. Without the availability and access for development of these resources, stakeholders feel that many adverse impacts could occur, including trade gaps, increasing prices, and strategic vulnerabilities. Additionally, the mineral industries have contributed to the tax base of both counties and the State, providing funds for local, regional, and State governments, infrastructure, schools, and other community services. Many people believe that this funding is vital to the economy of Alabama counties and the State. Some stakeholders will support these mining activities due

to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.

Conservation-focused stakeholders may not support mineral development or might support conditions and stipulations on development and production to reduce negative impacts to the surface and subsurface. These environmental stakeholders are concerned about erosion and water quality impacts associated with road and wellpad construction as well as water disposal in the production process. Some stakeholders believe that the potential long-term environmental risks of development are considerable compared to the short-term benefit of the resource extracted. Additionally, these types of stakeholders believe that mineral development impacts such as increased road building, associated road traffic, dust, and noise add to the negative impacts associated with this type of development.

Public land disposal may also be a contentious issue with the public. The BLM in Alabama manages a number of pocket properties scattered across the State, totaling 159 acres. Preservation-oriented stakeholders are concerned about protecting open spaces and limiting development on these lands, often to maintain a quality of life that the property provides. For example, quality of life attributes could include recreation, such as bird-watching or walking, solitude, and the knowledge that the property provides important wildlife habitat. Therefore, these types of stakeholders believe that keeping the surface lands in Federal ownership is preferable or selling these lands to organizations interested in preserving the lands. Developers might be interested in purchasing these lands for their economic value due to their location on the coast if the lands are buildable. Additionally, some people may feel that disposing of Federal lands provides important fiscal revenues as private property taxes can be collected.

Environmental Justice

Environmental justice is another component of the community that considers minority or low-income populations to determine whether or not any of the proposed alternatives have a disproportionately high and adverse human health or environmental effect on those populations. Environmental justice analysis is conducted in compliance with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations. On the basis of Council on Environmental Quality (CEQ) guidance, minority populations should be identified where (a) the minority population of the area exceeds 50 percent, or (b) the minority population percentage of the affected area is significantly greater than the minority population percentage in the general population or other appropriate unit of geographic analysis.[4] Low-income populations are defined as those below the Federal poverty thresholds. Those populations are identified using statistical poverty thresholds from the Bureau of Census—$17,463 for a family of four (U.S. Census 2000). EPA identifies a low-income community as an area with a significantly greater population of low-income families than a statistical reference area.[5] For the purposes of this socioeconomic analysis, a low-income population area will be defined as an area where the low-income population exceeds 20 percent poverty or one where isolated pockets of large low-income populations are present.

The poverty levels in three of the four counties (Fayette, Tuscaloosa, and Walker Counties) are higher than the statewide estimate of 16.1 percent, as summarized in Figure G-2 (Appendix G). Fayette County has the largest percentage of the population below the poverty level (17.3 percent). Jefferson County has the smallest percentage of the population below the poverty level (14.8 percent). The poverty levels in all four counties are below the set threshold of 20 percent for low-income populations and, therefore, do not

4 *Council on Environmental Quality, Environmental Justice Guidance Under the National Environmental Policy Act, 1997.*

5 *Environmental Protection Agency, Final Guidance for Incorporating Environmental Justice Concerns in EPA's NEPA Compliance Analysis, 1998.*

represent environmental justice populations. In comparison, in 2004, there were 19 of a total of 67 counties in Alabama that had populations that were greater than 20 percent in poverty status.

The ethnicity data for the study area in Figure G-3 (Appendix G) were also obtained from the U.S. Census Bureau. The four-county study area is predominantly white (62.4 percent). The remaining race distribution in the study area includes Black or African American (34.3 percent), Hispanic or Latino (1.4 percent), Asian (0.8 percent), two or more races (0.7 percent), American Indian or Native Alaskan (0.2 percent), other race (0.1 percent), and Native Hawaiian or other Pacific Islander (0.0 percent). The ethnic representation in the study area is similar to race distribution for the State, but has higher Black or African American estimates. The overall percentages of minority populations in Walker County (8.3 percent) and Fayette County (13.5 percent) are lower than the minority percentage for Alabama (29.7 percent), whereas the minority percentages for Tuscaloosa County (32.5 percent) and Jefferson County (42.6 percent) are higher than the State's percentage. However, the minority percentages for all four counties are below the CEQ threshold of 50 percent and not significantly higher than the State average of 29.7 percent.

3.2.14 Hazardous Materials

BLM-administered public lands and minerals provide opportunities for a variety of commercial uses in addition to resource management. Both activities can lead to releases of hazardous substances and creation of hazardous waste sites. The BLM engages in hazardous material emergency response actions, site evaluations, and prioritization of cleanups in accordance with laws and regulations. This involves working with the EPA, State environmental quality departments, counties, and potentially responsible parties (both public and private) to fund and expedite the cleanup of hazardous sites. Those sites that are an imminent threat to public health and safety, as well as those sites that are under a consent order and can therefore generate penalties and fines, are a priority for the Bureau. There are no known hazardous, toxic, or unapproved solid waste sites on public lands within the planning area.

3.3 ALABAMA SURFACE TRACT DESCRIPTION

The surface tract descriptions in this section include available detail on each of the surface tract groupings described in Chapter 2. General information and tract-specific information on soil resources, water resources, vegetative communities, fish and wildlife, special status species, cultural resources, visual resources, recreation and travel management, and lands and realty are provided for each tract grouping. Air quality, wildland fire ecology and management, minerals, and social and economic conditions are discussed in Section 3.2.

General. This section provides basic location and size of the surface tracts, as well as available background information.

Soil Resources. This section provides a table of the soils present at the tracts, the erosion hazard potential as indicated by NRCS, and the presence of prime or unique farmlands (defined in Section 0).

Water Resources. This section describes which drainage basin the surface tract is within.

Vegetative Communities. This section summarizes the vegetative communities related to the tracts. An analysis of the available GAP data was used to delineate the vegetative communities on the surface tracts. The GAP is coordinated by the Biological Resources Division of the U.S. Geological Survey (USGS).

Fish and Wildlife. This section summarizes the fish and wildlife species associated with the tracts. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS.

Special Status Species. This section summarizes the special status species associated with the tracts. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS. Available special status species occurrences on the tracts are discussed. Appendix E provides additional information on special status species in the areas around the surface tracts.

Cultural Resources. This section summarizes the known sites and cultural resources survey information for the surface tracts.

Visual Resources. This section addresses the visual setting of BLM-administered surface tracts. The surface tracts are not currently classified according to a VRM system. VRM classifications are described in Section 3.2.9. The surface tracts in Alabama have not been inventoried for VRM classification.

Recreation and Travel Management. This section addresses the existing recreational and travel management activities on BLM-administered surface tracts.

Lands and Realty. This section addresses the lands and realty actions associated with surface tracts, including withdrawals, disposals, and ROW actions.

3.3.1 Coosa River Tracts

General

The Coosa River tracts are 12 island tracts totaling approximately 42 acres in Calhoun, Coosa, Shelby, and Talladega Counties. These tracts are Federally owned, surveyed islands that have never been patented to private ownership. The islands range from water level to only a few feet above water level.

Soil Resources

There is no soil classification for this tract. The tracts are characterized as vegetated islands in the middle of the Coosa River.

Water Resources

All the Coosa River tracts are located within the Coosa River drainage basin.

Vegetative Communities

The Coosa River islands are located in areas inundated by a series of three dams constructed along the Coosa River between 1914 and the 1960s. The larger islands reflect the vegetation communities found in adjacent areas, primarily dry hardwood forest, with pine interspersed in the interior on the larger islands, in Mitchell Lake. On these islands, the hardwood component tends to be more diverse around the lower elevations of the islands and includes hickory (Carya spp.), common persimmon (Diospyros virginiana), sweetgum (Liquidambar styraciflua), southern hackberry (Celtis occidentalis), eastern sycamore (Platanus occidentalis), southern red oak (Quercus falcata), water oak (Quercus nigra), and loblolly pine (Pinus taedai). The interiors of the islands are generally dominated by larger water oak and loblolly pine with diameters up to 24 inches and 70–80 inches tall. The understory is relatively clear with young red maple (Acer rubrum)m common wax myrtle (Myrica cerifera)m blueberry (Vaccinium spp.)m American beautyberry (Callicarpa americana)m and bracken (Pteridium aquiline). There are some burn scars on larger pine, indicating past burns on some of the islands. Big Rock Island in Mitchell Lake rises approximately 120 feet above the lake and, as its name denotes, has sheer rock faces around much of the island, with seepage areas, ferns, and Spanish moss draping these areas. Smith and Prince Islands above Mitchell Lake tend to be flatter, lower, and dominated by mature water oak, with the additional species such as silver maple (Acer saccharinum), ashleaf maple (Acer negundo), and southern catalpa (Catalpa bignonoides). The leading edges of the smaller islands in the main river channel show signs of eroding, with downed trees and bare soils. The most northerly of the Coosa River tracts in Calhoun County was not visited, but from aerial photos it appears to be a sandbar with little or no vegetation.

Chinese privet (Ligustrum sinense), Japanese honeysuckle (Lonicera japonica), and mimosa tree (Albizia julibrissin) are present on most of the islands. Chinese privet occurs on the edges of the flatter islands north of Mitchell Lake and particularly frequently on the eroding leading edges of some islands. The Alabama Power Company treats aquatic invasive plant species throughout much of Coosa River. In 2002, over 200 acres were treated for emergent and submersed aquatic invasives in Lay, Jordon/Bouldin, and Mitchell Lakes, including alligator weed (Alternanthera philoxeriodes), floating water hyacinth (Eichhornia crassipes), parrot-feather (Myriophyllum aquatica), and spinyleaf naiad (Najas minor) (http://www.southerncompany.com/alpower/hydro/pdfs/E7_Issue_Recommendations.pdf).

Fish and Wildlife

The Coosa River islands provide a variety of shoreline habitats for resident and migratory wading birds, including great blue heron (Ardea herodias), black-crowned night heron (Nycticorax nycticorax), and little blue heron (Egretta caerulea). The wetland and upland habitats on the islands provide nesting habitat for neotropical migrants, such as prothonotary warbler (Protonotaria citrea), summer tanager (Piranga rubra) and solitary vireo (Vireo solitarius), and year-round residents such as belted kingfisher (Megaceryle alcyon), rufous-sided towhee (Pipilo erythrophthalmus), Carolina wren (Thryothorus ludovicianus), and downy woodpecker (Picoides pubescens). Typical reptiles include midland water snake (Nerodia sipedon pleuralis) and common five-lined skink (Eumeces fasciatus). Those tracts outside of Mitchell Lake, particularly the Calhoun County tract, could provide basking areas and even nesting sites for river turtles. Typical mammals would include otter (Lutra canadensis), mink (Mustela vison), and raccoon (Procyon lotor), while armadillo (Dasypus novemcinctus) are common in the upland areas of larger islands.

Special Status Species

A bald eagle nest was located on these islands in 2005. Most of the larger islands support suitable nesting trees and roosting habitat, and the Coosa River provides optimal foraging habitat. The islands do not provide suitable nesting habitat for red-cockaded woodpecker, although some of the larger islands provide marginally suitable foraging habitat.

There are no known records of Federally listed plants on the Coosa River islands; however, there have been no surveys of the tracts.

Cultural Resources

The Coosa River tracts have not been surveyed. However, two cultural sites are located within one-half mile of four tracts: the single tract in Calhoun County and three tracts in Talladega County.

Visual Resources

The islands that make up the Coosa River tracts are visible from the shore; there is little or no development or other human activity on the shores opposite the islands, except for residences opposite Prince Island.

Recreation and Travel Management

The Coosa River tracts are used for dispersed recreation. Opportunities for recreation on the islands, however, are limited by their small size and the fact that they are only accessible through travel by water. Fishing, picnicking, rest stops of boaters and canoeists, and wildlife observation are examples of recreation opportunities on the islands.

Although use on the islands is limited, they are identified as supporting water-based recreation opportunities by the Coosa River Recreation Plan (Alabama Power Co. 2005). The lakes that surround these islands (Mitchell Lake, Lay Lake, and H. Neely Henry Lake) are all popular for recreation activities such as boat fishing, pleasure boating, swimming, and picnicking. In 2000, these three developments combined to support 1,134,400 recreation days. Boat fishing was by far the most popular activity with 989,100 recreation days. Lay Lake hosted the 2007 Bassmasters Classic fishing tournament, and smaller tournaments are regularly held on these lakes.

Lands and Realty

All of the Coosa River islands are within areas impounded for hydroelectric purposes. Big Rock Island, Little Rock Island, and the Foshee Islands are in Mitchell Lake; Smith Island and Prince Island are in Lay Lake; and the unnamed island is within H. Neely Henry Lake. These projects are licensed under the authority of the Federal Water Power Act of 1920, which created the Federal Power Commission (FPC), now the Federal Energy Regulatory Commission (FERC). Mitchell Dam was originally licensed as Project No. 82, and Lay Dam and H. Neely Henry Dam were included in Project No. 2146. Now, these projects are combined for licensing purposes as Project No. 2146-111.

Public domain lands within project areas were withdrawn for water power purposes. After projects were completed, FPC often relinquished the withdrawal of the lands no longer needed for project purposes. In the case of the Coosa River islands, this generally included relinquishment of the land above the water level. For example, in 1955, the land withdrawn for the Mitchell Dam (Project No. 82) was modified to include only the land below the 360-foot elevation contour.

There are historical records of application to acquire some of the Coosa River islands. In 1959, for example, the State of Alabama Department of Conservation applied for Big Rock Island, Little Rock Island, and the Foshee Islands under the Recreation and Public Purposes (R&PP) Act, but the application was later withdrawn. In addition, several color-of-title applications were submitted in the 1950s, but all were rejected.

There are no BLM-authorized ROW or other uses on the Coosa River islands. A power line, however, crosses the southern end of Prince Island (with no ground supports on the island).

3.3.2 Fort Morgan Beach Tracts

General

Seven tracts in Baldwin County totaling 28.7 acres comprise the Fort Morgan Beach tracts. These tracts provide access to recreation activities on the Gulf and its beaches, which were severely damaged by Hurricane Ivan in 2004. Boardwalks partially destroyed by Ivan may be rebuilt. These tracts fall within the CZM Program.

Soil Resources

The soil classification for this tract is displayed in Table 3-9.

Table 3-9. Soil Classification for the Fort Morgan Beach Tracts

Soil Type	Description	Erosion Hazard	Prime Farmland
Coastal beaches	Moderately deep and poorly drained to excessively drained soils that border saltwater and freshwater lakes	None	No

Water Resources

The Fort Morgan Beach tracts are located within the Mobile River drainage basin.

Vegetative Communities

The Fort Morgan Beach tracts border the Gulf of Mexico and include back beach, primary dunes, and in some cases extend landward sufficiently to encompass secondary dunes. Throughout these tracts, the dominant species is sea oats (Uniola paniculata). Other species characteristic of this habitat include marsh-elder (Iva frutescens), and Gulf bluestem (Schizachyrium maritimum), sandhill rosemary (Ceratiola ericoides), woody goldenrod (Chrysoma pauciflosculosa), beach sand-squares (Paronychia erecta), and Gulf rockrose (Helianthemum arenicola). These tracts, along with the rest of the Fort Morgan peninsula, were heavily impacted by Hurricane Ivan in 2004, when storm surges inundated much of the peninsula. Coastal dunes throughout this area were destroyed and dune vegetation was obliterated. These dunes are dynamic systems adapted to these storm cycles. Since Hurricane Ivan and other major storms that hit this coastline in 2005, these dunes have continued to accrete, accelerated by pioneering sea oats. There are no known exotic plant species identified on the Fort Morgan Beach tracts.

Fish and Wildlife

The coastal dunes and back beach areas of the Fort Morgan Beach tracts provide important foraging habitat for a host of shorebirds, gulls, terns and others, such as Wilson's plover (Charadrius wilsonia), willet (Catoptrophorus semipalmatus), sanderling (Calidris alba), short-billed dowitcher (Limnodromus griseus), ring-billed gull (Larus delawarensis), royal tern (Sterna maxima), and black skimmer (Rynchops niger). Feral and domestic cats are a management concern in this area because of predation on beach mice and nesting shorebirds.

Special Status Species

All of the Fort Morgan Beach tracts are designated critical habitat for Alabama beach mouse and contain primary dunes, the preferred habitat for this species. Populations are recovering after Hurricane Ivan inundated much of this area in 2004, and Alabama beach mouse was found on the BLM beach tracts in early February 2007 (Matt Falcey personal communication). The tracts also provide nesting habitat for loggerhead sea turtle (Caretta caretta), and potentially green sea turtle (Chelonia mydas) and Kemp's Ridley sea turtle (Lepidochelys kempii). The adjacent Bon Secour NWR has documented loggerhead nests to be 4.5 to 5 nests per mile, higher than many areas along the Gulf Coast (USFWS 2004). The tracts also provide habitat for wintering piping plover (Charadrius melodus), likely a mixture of the threatened Atlantic Coast and endangered Great Lakes populations, although the designated critical habitat for wintering piping plover at Fort Morgan is west of the BLM tracts. Snowy plover (Charadrius alexandrinus), Wilson's plover (Charadrius wilsonia), and American oystercatcher (Haematopus palliatus) are known to nest on the refuge. There are no known records of Federally listed plants on these tracts.

Cultural Resources

The Fort Morgan Beach tracts have been surveyed. Four cultural sites are located within one-half mile of three of the beach tracts.

Visual Resources

Visual features of the Fort Morgan Beach tracts include sand dunes, beach and open sea, mixed vegetation, boardwalks, and adjacent residential and other development.

Recreation and Travel Management

The Fort Morgan Beach tracts provide access for recreational use of the beach, including saltwater fishing. There are no developments on the tracts, but some parking is available on adjacent roadways. In 2004, the vast majority of recreational use of similar tracts on the nearby Bon Secour NWR was classified as either beach/water use or saltwater fishing. There were a total of 53,395 visits for these two activities with 32,721 of the visits by residents, defined as people living within 30 miles.

Lands and Realty

In the early 1950s, much of the remaining public domain land on the Fort Morgan Peninsula was classified (by Alabama Small Tract Classification Orders No. 1 and 2) for disposal pursuant to the Small Tract Act of 1938. This land was subdivided into about 190 lots ranging in size from 0.72 to 2.61 acres. By 1960, the BLM had sold most of the lots, many to World War II veterans who were given a statutory preference.

The lots identified in this document as the Fort Morgan Beach tracts were not classified for disposal and were specifically "set aside" by the classification orders "and reserved as recreation areas for use by the general public." The classification orders also reserved "a 33-foot ROW for roads and public utilities" on the border of each lot, and some of these are partially on the Fort Morgan Beach tracts. The legacy of the Small Tract Act is still evident in the land use patterns in the area immediately surrounding the Fort Morgan Beach tracts. Other than the ROW reserved by the small tract classifications, there are no authorized uses on the Fort Morgan Beach tracts.

3.3.3 Fort Morgan Highway Tracts

General

The Fort Morgan Highway tracts are located in Baldwin County along the Dixie-Graves Highway (SH 180), which provides access to the end of the Fort Morgan Peninsula. There are five tracts totaling approximately 41 acres within this tract group. High-density development and highway expansion near these tracts could be planned for the future.

Soil Resources

The soil classification for the Fort Morgan Highway tracts is provided in Table 3-10.

Table 3-10. Soil Classification for the Fort Morgan Highway Tracts

Soil Type	Description	Erosion Hazard	Prime Farmland
Leon sand	Deep, poorly drained, nearly level soils on uplands; sandy surface layers and sandy and loamy subsoils	Slight	No
St. Lucie sand, 0 to 5 percent slopes	Deep, excessively drained, nearly level to steep soils on undulating ridges and short side slopes on uplands; sandy surface layers and underlying material	Very Severe	No
St. Lucie–Leon–Muck complex	Deep, poorly drained, nearly level soils on uplands; sandy surface layers and sandy loamy subsoils	None to Severe, depending on water saturation	No

Water Resources

The Fort Morgan Highway tracts are located within the Mobile River drainage basin.

Vegetative Communities

The narrow Fort Morgan Highway tracts are dominated by a sand pine/oak scrub plant community with scattered clusters of slash pine. Pine coverage is generally 10 to 15 percent, and trees are generally 5 to 10 inches diameter at breast height. In the more xeric sites, the shrub layer is dominated by 8 to 12 feet tall scrub oak species, including scrub live oak (Quercus geminata) and myrtle oak (Quercus myrtifolia). Other understory species include rosemary (Conradina canescens), gopher apple (Licania michauxii), St. John's wort (Hypericum crux-andreae), and saw palmetto (Serenoa repens). Reindeer lichen (Cladonia rangifera) and British soldier (Cladonia cristella) occur as a ground cover in protected areas of the scrub.

These highway tracts were inundated by Hurricane Ivan's storm surge in the fall of 2004. Although direct damage from wind was minimal, low areas where brackish waters stood for extended periods resulted in die-offs of pine and saw palmetto. A 30-foot utility corridor has been cleared on the southern edge of the tracts and contains more ruderal species, including blackberry/dewberry (Rubus spp.), groundsel-tree (Baccharis halimfolia), and common wax myrtle (Myrica cerifera).

In Lots 5 and 15, there are a small series of isolated wetlands dominated by sawgrass (Cladium jamaicense) with scattered patches of needlerush (Juncus roemerianus) and fringed by saw palmetto (Serenoa repens). Wild hibiscus (Hibiscus grandiflora), arrowhead (Sagittaria lancifolia), and titi (Cyrilla racemiflora) are also common in these low-lying areas. Both of these tracts show evidence of a previous burn.

Cogon grass (Imperata cylindrical) and Chinese tallow both occur sporadically along disturbed edges of the Fort Morgan Highway tracts.

Fish and Wildlife

Fort Morgan Peninsula, and the Bon Secour NWR in particular, provide the best remaining stopover and staging habitats for neotropical migratory songbirds along the Alabama coastline. In addition, the area is famous for its fall hawk migration. Over 370 species of birds have been identified at the Bon Secour NWR during migration seasons (USFWS 2007). Both the Bon Secour NWR and the nearby Fort Morgan State Park are designated Globally Important Bird Areas by the American Bird Conservancy. Several locations on the Fort Morgan Peninsula are listed on the Alabama Coastal Birding Trail, including several close to the BLM tracts.

Wetlands on Lots 5 and 15 of the Fort Morgan Highway tracts provide habitat for reptiles, amphibians, wading birds, and furbearers such as muskrat, mink, raccoon, and rabbit. The refuge has documented at least 15 species of turtles, 9 species of lizards, more than 30 species of snakes, and the American alligator (*Alligator mississippiensis*) in the area.

Special Status Species

The original critical habitat designation for Alabama beach mouse was recently modified to include the higher elevation scrub habitats determined to be important for the mouse during and after hurricane

events (Federal Register, Vol. 71, No. 21, Wednesday, February 1, 2006). This expanded critical habitat includes all of the Fort Morgan Beach tracts.

Cultural Resources

The Fort Morgan Highway tracts have been surveyed. Four cultural sites are located within one-half mile of five of the highway tracts.

Visual Resources

The Fort Morgan Highway tracts are forested with pine and scrub vegetation and are generally flat. The visual setting is dominated by human activity.

Recreation and Travel Management

Recreation use on the Fort Morgan Highway tracts is primarily associated with Highway 180 and the parkway corridor, which is designated as part of the Alabama Scenic Byway. Activities along the highway corridor include driving, sightseeing, bicycling, and hiking. Several hiking trails on the Bon Secour NWR can be accessed from the parkway corridor. Historic Fort Morgan State Park at the end of the peninsula is a popular destination.

Lands and Realty

The Fort Morgan Highway tracts are within the same small tract area as the Fort Morgan Beach tracts. The plats of survey for the small tract area, however, made separate lots of the public domain lands within the 330-foot wide Dixie Graves Parkway (Highway 180). These lots are referred to in this document as the Fort Morgan Highway tracts and were exempted from disposal by the small tract classification orders. In addition to Highway 180, there are also some utilities and driveways on the lots. While the BLM plats of survey identified the parkway as separate lots, there is no record that the BLM granted any ROW or other authorized uses within the parkway lots.

3.3.4 Fowl River Tract

General

There is no legal vehicle access to the 41.73-acre Fowl River tract in Mobile County. Adjacent land is privately owned. Bellingrath Gardens, a 65-acre estate with formal gardens, is located just north, and the Dauphin Island lies to the south. There are some homes adjacent to the tract, and a Shell oil refinery is located across the river about one-half mile east of the tract.

Soil Resources

The soil classification for the Fowl River tract is provided in Table 3-11.

Table 3-11. Soil Classification for the Fowl River Tract

Soil Type	Description	Erosion Hazard	Prime Farmland
Bayou-Escambia association, gently undulating	Deep, moderately well-drained, nearly level soils on uplands and stream terraces; loamy and sandy surface layers and loamy subsoils low in clay	Slight	No
Lafitte muck, 0 to 1 percent slopes	Level, very poorly drained, moderately, and rapidly permeable soils; in brackish marshes adjacent to the Gulf of Mexico	Slight	No
Pactolus loamy sand, 0 to 2 percent slopes	Deep, moderately well-drained, and somewhat poorly drained, nearly level to gently sloping soils on uplands; sandy throughout	Moderate	No

Water Resources

The Fowl River tract is located within the Mobile River drainage basin.

Vegetative Communities

This tract is located on the western bank of the Fowl River and contains four wetland plant communities. These include an emergent wetland composed of black needlerush (Juncus roemerianus) and a scrub-shrub wetland dominated by black titi (Clitftonia monophylla), inkberry (Ilex glaba), common wax myrtle (Myrica cerifera), fetter-bush (Lyona lucida), and several species of pitcher plants and ferns. Portions of the tract are seasonally flooded, hardwood-pine forest composed of sweet bay magnolia (Magnolia virginiana); sweetgum; loblolly bay (Gordonia lasianthus); Florida maple (Acer barbatum); various oak species such as water oak and laurel oak (Quercus laurifolia); and flowering dogwood (Cornus florida); and saw palmetto (Serona repens); with grasses as the principal ground covers. A fourth type is a slash pine flatwoods with dahoon holly (Ilex cassine), gallberry (Ilex coriacea), and saw palmetto.

This tract was not surveyed for exotic/invasive plant species, but Chinese privet, tallow tree, mimosa, and Japanese honeysuckle occur in the area.

Fish and Wildlife

This wetland tract provides habitat for a variety of species in association with the adjacent river, wetland habitats, and flatwoods. The tract provides suitable foraging habitat for wading birds such as the great blue heron, black-crowned night heron, and snowy egret. The wetland habitats provide foraging and nesting habitat for both resident and neotropical migratory songbirds. Southern water snake (Nerodia fasciata) and cottonmouth water moccasin (Agkistrodon piscivorus) are likely common on the tracts. Mammals are expected to include river otter (Lutra canadensis), raccoon (Procyon lotor), mink (Mustela vison), and gray fox (Urocyon cinereoargenteus).

Special Status Species

This tract could provide habitat for the endangered red-belly turtle (Pseudemys alabamensis). There are no known records of Federally listed plants on this tract.

Cultural Resources

The Fowl River tract was surveyed for cultural resources in 1983 (Jackson Field Office files). No cultural artifacts were found during shovel testing. One cultural site is located within one-half mile of the tract.

Visual Resources

The geography of the Fowl River tract is low lying and consists of several types of wetlands and associated forest and scrub vegetation. The visual setting is low-lying wetlands with relatively dense vegetation and some human activity.

Recreation and Travel Management

The Fowl River tract lies on the western side of the Fowl River. A portion of the tract is a wetland and is intermittently flooded. The tract may be accessed from the river, but there is no terrestrial access for the general public. Neither Delchamps Road, which formerly crossed the southern end of the tract, nor the power line ROW, provide public access. The tract is likely used by local residents for dispersed recreation such as fishing, canoeing, and kayaking.

In the 1960s, the tract was proposed as a recreation site and was transferred to the Alabama Department of Conservation for recreation purposes. The tract reverted to the BLM, however, because development as a recreation site proved to be infeasible.

Lands and Realty

On April 7, 1964, the Fowl River tract was patented to the State of Alabama, Department of Conservation for recreation purposes, under the R&PP Act. Under the terms of the patent, the site was required to be developed as a public recreation site. On October 8, 1976, the title to the tract was revested in the United States because the planned development had not occurred.

In 1983, the BLM proposed the Fowl River tract for sale, but the tract did not sell. The fact that the sale was subject to a "covenant running with the land" to restrict use in floodplains may have been a contributing factor to the fact that the tract was not sold.

In 1990, the BLM granted a power line ROW across the tract, running from west to east in the southern portion (Lot 5) of the tract. There are no other BLM ROW or use authorizations on the tract.

3.3.5 Geneva Tract

General

The Geneva County tract consists of an approximately 1-acre sandbar in the bend of Choctawhatchee River (near the Florida State line).

Soil Resources

There is no soil classification for this tract. It is a sandbar adjacent to the river.

Water Resources

The Geneva tract is located within the Choctawhatchee River drainage basin.

Vegetative Communities

This very small (0.95 acres) tract is located on a bend on the East Fork of the Choctawhatchee River. As mapped, this tract is primarily a sandbar or open water. A 1997 aerial photo of the area shows the area dominated by pine, including a clear-cut on the opposite side of the river.

There are no exotic invasive plant species known to occur on the tract at this time.

Fish and Wildlife

This tract is likely used by wading birds and nesting river turtles.

Special Status Species

This portion of the Choctawhatchee River has been designated as critical habitat for the Gulf sturgeon (Acipenser oxyrinchus desotoi).

Cultural Resources

The Geneva tract has not been surveyed. Three cultural sites are located within one-half mile of the tract.

Visual Resources

The visual setting of the Geneva tract is a river sandbar adjacent to dense forest vegetation.

Recreation and Travel Management

Because the Geneva County tract is remote and inaccessible, its value for public recreation is very limited. Any recreational use would probably be related to the use of the river and include activities such as canoeing, kayaking, and fishing.

Lands and Realty

According to subdivision of sections by a survey approved December 9, 1890, the Geneva County tract is identified as Lot 4 in the northeast corner of Section 22, west of the Choctawhatchee River. It is apparent that change of the river's course has affected the boundaries of Lot 4, which now may be at least partially in the channel of the river. There are no approved use authorizations on this tract, and no requests are expected.

3.3.6 Jordan Lake Tract

General

This 4.3-acre tract, located in Chilton County on the Coosa River below the Mitchell Dam (on the bank of Jordan Lake), is a steep, rocky slope with mixed hardwoods. The Coosa River Wildlife Management Area is located to the north and east of the tract.

Soil Resources

There is no soil classification for this tract. It is characterized as a rocky, steep slope adjacent to the lake.

Water Resources

The Jordan Lake tract is located within the Coosa River drainage basin.

Vegetative Communities

The Jordon Lake tract is a very narrow strip of land on the west bank of Jordon Lake. North of State Highway 22, the steep shoreline is dominated by hardwoods, typically hickory, persimmon, sweetgum, hackberry, sycamore, southern red oak, water oak, and scattered loblolly pine. South of the highway, the tract is flatter with mature trees and little understory.

Fish and Wildlife

General wildlife use is similar to the Coosa Island tracts discussed above. The presence of multiple campsites in the area limits use of the area by more reclusive species.

Special Status Species

There are no records of Federally listed plants or animals on this tract.

Cultural Resources

The Jordan Lake tract has been surveyed. Three cultural sites are located within one-half mile of the tract.

Visual Resources

The Jordan Lake tract sits high above the river and is visible from the highway as well as from the homes across the river.

Recreation and Travel Management

This long, narrow tract is bisected by State Highway 22. The recreation opportunity of the Jordan Lake tract is primarily as an access to Jordan Lake for swimming and fishing. Due to the tract's location and size, however, its value as a public recreation site is very limited. The owners of the adjacent small tracts and their guests undoubtedly use the tract for travel access to the lake.

In 1966, the tract was transferred to Chilton County under the R&PP Act to be used for recreational purposes. Because of difficulty in managing the tract for recreation, the County filed a quitclaim deed in 2000 to revert the tract to the United States.

Lands and Realty

The Jordan Lake tract is an extremely narrow strip of land on the west side of Jordan Lake. This narrow strip was created by a peculiar set of circumstances. The fractional portion of Section 14, west of the Coosa River, was withdrawn from the public domain by Power Site Classification No. 7, Alabama No. 1, approved July 30, 1921, (FPC Project 82). When the FPC relinquished withdrawal of lands above the 290-foot contour, the BLM completed a resurvey in 1956 to subdivide the lands for disposal. The Jordan Lake tract (Lot 1), because it was still withdrawn, had to be separated from the lands that were to be disposed. A 16.16-acre portion south of State Highway 22 was subdivided into 10 lots and classified for disposal under the Small Tract Act of 1938. By 1960, all of the small tracts had sold, and several small houses, or fishing camps, were built on these lots adjacent to the BLM Jordan Lake tract.

By 1966, the FPC allowed the BLM to convey the Jordan Lake tract to Chilton County, Alabama, subject to a reservation under Section 24 of the Water Power Act. The Jordan Lake tract was patented to Chilton County under the R&PP Act to be used for recreational purposes only and subject to reversion to the United States. The reversionary clause was invoked on April 17, 2000, when Chilton County filed a quitclaim deed to reconvey the tract back to the United States.

The ROW for State Highway 22 was granted as a Federal Aid Highway under the Act of November 9, 1921 (42 Stat. 212). This highway crosses the narrow Jordan Lake tract (less than 100 feet wide at this point) at the west side of the bridge that crosses the lake. There are no other ROW or authorized uses on the Jordan Lake tract.

3.4 MISSISSIPPI STATEWIDE PERSPECTIVE

3.4.1 Air Quality

Mississippi has a humid, subtropical climate characterized by temperate winters; long, hot summers; and an evenly distributed annual rainfall. The region is subject to periods of drought and flood, and the climatic conditions are rarely average. A feast-or-famine situation attributed to weather conditions is typically expected as the climate delivers energy and moisture in subtropical latitudes between a large landmass to the north and the Gulf of Mexico to the south (SERCC 2005).

Normal mean annual temperatures range from about 60°F in the north to 70°F along the coast. Temperatures regularly exceed 100°F throughout Mississippi and drop to zero or lower an average of once a year. Freezing temperatures reach the Gulf Coast almost every winter. Normal precipitation ranges from about 50 to 65 inches across the State from north to south (NOAA 2007a).

Air Quality Meteorology

Surface wind speeds vary depending on terrain and proximity to the coast. Average wind speeds vary from 6 to 10 miles per hour in most locations and follow water drainage features of the land or are driven by sea breezes. Dispersion can also be related to the NOAA Stagnation Index, which primarily focuses on ozone (NOAA 2005). On the basis of this index, Mississippi was prone to air stagnation on 25 to 50 percent of the days from May through September from 2002–2004. This dispersion index compares moderately to other areas in the country.

Baseline Air Quality

Ambient Air Quality. EPA has established ambient air quality standards for criteria pollutants considered harmful to public health and the environment. The ambient air quality measurements in Mississippi for SO_2, NO_2, CO, O_3, and PM_{10} and $PM_{2.5}$ are shown in Table 3-12. Ambient air quality measurements made by the Mississippi Department of Environmental Quality (MDEQ) indicate that ambient air quality is within standards, and are in attainment. Ozone is formed from the chemical reactions of nitrogen oxides, VOCs, and sunlight. No exceedances of ambient air quality standards are noted.

Table 3-12. Recent Highest Ambient Air Quality Measurements in Mississippi[1, 2]

Pollutant	Averaging Time	Highest Measured Value (ppm[3])	Location	National Ambient Air Quality Standard (ppm[3])
SO_2	1 year	0.002	Pascagoula	0.03
	24 hours	0.019	Pascagoula	0.14
	3 hours	0.035	Pascagoula	0.50
NO_2	1 year	0.004	Hancock County	0.053
CO	8 hours	3.9	Jackson	9.0
	1 hour	5.0	Jackson	35.0
O_3	8 hours	0.096	Hancock County	0.080

Pollutant	Averaging Time	Highest Measured Value (ppm[3])	Location	National Ambient Air Quality Standard (ppm[3])
	1 hour	0.112	Hancock County	0.120
PM_{10}	1 year	18.0	Jackson County	50.0 µg/m3
	24 hours	41.0	Jackson County	150.0 µg/m3
$PM_{2.5}$	1 year	13.6	Hattiesburg	15.0 µg/m3
	24 hours	36.2	Hattiesburg	65.0 µg/m3

1 MDEQ Annual Data Summary 2003 (MDEQ 2004).
2 One-year maximum—this is not technically a violation until the fourth-highest value exceeds the design value of 0.085 ppm.
3 ppm = parts per mjllion

Visibility and Atmospheric Deposition. Visibility and atmospheric deposition measurements are not available for Mississippi.

Area Air Quality Designations

PSD of areas meeting the ambient air quality standards are divided into three categories: Class I for areas of restricted growth, Class II for areas of moderate growth, and Class III for industrialized areas (Clean Air Act of 1977, as amended). All of Mississippi is designated as PSD Class II.

In addition to this area designation for the entire State, other nearby Class I areas (within 100 kilometers of the potential development activities) include the Breton NWR off the coast of Louisiana (managed by USFWS) and the Sipsey Wilderness Area in northwestern Alabama.

Climate Change

Ongoing scientific research has identified the potential effects of pollutants considered to be GHG emissions (including CO_2, CH_4, N_2O, water vapor, and several trace gasses) on global climate. Through complex interactions on a regional and global scale, these pollutants cause a net warming effect of the atmosphere, making surface temperatures suitable for life on earth, primarily by decreasing the amount of heat energy radiated by the earth back into space. Although GHG levels have varied for millennia, with corresponding variations in climatic conditions, recent industrialization and burning of fossil carbon sources have caused CO_2 concentrations to increase dramatically, and have been shown to contribute to overall climatic changes, typically referred to as global warming or climate change. Increasing CO_2 concentrations also lead to preferential fertilization and growth of specific plant species.

Some pollutants considered to be GHGs, such as CO_2, occur naturally and are emitted to the atmosphere through both natural processes and human activities, while others are created and emitted solely through human activities. The principal pollutants considered to be GHGs that enter the atmosphere because of human activities include CO_2, emitted through the burning of fossil fuels, solid waste, trees and wood products; CH_4 emitted during the production and transport of coal, natural gas, oil extraction, livestock production, deforestation, and other agricultural practices; N_2O emitted during agricultural and industrial activities and during the combustion of fossil fuels and solid waste; and fluorinated gases that are emitted from a variety of industrial processes (EPA 2008).

The assessment of GHG emissions and climate change is in its formative phase, and it is not yet possible to know with confidence the net impact to climate. Observed climatic changes may be caused by GHG

emissions, or may reflect natural fluctuations (U.S. GAO 2007). It is known that in the past, the earth has gone through a number of ice ages with periods of warming and droughts between the periods. The most recent Ice Age ended around 13,000 years ago and the climate has warmed and dried since then. The warming and drying has not been continuous. However, the rate at which atmospheric CO_2 concentrations have risen in the past 100 years is unprecedented, and corresponds with observed temperature changes. The Intergovernmental Panel on Climate Change (IPCC 2007) concluded that "Warming of the climate system is unequivocal" and "Most of the observed increase in globally average temperatures since the mid-20th century is very likely due to the observed increase in anthropogenic [man-made] greenhouse gas concentrations."

Global mean surface temperatures have increased nearly 1.8°F (1.0°C) from 1890 to 2006 (Goddard Institute for Space Studies 2007). However, both observations and predictive models indicate that average temperature changes are likely to be greater in the Northern Hemisphere. The Goddard Institute for Space Studies (2007) data indicated that northern latitudes (above 24° N) have exhibited temperature increases of nearly 2.1°F (1.2°C) since 1900, with nearly a 1.8°F (1.0°C) increase since 1970 alone. Without additional meteorological monitoring systems, it is difficult to determine the spatial and temporal variability and change of climatic conditions, but increasing concentrations of GHG are likely to accelerate the rate of climate change. In 2001, the IPCC indicated that by the year 2100, global average surface temperatures will rise 2.5 to 10.4°F (1.4 to 5.8°C) above 1990 levels. The National Academy of Sciences (2006) has confirmed these findings, but also indicated there are uncertainties how climate change will affect different regions. Computer model predictions indicate that increases in temperature will not be equally distributed, but are likely to be accentuated at higher latitudes. Warming during the winter months is expected to be higher than during the summer.

According to the *EPA Inventory of U.S. Greenhouse Gas Emissions and Sinks* (2008), the total U.S. GHGs were estimated at 7,054.2 Tg CO_2 Eq.[6] in 2006. Overall, total U.S. emissions have risen by 14.7 percent from 1990 to 2006. The primary GHG emitted by human activities in the U.S. was CO_2, representing approximately 84.8 percent of total GHG emissions. The largest source of CO_2, and of overall GHG emissions, was fossil fuel combustion. Conversely, U.S. GHG emissions were partly offset by carbon sequestration in forests, trees in urban areas, and agricultural soils, which, in aggregate, offset 12.5 percent of total emissions in 2006 (EPA 2008).

In the Southeast and Gulf Coast, potential impacts on the resources and environment from climate change could occur from sea level rise and a warmer climate, resulting in higher summer heat and reduced winter cold stress. The IPCC suggests that a two foot rise in sea level would eliminate approximately 10,000 square miles of land nationwide and, by 2080, sea level rise could convert as much as 33 percent of the world's coastal wetlands to open water (IPCC 2007). Some of the BLM-administered surface and mineral estate may become completely submerged. Coastal erosion, loss of barrier islands and wetlands, flooding, storm surge, and extreme precipitation events could greatly affect the biological resources within the planning area. For example, wildlife species could move northward and to higher elevations and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Additionally, the character of vegetation resources that provide wildlife habitat could change as disturbances (e.g., fire and insect outbreaks) increase (IPCC 2007). In the future, as tools for predicting climate changes in the planning area improve and/or changes in climate affect resources and necessitate changes in how resources are managed, BLM may be able to re-evaluate decisions made as part of this planning process and adjust management accordingly.

[6] Carbon comprises 12/44ths of carbon dioxide by weight. One teragram is equal to 10^{12} grams or one million metric tons.

Certain BLM-authorized activities within the planning area would produce pollutants considered to be GHGs, particularly CO_2. For example, oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation generate CO_2 and CH_4. These activities would impact the same resources in the planning area that could also be affected by climate change. Other activities may help sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks". BLM recognizes the importance of climate change and the potential effects it may have on the natural environment. However, BLM does not have an established mechanism to accurately predict the effect of resource management-level decisions from this planning effort on global climate change. The lack of scientific tools designed to predict climate change on regional or local scales limits the ability to quantify potential future impacts. A general discussion on the types of actions that would potentially impact climate change is presented in Chapter 4.

3.4.2 Soil Resources

Physiographic Regions and Soil Types

The State of Mississippi is located entirely within the Coastal Plain Physiographic Province (Fenneman 1938). Most of the State is located within the East Gulf Coastal Plain section of the province, and the remainder is found within the Mississippi Alluvial Plain section. Within the East Gulf Coastal Plain, the physiography is characterized by a distinctive series of belts that largely reflect the underlying geology. Nine of the 10 physiographic regions are belts of the East Gulf Coastal Plain: Loess Hills, Flatwoods, Pontotoc Ridge, Black Prairie, Tombigbee Hills, Jackson Prairie, Longleaf Pine Belt, Coastal Pine Meadows, and North Central Hills. The tenth physiographic region is the Yazoo Basin, which is part of the Mississippi Alluvial Plain.

Eight of the 12 soil orders (broad soil groups) recognized in the United States are found in Mississippi, which has great soil diversity (Pettry 2004). Soils in Mississippi are largely correlated with the State's topographic regions, due in part to effects that parent material and relief have on the soil formation process.

From an agricultural perspective, the two most productive soil areas of Mississippi are the Mississippi Delta (the Yazoo Basin physiographic region) and the Blackland Prairies (the Jackson Prairie and Blackbelt Prairie physiographic regions). Appendix F briefly describes the major parent soil units and their locations.

The characteristics of soils in BLM-administered, non-USFS FMO areas are described in Appendix F.

Prime and Unique Farmlands

The Farmland Protection Policy Act requires the identification of proposed actions that would affect any lands classified as prime and unique farmlands. NRCS administers this act to preserve farmland.

Prime farmland is defined as having the availability and best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops. Its soil quality, growing season, and moisture supply can produce economically sustained high yields of crops when treated and managed according to acceptable farming methods, including water management. In general, prime farmlands have an adequate and dependable water supply from precipitation or irrigation, a favorable temperature and growing season, acceptable acidity or alkalinity, acceptable salt and sodium content, and few or no rocks. The land is permeable to water and air. Prime farmlands are not excessively erodible or saturated with water for a long period of time, and they neither flood nor require protection from flooding.

Prime farmlands occur throughout most of Mississippi. Counties in Mississippi with oil and gas development likely include soil units that have been identified as prime farmland by NRCS. Appendix F includes prime farmland classification information that is available for soils within non-USFS FMO.

3.4.3 Water Resources

Surface Water

The surface waters of the State of Mississippi are divided into 10 major drainage areas or river basins: the Big Black River Basin, Coastal Streams Basin, Mississippi River Basin, North Independent Streams Basin, Pascagoula River Basin, Pearl River Basin, South Independent Streams Basin, Tennessee River Basin, Tombigbee River Basin, and Yazoo River Basin (Map 3-4). Appendix H briefly describes each of these major river basins.

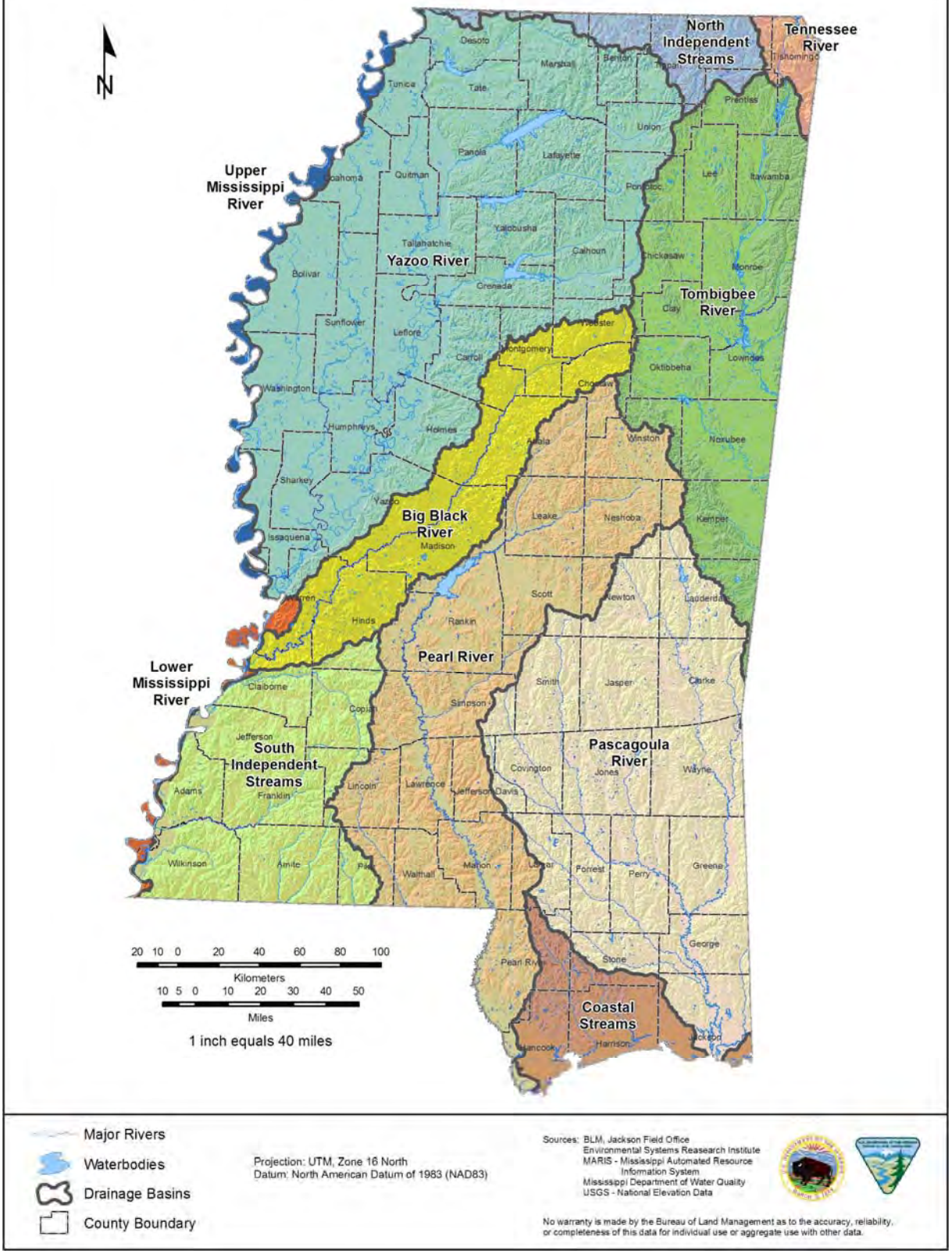
Wetlands occupy an estimated 4 million acres in Mississippi. Since the 1800s, almost 6 million acres of wetlands (including 10,000 acres of coastal wetlands) have been lost. Historically, loss was mainly the result of converting wetlands to agricultural lands. Today, wetland loss is primarily associated with residential and commercial development (MDEQ 2005).

The surface water quality of most of Mississippi's approximately 84,000 miles of rivers fully or partially supports designated uses. The major cause of impaired water quality is nonpoint agricultural runoff. Minor causes are industrial and municipal point-source discharges and runoff from nonagricultural nonpoint sources (USGS 2003b).

About 47 river miles are within BLM-administered, non-USFS FMO areas in Mississippi. Oil and gas leases exist on about 0.6 river mile. About 32,000 lake acres occur within non-USFS FMO areas. NWI data are limited for Mississippi. Because available digital data for freshwater wetlands in Mississippi is lacking, the non-USFS FMO acreage in freshwater wetland areas in Mississippi could not be estimated.

Map 3-4: Major Drainage Basins of Mississippi

Alabama-Mississippi RMP-EIS



Ground Water

Mississippi has 15 major aquifers that provide 80 percent of its public water supply for domestic and commercial, industrial, mining, thermoelectric power, and agricultural users (USGS 1998). Only two municipalities, Jackson and Tupelo, receive some public water from surface water sources. Mississippi has an abundant supply of ground water, which at some locations occurs at depths exceeding 3,000 feet (USGS 1998).

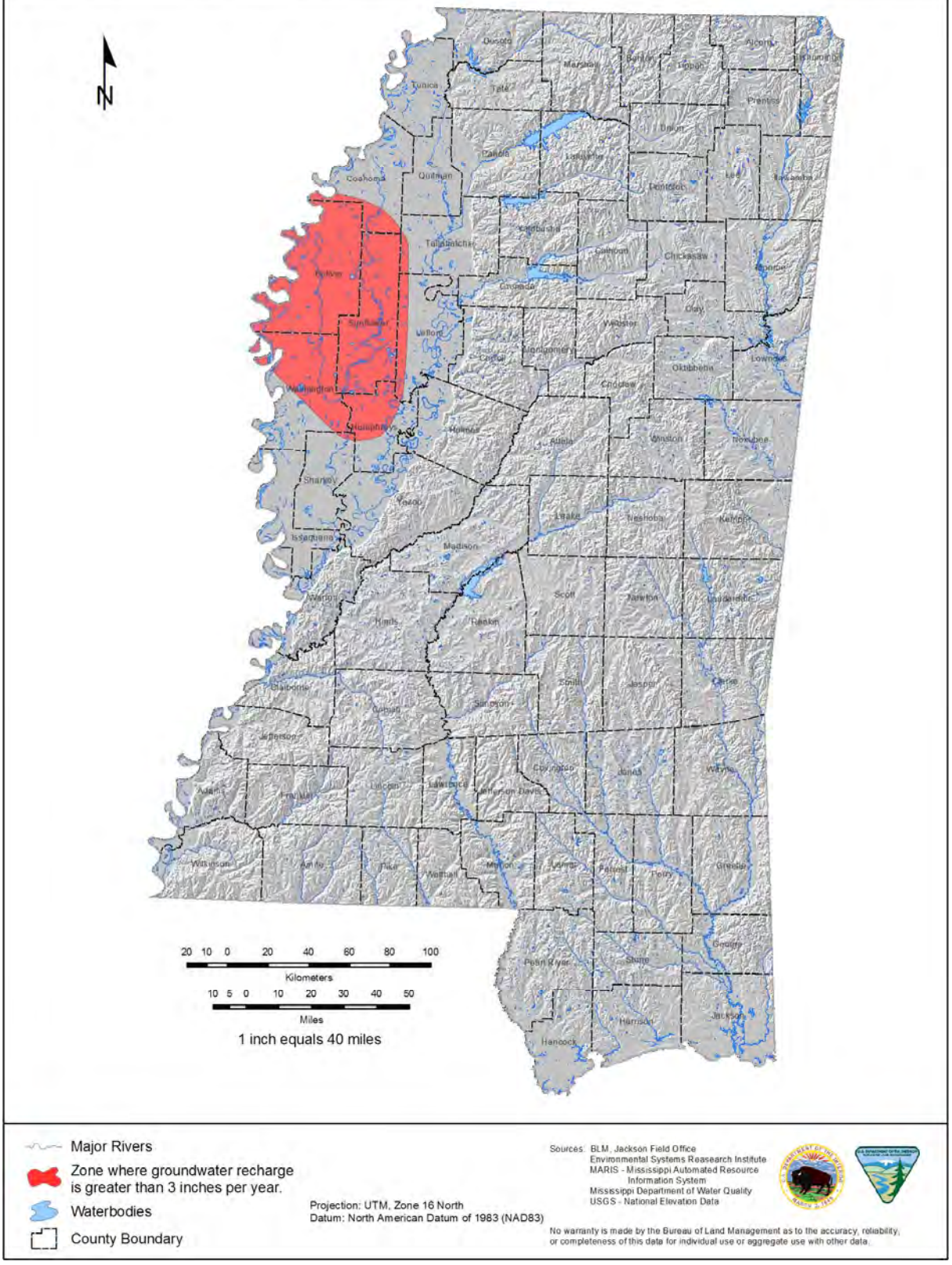
Ground water withdrawals are concentrated in the urbanized and industrialized areas of Mississippi and in the Mississippi River Alluvial Plain in northwestern Mississippi, where large withdrawals are made for crop irrigation and catfish production. These withdrawals have resulted in significant, long-term declines in water levels in some areas. Declining ground water levels and the ability of the aquifers to meet the increasing demand for water continue to be an important water resources concern in the State. For example, in central Mississippi, Cockfield and Sparta are two major aquifers. Water levels in the Cockfield Formation have slightly decreased at selected sites, whereas levels in a few wells near pumping centers have decreased by 1 to 4 feet. Some wells screened in the Sparta Sand indicated declines of 2 to 6 feet (USGS 2003b).

Precipitation is the ultimate source of water that recharges the major aquifers in Mississippi. Studies show that less than 50 percent of the annual precipitation ends up in stream runoff. Only a small amount of water recharges aquifers that are either exposed or buried to shallow depths, and an even smaller amount percolates downward and enters the deep-flow system (USGS 1998).

Map 3-5 presents the areas that are primary ground water recharge zones in Mississippi. On the basis of a rough geospatial analysis, 4,470 acres of non-USFS FMO occur in primary ground water recharge zones (defined as recharge greater than 3 inches per year).

Map 3-5: Primary Groundwater Recharge Zones in Mississippi

Alabama-Mississippi RMP-EIS



Coastal Zone

The National CZM Program is a voluntary partnership between the Federal Government and U.S. coastal States and territories authorized by the Coastal Zone Management Act of 1972. The Coastal Programs Division, within NOAA's Office of Ocean and Coastal Resource Management, administers the program at the Federal level and works with State CZM partners. The Mississippi CZM Program (MSCZMP) focuses primarily upon coastal wetlands below the watermark of the ordinary high tide and adjacent wetlands. The Hancock County tracts, in addition to BLM-administered, non-USFS FMO, fall within the MSCZMP.

The Mississippi Gulf Coast encompasses 370 miles of shoreline and nearly 56,000 acres of emergent wetlands. The coastal wetlands habitat of Mississippi is among the most ecologically diverse systems in the country. This system provides for ecological functions such as pollution filtering, sediment trapping, and flood control and is an important nursery area that increases the productivity of an abundant fishery resource. These ecological functions also provide economic benefits through commercial and recreational fisheries, hunting, trapping, and many other forms of recreation and commerce (MPA 2005). The Mississippi Department of Marine Resources (DMR) is preparing a Comprehensive Resource Management Plan (CRMP) that will include management and protection applications for coastal wetlands and marine resources in the six coastal counties of Mississippi (including Hancock County, where a BLM surface tract is located) by coordinating Agency efforts, developing the necessary partnerships among public and private entities, and integrating wetlands protection and management into the lifestyle of the coastal community. The Mississippi CRMP was unavailable for reference in this plan.

On the basis of the rough geospatial analysis, about 32,440 acres of BLM-administered, non-USFS FMO are within Mississippi coastal wetlands. However, about 24,000 of these acres are within 10 miles of the Stennis Space Center, one of NASA's primary centers for rocket propulsion testing, and are not likely to be developed. Of about 8,380 acres of non-USFS FMO in wetlands, 990 acres are in high-potential areas for future mineral development.

3.4.4 Vegetative Communities

For this planning effort, GAP was used to delineate land cover types on non-USFS FMO in Mississippi. This land cover map is based on Landsat-7 satellite imagery using the NLCD, which includes 21 very broad land cover classifications. The decision to use this data set was based on its statewide application and availability in a geographical information system format at the time this planning effort was initiated. Analysis of the GAP land cover map resulted in the identification of eight dominant cover types on non-USFS FMO lands in Mississippi. The dominant vegetation cover types on non-USFS FMO within Mississippi include evergreen forest/woodland (23 percent), wetland forest/shrub land (14 percent), deciduous forest/woodland (11 percent), row/crops (10 percent), grassland/herbaceous (9 percent), open water (9 percent), pasture/hay (6 percent), and mixed forest/woodland (4 percent). Several less dominant communities (14 percent) are not discussed herein. A brief description of each community follows.

- **Evergreen Forests/Woodlands (23 percent).** This classification delineates areas where 75 percent or more of the tree species are evergreen. In Mississippi, the dominant pine species are loblolly, longleaf, slash, and shortleaf. This classification includes commercial pine plantations, where loblolly is the most commonly planted pine species. An additional species, sand pine, dominates a narrow band of scrub habitats behind the coastal dune systems along the Gulf of Mexico.

- **Wetland Forest/Shrub Land (14 percent).** This classification is dominated by bottomland hardwood vegetation that is periodically inundated by water and encompasses diverse

communities ranging from forested swamps and bogs to coastal marshes. Common vegetation in seasonally flooded forests include sweet bay, southern magnolia, sweetgum, wax myrtle, various oaks, and titi. Typical wetland or bog species include pitcher plants, various rushes, sedges, arrowhead, and St. John's wort. Typical species of coastal marshes include sawgrass, needlerush, and bulrush.

- **Deciduous Forests/Woodlands (11 percent).** This classification is dominated by trees of which 75 percent or more are hardwoods. Common trees in these areas include a wide variety of oak and hickory species, maple, ash, hackberry, yellow poplar, beech, elm, sweetgum, persimmon, and cherry.
- **Row/Crops (10 percent).** This classification includes areas being actively cultivated.
- **Grassland/Herbaceous (9 percent).** Grassland/Herbaceous communities are composed of dry systems dominated by low herbaceous vegetation and are absent of woodlands.
- **Open Water (9 percent).** This classification denotes water and does not support terrestrial vegetation species.
- **Pasture/Hay (6 percent).** Vegetation in this community is largely composed of introduced grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of hay crops.
- **Mixed Forests/Woodlands (4 percent).** This classification delineates areas where neither hardwood nor pine species represent more than 75 percent of the cover. These mixed hardwood/pine areas are typically dominated by loblolly, shortleaf, slash, and/or longleaf pine, with a wide variety of oak and hickory species, plus hackberry, elm, sweetgum, persimmon, and yellow poplar.

Mississippi Invasive/Exotic Species

The Mississippi Exotic Pest Plant Council lists the top ten worst invasive plants as tallowtree (Triadica sebifera), Chinese privet (Ligustrum sinense), Japanese honeysuckle (Lonicera japonica), tropical soda apple (Solanum viarum), purple loosestrife (Lythrum salicaria), kudzu (Pueraria montana var. lobata), cogon grass (Imperata cylindrica), Johnson grass (Sorghum halepense), water hyacinth (Eichornia crassipes), alligator weed (Alternanthera philoxeroides), and Eurasian milfoil (Myriophyllum spictum). To date, Chinese tallow, Chinese privet, Japanese honeysuckle, kudzu, and cogon grass have been the most frequent exotic species occurring on BLM non-USFS FMO. Cogon grass, in particular, has the potential to affect future land use practices because of its ability to alter natural fire regimes, its thick growth habit that excludes other vegetation, and the difficulty to control it. Chinese privet is a common invasive along edges and disturbed sites throughout the State. Chinese tallow tree is often found near wetlands and disturbed areas including fence rows and roads.

3.4.5 Fish and Wildlife

Game Species

Mississippi has abundant and diverse game populations actively managed across the State. The State supports the highest white-tailed deer density in the nation with the population estimated at 1.75 million. The wild turkey population is estimated at 300,000. Both species were brought back by extensive restocking efforts during the 1950s and 1960s. Mourning dove is common throughout farms, woodlots, agricultural fields, and grasslands. Small game species include rabbit, gray squirrel, and fox squirrel.

Naturalized populations of wild hog are now found in at least 65 of Mississippi's 82 counties. Mississippi is part of the Mississippi Flyway; reservoirs, ponds and swamps across the State provide important winter habitat for waterfowl that are produced in the Prairie Pothole Region and Great Lakes States. In most years, Mississippi winters significant numbers of mallards and wood ducks across the State. Historically, flooded forests in the Delta region of northwestern Mississippi provided reliable, high-quality habitat for millions of mallards, wood ducks, and other waterfowl. This region is the focus of major waterfowl conservation efforts, including the Lower Mississippi Joint Venture program.

Neotropical Migratory Birds

According to the Mississippi Ornithological Society, 396 bird species have been seen in Mississippi. The State is an important migration route for many migratory songbirds. The Mississippi Gulf Coast is a key staging area for migrants as they replenish fat reserves for the trans-Gulf flight during the fall and provides the first landfall for tired migrants during spring migrations.

3.4.6 Special Status Species

For the purposes of this document, special status species are defined as all Federal and State-listed, species occurring in the State, species proposed or candidates for Federal or State listing, and those species identified by the BLM as sensitive species. The BLM Eastern State's policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs, as well as potentially affected bird species included on the USFWS Birds of Conservation Concern and Game Birds Below Desired Condition lists. The USFWS lists 39 Federally listed species, which currently or historically occurred in Mississippi. The Mississippi Natural Heritage Program (MNHP) inventory lists 339 species ranked as either critically imperiled (S-1) or imperiled (S-2) in the State. A list of S-1 and S-2 species being tracked by MNHP is included in Appendix E. A complete list of the wildlife species of conservation concern in the State is available in the Mississippi CWCS (2005).

This discussion of special status species takes a statewide perspective, even though management of the BLM's scattered surface acreage and oil and gas development would probably directly affect less than 229 acres in total. Oil and gas leasing of non-USFS FMO in particular could occur anywhere in the State, and future oil and gas development has the potential to affect aquatic systems downstream from locations, substantially increasing the area potentially affected. Therefore, a statewide perspective is needed to cover the full geographic range of potential impacts.

Overview

The State of Mississippi covers four ecoregions: the East Gulf Coastal Plain, the Upper East Gulf Coastal Plain, the Mississippi Alluvial Plain, and the Northern Gulf Coastal Plain (see Section 0). The following discussions highlight the special status issues in each of these ecoregions.

The **East Gulf Coastal Plain** is one of the most biologically rich ecoregions in the country. Many of the special status species in this area are associated with the vast longleaf pine forests and embedded wetland bogs that once stretched across much of the southern United States. Longleaf forests are now found on about three percent of the original acreage, much of it converted to commercial pine plantations for loblolly and slash pine. What acreage remains is often degraded by exclusion from the frequent fires that historically maintained this system and by habitat fragmentation. Species endemic to the ecoregion, many of which were never common, have been further imperiled by these changes (Mississippi CWCS 2005). Keystone species in this habitat are the red-cockaded woodpecker and gopher tortoise, both Federally and

State-listed. Others include the highly restricted Mississippi gopher frog found only in a handful of ponds in Harrison and Jackson Counties.

Wet savannas in the East Gulf Coastal Plain are estimated to be reduced to less than 5 percent of their original acreage (Mississippi CWCS 2005). Most of the largest patches of this habitat are located in the Sandhill Crane NWR. This region's pitcher bogs and pine seeps support an exceptionally diverse flora and endemic crawfish species, including one Federally listed crayfish and six other crayfish listed as imperiled or critically imperiled.

Two large and biologically important river systems flow through this portion of the East Gulf Coastal Plain: the Pearl River and the Pascagoula River. Both are considered vulnerable (Mississippi CWCS 2005). The lower Pearl River is affected by impoundment at the Ross Barnett Reservoir, as well as channelization and increased sediments from surrounding land uses. The Pascagoula is America's longest unencumbered river and one of the most intact in the southeast (Mississippi CWCS 2005). These river systems support 13 Federally or State-listed species and 19 other special status species, mostly fish and mussels. The rivers and major tributaries are designated critical habitat for Gulf sturgeon.

The **Mississippi River Alluvial Plain** bordered by the Mississippi River on the west is dominated by bottomland hardwood forests. These rich frequently flooded forests and associated habitats support over 240 fish species, 45 species of reptiles and amphibians, and 37 species of mussels. In addition, 50 species of mammals and approximately 60 percent of all bird species in the contiguous United States currently utilize this ecoregion (Mississippi CWCS 2005). This area is important to the recovery of the endangered Louisiana black bear, and recently supported one of the two litters recorded in the State in over 30 years. Old-growth hardwoods are crucial habitat for 11 of 18 bat species in the southeast (Mississippi CWCS 2005). At least four Federally listed species and seven other special status species occur in this area.

The **Upper East Gulf Coastal Plain** in Mississippi ranges from the northern edge of the longleaf pine forests grading to the north through oak-hickory-pine forests to oak-hickory forests. Many of the most vulnerable special status species occurring in this area are associated with the river systems, wetland habitats, and prairie opening scattered through Jackson and larger Black Belts. This region supports a large number of endemic crayfish, mussel species, and fish. Key rivers include the Tombigbee, Yazoo, and Big Black Rivers, all of which have been substantially altered by impoundments and channelization. Tributaries and streams in this area have been subjected to increased sedimentation from agricultural and forestry. The Mississippi CWCS (2005) lists 45 crayfish, fish and mussel special status species as critically imperiled (S-1) or imperiled (S-2) in the Tombigbee River system, this in addition to 13 Federally listed species. Six of these mussel species in Tombigbee are presumed or expected to be extirpated from the State. Karst areas in Mississippi are primarily associated with the "Vicksburg Group" of soils in Clark, Jasper, and Wayne Counties in east central Mississippi, and Union and Tishomingo Counties. About 65 caves covering less than 100 acres support several special status species, including cave salamander, spring salamander, and many of the State's bat species.

The **Mississippi Northern Gulf Coastal Plain** includes barrier islands with beaches, coastal marshes, and maritime scrub and woodlands. At the coastline, these habitats grade through salt marshes to productive estuaries (Mississippi CWCS 2005). Mississippi has established an 83,000-acre coastal preserve system to protect and enhance coastal wetlands and barrier islands. The system is dominated by coastal wetlands that support a number of special status shorebirds, including the piping plover, American oystercatcher, and Wilson's plover; wading birds, such as reddish egret and white ibis; and others such as the brown pelican. They also support the Mississippi diamondback terrapin. Natural beaches in the State tend to be mud shores often associated with the estuaries of larger rivers and provide important foraging areas for wading birds and shorebirds. Maritime woodlands dominated by live oak, laurel oak, and saw palmetto provide crucial staging areas for neotropical migrants to rest and build or replenish fat reserves,

particularly during inclement weather and for exhausted birds making landfall. This habitat is considered critically imperiled due to its extreme rarity and because of the threats of urbanization and exotic weeds.

Species Accounts

The following Federally listed or candidate species are known to occur or to have potential to occur on BLM non-USFS FMO (Natureserve 2006). A list of species ranked by MNHP as critically imperiled (S-1) or imperiled (S-2) is provided in Appendix E.

Mammals

Louisiana black bear (Ursus americanus luteolus), Federally listed as endangered, State-listed as endangered

The Louisiana black bear prefers forested areas with dense understory vegetation, particularly bottomland hardwoods which include hard and soft mast, escape cover, denning sites, corridor habitat, and distance from humans. Escape cover is especially critical for bears that live in fragmented habitat and close to humans. Access to a variety of habitat is consistent with the black bear's need for a seasonal assortment of foods during the year. Louisiana black bears have been known to travel long distances in search of food, habitat, and mates. Modification and loss of habitat are the primary reasons for the decline of the black bear (USFWS 1995). There are an estimated 50 Louisiana black bears in Mississippi. Recent litters in Washington County and in the Mississippi Delta are the first recorded in 30 years.

Gray myotis (Myotis grisescens), Federally listed as endangered, State-listed as endangered

Gray myotis roost almost exclusively in caves, generally utilizing different caves for summer and winter hibernaculum. Gray bats were last documented in Mississippi in 1967 in the northeastern corner of Tishomingo County. A male was found on private property in Tishomingo County on September 20, 2004. The location is approximately 90 km southwest of the closest known gray bat maternal colony, located at Blowing Springs Cave, Alabama (Sherman and Martin 2006).

Indiana bat (Myotis sodalis), Federally listed as endangered, State-listed as endangered

Indiana bats hibernate in caves, typically limestone with pools where the mean midwinter temperature is 4–8 degrees Celsius. During the summer, their habitat consists of wooded or semiwooded areas, often but not always along streams. Indiana bats roost in hollow trees or under loose bark during the summer, including the season for rearing their young. Foraging habitats include riparian areas, upland forests, ponds, and fields (Menzel *et al* 2001). There are no known hibernacula in Mississippi, but there is potential for this species to occur in Tishomingo County, utilizing summer habitats.

Birds

Southeastern snowy plover (Charadrius alexandrinus tenuirostris), State-listed as endangered

This species occurs year-round on the coastal beaches, dry mud or salt flats, and sandy shores of rivers, lakes, and ponds. The species nest on the ground on broad open beaches or salt or dry mud flats, where vegetation is sparse or absent (small clumps of vegetation are used for cover by chicks); nests are found beside or under objects or in the open.

Interior least tern (Sterna antillarum athalassos), Federally listed as endangered, State-listed as endangered

This population is Federally listed where it occurs along sandbars and beaches along the Mississippi River.

Mississippi sandhill crane (Grus canadensis pulla), Federally listed as endangered, State-listed as endangered

This non-migrating subspecies is currently restricted to an area in southern Jackson County, Mississippi, extending from the Pascagoula River west to the Jackson County line, south to Simmons Bayou, north latitude about 4 miles north of Vancleave; part of this area is within the Mississippi Sandhill Crane NWR. Typical habitat is open savannas, swamp edges, young pine plantations, and wetlands along edges of pine forests; associated trees and shrubs include longleaf pine, slash pine, bald cypress, gallberry, wax myrtle, black gum, sweet bay, and yaupon. Approximately 26,000 acres have been designated as critical habitat for the Mississippi Sandhill Crane in Jackson County, Mississippi.

Bewick's wren (Thryomanes bewickii), State-listed as endangered

An extremely rare bird east of the Mississippi River, Bewick's wrens are seen occasionally in Mississippi during the winter, rarely breeding in the State.

Piping plover (Charadrius alexandrinus), Atlantic Coast and Great Plains populations Federally listed as threatened, and Great Lakes populations Federally listed as endangered, State-listed as endangered

All three populations of piping plover winter along the southern Atlantic and Gulf Coasts where they are classified as threatened. On July 3, 2001, USFWS designated 165,211 acres along 1,798 miles of coastline in eight southern States as critical habitat for the wintering population of piping plover. This includes much of the Mississippi coastline. Wintering birds are present from August to May, but numbers peak during the winter months.

Bald eagle (Haliaeetus leucocephalus), Federally listed as threatened, proposed for delisting, State-listed as endangered

Bald eagles are found throughout the State primarily along larger rivers and numerous reservoirs. In 2006, there were 31 active nests in the State being monitored with up to 62 chicks, and the possibility of 13 additional nests (Nick Winstead personal communication).

Wood stork (Mycteria americana), under status review by U.S. Fish and Wildlife Service, State-listed as endangered

The wetlands of the Coastal Plain of Mississippi provide important foraging habitat for wood storks that disperse from breeding areas in Florida, Georgia, and South Carolina in late summer and early fall. Primarily habitats are marshes, swamps, lagoons, ponds, and flooded fields and ditches. During extended drought, depressions in marshes and brackish wetlands have increased importance. In Mississippi, wood storks occur primarily in the coastal counties, including Hancock, Jackson, and Harrison Counties.

*Brown pelican (Pelecanus occidentalis), Federally listed as endangered, although under status review for delisting (***Federal Register***, May 24, 2006), State-listed as endangered*

The brown pelican is a coastal species that makes extensive use of sand spits, offshore sandbars, and islets for nocturnal roosting and daily loafing, especially by nonbreeders and during the non-nesting season. Dry roosting sites are essential. Some roosting sites eventually may become nesting areas.

Red-cockaded woodpecker (Picoides borealis), Federally listed as endangered, State-listed as endangered

Red-cockaded woodpeckers require open pine woodlands and savannahs with large old pines for nesting and roosting habitat. Large old pines are required as cavity trees and are typically in open stands with little or no hardwood midstory and few or no overstory hardwoods. Hardwood encroachment resulting from fire suppression is a well-known cause of cluster abandonment. Suitable foraging habitat typically

consists of mature pines with an open canopy, low densities of small pines, little or no hardwood or pine midstory, few or no overstory hardwoods, and abundant native bunchgrass, and forb ground covers. The Federal threshold for minimally suitable foraging habitat is stands of at least 50 percent pine, where the dominant trees are pines over 30 years of age. Minimum criteria for nesting habitat is pines 60 years or older, which may be dispersed among younger stands, located within 0.5 miles of suitable foraging habitat.

Reptiles

Black pine snake (Pituophis melanoleucus lodingi), a Federal candidate for listing, State-listed as endangered

Black pine snake habitat is characterized as sandy, well-drained soils with an overstory of longleaf pine, a fire-suppressed midstory, and dense herbaceous ground cover. In Mississippi, there are recent records in nine out of 14 counties with historic records (Forrest, George, Greene, Harrison, Jones, Lamar, Marion, Pearl River, Perry, Stone, and Wayne). The distribution of populations within these counties has become highly restricted due to the fragmentation of the remaining longleaf pine habitat. In seven of the nine occupied Mississippi counties, populations of black pine snakes are concentrated in the DeSoto National Forest. In the remaining occupied Mississippi counties, one population is known from the Marion County Wildlife Management Area, and one occurs on private land.

Loggerhead sea turtle (Caretta caretta), Federally listed as threatened, State-listed as endangered

The most common nesting sea turtle in Mississippi, loggerheads nest on open sandy beaches above high-tide mark, seaward of well-developed dunes primarily on barrier islands. Nesting normally occurs from early May through August, with the majority of nests being laid during June and July. Females lay three to five nests, and sometimes more, during a single nesting season. The eggs incubate approximately 2 months before hatching sometime between late June and mid-November.

Rainbow snake (Farancia erytrogramma) State-listed as endangered

The Rainbow snake lives primarily in or near rivers, creeks, swamps, springs, and open marshes, including brackish tidal areas; in some areas hibernation occurs in uplands near water. In Mississippi, there are records for this snake in Forrest, Hancock, Jackson, and Lamar Counties.

Gopher tortoise (Gopherus polyphemus), Federally listed as threatened, State-listed as endangered

In Mississippi, gopher tortoise populations are restricted to the well-drained sandy soil that once supported the vast longleaf forests across the State and much of the southeast. Gopher tortoise occur in suitable habitats south of the city of Jackson and east of the Pearl River. Research has shown that gopher tortoises move up to 600 feet between burrows for breeding purposes, and two or more burrows within 600 feet of each other can be defined as a population (McDearman personal communication)

Yellow-blotched map turtle (Graptemys flavimaculata), Federally listed as threatened, State-listed as endangered

The yellow-blotched map turtle is found only in the Pascagoula River system, including its tributaries: the Leaf, Chickasawhay, and Escatawpa Rivers in southern Mississippi.

Black-knobbed map turtle (Graptemys nigrinoda), State-listed as endangered

Black-knobbed map turtle habitat consists of rivers and streams with moderate current, sand or clay bottom, and logs and other basking sites in northeastern Mississippi in Clay, Lowndes, and Monroe Counties.

Ringed map turtle (Graptemys oculifera), Federally listed as threatened, State-listed as endangered

Typical habitat is medium-size streams and rivers with moderate to fast current, numerous basking logs, nearby sand and gravel bars, and a channel wide enough to allow sun to reach basking logs from 10:00 a.m. to 4:00 p.m. (McCoy and Vogt 1980, Dickerson and Reine 1996). This species requires high water quality to support main food sources. Eggs are laid in nests dug in sandy beaches or gravel bars. In Mississippi, the ringed map turtle is found in the Pearl River system from the vicinity of Philadelphia, Neshoba County, downstream in the Pearl (including Ross Barnett Reservoir) and West Pearl rivers to near the town of Pearl River. Distribution includes habitats in Copiah, Hinds, Lawrence, Leake, Madison, Marion, Neshoba, Pearl River, Rankin, Scott, and Simpson Counties.

Green sea turtle (Chelonia mydas), Federally listed as threatened, State-listed as endangered

The green sea turtle may be an occasional visitor to Mississippi waters, but is not known to nest in the State.

Kemp's Ridley sea turtle (Lepidochelys kempii), Federally listed as endangered, State-listed as endangered

Kemp's Ridley sea turtle is an occasional visitor to Mississippi waters, where it is sometimes caught in shrimp nets. Almost the entire population nests in Mexico and southern Texas.

Leatherback sea turtle (Dermochelys coriacea), Federally listed as endangered, State-listed as endangered

The leatherback sea turtle is an occasional visitor to Mississippi waters, but not known to nest in the State.

Eastern indigo snake (Drymarchon couperi), Federally listed as threatened, State-listed as endangered

The historical range of the eastern indigo snake was from the east coast of South Carolina through southern Georgia, Florida, into southern Alabama and southwest Mississippi, often associated with gopher tortoises. Particularly outside of southern Florida, gopher tortoise burrows provide important refugia from temperature extremes. Naturally occurring populations are now found only in southern Georgia and Florida. Indigo snakes were historically found in the lower coastal plain along with the burrowing gopher tortoise. This species is very rare and possibly extirpated in Mississippi.

Hawksbill sea turtle (Eretmochelys imbricata), Federally listed as endangered, State-listed as endangered

Hawksbill sea turtles may be an occasional visitor to Mississippi waters, but are not known to nest in the State.

Southern hognose snake (Heterodon simus), State-listed as endangered

Historically this snake occurred in open, xeric habitats with well-drained, sandy soils in the Coastal Plain from eastern North Carolina to southern Florida, west to southeastern Mississippi. It is now presumed to be extirpated in Mississippi and possibly extirpated in Alabama.

Amphibians

One-toed amphiuma (Amphiuma pholeter), State-listed as endangered

This species is found in deep, organic, liquid muck in alluvial swamps of low-gradient second or third order streams, spring runs, and occasionally floodplain swampy terrace streams. There are records from Jackson County in Mississippi.

Mississippi gopher frog (Rana sevosa), Federally listed as endangered, State-listed as endangered

This species once existed in the longleaf pine forests of the lower coastal plain from east of the Mississippi River in Louisiana to the Mobile River delta in Alabama. It has not been seen in Louisiana since 1967 or in Alabama since 1922. It is currently known to exist in four locations in Mississippi. The largest and best known population is at Glen's Pond located in Harrison County, Mississippi, on the De Soto National Forest. Two other occupied ponds were found in 2004; one pond is owned by the State of Mississippi, and the other is on private land in Jackson County. An additional pond has been established to assist with the recovery of the species.

Green salamander (Aneides aeneus), State-listed as endangered

This salamander is limited to northeastern Mississippi with records from Tishomingo County. It prefers damp (but not wet) crevices in shaded rock outcrops and ledges. It sometimes reaches high population densities in logged areas where tree tops are left.

Cave salamander (Eurycea lucifuga), State-listed as endangered

This salamander is found in caves (usually limestone); also rocky streams and springs, and wooded areas and fields, usually near caves or limestone outcrops in northern Mississippi. There are records from Tishomingo County.

Spring salamander (Gyrinophilus porphyriticus) State-listed as endangered

This salamander is found in small, clear upland streams; clear springs; caves; shaded seepages; occasionally in swamps and lake margins, sometimes also in forested wet areas away from streams, especially during rainy periods. There are records of this salamander from Tishomingo County.

Fish

Gulf sturgeon (Acipenser oxyrinchus desotoi), Federally listed as threatened, State-listed as endangered

Adult Gulf sturgeon migrate into large river systems between late March and early April to spawn, sometimes moving as much as 140 miles upstream. Adults and subadults return to the Gulf of Mexico in late fall. The young generally stay in the river mouth through winter and spring. Critical habitat has been designated and in Mississippi includes the Pearl and Pascagoula Rivers and their major tributaries.

Pallid sturgeon (Scaphirhynchus albus), Federally listed as endangered, State-listed as endangered

The pallid sturgeon is a species of large, turbid, free-flowing rivers and occurs in strong current over firm gravel or sandy substrate. In Mississippi, records are from the Mississippi River and Sunflower River/Yazoo Rivers.

Crystal darter (Crystallaria asprella), State-listed as endangered

The crystal darter is found in large creeks and rivers with extensive clean sand and gravel raceways. In Mississippi, crystal darters may be extirpated from the Tombigbee River, as they have not been collected since shortly after it was completed. There are other records from Pearl River system and Bayou Pierre.

Bayou darter (Etheostoma rubrum), Federally listed as threatened, State-listed as endangered

The bayou darter distribution is very localized and found in Bayou Pierre and its tributaries in Copiah County. The largest concentrations occur in sections of Bayou Pierre and Foster Creek, north of State Highway 548. Bayou darter prefers stable, moderately swift riffles of large gravel and rock in creeks and small to medium rivers.

Pearl Darter (Percina aurora), candidate for Federal listing

The Pearl darter are thought to be extirpated from the Pearl River, but is extant in the Pascagoula River system, including the Leaf River. Records occur in a variety of habitats ranging from silt, gravel, and cobble substrates, in shallow to deep water.

Ironcolor shiner (Notropis chalybaeus), State-listed as endangered

This shiner occurs in low gradient coastal streams along the Atlantic and Gulf Coasts. In Mississippi, surveys in 1995–1996 did not find any ironcolor shiners at 15 historic locations. During this survey, a new locality was recorded in extreme southeastern Mississippi in the Escatawapa River (Albanese and Slack 1998).

Frecklebelly madtom (Noturus munitus), State-listed as endangered

This fish occurs chiefly in rocky riffles in medium to large rivers. In Mississippi, the current range is restricted to the Tombigbee and Pearl River systems.

Greenside darter (Etheostoma blennioides), State-listed as endangered

Habitat preferences are variable; often in medium to large creeks and small to medium rivers with gravel- or rubble-strewn riffles, although they also occur in silt-free, shallow bedrock pools with steady current, and sometimes inhabit relatively quiet lake shores. In Mississippi, records are from the northeastern corner of the State in Tishomingo County.

Saltmarsh topminnow (Fundulus jenkinsi) Federal candidate for listing

This coastal species is found in cord grass marshes. During a recent survey, 90 percent of the saltmarsh topminnow was found in water with less than or equal to 12 percent salinity. In Mississippi, there are scattered records along the coast, including the Simmons Bay, Old Fort Bayou, Biloxi Bay, and Bay St. Louis.

Bigeye shiner (Notropis boops), State-listed as endangered

This fish is generally confined to upland streams in the Mississippi River Basin from the Tennessee and Ohio River Basins west to Missouri and Arkansas. In Mississippi, there are records from the Tennessee River system in the northeastern portion of the State.

Slenderhead darter (Percina phoxocephala), State-listed as endangered

This species is found in runs and riffles of creeks and small to medium rivers with moderate to strong flow and gravel, rubble, or bedrock substrate. In Mississippi, records are from Tishomingo County in the northeast corner of the State.

Suckermouth minnow (Phenacobius mirabilis) State-listed as endangered

This bottom-feeding minnow is found in low-gradient and moderate-gradient rivers and large creeks. In Mississippi, there are records in Tishomingo County.

Southern redbelly dace (Phoxinus erythrogaster) State-listed as endangered

This dace is generally found in headwater streams and upland creeks. In Mississippi, there are records from Tallahatchie, Tishomingo, Warren, Wilkinson, and Yazoo Counties.

Slender madtom (Noturus exilis) State-listed as endangered

This species uses a wide range of depths and current velocities. In Mississippi, there are records from Tishomingo County.

Mussels

The following mussel species are Federally or State-listed in Mississippi.

Table 3-13. Federally and State-listed Mussel Species in Mississippi

Federally and State-listed Mussel Species in Mississippi	Federal Status	State Status	Critical Habitat Designated	County Occurrence Records
Alabama moccasinshell (*Medionidus acutissimus*)	T	E	Yes	Lowndes and Monroe Counties
Black clubshell (*Pleurobema curtum*)	E	E	Yes	Monroe County
Delicate spike (*Elliptio arctata*)		E	No	George, Leake, Lowndes, Monroe, and Simpson Counties
Fat pocketbook (Potamilus (=Proptera) capax)	E	E	No	Adams, Issaquena, and Jefferson Counties
Flat pigtoe (Pleurobema marshalli)	E	E	Yes	Lowndes County
Heavy pigtoe (Pleurobema taitianum)	E	E	Yes	Lowndes and Itawamba Counties
Inflated heelsplitter (*Potamilus inflatus*) **likely extirpated from the State**	T	E	Yes	NA (Pearl and Tombigbee Rivers)
Kidneyshell (Ptychobranchus fasciolaris)		E	No	Tishomingo County
Monkeyface (Quadrula metanevra)		E	No	Clay, Lowndes and Monroe Counties
Orange-nacre mucket (*Lampsilis perovalis*)	T	E	Yes	Itawamba, Lowndes, and Monroe Counties
Ovate clubshell (Pleurobema perovatum)	E	E	Yes	Clay, Itawamba, Lowndes, and Monroe Counties, potential habitat in those counties bordering the Mississippi River
Pyramid pigtoe (*Pleurobema rubrum*)		E	No	Coahoma, Hinds, Humphreys, Sunflower, Warren, and Washington Counties
Sheepnose mussel (*Plethobasus cyphus*)		E	No	Sunflower County

Federally and State-listed Mussel Species in Mississippi	Federal Status	State Status	Critical Habitat Designated	County Occurrence Records
Slabside pearlymussel (Lexingtonia dolabelloides)		E	No	NA (Lake Pontchartrain)
Snuffbox (Epilblasma triquetra)		E	No	Tishomingo County
Southern clubshell (*Pleurobema decisum*)	E	E	Yes	Clay, Itawamba, Lowndes, and Monroe Counties
Southern combshell (*Epioblasma penita*)	E	E	Yes	Clay, Itawamba, Lowndes, and Monroe Counties
Spike (Elliptio dilatata)		E	No	Benton and Sunflower Counties
Stirrupshell (*Quadrula stapes*)	E	E	Yes	Lowndes County

Crayfish

Camp Shelby burrowing crawfish (Fallicambarus gordoni), a Federal candidate for listing, State-listed as endangered

This crayfish is restricted to bogs in pitcher plant wetlands in the Leaf River watershed, in the De Soto National Forest in Perry County, Mississippi.

Insects

Mitchell's satyr butterfly (Neonympha mitchellii mitchellii), Federally listed as endangered

There are recent records of this butterfly in Prentiss and Tishomingo Counties in northeastern Mississippi.

Plants

Louisiana quillwort (Isoetes louisianensis), Federally listed as threatened

Louisiana quillwort is restricted to shallow blackwater streams in riparian woodland and bayhead forest areas of pine flatwoods. The plants are found on stable sand and gravel bars, moist overflow channels with silty sand substrates, and on low, sloping banks near and below water level. In Mississippi, there are records from Jackson and Perry Counties.

Pondberry (Lindera melissifolia), Federally listed as endangered

Pondberry habitat is characterized as seasonally flooded wetlands, such as floodplain hardwood forests and forested swales. Pondberry is usually found in shade but tolerates full sun. In Mississippi, there are records of approximately 204 colonies, primarily in the Delta National Forest (192 colonies in the Delta National Forest and 12 colonies on private lands approximately 65 miles north of the Forest) (GSRC 2002).

Price's potato bean (Apios priceana), Federally listed as threatened

Price's potato bean is an herbaceous twining perennial vine typically located under mixed hardwoods or in associated forest clearings, often where bluffs or ravine slopes meet creek or river bottoms. Soils are generally well-drained and loamy, formed on alluvium or over calcareous boulders. Several populations extend onto road or powerline ROWs. There are four populations in Mississippi located in three counties: Clay, Oktibbeha, and Lee (Norquist 1990).

American chaffseed (Schwalbea americana), Federally listed as endangered

American chaffseed is a perennial member of the figwort family found in acidic, sandy, or peaty soils in open pine flatwoods, pitch pine lowland forests, seepage bogs, palustrine pine savannahs, and other grass- and sedge-dominated plant communities. It frequently grows in ecotonal areas between peaty wetlands and xeric sandy soils. In these situations, individuals sometimes extend well into the drier communities but seldom into the areas that support species characteristic of wetter soils. Surrounding plant communities are typically rich in species diversity. There are historic records from Jackson County.

3.4.7 Wildland Fire Ecology and Management

Characteristics of wildfire in southeastern States are discussed in Section 3.2.7; however, the southern one-third of Mississippi generally tends to have the most wildland fire activity (Southern Group of State Foresters 2004). Mississippi's forests and associated species are adapted to regular wildland fire. However, changing land use practices, urban sprawl, land fragmentation, natural disasters such as hurricanes, increasing land values, population increases, and the transition from urban to rural populations results in a buildup of fuels and a need to increase fuels management and wildland fire activities (Southern Group of State Foresters 2004). Through the course of an average year in Mississippi, there are 3,635 individual wildland fires that burn 47,597 acres per year over the last 5 years (fiscal years 2000–2004) (MFC 2004). The average wildfire size is approximately 10 acres per fire (MFC 2004).

Although Mississippi has WUI areas across the State, relatively few homes and structures are lost to wildland fires annually. An average of 12 homes and eight other structures are lost each year to wildland fires. There are usually 15 vehicles damaged or destroyed by wildland fire each year (Southern Group of State Foresters 2004).

The Mississippi Forestry Commission (MFC) is responsible for protecting 14.8 million acres of private non-industrial forestland within the State (Southern Group of State Foresters 2004). MFC provides forest protection through the placement of county fire crews and by working closely with Federal agencies through cooperative agreements and Memoranda of Understanding (MOU) (Southern Group of State Foresters 2004). On Federally managed lands (9.8 percent of the forestland base), the MFC has mutual aid agreements to support Federal wildland fire suppression efforts. Timber companies suppress wildland fires on their property and at times assist in suppression efforts on private lands (Southern Group of State Foresters 2004).

Since forestlands and species in Mississippi are adapted to regular disturbance by wildland fires to maintain forest health, but suppression activities limit the role of natural wildland fires, managed fuels treatments are needed to maintain forest health. Table 3-14 shows the fuels treatments completed in Mississippi by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Mississippi over these 4 years. Over 95 percent of these treatments were completed by the USFS using prescribed fires approximately 80 percent of the time. Over 96 percent of Federal fuels treatments were applied in WUI areas.

Table 3-14. DOI and USDA Fuels Treatment Accomplishments for Mississippi (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	101,385	117,052	218,437	2,847	846	3,693	222,130
2005	256,138	18,879	275,017	10,312	27	10,339	285,356
2004	251,924	10,496	262,420	16,820	672	17,492	279,912

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2003	264,855	605	265,460	6,598	466	7,064	272,524
Source: http://www.fireplan.gov/overview/States/ms.html, accessed March 2, 2007							

Fuels treatments, including prescribed fire, are also implemented by the MFC on the private and State-owned forests. In addition, the MFC provides training and permitting to ensure that fuels treatments in these areas, and prescribed fire in particular, are completed in a manner that protects firefighter and public safety, as well as capital improvements and natural resources.

3.4.8 Cultural Resources

Mississippi surface and non-USFS FMO tracts have not been fully surveyed for cultural resources. The surveys that have been conducted were usually initiated by project proponents on a project-specific basis, such as for oil and gas, coal mining, transportation, or water projects, to comply with the requirements of Section 106 of NHPA, 36 CFR Part 800, described in Section 3.2.8.

A cultural resources literature and records search was conducted for the BLM surface and non-USFS FMO tracts in the State of Mississippi. The results of the research are presented in an overview (Panamerican Consultants, Inc. 2005a) that is on file at the BLM office in Jackson. The following cultural resource information was taken from Panamerican Consultants Inc. (2005b), unless otherwise noted. Descriptions of the prehistoric periods are provided in Table 3-5. Cultural resources from any of these time periods may be present on BLM-administered surface and non-USFS FMO.

Prehistory

A variety of cultural resource site types attributed to a range of culturally distinct chronological periods from 10,000-plus years ago to the present day have been recorded in the Southeast. The cultural periods represented include Paleoindian, Archaic, Gulf Formational, Woodland, Mississippian, and Protohistoric. Descriptions of the prehistoric periods and general types of cultural materials associated with each one are provided in Table 3-5 in Section 3.2.8.

History

A wealth of Mississippi history is associated with American Indian inhabitants, European exploration, multiple battles, and the evolution of Southern culture. These events, discussed below, provide the context and relative importance of the cultural site types that may be encountered on BLM-administered surface and non-USFS FMO.

From the 16th to the 19th century, Spain, France, and England fought for domination and possession of the territories and resources in the southeastern United States. European exploration of this area was discussed in Section 3.2.8. Mississippi was home to many American Indian groups during this time, but European disease epidemics and Chickasaw slave raids greatly reduced their populations (Galloway 1995). The three best known American Indian groups in Mississippi are the Choctaw, Chickasaw, and Natchez (Cushman 1899). The Choctaw, who had the largest population, occupied most of southeastern Mississippi and a portion of western Alabama. The Chickasaw occupied the northeastern section of Mississippi and claimed western Tennessee as a hunting ground. The Natchez occupied the loess bluffs overlooking the Mississippi River in southwestern Mississippi. If any cultural material potentially tied to

these Indian Nations is encountered, Federally recognized Native American tribes will need to be consulted before any undertaking, as discussed in Section 3.2.8.

After the American Revolution, the lands east of the Mississippi River became part of the United States. The Mississippi Territory was created in 1798, and Mississippi became a State in 1817 (Bettersworth 1959; Haynes 1973). The largest population growth and county organization in Mississippi history occurred between 1832 and 1854 (Gonzales 1973). Numerous railroads were chartered, seagoing steamboats came upriver to Natchez, and many domestic travel improvements were made. Land development, the rise of cotton as a major cash crop, and easier means of transporting goods contributed to the State's growing prosperity. Slavery played a vital role in the growth and production of cotton and became a contentious issue in Mississippi and the other States. The pro-slavery States began to move toward secession from the Union, and in 1861, Mississippi voted to secede (Bettersworth 1959). The Mississippi River was of great importance to the Union because it kept the Midwest commerce moving and was a major focus for Northern generals during the Civil War. In 1865, the war ended and the slaves were emancipated, which dramatically affected Southern agriculture and economics. Sharecropping and tenant farming became the common mode of farming after the abolition of slavery.

In the late 1800s, manufacturing in the State was in the form of textile mills. The lumber industry became a growing economic force, as did the cottonseed and fertilizer industries (Bettersworth 1959). Mississippi's centennial celebration was overshadowed by the entry of the United States into World War I. Camp Shelby, near Hattiesburg, was made a major training camp. One of the few air bases in the country was located near the town of Columbus (Bettersworth 1959). Following World War I, the Mississippi River Flood of 1927 covered nearly half of the delta with 30 feet of water for months (Barry 1998; Bettersworth 1959). Nearly 300,000 Black Americans migrated to northern cities as a result of this flood. Another result was the creation of several large flood-control steps by the U.S. Army Corps of Engineers in Vicksburg (Barry 1998). The Depression followed the flood, and Mississippi's economy was once again shattered (Emmerich 1973). World War II and military mobilization brought significant change to the State's economy.

Cultural Sites

As discussed in Section 3.2.8, prehistoric or historic cultural resource sites, structures, or objects listed on or eligible for listing on NRHP are protected and managed as directed by 36 CFR 800. Cultural resources found ineligible for NRHP require no further archaeological work and are not protected by law. Sites are identified as undetermined/unknown when additional work is required to determine the site's eligibility. The nature and location of any archaeological resources are protected under ARPA (also discussed in Section 3.2.8).

Records were searched for 3,698 non-USFS FMO tracts in Mississippi. The records revealed 601 sites, of which 28 sites were considered eligible for NRHP. Most of the tracts have never been surveyed, and there is a high potential for finding additional archaeological sites. There are two sites listed on NRHP that are located near BLM-administered, non-USFS FMO tracts.

Records were searched for the BLM surface tract in Mississippi, which cover 174 acres in Hancock County. This tract does not contain any previously recorded sites; however, there are three cultural sites recorded within one-half mile of the tract. There are 20 NRHP-listed properties in Hancock County (NRHP 2004), but only one NRHP-listed archaeological site is located within 800 meters of the tract. Cultural sites on adjacent lands could provide information on the potential for the occurrence and types of sites that could be discovered on the BLM surface tracts; however, these sites are not affected by BLM activities and management. Table 3-15 summarizes the cultural sites identified.

Table 3-15. Cultural Sites on BLM Surface and Non-USFS FMO Tracts in Mississippi

Tract Type	Total Sites	NRHP Status		
		Potentially Eligible/ Eligible	Not Eligible	Undetermined/Unknown
Non-USFS FMO Tracts	601	28	173	400
Hancock County Surface Tract	0	0	0	0
Areas Adjacent to the Surface Tract[1]	3	3	0	0

1 One NRHP-listed archaeological site is located within 800 meters of the surface tract.

3.4.9 Visual Resources

Visual resources consist of the natural and manmade features that contribute to a particular environment's aesthetics. These features may be natural (e.g., canyon views) or manmade (e.g., city skyline). Together, they form the overall impression of an area referred to as the landscape character. Visual resources also have a social setting, which includes public values, awareness, and concern about visual quality. VRM classifications are established for public lands so that visual resource values can be maintained through informed management decisions. Current conditions of visual character on the BLM-administered surface tracts are discussed in Section 3.5.

The visual resource inventory process contained in BLM Handbook H-8410-1 provides the BLM managers guidance for determining visual values. The inventory consists of scenic quality evaluation, sensitivity level analysis, and delineation of distance zones. Based on these three factors, BLM-administered lands are placed into one of four visual resource inventory classes. These inventory classes represent the relative value of the visual resource: Classes I and II are the most valued, Class III represents a moderate value, and Class IV has the least value. Management objectives have been assigned to each class. An area may be inventoried as VRM Class III, but a decision may be made to manage it as VRM Class IV, or vice versa. Cultural modifications may detract from the scenery, complement it, or improve the overall scenic quality of an area. Cultural modifications in landform/water and vegetation values and addition of structures will be considered in examining proposed resource management actions.

The following VRM Class definitions from BLM Handbook H-8410-1 have been amended for the purpose of developing and implementing this RMP. Amendments incorporate the visual resource values provided by existing cultural features that are significant to the character of the landscape in Mississippi.

- **VRM Class I Objective.** The objective of this class is to preserve the existing natural and cultural character of the landscape. This class provides for natural ecological changes; however, it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not detract from the existing landscape character.
- **VRM Class II Objective.** The objective of this class is to retain the existing natural and cultural character of the landscape. The level of change to the characteristic should be low. Management activities may be visible but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural and/or cultural features of the characteristic landscape.

- **VRM Class III Objective.** The objective of this class is to partially retain the existing natural and cultural character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may be visible but should not dominate the view of the casual observer. Changes should blend with the natural environment.
- **VRM Class IV Objective.** The objective of this class is to provide for management activities that require significant modification of the existing landscape or the existing character of the natural and cultural landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of the casual observer's attention; however, every attempt should be made to minimize the impact of these activities through selective location, minimal disturbance, and repetition of basic elements.

3.4.10 Minerals

There are 517,934 acres of BLM-administered, non-USFS FMO in Mississippi that underlie various surface ownership. Surface owners include the BLM, DoD, NPS, USFWS, and other Federal agencies. Table 3-16 shows BLM-administered FMO by surface ownership in Mississippi.

Table 3-16. BLM-administered Federal Mineral Ownership by Surface Ownership

Surface Ownership	Federal Mineral Ownership in Mississippi (Acres)
BLM	174
DoD	40,580
NPS	2,797
USFWS	60,207
Other Federal Agencies	12,766
Non-Federal surface	401,410
TOTAL non-USFS FMO	**517,934**
USFS	1,055,227
TOTAL FMO (includes USFS)	**1,573,161**

Minerals—Oil and Gas

The first oil and gas exploration in Mississippi was undertaken in 1903. The Alabama-Mississippi Investment and Development Company in Enterprise, Mississippi, drilled the first well just east of Enterprise in Clarke County. It was a dry hole that was drilled to 1,842 feet. The first commercial discovery occurred near Amory, Mississippi, in Monroe County in October 1926, when gas flowed from the 2,404-foot Amory Petroleum Company Carter Oil #1 well. As of April 2005, there are 27 active oil and gas wells on BLM non-USFS FMO according to data from the Automated Fluid Mineral Management System.

Mississippi oil and gas production data from the Mississippi Oil and Gas Board were available for the period 1951–2004. The number of wells increased from 1,780 in 1951 to 4,307 in 2003. The number of wells peaked at 4,530 wells in 1990. Oil production decreased from 27,494,492 barrels in 1990 to 17,238,528 barrels in 2004. Oil production was at its lowest in 2004 and peaked at 65,119,072 barrels in 1970. Gas production decreased from 200,980,232 mcf in 1990 to 174,438,213 mcf in 2004. As of April

2005, 1,223 Federal leases are authorized in Mississippi. There are 42 existing leases on non-USFS FMO and 1,181 leases on USFS FMO.

Map 3-1 shows counties in Mississippi with historical oil and gas production. Reasonable foreseeable development is anticipated in the areas of historical oil and gas production (BLM 2004b). The areas of historical production are the salt basin and the coastal plain. The BLM projects that 10 wells accessing non-USFS FMO in Mississippi will be drilled over the next 20 years (BLM 2004b).

Salt Basin

The salt basin is part of the Gulf Coast geosyncline that contains more than 50 piercement-type salt domes (Spiers and Gandl 1980). The individual salt domes evolved from the uprising of salt from the extensive Jurassic Louann Salt Formation through the overlying sediments. These piercement structures have deformed the younger units. Oil and gas have been found on the dome flanks in the past 20 years.

The oldest rocks in the area penetrated by drilling are those of the Louann Salt. The salt is overlaid by Upper Jurassic sandstones, followed by a thick sequence of cretaceous deposits, which consist primarily of sandstone, limestone, and shale. The Cretaceous deposits are overlain by Tertiary deltaic deposits and alluvium of Quaternary or Recent age.

Coastal Plain

The coastal plain is a continuation of the same feature in the southern Alabama Basin. These lands are in an area dominated by the Gulf Coast geosyncline. This large basin formed in the Jurassic period with a southward downwarping. The basin has accumulated sedimentary deposits as thick as 30,000 feet. Fault zones parallel the basin hingeline and can trap hydrocarbons (Murray 1964). Other structural features, such as small basement highs, also trap hydrocarbons in this area.

The deposits in the major geologic units mainly consist of alternating layers of sand and clay, with occasional beds of carbonates and anhydrite. Permeable horizons exist in all formations, and oil and gas are produced from each horizon in the region, with the Haynesville, Smackover, and Norphlet Formations being important (Cate 1982; Poe 1979; May 1974; Moore 1971; Dinkins 1968).

Leasable Minerals – Coal

Coal resources in Mississippi are not described because consideration of coal leasing in this Proposed RMP-FEIS is limited to the Warrior coal basin in Alabama. Development of Federal coal resources in Mississippi over the next 20 years is not economically viable because of the depth to the coal.

3.4.11 Recreation and Travel Management

Recreation encompasses various human activities that affect and are affected by resources and other resource uses. Dispersed recreation is characterized by unstructured activities that are not confined to specific locations (such as developed recreation sites). Dispersed recreation can involve various activities, which on the Mississippi surface tract can include saltwater marsh activities such as hunting, fishing, nature study, and boating.

There are no roads on the Hancock County tract. The only effective means of transportation is by watercraft.

The BLM-administered, non-USFS FMO includes the mineral estate where the surface is managed by another Federal surface managing agency. These properties and installations managed by other Federal agencies as well non-Federal agencies such as private, State, or county are summarized in Table 3-17 and shown on Map 1-1 and Map 1-2.

For those tracts where the surface is managed by another surface managing agency, and where public access for recreation and oil and gas leasing are permitted, recreation experiences and resulting benefits could be affected by the BLM management actions. Information on public recreation and minerals leasing on other Federal surface management agencies is listed in Table 3-17.

Table 3-17. BLM-administered, non-USFS Federal Mineral Ownership[1] by Surface Managing Agency in Mississippi

Surface Managing Agency	Installations/Areas	Public Access for Recreation (Yes/No)[2]	Mineral Leasing (Open/Closed)[2]
USFWS	Grand Bay NWR	Yes	Closed
	Mississippi Sandhill Crane NWR	No	Closed
	Bogue Chitto NWR	Yes	Closed
	Panther Swamp NWR	Yes	Closed
	Hillside NWR	Yes	Closed
	Noxubee NWR	Yes	Closed
DoD	Meridian Naval Air Station (Navy)	ND	Open
	Alpha Naval Auxiliary Station (Navy)	ND	Open
	Multipurpose Target Range (Navy)	ND	Open
	Aliceville Lake (Army Corps of Engineers)	Yes	Open
	Columbus Lake (Army Corps of Engineers)	Yes	Open
	Aberdeen Lake (Army Corps of Engineers)	Yes	Open
	Grenada Lake (Army Corps of Engineers)	Yes	Open
	Enid Lake (Army Corps of Engineers)	Yes	Open
	Sardis Lake (Army Corps of Engineers)	Yes	Open
NPS	Vicksburg National Military Park	Yes	Closed
	Natchez-Trace National Parkway	Yes	Closed
	Gulf Island National Seashore	Yes	Closed
	Other small NPS sites	Yes	Closed
Other	Areas Managed by Other Federal Agencies	No	Varies

ND means no information was available from the surface managing agency.
1 Does not reflect BLM FMO for BLM surface tracts (174 acres).
2 Closed means closed to new leases. Existing leases could be present on areas currently closed.

The BLM administration of travel resources in Mississippi is limited to access routes and associated access/maintenance routes for ROW such as transmission lines. Public travel routes are administered and maintained by other Federal, State, and local agencies. Information on tract-specific travel resources is contained in Section 3.5.

3.4.12 Lands and Realty

The goals of the lands and realty program are to manage the public lands to support the goals and objectives of other resource programs, provide for uses of public lands in accordance with regulations and compatibility with other resources, and improve management of the public lands through land tenure adjustments. The lands and realty program is a support program to all other resources to help ensure that BLM-administered lands are managed to benefit the public. Current conditions of lands and realty on the BLM-administered surface tracts are discussed in Section 3.5.

3.4.13 Social and Economic

The BLM surface lands for this planning effort in Mississippi are located in an isolated section of Hancock County. BLM-managed, non-USFS FMO is scattered throughout the State. Thus, the description of affected environment for Mississippi will focus on general socioeconomic information for the State, in addition to descriptions of notable statistics in counties within the State.

Economic Characteristics

Household and Personal Income

Median household income for Mississippi was $32,397 in 2003 (U.S. Census Bureau). Information on per capita income was obtained from U.S. Census Bureau and indicates that average per capita income reported for 2004 in Mississippi was $24,518. Gross State Product in 2003 was $72 billion (BEA). In 2005, Mississippi ranked fiftieth in the United States in per capita income (including the District of Columbia). According to BEA, Mississippi per capita income is 71 percent of the national average of $36,608 (2006 dollars).

Some of the nation's poorest counties are located in Mississippi, with approximately 13 counties that are within the 100 poorest counties in the nation in terms of per capita income. The counties and their associated average per capita income are located in Figure G-7 (Appendix G). These counties are located primarily along the western border of the State. In contrast, Mississippi does not have any counties that are within the wealthiest 100 counties in the nation. Rankin County, encompassing many of the suburbs of Jackson, has the highest per capita income of $30,849 in 2006 dollars.

Employment and Compensation

Employment for the State was 1.5 million in 2005 (BLS 2005). Figure F-8 (Appendix F) summarizes the employment by industry for 2005. In 2005, there were three large employers in Mississippi: Government (18 percent), manufacturing (12 percent), and retail trade (11 percent), comprising 41 percent of the total employment for the State. Other industries in the State include health care, accommodation and food service, and construction. Table 3-18 summarizes the employment by industry between 2000 and 2005.

Table 3-18. Employment by Industry, 2000–2005

Industries	2000	2001	2002	2003	2004	2005	Percent Change 2000-2005
Retail Trade	171,882	171,104	170,592	172,291	172,384	174,166	-1
Transportation	51,141	50,901	49,587	49,506	48,992	50,193	2

Industries	2000	2001	2002	2003	2004	2005	Percent Change 2000-2005
Finance and Insurance	47,734	47,357	47,282	47,530	47,128	47,986	-1
Real Estate	38,092	35,730	32,986	32,833	32,070	32,089	19
Professional Services	56,268	52,825	50,148	48,683	48,081	46,980	20
Administrative and Waste Services	68,605	63,810	59,262	57,212	54,206	57,252	20
Health Care	124,422	122,515	120,171	116,127	111,908	108,386	15
Accommodation and Food Services	118,503	119,166	117,468	114,441	106,631	106,168	12
Other Services	84,969	84,979	80,702	80,009	76,930	75,441	13
Government	277,404	281,982	281,442	277,815	275,254	273,722	1
Farming	50,367	50,874	51,031	53,668	53,062	54,955	-8
Construction	90,915	85,724	85,348	86,899	86,020	88,129	3
Manufacturing	183,425	184,519	183,613	192,715	205,517	224,759	-18
Wholesale Trade	39,751	39,250	38,667	38,814	39,102	41,262	-4
Other	101,789	102,410	102,265	104,382	112,102	111,184	-8
Total Employment	**1,505,277**	**1,493,146**	**1,470,564**	**1,472,925**	**1,469,614**	**1,492,672**	**6**

Source: Bureau of Labor Statistics

Government, retail trade, and construction industries have remained relatively stable over the past several years, while the manufacturing industry has decreased its employment in the State by 18 percent and the health care and accommodation and food services industries have increased employment by 15 and 12 percent, respectively.

The unemployment rate in Mississippi has been consistently above the national average, as depicted in Figure G-9 (Appendix G). The employment rate peaked to 8.8 percent in 2005, likely as a result of the devastation of Hurricane Katrina. Figure G-10 (Appendix G) shows a map of Mississippi unemployment rates by county and indicates that the highest unemployment rates are in Jefferson, Sharkey, Humpreys, Holmes, and Noxubee Counties.

Oil and gas also provide employment and income within the State. However, over the past 20 years, the BLM has permitted 7 wells of a total of 7,362 wells permitted within the State. Therefore, although these BLM-administered oil and gas resources do contribute to employment and earnings in this area, it is a fairly small amount.

Social Characteristics

Demographics

Population trend data were obtained from the Census Bureau. Figure G-11 (Appendix G) shows the State's population trend between 2000 and 2005, a percentage change of 3 percent over the 6-year time period. The densest counties include Hinds and Rankin, both comprising the Jackson metropolitan area,

as well as Harrison and Jackson Counties, on the southeastern coast. De Soto County, comprising the suburbs of Memphis, Tennessee, also has a relatively dense population. Counties that have fairly low population densities relative to the other counties in the State include Webster, Choctow, Quitman, Franklin, Jefferson, Issaquena, and Benton. Counties experiencing very high growth rates between 2000 and 2005 include De Soto (26 percent), Lamar (13 percent), and Rankin (13 percent). On the other hand, Issaquena and Sharkey Counties are decreasing in population: 15 and 9 percent, respectively. The median age of the State population in 2000 was estimated to be 33.8, which is slightly lower than the nation's median of 35.3 (U.S. Census 2000).

Housing

In the State, 90.1 percent of the 1.1 million housing units were occupied in 2000. Homeowners inhabited 72.3 percent of the total occupied housing units. The State has a low homeowner vacancy rate, 1.6 percent, indicating that most of the owner-occupied homes in Mississippi are occupied by owners and are not second homes. The average household size for owner-occupied units is 2.67 people, as compared to 2.52 for rental-occupied units (U.S. Census Bureau 2000). In 2000, the median value of a housing unit was $71,400, 59 percent of the national median value of $119,600. Although the personal income is less than the national average (71 percent), the cost of housing is significantly lower (59 percent), indicating that the cost of living in Mississippi is likely lower than the nation, on average.

Education

Of the State's population above age 25, 72.9 percent has graduated from high school and 16.9 percent holds a bachelor's degree (U.S. Census 2000). This is lower than the national average for high school graduates (80.4 percent) and bachelor's degree (24.4 percent). Ninety-six percent of the State's population speaks English at home.

Attitudes and Beliefs of Mississippi Stakeholders

In Mississippi, the BLM has responsibility for a number of issues and decisions that could be important to stakeholders and their beliefs, including Federal land disposal and oil and gas development. This section will briefly describe stakeholders' attitudes and beliefs related to these specific issues to provide a social context for these decisions.

Public lands are important in providing a natural resource base for economic activities. The potential additional oil and gas development will be supported by some stakeholders and not by others. Stakeholders who support oil and gas development believe that domestic production of resources will reduce the nation's dependency on foreign oil and gas sources and potentially affect prices. Additionally, the oil and gas industry has contributed to the tax base of both counties and the State, providing funds for local, regional, and State governments, infrastructure, schools, and other community services. Many people believe that this funding is vital to the economy of Mississippi counties and the State.

Conservation-focused stakeholders may not support oil and gas development or might support conditions and stipulations on development and production to reduce negative impacts to the surface and subsurface. These environmental stakeholders are concerned about erosion and water quality impacts associated with road and wellpad construction and water disposal in the production process. Some stakeholders believe that the potential long-term environmental risks of development are considerable compared to the short-term benefit of the resource extracted. Additionally, these types of stakeholders believe that oil and gas impacts such as increased road building, associated road traffic, dust, and noise add to the negative impacts associated with this type of development.

Public land disposal may also be a contentious issue with the public. The BLM in Mississippi manages one pocket property, the Hancock County tract, located on the southern coast of Mississippi. Preservation-oriented stakeholders are concerned about protecting open spaces and limiting development on these lands, often to maintain a quality of life that the property provides. For example, quality of life attributes could include recreation, such as bird-watching or walking, solitude, and the knowledge that the property provides important wildlife habitat. Therefore, these types of stakeholders believe that keeping the surface lands in Federal ownership is preferable or selling these lands to organizations interested in preserving the lands. Developers might be interested in purchasing these lands for their economic value due to their location on the coast if the lands are buildable. Additionally, some people may feel that disposing of Federal lands provides fiscal revenues as private property taxes can be collected.

Environmental Justice

The environmental justice purpose and threshold criteria are provided in Section 3.2.13.

Poverty level estimates for the State were estimated to be 19.9 percent, compared to the national average of 12.5 percent, as shown in Figure G-12 (Appendix G). The poverty levels in the State are below the set threshold of 20 percent for low-income populations. Table 3-19 shows the ten poorest counties in Mississippi and the associated percentage of the population below poverty, located primarily along the western border of the State.

Table 3-19. Poorest Counties in Mississippi

Counties	Percent of Population Below Poverty
Wilkinson County	28.1
Jefferson County	28.2
Coahoma County	28.4
Washington County	28.5
Leflore County	29.5
Sharkey County	29.5
Issaquena County	29.6
Humphreys County	30.2
Sunflower County	30.5
Holmes County	32.4
Source: Bureau of Census, 2000	

Ethnicity information for the State was obtained from the U.S. Census Bureau and is summarized in Figure G-13 (Appendix G). In 2005, the State was predominantly Caucasian (61.2 percent). The remaining race distribution is Black or African American (36.9 percent), Hispanic or Latino (1.7 percent), Asian (0.7 percent), two or more races (0.6 percent), American Indian or Native Alaskan (0.4 percent), and Native Hawaiian or other Pacific Islander (0 percent). The ethnic representation in Mississippi indicates than on average Mississippi has fewer minorities than the rest of the nation. There are obvious variations in ethnicity across the State. In 2000, 24 of the 82 counties in Mississippi have Black or African American populations of greater than 50 percent (Bureau of Census 2000). Sixteen counties in Mississippi have Blacks or African Americans representing 60 percent or greater of the population. These 16 counties and the percentage of Black and African Americans are shown in Table 3-20.

Table 3-20. Mississippi Counties with Black or African American Populations, 2000

Counties	Percent of County Representing Black or African American Ethnicity
Bolivar	65.1
Claiborn	84.1
Coahoma	69.2
Hinds	61.1
Holmes	78.7
Humphreys	71.5
Issaquena	62.8
Jefferson	86.5
Leflore	67.6
Noxubee	69.3
Quitman	68.8
Sharkey	69.3
Sunflower	69.9
Tunica	70.2
Washington	64.6
Wilkinson	68.2
Source: Bureau of Census, 2000	

3.4.14 Hazardous Materials

BLM-administered public lands and minerals provide opportunities for a variety of commercial uses in addition to resource management. Both activities can lead to releases of hazardous substances and creation of hazardous waste sites. The BLM engages in hazardous material emergency response actions, site evaluations, and prioritization of cleanups in accordance with laws and regulations. This involves working with the EPA, State environmental quality departments, counties, and potentially responsible parties (both public and private) to fund and expedite the cleanup of hazardous sites. Those sites that are an imminent threat to public health and safety, as well as those sites that are under a consent order and can, therefore, generate penalties and fines, are a priority for the Bureau. There are no known hazardous, toxic, or unapproved solid waste sites on public lands within the planning area.

3.5 MISSISSIPPI SURFACE TRACT DESCRIPTION

The surface tract descriptions in this section include available detail on the Hancock County tract described in Chapter 2. General information and tract-specific information on soil resources, water resources, vegetative communities, fish and wildlife, special status species, cultural resources, visual resources, recreation and travel management, and lands and realty are provided. Air quality, wildland fire ecology and management, minerals, and social and economic conditions are discussed in Section 3.4.

General. This section provides basic location and size of the surface tract, as well as available background information.

Soil Resources. This section provides a table of the soils present at the tract, the erosion hazard potential as indicated by NRCS, and the presence of prime or unique farmlands (defined in Section 0).

Water Resources. This section describes which drainage basin the surface tract is within.

Vegetative Communities. This section summarizes the vegetative communities related to the tract. An analysis of the available GAP data was used to delineate the vegetative communities on the surface tracts. The GAP is coordinated by the Biological Resources Division of USGS.

Fish and Wildlife. This section summarizes the fish and wildlife species associated with the tract. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS.

Special Status Species. This section summarizes the special status species associated with the tract. GAP provides geographic information on the status and location of species and their habitat. The GAP is coordinated by the Biological Resources Division of USGS. Available special status species occurrences on the tracts are discussed. Appendix E provides additional information on special status species in the areas around the surface tract.

Cultural Resources. This section summarizes the known sites and cultural resources survey information for the surface tract.

Visual Resources. This section addresses the visual setting of the surface tract. The surface tract is currently classified according to a VRM system. VRM Classifications are described in Section 0. The Hancock County tract has not been inventoried for VRM classification.

Recreation and Travel Management. This section addresses the existing recreational and travel management activities on the surface tract.

Lands and Realty. This section addresses the lands and realty actions associated with the surface tract, including withdrawals, disposals, and ROW actions.

3.5.1 Hancock County Tract

General

One tract comprising about 174 acres in Hancock County, Mississippi, was patented to the University of Mississippi in 1961 under the R&PP Act; however, the patent contains a reversionary clause. This

Proposed RMP-FEIS provides for management of these tracts should the patent be revoked and the tracts returned to the BLM administration.

Soil Resources

The soil classification for the Hancock County tract is provided in Table 3-21.

Table 3-21. Soil Classification for the Hancock County Tract

Soil Type	Description	Erosion Hazard	Prime Farmland
Eustis loamy fine sand, 2 to 5 percent slope	Somewhat excessively drained soils, nearly level to steep areas of coastal plain; surface and subsurface consisting of sands and subsoils consisting of a fine loamy sand	Slight	No
Handsboro association	Very poorly drained soils in tidal marshes; surface layers of mucky silt loam	None	No

Water Resources

The Hancock County tract is located within the Coastal Streams drainage basin.

Vegetative Communities

The 174-acre Hancock County tract is located in the Hancock Marshes Coastal Preserve, part of a State-designated 83,000-acre estuarine preserve system bordering the Mississippi Sound from the Pearl River to Point Clear. The 13,570-acre Hancock County Marshes unit protects the second largest continuous marsh area in the State. These coastal marshes include several low ridges and small hammocks, the most prominent in this unit being Point Clear Island and Campbell Island. These elevated sandy areas have characteristics similar to the barrier islands and include forested areas supporting slash pine with redcedar and sand live oak (Quercus geminata). The BLM tract is located in the center of the preserve and is bordered by Bryan Bayou to the north. The very southeastern corner of the tract includes a portion of Point Clear Island. The bulk of the tract is part of a needlerush marsh that dominates the area between Bayou Caddy/Bryan Bayou and Point Clear Island. Hurricane Katrina deposited substantial amounts of flotsam in some areas of the marshes.

No exotic invasive species are known to occur on this tract, but cogon grass and torpedo grass are a concern in the area of Point Clear Island.

Fish and Wildlife

The marsh area is well known for an abundance of waterfowl and wading birds, including white-faced ibis and black-crowned night heron. Swallowtail kite numbers are high during the summer months.

Special Status Species

The special status species utilizing the Hancock County Marshes include mottled duck (Anas fulvigula), royal tern (Sterna maxima), Mississippi diamondback terrapin (Malaclemys terrapin pilea), Gulf salt snake (Nerodia clarkii clardii), brown pelican (Pelecanus occidentalis), least tern (Serna antillanum),

American oystercatcher (Haematopus palliates), and gull-billed tern (Sterna nilotica). The islands of this marsh support several rare plant species, including the tiny-leaved buckthorn (Sageretia minutiflora), which in this area is restricted to rare shell middens.

Cultural Resources

The Hancock County tract has not been surveyed. However, three cultural sites are recorded within one-half mile of the tracts.

Visual Resources

The Hancock County tract is remote and not visible from residential or other types of development. The visual character is low-lying wetlands with relatively dense vegetation and limited human activity.

Recreation and Travel Management

The Hancock County tract is patented to the University of Mississippi for the purposes of research and recreation. The tract is used for dispersed recreation, but it is primarily wetland and is not easily accessible to the public. Travel to the area is generally by boaters and anglers on an occasional and seasonal basis for fishing and waterfowl hunting.

Lands and Realty

The Hancock County tract was patented to the University of Mississippi in 1961, under the authority of the R&PP Act. The tract is still owned by the University. Under terms of the patent, the tract is to be used only for recreational and research site purposes. The patent contains a clause stating that ownership of the surface estate will revert to the United States if the land is devoted to a use other than that for which the land was conveyed. It is expected that the University will relinquish this tract and that title will revert to the United States. In anticipation of the title transfer, this tract is being considered BLM-managed surface estate for land use planning purposes. There are no ROWs on the tract, and no request for ROW or other uses are expected in this relatively remote area.

CHAPTER 4—ENVIRONMENTAL CONSEQUENCES

4.1 INTRODUCTION

This chapter evaluates potential environmental impacts that could occur from implementing management actions included in each of the alternatives discussed in Chapter 2 for Bureau of Land Management (BLM)-administered surface tracts and non-U.S. Forest Service (non-USFS) Federal mineral ownership (FMO) in Alabama and Mississippi[1]. Potential impacts considered in this chapter include ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, and health (40 Code of Federal Regulations [CFR] §1508.8) impacts. The baseline used for determining the potential impacts is the current resource condition described in Chapter 3. Resources are discussed in the same order that they are presented in Chapter 3.

The analysis focuses on impacts that could eventually result in on-the-ground changes by planning for uses on surface and non-USFS FMO tracts over the next 20 years. Some BLM management actions may affect only certain resources and only under certain alternatives. Some impacts may be from actions that are common to all alternatives. If an activity or action is not addressed in a given section, no impacts are expected or the impact is expected to be minimal.

4.1.1 How to Read This Chapter

This chapter is divided into four sections:

- **Introduction (Section 4.1).** This section provides direction on How to Read This Chapter (Section 4.1.1), presents the approach to the analysis including types of effects (Section 4.1.2), and discusses availability of data and incomplete information (Section 4.1.3).
- **Direct and Indirect Impacts from BLM Management Actions in Alabama (Section 4.2).** This section discusses potential impacts anticipated from implementation of management actions under each alternative for the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts in Alabama and 313,819 acres of non-USFS FMO in 57 Alabama counties, mostly composed of split-estate.
- **Direct and Indirect Impacts from BLM Management Actions in Mississippi (Section 4.3).** This section discusses the potential impacts anticipated from implementation of the management actions under each alternative for the Hancock County tract in Mississippi and for non-USFS FMO on about 517,934 acres in 79 Mississippi counties, mostly composed of split-estate. Impacts from the allowable uses and management actions proposed for the Hancock County tract are analyzed if the Recreation and Public Purposes (R&PP) patent held by the University of Mississippi were to revert to the BLM.

1 In those areas where (1) the Federal land surface is administered by the USFS, and (2) planning decisions for surface management and for mineral leasing, pursuant to the Federal Onshore Oil and Gas Leasing Reform Act of 1987 and Federal regulation (36 CFR 228.102), are the responsibility of USFS, and (3) BLM has responsibility for issuing and administering mineral leases; the RMP will not include management decisions for the Federal minerals on these lands, and BLM will carry out its minerals management responsibilities under the guidance of USFS land use plans. At the same time, surface and minerals management actions and development activities anticipated on these lands will be taken into account for purposes of cumulative impact analysis.

- **Cumulative Impacts (Section 4.4).** This section discusses the potential cumulative impacts anticipated from implementation of the BLM management actions proposed for Alabama and Mississippi in the context of other actions occurring across the State, including other Federal agency and non-Federal actions.

4.1.2 Approach to the Analysis

This section provides the basic framework used in the impacts analysis. Definitions of types of effects and terminology, general types of impacts analyzed for each resource, analytical assumptions, and cumulative projects and activities considered in the analysis are further discussed in the following subsections.

Types of Effects

The analysis of the alternatives focused on identifying types of impacts and estimating their potential significance. Throughout this chapter, the terms "impact" and "effect" are synonymous. Although impacts may be perceived as positive (beneficial) or negative (adverse), those determinations are left for the reader of this document to make. An overview of impacts is presented in Table 4-1.

Table 4-1. Types of Impacts

Type	Description
Direct Impacts	These are effects caused by the action and occur at the same time and place. For example, elimination of original land use through erection of a structure. Direct impacts may cause indirect impacts, such as ground disturbance resulting in resuspension of dust.
Indirect Impacts	These are effects that are caused by the action but occur later in time or are further removed in distance but are still reasonably foreseeable and related to the action by a chain of cause and effects. Indirect impacts may reach beyond the natural and physical environment (e.g., environmental impact) to include growth-inducing effects and other effects related to induced changes to resource users (e.g., social impact).
Cumulative Impacts	These are effects that result from the incremental impact of the action when it is added to other past, present, and reasonably foreseeable future actions, regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions that take place over time.

For ease of reading, impacts presented are direct, broad (occurring within the larger planning area), and long term, unless otherwise noted as indirect, localized, or short term/temporary. Potential significant impacts are identified as they arise, and analysis of why an impact is considered significant is explained. The concept of significance requires consideration of the context, intensity, and duration of the impact. Context relates to environmental circumstances at the location of the impact and in the immediate vicinity, as well as the interests that are potentially affected. Intensity refers to the severity or extent of the impact or magnitude of change from existing conditions. Duration refers to the permanence and longevity of the impacts, which is depicted as short term or long term. Short term is defined as anticipated to begin and end within the first 5 years after the action is implemented. Long term is defined as lasting beyond 5 years to the end of or beyond the 20-year planning time frame addressed in the Resource Management Plan (RMP).

4.1.3 Availability of Data and Incomplete Information

As is typical in programmatic planning efforts, site-specific data is used to the extent possible and may not be entirely available. The best available information that is pertinent to management actions was used in developing the Proposed RMP and Final Environmental Impact Statement (FEIS). Considerable effort has been taken to acquire and convert resource data into digital format for use in the plan—both from BLM sources and from outside sources, such as the Natural Heritage Program and the National Resources Conservation Service (NRCS).

Certain information was unavailable for use in developing this plan, usually because inventories were not conducted or complete. Some of the major types of unavailable data include Native American traditional use areas; cultural surveys; data collection of visitor use trends; visual resource inventory (VRI); field inventory of soils and water conditions; and field inventory of wildlife, vegetation, and special status species.

As a result, some impacts cannot be quantified given the proposed management actions. Where this gap occurs, impacts are projected in qualitative terms or, in some instances, are described as unknown. Subsequent project-level analysis will provide the opportunity to collect and examine site-specific inventory data required to determine appropriate application of RMP-level guidance. In addition, ongoing inventory efforts by the BLM and other agencies within the planning area would be used to continue to update and refine information used to implement this plan.

4.2 DIRECT AND INDIRECT IMPACTS FROM BLM MANAGEMENT ACTIONS IN ALABAMA

This section discusses potential impacts anticipated from implementation of management actions under each alternative for the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts in Alabama and 313,819 acres of non-USFS FMO in 57 Alabama counties, mostly composed of split-estate.

The section is organized by alternative, and then by resource. Under each resource, each management action is discussed, including vegetative communities, fish and wildlife habitat, minerals, recreation and travel, and lands and realty. A discussion of cumulative impacts for each resource is contained in Section 4.4.1.

4.2.1 Alternative 1 (No Action)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be greenhouse gases (GHG), particularly carbon dioxide (CO_2). However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as “carbon sinks”.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Combustion processes, construction activities, and vehicle travel associated with potential oil and gas development and coal mining produce air emissions. Estimated emissions from the development of 20 wells over the next 20 years on BLM-administered, non-USFS FMO would produce considerably less emissions than the combined emissions from total planned oil and gas developments in the State (presented in Table 4-2). Those emissions would likely occur over a dispersed geographic area and would, therefore, not cause any noticeable or measurable effect.

Potential oil and gas leasing on BLM-administered, non-USFS FMO are in close proximity to the Sipsey Wilderness and the Birmingham nonattainment area. These emissions could potentially deteriorate wilderness air quality values and jeopardize ambient air quality attainment. Since emissions would be dispersed over a large geographic area, air quality impacts would not be anticipated.

On the basis of a conservative estimate, it is anticipated that 1.9 million tons of Federal coal would be produced annually over the next 20 years (BLM 2005b). The results are shown in Table 4-3. Since the analysis is qualitative and coal production data are limited throughout the State, a comparison with best available data from the Warrior Basin is provided. As shown in Table 4-3, BLM-proposed coal mining activities are less in comparison to the Warrior Basin activities and will, therefore, produce much less emissions.

Table 4-2. Maximum Potential Oil and Gas Air Emissions for BLM and Non-BLM Activities in Alabama (tons per year)[1, 2]

Well Locations	Emission Type/Pollutant				
	Nitrogen Oxides (NO_x)	Sulfur Dioxide (SO_2)	Particulate Matter (PM_{10})	Carbon Monoxide (CO)	Volatile Organic Compounds (VOC)
BLM-administered, non-USFS FMO Estate in Alabama	110	1.7	35.1	111	67.1
Other Mineral Estate Across Alabama	21,460	332	6,815	21,761	13,947

1. Using conservative assumptions typical of liquid mineral wells on BLM lands.
2. Assumption that 25 percent of wells are conventional natural gas wells and 75 percent wells are coalbed natural gas wells (BLM 2005a).

Table 4-3. Maximum Potential Coal Mining Air Emissions for BLM and Non-BLM Activities in Alabama (tons per year) [1, 2]

Mine Locations	Emission Type/Pollutant				
	NO_x	SO_2	PM_{10}	CO	VOC
BLM-administered, non-USFS FMO Estate in Alabama	61.2	6.8	48.6	108.0	5.7
Warrior Basin	684	76	5,433	1,207	64

1. Using Environmental Protection Agency (EPA)-approved emissions factors and conservative assumptions typical of western surface mines, because emission factors do not exist for eastern surface mining. Assumption that all emissions eventually are introduced into the environment (EPA 1995 and BLM 2004a).

Impacts from Recreation and Travel Management Actions

Short-term, localized increases in dust and emissions could potentially occur from recreation activities and travel on unpaved roads. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Lands and Realty Management Actions

Short-term, localized increases in dust and emissions would occur from use of trucks and heavy equipment (bulldozers, etc.) in right-of-way (ROW) development. These actions would be conducted in accordance with the Alabama State Implementation Plan (SIP) and local dust control regulations; however, given the small amount and scattered nature of surface ownership, lands and realty management actions would not be anticipated to individually deteriorate air quality conditions or violate air quality standards or regulations.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Mineral exploration, development, and operations on non-USFS FMO would include ground-disturbing and potential contaminant-introducing activities that could impact soils. Oil and gas development operations—specifically, construction of drilling pads, reserve pits, and access roads—would disturb topsoils and alter surface soil characteristics, which could result in both a slight decline in soil productivity and an increase in surface runoff. Shallow coalbed methane wells generally require small 1- to 2-acre wellpads. Because much of the Black Warrior River Basin has very rolling terrain, up to 3 acres could be needed to construct a suitably flat drillpad. Cut and fill areas to support these pads and access routes can contribute to local soil erosion, especially when heavy or persistent rains typical of this region exacerbate the situation. Ground-disturbing activities in areas where the soils are classified as no or slight to moderate erosion hazard do not generally accelerate soil erosion. Since future coal development is anticipated to be subsurface and use existing infrastructure, these activities would not disturb the soils on the surface.

Except for 8,179 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated 20 wells to be developed on non-USFS FMO in Alabama over the next 20 years would disturb approximately 105 acres. Both Federal and State laws would require the reclamation of mined lands concurrently with

mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would produce only localized effects on soils.

Operation of the oil and gas wells could also impact the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials or waste; however, Federal, State, and local regulations would require site characterization and corrective action to restore soil integrity and productivity.

In a few locations, there are prime or unique farmlands on non-USFS FMO. Though not likely, it is possible that some of the 105 acres of soil disturbance could be on prime or unique farmland. In the event that development is proposed in such an area, the BLM would implement appropriate mitigation measures to avoid or minimize impacts as described in Section 2.3.3.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use on the surface tracts, could result in short-term and site-specific increases in erosion. Given the limited interest in recreation and travel on the surface tracts, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If construction were to occur in new or existing ROWs, soils could be impacted by vegetation-clearing activities and ground disturbance. Wind and water erosion, and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term if roads or structures were constructed on the tracts, but they would be localized.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Except for 8,179 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (305,640 acres). The estimated development of 20 wells in Alabama over the next 20 years would disturb approximately 105 non-USFS FMO acres. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on water resources.

Mineral exploration, development, and operations would include ground-disturbing activities that increase surface runoff, which increases nutrient levels and turbidity and decreases water quality. These activities could also introduce hazardous waste or result in accidental spills that could also deteriorate surface water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Although Federal, State, and local regulations would require site characterization and corrective action for hazardous waste and spills, impacts to the water quality could be localized but long term and especially affect nonflowing water bodies (e.g., small ponds or wetlands) and ground water resources. Additionally, access roads and wellpads can alter the local hydrology, reducing surface flow to mesic areas and diverting or degrading surface water. Installation of culverts and diverting existing drainages around wellpads can help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow.

The preferred method of disposal of water produced from oil and gas production would be underground injection. Reinjection of produced water would prevent impacts to surface water quality; however, a critical aspect of underground injection is finding a permanent formation with a concentration of total dissolved solids (TDS) greater than 10,000 mg/L (Geological Survey of Alabama [GSA] 2005). In order to reinject produced water, an oil and gas operator must obtain a permit as required by the Onshore Oil and Gas Order No. 7. The Environmental Potection Agency (EPA) has granted the State of Alabama primacy over the permitting of underground injection wells. The underground injection regulations address the siting, construction, operation, monitoring, and closing of an injection well. These requirements are designed to prevent contamination of surface and underground drinking water sources.

At present, stream discharge is the most common method of water disposal produced from oil and gas production in the Warrior Basin.[2] Although the surface discharge of produced water into water systems could potentially increase the salinity of surface waters and increase flow rates, resulting in increased soil erosion, operators must obtain a National Pollutant Discharge Elimination System (NPDES) permit (administered by Alabama Department of Environmental Management [ADEM]) to discharge produced water into streams in Alabama. The type of permit currently offered is a Tier II permit. This permit requires the monitoring of water quality in streams and limits instream TDS concentrations to 230 mg/L (GSA 2005). Because surface discharge of produced water would be a permitted activity requiring standards of water quality, direct impacts to water quality from the disposal of water produced from oil and gas production on non-USFS FMO would be minimized. Also, methods of disposing produced water, other than by reinjection, would be considered but would require preparation of additional National Environmental Policy Act of 1969 (NEPA) analysis that would identify conditions of approval (COA) or best management practices (BMP) to alleviate the potential for extensive harm to water quality.

Impacts on ground water from coal mining operations would also occur. Approximately 9,000 acres of new coal leases in the Warrior Basin coal field would yield an estimated average of 1.9 million tons of coal per year over the next 20 years. Coal development in the Warrior Basin would involve mining of existing underground coal mines, which would further increase the potential for ground water contamination. Migration of contaminants into the surrounding soils and aquifers could degrade ground water quality and, thereby, affect wells and springs that may serve household and domestic uses.

Impacts from Recreation and Travel Management Actions

Managing the surface tracts as open to recreation and motorized vehicle use could result in short-term and site-specific increases in erosion and surface runoff, which increases nutrient levels and turbidity and decreases water quality. Given the limited interest in recreation and travel on the surface tracts, any potential effects would be minor and localized.

[2] The term Warrior Basin is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.

Impacts from Lands and Realty Management Actions

If construction were to occur in new or existing ROWs, vegetation-clearing activities and construction ground disturbance would increase soil erosion and surface runoff, which increases nutrient levels and turbidity and decreases water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term, if roads or structures were constructed on the tracts, but would be localized.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on the BLM surface tracts. Chinese privet is present and likely to continue to spread on the Coosa River tracts. The Fort Morgan Highway tracts are vulnerable to both cogon grass and Chinese tallow. Cogon grass in particular, once established, would displace native herbaceous plant species and ultimately could reduce some shrub and tree components by increasing the frequency of wildfires and crowding out seedlings.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Impacts to vegetation from oil and gas development in Alabama are dependent on the location and design of wellpads, roads, and production facilities. Since 1983, all of the wells drilled on non-USFS FMO in Alabama have been in the Black Warrior River Basin, almost all in Tuscaloosa County. Typically vegetation in this area is dominated by oak/hickory/pine forests, much of it secondary growth managed as commercial timberlands. Older growth is most often found in steeper, more protected terrain, areas that could harbor mesic forests. Shallow coalbed methane wells generally require small 1- to 2-acre wellpads. Because much of the Black Warrior River Basin has very rolling terrain, up to 3 acres can be needed to construct a suitably flat drillpad. Cut and fill areas can contribute to local erosion and heavy or persistent rains typical of this region exacerbate the situation. This erosion can degrade the adjacent vegetation communities by burying herbaceous growth and stressing or killing trees by burying surface roots. Some sites require the installation of erosion blankets on slopes over 3:1, particularly if an adequate cover planting cannot be established or the wellpad is close to or above a creek, river, or wetland.

During a routine wellpad installation, saleable timber would be removed from the site if logs are commercially viable, but otherwise it is cut and left onsite. Vegetation debris piles are stored along the edges of the construction site and may be buried onsite, burned, or left in place after drilling operations are completed. Vegetation debris is not permitted in the reserve pit, as it can disrupt future monitoring.

During interim reclamation, the reserve pit area is graded and the surface is fertilized, seeded, and mulched. Although the operators are encouraged to use native seed, the final mix and tree planting are

approved by the private landowner or surface managing agency. By policy, the BLM excludes invasive species, although non-native grasses, particularly annual rye, Bahia, and Bermuda grass are used to establish a quick cover on disturbed slopes. These sites typically progress through "old field" stage as opportunistic pioneer plant species become established. Within a few years, young sapling pine and hardwoods become established. Faster growing pines generally dominate the site until gradually overtaken by longer lived hardwoods. It may take 100 years or more to reestablish hardwood forests with similar structure and even longer before species diversity returns to near pre-disturbance levels.

Surface-disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) to provide a quick cover for disturbed soils. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site; however, if the sites are replanted in pine or left unmowed, the areas can be expected to progress through old field type growth, which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even the small acreages from BLM-permitted oil and gas activities has a disproportionate effect on the plant diversity in an area.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach and Highway tracts could experience localized vegetation damage as a result of public foot traffic at traditional beach access points at Veterans Road and Mobile Road. Repetitive use erodes the dunes and keeps dune vegetation from becoming established, excluding use by Alabama beach mouse.

At the Coosa River, Fowl River, and Geneva tracts, which contain sensitive wetland and riverine habitat, dispersed recreational use is primarily boat-related and is not expected to have substantial impacts on vegetation. Heavier recreation use on the southern portion of the Jordan Lake tract occurs as a result of the adjacent camps and keeps shrubs and forbs from establishing a natural riparian zone along this portion of Jordon Lake.

Impacts from Lands and Realty Management Actions

New ROWs for access roads and utilities could occur on the Fort Morgan Highway or Beach tracts, where new disturbance is likely to total less than an acre. This is most likely to occur in upland scrub or flatwood communities. In addition, maintenance activities in existing ROW are likely to keep native plant communities from establishing a shrub or tree component and would foster the spread of invasive, exotic plant species, particularly cogon grass and Chinese tallow, both of which occur on or near the BLM highway tracts.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The maritime forests, scrubs, and flatwoods on the Fort Morgan Highway tracts are particularly vulnerable to cogon grass and Chinese tallow. Cogon grass could displace native grasses and forbs that provide foraging habitat for migratory and resident birds and would increase susceptibility of coastal scrub habitats to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO is expected to result in the disturbance of 105 acres. Impacts would include the direct loss of habitat from the construction of drillpads, production facilities, pipelines and roads, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology, and from the surface discharge of water produced from coalbed methane wells. These impacts could occur in any of the oil and gas potential areas in the State, but have in the past been concentrated in Jefferson and Walker Counties in the Black Warrior River Basin. Wherever wells are constructed, impacts to general wildlife are dependent on the wellpad location, design, and need for additional access roads.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the wellpad areas during construction. Less mobile species are directly impacted and during the spring and early summer; this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction activities have ceased; however, construction in high-value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older-growth forests which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles are often located in riparian/wetland zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time, most wildlife, including waterfowl and many songbirds, are expected to avoid the immediate area; however, once drilling is completed, reserve pits with water can become a hazard for waterfowl and other birds which can become soiled by drilling fluids. If the well is put into production, there is documentation that birds and bats may use open-vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Alabama is expected to be similar.

Access roads and wellpads can alter the local hydrography and reduce surface flow to mesic areas and divert or degrade surface water supporting wetland habitats. Installation of culverts and diversion of existing drainages around wellpads help maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

For impacts from disposal of coalbed methane produced waters, see the special status species discussion.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach and Highway tracts could experience localized vegetation damage and habitat loss as a result of frequent dispersed recreation use and lack of active recreation management. Noise and human presence associated with beach recreation could displace foraging shorebirds and result in reduced nesting efforts or success by beach nesting birds. Dispersed recreation use currently occurs on the Coosa River, Fowl River, and Geneva tracts, which contain sensitive wetland and riverine habitat. If recreation use became more frequent on these tracts in the long term, species susceptible to disturbance could be affected (such as freshwater snails, mussels, turtles, amphibians, migratory and shorebirds, and nesting species, as well as terrestrial wildlife, avifauna, and aquatic species). Recreational fishing on the Jordan Lake tract could result in surface disturbance resulting in damage to riparian/wetland areas and trampling of the understory that could further disturb riparian/wetland and aquatic species in the adjacent river.

Impacts from Lands and Realty Management Actions

New or expanded ROWs on the Fort Morgan Highway tracts are anticipated to result in less than an acre of new disturbance. This acreage is expected to be near or on existing maintained ROW, and is likely to occur in coastal scrub habitats. This activity could be particularly disruptive during spring and fall migrations, when this narrow band of vegetation can support high numbers of migrating songbirds.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on the BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity.

Under this alternative, the BLM would not actively promote the restoration of coastal dunes following damage by major storm events, which would promote sand deposition and facilitate the return of habitat conditions suitable for Alabama beach mouse.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements) would be allowed; however, lack of specific areas and species being managed

could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO in Alabama is expected to result in the disturbance of 105 acres, any of which could occur in habitats supporting special status species. Historically, oil and gas drilling on non-USFS FMO has occurred in the Black Warrior River Basin, but drilling on non-USFS FMO could occur anywhere in the State (outside of the 10 southeastern counties that do not contain non-USFS FMO). Development interests are prompted by new oil and gas finds in the State, improvements in drilling and extraction technologies, and high prices. Because of this, there is some potential to impact almost any of the special status species in the State. Impacts to special status species could include the direct loss of habitat from the construction of drilling pads, production facilities, pipelines and roads; from degradation of nearby aquatic or wetland habitats through contamination, sedimentation, or changes in hydrology; and from the surface discharge of water produced from coalbed methane wells. The following discussion focuses on the potential for these activities to affect habitats that support the majority of the State's special status species. In addition, individual species with established management guidelines, such as gopher tortoise, red-cockaded woodpecker, and bald eagle are also discussed. No development is anticipated on the BLM surface tracts, many of which support Federally listed species and contain designated critical habitat; however, the non-USFS FMO under those tracts could be developed through directional drilling.

Given the high number and wide distribution of special status species in aquatic and wetland habitats in Alabama, all oil and gas activity near rivers, creeks, or wetland habitats has a high potential of affecting special status species in the immediate area or downstream of the disturbance. Impacts to aquatic and wetland habitats would occur through degradation of water quality through increased sedimentation or turbidity, contamination, direct loss of habitat, and changes in local hydrography. Disposal of water produced by coalbed methane wells in the Black Warrior River Basin also has the potential to affect special status species by increasing salinity and introducing other contaminants. Some special status species cannot tolerate increases in human activity and could be impacted directly by increases in vehicle activity and construction activities.

Sedimentation and increased turbidity are a current threat to most of Alabama's mussels and special status fish species. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of wellpad design, erodibility of the soils, proximity of the disturbance, slope, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Before protective plant covers have been established, cut and fill slopes are particularly vulnerable to erosion. Intact vegetation along riparian/wetland zones and around wetlands can substantially buffer these areas. Research has shown that a minimum of a 30-foot buffer of vegetation is needed to control sediments and maintain stream temperature; however, 100-foot buffers may be needed to protect stream invertebrates, and 1,000 feet or more may be needed to protect some amphibians, reptiles, and forest-interior birds (Wenger 1999). Sediments deposited in intermittent drainages and headwater streams would be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams.

Filling wetlands (including bogs, seepage slopes, wet flatwoods, and forested swamps) generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future and could result in direct habitat loss for a wide variety of special status species that use these habitats. Because so many of these species have limited ranges, the list of species potentially affected would vary by location. Generally, because of the limited acreage of these vegetation communities, loss from even the small amount of disturbance associated with BLM-permitted oil and gas activities has the potential to

destroy or degrade habitat for special status species. For instance, there are up to 12 special status crayfish across the State that are vulnerable to habitat disturbance in bogs and wet flatwoods. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction activities, and particularly linear disturbances related to new roads and pipelines, can disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

In the Black Warrior River Basin, water produced from coalbed methane wells is typically disposed of through surface discharge. The chemical makeup of produced waters can vary by well with salinity, measured as TDS, being the most limiting factor. TDS in the Black Warrior Basin varies from less than 1,000 mg/L to more than 43,000 mg/L (U.S. Department of Energy 2003). Produced water is stored in ponds to precipitate out metals and to lower pH prior to discharge. NPDES permits issued by the State limit in-stream TDS concentrations to 230 mg/L. This threshold is approved by the EPA for general wildlife habitat and is met by discharging into rivers with sufficient flow to dilute and meet the in-stream thresholds. NPDES permits require monitoring of pH, iron, manganese, biochemical oxygen demand, oil and grease, and dissolved oxygen; additional monitoring requirements for conductivity, chlorides, and effluent toxicity are included. Dischargers are required to install a diffuser on the end of their discharge pipes to minimize scouring and are required to implement a BMP plan. Other elements, such as trace amounts of metals, are not routinely monitored under NPDES permits. Thresholds for most mussels have not been studied, and there is concern that the existing thresholds may not be sufficient to protect these bottom-dwelling species.

Karst formations support cave habitats with high numbers of special status species, including many endemic crayfish, salamanders, and bats, and are particularly sensitive to oil and gas development. In caves, even minor alterations in temperature, humidity, and water quality or quantity can result in irreversible impacts. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. Wells drilled through cave/karst resources can result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats can be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting ground water flow and introducing pollutants into karst systems. Other possible impacts are vented or escaped gases collecting in sinkholes and caves. These gases can cause a die-off of plant and animal life that use the special habitat created by the microclimate of the cave entrances or sinkhole.

Along the Alabama coast, there are 365 acres of non-USFS FMO within the designated critical habitat for Alabama beach mouse. Portions of this acreage also contain coastal beaches used by nesting loggerhead sea turtles and potentially by green sea turtle and Kemp's Ridley sea turtle, as well as piping plover, snowy plover, and Wilson's plover. Any disturbance of the surface from oil and gas development in this area is likely to adversely affect Federally listed species. Section 7 consultations with the U.S. Fish and Wildlife Service (USFWS) would be required prior to BLM permitting any action that could adversely affect these Federally listed species or designated habitat. Subsequent actions would comply with the conditions established by any subsequent biological opinions (BO). Although it is unlikely that oil and gas development would occur on the BLM surface tracts, non-USFS FMO could be used to consolidate acreage to meet State spacing requirements, prompting oil and gas activity in suitable or occupied Alabama beach mouse and nesting sea turtle habitat.

In the coastal plain areas, gopher tortoise could be affected by oil and gas activity in upland habitats. Tortoises could be impacted by the loss or damage to burrows, destruction of foraging habitat, and tortoises could be killed during construction or by service vehicles. Construction activities and roads within 600-feet of burrows could isolate individuals and reduce reproductive potential within a

population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, including the black pine snake (*Pituophis melanoleucus lodingi*).

Red-cockaded woodpecker could be affected by oil and gas development on 888 acres of non-USFS FMO. Red-cockaded woodpeckers could be affected by the loss of nesting habitat within existing clusters and the loss of current or potential foraging habitat within 0.5 mile of existing clusters, particularly on non-USFS FMO near the Talladega and Conecuh National Forests, which support most of the State's population.

Throughout the State, breeding and wintering bald eagles could be affected by drilling near large rivers or reservoirs. Bald eagles are particularly sensitive when courting, nesting, and fledging young. In Alabama, this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Impacts from Recreation and Travel Management Actions

The coastal dune habitat associated with the Fort Morgan Beach tracts would continue to be trampled at traditional beach access points as Veterans Road and Mobile Street, damaging habitat for the Alabama beach mouse. Recreational use can flush foraging shorebirds and result in reduced nesting efforts or success by beach nesting birds. Unmanaged recreational use of beaches could also hamper or deter nesting attempts by sea turtles and interfere with incubating egg clutches and the sea approach of hatchlings (National Marine Fisheries Service and USFWS 1991). The Fort Morgan Highway tracts, also designated as critical habitat, could experience loss or damage to vegetation as a result of continuing to be managed as open to recreation use. Dispersed recreation use of the Coosa River tracts has the potential to cause bald eagles to abandon nest sites.

Impacts from Lands and Realty Management Actions

New ROWs for access roads and utilities could occur on the Fort Morgan Highway or Beach tracts, where new disturbance is likely to total less than an acre. These tracts are designated critical habitat for Alabama beach mouse. Any surface disturbance, mowing, or other vegetation management activities could adversely affect the Alabama beach mouse, destroying burrows or removing plants that could provide a seed source. Because these tracts are within designated critical habitat for Alabama beach mouse, plantings to stabilize disturbed soils would be limited to locally occurring native species.

Wildland Fire Ecology and Management

Suppressing all wildland fires, unless an in-place site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the wildland-urban interface (WUI) and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving the ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted. Fire response and fuels treatments would apply to the 159 acres of BLM-administered surface land.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the surface tracts.

This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would result in similar impacts as discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals development activities would introduce additional ignition sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence. Disturbance of 105 acres associated with the development of 20 wells on non-USFS FMO could provide increased accessibility for fire suppression equipment and provide fuel breaks in the case of wildland fire events. In addition, the infrastructure associated with the 20 new wells would require protection in wildland fire events. Impacts from mineral-development activities would not occur on the 8,179 acres closed to oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to manage the surface tracts as open to recreation use would allow for dispersed recreation use, which could introduce additional ignition sources and increase the probability of wildland fire occurrence. This would be more prevalent in areas that are more accessible.

Impacts from Lands and Realty Management Actions

Development of above-ground ROWs on the surface tracts, which would be managed as open to ROW development, would require additional efforts by firefighters to protect these areas in wildland fire events. Development of ROWs would also result in clearing vegetation to make way for linear features such as roads, pipelines, and transmission lines. ROWs could provide fuel breaks, which could help prevent the spread of wildland fires. ROWs could also provide firefighters with increased accessibility for fire suppression equipment. While more ROWs could increase suppression costs, the aspects of ROW development related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.

Cultural Resources

Management of cultural resources provides protection from the potentially damaging effects of surface-disturbing activities through implementation of existing laws and policy, such as Section 106 of the National Historic Preservation Act (NHPA) and the Federal Lands Policy and Management Act of 1976 (FLPMA). Federal undertakings typically require cultural resource inventories that would result in the identification of cultural resource sites and determination of eligibility to the National Register of Historic Places (NRHP). The cultural resources data acquired through inventories and evaluations would increase knowledge of cultural resources on BLM-administered lands and minerals in the State. Following site-specific inventories, mitigation measures would be prescribed as necessary for eligible properties. Any cultural sites discovered may be considered for further evaluation to assess its eligibility for listing on the NRHP. Through this process, significant impacts on cultural sites eligible for the NRHP would be

avoided or mitigated. Avoidance is the BLM's preferred measure to eliminate potential adverse effects. Avoidance preserves the cultural resource in place. If this is not possible under reasonable circumstances, scientifically valid excavation and data recovery is an alternative mitigation method. Scientifically valid excavation would be used as a final measure, and the extent of excavation would be determined through BLM consultation with the State Historic Preservation Officer (SHPO) and tribes.

Data recovery preserves as much of the cultural record as possible through archaeological methods. Any mitigation effort requiring archaeological data recovery is subject to the terms outlined in a Data Recovery Plan and documented through a signed Memorandum of Understanding (MOU) with the SHPO, tribes, and other consulting parties. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed. Mitigation through data recovery also reduces or eliminates other uses of cultural resources sites, such as traditional, public, conservation, or experimental use. The inventory and avoidance procedures conducted in conjunction with surface-disturbing actions would protect most cultural resources from significant impacts.

Despite the best efforts to identify all cultural resources, there remains a potential for inadvertent impacts to previously undiscovered sites, especially buried sites with no surface indications. Following discovery of cultural resources, activities would stop to allow for mitigation to minimize further damage to cultural resources. There is a set process through Section 106 for identifying, evaluating, and treating the effects of inadvertent discoveries to reduce potential impacts from these discoveries.

Wildfire and prescribed fire could impact cultural resource sites, including the eligibility characteristics of sites that are listed or eligible for listing on the NRHP. Impacts would be limited to the Coosa River tracts, as the Geneva tract contains small amounts of vegetation that maintains foliage year-round. The other tracts have been inventoried for cultural resources and no sites were identified.

Prehistoric and historic resources potentially affected by wildfire may be inorganic or organic. Generally speaking, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic materials. Wildfire impacts on inorganic cultural resources include fracturing, shattering, and changes in color and internal luster, which might reduce an artifact's ability to render information about the past. As a general rule, fire would not affect buried cultural materials. Studies show that even a few centimeters of soil cover (4 inches) are sufficient to protect cultural materials (Oster N.D.). Wildfires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or burn for a long time period, allowing heat from the fire to penetrate the surface. In addition, heat from wildland fires could change the physical nature of the ground, making it harder to identify cultural resources. The isolated nature of vegetation on the Coosa River tracts would limit the potential for ignition or spread of wildland fire, and decrease the potential impacts to cultural resources.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives would allow vegetation manipulation to meet resources objectives and would require cultural resource clearances before any activities were to occur. Therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat

improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would require cultural resource clearances before any activities were to occur. Therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Cultural resources on 305,640 acres of non-USFS FMO in Alabama managed as open to leasing and subject to standard lease terms and conditions could be impacted by oil and gas development. Based on the RFDS, oil and gas developments within these areas would impact 105 acres through the development of 20 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance. This would result in the identification and potential excavation of cultural sites. Cultural sites on 8,179 acres closed to leasing would be protected from oil and gas development.

Sixty-eight known cultural resources sites exist within non-USFS FMO in the coal potential area, and 66 known sites are within one-half mile of the tracts. Based on the RFDS, production of 37.6 million tons of coal from preexisting underground mines over 20 years would not result in new surface disturbance; therefore, no impacts to cultural resources would be anticipated from coal development.

Impacts from Recreation and Travel Management Actions

Recreation activities on the surface tracts could result in inadvertent damage and vandalism to cultural sites on tracts that contain cultural resources. Although the tracts are not anticipated to be used extensively for recreation, many surface tracts are located in rivers, wetlands, and beach areas that are desirable locations for recreation and there is a high potential for cultural resources to be found. Impacts from travel management actions would not be anticipated because the Coosa River and Geneva tracts that have not been surveyed for cultural resources are only accessible by boat and no cultural resources were found on all the other tracts that have been surveyed.

Impacts from Lands and Realty Management Actions

Ground-disturbing activities associated with ROW construction and maintenance could impact cultural resources. If a permitted ROW for an access road, utility tower, or bridge pier were approved on a surface tract, an appropriate level of cultural resource survey would need to be conducted. Approved activities in areas not previously surveyed, or in areas surveyed prior to 1996, would be subject to a ground survey and consultation requirements with the SHPO under NHPA Section 106 regulations prior to construction.

A cultural resource survey would also be required if existing ROWs on the Fort Morgan Highway and Jordan Lake tracts were expanded or modified. Construction projects could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery of cultural resources, activities would stop in accordance with the ROW grant which would minimize further damage to cultural resources. Therefore, impacts to cultural resources would be anticipated to be minimal.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality

would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Mineral exploration and development on non-USFS FMO tracts (313,819 acres) would result in impacts to visual resources on 105 acres from 20 wells. Removal of vegetation and construction of wells and wellpads and introduction of other equipment would impact visual quality. The BLM does not manage the surface for non-USFS FMO tracts; however, the BLM can place COAs or best practices to minimize impacts to visual resources in accordance with the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating. Impacts would not be anticipated on the 8,179 non-USFS FMO acres closed to leasing. Since no mineral-development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities and motorized vehicle use on the surface tracts could impact visual quality over time from changes to existing natural or manmade landforms and scenic vistas through vegetation and soil loss, particularly on tracts that are in undeveloped areas. Since the surface tracts are not anticipated to be used extensively for recreation and travel, these impacts would be minimal.

Impacts from Lands and Realty Management Actions

If the existing ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, visual quality would be impacted. No existing utility and road ROWs exist on the Coosa River, Fort Morgan Beach, Geneva, and Fowl River tracts. If a new road or utility ROW were authorized on these tracts, visual quality would be impacted if the ROW were to dominate the view of the casual observer.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Under this alternative, 305,640 non-USFS FMO acres would be open to leasing, subject to standard lease terms and conditions; 8,179 non-USFS FMO acres would be closed to leasing due to restrictions placed by other Federal surface management agencies. No impacts to oil and gas minerals exploration and development would be anticipated from management of non-USFS FMO tracts.

No impacts to coal leasing and development in the Warrior Basin would be anticipated. Coal production would continue at historical rates.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated. The BLM would only dispose of non-USFS FMO with no suspected value and, therefore, there would be no loss of opportunity.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from vegetation treatment areas until revegetation occurs; however, the vegetation treatments would benefit recreationists by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that result in impacts to recreation. Recreationists could be displaced from protected areas or treated areas until revegetation occurs; however, the habitat improvements and protections would benefit recreationists by improving the long-term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO tracts with surface management by other Federal agencies that are open to the public for recreation, as identified in Table 3-17, could be affected by the leasing of Federal minerals by the BLM. Those areas or installations not open to recreation or leasing would not be affected, including National Park Service (NPS) and USFWS lands. Oil and gas development could provide additional opportunities for travel due to the construction of access roads.

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO, there could be a decrease in nature-based recreational opportunities due to conflicts with the developments or in areas where the public were excluded. Mineral leasing in recreational areas could result in the removal of vegetation; construction of access roads, wellpads, and other infrastructure; introduction of drilling equipment; and associated noise and dust emissions. Effects would include a less-enjoyable recreational environment, though travel management opportunities could improve due to the construction of access roads. Stipulations applied under this alternative by other surface management agencies could indirectly protect the recreational resources in areas where development would be precluded (8,179 acres).

Since future coal development is anticipated to occur at underground sites without additional infrastructure, additional impacts to recreation would not be anticipated.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities and motorized vehicle use on the surface tracts would maintain existing recreation and travel opportunities. Allowing motorized travel uses on all surface tracts could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience.

Impacts from Lands and Realty Management Actions

Although Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS, these lots would remain within the boundaries of the Bon Secour National Wildlife Refuge (NWR) (where they are currently, but are not managed by the USFWS). After transfer, these lots would be managed according to their Comprehensive Conservation Plan. Since all surface tracts would remain in Federal ownership, access to recreation activity in a generally undeveloped setting would be maintained.

If existing utility and road ROWs that bisect the Fort Morgan Highway and Jordan Lake tracts were expanded or otherwise modified, the recreation experience could be impacted as a result of construction activity, ground disturbance, and introduction of new infrastructure. No existing utility and road ROWs exist on the Coosa River, Fort Morgan Beach, Geneva, and Fowl River tracts. If a new road or utility ROW were authorized on these tracts, the recreation experience could be impacted as a result of construction activity, ground disturbance, and introduction of new infrastructure. These actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Lands and realty is a resource use rather than an environmental component and impacts on lands and realty are a direct result of their management. Therefore, the following discussion is limited to impacts from lands and realty management actions for the 159 acres of BLM-administered surface ownership in Alabama. Impacts from disposal of FMO are discussed under Impacts to Minerals from Lands and Realty Actions.

Under Alternative 1, all 159 acres of the surface tracts in Alabama would remain open to ROW applications; therefore, no impacts would be anticipated to lands and realty actions. Retaining the surface tracts under the BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership. Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots.

Social and Economic

Definitions and descriptions of potential Environmental Justice populations, including low income and ethnicity statistics, were provided in Section 3.2.13. Since this four-county study area where mineral development is anticipated does not encompass Environmental Justice populations as defined, there would likely be no disproportionate effect on those populations under each alternative. Since the specific location of the oil and gas development is yet to be determined, Environmental Justice population locations should be further considered at the implementation level to minimize the potential for disproportionate impacts to Environmental Justice populations and to identify any possible mitigation measures that may be required to reduce impacts (e.g., dust, noise, traffic, ground water quality) to these populations.

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions, since no actions are proposed under this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions, since no actions are proposed under this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Since only 20 fluid mineral wells would likely be drilled with standard lease terms and conditions over the next 20 years, there would be minimal economic impacts from these activities. This type of BLM mineral development is consistent with the development that occurred in the past, including 17 applications for permits to drill between 1983 and 2004. Therefore, there would be minimal changes. The potential minimal changes include a slight increase in employment or income. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative from oil and gas activities.

With continued development of oil and gas resources, 105 acres of surface disturbance are anticipated for wellpads, roads, and pipeline over the next 20 years. Disturbances from oil and gas development could *potentially* include slight increases in air emissions from construction of wellpads and roads, noise from construction activities and trucking, contamination of soils and vegetation, habitat impacts, and ground water contamination. Stakeholders who believe oil and gas activity should be constrained with conditions and stipulations to protect wetlands and aquatic habitat would likely feel that this alternative does not do enough to ensure protection of these types of resources. Additionally, oil and gas industry stakeholders, as well as others who value maintaining access to Federal minerals for oil and gas development, would likely prefer this alternative over the others.

The anticipated amount of coal to be produced under this alternative for the next 20 years (1.9 million tons per year) is consistent with coal development over the last 10 years. Currently, coal produced from BLM-administered minerals accounts for approximately 10 percent of the total amount of coal produced

in the State, 19.5 million tons of coal (Energy Information Agency 1999). In Alabama, mining (non–oil and gas) accounts for approximately 6,773 employees and employee compensation of $482,361,000 (Bureau of Economic Analysis [BEA] 2005). If 10 percent of this employment and employee compensation can be attributed to BLM-administered minerals, this activity provides for 677 employees in mining, with total mining employee compensation of $48,236,100. The average annual employee compensation for these workers is $71,218, compared with average annual compensation from all industries in the State of $34,877 (BEA 2005). Mining in the four-county study area where mineral development is possible likely provides fiscal revenues to local and State governments, supporting community and emergency services, school, and infrastructure. Impacts on stakeholder groups from mining activities are likely similar to those stated in the previous paragraph concerning socioeconomic oil and gas impacts. Some stakeholders will support these mining activities due to the economic benefits in income, jobs, and government revenues, while others will be concerned that the economic benefit may not offset the risks to environmental and water resources from the activity.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not cause changes in the economic characteristics (employment, income, and industries) or quality of social assets (housing, education, values, and attitudes) in the four-county study area where mineral development is possible, as there are no anticipated changes in recreation and travel management actions under this alternative.

Impacts from Lands and Realty Management Actions

All the BLM lands under this alternative would remain in Federal ownership. Additionally, new ROW may be developed on the surface tracts. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this alternative. Quality of social assets (demographics, housing, cost of living, education) in local communities linked with the remote and scattered BLM surface tracts are not likely to be affected by retaining these lands in Federal ownership. Stakeholders who would like to see these BLM surface tracts sold to either private developers or non-profit organizations for a change in management and use would be adversely impacted by this alternative, while those stakeholders who believe that retention of the Federal lands is important to maintain open space and current management would feel this alternative is consistent with their values.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include the use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100–185, 40 CFR 100–400, Comprehensive Environmental Response Compensation and Liability Act (CERCLA), Resource Conservation and Recovery Act (RCRA), Superfund Amendment Reauthorization Act (SARA), Toxic Substances Control Act (TSCA), and the Clean Water Act (CWA) and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if a release were to occur, it would be immediately addressed and remediated in accordance with regulation.

4.2.2 Alternative 2

Air Quality

Under this alternative, there is a potential for wildfires, which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

Vegetation treatments, including prescribed fire, and associated use of trucks and heavy equipment would cause short-term, localized increases in dust and emissions. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Use of trucks and heavy equipment associated with proposed fish and wildlife habitat improvements, such as constructing dune walkovers on the Fort Morgan Beach tract and conducting prescribed burns to improve habitat on the Fort Morgan Highway tract, would cause short-term, localized increases in dust and emissions. Given the small amount and scattered nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas (20 wells over the next 20 years) and coal development (1.9 million tons produced annually over the next 20 years) and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity contributing to emissions and associated air quality impacts would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts could increase site-specific erosion in the short term. Sand deposition would be facilitated by planting native coastal dune vegetation as part of dune restoration activities after damage by major storms. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils. In addition under this alternative, there would be minimal short-term soil disturbance from the construction of dune walkovers on the Fort Morgan Beach tracts and conducting prescribed burns to improve habitat on the Fort Morgan Highway tracts. These soils are not prone to compaction, and the construction is not expected to alter the soil horizons in the long term.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, controlled surface use (CSU) (91,702 acres), and no surface occupancy (NSO) (94,589 acres) restrictions would be implemented, which reduces disturbance to soils within the protected areas. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could increase erosion and associated impacts to soils would not be anticipated to change compared to Alternative 1, since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and increased erosion associated with ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would increase site-specific erosion, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as constructing dune walkovers on the Fort Morgan Beach tracts and conducting prescribed burns to improve habitat on the Fort Morgan Highway tracts, could increase erosion and runoff, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving and protecting fish and wildlife habitats would reduce erosion and overland flows.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (91,702 acres), and NSO (94,589 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. This buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

Impacts from coal mining would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and impacts to water resources associated with ROW development compared to Alternative 1. No coastal wetland habitats or water bodies occur on or adjacent to the Fort Morgan Highway tracts. Development of additional transportation routes and ROWs on the Jordan Lake tract could contribute to the already degrading water quality of the Coosa River, located adjacent to the tract, as well as Jordan Lake, located about 10 miles downstream. Impacts contributing to decreased water quality could result from decreased soil stability and increased surface runoff caused by vegetation-clearing activities and construction ground disturbance.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Early detection and removal of exotic plant species from the Fowl River and Coosa River tracts would safeguard the wetland emergent vegetation and wet flatwoods communities on this tract. On the Fort Morgan Highway tracts, woody exotic, invasive species such as Chinese tallow and Chinese privet would be removed by hand and stump treated with approved herbicides. Selective hand spraying of cogon grass may be required where it is established. More active management of vegetation communities would provide better vegetation composition on all surface tracts than under Alternative 1.

Impacts from Fish and Wildlife Habitat Management Actions

For the Fort Morgan Beach tracts, the construction of dune walkovers would funnel foot traffic across sensitive dune habitats and allow sand to accrete and native dune vegetation to reestablish. On the Fort Morgan Highway tracts, forbs and native grasses would benefit from periodic prescribed burns of wet flatwoods and wetlands conducted in coordination with the Bon Secour NWR.

Impacts from Minerals Management Actions

In addition to the impacts from standard management common to all alternatives discussed under Alternative 1, oil and gas activities would be excluded from a 1,000-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species under this alternative. Buffering these areas would provide additional protection for high-value plant communities from potential sedimentation or contamination from surface runoff or inadvertent leaching from the reserve pit.

Impacts from Recreation and Travel Management Actions

In attempt to offset the impacts discussed under Alternative 1 on the Fort Morgan Beach and Highway tracts, this alternative would construct two dune walkovers at Veterans Road and Mobile Road to funnel visitors across sensitive dune habitat, allowing dune vegetation to reestablish at these traditional access points. Plantings of native coastal dune vegetation would restore several acres of dunes trampled at these beach access points. Impacts to the Coosa River, Fowl River, and Geneva tracts would be the same as Alternative 1.

Impacts from Lands and Realty Management Actions

All surface tracts except the Fort Morgan Highway and Jordan Lake tracts would be managed as ROW avoidance areas. No new disturbance would be allowed in the existing ROW corridors on the Fort Morgan Highway tracts; however, maintenance activities would be permitted. These existing utility ROWs have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate and establishes dense stands that displace native vegetation communities.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Dune restoration activities, such as planting sea oats and other dune-stabilizing natives at Fort Morgan would benefit a wide variety of shorebirds by providing additional areas for loafing and potential nesting sites. At all sites, wildlife would benefit from removal of exotic invasive plant species. Early detection and removal reduces the overall impact to wildlife species by limiting the amount of change to the habitat structure that can occur when large woody invasives are removed and by eliminating or reducing the amount of herbicide needed to control herbaceous invasives.

Impacts from Fish and Wildlife Habitat Management Actions

Many of the benefits discussed under the special status species and vegetation impacts sections would also benefit general wildlife values. At the Fort Morgan Beach tracts, dune-nesting shorebirds would

benefit from actions to enhance and protect coastal dunes. The construction of dune walkovers on the Fort Morgan Beach tracts would protect sensitive dune habitats from foot traffic and allow additional habitat to develop at these traditional public access points. Shorebirds benefit from funneling foot traffic across these sensitive habitats by reducing human intrusions on loafing and nesting areas. On all tracts, wildlife would benefit from early detection and removal of exotic invasive weed species, which once established can substantially alter habitats.

Impacts from Minerals Management Actions

General impacts to wildlife are expected to be the same as Alternative 1; however, under this alternative oil and gas activities would be excluded from high-value wildlife habitats. This includes a 1,000-foot buffer around wetlands and aquatic habitats, avoidance of karst areas, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species.

BMPs would be applied under this alternative to reduce potential impacts to bats, songbirds, and waterfowl. Reserve pits still containing water 10 days after a well is completed would be netted to exclude migratory birds. Other approved methods could also be used to exclude birds. Open-vent equipment, such as heater-treaters, separators, and dehydration units would be covered with anti-perching cones to exclude cavity-nesting birds and bats. Any power lines would be built using approved raptor-safe designs to prevent electrocution.

Impacts from Recreation and Travel Management Actions

Limiting vehicle access to existing roads and authorized ROW would eliminate new use patterns from developing which could degrade habitats on the BLM surface tracts. This would particularly benefit the Fort Morgan Beach tracts where even occasional vehicle use would damage dunes and destroy dune-stabilizing vegetation.

Impacts from Lands and Realty Management Actions

All surface tracts except the Fort Morgan Highway and Jordan Lake tracts would be managed as ROW avoidance areas. No new disturbance would be allowed in the existing ROW corridors on the Fort Morgan Highway tracts; however, maintenance activities would be permitted. These existing utility ROWs have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate and establishes dense stands that displace native vegetation communities. Maintenance activities, as well as invasive exotic species in the utility corridors, would deteriorate wildlife habitat.

Special Status Species

Impacts from Vegetative Communities Management Actions

Alabama beach mouse and nesting shorebirds would benefit from plantings of native coastal dune vegetation on the Fort Morgan Beach tracts after damaging storms. These plantings promote sand deposition and help to reestablish the dunes more quickly. On the Fowl River, Coosa River, and Fort Morgan Highway tracts, woody exotic, invasive species such as Chinese tallow and Chinese privet would be removed by hand and stump treated with approved herbicides. Selective hand spraying of herbaceous growth, especially cogon grass, may be required where it has become established. Early detection and

control of invasive plant species would reduce the amount of native vegetation displaced and minimize changes to structure that occurs when large amounts of invasive woody material is removed.

Impacts from Fish and Wildlife Habitat Management Actions

Alabama beach mouse and nesting shorebirds at the Fort Morgan Beach tracts would benefit from the installation of two dune walkovers that would eliminate damaging foot traffic and allow dunes and vegetation to recover at traditional public access areas at Veterans Road and Mobile Road. Prescribed fire could be used to increase herbaceous species in flatwoods or wetlands on the Fort Morgan highway tracts. These burns would be conducted only in conjunction with prescribed burns on adjacent lands managed by the Bon Secour NWR to benefit endemic species. These actions would improve habitat for special status species.

Impacts from Minerals Management Actions

Although the number of wells (20) and acres disturbed (105) would remain the same under this alternative as compared to Alternative 1, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. This is accomplished with NSO buffers or seasonal restrictions.

To protect special status species occurring in aquatic or wetland habitats, all oil and gas development activities would be excluded from a 1,000-foot buffer around these habitats. In areas with slopes less than 10 percent, the 1,000-foot buffer could be reduced to a minimum of 100 feet if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100 yards upstream and 300 yards downstream of the site. This stipulation could be applied to an estimated 90,930 acres or 29 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

A 250-foot NSO buffer around known caves, fractures, and sinkholes would reduce the chances of drilling through karst formations, providing protection for cave endemics, such as Alabama cave shrimp, Alabama cave fish, gray myotis, Indiana bat, and others. Some potential remains for inadvertently drilling through unknown karst formations and damaging connected cave habitats through introduction of lost drilling fluids and muds, altering temperature and moisture regimes and modifying the hydrology supporting the karst system. The 3,044 acres of FMO within 0.5 mile of caves known to be occupied by gray myotis or Indiana bat would be excluded from surface occupancy, protecting these species and their habitats from disturbance associated with oil and gas activity.

Under this alternative, the 365 acres of non-USFS FMO associated with suitable and designated critical habitat for the Alabama beach mouse, including upland scrub sites, would be excluded from leasing. This would avoid potential impacts to Alabama beach mouse, nesting sea turtles, piping plover, and other coastal special status species, including least tern, American oystercatcher, and Wilson's plover.

Areas with suitable soils and at least 10 percent open pine forest in southern Alabama counties, including Choctaw, Washington, Mobile, Baldwin, Barbour, Bullock, Butler, Clarke, Crenshaw, Coffee, Conecuh, Covington, Dale, Escambia, Geneva, Henry, Houston, Monroe, Montgomery, Pike, and Wilcox Counties would require a survey for gopher tortoises prior to any surface-disturbing activities. No disturbance would be permitted within 600 feet of a gopher tortoise burrow. This buffer is expected to protect any breeding populations of gopher tortoise and maintain habitat for associated species, including black pine snake. It would also protect habitat values in areas suitable for eastern indigo snake.

Under this alternative, NSO would be permitted within 0.5 mile of a red-cockaded woodpecker cluster. This stipulation would be applied to 888 acres of FMO within known clusters and would be applied as needed to potential or occupied habitat identified during site assessments conducted prior to leasing. This buffer is expected to contain all foraging habitat required to maintain the red-cockaded woodpecker cluster. There are options for oil and gas activity to occur within suitable foraging habitat, if the foraging requirements for the cluster are met elsewhere (e.g., clusters maintained on National Forests). This exception would require a concurrence from the USFWS and the State of Alabama. A concurrence would cause disturbance within the suitable foraging habitat, but if granted, would not be anticipated to affect local populations.

Under this alternative, NSO would be permitted within 1,500 feet of a bald eagle nest and/or communal roost site, and no surface-disturbing activities would be permitted within 1.5 miles of bald eagle nests during the nesting season from December 1 through August 1. This stipulation is expected to avoid potential impacts to bald eagles. This buffer may be modified as needed in the future to comply with the most current Federal guidelines. The no surface occupancy stipulation could apply to an estimated 30 acres of FMO within 1,500 feet of known bald eagle nests, and the seasonal restriction would apply to an estimated 848 acres of FMO within 1.5 miles of known bald eagle nests. These stipulations could be applied to additional acreage, if new nests or communal roosts are identified during site assessments conducted prior to leasing.

Leases containing potential habitat for specials status plant species, including Federally listed and candidate species, as well as those ranked as critically imperiled (S-1) and imperiled (S-2) by the Alabama Natural Heritage Program (ANHP) would require botanical surveys prior to surface-disturbing activities. Operations would be excluded from areas supporting these special status plant species. This stipulation is expected to protect most naturally occurring glades, prairies, and other habitats which support special status plant species. This stipulation is estimated to apply to 103 acres of FMO. This is based on known occurrences of special status plants on FMO, and because most of the private land overlaying FMO has not been inventoried for special status plants, this stipulation is expected to be applied more broadly at the lease stage based on site assessments conducted prior to leasing.

Impacts from Recreation and Travel Management Actions

Closing tracts to motorized use or restricting public vehicle use to designated roads and authorized ROWs (depending on tract) would prevent habitat damage to occupied Alabama beach mouse habitat, as well as sea turtle nesting habitat and important shorebird loafing and foraging areas. These closures or restrictions would be consistent with Florida Department of Environmental Management requirements that require permits for use of vehicles on State beaches, and they would allow the BLM to sign and more effectively enforce vehicle closures and restrictions.

Impacts from Lands and Realty Management Actions

Under this alternative, two Fort Morgan Beach tract lots (Lots 73 and 74) would be transferred to USFWS for inclusion in the Bon Secour NWR. No new disturbance would be allowed for ROWs on the BLM surface tracts. This would include the existing ROW corridors on the Fort Morgan Highway tracts, which are designated as critical habitat for Alabama beach mouse, although maintenance of these existing ROWs would be permitted. The existing utility ROWs on the Fort Morgan Beach tracts have been repeatedly disturbed and maintained in an early seral stage dominated by grasses and herbaceous growth. The continued maintenance of these utility corridors prevents the establishment of the scrub vegetation characteristic of this elevation. In addition, these disturbed sites are prone to the establishment of exotic, invasive plant species, particularly cogon grass and Chinese tallow which are common along the Highway 180 corridor. Cogon grass is very difficult to eradicate and establishes dense stands that displace native

vegetation communities. Maintenance activities may introduce additional invasive exotic species in the utility corridors, which would adversely affect Alabama beach mouse critical habitat. Additional work may be needed to assess the role that modified areas play in Alabama beach mouse habitat and to determine BMPs regarding the maintenance of this ROW corridor.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would reduce the potential for changes in the vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as conducting prescribed burns to improve habitat, would reduce the potential for changes in the vegetation communities from invasive species. Treatments to improve habitat conditions would maintain or restore natural fire regimes through removal of decadent vegetation or invasive species. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 105 acres would be the same as Alternative 1; however, impacts would not occur on the closed (8,297 acres) and NSO (94,589 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

The potential for increased wildland fire occurrence would decrease compared to Alternative 1 because travel on the surface tracts would be designated as closed or limited to designated routes. This would decrease the ease of accessibility to these areas and reduce the potential for additional ignition sources through increased human use.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as avoidance areas (a total of 114 acres or 71 percent BLM surface ownership in Alabama), there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1. This would decrease infrastructure needing protection but would also decrease improvements in accessibility to fires and providing fire-breaks on these tracts. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions, such as removing invasive species and conducting prescribed fire, on surface tracts would increase ground disturbance and associated potential impacts to cultural resources. Activities to control noxious and invasive plant species on the Coosa River and Geneva tracts could result in surface and shallow subsurface disturbance, which could introduce organic materials to lower soil layers, contaminating shallow subsurface cultural resource sites containing early historic or prehistoric datable organics. Surface and shallow subsurface effects could also include horizontal and vertical displacement of the upper portion of soils, which could compromise depositional context and integrity, and causing artifact damage. Surveys completed prior to treatments would result in the identification of cultural sites. Weed control with non-disturbing methods would have no impacts. There would be no impact to cultural resources on the Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Jordan Lake tracts as these areas have been inventoried and do not contain cultural sites.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions, such as conducting prescribed burns, would increase ground disturbance and associated potential impacts to cultural resources similar to that discussed under Impacts from Vegetative Management Actions. Wildlife habitat manipulation would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and to avoid or mitigate any potential damage.

Impacts from Minerals Management Actions

Cultural resource impacts could occur from managing 119,231 acres of non-USFS FMO as open to leasing subject to standard lease terms and conditions and 91,702 acres of non-USFS FMO as CSU. Based on the RFDS, oil and gas developments within these areas would impact 105 acres through the development of 20 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Stipulations and BMPs applied under this alternative would protect and preserve cultural resources on the 94,589 acres managed as NSO and in areas where surface disturbance would be precluded (8,297 acres).

Impacts to cultural resources from coal development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for ground disturbance and impacts to cultural resources associated with ROW development compared to Alternative 1. If a ROW were proposed on the Fort Morgan Highway and Jordan Lake tracts, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted prior to approval. A cultural resource survey would also be required if existing ROWs on the Fort Morgan Highway and Jordan Lake tracts were expanded or modified. Construction projects could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery

of cultural resources, activities would stop in accordance with terms and conditions in the ROW grant, which would minimize further damage to cultural resources. Collocating ROWs where possible would reduce the amount of surface disturbance and potential for inadvertent damage.

Visual Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the surface tracts would temporarily diminish visual quality. Visual quality would be improved in the long term as the conditions of vegetation communities improve to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve fish and wildlife habitat on the surface tracts, such as prescribed burning, would temporarily diminish visual quality. Visual quality would be improved in the long term as wildlife-related recreation and habitat conditions were improved to meet VRM class objectives.

Constructing dune walkover structures and installing sand fencing to enhance and protect existing dune habitat on the Fort Morgan Beach tract would introduce developments in previously undeveloped areas and, thereby, altering the visual quality if the developments were to dominate the view of the casual observer. Any potential impacts could be mitigated through careful placement in low-lying areas and applying treatments to blend any structures in with the natural setting in accordance with the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect visual resources on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres). Since no mineral-development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Continuing to allow recreation use on the surface tracts would result in impacts similar to those described under Alternative 1. Since the tracts would be managed as limited or closed to motorized vehicle use, impacts to visual quality would be reduced under this alternative compared to Alternative 1 as there would be less potential for vegetation and soil removal from these activities. Furthermore, because the surface tracts are not currently used extensively for recreation, anticipated impacts would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as ROW avoidance areas would retain the visual quality on these tracts since ROWs would not be approved on the tract unless it met resource objectives. Making the Fort Morgan Highway and Jordan Lake tracts available for ROWs could further diminish visual resource qualities if the ROWs were to dominate the view of the casual observer; however, collocating ROWs could reduce the extent of impacts to visual quality.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Impacts would not be anticipated on approximately 119,231 acres open to leasing subject to standard lease terms and conditions. Managing approximately 91,702 acres as open to leasing subject to minor constraints and 94,589 acres as open to leasing subject to major constraints would allow for recovery of resources and could increase development costs. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources. Closing 8,297 acres to oil and gas leasing would preclude oil and gas development and exploration in these areas.

Impacts to coal leasing and development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities on the surface tracts, such as removing invasive species, would temporarily diminish the recreation experience since recreationists could be displaced from vegetation treatment areas until revegetation occurs. The recreation experience would be improved in the long term as the condition of vegetation communities improves by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve wildlife habitat on the surface tracts, such as prescribed burning, would temporarily diminish the recreation experience since recreationists could be displaced from protected areas or treated areas until revegetation occurs. The recreation experience would be improved in the long term as wildlife-related recreation and habitat conditions are improved by improving the long-term aesthetics and wildlife viewing of an area.

Constructing dune walkover structures and installing sand fencing to enhance and protect existing dune habitat on the Fort Morgan Beach tract would enhance the recreation experience. Installing walkovers and fencing would introduce developments in previously undeveloped areas. It would also introduce intrusions to the natural setting. While this could reduce some recreationists' experience, these facilities are generally accepted by the public. Any potential impacts could be mitigated through applying treatments to blend any structures in with the natural setting.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells on non-USFS FMO (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 94,589 acres managed as NSO and in areas where development would be precluded (8,297 acres) by precluding ground disturbance and infrastructure associated with oil and gas development.

Impacts from Recreation and Travel Management Actions

Since motorized vehicle use would be limited or closed on the surface tracts under this alternative, more non-motorized recreation opportunities would increase, while there could be a loss of travel opportunities. Since surface tracts are not currently used extensively for motorized travel, the anticipated impact would be minimal.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Managing the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) as ROW avoidance areas would retain the recreation experience on these tracts. Making the Fort Morgan Highway and Jordan Lake tracts available for ROWs could diminish the quality of the recreation experience. These actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Under Alternative 2, the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent BLM surface ownership in Alabama) would be managed as avoidance areas for ROW. This could impose design and siting requirements and associated costs on new ROWs or amended or renewed ROW at existing sites. There would be an increased potential for requests for new or amended and renewed ROW at existing sites to be denied. Making the Fort Morgan Highway and Jordan Lake tracts available for ROW would accommodate access and efficient energy supply (by allowing pipelines and transmission lines) and would minimize additional costs; however, new ROW would be restricted to the existing ROW corridor on the Fort Morgan Highway tract and ROWs would be collocated if possible on the Jordan Lake tract. This would affect desired placement of facilities on these tracts.

Retaining the surface tracts under the BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations but would not allow for non-Federal ownership opportunities. Partnerships would allow for more efficient and comprehensive resource management of the surface tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

This alternative includes the removal of invasive species on three BLM land tracts and the planting of dune vegetation on the Fort Morgan Beach tract. Impacts from these actions on the economic indicators would not be anticipated from these types of vegetation management actions. Stakeholders who value access may be impacted by restrictions to the Fort Morgan Beach tracts from planting activities.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 are anticipated under this alternative. This alternative would apply leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase, while the availability for locations for wellpads could decrease. This alternative would also provide for the greatest amount of protection for wetland resources. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal changes, with possibly slight increases in employment or income (and the same as Alternative 1). Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Similar disturbances from oil and gas development would occur as compared to Alternative 1, although potential impacts to wetlands, soils, vegetation, habitat, and wildlife would be anticipated to be reduced under this alternative due to the implementation of seasonal, NSO, CSU stipulations. Oil and gas development and production can have implications for visual and scenic qualities as well as property values, as described under Alternative 1. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on wellpad locations under Alternative 2. Industry costs and availability for wellpad locations would likely increase under this alternative, which would result in adverse impacts for the oil and gas industry.

Under this alternative, impacts would be the same as Alternative 1 for coal development.

Impacts from Recreation and Travel Management Actions

Under this alternative, surface tracts would be open to recreational use but designated as limited for off-highway vehicles (OHV), and vehicle use is only allowed on public roads and authorized ROW. Minimal changes in recreation and travel management are anticipated; however, OHV users would likely be adversely impacted if trails and roads are closed to this type of motorized use.

Impacts from Lands and Realty Management Actions

Although the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts would be managed as ROW avoidance areas, impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.2.3 Alternative 3 (Proposed RMP)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas and coal development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity contributing to emissions would not change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent of BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would reduce protections to soils within these areas as compared to Alternative 2. In most cases, this buffer is expected to prevent construction activities from increasing erosion to the point that sedimentation of local drainages and wetlands increases. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to soil resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the surface tracts under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative would limit or restrict activities that impact soils. Although development once the tracts are disposed could result in soil impacts from vegetation-clearing activities and construction ground disturbance, limitations for habitat protection and resource management would be likely to reduce the potential for erosion or loss in soil productivity. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to soils would be the same as Alternative 2.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 105 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (117,506 acres), and NSO (43,239 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would allow development to occur in close proximity to water resources and the potential for impacts to occur. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize

disturbed soils above wetlands or aquatic habitats to the point they are not impacted by increased sedimentation.

Impacts from coal mining would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to water resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the surface tracts under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative would limit or restrict activities that impact water resources. Although development of the tracts could involve vegetation-clearing activities and construction ground disturbance that could increase surface runoff and degrade water quality, limitations for habitat protection and resource management would be likely to reduce the potential for these impacts. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to water resources would be the same as Alternative 2.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Under this alternative, oil and gas development would be excluded from a 250-foot buffer around wetland and aquatic habitats and could be extended up to 600 feet where slopes exceed 10 percent. This buffer could be reduced to 100 feet where slopes are less than 10 percent, where there are no special status species issues. This buffer is expected to be adequate to protect most riparian zones and wetland habitats. It is estimated that this stipulation would apply to 38,111 acres or about 12 percent of the FMO, versus 90,930 or approximately 29 percent of the FMO in Alabama.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROWs would be the same as Alternative 2. Under this alternative, the Fort Morgan, Fowl River, and Coosa River tracts would be available for transfer to other agencies or groups, but future management would be constrained by the management objectives outlined in this plan. All of the Fort

Morgan Beach and Highway tracts would be transferred to the Bon Secour NWR and would be managed as part of that refuge. The Geneva County and Jordan Lake tracts would be available for transfer out of Federal ownership. Impacts to vegetation on the Fort Morgan, Fowl River, and Coosa River tracts would be the same as Alternative 2. The sale of the Geneva County tract is not expected to change the current uses, and no impacts to vegetation are anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The acreage disturbed would be the same under all alternatives, and wells would be shifted away from sensitive habitats, although, under this alternative, the buffer would be reduced to 250 feet, with the option of increasing it to 600 feet where needed because of steep slopes or erosive soils. The buffer could be reduced to 100 feet where slopes are less than 10 percent and there are no special status species issues. These buffers are expected to be sufficient for most wildlife species using wetland and aquatic habitats, but interior forest-nesting birds and some amphibians and reptiles may be impacted by this reduced buffer through habitat disturbance. Karst habitats and most naturally occurring prairies and glades would be protected under this alternative.

Under this alternative, the coastal no-lease areas would be replaced with an NSO buffer. This change has some potential to promote offsite drilling. Disturbance of maritime habitats would contribute to the loss of important foraging habitats for migrating songbirds and shorebirds nesting in nearby dunes.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROWs would be the same as Alternative 2. No impacts to wildlife are anticipated from the disposal of the Geneva County tract because no land use changes are expected.

Special Status Species

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The number of wells (20) and acres disturbed (105) would remain the same under this alternative, and impacts would be the same as Alternative 2, except in the following situations.

The aquatic and wetland buffer would be reduced to 250 feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600 feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100 feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100 yards upstream and 300 yards downstream of the site. This stipulation could be applied to an estimated 38,111 acres or 12 percent of the non-USFS FMO available for leasing in Alabama. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

Under this alternative, the coastal no-lease areas would be replaced with an NSO buffer. This change could affect nesting sea turtles, piping plover, and critical habitat for Alabama beach mouse, including adjacent upland scrub habitats. Although no surface disturbance would occur on non-USFS FMO or the BLM surface tracts, offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional wells targeting non-USFS FMO that may affect Federally listed species or critical habitat would require coordination with the USFWS.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROW would be the same as Alternative 2. Under this alternative, the Fort Morgan, Fowl River, and Coosa River tracts would be available for transfer to other agencies or groups, but future management would be constrained by the management objectives outlined in this plan. All of the Fort Morgan Beach and Highway tracts would be transferred to the Bon Secour NWR and would be managed as part of that refuge. Alabama beach mouse, piping plover, and snowy plover would benefit from the same activities discussed under Alternative 2.

Under this alternative, the Geneva and Jordan Lake tracts would be transferred out of Federal ownership. This tract is adjacent to Gulf sturgeon critical habitat, but no changes of use are anticipated. At the Jordan Lake tract, there may be opportunities to construct boat docks or other lake access facilities, but the tract may be too narrow to prompt the construction of additional camps. In both cases, the overall use pattern is not expected to change, and no adverse effects to special status species are anticipated.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 105 acres would be the same as Alternative 1. Impacts would not occur on the closed (8,179 acres) and NSO (43,239 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 144,895 acres would be managed as open to leasing subject to standard lease terms and conditions, 117,506 acres as CSU, 43,239 acres as NSO, and 8,179 acres as closed. The 105 acres of disturbance resulting from the anticipated 20 wells could impact cultural resources within areas managed as open to leasing subject to standard lease terms and conditions or CSU. Impacts to cultural resources are not anticipated in areas managed as NSO or closed since surface disturbance would be precluded.

Impacts to cultural resources from coal development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the surface tracts available for disposal could result in the removal of cultural properties from Federal ownership and the associated protection by laws, regulations, and policies. Before any transfer of management responsibilities or ownership, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted. Disposing the property from Federal ownership would remove protection of any cultural resources under Federal law; however, by applying conditions and restrictive covenants on management and use after disposal, damage to previously undetected cultural resources could be mitigated.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), removal of vegetation and construction of wells and wellpads and introduction of other equipment would decrease visual quality. However, stipulations applied under this alternative could preclude oil and gas development thereby protecting visual resources on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres). Since no mineral-development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, specified conditions on management and use after disposal to meet resource objectives would protect visual quality.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet and the no-lease stipulation for Alabama beach mouse habitat would be NSO. Impacts would not be anticipated on approximately 144,895 acres open to leasing subject to standard lease terms and conditions. Managing approximately 117,506 acres as open to leasing subject to minor constraints and 43,239 acres as open to leasing subject to major constraints could increase development costs. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources.

Impacts to coal leasing and development would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 105 acres of vegetation removal and construction activities would result from the development of 20 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 43,239 acres managed as NSO and in areas where development would be precluded (8,179 acres) by eliminating associated ground disturbances, noise, and infrastructure.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Although the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts would be available for disposal from Federal ownership, specified conditions on management and use after disposal to meet resource objectives could protect recreational settings, although access could be reduced if not specifically included in the conditions for use or restrictive covenants.

ROW management actions and associated impacts would be the same as Alternative 2.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Under Alternative 3, the Coosa River and Fowl River tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative. This would allow opportunities for other Federal agency or non-Federal ownership but would restrict future use of the tracts. All of the Fort Morgan Beach (including Lots 73 and 74) and Fort Morgan Highway tracts would be available for transfer to the USFWS as part of the Bon Secour NWR. This would facilitate Federal management of the tracts but would not allow opportunities for other Federal agency or non-Federal ownership. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to social and economic conditions would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 is anticipated under this alternative; however, this alternative places leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations of wellpads could decrease, which would result in adverse impacts to the oil and gas industry. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal social and economic changes, possibly slight increases in employment or income, as compared with the current situation. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on wellpad locations under Alternative 3. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Under Alternative 3, impacts would be the same as Alternative 1 for coal development.

Impacts from Recreation and Travel Management Actions

Under Alternative 3, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 3, Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership with specified conditions on management and use after disposal to meet prescribed resource objectives. Although development could be allowed on these properties, it would be limited or restricted to activities that are consistent with prescribed resource management objectives. Since the types of activities on these lands are not likely to considerably change, there would be minimal impact to social and economic conditions under this alternative.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.2.4 Alternative 4

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas and coal development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity contributing to emissions would not change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts (a total of 114 acres or 71 percent of BLM surface ownership in Alabama) would be managed as ROW avoidance areas, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for

ROW development compared to Alternative 1. Impacts from potential ROW development on the Jordan Lake and Fort Morgan Highway tracts would be the same as Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Impacts to soil resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact soil resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tracts from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to soil resources. This could result in impacts to soils from vegetation-clearing activities and construction ground disturbance, which could increase surface runoff and erosion. The effects from ground disturbance during construction, vegetation treatments, or habitat improvements would be short term. If permanent roads or structures are constructed on the tracts, the effects would be long term but localized.

ROW management actions and associated impacts to soil resources would be the same as Alternative 2.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Impacts to water resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tracts from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to water resources, as described under the Soil Resources section.

ROW management actions and associated impacts to water resources would be the same as Alternative 2.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on the BLM surface tracts. Chinese privet is likely to continue to spread on the Coosa River tracts, and the Fort Morgan Highway tracts are vulnerable to both cogon grass and Chinese tallow. Cogon grass in particular, once established, would displace native herbaceous plant species and ultimately could reduce some shrub and tree components by increasing the frequency of wildfires and crowding out seedlings.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Following disposal, it is assumed that the Fort Morgan and Fowl River tracts would be developed for residential or recreational use and that recreational facilities would be constructed on the Coosa River and Jordan Lake tracts. It is expected that there would be some short-term and long-term loss of vegetation at all of these sites depending on the extent of the development as a result of vegetation removal, conversion to development, and introduction of invasive species. No impacts to vegetation are anticipated at the Geneva County tract as changes of use are not anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The maritime forests, scrubs, and flatwoods on the Fort Morgan Highway tracts are particularly vulnerable to cogon grass and Chinese tallow.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from ROW actions would be the same as Alternative 2. After transfer to private ownership, the Fort Morgan and Fowl River tracts are expected to be developed for residential and recreational use. At Fort Morgan, private development of the beach tracts could result in the loss of up to 28.7 acres of habitat for nesting and wintering shorebirds. Additional development of the Fort Morgan Highway tracts could

result in the loss of up to 41.28 acres of maritime forest, scrub, and wetland habitats. These tracts are part of a narrow band of habitat that provides crucial refuge for migrating songbirds as well as resident wading birds, songbirds, and a wide variety of reptiles and amphibians, including alligators and up to eight native frog species.

Development of the Fowl River tract would likely result in the loss of wetland habitats and increased public use that would exclude more secretive wildlife, including many species of wading birds. Recreational development of the Jordon Lake and Coosa River tracts is not expected to alter species diversity or patterns of use at those tracts since the Jordan Lake tract is already developed for recreation and the Coosa River tracts are generally inaccessible islands.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could increase the potential for exotic, invasive species to become established or spread on the BLM surface tracts. Cogon grass at the Fort Morgan Highway tracts, in particular, has the potential to alter Alabama beach mouse critical habitat as it forms dense stands displacing native herbaceous plants and potentially increasing fire frequency and intensity.

Under this alternative, the BLM would not actively promote the restoration of coastal dunes through plantings/sand fence installation projects following damage by major storm events. These dune restoration projects promote sand deposition and facilitate the return of habitat conditions suitable for Alabama beach mouse. Without these projects, it is likely to take longer for sand to accumulate and for dune vegetation to become reestablished, postponing the reestablishment of Alabama beach mouse populations after catastrophic events.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Impacts from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

The transfer of the BLM surface tracts to private ownership is likely to result in loss of habitat for the Alabama beach mouse, piping plover, snowy plover, and bald eagle, as well as potential habitat for

Alabama red-belly turtle. Any development of the Fort Morgan Beach tracts would result in the direct loss of occupied critical habitat for the Alabama beach mouse. Development of the highway tracts are likely to result in the loss of important scrub habitats designated as critical habitat. Because the Fort Morgan Beach and Highway tracts are designated critical habitat, USFWS would have to authorize a taking permit through the Section 7 process of the Endangered Species Act before such transfers could be approved.

Recreational development of the Coosa River tracts could result in abandonment of the existing bald eagle nest and exclude future nesting, depending on the location of facilities and intensity of public use. No impacts to special status species are expected as a result of anticipated development on the Fowl River, Jordon Lake, or Geneva County tracts. At Fowl River, it is unlikely that any future development of the site would substantially alter the wetland characteristics of the site and render it unsuitable for Alabama red-belly turtle. The Jordon Lake tract does not support any known populations of special status species. No development is expected to occur on the Geneva County tract, which is adjacent to critical habitat for the Gulf sturgeon.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the surface tracts. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative; therefore, no impacts would be anticipated. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would result in impacts similar to those discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to wildland fire ecology and management would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Impacts to wildland fire ecology and management from recreation and travel management actions would be the same as Alternative 2 because travel designations would be the same for this alternative.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Impacts to cultural resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although surface tracts would be closed or limited to motorized use under this alternative, the level of activity and associated potential impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal could result in the removal of cultural properties from Federal ownership and the associated protection by laws, regulations, and policies. Before any transfer of management responsibilities or ownership, an appropriate level of cultural resource survey and consultation with the SHPO under NHPA Section 106 regulations would need to be conducted. Disposing the property from Federal ownership would remove protection of any cultural resources under Federal law. Disposing the tracts without any specified management or use would increase the potential for damage or loss of previously undetected cultural resources after the transfer.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Minerals management, including oil and gas and coal development, and associated impacts to visual resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership without conditions could result in changes to existing natural or manmade landforms, which would diminish visual quality if the use were to dominate the view of the casual observer. Following disposal, private development actions could create visually intrusive development.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Mineral management actions for oil and gas and coal and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to recreation and travel would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Impacts from the transfer of Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS would be the same as Alternative 1. Making the Coosa River, Fort Morgan Beach (Lots 13, 14, 24, 54, and 55), Fort Morgan Highway, Fowl River, Geneva, and Jordan Lake tracts available for disposal from Federal ownership without conditions could result in reduced access for recreation and travel opportunities. Following disposal, tracts could be made unavailable for public recreation and inaccessible to travel.

ROW management actions and associated impacts would be the same as Alternative 2.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Transferring Lots 73 and 74 of the Fort Morgan Beach tracts to the USFWS as part of the Bon Secour NWR would facilitate Federal management of the lots. Under Alternative 4, the Coosa River, Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts; however, disposal would not be allowed if it would jeopardize Federally listed species or designated critical habitat, which could limit some disposals. The Geneva and Jordan Lake tracts would be available for disposal from Federal ownership, which would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions since no actions are proposed under this alternative. Standard management actions common to all alternatives, which would allow vegetation manipulation to meet resource objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. Standard management actions common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to be of a severity or extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Minerals management actions, including oil and gas and coal development, and associated impacts to social and economic conditions would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Under Alternative 4, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 4, Lots 73 and 74 of the Fort Morgan Beach tracts would be transferred to the USFWS and a number of dispersed BLM surface land tracts would be available for disposal from Federal ownership without conditions on management and use after disposal. This could result in reduced access for recreational activities on these lands and changes to the existing natural landscape. Additionally, private recreational or residential development could impact visual resources, habitat quality, and wildlife populations. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting the counties and the State. It is possible that the private development of these tracts could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3 DIRECT AND INDIRECT IMPACTS FROM BLM MANAGEMENT ACTIONS IN MISSISSIPPI

This section discusses the potential impacts anticipated from implementation of the management actions under each alternative for the Hancock County tract in Mississippi and for non-USFS FMO on about 517,934 acres in 79 Mississippi counties. Impacts from the allowable uses and management actions proposed for the Hancock County tract are analyzed if the R&PP patent held by the University of Mississippi were to revert to the BLM.

This section is organized by alternative, then by resource. Under each resource, each management action is discussed, including vegetative communities, fish and wildlife habitat, minerals, recreation and travel, and lands and realty. A discussion of cumulative impacts for each resource is contained in Section 4.4.2.

4.3.1 Alternative 1 (No Action)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Combustion processes, construction activities, and vehicle travel associated with potential oil and gas development produce air emissions. Estimated emissions from the development of 10 wells over the next 20 years on BLM-administered, non-USFS FMO would produce considerably less emissions than the total planned oil and gas developments in the State (presented in Table 4-4). Those emissions would likely occur over a dispersed geographic area and would not cause any noticeable or measurable effect.

Potential oil and gas leasing on BLM-administered, non-USFS FMO is in close proximity to the Sipsey Wilderness Area in Alabama and the Breton NWR in Louisiana. These emissions could potentially deteriorate wilderness air quality values and ambient air quality attainment. Since emissions would be dispersed over a large geographic area, air quality impacts would not be anticipated.

Table 4-4. Maximum Potential Oil and Gas Air Emissions for BLM and Non-BLM Activities in Mississippi (tons per year)[1, 2]

Well Locations	Emission Type/Pollutant				
	NO_x	SO_2	PM_{10}	CO	VOC
BLM-administered, non-USFS FMO Estate in Mississippi	27.5	0.3	7.8	32.9	27.5
Other Mineral Estate Across Mississippi	33,028	360	9,368	39,513	33,028

1. Using conservative assumptions typical of liquid mineral wells on BLM land.
2. Assumption that all wells are conventional natural gas wells (BLM 2005a).

Impacts from Recreation and Travel Management Actions

Short-term, localized increases in dust and emissions could potentially occur from recreation activities and motorized travel. Given the small amount and marsh nature of the Hancock County tract, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Lands and Realty Management Actions

Short-term, localized increases in dust and emissions would occur from use of trucks and heavy equipment (bulldozers, etc.) in ROW development. These actions would be conducted in accordance with the Mississippi SIP and local dust control regulations and, given the small amount and marsh nature of the Hancock County tract, would not be anticipated to individually deteriorate air quality conditions or violate air quality standards or regulations.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative; therefore, there would be no impacts to soil resources. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Mineral exploration, development, and operations on non-USFS FMO would include ground-disturbing and potential contaminant-introducing activities that could impact soils. Oil and gas development operations—specifically, construction of drilling pads, reserve pits, and access roads—would disturb topsoils and alter surface soil characteristics, which could result in both a slight decline in soil productivity and an increase in surface runoff. Increases in erosion and loss of soils due to oil and gas development are a factor of wellpad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for erosion increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes are particularly vulnerable before protective plant covers have been established.

Except for 63,004 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated 10 wells to be developed on non-USFS FMO in Mississippi over the next 20 years would disturb approximately 55 acres. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on soils. Operation of the oil and gas wells could also affect the surrounding soils by potential contamination from accidental spills or improper management of hazardous materials or waste. Federal, State, and local regulations would require site characterization and corrective action that would restore soil integrity and productivity.

In a few locations, there are prime or unique farmlands on non-Forest Service FMO. Though not likely, it is possible that some of the 105 acres of soil disturbance could be on prime or unique farmland. In the event development is proposed in such an area, the BLM would implement appropriate mitigation measures to avoid or minimize impacts as described in Section 2.3.3.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use on the Hancock County tract, could result in short-term and site-specific increases in erosion; however, given the limited interest in recreation and travel on the tract, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If new ROW construction were to occur, soils could be impacted by vegetation-clearing activities and ground disturbance. Wind and water erosion and subsequent loss in soil productivity would occur in disturbed areas where revegetation does not occur. These effects would be localized and short term in areas where revegetation is enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Except for 63,004 acres closed to leasing by other surface management agencies, non-USFS FMO would be open to leasing subject to standard lease terms and conditions (454,930 acres). The estimated development of 10 wells on non-USFS FMO in Mississippi over the next 20 years would disturb approximately 55 acres. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of wellpad design, slope, erodibility of the soils, proximity of the disturbance, and the vegetation composition. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity in higher order streams and potentially affecting water quality substantial distances from the construction site. Both Federal and State laws would require the reclamation of mined lands concurrently with mining operations; therefore, the required reclamation and the minimal surface that might be disturbed would result in only localized effects on water resources.

Mineral exploration, development, and operations would include ground-disturbing activities that increase surface runoff, which increases nutrient levels and turbidity and decreases water quality. These activities could also introduce hazardous waste or result in accidental spills that could also deteriorate surface water quality. Leakage of drill fluids, hazardous waste spills, or leakage from reserve pits could be introduced into the ground water as well. Although Federal, State, and local regulations would require site characterization and corrective action for hazardous waste and spills, impacts to the water quality could be localized but long term, especially affecting nonflowing water bodies (e.g., small ponds or wetlands) and ground water resources. Additionally, access roads and wellpads could alter the local hydrology, reducing surface flow to mesic areas and diverting or degrading surface water. Installation of culverts and diverting existing drainages around wellpads help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and could retard sheet flow.

Impacts from Recreation and Travel Management Actions

Managing the surface tracts as open to recreation and motorized vehicle use could result in short-term and site-specific increases in erosion and surface runoff, which increases nutrient levels and turbidity and decreases water quality; however, given the limited interest in recreation and travel on the Hancock County tract, any potential effects would be minor and localized.

Impacts from Lands and Realty Management Actions

If new ROW construction were to occur on the Hancock County tract, vegetation-clearing activities and construction ground disturbance could increase soil erosion and surface runoff, which increase nutrient levels and turbidity and decrease water quality. Impacts would be short term in areas where revegetation was enhanced or permitted. The effect would be long term but localized if roads or structures were constructed on the tracts. The hydric soils associated with the wetlands that encompass most of the tract could be affected by development or construction activities that would dredge or fill the wetlands, compacting soils and hindering natural flow through the wetlands and potentially resulting in the loss of these emergent wetlands.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and, if uncontrolled, could substantially alter these maritime habitats by displacing native species and increasing the susceptibility to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Oil and gas development is expected to disturb 55 acres of vegetation under this alternative. The effect this disturbance would have on vegetation would be dependent on the location and design of wellpads, roads, and production facilities. In recent years, most wells on non-USFS FMO have been located in the Maxie Field in Forrest County. Typically, the vegetation most likely to be affected in this area is pine plantations or commercial pine forests, often loblolly pine. Understory species vary depending on how the stand has been managed. Once young pine plantations shade out “old field growth” at about 10 to 15 years of age, the midstory and ground cover are generally very limited. After thinning, shrubs and young hardwoods become established. Use of prescribed fire in these stands favors an increase in grasses and native forbs.

During a routine wellpad installation, saleable timber would be removed from the site if the stand is commercially viable, but it is otherwise cut and left onsite. Vegetation debris piles are stored along the edges of the construction site and may be buried onsite, burned, or left in place after drilling operations are completed. Vegetation debris is not permitted in the reserve pit, as it can disrupt any future monitoring of the pit contents.

During interim reclamation, the reserve pit area is graded and the surface fertilized, seeded, and mulched. Although the operators are encouraged to use native seed, the final mix and tree planting are approved by

the private landowner or surface managing agency. The BLM, by policy, excludes invasive species, although non-native grasses, particularly annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months) are often used to provide a quick cover for disturbed soils. These sites typically progress through "old field" stage as opportunistic pioneer plant species become established. Within a few years, young sapling pine and hardwoods become established. Faster growing pines generally dominate the site for several decades. Outside of the pine belt, pines would gradually be overtaken by longer lived hardwoods. In areas where mature hardwood forests are removed, it may take 100 years or more to reestablish hardwood forests with similar structure and even longer before species diversity returns to near pre-disturbance levels.

Surface-disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Cogon grass is a particular concern because it is very difficult to control and because of its ability to degrade native plant communities and commercial forests. Cogon grass displaces native species and can crowd out pine seedlings and increase susceptibility to wildfire. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine or left unmowed, the areas would progress through old field-type growth, which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types, such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in or near these plant communities can alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even the small acreages from BLM-permitted oil and gas activities has a disproportionate effect on the plant diversity in an area.

Impacts from Recreation and Travel Management Actions

The Hancock County tract would be open to recreation. Although the Hancock County tract is accessible only by boat, the site would remain open for vehicle use. In the unlikely event that four-wheelers were transported to Point Clear Island, substantial damage could be done on this sensitive barrier island in a very short time. Repetitive use on these sandy soils would damage herbaceous growth and young shrubs and could introduce or promote the spread of exotic plants, particularly Chinese tallow and cogon grass. Repetitive use on Point Clear would substantially degrade the maritime forest, a critically imperiled plant community in Mississippi.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could degrade habitats for migratory birds and other wildlife on Point Clear Island by displacing native vegetation and increasing susceptibility to wildfire.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland enhancements, would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO is expected to result in the loss of 55 acres of habitat. The effect on general wildlife resources is dependent on the wellpad location, design, and need for additional access roads. Impacts would include the direct loss of habitat from the construction of drilling pads, production facilities, pipelines and roads, and from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology. These impacts could occur anywhere on non-USFS FMO in the State, but have in the past occurred primarily in Forrest County. Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the wellpad areas during construction. Less mobile species are directly impacted, and during the spring and early summer this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction activities have ceased. However, construction in high-value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests, which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles, are often located in riparian/wetland zones. These areas have been set aside as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed; during this time, most wildlife, including waterfowl and many songbirds, are expected to avoid the immediate area. However, once drilling is completed, reserve pits with water can become a hazard for waterfowl and other birds, which can become soiled by drilling fluids. If the well is put into production, there is documentation that birds and bats may use open-vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Mississippi is expected to be similar.

Access roads and wellpads can alter the local hydrography, reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages around wellpads help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles

associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts from Recreation and Travel Management Actions

Point Clear and the surrounding marshes provide secluded areas for nesting shorebirds, wading birds, and songbirds. Although unlikely, the use of any vehicles, such as four-wheelers, during the spring and summer months is expected to increase nest/chick abandonment and could result in the loss of ground-nesting bird nests. During the rest of the year, vehicle use is likely to flush foraging and loafing wading birds and shorebirds and could reduce their use of this critically imperiled plant community.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species, which a variety of wildlife species are dependent upon. Depending on the time of year, development activities could cause nesting shorebirds to abandon nests and could change use patterns of foraging shorebirds.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and, if uncontrolled, could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO in Mississippi is expected to result in the direct loss of 55 acres. Based on previous oil and gas activity, the Federally listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, and bald eagles associated with reservoirs and rivers in the northern portion of the State. Drilling could occur outside of these areas and there is some potential to affect small acreages supporting special status species anywhere in the State, outside of three northwestern counties which do not contain non-USFS FMO: Coahoma, DeSoto, and Sunflower. There is potential statewide to affect Federal- and State-listed aquatic species.

Gopher tortoise could be impacted by oil and gas activity in upland areas of the East Gulf Coastal Plain where forest practices on private lands have maintained at least a marginally suitable habitat. Foraging habitat for tortoise could also be affected on non-USFS FMO associated with private holdings in the Chickasawhay, De Soto, and Homochitto National Forests, which support substantial tortoise populations. During construction of wellpads, access roads, and production facilities, gopher tortoises could be impacted by the loss of or damage to burrows, destruction of foraging habitat, or killed during construction or by service vehicles. Construction activities and roads within 600 feet of burrows could isolate individuals and reduce reproductive potential within a population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, many of them special status species such as the black pine snake (*Pituophis melanoleucus lodingi*), which could also be impacted by oil and gas activities.

Red-cockaded woodpecker could be affected by oil and gas development through the loss of nesting habitat within existing clusters and through the loss of current or potential foraging habitat within 0.5 mile of existing clusters. Non-USFS FMO in areas supporting red-cockaded woodpecker is generally privately owned and often managed for commercial timber production. Harvest rotations on these properties are typically too short to sustain suitable nesting habitat for red-cockaded woodpeckers; however, there is potential to impact suitable foraging habitat, particularly on non-USFS FMO near the Chickasawhay, De Soto, and Homochitto National Forests or Noxubee NWR, areas that support most of the State's population. This stipulation would be applied to the estimated 11,710 acres of non-USFS FMO within 0.5 mile of known red-cockaded woodpecker clusters.

Throughout the State, breeding and wintering bald eagles could be affected by drilling near large rivers or reservoirs. Bald eagles are particularly sensitive during courting, nesting, and fledging young; in Mississippi this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Throughout the State, oil and gas development has the potential to impact aquatic and wetland habitats. This could result in degradation of water quality through contamination and increased sedimentation, direct loss of habitat, and changes in the local hydrography supporting these systems. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of wellpad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes are particularly vulnerable before protective plant covers have been established. While intact vegetation along riparian/wetland zones and around wetlands can substantially buffer these areas, the steepness of the intervening slopes, particularly over 25 percent, can reduce the effectiveness of buffers. Research has shown that a minimum of a 30-foot buffer of vegetation is needed to control sediments; however, construction activities within 100 feet can reduce stream invertebrates, and 1,000 feet or more may be needed to protect some amphibians, reptiles, and forest interior birds (Wenger 1999). Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams and potentially affecting special status species substantial distances from the construction site, including Louisiana quillwort (*Isoetes louisianensis*), listed as Federally endangered.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps, generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future and could result in direct habitat loss for a wide variety of special status species. Because of the limited acreage of these vegetation communities, loss of even the small acreages associated with BLM-permitted oil and gas activities has a high potential of destroying or degrading habitat for special status species. Many of these species have limited ranges, so the list of species potentially affected varies by location. For example, the

Mississippi Comprehensive Wildlife Conservation Strategy (CWCS) notes 14 special status species are associated with pine seeps and pitcher plant bogs, including eight special status crayfish, five of which are endemic. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction activities, and particularly linear disturbances related to new roads and pipelines, can disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps, degrading these habitats.

There are estimated to be 65 caves in Mississippi located in the northeast corner and east central portions of the State. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. In Mississippi, this includes two State-listed salamanders and a number of bat species. Although the potential to affect these areas is low, caves are particularly sensitive to oil and gas development. Even minor alterations in temperature, humidity, and water quality or water quantity can result in irreversible impacts. Drilling through cave/karst resources can result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats can be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting ground water flow and introducing pollutants into karst systems.

Drilling in coastal areas would affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi diamondback terrapin, and saltmarsh topminnow. At least one special status plant species, tiny-leaved buckthorn (*Sageretia minutiflora*), occurs on coastal shell mounds in this area, but the potential for oil and gas wells being located on non-USFS FMO in these areas is low.

Impacts from Recreation and Travel Management Actions

Because this tract is not accessible by road, few impacts are anticipated by designating the tract open to recreation and vehicles; however, use of four-wheelers on remote upland areas, such as Point Clear Island, could damage sensitive maritime forests and scrubs. Depending on the time of year, any vehicle use could cause nesting shorebirds to abandon nests and could change use patterns of foraging shorebirds, like piping plover, snowy plover, and American oystercatcher.

Impacts from Lands and Realty Management Actions

The Hancock County tract would remain open to ROW applications. Any ROW development could damage sensitive maritime forests and scrubs through ground disturbance, vegetation removal, and introduction of invasive species. Depending on the time of year, development activities could cause nesting shorebirds to abandon nests and could change use patterns of foraging shorebirds, like piping plover, snowy plover, and American oystercatcher or damage their habitats.

Wildland Fire Ecology and Management

Suppressing all wildland fires, unless an in-place, site-specific plan determines otherwise, would minimize immediate threats and damage to life, public safety, and developments in the WUI and to natural resource values. Allowing prescribed burning on a case-by-case basis would allow for a reduction in hazardous fuel conditions, improving the ability to suppress wildfires while maintaining disturbance levels to which vegetation communities have adapted. Fire response and fuel treatments would apply to the 174 acres of BLM-administered surface land.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities management actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would generally serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the Hancock County tract. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would result in impacts similar to those discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals development activities would introduce additional ignition sources throughout the non-USFS FMO, increasing the potential of wildland fire occurrence. Disturbance of 55 acres associated with development of 10 wells on non-USFS FMO could provide increased accessibility for fire suppression equipment and provide fuel breaks in the case of wildland fire events. In addition, the infrastructure associated with the 10 new wells would require protection in wildland fire events. Impacts from mineral-development activities would not occur on the 63,004 acres closed to oil and gas development.

Impacts from Recreation and Travel Management Actions

Continuing to manage the Hancock County tract as open to recreation use would allow for dispersed recreation use, which could introduce additional ignition sources and increase the probability of wildland fire occurrence. This would be more prevalent in areas of the tract that are more easily accessible.

Impacts from Lands and Realty Management Actions

Managing the Hancock County surface tract as open for ROW applications could result in the development of ROWs. Development of above-ground ROWs on the Hancock County tract would require additional efforts by firefighters to protect these areas in wildland fire events. Development of ROWs would also result in clearing vegetation to make way for linear features. ROWs could provide fuel breaks, which could help prevent the spread of wildland fires. ROWs could also provide firefighters with increased accessibility for fire suppression equipment. While more ROWs could increase suppression costs, the aspects of ROW development related to vegetation clearing and the potential for increased accessibility could reduce suppression costs.

Cultural Resources

Management of cultural resources provides protection from the potentially damaging effects of surface-disturbing activities through implementation of existing laws and policy, such as Section 106 of the NHPA and FLPMA. Federal undertakings typically require cultural resource inventories that would result in the identification of cultural resource sites and determination of eligibility to the NRHP. The cultural resources data acquired through inventories and evaluations would increase knowledge of cultural

resources on BLM-administered lands and minerals in the State. Following site-specific inventories, mitigation measures would be prescribed as necessary for eligible properties. Any cultural sites discovered may be considered for further evaluation to assess its eligibility for listing on the NRHP. Through this process, significant impacts on cultural sites eligible for the NRHP would be avoided or mitigated. Avoidance is the BLM's preferred measure to eliminate potential adverse effects. Avoidance preserves the cultural resource in place. If this is not possible under reasonable circumstances, scientifically valid excavation and data recovery is an alternative mitigation method. Scientifically valid excavation would be used as a final measure, and the extent of excavation would be determined through BLM consultation with the SHPO and tribes.

Data recovery preserves as much of the cultural record as possible through archaeological methods. Any mitigation effort requiring archaeological data recovery is subject to the terms outlined in a Data Recovery Plan and documented through a signed MOU with the SHPO, tribes, and other consulting parties. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed. Mitigation through data recovery also reduces or eliminates other uses of cultural resources sites, such as traditional, public, conservation, or experimental use. The standard inventory and avoidance procedures conducted in conjunction with surface-disturbing actions would protect most cultural resources from significant impacts.

Despite the best efforts to identify all cultural resources, there remains a potential for inadvertent impacts to previously undiscovered sites, especially buried sites with no surface indications. There is a set process through Section 106 for identifying, evaluating, and treating the effects of inadvertent discoveries, reducing potential impacts from these discoveries.

Wildfire, wildfire suppression efforts, and prescribed fire could impact cultural resource sites within the Hancock County tract, including the eligibility characteristics of sites that are listed or eligible for listing on the NRHP. Impacts from wildland fire vary, depending on the temperature and duration of exposure to heat. Generally, higher temperatures and/or longer duration of exposure to heat increase the potential for damage to cultural resources. The nature of wetland vegetation in this tract would result in low-intensity wildland fires. Prehistoric and historic resources potentially affected by wildfire may be inorganic (e.g., lithic/rock, ceramics, cans, glass) or organic (e.g., textiles, leathern works, wooden structures). Generally speaking, organic materials are more at risk as they tend to burn or alter at lower temperatures than inorganic items. Wildfire impacts on inorganic cultural resources include fracturing, shattering, and changes in color and internal luster, which might reduce an artifact's ability to render information about the past. As a general rule, fire would not affect buried cultural materials. Studies show that even a few centimeters of soil cover (4 inches) is sufficient to protect cultural materials (Oster N.D.). Wildfires that burn hot and fast through a site may have less of an effect on certain types of cultural materials than fires that smolder in the duff or burn for a long time period, allowing heat from the fire to penetrate the surface. In addition, heat from wildland fires could change the physical nature of the ground, making it harder to identify cultural resources.

Often, cultural resources are more at risk of impact due to fire suppression activities than from wildland fire. Potential impacts from the use of retardants would include rapid cooling and subsequent damage (e.g., breakage, spalling, corrosion, staining, rusting) to archaeological materials. Discoloration or warping of metallic surfaces could also occur. Consultation with a cultural resource specialist during suppression activities in areas containing sensitive cultural resources would help to minimize impacts. Prescribed fire typically burns at a lower temperature and duration than wildfire events, so potential impacts would be less severe than unmanaged wildland fire. Prescribed fire events are managed to obtain

a smaller, more manageable, and less intense planned burn. The potential impacts from prescribed fires would typically have less long-term impacts than those from an unmanaged wildland fire event.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would require cultural resources clearances before any activities were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Cultural resources on 454,930 acres of non-USFS FMO in Mississippi that are open to leasing subject to standard lease terms and conditions could be impacted by oil and gas development. Based on the RFDS, oil and gas developments within these areas would impact 55 acres through the development of 10 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Cultural sites on 63,004 acres closed to leasing would be protected from oil and gas development.

Impacts from Recreation and Travel Management Actions

Recreation activities on the Hancock County tract, including motorized vehicle use, could result in inadvertent damage and vandalism to previously undetected cultural sites. Although the tract would not be used extensively for recreation, the tract is located in wetlands with a high potential for cultural resources to occur, which could increase the potential for inadvertent damage and vandalism.

Impacts from Lands and Realty Management Actions

Ground-disturbing activities associated with ROW construction and maintenance could inadvertently damage cultural resources. Because the Hancock County tract has not been previously surveyed, approved activities would be subject to a ground survey and consultation requirements with SHPO under NHPA Section 106 regulations before construction. Therefore, impacts to cultural resources would be anticipated to be minimal.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality

would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Mineral exploration and development on non-USFS FMO tracts (517,934 acres) would result in impacts to visual resources on 55 acres from 10 wells. Removal of vegetation and construction of wells and wellpads and introduction of other equipment would impact visual quality. The BLM does not manage the surface for non-USFS FMO tracts; however, the BLM can place COAs or best practices to minimize impacts to visual resources as needed and in accordance with the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating. Impacts from these activities would not be anticipated on 63,004 non-USFS FMO acres closed to leasing. Since no mineral-development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use, on the Hancock County tract could result in impacts to visual quality over time from changes to existing natural or manmade landforms and scenic vistas through vegetation and soil loss, particularly on tracts that are in undeveloped areas. Since the surface tracts would not be used extensively for recreation, these impacts are anticipated to be minimal.

Impacts from Lands and Realty Management Actions

If a new ROW were authorized on the currently undeveloped Hancock County tract, visual quality would be impacted if the ROW were to dominate the view of the casual observer.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Under this alternative, 454,930 acres of non-USFS FMO would be open to leasing, subject to standard lease terms and conditions; 63,004 acres of non-USFS FMO would be closed to leasing. No impacts to oil

and gas minerals exploration and development would be anticipated from management of non-USFS FMO tracts.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated. The BLM would only dispose of non-USFS FMO with no suspected value and, therefore, there would be no loss of opportunity.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from vegetation treatment areas until revegetation occurs; however, the vegetation treatments would benefit recreationists by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation. Recreationists could be displaced from protected areas or treated areas until revegetation occurs; however, the habitat improvements and protections would benefit recreationists by improving the long-term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO tracts with surface management by other Federal agencies that are open to the public for recreation, as identified in Table 3-17, could be impacted by the leasing of Federal minerals by the BLM or in areas where the public were excluded. Those areas and installations not open to recreation or leasing, which include NPS and USFWS lands, would not be affected. Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells on non-USFS FMO, there could be a decrease in nature-based recreational opportunities due to conflicts with the developments. Mineral leasing in recreational areas could result in the removal of vegetation; construction of access roads, wellpads, and other infrastructure; drilling equipment; and associated noise and dust emissions. Impacts from these activities would include decreased quality of the recreational experience of the non-USFS FMO tracts; however, stipulations applied under this alternative by other surface management agencies could indirectly protect the recreational resources in areas where development would be precluded (63,004 acres). Oil and gas development could provide additional opportunities for travel due to the construction of access roads.

Impacts from Recreation and Travel Management Actions

Allowing recreation activities, including motorized vehicle use, on the Hancock County tract would maintain existing recreation and travel opportunities; however, allowing motorized travel could result in conflicts between motorized recreationists and recreationists seeking a more natural setting or experience. Since the tract is not currently used extensively for recreation or travel, these impacts are anticipated to be minimal.

Impacts from Lands and Realty Management Actions

If a new road or utility ROW were authorized on the currently undeveloped Hancock County tract, the largely natural recreational experiences available would be impacted as a result of construction activity, ground disturbance, and introduction of new infrastructure; however, these actions could provide additional opportunities for travel due to the construction of access roads.

Lands and Realty

Lands and realty is a resource use rather than an environmental component and impacts on lands and realty are a direct result of their management. Therefore, the following discussion is limited to impacts from lands and realty management actions for the 174 acres of BLM-administered surface ownership in Hancock County, Mississippi. Impacts from disposal of FMO are discussed under Impacts to Minerals from Lands and Realty actions.

Under Alternative 1, the 174-acre Hancock County tract would remain open to ROW applications; therefore, no impacts would be anticipated to lands and realty actions. Retaining the Hancock County tract under the BLM administration would not allow for opportunities for other Federal agency or non-Federal ownership.

Social and Economic

Definitions and descriptions of potential Environmental Justice populations, including low income and ethnicity statistics, were provided in Section 3.4.13. Since the locations of specific BLM oil and gas activities could not be identified, the Environmental Justice analysis identified low-income populations and high minority populations in counties across the State. Environmental Justice population locations should be further considered at the implementation level to minimize the potential for disproportionate impacts to Environmental Justice populations and to identify any possible mitigation measures that may be required to reduce impacts (e.g., dust, noise, traffic, ground water quality) to these populations.

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions under this alternative. The proposed standard management actions common to all alternatives, allowing vegetation manipulation to meet resources objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. The proposed standard management actions common to all alternatives would provide habitat improvements and protections under State wildlife conservation strategies, including control of invasive plant species, use of prescribed fire, and wetland

enhancements, which would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Since only 10 fluid mineral wells (with standard lease terms and conditions) would likely be drilled over the next 20 years, there would be minimal economic impacts from these activities. This type of BLM mineral development is consistent with the development that occurred in the past, including seven applications for permits to drill between 1983 and 2004. Therefore, there would be minimal yet slight increases in employment or income. For example, over the past 20 years, there have been 7,632 wells drilled and completed (382 wells drilled per year), with a 5-year annual employment average of 3,089 employees in the support sector for mining and oil and gas. If we assume that most of this support goes to the drilling and development of the oil and gas wells, there are approximately 8 employees (3089/382) supported annually per well drilled on the BLM-administered minerals. Therefore, over the next 20 years, an additional 10 BLM-administered wells will contribute to the employment of 80 people in these support industries. Social impacts, such as housing, education, and cost of living, would not be anticipated to change as a result of this activity.

Oil and gas development and production can have implications for visual and scenic qualities as well as property values. Although the BLM does not own much of the surface land in Alabama on which wells will be drilled, the permitting of these split-estate lands could impact a number of socioeconomic factors. The recreation literature indicates that visitors are likely to pay to view less development or development infrastructure in their recreation experience (Brookshire *et al* 1979; Boyle and Bishop 1984). Since the FMO-administered wells are mostly located on private or State lands, there could be visual impacts, but they would likely be borne by residents, not visitors. Additionally, decreases in property values have been associated with the drilling phase (more dramatic) as well as the existence of operating wells (BBC Research and Consulting 2001, 2006). Because these socioeconomic impacts are associated with mineral development, these impacts are likely greatest under Alternative 1, where standard lease conditions apply as compared to Alternatives 1, 2, and 3, where there are more conditions and constraints on wellpad locations.

Impacts from Recreation and Travel Management Actions

The BLM surface tract is open to dispersed recreational use, including hunting, fishing, hiking, and nature study, and no construction of recreational facilities is expected. Recreation and travel management actions provide for quality of life benefits (i.e., recreation, solitude, open space, scenic values) to local residents and visitors, which are often difficult to quantify. These types of limited recreation and travel management actions do not provide significant economic benefits in terms of employment and income and will not affect social assets, such as housing, education, and crime rates, in the area. Under Alternative 1, these types of socioeconomic impacts are assumed to continue.

Impacts from Lands and Realty Management Actions

Under Alternative 1, the Hancock County tract would remain in Federal ownership. Lands and realty management actions would not cause changes in the economic characteristics (employment, income, and industries) as there are very little changes anticipated under this alternative. The quality of social assets (demographics, housing, cost of living, education) in Hancock County is not likely to be affected by retaining these lands in Federal ownership.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include the use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100–185, 40 CFR 100–400, CERCLA, RCRA, SARA, TSCA, and CWA, and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if a release were to occur, it would be immediately addressed and remediated in accordance with regulation.

4.3.2 Alternative 2

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions; however, since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract and associated use of trucks and heavy equipment would cause short-term, localized increases in dust and emissions. Given the small amount and remote nature of surface ownership, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would cause short-term, localized increases in dust and emissions. Given the small amount and remote nature of the tract, these activities would not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Although the tract would be limited to motorized boating, impacts would be the same as Alternative 1 since this tract is not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for emissions associated with the use of trucks and heavy equipment (bulldozers, etc.) for ROW development compared to Alternative 1.

Soil Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract could increase site-specific erosion in the short term. Over the long term, improving vegetation communities would reduce erosion and overland flows.

Impacts from Fish and Wildlife Habitat Management Actions

The impacts from standard management common to all alternatives would be the same as discussed under Alternative 1. In addition, conducting prescribed burns to improve habitat on the Hancock County tract could increase site-specific erosion in the short term. Over the long term, improving marsh health would reduce erosion.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. In addition to the stipulations in Appendix D, areas within 1,000 feet of aquatic habitats would be managed with an NSO stipulation, which would eliminate impacts to soils in these areas. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could increase erosion and associated impacts to soils would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract could increase site-specific erosion, which could increase nutrient levels and turbidity and decrease water quality in the short term. Over the long term, these actions would maintain the emergent wetlands, water quality, and ground water recharge.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would increase erosion and runoff, which increases nutrient levels and turbidity and decreases water quality in the short term. Over the long term, improving and protecting fish and wildlife habitats would reduce erosion and overland flows.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. A 1,000-foot NSO buffer around aquatic habitats and applying the stipulations in Appendix D would increase the area where seasonal, CSU (123 acres), and NSO (184,192 acres) restrictions would be implemented. This would reduce disturbance to water resources within the protected areas. This

stipulation could be applied to an estimated 168,383 acres or 33 percent of the non-USFS FMO available for leasing in Mississippi. This buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands.

Impacts from Recreation and Travel Management Actions

Motorized travel would be closed or limited to designated routes on all tracts under this alternative. However, the level of activity that could affect water resources would not be anticipated to change compared to Alternative 1 since these tracts are not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

The Hancock County tract would benefit from removal of woody exotic, invasive species such as Chinese tallow and Chinese privet, which would be removed by hand and stump treated with approved herbicides. Selective hand spraying of cogon grass may be required where it is established. Any removal and treatment of exotic, invasive plants on this tract would be coordinated with the Hancock County Marshes staff and/or The Nature Conservancy to improve removal of invasive species and minimize impacts to the marshes.

Impacts from Fish and Wildlife Habitat Management Actions

Natural fire is infrequent in these coastal marshes, and the use of prescribed fires is expected to be infrequent and closely coordinated as part of an overall fire plan for the Hancock County Marshes Preserve.

Impacts from Minerals Management Actions

The estimated 55 acres of disturbance from oil and gas development would impact vegetation; however, under this alternative, oil and gas activities would be excluded from a 1,000-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species. This alternative provides additional protection for riparian/wetland areas and reduces the potential for contaminants to leach into wetland communities. Impact to exotic invasive plant species would be the same as in Alternative 1.

Impacts from Recreation and Travel Management Actions

Limiting the Hancock County tract to motorized boating would prevent damage to vegetative communities by reducing travel and access to recreation opportunities.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to vegetative communities associated with ROW development compared to Alternative 1.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Wildlife would benefit from control of invasive exotic plant species, which could substantially alter upland areas on Point Clear Island. Invasive species control would foster native vegetation and habitats that support wildlife species.

Impacts from Fish and Wildlife Habitat Management Actions

There may be some benefits to wildlife by burning heavy mats of flotsam left by Hurricane Katrina, where it is hampering restoration of marsh and upland habitats. This would foster native vegetation and habitats that support wildlife species.

Impacts from Minerals Management Actions

Oil and gas development on non-USFS FMO is expected to result in the loss of 55 acres of habitat; however, under this alternative, oil and gas activities would be excluded from higher value wildlife habitats, including a 1,000-foot buffer around wetlands and aquatic habitats, shoreline habitats, and habitats like naturally occurring prairies and glades with special status species.

BMPs would be applied under this alternative to reduce impacts to bats, songbirds, and waterfowl. All pits containing water 10 days after a well is completed would be netted to exclude migratory birds. Other approved methods could also be used to exclude birds. Open-vent equipment, such as heater-treaters, separators, and dehydration units, will be covered with anti-perching cones to exclude cavity nesting birds and bats. Any power lines would be built using approved raptor-safe designs to prevent electrocution hazards.

Impacts from Recreation and Travel Management Actions

Designating the Hancock County tract as limited to motorized boating would benefit wildlife using these remote marshes and the uplands on Point Clear Island by limiting disturbance to species and their habitats. Any vehicle use on the narrow sand islands would flush foraging and loafing shorebirds and could cause abandonment of nests.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to fish and wildlife associated with ROW development compared to Alternative 1.

Special Status Species

Impacts from Vegetative Communities Management Actions

Removing exotic invasive plant species, particularly cogon grass, could improve habitat conditions for the tiny-leaved buckthorn and Mississippi diamondback terrapin. Early detection and control of invasive plant species would reduce the amount of native vegetation displaced and minimize changes to structure that occurs when large amounts of invasive woody material is removed.

Impacts from Fish and Wildlife Habitat Management Actions

Prescribed burns could be used to remove wood debris and flotsam left from Hurricane Katrina that create hazards for wildlife and degrade marshes. Since natural fire is infrequent in these coastal marshes, the use of prescribed fires is expected to be infrequent (to mimic natural conditions) and closely coordinated as part of an overall fire plan for the Hancock County Marshes Preserve.

Impacts from Minerals Management Actions

Although the number of wells (10) and acres disturbed (55) would remain the same under this alternative as compared to Alternative 1, lease stipulations would shift surface-disturbing activities away from sensitive habitats with potential to support special status species. This is accomplished with NSO buffers or seasonal restrictions. These stipulations could be applied to 211,605 acres or about 41 percent of the non-USFS FMO in Mississippi.

To protect special status species occurring in aquatic or wetland habitats, all oil and gas development activities would be excluded from a 1,000-foot buffer around these habitats. In areas where slopes exceed 10 percent, the buffer could be extended up to 600 feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100 feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100 yards upstream and 300 yards downstream of the site. This stipulation could be applied to an estimated 168,383 acres or about 33 percent of the non-USFS FMO available for leasing in Mississippi. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

A 250-foot buffer around known caves, fractures, and sinkholes would reduce the chances of drilling through karst formations, providing protection for cave endemics, such as cave salamander and spring salamander. Some potential remains for inadvertently drilling through unknown karst formations and damaging connected cave habitats through introduction of lost drilling fluids and muds, altering temperature and moisture regimes and modifying the hydrology supporting the karst systems. This habitat is extremely limited in Mississippi; less than 100 acres, according the Mississippi CWCS, so potential for impacting these areas in Mississippi is low.

Under this alternative, NSO stipulations would be applied to coastal shorelines. This buffer would be applied to 4,237 acres of non-USFS FMO in Mississippi located within 100 feet of mean high tide. Wintering piping plover, snowy plover, brown pelican, least tern, and Mississippi diamondback terrapin are among the many coastal species that would benefit from this buffer. Offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional wells that may affect Federally listed species or critical habitat would require coordination with the USFWS.

Areas with suitable soils in southern Mississippi counties would require a survey for gopher tortoises prior to any surface-disturbing activities. No disturbance would be permitted within 600 feet of a gopher tortoise burrow. This buffer is expected to protect any breeding populations of gopher tortoise and maintain habitat for associated species, including black pine snake. It would also protect habitat values in areas suitable for eastern indigo snake and mimic glass lizard.

Under this alternative, NSO would be permitted within 0.5 mile of a red-cockaded woodpecker cluster. This stipulation could be applied to 11,710 acres of non-USFS FMO within 0.5 mile of known clusters and could be applied to additional areas as needed to protect new clusters or potential habitat identified during site assessments prior to leasing. This buffer is expected to contain all foraging habitat required to maintain the red-cockaded woodpecker cluster. There are options for oil and gas activity to occur within suitable foraging habitat if the foraging requirements for the cluster are met elsewhere, for example, clusters maintained on National Forests. This exception would require a concurrence from the USFWS and the State of Mississippi. A concurrence would cause disturbance within the suitable foraging habitat, but if granted would not be anticipated to affect local populations.

Under this alternative, NSO would be permitted within 1,500 feet of a bald eagle nest and/or communal roost site, and no surface-disturbing activities would be permitted within 1.5 miles during the nesting season from December 1 through August 1. This buffer complies with the current Federal guidelines for bald eagle protection. Based on the known nest sites in Mississippi, this stipulation could be applied to 1,089 acres of non-USFS FMO. Oil and gas activity complying with these parameters is not expected to adversely affect bald eagles. New protocols have been drafted that reflect the ongoing recovery of this species. When finalized, the new guidelines would reduce the buffer to 660 feet for construction activities, although existing activities could be conducted within 330 feet of the nest outside of a more refined nesting season (December 15 through June 30).

Leases containing potential habitat for special status plant species, including Federally listed and candidate species as well as those ranked as critically imperiled (S-1) and imperiled (S-2) by the Mississippi Natural Heritage Program (MNHP), would require botanical surveys prior to surface-disturbing activities. Operations would be excluded from areas supporting these special status plant species. This stipulation is expected to protect most naturally occurring glades, prairies, and other habitats which support special status plant species. The potential acreage affected by this stipulation is not available. This stipulation would be applied on a case-by-case basis based on site inspections conducted prior to leasing.

Impacts from Recreation and Travel Management Actions

Limiting the Hancock County tract to motorized boating would prevent damage to sensitive coastal habitats for tiny-leaved buckthorn and Mississippi diamondback terrapin by limiting disturbance to species and their habitats. It would also retain the secluded nature of this barrier island and allow for undisturbed nesting and foraging of special status shorebirds, including royal tern.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to special status species associated with ROW development compared to Alternative 1.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract would reduce the potential for changes in the marsh vegetation communities from invasive species. As a result, the natural fire regimes would be maintained or restored. This would improve the ability to manage wildland fire in its natural role through application of prescribed fires, as necessary. Undesired wildfires in the marsh vegetation communities that are within their natural fire regimes would also be safer and less expensive to suppress.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would promote marsh health and allow for the reintroduction of wildland fire as a natural process and maintain or restore the natural fire regimes. Undesired wildfires in the marsh vegetation communities that are within their natural fire regimes would also be safer and less expensive to suppress.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 55 acres would be the same as Alternative 1. Impacts would not occur on the closed (63,004 acres) and NSO (184,192 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

The Hancock County tract would be limited to motorized boating under this alternative. However, impacts would be the same as Alternative 1 because the potential for increased probability of wildland fire occurrence associated with travel ignition sources in easily accessible areas would remain.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for wildfire impacts associated with ROW development compared to Alternative 1. This would decrease infrastructure needing protection, but would also decrease improvements in accessibility to fires and providing fire-breaks on these tracts.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Undertaking actions to remove invasive plant species on the Hancock County tract would increase the potential for damage to cultural resource sites. Mechanical treatments are more likely to impact cultural resources than low intensity treatments such as chemical treatments or hand treatments. Vegetative

communities management actions would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and avoid or mitigate any potential damage.

Impacts from Fish and Wildlife Habitat Management Actions

Conducting prescribed burns to improve habitat on the Hancock County tract would increase ground disturbance and associated potential impacts to cultural resources. Wildlife habitat manipulation would require cultural resource inventories and clearance prior to ground disturbance to identify the presence of any cultural sites and avoid or mitigate any potential damage.

Impacts from Minerals Management Actions

Cultural resources could be impacted by managing 270,615 acres of non-USFS FMO as open to leasing subject to standard lease terms and conditions and 123 acres of non-USFS FMO as CSU. Based on the RFDS, oil and gas developments within these areas would impact 55 acres through the development of 10 wells over 20 years. Development on these acres would typically be subject to Class III cultural resource inventories and evaluation on a project-by-project basis prior to allowing disturbance, resulting in the identification and potential excavation of cultural sites. Stipulations and BMPs applied under this alternative would protect and preserve cultural resources on the 184,192 acres managed as NSO and in areas where surface disturbance would be precluded (63,004 acres).

Impacts from Recreation and Travel Management Actions

Although the tract would be limited to motorized boating under this alternative, the level of activity that could impact cultural resources would not be anticipated to change compared to Alternative 1 since the tract is not anticipated to be used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would reduce the potential for ground disturbance and potential impacts to cultural resources associated with ROW development compared to Alternative 1. Construction of development within a ROW could result in inadvertent damage if cultural resources that were undetected during surveys were unearthed during ground-disturbing activities. Following discovery of cultural resources, activities would stop in accordance with terms and conditions in the ROW grant which would minimize further damage to cultural resources.

Visual Resources

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities on the Hancock County tract, such as removing invasive species, would temporarily diminish visual quality. Visual quality would be improved in the long term as the conditions of vegetation communities improve to meet VRM class objectives in accordance with the guidance and procedures defined in VRM Handbook H-8431-1 Visual Resource Contrast Rating.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve fish and wildlife habitat on the Hancock County tract, such as prescribed burning, would temporarily diminish visual quality if the developments were to dominate the view of the casual observer. Visual quality would be improved in the long term as wildlife-related recreation and habitat conditions were improved.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect visual resources on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres).

Impacts from Recreation and Travel Management Actions

Since the tract would be managed as limited to motorized boating, impacts to visual quality would occur under this alternative as there would be less potential for vegetation and soil removal from these activities. Furthermore, because the tract is not currently used extensively for recreation, this impact would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would retain the visual quality in the undeveloped wetland setting since ROWs would not be approved on the tract unless it met resource objectives.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Impacts would not be anticipated on approximately 270,615 acres open to leasing subject to standard lease terms and conditions. Managing approximately 123 acres as open to leasing subject to minor constraints and 184,192 acres as open to leasing subject to major constraints could increase development costs. Closing 63,004 acres to leasing would not affect oil and gas leasing because approximately 5 percent of the closed areas would be in areas of historical oil and gas production. Allowing for exceptions, waivers, and modifications to these stipulations could create opportunities for the discovery of new oil and gas resources.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Undertaking actions to improve vegetation communities, such as removing invasive species, on the Hancock County tract would temporarily diminish the recreation experience or eliminate the recreation opportunity since recreationists could be displaced from vegetation treatment areas until revegetation occurs. The recreation experience and opportunity would be improved in the long term as the conditions of vegetation communities improve by improving the long-term aesthetics of an area.

Impacts from Fish and Wildlife Habitat Management Actions

Undertaking actions to improve wildlife habitat on the Hancock County tract, such as prescribed burning, would temporarily diminish or eliminate the recreation experience and opportunities for travel since recreationists could be displaced from protected areas or treated areas until revegetation occurs. The recreation experience would be improved in the long term as wildlife-related recreation and habitat conditions are improved by improving the long-term aesthetics and wildlife viewing of an area.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could protect the recreational opportunities on the 184,192 acres managed as NSO and in areas where development would be precluded (63,004 acres) by precluding ground disturbance and infrastructure associated with oil and gas development.

Impacts from Recreation and Travel Management Actions

Since motorized vehicle use would be limited to motorized boating, motorized recreation opportunities would be maintained. Since the tract is not currently used extensively for recreation or motorized travel, this anticipated impact would be minimal.

Impacts from Lands and Realty Management Actions

Managing the Hancock County tract as a ROW avoidance area would retain the recreation experience in the undeveloped wetland setting since ROWs would not be approved on the tract unless they met resource objectives.

Lands and Realty

Under Alternative 2, the 174-acre Hancock County tract would be managed as a ROW avoidance area. This could impose design and siting requirements and associated costs on new ROW. There would be an increased potential for requests for new ROW to be denied if the ROW did not meet resource objectives of the tract.

Retaining the Hancock County tract under the BLM administration and pursuing partnerships with other agencies and organizations could allow for management opportunities for other agencies and organizations but would not allow for non-Federal ownership opportunities. Partnerships would allow for more efficient and comprehensive resource management of the surface tracts.

Social and Economic

Impacts from Vegetative Communities Management Actions

This alternative includes the removal of invasive species on the Hancock County tract. Impacts from these actions on the socioeconomic indicators would not be anticipated from these types of vegetative communities management actions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from vegetative communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance is anticipated under this alternative; however, this alternative would apply leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations for wellpads could decrease. This alternative would also provide for the greatest amount of protection for wetland resources. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal changes as compared with the current situation, possibly slight increases in employment or income (and the same as Alternative 1). Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Similar disturbances from oil and gas development would occur as compared to Alternative 1, although potential impacts to wetlands, soils, vegetation, habitat, and wildlife would be anticipated to be reduced under this alternative due to the implementation of NSO conditions on oil and gas leasing. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on wellpad locations under Alternative 2. Industry costs and availability for wellpad locations would likely increase under this alternative, which would result in adverse impacts for the oil and gas industry.

Impacts from Recreation and Travel Management Actions

Under this alternative, the surface tract would be open to recreational use, but designated as limited to motorized boating. Minimal changes in recreation and travel management are anticipated; however, OHV users would likely be adversely impacted since the tract would not be available for this type of motorized use.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3.3 Alternative 3 (Proposed RMP)

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Soil Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to soils within the protected areas. Under this alternative, the NSO area around aquatic

habitats identified in Alternative 2 would be reduced to 250 feet, which would reduce protections to soils within these areas as compared to Alternative 2. Impacts to prime or unique farmlands would be the same as described for Alternative 1.

Impacts from Recreation and Travel Management Actions

Although travel management would be limited to motorized boating under this alternative, the level of activity that could increase erosion would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated impacts on 55 acres would be the same as Alternative 1. Applying the stipulations in Appendix D would increase the area where seasonal, CSU (3,021 acres), and NSO (92,269 acres) restrictions would be implemented, which would reduce disturbance to water resources within the protected areas. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet, which would allow development to occur in close proximity to water resources and the potential for impacts to water resources to occur.

Impacts from Recreation and Travel Management Actions

Although travel management would be limited to motorized boating under this alternative, the level of activity that could impact water resources would not be anticipated to change compared to Alternative 1. Therefore, the impacts would be the same as Alternative 1.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as an avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

In addition to the impacts from standard management common to all alternatives discussed under Alternative 1, under this alternative, oil and gas activities would be excluded from a 250-foot buffer around wetlands and aquatic habitats, karst areas, shoreline habitats and habitats like naturally occurring prairies and glades with special status species. There is the option of increasing the buffer to 600 feet where needed because of slopes over 10 percent or erosive soils. The buffer under this alternative is expected to be sufficient to protect wetland and riparian vegetation and most naturally occurring glades and prairies. Impacts to exotic invasive plant species would be the same as in Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal; however, future management of the tract would be constrained to meet the same resource objectives as under Alternative 2, so impacts to vegetative communities are not anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to vegetative communities associated with ROW development compared to Alternative 1.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The acreage disturbed (55) from minerals development would be same under all alternatives, but wells would be shifted away from sensitive habitats. Under this alternative, the buffer would be reduced to 250 feet, with the option of increasing it to 600 feet where needed because of steep slopes or erosive soils. The buffer could be reduced to 100 feet where slopes are less than 10 percent and there are no special status species issues. These buffers are expected to be sufficient for most wildlife species utilizing wetland and aquatic habitats, but interior forest nesting birds and some amphibians and reptiles that range farther from the riparian/wetland zone would be adversely impacted by this reduced buffer through habitat disturbance. Karst habitats and most naturally occurring prairies and glades would be protected under this alternative.

Under this alternative, the coastal no-lease areas, including sea turtle nesting habitat and shorelines suitable for least tern, piping plover, and snowy plover, would be replaced with an NSO buffer. This

change has some potential to promote offsite drilling. Loss of even small acreages of maritime forests or shrub lands would result in the loss of important foraging habitats for migrating songbirds, wading birds and shorebirds, as well as other species associated with these critically imperiled habitats.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal; however, future management of the tract would be constrained to meet the same resource objectives as under Alternative 2 and so impacts to fish and wildlife are not anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to fish and wildlife associated with ROW development compared to Alternative 1.

Special Status Species

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

The number of wells (10) and acres disturbed (55) would remain the same under this alternative and impacts would be the same as Alternative 2, except in the following situations. The aquatic and wetland buffer would be reduced to 250 feet. In areas where slopes exceed 10 percent, the buffer could be extended up to 600 feet to provide adequate protection. In areas with slopes less than 10 percent, the 250-foot buffer could be reduced to a minimum of 100 feet, if the adjacent waterway or wetlands have been surveyed and no special status species occur within 100 yards upstream and 300 yards downstream of the site. This stipulation could be applied to an estimated 68,656 acres or 13 percent of the non-USFS FMO available for leasing in Mississippi. In most cases, this buffer is expected to prevent construction activities from increasing the sedimentation of local drainages and wetlands. In areas with slopes over 25 percent, additional measures may be needed to stabilize disturbed soils above wetlands or aquatic habitats.

Under this alternative, the no-lease area along the coast would be replaced with an NSO buffer. Although no surface disturbance would occur on non-USFS FMO or the BLM surface tracts within this buffer, offsite directional drilling to target these Federal minerals would be permitted under this alternative. Any directional drilling targeting non-USFS FMO may affect Federally or State-listed species using this coastal area, including piping plover, snowy plover, Wilson's plover, and American oystercatcher.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to special status species associated with ROW development compared to Alternative 1.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to wildland fire ecology and management from anticipated oil and gas development and associated disturbance of 55 acres would be the same as Alternative 1. Impacts would not occur on the closed (63,004 acres) and NSO (92,269 acres) areas created through applying the stipulations in Appendix D.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Impacts to cultural resources from management of non-USFS FMO would be the same as Alternative 2, except 259,640 acres would be managed as open to leasing subject to standard lease terms and conditions, 3,021 acres as CSU, 92,269 acres as NSO, and 63,004 acres as closed. The 55 acres of disturbance

resulting from the anticipated 10 wells could impact cultural resources within areas managed as open to leasing subject to standard lease terms and conditions or CSU. Impacts to cultural resources are not anticipated in areas managed as NSO or closed since surface disturbance would be precluded.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be managed as limited to motorized boating under this alternative, the level of activity and associated impacts to cultural resources would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife habitat management actions and associated impacts would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. However, stipulations applied under this alternative could preclude oil and gas development thereby protecting visual resources on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres). Since no mineral-development activities would occur on the surface tracts, there would be no violations of VRM class objectives.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Applying the lease stipulations and BMPs in Appendix D could restrict or preclude oil and gas development and exploration. Under this alternative, the NSO area around aquatic habitats identified in Alternative 2 would be reduced to 250 feet and the no-lease stipulation for Alabama beach mouse habitat would be NSO. Impacts would not be anticipated on approximately 259,640 acres open to leasing subject to standard lease terms and conditions. Managing approximately 3,021 acres as open to leasing subject to minor constraints and 92,269 acres as open to leasing subject to major constraints could increase development costs. Closing 63,004 acres to leasing would not affect oil and gas leasing because approximately 5 percent of the closed areas would be in areas of historical oil and gas production. Allowing for exceptions, waivers, and modifications to these stipulations (Appendix D) could create opportunities for the discovery of new oil and gas resources.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Impacts from Minerals Management Actions

Since approximately 55 acres of vegetation removal and construction activities would result from the development of 10 oil and gas wells (as with Alternative 1), impacts would be the same as Alternative 1. Stipulations applied under this alternative could indirectly protect the recreational opportunities on the 92,269 acres managed as NSO and in areas where development would be precluded (63,004 acres) by eliminating associated ground disturbances, noise, and infrastructure.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to recreation and travel would be the same as Alternative 2.

Lands and Realty

Lands and realty management actions and associated impacts to lands and realty would be the same as Alternative 2.

Social and Economic

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions and associated impacts to social and economic conditions would be the same as Alternative 2.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions from fish and wildlife habitat management actions would be the same as impacts identified from vegetative communities management actions.

Impacts from Minerals Management Actions

The same number of wells and acres of surface disturbance as Alternative 1 is anticipated under this alternative; however, this alternative applies leasing stipulations to protect sensitive species and their habitats, including buffers for wetland and aquatic resources. Relative to Alternative 1, the exploration and development costs could increase while the availability for locations of wellpads could decrease, resulting in adverse impacts to the oil and gas industry. Since the number of wells anticipated is small relative to total wells in the area, there would be minimal social and economic changes, possibly slight increases in employment or income, as compared with the current situation. Oil and gas development and production can have implications for visual and scenic qualities as well as property values. These impacts are likely less than those under Alternative 1, as there are more conditions and constraints on wellpad locations under Alternative 3. Social indicators such as housing, education, and cost of living would not be anticipated to change under this alternative.

Impacts from Recreation and Travel Management Actions

Under Alternative 3, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts to social and economic conditions would be the same as Alternative 1.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.3.4 Alternative 4

Air Quality

Under this alternative, there is a potential for wildfire which could lead to air emissions. Since all fires would be suppressed, these occurrences would be short term and localized and not be anticipated to individually deteriorate air quality conditions. Certain BLM-authorized activities within the planning area, such as oil and gas development, construction activities, vehicle travel, and mechanical hand tools or prescribed burning used in vegetation and wildlife habitat manipulation, would produce emissions considered to be GHGs, particularly CO_2. However, due to the anticipated dispersed and infrequent nature of these activities, the project emissions would not have any noticeable or measurable effect and, therefore, the total contribution of GHGs from authorized activities would be small as well. Other BLM activities may help offset any emissions and sequester carbon, such as maintaining vegetative and forested cover, which may help build organic carbon in soils and function as "carbon sinks".

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet vegetation resource objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would deteriorate air quality conditions. Prescribed burning conducted to meet habitat objectives would be short term and localized and not be anticipated to individually deteriorate air quality conditions.

Impacts from Minerals Management Actions

Anticipated levels of oil and gas development and associated air emissions would be the same as Alternative 1.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Soil Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in disturbance or loss of soils.

Impacts from Minerals Management Actions

Impacts to soil resources from oil and gas development would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity that increases erosion would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to soil resources. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to soils associated with ROW development compared to Alternative 1.

Water Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of

prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to water quality.

Impacts from Minerals Management Actions

Impacts to water resources from minerals management, including oil and gas and coal development, would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity that impacts water resources would not be anticipated to change compared to Alternative 1 since the tract is not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to water resources. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Since the Hancock County tract (a total of 174 acres or 100 percent of BLM surface ownership in Mississippi) would be managed as a ROW avoidance area, there would be less potential for impacts to water resources associated with ROW development compared to Alternative 1.

Vegetative Communities

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the vegetative communities. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to vegetative communities. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated.

Fish and Wildlife

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives would be allowed; however, lack of specific areas and species being managed could result in habitat degradation on any of the BLM surface tracts. The Hancock County tract located on Point Clear Island is particularly vulnerable to cogon grass and Chinese tallow.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Disposing the tract from Federal ownership with no restrictive covenants could increase chances for subsequent development and associated impacts to vegetative communities. However, given this tract's remoteness and location in the Hancock County Marshes Coastal Preserve, development would not be anticipated. Management of wildlife values is expected to continue in coordination with the Mississippi Coastal Preserve System.

Special Status Species

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed in this alternative. Under standard management common to all alternatives, allowing vegetation manipulation to meet resources objectives

would be allowed; however, lack of specific areas and species being managed could result in increased potential for invasive/exotic species becoming established or spreading. This is particularly true of the higher elevations of the Hancock County tract located on Point Clear Island. Cogon grass and Chinese tallow are both known to occur in the area and if uncontrolled could substantially alter the habitats supporting Mississippi diamondback terrapin and tiny-leaved buckthorn. Dense stands of cogon grass would displace native vegetation and could make the island and adjacent marshes more vulnerable to frequent wildfires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed in this alternative. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would be allowed; however, lack of specific areas and species being managed could result in the same impacts discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Under this alternative, the Hancock County tract would be available for disposal from Federal ownership. The effect this has on special status species is not known. Its location at the center of the Hancock County Marsh Preserve and the presence of extensive wetlands would make development of the tract difficult. It is likely that special status species would continue to benefit from the tract being managed in coordination with the Mississippi Coastal Preserve System.

Wildland Fire Ecology and Management

Impacts from suppressing all wildland fires and allowing prescribed burning on a case-by-case basis would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

Although no specific vegetative communities management actions are proposed, allowing vegetation manipulation to meet resources objectives under standard management common to all alternatives would generally serve to decrease vegetation density and cover (fuel load) and maintain natural fuel conditions across the Hancock County tract. This would maintain natural disturbance regimes which would be easier to manage through prescribed fire or other treatments. This would also decrease the frequency and intensity of wildland fires and allow fires to be more easily controlled, better protecting life, public safety, and property and resource values. However, lack of specific areas and species being managed could result in invasions and fuel accumulations that would increase the frequency and intensity of wildland fires.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative; therefore, no impacts would be anticipated. Under standard management common to all alternatives, providing habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would result in impacts similar to those discussed under Impacts from Vegetative Communities Management Actions.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to wildland fire ecology and management would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Impacts to wildland fire ecology and management from recreation and travel management actions would be the same as Alternative 2 because travel designations would be the same for this alternative.

Impacts from Lands and Realty Management Actions

ROW management actions and associated impacts would be the same as Alternative 2.

Cultural Resources

Impacts from cultural resources management and wildland fire management actions would be the same as Alternative 1.

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would require cultural resource clearances before activity were to occur; therefore, impacts would not be anticipated.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to cultural resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Although the Hancock County tract would be limited to motorized boating under this alternative, the level of activity and associated potential impacts to cultural resources would not be anticipated to change compared to Alternative 1 since these tracts are not used extensively for recreation or travel.

Impacts from Lands and Realty Management Actions

Making the Hancock County tract available for disposal without any specified management or use conditions could have impacts if the property contained previously undetected, potentially eligible NRHP cultural sites. Disposing the property from Federal ownership would remove the protection of any cultural resources under Federal law, and not applying management or use conditions would increase the potential for damage of previously undetected cultural resources. Before any transfer of management responsibilities or ownership, a cultural resource survey and consultation with SHPO under NHPA Section 106 regulations would be required, mitigating this impact.

Management actions and impacts associated with ROW development would be the same as Alternative 2.

Visual Resources

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to visual quality. Although visual quality would deteriorate in the short term, visual quality would improve in the long term once vegetation has reestablished to meet VRM class objectives.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to visual resources would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts to visual resources would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions if the R&PP were revoked could result in changes to the existing natural or manmade landforms, which would diminish visual quality if the use were to dominate the view of the casual observer. Following disposal, private development actions could create visually intrusive development.

ROW management actions and associated impacts would be the same as Alternative 2.

Minerals

Impacts from Vegetative Communities Management Actions

Vegetative communities management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Fish and Wildlife Habitat Management Actions

Fish and wildlife management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Minerals Management Actions

Mineral management actions for oil and gas and associated impacts would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Impacts from Lands and Realty Management Actions

Lands and realty management actions would not restrict or preclude mineral development and exploration; therefore, impacts are not anticipated.

Recreation and Travel Management

Impacts from Vegetative Communities Management Actions

No specific vegetative communities management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would allow vegetation manipulation to meet resources objectives, would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Fish and Wildlife Habitat Management Actions

No specific fish and wildlife habitat management actions are proposed under this alternative. Actions proposed under standard management common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to involve ground-disturbing activities of a severity or extent that would result in impacts to recreation.

Impacts from Minerals Management Actions

Minerals management actions and associated impacts to recreation and travel would be the same as Alternative 3.

Impacts from Recreation and Travel Management Actions

Recreation and travel management actions and associated impacts would be the same as Alternative 2.

Impacts from Lands and Realty Management Actions

Making the Hancock County tract available for disposal from Federal ownership without any specified management or use conditions if the R&PP were revoked could result in reduced access for recreation and travel opportunities. Following disposal, the tract could be made unavailable for public recreation and become inaccessible.

Lands and Realty

ROW management actions and associated impacts to lands and realty would be the same as Alternative 2. Under Alternative 4, the 174-acre Hancock County tract would be available for disposal from Federal ownership with no restrictive covenants. This would allow for opportunities for other Federal agency or non-Federal ownership without specified conditions on future use of the tract; however, disposal would not be allowed if it would jeopardize Federally listed species or designated critical habitat, which could limit some disposals.

Social and Economic

Impacts from Vegetative Communities Management Actions

Impacts to social and economic conditions would not be anticipated from vegetative communities management actions since no actions are proposed under this alternative. Standard management actions common to all alternatives, which would allow vegetation manipulation to meet resource objectives, would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Fish and Wildlife Habitat Management Actions

Impacts to social and economic conditions would not be anticipated from fish and wildlife habitat management actions since no actions are anticipated. Standard management actions common to all alternatives, which would provide habitat improvements and protections under State wildlife conservation strategies (including control of invasive plant species, use of prescribed fire, and wetland enhancements), would not be anticipated to be of an extent that would result in impacts to economic or social conditions.

Impacts from Minerals Management Actions

Minerals management actions and the associated impacts to social and economic conditions would be the same as those under Alternative 3.

Impacts from Recreation and Travel Management Actions

Under Alternative 4, socioeconomic impacts would be the same as those identified under Alternative 2.

Impacts from Lands and Realty Management Actions

Under Alternative 4, the Hancock County tract would be available for disposal from Federal ownership without conditions on management and use after disposal. This could result in reduced access for recreational opportunities on these lands. Since development could be allowed on these properties, it is possible that the property tax revenues to the local counties would increase more than the Federal Payments in Lieu of Taxes, economically benefiting Hancock County and the State. It is possible that the private development of this tract could slightly increase employment and income in these areas. Social indicators, such as housing, education, and cost of living are not expected to be influenced by the minimal development.

Hazardous Materials

Impacts would be the same as Alternative 1.

4.4 CUMULATIVE IMPACTS

Cumulative impacts analysis considers the alternatives in the context of the broader human environment—specifically, actions that occur outside the scope and geographic area covered by the Proposed RMP-FEIS. The following factors are considered in the cumulative impact assessment: Federal, non-Federal, and private actions; the potential for synergistic effects or synergistic interaction among or between effects; the potential for effects to cross political and administrative boundaries; other spatial and temporal characteristics of each affected resource; and the comparative scale of cumulative impacts across alternatives.

Past, present, and potential future actions are considered in the analysis to identify whether the environment has been degraded or enhanced, and to what extent; whether ongoing activities are causing impacts; and trends for activities and impacts in the area. Projects and activities are evaluated on the basis of proximity, connection to the same environmental systems, potential for subsequent impacts or activity, similar impacts, the likelihood a project will occur, and whether the project is reasonably foreseeable. Projects and activities considered in the cumulative analysis were identified through discussions with agency officials and review of publicly available materials and websites. The following projects and activities were identified:

- **Mineral Development.** Between 1983 and 2004, 8,068 wells have been completed in Alabama. Of those, 17 wells were drilled to BLM-administered, non-USFS FMO. The BLM currently oversees 30 active leases on BLM-administered, non-USFS FMO and 106 active leases on USFS FMO in Alabama. An estimated 20 wells (105 acres of surface disturbance) could be developed on BLM-administered, non-USFS FMO lands in Alabama over the next 20 years. An estimated 4,000 wells (20,811 acres of surface disturbance) could be developed on non-Federal and USFS lands in Alabama over the next 20 years. Future anticipated well development in Alabama is shown in Table 4-5.

Table 4-5. Future Anticipated Well Development In Alabama

	Federal (non-USFS)	Federal (USFS)	Non-Federal	Total
Number of Wells	20	12	3,988	4,020
Total Acres of Surface Disturbance	105	61	20,750	20,916

Between 1983 and 2004, 7,362 wells have been completed in Mississippi. Of those, seven wells were drilled to BLM-administered, non-USFS FMO, two of which were drilled from other Federal agency surface ownership and five from non-Federal surface ownership. The BLM currently oversees 42 active leases on BLM-administered, non-USFS FMO and 1,181 active leases on USFS FMO in Mississippi. An estimated 10 wells (55 acres of surface disturbance) could be developed on BLM-administered, non-USFS FMO lands in Mississippi over the next 20 years. An estimated 12,000 wells (59,745 acres of surface disturbance) could be developed on non-Federal and USFS lands in Mississippi over the next 20 years. Future anticipated well development in Mississippi is shown in Table 4-6.

Table 4-6. Future Anticipated Well Development In Mississippi

	Federal (non-USFS)	Federal (USFS)	Non-Federal	Total
Number of Wells	10	350	11,650	12,010
Total Acres of Surface Disturbance	55	1,925	57,820	59,800

- **Coal Development.** For the purposes of this analysis, new Federal coal leases of 9,000 acres could be anticipated. Approximately 37.6 million tons of Federal coal would be produced over the next 20 years (avg. 1.9 tons/yr.) as part of preexisting underground mines with no new surface disturbance.

- **Potential Development after Disposal of the Surface Tracts.** For the purposes of the cumulative impact analysis, assumptions were made as to the potential development of the surface tracts following disposal for Alternatives 3 and 4.

  Under Alternative 3, the Jordan Lake tract would likely be developed as a recreation camp following disposal. No development would be expected following disposal of the Geneva County tract.

  Under Alternative 4, the Fort Morgan Beach, Fort Morgan Highway, and Fowl River tracts would be developed for residential or recreational use. The Coosa River and Jordan Lake tracts would be developed as recreation camps following disposal. No development would be expected following disposal of the Geneva County tract.

  Under Alternatives 3 and 4, the Hancock Country tract in Mississippi would continue to be used for recreation and research site purposes with no expected development.

- **Fuels Treatments.** Table 4-7 shows the fuels treatments completed in Alabama by Department of the Interior (DOI) agencies and USFS. The BLM did not conduct any fuels treatments in Alabama over these 4 years. Over 98 percent of these treatments were completed by the USFS using prescribed fires approximately 90 percent of the time; the remainder were completed with mechanical treatments. Over 97 percent of Federal fuels treatments were applied in WUI areas.

Table 4-7. DOI and USDA Fuels Treatment Accomplishments for Alabama (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	69,112	3,602	72,714	3,529	5,190	8,719	81,433
2005	84,804	12,313	97,117	157	282	439	97,556
2004	82,391	6,336	88,727	0	0	0	88,727
2003	76,884	16	76,900	0	0	0	76,900
Source: http://www.fireplan.gov/overview/States/al.html, accessed March 2, 2007							

Table 4-8 shows the fuels treatments completed in Mississippi by Department of the Interior agencies and USFS. The BLM did not conduct any fuels treatments in Mississippi over these 4

years. Over 95 percent of these treatments were completed by the USFS using prescribed fires approximately 80 percent of the time; the remainder were completed with mechanical treatments. Over 96 percent of Federal fuels treatments were applied in WUI areas.

Table 4-8. DOI and USDA Fuels Treatment Accomplishments for Mississippi (Acres)

Year	Wildland-Urban Interface			Other			Total
	Fire	Mechanical	Total	Fire	Mechanical	Total	
2006	101,385	117,052	218,437	2,847	846	3,693	222,130
2005	256,138	18,879	275,017	10,312	27	10,339	285,356
2004	251,924	10,496	262,420	16,820	672	17,492	279,912
2003	264,855	605	265,460	6,598	466	7,064	272,524
Source: http://www.fireplan.gov/overview/States/ms.html, accessed March 2, 2007							

- **Soil Disturbance and Vegetation Loss from Construction Projects.** Other construction projects across the State, including private development and transportation projects, create soil disturbance and vegetation loss. The 1997 and 2003 National Resources Inventories (NRI) provide for estimates of land use conversion over time. Surface disturbance for oil and gas development would be comparable to the NRI category of "Developed Land." Comparison with the NRI data will put the proposed actions of the Proposed RMP (e.g. the oil and gas RFDS) in context for cumulative impact analysis. The information from the 1997 NRI (including data for the period 1982–1997) and the 2003 NRI is briefly described below and is shown in Table 4-9. The increase in developed land over time can be seen by scanning down the "Developed" land column.

  The 1997 NRI data indicates that the acres of developed land in Alabama increased by 635,700 acres from 1982 to 1997, an average of 42,380 acres per year. The 2003 NRI shows that developed land increased to 2,273,900 acres in Alabama by 2003. This is an increase of 471,600 acres for the 6-year period, 1997–2003, an annual average of 78,600 acres.

  The 1997 NRI data indicates that the acres of developed land in Mississippi increased by 353,800 acres from 1982–1997, an average of 23,587 acres per year. The 2003 NRI shows that developed land increased to 1,676,300 acres in Mississippi by 2003. This is an increase of 202,300 acres for the 6-year period, 1997–2003, an annual average of 33,717 acres.

Table 4-9. Developed Surface Area of Non-Federal and Federal Land and Water Areas, by State and Year (data per 1,000 acres)

State	Year	Federal Land	Water Areas	Non-Federal Land			Total Surface Area
				Developed	Rural	Total	
Alabama	1982	949.3	1,166.8	1,616.6	29,691.1	31,307.7	33,423.8
	1987	950.1	1,181.4	1,807.2	29,485.1	31,292.3	33,423.8
	1992	970.0	1,201.0	1,937.0	29,315.8	31,252.8	33,423.8
	1997	997.9	1,223.2	2,252.3	28,950.4	31,202.7	33,423.8
	2003	997.9	1,281.4	2,723.9	28,420.6	31,144.5	33,423.8
Mississippi	1982	1,634.6	720.5	1,120.2	27,052.0	28,172.2	30,527.3

State	Year	Federal Land	Water Areas	Non-Federal Land			Total Surface Area
				Developed	Rural	Total	
	1987	1,673.5	791.4	1,193.1	26,869.3	28,062.4	30,527.3
	1992	1,751.9	829.8	1,267.6	26,678.0	27,945.6	30,527.3
	1997	1,769.7	855.0	1,474.0	26,428.6	27,902.6	30,527.3
	2003	1,794.8	884.3	1,676.3	26,171.9	27,848.2	30,527.3

Notes: The following are definitions from the NRI:

Developed Land. A combination of land cover/use categories, large urban and built-up areas, small built-up areas, and rural transportation land.

Large Urban and Built-up Areas. A land cover/use category composed of developed tracts of at least 10 acres—meeting the definition of urban and built-up areas.

Rural Transportation Land. A land cover/use category which consists of all highways, roads, railroads, and associated ROW outside urban and built-up areas; also includes private roads to farmsteads or ranch headquarters, logging roads, and other private roads (field lanes are not included).

Small Built-up Areas. A land cover/use category consisting of developed land units of 0.25 to 10 acres, which meet the definition of urban and built-up areas.

Urban and Built-up Areas. A land cover/use category consisting of residential, industrial, commercial, and institutional land; construction sites; public administrative sites; railroad yards; cemeteries; airports; golf courses; sanitary landfills; sewage treatment plants; water control structures and spillways; other land used for such purposes; small parks (less than 10 acres) within urban and built-up areas; and highways, railroads, and other transportation facilities if they are surrounded by urban areas. Also included are tracts of less than 10 acres that do not meet the above definition but are completely surrounded by urban and built-up land. Two size categories are recognized in the NRI: areas of 0.25 acre to 10 acres, and areas of at least 10 acres.

Sources: USDA 2000, USDA 2007

4.4.1 Cumulative Impacts from BLM Management Actions in Alabama

Air Quality

The cumulative impacts on air quality are evaluated by comparing the BLM site emissions with regionwide emissions. For the State of Alabama, comprehensive emissions are only available for NO_X, CO, and VOCs in the major urbanized areas. These emissions can be obtained from the ADEM. Using the best available information from ADEM, Table 4-10 shows a comparison between the Birmingham Non-Attainment Area and the BLM induced emissions. Based on this data, emissions from activities associated with potential oil and gas development and minerals mining on BLM-administered, non-USFS FMO tracts proposed in this RMP would not considerably contribute to cumulative air quality emissions within the region (presented in Table 4-10). Over the next 20 years, emissions from 20 wells would compose less than 1 percent of the emissions associated with the estimated 4,000 wells that could be developed on non-Federal and USFS lands in Alabama. These impacts would be the same for all alternatives.

BLM-authorized activities would have small contributions to GHG emissions in comparison to the estimated U.S. emissions of CO_2 in 2006 (5,983.1 Tg CO_2 Eq.[3] (EPA 2008). These impacts would be the same for all alternatives. As discussed in Chapter 3, in the Southeast and Gulf Coast, potential impacts on the resources and environment from climate change could occur from sea level rise and a warmer climate, resulting in higher summer heat and reduced winter cold stress. The IPCC suggests that a two foot rise in sea level would eliminate approximately 10,000 square miles of land nationwide and, by 2080, sea level rise could convert as much as 33 percent of the world's coastal wetlands to open water (IPCC 2007).

[3] Carbon comprises 12/44ths of carbon dioxide by weight. One teragram is equal to 10^{12} grams or one million metric tons.

Some of the BLM-administered surface and mineral estate may become completely submerged. Coastal erosion, loss of barrier islands and wetlands, flooding, storm surge, and extreme precipitation events could greatly affect the biological resources within the planning area. For example, wildlife species could move northward and to higher elevations and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Additionally, the character of vegetation resources that provide wildlife habitat could change as disturbances (e.g., fire and insect outbreaks) increase (IPCC 2007). In the future, as tools for predicting climate changes in the planning area improve and/or changes in climate affect resources and necessitate changes in how resources are managed, BLM may be able to re-evaluate decisions made as part of this planning process and adjust management accordingly.

Table 4-10. Comparison of Potential BLM Emissions with Cumulative Emissions for Alabama (tons per year) [1, 2]

Well and Mine Locations	Emission Type/Pollutant		
	NO_x	CO	VOC
BLM-administered FMO Estate in Alabama	171	219	73
Birmingham NAA	578,799	2,902,972	448,946

1. Compared with best available 2002 data from the Alabama Department of Environmental Management (ADEM 2005).
2. A combination of oil and gas and coal mining.

Soil Resources

In Alabama, the disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama composes less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands over the next 20 years. Although more than 8,000 wells have been completed in Alabama since 1983, the minimal number of 20 additional wells identified in the reasonably foreseeable development scenario (RFDS) would have no long-term impacts to soil productivity and, therefore, would not contribute to significant cumulative effects. These impacts would be the same for all alternatives.

Possible soil impacts associated with vegetative communities, fish and wildlife habitat, and lands and realty management actions, including ROW development and potential development after disposal on the 159 acres of surface tracts, compose less than one percent of the 78,600 acres disturbed annually (1997–2003) from other construction projects across the State, including private development and transportation projects (as estimated by the NRI data). There would be more potential for soil disturbance impacts associated with vegetative communities and fish and wildlife habitat management actions proposed under Alternatives 2 and 3 as opposed to Alternatives 1 and 4, which do not propose any actions beyond standard management common to all alternatives. There would be more potential for soil disturbance impacts associated with ROW management actions under Alternative 1, which allows ROW development on all surface tracts, than Alternatives 2, 3, and 4, which designate 114 acres or 71 percent BLM surface ownership in Alabama as ROW avoidance areas. There would be more potential for soil disturbance impacts associated with potential development after disposal without conditions under Alternative 4 than Alternatives 1, 2, and 3, which either retain the tracts (Alternatives 1 and 2) or place restrictive covenants on the use after disposal (Alternative 3).

Water Resources

Water resources located on or adjacent to Alabama surface tracts could experience change as a result of mineral exploration and development or construction activities. However, the BMPs and stipulations identified in Appendix D would minimize irreversible and irretrievable commitment of resources and unavoidable adverse impacts. Impacts to water quality associated with possible ROW development and the disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama compose less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal agency and USFS lands. However, the minimal number of 20 additional wells identified in the RFDS would have no long-term impacts to soil stability or water quality and would limit the likelihood of leakage of drill fluids, hazardous waste spills, or leakage from reserve pits (if established) that could impact surface water and ground water quality. The cumulative impact of brine waste reinjection into aquifers beneath Federal and non-Federal lands over the next 20 years could be significant because by the year 2027, the number of new wells on non-federal lands is estimated to be 4,020 in Alabama and 12,010 in Mississippi. However, the minimal number of 20 additional wells identified in the RFDS would have no long-term cumulative impacts from waste brine reinjection. Thus, significant cumulative impacts would not be anticipated. In order to reinject produced water from federal and nonfederal, an oil and gas operator must obtain a permit as required by the Onshore Oil and Gas Order No. 7, which is intended to minimize the potential for cumulative impacts. EPA has granted the State of Alabama primacy over the permitting of underground injection wells. The underground injection regulations address the siting, construction, operation, monitoring, and closing of an injection well. These requirements are designed to prevent contamination of surface and underground drinking water sources and would reduce cumulative impacts. Potential development after disposal on the 159 acres of surface tracts composes less than one percent of the 78,600 acres disturbed annually (1997–2003) from other construction projects across the State, including private development and transportation projects (as estimated by the NRI data).

Coal mining activities within the Warrior Basin would be expanded to include 9,000 acres of new coal leases that would yield an estimated average of 1.9 million tons of coal per year over the next 20 years. Although this increased mining would be limited to existing underground coal mines, the potential for ground water contamination would cumulatively increase as a result of the increased mining activities. Migration of contaminants into the surrounding soils and aquifers could degrade ground water quality and thereby affect wells and springs that may serve household and domestic uses. These impacts would be the same for all alternatives.

Vegetative Communities

The continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects in the State (approximately 78,600 acres of surface disturbance annually) has a high potential of affecting vegetative communities, such as glades and prairies, that are sensitive to disruption and difficult to restore after surface-disturbing activities. These activities also have the potential to introduce and promote the spread of invasive, exotic plant species.

Throughout the State, some vegetative communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetative communities, loss of even small acreages has a disproportionate effect on the plant diversity in an area.

Surface-disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months), to provide a quick cover for disturbed soils. Including native species in the mix increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine or left unmowed, the areas can be expected to progress through old field-type growth, which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Although effects to vegetative communities from surface-disturbing activities and the introduction of invasive, exotic plant species would likely occur as a result of the reasonably foreseeable actions identified for this analysis, BLM activities would have a minimal contribution to these effects on plant communities due to the small amount of acreage that would be disturbed under the BLM management alternatives and the BLM policies on BMPs for mineral development reclamation and control of noxious, exotic species.

Fish and Wildlife

The continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 78,600 acres of surface disturbance annually) has a high potential of affecting wildlife and associated habitat through displacement, habitat degradation, and direct habitat loss.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the wellpad areas during construction and maintenance. Less mobile species are directly impacted and, during the spring and early summer, this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction and maintenance activities have ceased. Intermittent maintenance and inspection activities conducted on the established pad for the life of the well are not expected to alter the overall use of the area by wildlife. However, construction in high-value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests, which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles, are often located in riparian zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time, most wildlife, including waterfowl and many songbirds, are expected to avoid the immediate area. However, once drilling is completed, reserve pits with water (which can become soiled by drilling fluids) can become a hazard for waterfowl and other birds. If the well is put into production, there is documentation of birds and bats using open-vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western States, the situation in Alabama is expected to be similar.

Roads and other construction projects across the State can alter the local hydrography, reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages help to maintain existing hydrologic systems, but the disturbance

causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts would also include the direct loss of habitat from the general construction projects, including private development and transportation projects, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, the BLM activities would have a minimal contribution to these effects on wildlife due to management protection provided under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. In the long term, depending on the location and intensity of construction and minerals development, it is likely that public lands containing viable habitats for wildlife would continue to be utilized by these species.

Special Status Species

Given the high number and dispersed distribution of special status species in aquatic and wetland habitats in Alabama, the continuation of mineral development (totaling approximately 4,000 wells with 20,811 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 78,600 acres of surface disturbance annually) near rivers, creeks, or wetland habitats has a high potential of affecting special status species in the immediate area or downstream of the disturbance.

Impacts to aquatic and wetland habitats would occur through degradation of water quality through increased sedimentation or turbidity, contamination, direct loss of habitat, and changes in local hydrography. Sedimentation and increased turbidity are listed as current threats to most of Alabama's mussels and special status fish species. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes associated with other construction projects across the State are particularly vulnerable before protective plant covers have been established. Intact vegetation along riparian zones and around wetlands could substantially buffer these areas. Sediments deposited in intermittent drainages and headwater streams would be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps, for construction and maintenance of wellpads for oil and gas development and/or other construction projects across the State generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future, and could result in direct habitat loss for a wide variety of special status species that use these habitats. Because so many of these species have limited ranges, the list of species potentially affected varies by location. Generally, because of the limited acreage of these vegetation communities, loss from even the small amount of disturbance has the potential of destroying or degrading habitat for special status species. Construction and maintenance activities and other construction projects across the State could disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

Karst formations support cave habitats with high numbers of special status species, including many endemic crayfish, salamanders, and bats and are particularly sensitive to oil and gas development. In caves, even minor alterations in temperature, humidity, and water quality or water quantity could result in irreversible impacts. Caves, by their nature, are isolated and support highly endemic faunas often with extremely narrow habitat requirements. Wells drilled through cave/karst resources could result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats

could be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting ground water flow and introducing pollutants into karst systems. Other possible impacts are vented or escaped gases collecting in sinkholes and caves. These gases could cause a die-off of plant and animal life that use the special habitat created by the microclimate of the cave entrances or sinkhole.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, the BLM activities would have a minimal contribution to these effects on special status species due to the minimal numbers of oil and gas development anticipated (20 wells) and management protection provided for these species under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. The BLM would also be required to consult with USFWS to identify and establish specific conservation actions that could be taken to mitigate the potential effects of land management activities.

Wildland Fire Ecology and Management

In addition to the ignition sources associated with development of 20 new oil and gas wells noted in the impact analysis, there are over 8,000 existing oil and gas wells throughout Alabama. An additional 4,000 oil and gas wells would be developed on non-Federal and USFS FMO over the next 20 years. Cumulatively, the potential increases in wildland fires from the addition of 20 wells compared to 12,000 existing and potential wells would not significantly increase the risk of fire in Alabama. Likewise, the infrastructure associated with oil and gas or ROW developments would not significantly improve access or provide fuels breaks compared to the cumulative developments and current rate of 78,600 acres of land developed annually (1997–2003) in Alabama.

The cumulative effect of proposed vegetation treatments on the 159 acres of surface tracts would be in addition to 86,154 acres of vegetation treatments by other Federal agencies, as well as prescribed burns performed by State and local agencies and private or corporate forestry operations. The proposed treatments would help maintain or restore small areas to their natural regimes as well as improve the ability to protect WUI areas from wildfire. Cumulatively, the implementation of all these treatments would reduce the cost of suppressing wildfires.

Cultural Resources

While cultural resources on USFS FMO and non-USFS FMO enjoy legal protection, similar protection from surface-disturbing activities does not apply to cultural resources from private actions on private lands. Oil and gas development in areas with private surface and FMO still require compliance with cultural resource laws. However, oil and gas development in areas of private surface and private mineral ownership, or non-mineral developments in areas with private surface FMO, could result in cumulative impacts to cultural resources throughout Alabama. This could result in unmitigated damage and loss of cultural sites and artifacts in areas of private surface and mineral ownership where oil and gas wells are developed. Cumulatively, Alternative 2 provides the greatest level of protection from cumulative impacts due to the largest number of closed and NSO acres. Alternatives 3 and 4 provide the next greatest level of protection. In these areas, the potential for inadvertent damage and loss of cultural resources is the lowest.

An additional 105 acres associated with development of 20 wells on non-USFS FMO and 20,811 acres associated with development of an estimated 4,000 additional wells on non-Federal mineral estate and USFS FMO would be added to the existing disturbance from development of over 8,000 oil and gas wells in Alabama over the past 20 years. Acreage developed on USFS FMO would receive protections from Federal law, regulation, and policy. Developments in those areas would be required to comply with

NHPA and Archaeological Resources Protection Act (ARPA) in inventorying areas and determining eligibility of sites for the NRHP. Additional developments on USFS FMO would result in the identification of more cultural sites during inventories. Excavation of sites as part of mitigating impacts from development on USFS FMO would enable scientific retrieval and study of cultural resources, using today's technology and methodology. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed.

Combined with disturbance from mineral development, other Federal agencies perform over 86,000 acres of vegetation treatments throughout Alabama annually. Approximately 92 percent of the treated acres (79,219 acres) would be treated by prescribed fire. Additional acreages would be treated by State and local agencies and private individuals. Treatments by Federal agencies would require cultural inventories prior to implementation, identifying and protecting cultural sites. However, treatments by State and local agencies and private individuals could impact cultural resources through burning and suppression efforts. Cumulatively, the alternatives would have little effect on these impacts as the levels of treatment and the BLM surface acreage are very small in comparison, although Alternatives 3 and 4 would have the greatest cumulative effect as they propose the greatest levels of vegetation treatment to support other resources.

Development of the BLM surface tracts would not be permitted until disposal, which would only occur under Alternatives 3 and 4. Protection measures in Alternative 3 would protect cultural resource sites from damage or loss. However, under Alternative 4, it is assumed that the Coosa River, Fort Morgan Beach, Fort Morgan Highway, Fowl River, and Jordan Lake tracts would all be developed. All the tracts except the Coosa River tracts have been inventoried, so potential impacts would be limited to those 42 acres. Following disposal, developments on these tracts would no longer require cultural inventories or mitigation, which could result in the damage or loss of cultural sites. Cumulatively, this would be in addition to an approximate 78,600 acres of development per year on private land, which could similarly impact cultural sites.

The number of sites anticipated to be cumulatively damaged resulting from actions proposed in this RMP combined with other cumulative projects and activities is unknown because most areas have not been surveyed for cultural resources.

Visual Resources

Cumulative impacts on visual resources would occur primarily from activities that affect the visual quality of the area. Such impacts would result from mineral-development activities, ROW development, increased recreational activity, and actions associated with management of vegetative communities and fish and wildlife habitat. Surface-disturbing activities associated with mineral development and ROWs would create visual intrusions that could alter the landscape setting and degrade visual quality. The possible ROW development and disturbance of a maximum of 105 acres from oil and gas development across the State of Alabama composes less than one percent of the 20,811 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands. Although more than 8,000 wells have been completed in Alabama since 1983, the minimal number of 20 additional wells identified in the RFDS would not significantly diminish visual quality. Closing or limiting areas to motorized recreation uses and implementing restrictions designed to protect sensitive resources would help to maintain the visual quality in restricted areas. Efforts to maintain and improve vegetative communities and fish and wildlife habitat would indirectly enhance visual quality through improvement of the visual landscape.

Cumulative impacts would be similar among the four alternatives, as the same level of development is expected under all alternatives. However, Alternatives 2, 3, and 4 provide for specific actions to improve vegetative communities and fish and wildlife habitat, thereby enhancing visual quality. In addition, implementing an NSO stipulation within 1,000 feet of aquatic habitats under Alternative 2 would preserve the visual quality within these areas. Impacts would likely be greatest under Alternative 4, as development of the tract is expected to occur subsequent to disposal, which would add to the visual intrusions of development on adjacent lands for some tracts, such as the Fort Morgan tracts.

Minerals

In Alabama, no cumulative impacts would be anticipated to minerals exploration and development as a result of BLM-administered surface tract and non-USFS FMO land use allocations and management actions since the RMP would not restrict or preclude mineral development and exploration. An irretrievable commitment of oil and gas and coal would result from mineral extraction via 20 wells developed over the next 20 years in Alabama and continued leasing of 1.9 million tons of coal per year over the next 20 years (37.6 million tons of Federal coal) on non-USFS FMO in the Warrior Basin. These impacts would be the same for all alternatives.

Recreation and Travel Management

Most of Alabama is not managed by the Federal Government, and recreation and travel opportunities are often dependent on whether the private landowner allows access to the private surface. Therefore, maintaining Federal ownership of public lands under Alternatives 1 and 2 would maintain limited opportunities for public recreation and travel. Under Alternatives 3 and 4, opportunities for travel and recreation could be precluded after disposal, cumulatively adding to the current restrictions on private lands throughout the State. Although the BLM management actions and disposal actions under the alternatives could have localized impacts to recreation experience and travel opportunities, no significant cumulative impacts would be anticipated because of the small size and scattered nature of BLM-administered surface tracts. Much of the access to the scattered BLM tracts is controlled by other surface owners. Cumulative projects and activities (continued mineral development and other construction projects) could lead to more travel opportunities associated with increased route construction to support mineral development, but there would also be a reduction in primitive/non-motorized recreation opportunities. Minerals development on non-USFS FMO lands open to recreation and leasing could result in unavoidable adverse impacts to recreation through detracting from the recreational setting. Mineral exploration and development activities would have short-term effects on the quality of the setting because of drilling equipment and long-term impacts from road construction and vegetation removal.

Development assumed to occur on disposed tracts under Alternative 4 could change the recreation opportunities from dispersed in nature to more developed on the Coosa River, Jordan Lake, Fort Morgan Beach and Highway, and Fowl River tracts. In these areas, recreational developments would reduce opportunities for dispersed recreation, as well as reducing travel in these areas of private development. Under Alternative 3, this impact would be limited to the Jordan Lake tract.

Lands and Realty

Increasing development leads to a greater demand for lands and realty actions, creating the need for additional ROWs for roads, pipelines, and power lines. Restrictions on ROWs under Alternatives 2, 3, and 4 would have a negligible cumulative effect by reducing routing options and possibly increasing construction costs for ROW development since there are only 159 acres of BLM-administered lands scattered across the State. Increasing development also leads to a greater demand for additional available land.

Social and Economic

BLM-administered minerals comprise a very small proportion of oil and gas development in Alabama. Twenty new oil and gas wells in Alabama constitute less than one percent (0.5 percent) of the 4,000 anticipated oil and gas wells on USFS and non-Federal agencies lands. Historically, the BLM has permitted 17 wells on BLM-administered FMO in Alabama, representing 0.2 percent of the 8,068 total wells permitted over the past 20 years. In Alabama, with the anticipated well projections, BLM FMO would represent slightly more of the total wells, compared to the previous 20 years; however, the BLM-administered FMO wells are half of one percent and still relatively a very small percentage.

Overall, the rate of oil and gas development in Alabama is expected to decrease, from 8,068 wells (average of 403 wells per year) to 4,000 anticipated over the next 20 years (average of 200 wells per year). This is a decrease in oil and gas development by 50 percent (from the last 20 years to the next 20 years).

Many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the region and would be perpetuated in the future. For instance, oil and gas activity is generating employment opportunities and labor earnings for communities that support these types of activities. However, the employment and income from BLM-administered oil and gas are likely very low since it represents such a small proportion of the total development and production in Alabama. Overall, however, with slight decreases in oil and gas development expected to occur across the State, there would be decreases in tax revenue to local, State, and Federal Government entities. With the decreases in overall oil and gas development in the State, socioeconomic characteristics and trends, such as infrastructure and community services, may be slightly decreasing as a result of decreasing fiscal revenues that often support these types of services within the State.

In general, the pace and timing of mineral-development activities is dependent on a variety of factors beyond the management decisions of the BLM. This includes national and international energy demand and prices, production factors within the planning area and business strategies of operators. Because the pace of development in the planning area is only an estimate, actual cumulative impacts may vary if the oil and gas activity across the State changes over the planning period.

Coal development is expected to only occur on the Alabama BLM-administered minerals, with potential development of 1.9 million tons of coal produced per year, in essence an extension of the BLM coal production rates that have occurred in the past 10 years. The existing two leases are expected to be mined out, while new development could occur on four additional leases. In 1999, the 1.9 million tons of coal produced from BLM-administered minerals represented 9.7 percent of the coal produced in Alabama of 19.5 million tons (Energy Information Agency). Between 1990 and 1999, coal production in the State decreased by an average annual rate of 4.3 percent. If this decreasing production continues in the future, coal production from BLM-administered minerals would likely represent a larger portion of the total coal produced from the State. Coal production supports employment and employee compensation in the State (677 employees and $48 million in employee compensation); with decreasing production across Alabama, it is likely that overall, employment and earnings are also decreasing in the coal mining industry and in industries that support coal mining. This also suggests that royalty revenues from BLM-administered coal mining may be increasing as a proportion of total coal mining, which could influence the relocation of industries that support coal development closer to these BLM-administered minerals. There are likely some slight fiscal revenue declines since the production levels are decreasing across the State, which could also have impacts for infrastructure, social services, school funding, and other related government services.

A number of the alternatives in this Proposed RMP-FEIS consider Federal disposal of various tracts of surface lands. Under Alternative 4, there are three tracts (Fort Morgan Beach, Fort Morgan Highway, and Fowl River) available for recreational or residential development in Alabama comprising 117 acres, while one additional tract (Jordan Lake) could be developed as recreational camps (4 acres). In total, 121 acres could potentially be developed for recreational or residential use in Alabama. The State of Alabama comprises 33.5 million acres of surface land, of which the BLM manages 159 acres (less than one percent) and the USFS manages 667,000 acres (2 percent). The disposal of these 159 acres and subsequent development of 117 acres of surface lands is not likely to have cumulative socioeconomic impacts as the disposal acres represent such a small portion of the BLM lands, Federal lands, and private lands within the State. For the socioeconomic impacts of the individual alternatives, please see Section 4.2.

Environmental Justice

There were no Environmental Justice populations identified within the four-county area where mineral development is anticipated in Alabama. Therefore, there would be no anticipated cumulative impacts on these populations. Since the additional expected oil and gas activity locations for the BLM-administered FMO have not been specified, impacts to these populations should be considered at the time of implementation.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100–185, 40 CFR 100–400, CERCLA, RCRA, SARA, TSCA, and the CWA, and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any release was to occur, it would be immediately addressed and remediated in accordance with regulation, and cumulative impacts are not anticipated. Contribution of hazardous materials, substances, and waste could occur from other sources on adjacent lands that could lead to cumulative impacts on the BLM lands.

4.4.2 Cumulative Impacts from BLM Management Actions in Mississippi

Air Quality

The cumulative impacts of air quality are evaluated by comparing the BLM site emissions with regionwide emissions. For the State of Mississippi, comprehensive emissions are only available for NO_X, CO, and VOCs. These emissions can be obtained from the Mississippi Department of Environmental Quality (MDEQ). Using the best available data from MDEQ, Table 4-11 shows a comparison between the statewide sources and the BLM-induced emissions. Based on this data, emissions from activities associated with potential oil and gas development and minerals mining on BLM-administered, non-USFS FMO tracts proposed in this RMP would not considerably contribute to cumulative air quality emissions within the region (presented in Table 4-11). Over the next 20 years, emissions from 10 wells would compose less than 1 percent of the emissions associated with the estimated 12,000 wells that could be developed on non-Federal and USFS lands in Mississippi. These impacts would be the same for all alternatives.

BLM-authorized activities would have small contributions to GHG emissions in comparison to the estimated U.S. emissions of CO_2 in 2006 (5,983.1 Tg CO_2 Eq.[4] (EPA 2008). These impacts would be the same for all alternatives. As discussed in Chapter 3, in the Southeast and Gulf Coast, potential impacts on the resources and environment from climate change could occur from sea level rise and a warmer climate, resulting in higher summer heat and reduced winter cold stress. The IPCC suggests that a two foot rise in sea level would eliminate approximately 10,000 square miles of land nationwide and, by 2080, sea level rise could convert as much as 33 percent of the world's coastal wetlands to open water (IPCC 2007). Some of the BLM-administered surface and mineral estate may become completely submerged. Coastal erosion, loss of barrier islands and wetlands, flooding, storm surge, and extreme precipitation events could greatly affect the biological resources within the planning area. For example, wildlife species could move northward and to higher elevations and extinction of endemic threatened/endangered plants may be accelerated. Due to loss of habitat, or due to competition from other species whose ranges may shift northward, the population of some animal species may be reduced. Additionally, the character of vegetation resources that provide wildlife habitat could change as disturbances (e.g., fire and insect outbreaks) increase (IPCC 2007). In the future, as tools for predicting climate changes in the planning area improve and/or changes in climate affect resources and necessitate changes in how resources are managed, BLM may be able to re-evaluate decisions made as part of this planning process and adjust management accordingly.

Table 4-11. Comparison of Potential BLM Emissions with Cumulative Emissions for Mississippi (tons per year) [1, 2]

Well and Mine Locations	Emission Type/Pollutant		
	NO_x	CO	VOC
BLM-administered FMO Estate in Mississippi	89	141	23
Other Mineral Estate Across Mississippi	295,456	1,301,914	272,897

1. Compared to best available 2002 data from the Mississippi Department of Environmental Quality (MDEQ 2005).
2. Combination of oil and gas and coal mining.

Soil Resources

In Mississippi, the disturbance of a maximum of 55 acres from oil and gas development across the State of Mississippi composes less than one percent of the 59,745 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands over the next 20 years. Although more than 7,000 wells have been completed in Mississippi since 1983, the minimal number of 10 additional wells identified in the RFDS would have no long-term impacts to soil productivity and, therefore, would not contribute to significant cumulative effects. These impacts would be the same for all alternatives.

Possible soil impacts associated with vegetative communities, fish and wildlife habitat, and lands and realty management actions, including ROW development and potential development after disposal on the 174-acre Hancock County tract, composes less than one percent of the 33,717 acres disturbed annually (1997–2003) from other construction projects across the State, including private development and transportation projects (as estimated by the NRI data). There would be more potential for soil disturbance impacts associated with vegetative communities and fish and wildlife habitat management actions proposed under Alternatives 2 and 3 as opposed to Alternatives 1 and 4, which do not propose any actions

[4] Carbon comprises 12/44ths of carbon dioxide by weight. One teragram is equal to 10^{12} grams or one million metric tons.

beyond standard management common to all alternatives. There would be more potential for soil disturbance impacts associated with ROW management actions under Alternative 1, which allows ROW development on the Hancock County tract, than Alternatives 2, 3, and 4, which designate the tract as a ROW avoidance area. The potential for soil disturbance impacts associated with lands and realty disposal actions would be the same under all alternatives, since the Hancock Country tract would continue to be used for recreation and research site purposes with no expected development.

Water Resources

The emergent wetlands that comprise the Hancock County tract would change as a result of mineral exploration and development or construction activities. However, BMPs and stipulations identified in Appendix D would minimize irreversible and irretrievable commitment of resources and unavoidable adverse impacts. The disturbance of a maximum of 55 acres from oil and gas development across the State of Mississippi composes less than one percent of the 59,745 acres of surface disturbance anticipated from oil and gas development on non-Federal and USFS lands. However, the minimal additional 10 wells identified in RFDS would have no long-term impacts to water resources. The cumulative impact of brine waste reinjection into aquifers beneath Federal and non-Federal lands over the next 20 years could be significant because by the year 2027, the number of new wells on non-federal lands is estimated to be 4,020 in Alabama and 12,010 in Mississippi. However, the minimal number of 10 additional wells in Mississippi identified in the RFDS would have no long-term cumulative impacts from waste brine reinjection. Thus, significant cumulative impacts would not be anticipated. In order to reinject produced water from federal and nonfederal, an oil and gas operator must obtain a permit as required by the Onshore Oil and Gas Order No. 7, which is intended to minimize the potential for cumulative impacts. EPA has granted the State of Mississippi primacy over the permitting of underground injection wells. The underground injection regulations address the siting, construction, operation, monitoring, and closing of an injection well. These requirements are designed to prevent contamination of surface and underground drinking water sources and would reduce cumulative impacts. These impacts would be the same for all alternatives.

Vegetative Communities

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting plant communities, such as glades and prairies, that are sensitive to disruption and difficult to restore after surface-disturbing activities. These activities also have the potential to introduce and promote the spread of invasive, exotic plant species.

Throughout the State, some plant communities, embedded in the larger forested landscape, are particularly sensitive to disruption and are difficult to restore after surface-disturbing activities. Many of these are restricted to a narrow range of soil types, such as glades and prairies; others are sensitive to changes in hydrography, such as bogs, forested wetlands, and seepage slope communities. Construction activities in these plant communities generally alter the site sufficiently to preclude the reestablishment of these communities in the foreseeable future. Also, because of the limited acreage of these vegetation communities, loss of even small acreages has a disproportionate effect on the plant diversity in an area.

Surface-disturbing activities have the potential to introduce or promote the spread of invasive, exotic plant species. Impacts are dependent on the species planted during restoration activities and the management of the site during and following restoration. Restoration activities typically include seeding non-native grasses, such as annual rye (during the winter months) and Bahia or Bermuda grass (during the summer months), to provide a quick cover for disturbed soils. Including native species in the mix

increases diversity and provides a more natural structure. If these areas are mowed following abandonment, these non-native grasses are expected to persist and dominate the site. If, however, the sites are replanted in pine or left unmowed, the areas can be expected to progress through old field-type growth, which is dominated by opportunistic native and non-native species alike. Ultimately, both Bahia and Bermuda grass are expected to become shaded out as a tree or heavy shrub layer becomes established. Japanese honeysuckle and Chinese privet can both persist in shaded situations.

Although effects to vegetative communities from surface-disturbing activities and the introduction of invasive, exotic plant species would likely occur as a result of the reasonably foreseeable actions identified for this analysis, the BLM activities would have a minimal contribution to these effects on plant communities due to the small amount of acreage that would be disturbed under the BLM management alternatives and the BLM policies on BMPs for mineral development reclamation and control of noxious, exotic species.

Fish and Wildlife

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting fish and wildlife and associated habitat through displacement, habitat degradation, and direct habitat loss.

Impacts to many wildlife species from oil and gas development are localized and temporary. Most common game species and other mobile wildlife species avoid the wellpad areas during construction and maintenance. Less mobile species are directly impacted and, during the spring and early summer, this can include nesting neotropical birds. Habitat generalists, including most game species, tend to return to surrounding habitats after the well is completed and construction and maintenance activities have ceased. Intermittent maintenance and inspection activities conducted on the established pad for the life of the well are not expected to alter the overall use of the area by wildlife. However, construction in high-value habitats or in areas with more narrowly adapted wildlife species can alter the overall species diversity. Wells and roads in areas of contiguous forests increase habitat fragmentation, reducing the suitability of the area for interior nesting birds and making nests more susceptible to predation and parasitism. Older growth forests, which provide habitat for interior forest nesting birds and a wider diversity of amphibians and reptiles, are often located in riparian zones left as buffers during logging operations or in steeper, less accessible slopes.

Oil and gas drilling continues for 24 hours a day until the well is completed. During this time, most wildlife, including waterfowl and many songbirds, are expected to avoid the immediate area. However, once drilling is completed, reserve pits with water (which can become soiled by drilling fluids) can become a hazard for waterfowl and other birds. If the well is put into production, there is documentation of birds and bats using open-vent stacks for roosting or perching. Once in these stacks, animals can become trapped or asphyxiated. While much of the work documenting this problem has occurred in western states, the situation in Mississippi is expected to be similar.

Roads and other construction projects across the State can alter the local hydrography, reducing surface flow to mesic areas and diverting or degrading surface water supporting wetland habitats. Installation of culverts and diverting existing drainages help to maintain existing hydrologic systems, but the disturbance causes local sedimentation and can retard sheet flow to wetland habitats. Amphibians and many reptiles associated with wetland communities are vulnerable to disturbance, as they are not highly mobile and tend to have narrow habitat requirements.

Impacts would also include the direct loss of habitat from the general construction projects, including private development and transportation projects, from degradation of nearby aquatic or wetland habitats through sedimentation or changes in hydrology.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, the BLM activities would have a minimal contribution to these effects on wildlife due to management protection provided under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. In the long term, depending on the location and intensity of construction and minerals development, it is likely that public lands containing viable habitats for wildlife would continue to be utilized by these species.

Special Status Species

The continuation of mineral development (totaling approximately 12,000 wells with 59,745 acres of surface disturbance) and soil disturbance and vegetation loss from other construction projects across the State (approximately 33,717 acres of surface disturbance annually) has a high potential of affecting special status species through habitat loss or degradation and species displacement.

The Federally listed species most likely to be affected are gopher tortoise, red-cockaded woodpecker, and black pine snake in the East Gulf Coastal Plain, as well as the recently delisted (as of August 2007) bald eagles associated with reservoirs and rivers in the northern portion of the State. There is some potential to affect the small acreages supporting special status species anywhere in the State, and a potential statewide to affect Federal- and State-listed aquatic species.

Gopher tortoise could be impacted by surface-disturbing activities, including mineral exploration and development and other construction projects across the State, in upland areas of the East Gulf Coastal Plain where forest practices on private lands have maintained at least marginally suitable habitat. Foraging habitat for tortoise could also be affected on non-USFS FMO associated with private holdings in the Chickasawhay, De Soto, and Homochitto National Forests, which support substantial tortoise populations. During general construction projects across the State, including private development and transportation projects, and construction of wells pads, access roads, and production facilities, gopher tortoises could be impacted by the loss or damage to burrows, destruction of foraging habitat, or killed during construction or by service vehicles. Construction activities and roads within 600 feet of burrows could isolate individuals and reduce reproductive potential within a population. In many cases, the presence of gopher tortoises indicates that habitat is suitable for a host of species associated with dry longleaf pine forests, many of them special status species such as the black pine snake (*Pituophis melanoleucus lodingi*), which could also be impacted by activities.

Red-cockaded woodpecker could be affected by oil and gas development and other general construction projects across the State, including private development and transportation projects, through the loss of nesting habitat within existing clusters and through the loss of current or potential foraging habitat within 0.5 mile of existing clusters. Non-USFS FMO in areas supporting red-cockaded woodpecker is generally privately owned and often managed for commercial timber production. Harvest rotations on these properties are typically too short to sustain suitable nesting habitat for red-cockaded woodpeckers; however, there is potential to impact suitable foraging habitat, particularly on non-USFS FMO near the Chickasawhay, De Soto, and Homochitto National Forests or Noxubee NWR areas, which support most of the State's population.

Throughout the State, breeding and wintering bald eagles could be affected by drilling and other general construction projects across the State, including private development and transportation projects, near large rivers or reservoirs. Bald eagles are particularly sensitive during courting, nesting, and fledging

young; in Mississippi this typically occurs between December 1 and August 1. Construction activities within 1.5 miles of nest sites could result in nest abandonment depending on factors such as visibility and tolerance of individual pairs.

Throughout the State, oil and gas development and other general construction projects, including private development and transportation projects, have the potential to impact aquatic and wetland habitats. These could result in degradation of water quality through contamination and increased sedimentation, direct loss of habitat, and changes in the local hydrography supporting these systems. Increases in sedimentation to streams and wetlands by oil and gas development are a factor of wellpad design, slope, erodibility of the soils, proximity of the disturbance, and the intervening vegetation. The potential for sedimentation increases with prolonged or heavy rains that are typical in this area. Cut and fill slopes associated with other construction projects across the State are particularly vulnerable before protective plant covers have been established. While intact vegetation along riparian zones and around wetlands could substantially buffer these areas, the steepness of the intervening slopes, particularly over 25 percent can reduce the effectiveness of buffers. Research has shown that a minimum of a 30-foot buffer of vegetation is needed to control sediments. However, construction activities within 100 feet can reduce stream invertebrates, and 1,000 feet or more may be needed to protect some amphibians, reptiles, and forest interior birds (Wenger 1999). Sediments deposited in intermittent drainages during construction can be transported downstream during periods of high water, increasing turbidity and burying aquatic invertebrates in higher order streams and potentially affecting special status species substantial distances from the construction site, including Louisiana quillwort (*Isoetes louisianensis*), listed as Federally endangered.

Filling wetlands, including bogs, seepage slopes, wet flatwoods, and forested swamps for construction and maintenance of wellpads for oil and gas development and/or other construction projects across the State generally alters the site sufficiently to preclude the reestablishment of these communities in the foreseeable future and could result in direct habitat loss for a wide variety of special status species. Because of the limited acreage of these vegetation communities, loss of even the small acreages has a high potential of destroying or degrading habitat for special status species. Many of these species have limited ranges so the list of species potentially affected varies by location. For example, the Mississippi CWCS (2005) notes 14 special status species are associated with pine seeps and pitcher plant bogs, including eight special status crayfish, five of which are endemic. Henslow's sparrow wintering habitat and breeding habitat for Bachman's sparrow could be lost by construction in or near grassy bogs or wet flatwoods. Construction and maintenance activities and other construction projects across the State could disrupt the local hydrography supporting seepage slopes or sheet flow to bogs and swamps degrading these habitats.

There are estimated to be 65 caves in Mississippi located in the northeast corner and east central portions of the State. Caves by their nature are isolated and support highly endemic faunas often with extremely narrow habitat requirements. In Mississippi, this includes two State-listed salamanders and a number of bat species. Although the potential to affect these areas is low, caves are particularly sensitive to oil and gas development. Even minor alterations in temperature, humidity, and water quality or water quantity could result in irreversible impacts. Drilling through cave/karst resources could result in contaminants, such as drilling fluids and cements, draining into the cave/karst system. Karst habitats could be degraded by hydrocarbons from spills or leaks from well casings, storage tanks, reserve pits, pipelines, and production facilities that may enter into the cave/karst systems. Additionally, cementing operations could affect portions of underground drainage systems by restricting ground water flow and introducing pollutants into karst systems.

Construction in coastal areas could affect the 18 special status species that are associated with coastal marshes and maritime scrub and woodlands, including brown pelican, Wilson's plover, Mississippi

diamondback terrapin, and saltmarsh topminnow. Impacts would occur from direct habitat loss, destruction of foraging and nesting habitat, and habitat abandonment.

Although significant habitat degradation and loss would likely occur as a result of the reasonably foreseeable actions identified for this analysis, the BLM activities would have a minimal contribution to these effects on special status species due to the minimal numbers of oil and gas development anticipated (10 wells) and management protection provided for these species under all alternatives, with Alternatives 2, 3, and 4 providing more stringent protection than Alternative 1. The BLM would also be required to consult with USFWS to identify and establish specific conservation actions that can be taken to mitigate the potential effects of land management activities.

Wildland Fire Ecology and Management

In addition to the ignition sources associated with development of 10 new oil and gas wells noted in the impact analysis, there are over 7,362 existing oil and gas wells throughout Mississippi. An additional 12,000 oil and gas wells would be developed on non-Federal and USFS FMO over the next 20 years. Cumulatively, the potential increases in wildland fires from the addition of 10 wells compared to 19,362 existing and potential wells would not significantly increase the risk of fire in Mississippi. Likewise, the infrastructure associated with oil and gas or ROW developments would not significantly improve access or provide fuel breaks compared to the cumulative developments and current (1997–2003) rate of 33,717 acres of land developed annually in Mississippi.

The cumulative effect of proposed vegetation treatments on the 174 acres of the Hancock County tract would be in addition to 264,981 acres of vegetation treatments by other Federal agencies, as well as prescribed burns performed by State and local agencies and private or corporate forestry operations. The proposed treatments would help maintain or restore small areas to their natural regimes as well as improve the ability to protect WUI areas from wildfire. Cumulatively, the implementation of all these treatments would reduce the cost of suppressing wildfires.

Cultural Resources

As noted in the Alabama cumulative impacts, cultural resources on private surface do not enjoy the same legal protections as sites on USFS FMO and non-USFS FMO. As such, oil and gas development in areas of private surface and private mineral ownership, or non-mineral developments in areas with private surface and FMO, could result in cumulative impacts to cultural resources throughout Mississippi. This could result in unmitigated damage and loss of cultural sites and artifacts in areas of private surface and mineral ownership where oil and gas wells are developed. Cumulatively, Alternative 2 provides the greatest level of protection from cumulative impacts due to the largest number of closed and NSO acres. Alternatives 3 and 4 provide the next greatest level of protection. In these areas, the potential for inadvertent damage and loss of cultural resources is the lowest.

An additional 55 acres associated with development of 10 wells on non-USFS FMO and 59,745 acres associated with development of an estimated 12,000 additional wells on non-Federal mineral estate and USFS FMO would be added to the existing disturbance from development of over 7,000 oil and gas wells in Mississippi over the past 20 years. Acreage developed on USFS FMO would receive protections from Federal law, regulation, and policy. Developments in those areas would be required to comply with NHPA and ARPA in inventorying areas and determining eligibility of sites for the NRHP. Additional developments on USFS FMO would result in the identification of more cultural sites during inventories. Excavation of sites as part of mitigating impacts from development on USFS FMO would enable scientific retrieval and study of cultural resources, using today's technology and methodology. While data recovery preserves as much data as possible, the excavated portions of the property would be lost or

damaged. Removing cultural resources from a site using current scientific methods also reduces future scientific value if more accurate methods of analysis are developed.

Combined with disturbance from mineral development, other Federal agencies perform approximately 227,720 acres of vegetation treatments throughout Mississippi annually. Approximately 86 percent of the treated acres (227,720 acres) would be treated by prescribed fire. Additional acreages would be treated by State and local agencies and private individuals. Treatments by Federal agencies would require cultural inventories prior to implementation, identifying and protecting cultural sites. However, treatments by State and local agencies and private individuals could impact cultural resources through burning and suppression efforts. Cumulatively, the alternatives would have little effect on these impacts as the levels of treatment and the BLM surface acreage are very small in comparison, although Alternatives 2 and 3 would have the greatest cumulative effect as they propose the greatest levels of vegetation treatment to support other resources.

Development throughout Mississippi disturbs approximately 33,717 acres annually. Disposal and development of the BLM surface tract in Hancock County would only be permitted in Alternative 4, although it would have to be managed in a manner to protect Federally listed species and associated wetland/aquatic habitat. The potential to disturb, damage, or lose cultural resources would be low in these instances, but there would be no protections specifically for cultural resources if transferred from Federal ownership. Cumulatively, however, management of a disposed Hancock County tract would not result in significant additions to the annual disturbances throughout Mississippi. Alternatives 1, 2, and 3 would protect any cultural sites in the Hancock County tract.

The number of sites anticipated to be cumulatively damaged resulting from actions proposed in this RMP combined with other cumulative projects and activities is unknown because most areas have not been surveyed for cultural resources.

Visual Resources

Cumulative impacts on visual resources would occur primarily from activities that affect the visual quality of the area. Such impacts would result from mineral-development activities, ROW development, increased recreational activity, and actions associated with management of vegetative communities and fish and wildlife habitat. Surface-disturbing activities associated with mineral and ROW development would create visual intrusions that could alter the landscape setting and degrade visual quality. The disturbance of a maximum of 55 acres across 517,934 acres of Mississippi FMO and possible ROW development as a result of management actions would not contribute to significant cumulative impacts. Although more than 7,000 wells have been completed in Mississippi since 1983, the minimal number of 10 additional wells identified in the RFDS would not significantly diminish visual quality. Closing or limiting areas to motorized recreation uses and implementing restrictions designed to protect sensitive resources would help to maintain the visual quality in restricted areas. Efforts to maintain and improve vegetative communities and fish and wildlife habitat would indirectly enhance visual quality through improvement of the visual landscape.

Cumulative impacts would be similar among the four alternatives, as the same level of development is expected under any of the alternatives. However, Alternatives 2 and 3 provide for specific actions to improve vegetative communities and fish and wildlife habitat, thereby enhancing visual quality. In addition, implementing an NSO stipulation within 1,000 feet of aquatic habitats under Alternative 2 would preserve the visual quality within these areas. No visual impacts are anticipated under all alternatives from lands and realty disposal actions since the Hancock Country tract would continue to be used for recreation and research site purposes with no expected development. Given the remote marsh

nature of the tract, any development on adjacent lands would be minimal and the disposal would not cumulatively contribute to land development in the area.

Minerals

In Mississippi, no cumulative impacts would be anticipated to minerals exploration and development as a result of BLM-administered surface tract and non-USFS FMO land use allocations and management actions since the RMP would not restrict or preclude mineral development and exploration. In addition, an irretrievable commitment of oil and gas would occur from mineral extraction from 10 wells developed over the next 20 years in Mississippi. These impacts would be the same for all alternatives.

Recreation and Travel Management

Most of Mississippi is not managed by the Federal Government, and recreation and travel opportunities are often dependent on whether the private landowner allows access to the private surface. Therefore, maintaining Federal ownership of public lands under Alternatives 1, 2, and 3 would maintain limited opportunities for public recreation and travel. Under Alternative 4, opportunities for travel and recreation could be precluded after disposal, cumulatively adding to the current restrictions on private lands throughout the State. Although the BLM management actions and disposal actions under the alternatives could have localized impacts to recreation experience and travel opportunities, no significant cumulative impacts would be anticipated because of the small size of the BLM-administered surface tract. Cumulative projects and activities (continued mineral development and other construction projects) could lead to more travel opportunities associated with increased route construction to support mineral development, but there would also be a reduction in primitive/non-motorized recreation opportunities. Minerals development on non-USFS FMO lands open to recreation and leasing would result in unavoidable adverse impacts to recreation through detracting from the recreational setting. Mineral exploration and development activities could have short-term effects on the quality of the setting because of drilling equipment and long-term impacts from road construction and vegetation removal.

Lands and Realty

Increasing development leads to a greater demand for lands and realty actions, creating the need for additional ROWs for roads, pipelines, and power lines. Restrictions on ROWs under Alternatives 2, 3, and 4 would have a negligible cumulative effect by reducing routing options and possibly increasing construction costs for ROW development since there are only 174 acres of BLM-administered lands scattered across the State. Increasing development also leads to a greater demand for additional available land.

Social and Economic

The greatest potential for cumulative socioeconomic impacts is associated with increasing oil and gas development throughout Mississippi. The following information indicates that, overall, Mississippi is expected to experience an increase in oil and gas development of 63 percent (between the last 20 years and the next 20 years). Overall, there were 7,362 wells permitted over the past 20 years (average of 368 wells per year) to an anticipated 12,000 total wells over the next 20 years (average of 600 wells per year).

In Mississippi, the estimated development of 10 new oil and gas wells from the BLM-administered FMO constitute less than a tenth of one percent (0.08 percent) of the total wells projected for the State over the 20-year planning period. Historically, the BLM-administered wells in Mississippi have comprised about the same percentage (0.09 percent), indicating a relatively constant although very small proportion of oil and gas development over time. Since the BLM-administered FMO oil and gas wells compose so little of

the total wells in the Mississippi, there are very little cumulative socioeconomic impacts that could be attributed with this anticipated BLM development.

Many of the cumulative socioeconomic impacts associated with oil and gas development are already occurring in the State and would be perpetuated in the future. For instance, oil and gas activity is generating employment opportunities and labor earnings for communities that support these types of activities. However, the employment and income from BLM-administered oil and gas is likely very low since it represents such a small proportion of the total development and production in Mississippi. With the increases in overall oil and gas development, socioeconomic characteristics and trends, such as infrastructure and community services, may be slightly increasing and better funded as fiscal revenues often support these types of services within the State.

The pace and timing of mineral-development activities is dependent on a variety of factors beyond the management decisions of the BLM. This includes national and international energy demand and prices, production factors within the planning area, and business strategies of operators. Because the pace of development in the planning area is only an estimate, actual cumulative impacts may vary if the oil and gas activity across the two States changes over the planning period.

Alternative 4 in this Proposed RMP-FEIS considers Federal disposal of the 174-acre Hancock County tract, and this tract is likely to be used for recreation and research site purposes, with limited to no development occurring. The disposal of this tract of land would not likely have cumulative socioeconomic impacts as the acres represent such a small portion of total lands within the State, and the general management of the lands is not expected to change. For the socioeconomic impacts of the individual alternatives, please see Section 4.13.

Environmental Justice

Since the additional expected oil and gas activity locations for the BLM-administered, non-USFS FMO have not been specified, impacts to these populations should be considered at the time of implementation. For Mississippi, Section 3.4.13 in Chapter 3 indicates the counties that compose the largest low-income and minority populations. Once oil and gas development locations have been specified, Environmental Justice population locations should be revisited to assess any potential cumulative impacts to these populations.

Hazardous Materials

BLM-authorized activities on surface tracts and non-USFS FMO could include use of hazardous materials, substances, and waste (including storage, transportation, and spills). Such activities include oil and gas development, coal development, and application of pesticides to improve vegetative communities and wildlife habitat. These activities are conducted in compliance with 29 CFR 1910, 49 CFR 100–185, 40 CFR 100–400, CERCLA, RCRA, SARA, TSCA, and the CWA, and other Federal and State regulations and policies regarding hazardous materials management. Therefore, if any release was to occur, it would be immediately addressed and remediated in accordance with regulation, and cumulative impacts are not anticipated. Contribution of hazardous materials, substances, and waste could occur from other sources on adjacent lands that could lead to cumulative impacts on the BLM lands.

CHAPTER 5—CONSULTATION AND COORDINATION

5.1 OVERVIEW OF THE PROCESS

Consultation, coordination, and public involvement were undertaken by the BLM throughout the development and preparation of Proposed Resource Management Plan (RMP) and Environmental Impact Statement (EIS) through public and informal meetings, individual contacts, bulletins, news releases, and *Federal Register* notices. Public involvement is mandated by several Federal regulations and guidelines, including the Federal Land Policy and Management Act of 1976 (FLPMA), National Environmental Policy Act of 1969 (NEPA), and guidelines from the President's Council on Environmental Quality (CEQ). In addition, the public participation process is outlined in the BLM Land Use Planning Handbook (H-1601-1).

5.2 CONSULTATION AND COORDINATION

This section documents the consultation and coordination efforts undertaken by the Bureau of Land Management (BLM) throughout the development and preparation of this Proposed RMP-EIS. Because of jurisdictional responsibilities, the BLM is required to consult with certain Federal, Native American, and State agencies and entities (40 Code of Federal Regulations [CFR] §1502.25) during the NEPA decisionmaking process. The BLM is also directed to integrate NEPA requirements with other environmental review and consultation requirements to reduce paperwork and delays (40 CFR §1500.4–5). Title II, Section 202, of FLPMA directs the BLM to coordinate planning efforts with Native American tribes and Federal, State, and local government agencies as part of its land use planning process.

5.2.1 Other Federal Agency Consultation

Section 7 of the Endangered Species Act of 1973 (ESA) requires Federal agencies (such as the BLM) to address impacts on species listed under ESA through consultations with the U.S. Fish and Wildlife Service (USFWS). Consultations begin informally when a Federal agency requests a list of species under ESA. If a listed species exists in the area being assessed, the BLM may prepare a biological assessment (BA). The initial determination of effect is made by the lead agency, in this case the BLM (50 CFR Part 420). If the BA determines that the proposed action may adversely affect a listed species or its habitat, the BLM must enter formal consultation with USFWS, which then prepares a biological opinion (BO) that determines whether the Proposed RMP would adversely affect listed species or critical habitat. Although the BO is based on information provided in the BA, it may concur with or dispute the determination of impact. The process of formal and informal consultation with USFWS ensures that the BLM actions conserve listed species and their critical habitat.

The USFWS was involved in the planning process. This was initiated through informal consultation, which included obtaining a species list, development of oil and gas leasing stipulations, and development of best management practices (BMP), and concluding with formal consultation on the RMP-EIS. The goal is to not jeopardize the continued existence of listed species or destroy or adversely modify designated critical habitat, and where possible, to minimize the potential to adversely affect Federally listed species.

5.2.2 State and Local Agency Consultation

Letters were sent to Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the RMP planning process. The States of Alabama and Mississippi were requested to be involved in the planning process as cooperating agencies. Only the State of Mississippi accepted the invitation to become an official cooperating agency through a Memorandum of Understanding signed on December 13, 2002. Multiple State agencies were consulted during the RMP-EIS process, including the Department of Environmental Quality, State Heritage groups, and the State Historic Preservation Office (SHPO).

The National Historic Preservation Act of 1966 (NHPA), as amended (16 United States Code [USC] 470), expands protection of historic and archeological properties to include those of national, State, and local significance. NHPA (in Section 106) requires Federal agencies to consult with the SHPO, and sometimes with the Advisory Council on Historic Preservation, concerning the potential effects of agency actions on properties listed on or eligible for the National Register of Historic Places (NRHP). The SHPO is also sometimes consulted concerning applicable methods for determining whether there are NRHP-eligible properties in an agency undertaking's area of potential effect, whether properties are eligible, and appropriate mitigation measures.

The SHPOs for both Mississippi and Alabama were informally contacted concerning potential effects to properties that are listed on or eligible for the NRHP. Formal consultation has been completed for both States. Comments from the Alabama SHPO were incorporated into the Final RMP-EIS.

5.2.3 Native American Consultation

The BLM provides government officials of Federally recognized tribes opportunities to comment on and participate in the development of the RMP. The BLM considers comments, notifies consulted tribes of final decisions, and informs them of how their comments were addressed in those decisions. Land use plans and coordination activities must address consistency with tribal plans (Section 202[c][9] of the FLPMA) and protection of treaty rights and must comply with the following statutes and executive orders:

- **Section 101(d)(6) of the NHPA** requires the BLM to consult with Native American tribes when historic properties of traditional religious or cultural importance to a tribe would be affected by BLM decisionmaking.
- **The American Indian Religious Freedom Act (AIRFA)** requires the BLM to protect and preserve the freedom of American Indians and Alaska Natives to exercise their traditional religions, including access to sites and freedom to worship through ceremonial and traditional rites.
- **Executive Order 13007 (Indian Sacred Sites)** requires the BLM to accommodate access to and use of sacred sites and to avoid adversely affecting the physical integrity of sacred sites to the extent practicable, as permitted by law and consistent with essential agency functions.
- **Executive Order 12898 (Environmental Justice)** requires the BLM to take into account relevant CEQ guidelines and Department of the Interior policies and goals.

Specific guidance on Native American consultation is outlined in BLM Manual 8120 and BLM Handbook H-8120-1.

Land use plans and accompanying EISs must identify potential effects on Indian trust resources, trust assets, or tribal health and safety. Any effect must be explicitly identified and documented in the land use plan.

The BLM contacted appropriate Native American tribes (see page 5-5 for a list of tribes contacted), inviting them to participate in the Alabama and Mississippi RMP-EIS development process, and offered to meet with tribal leaders or representatives in person to discuss issues, concerns, and questions they might have. The tribes contacted did not express interest in participating in meetings regarding the RMP-EIS or in becoming cooperating agencies.

5.3 PUBLIC PARTICIPATION

Public participation in the RMP-FEIS process includes a variety of efforts to identify and address public concerns and needs. The public involvement process assists the agencies in broadening the information base for decisionmaking, informing the public about the Proposed RMP-FEIS and the potential impacts associated with various management decisions, and ensuring that public needs and viewpoints are understood by the agency.

5.3.1 Project Website

A project website was created to provide the public with information on planning issues and the overall planning process as well as to afford the opportunity to submit input directly to the BLM. The project website, www.es.blm.gov/AL_MS_RMP, became publicly accessible in August 2004 and featured information on resource and planning issues associated with the Alabama and Mississippi RMP. Information included *Federal Register* notices, planning bulletins, survey plats of BLM-administered public lands on Fort Morgan Peninsula, a map of the planning area, a form allowing users to add their names to the project mailing list, and a form for users to submit input as part of the alternatives development process.

5.3.2 Public Scoping

Scoping is an early and open process for determining the scope of issues to be addressed in the planning process, as defined by 40 CFR Parts 1500 et seq. Scoping serves to solicit agency and public input on planning issues and criteria, areas of concern, and ideas and proposals for long-term management. Scoping provides a formal mechanism for engaging the public in identifying key planning and land management issues.

The official scoping period started with publication of the notice of intent (NOI) in the *Federal Register* on July 12, 2002, and ran through September 2002. The NOI announced the BLM's intent to prepare an RMP for Alabama and Mississippi, called for coal information, and invited the public to participate in identification of issues and review of planning criteria.

Letters were sent to Alabama and Mississippi State agencies, county supervisors and commissioners, and the governors of both States to inform them of the planning process. Letters were also sent to several coal companies to inform them of the planning process and solicit coal data. Individuals were encouraged to submit e-mail or hardcopy comments to the BLM Jackson Field Office.

One e-mail with comments was submitted during the scoping period. Comments addressed a variety of issues, such as the need to have adequate, site-specific data on threatened, endangered, and candidate

species in the planning area; data on soils and aquatic species; and an accurate impact assessment of minerals development on recreation (BLM 2002).

5.3.3 Development of Planning Criteria

The NOI also announced preliminary planning criteria—the framework of laws, regulations, policies, and guidance within which a resource management plan must be developed. Comments on the planning criteria were solicited during the scoping period. No comments were received; therefore, planning criteria presented in the NOI became final.

5.3.4 Public Workshop During Alternatives Development

A public workshop (with an emphasis on the BLM tracts in Baldwin County, Alabama) was held in Gulf Shores, Alabama, on September 2, 2004, to solicit additional comments for developing alternatives. The workshop was conducted in an open house format, with resource stations and with the BLM staff available for individual discussions. Eight participants attended the workshop, including representatives from the Alabama State Lands Division. Information meetings with Baldwin County also took place during this period. Although the BLM provided a deadline of November 30, 2004, to receive information and input via mail, e-mail, or the project website, none were submitted; however, the BLM accepted input from the public and interested agencies throughout the planning process. Comment letters that were submitted after the November deadline dealt primarily with the Baldwin County land tracts and how they should be managed by the BLM. All comments were collected, analyzed, and included in the project administrative record.

5.3.5 Public Meetings on the Draft RMP and EIS

Three public meetings were held in October 2007 to give the public an opportunity to comment on the Alabama and Mississippi Draft RMP-EIS. During the three meetings, nine people registered their attendance. These public meetings featured an open house format with the BLM specialists available to provide information. The public was also instructed on how to submit comments on the Draft RMP-EIS.

5.3.6 Open Comment Period on the RMP and Draft EIS

The BLM provided the public with 90 days from the date of publication of the BLM's Notice of Availability (NOA) for the Alabama and Mississippi Draft RMP-EIS to review and submit comments. The Environmental Protection Agency (EPA) filed the NOA in the *Federal Register* on August 31, 2007. The 90-day public comment period officially ended on November 29, 2007. The BLM received comments on the Draft RMP-EIS from members of the public; Federal, State, and local agencies; and private and public organizations. These comments were sent by mail or e-mail or submitted at the public meetings.

A total of 24 letters were received: 14 were sent by e-mail, and 10 were submitted in hard copy or sent by mail. Of the 24 letters received, 6 were identified as being form letters, while the remaining 18 were considered unique letters. Form letters are described as letters containing identical text submitted by more than five individuals. From the 24 letters received, 97 unique comments were identified, of which 32 were considered nonsubstantive and 65 were considered substantive.

5.3.7 Future Public Participation

A 30-day protest period will follow the release of this Proposed RMP-FEIS. The Proposed RMP-FEIS will also be sent to the governors of Alabama and Mississippi for a 60-day review for consistency with State or local plans, policies, and programs (43 CFR 1610.3-2). Finally, the Approved RMP/Record of Decision (ROD) will be prepared after any protests and inconsistencies have been resolved (43 CFR 1610.5-2).

5.3.8 Public Comment Process and Methodology

The BLM is required to identify and formally respond to all substantive public comments. BLM-specific direction on comment analysis can be found in the National Environmental Policy Act Handbook (H-1790), Section V-11, Subsection 4, "Analyzing the Comments and Preparing the Final EIS." Substantive comments specifically meet the following criteria:

- **Comments on Inaccuracies and Discrepancies.** Corrections to factual information, data, or analysis should be made in the Final EIS.
- **Comments on the Adequacy of the Analysis.** Comments that reflect a professional disagreement with the conclusions of the analysis or assert that the analysis is inadequate may or may not lead to changes in the Final EIS. Interpretations of the analysis are based on professional expertise. Close scrutiny is warranted where there are disagreements within a discipline. If a change is not warranted, a comment response with rationale must be provided.
- **Comments that Identify New Impacts, Alternatives, or Mitigation Measures.** If comments identify impacts, alternatives, or mitigation measures that were not addressed in the Draft EIS, the BLM must determine if they warrant further consideration. If so, they may be analyzed in the Final EIS, a draft supplement, or a revised and re-circulated Draft EIS.
- **Disagreements with Significance Determinations.** Comments may directly or indirectly question significance determinations or severity of impact. Close scrutiny must be given because this is a compelling part of the NEPA decisionmaking process. If the BLM finds the significance assertion invalid, it must document its rationale in the Final EIS.

Conversely, nonsubstantive comments simply state a position in favor of, or against, an alternative; merely agree or disagree with the BLM policy; or otherwise express an unsupported personal preference or opinion. The BLM is not required to respond to nonsubstantive comments.

After substantive public comments were identified, the comments were entered verbatim into a comment-response table, which enabled the BLM to develop responses to substantive comments and study the relationship among the comments. The list of substantive comments and associated responses can be found in Table 5-1.

During the process of identifying substantive comments, all comments were treated equally. The comments were not weighted by organizational affiliation or status of respondents, and duplicate comments did not add more bias to one comment than another. The process was not one of counting votes, and no effort was made to tabulate the number of people for, or against, any given aspect. Rather, emphasis was placed on the content of each comment.

5.3.9 Comments and Responses

The BLM is required to respond only to substantive comments to fully inform the public of concerns raised. In Table 5-1, the BLM provides responses to substantive public comments identified during comment analysis.

Table 5-1. Substantive Public Comments and Responses on the Draft RMP-EIS

Public Comment	BLM Response
The RMP cites our draft CCP as a reference (References, 6); however, the final CCP was approved in 2005. This document is available on the Internet at: http://www.fws.gov/southeast/planning/FinalRefugesDocuments.htm.	The Proposed RMP and Final EIS have been updated to reflect the Final Bon Secour Comprehensive Conservation Plan (CCP), approved in November 2005.
On page 3-13, we suggest a few revisions to the marine turtle species accounts. There are no confirmed records of green turtles (*Chelonia mydas*) nesting in Alabama. To date, there have been 3 confirmed nests by Kemp's ridleys (*Lepidochelys kempi*) in Alabama (2001, 2006, 2007). Based on our standing records, juvenile Kemp's ridleys are the most common marine turtle in Alabama bays and estuaries.	Section 3.2.6 of the Proposed RMP and Final EIS have been updated to reflect this data from USFWS.
When these parcels are incorporated into the Refuge, some mechanism needs to address the proper planning of individuals submitting a request to place roads or driveways to their adjoining property at some future time through the highway tracts. Page 2-28 in the RMP-EIS draft book states that existing facilities within the highway ROW would be allowed: "New disturbance would be avoided because of the presence of the Federally listed species and designated critical habitat." The standard should allow very few roads or driveways into these areas. This practice should be similar to the application process that is obtainable through the Alabama Department of Conservation, which allegedly owns other portions of the ROW.	As stated in the Draft RMP-DEIS Section 2.3.14, "Valid authorizations would be protected if the land undergoes disposal." If the Fort Morgan tracts are transferred to the Bon Secour National Wildlife Refuge, requests for roads and access would be handled by USFWS. Under BLM management, rights-of-way approvals would avoid new disturbance of native habitat.
If it is the case that the Refuge does not accept certain highway tracts into their ownership for whatever reason, then BLM should revert to Alternative One (1), no action, and retain the property themselves. It is highly requested that BLM does not transfer ownership of these highway tracts to the Alabama Department of Conservation or to the City of Gulf Shores. This request is placed at the consideration of BLM, so that, as per page ES-4 of the draft, " ... the RMP-EIS process includes a variety of efforts to identify and address public concerns and needs.". It also states that " ... the potential impacts associated with various management decisions and ensuring that public needs and viewpoints are understood by the agency." . The real residents and property owners of Fort Morgan who call the area their home ... have a current ongoing dilemma that would not be beneficial if ownership of those tracts were placed into the wrong hands. The Alabama	Under the Proposed RMP, the BLM will retain the highway tracts if they are not transferred to USFWS. The BLM modified the Proposed RMP (Alternative 3) for the Fort Morgan Beach and Highway Tracts lands and realty actions to include the following statement in Tables 2-7 and 2-8: "If the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts."

Public Comment	BLM Response
Department of Conservation or the City of Gulf Shores are the "wrong hands."	
It is requested that BLM transfer the ownership of lots #54 and #55 with the following covenants so that the criteria used in the draft can be fulfilled. The covenants should contain language that does not allow any building of a parking lot, or public showers or bathrooms located on these two lots. It is also requested that these covenants be worded in such a way that a Habitat Conservation Plan (HCP) not be able to be used to circumvent these covenants. An HCP is a proposed plan which allows the development of property and interjects a mediation as it pertains to the use of the land and any endangered species such as the ABM. This would benefit the maintenance of the existing fish and wildlife habitat diversity and actively promote the recovery of the Federally listed ABM as well as other endangered species as per the language given in the chart on page 2-27 of the draft. The placement of a boardwalk at some future time over lots #54 and #55 and the placement of sand fence would be beneficial to the area. This would allow continued access to recreation compatible with habitat management, including use of the beach and saltwater fishing. It is also requested that lots #54 and #55 be transferred under the condition/covenant that the placement of all currently existing roadways not be disturbed ... due to that they have been located in their current location for many years.	Covenants would not be used in transfer to USFWS, but would only be used in disposal from Federal ownership to a non-Federal entity (such as the State, county, city, or private). Disposal from Federal ownership was addressed under Alternative 4 to provide a range of alternatives in accordance with NEPA, but is not proposed. Under the Proposed RMP, these tracts would remain in Federal ownership, be transferred to USFWS, and be managed as part of the National Wildlife Refuge System. Upon transfer to USFWS, management decisions for these tracts would follow USFWS policies and management guidance.
I am asking that BLM will transfer the ownership of these lots (No. 54 & 55) with covenants to insure that the criteria in the draft will be fulfilled. The covenants should contain language that **will not** allow any building of a parking lot or public restrooms/showers on these two lots. It is also important that these covenants are constructed to prevent any Habitat Conservation Plan (HCP) to be used to circumvent these matters or covenants. The placement of a boardwalk and any sand fences in the future over these lots would be very beneficial to the area as it would allow continued access to recreational and educational activities compatible with the habitat. All of this is vital to continue and improve the maintenance of the existing wildlife and fish habitats, as well as to insure the recovery of the Federally listed ABM and other endangered species referred to in the chart on page 2-27 of the draft. I would also like to request that any covenants involved with this consider that the existing roadways **will not** be disturbed due to the fact that they have been in their current location for many years and that the two roadways adjacent to these lots are and have been maintained at a significant expense by the private land owners located on these roads.	Covenants would not be used in transfer to USFWS, but would only be used in disposal from Federal ownership to a non-Federal entity (such as the State, county, city, or private). Disposal from Federal ownership was addressed under Alternative 4 to provide a range of alternatives in accordance with NEPA, but is not proposed. Under the Proposed RMP, these tracts would remain in Federal ownership, be transferred to USFWS, and be managed as part of the National Wildlife Refuge System. Upon transfer to USFWS, management decisions for these tracts would follow USFWS policies and management guidance.
Upon review of the information forwarded by your office, we have determined that the document is well though out and very informative. However, we would like to inform you that all areas which were surveyed for cultural resources	Changes were made in the Proposed RMP and Final EIS in Section 2.3.9. The BLM would consult with the SHPO prior to property disposal or mineral leasing and resurvey the area, if necessary, if a cultural resource survey was

Public Comment	BLM Response
prior to 1996 when the AHC cultural resource assessment standards were established will have to be re-surveyed. Furthermore, there are two areas which we feel need clarification. 1. Regarding disposals of property, our office should be consulted to determine if a cultural resource assessment have been conducted after 1996 or if an assessment is needed. Please advise us as to whether or not this will be practiced. 2. Regarding areas where federally owned minerals lie below privately owned land, our office should be consulted to determine if a cultural resource assessment if warranted. It is our opinion that the private land would not be disturbed if the federally owned minerals were not to be mined. Please advise use as to your position on this issues.	conducted prior to 1996.
However, I'm disturbed by the editor's observation (third para.) that the plan "does not appear to recommend the transfer of the highway tracts to the NWR", and by his quote from the Plan to the effect that "the tracts [beach and highway] would be open to leasing…" Although these leases would apparently prohibit "surface occupancy", I'm wondering what kind of uses would be allowed under "standard lease terms and conditions and best management practices. This to me is scary. I'm wondering why, in view of the proximity of those lots to the NWR (whether or not contiguous), and the importance of protecting and providing habitat for the environmentally sensitive wildlife in that area, and the very limited habitat remaining in the area for those species, – I'm wondering why it would not be appropriate to transfer all of the BLM lands in that vicinity to the NWR, irrespective of whether they may be classified as "beach" or "highway"?	Under the Proposed RMP, all of the Fort Morgan tracts, including the Highway tracts, are identified for transfer to USFWS. In addition, the Proposed RMP states that "the BLM would retain the tracts if the tracts are not transferred to the USFWS" in Tables 2-7 and 2-8. Under the Proposed RMP, the Fort Morgan Beach and Highway tracts would be open to oil and gas leasing subject to a no-surface-occupancy stipulation, which is in addition to standard lease terms and conditions. This means that the minerals are available for leasing but could only accessed by directional drilling from other properties and allows no surface use of the BLM tracts.
Page D-8, Appendix D: Proposed Conservation Measures and BMPs, "Disposal of Produced Water" – This Section prescribes disposal of mining/gas/oil water wastes by reinjection into a permeable formation, or alternatively, discharged into surface waters. EPA suggests that the discussion relating to waste water disposal be more robust, given that mining and production gas well wastes are inevitably generated from these operations and can have significant impacts to the environment. As national energy needs increase, hydrocarbon exploration in these regions will most likely continue. Reasonably foreseeable development scenarios (Appendix J) indicated that during the next 20 years, installation of oil and gas wells on federal lands is estimated to number 32 in Alabama, and up to 360 in Mississippi. The cumulative impact of brine waste reinjection into aquifers beneath federal and in adjacent non-federal lands over the next 20 years could be significant: by year 2027, the number of new wells on non-federal lands is estimated to be 4,020 in Alabama and 12,010 in Mississippi.	We agree with EPA that the discussion relating to waste water disposal should be more robust. The cumulative impacts discussion was expanded to address the concerns regarding brine waster reinjection under the water resources discussions in Sections 4.4.1 and 4.4.2. Additional information regarding State underground injection well control (UIC) programs have been included in Appendix D under the "Disposal of Produced Water" heading.

Public Comment	BLM Response
Basic information regarding State underground injection well control (UIC) programs should have been included in the draft EIS/RMP. UIC programs are direct implementation programs that are federally administered by EPA Regional Offices or primacy programs that are administered by State agencies which have been delegated primary enforcement authority. The UIC program may, in some instances, consist of a State-administered program applicable to other classes of wells. Federal regulations establish requirements for federally administered programs, and establish minimum requirements for State-administered programs. While EPA has oversight responsibility for delegated programs, UIC Programs in Alabama and Mississippi are primacy programs administered by one or more State agencies. Alabama's Department of Environmental Management (ADEM) prohibits injection of pollutants from Class I Wells below an Underground Source of Drinking Water (USDW); injection of wastes from oil and gas production (Class III Wells) is regulated by the Alabama State Oil & Gas Board; ADEM regulates Class III Wells involving solution mining of certain minerals, such as salt. Class IV Wells are banned national by federal regulations; all others (Class V Wells) comprise about 90% of permitted injection wells in Alabama. EPA regulates all classes of injection wells on Tribal lands in Alabama. For surface water discharges into waters of the U.S., applicants would need State-issued National Pollution Discharge Elimination System (NPDES) permits, or federally-issued NPDES permits if the receiving water were on Tribal lands. The UIC Program in Mississippi is implemented by the Mississippi Department of Environmental Quality (DEQ) and the Mississippi Oil & Gas Board. The Oil and Gas Board regulates Class II wells, and the DEW Management Support Brand, regulates all other well classes. In addition to Class II injection wells, Mississippi has Class I hazardous waste injection wells, Class I non-hazardous injection wells, ad Class V injection wells. EPA regulates all classes of injection wells on Tribal lands in Mississippi. For surface water discharges into waters of the U.S., applicants would need State-issued NPDES permits, or federally-issued NPDES permits if the receiving waters were on Tribal lands.	We agree with EPA that the discussion relating to waste water disposal should be more robust. The cumulative impacts discussion was expanded to address the concerns regarding brine waster reinjection under the water resources discussions in Sections 4.4.1 and 4.4.2. Additional information regarding State underground injection well control (UIC) programs have been included in Appendix D under the "Disposal of Produced Water" heading.
Page D-8: Section Disposal of Produced Water – The first paragraph, line 2: The text reads "…The preferred method for disposal of produced water will be disposed of through reinjection to a permeable formation of total dissolved solids (TDS) content higher than 10,000 mg/l*…" This asterisk references an avian raptor electrocution study, an unlikely source for TDS values, and is probably a typographical error.	The asterisk is a typographical error and corrections have been made in Appendix D.
Page D-9: Section Disposal of Produced Water—The information in the reference *Avian Power Line Interaction Committee (APLIC), 1996*. may be out of date. This publication has been updated with *The Avian Power Line*	This reference has been updated in the 2006 revision of this report.

Public Comment	BLM Response
Interaction Committee (APLIC), 2006. Suggested Practices for Raptor Protection on Power Lines: State of the Art 2006. APLIC, Edison Electric Institute, and the California Energy Commission. Washington D.C. and Sacramento, CA.	
EPA supports BLM's suite of Preferred Alternatives. Because of the high number of new wells that are estimated to be drilled on federal and non-federal lands over the next 20 years, we suggest a more robust discussion of the Alabama and Mississippi underground injection well control programs. EPA rates this draft EIS as "EC-2", that is, we have environmental concerns and suggest that the final EIS provide additional information on State UIC programs.	We agree with EPA that the discussion relating to waste water disposal should be more robust. The cumulative impacts discussion was expanded to address the concerns regarding brine waster reinjection under the water resources discussions in Sections 4.4.1 and 4.4.2. Additional information regarding State underground injection well control (UIC) programs have been included in Appendix D under the "Disposal of Produced Water" heading.
90-day Comment Period Shortened to 76 Days. Dear Reader letter, 3rd paragraph, 2nd sentence. "A 90-day comment period will begin with the date the Environmental Protection Agency (EPA) publishes the filing of this Draft RMP-EIS in the Federal Register." In JFO's September 2007 Newsletter (http://www.es.blm.gov/AL_MS_RMP/documents. php): "The document was published on August 17, 2007, and initiated the 90-day public review period. Written comments on the Draft RMP/EIS will be accepted until **November 15, 2007**." (See the attached JFO newsletter.) As per EPA's August 31, 2007 Federal Register Notice, the "**Comment Period Ends 11/29/2007**." **JFO has shortened the official 90-day comment period by 14 days**. What, if anything, can JFO do to rectify this major regulatory, procedural error? Will the public be notified they have more time to submit comments on the draft plan? If so, when and how will that be done? Will another Federal Register notice be published? Given the fact the public didn't have 90-days to comment on the draft plan, can any of these actions remedy such an astonishing error?	The BLM followed its regulations by providing the required 90-day comment period. 43 CFR §1610.2(e). The BLM did not shorten the comment period for the Alabama-Mississippi Draft RMP-DEIS. While there was an error in the newsletter that, unfortunately, was not noticed before its printing and distribution, the BLM adhered to its regulations and to the EPA's Federal Register Notice announcing the availability of the Draft RMP-DEIS and accepted comments until the close of the comment period, November 29, 2007.
Crucial Information Missing from Required FOIA Notification Dear Reader letter, 4th paragraph, 2nd and 3rd sentences. "Before you include your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment – including your personal identifying information may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so." As written, these statements sound more like a warning, than the required public notification required by FOIA and BLM's planning handbook. Offices must place the following or a similar statement in all notices ... Individual respondents may request confidentiality. If you wish to withhold your	The text noted in the "Dear Reader" letter notifies commenters that they can request that the BLM keep their information confidential. To quote: "While you can ask us in your comment to withhold your personal identifying information from public view…". That is the process the public should follow, and the BLM fully intends to keep personal information confidential to the extent permitted by law, as stated in the Dear Reader letter. The BLM will attempt to retain confidentiality of those commenters that requested that their information be withheld. However, as the text in the "Dear Reader" letter notes, all of the information submitted becomes part of the public record for the project. And, while this information will not be included in the documents that are publicly released, the information will be contained within the project record.

Public Comment	BLM Response
name or address from public review or from disclosure under the Freedom of Information Act, **you must state this prominently at the beginnin**g o**f your comments.** Such requests will be honored to the extent allowed by law (see Section I. C). (Bold added for emphasis.) JFO didn't advise the public on the process they're suppose to follow, to request confidentiality of their name and personal information. Will JFO staff contact people who sent comments, to see if they want their name and personal information kept confidential? If so, how and when will that be done? How will JFO document what they did? If people want their information kept confidential, how will their request be documented in writing? Include the correct FOIA notification text, in future Federal Register notices and Dear Reader letters, preferably the sample text that's provided in the planning handbook.	
BLM-administered Coal Dropped From the Draft RMP -EIS. **Alternatives Analyzed in Detail**, Section 2.4.1 Management of Federal Mineral Ownership. Page 2-9, last paragraph, 3rd sentence. "Proposed management for **coal leasing is presented in Section 2.3**, Standard Management Common to All Alternatives." (Bold added for emphasis.) Standard Management Common to All Alternatives, Section 2.3.12 Minerals. Page 2-6, 3rd paragraph, last two sentences. "Non-USFS FMO in the Warrior Basin would be available for further coal leasing considerations and limited to underground mining methods. BMP's would be applied as appropriate when processing a Lease by Application." Simply stating that BLM-administered coal will be available for future leasing, doesn't fulfill FLPMA and NEPA requirements. **JFO** dropped **BLM-administered** coal from the draft plan, with a single policy statement. There's no "proposed action" for leasing and developing BLM-administered coal in Alabama. There's no need for the coal data in Chapter 3 and nothing to analyze in Chapter 4. If minerals planning isn't conducted in the AL-MS Plan: JFO staff will need to prepare RMP amendments, before (1) lease by applications (LBAs) can be processed and (2) lease sales conducted by the Eastern States Office (ESO). JFO admits it won't do planning, for oil and gas minerals found (identified), after the plan is approved (see page 2-6, 2nd paragraph.). To be consistent with this management policy, JFO won't do planning for coal after the AL-MS Plan is approved. If minerals planning isn't done in this or RMP amendments, JFO will violate FLPMA, NEPA and other laws and regulations. Do the planning work that was supposed to have been done, for BLM-administered coal in the Draft AL-MS RMP-EIS.	As required by the BLM land use planning handbook, the RMP identifies areas for further consideration for coal leasing. This was included as an action Common to All Alternatives in Section 2.3.12 and was analyzed in Chapter 4 as required by NEPA. A coal development reasonable foreseeable development scenario was developed for the cumulative impact analysis in Section 4.4. The Council on Environmental Quality (CEQ) regulations for implementing the procedural provisions of the National Environmental Policy Act (NEPA) requires the agency to explore and evaluate all reasonable alternatives. 40 CFR §1502.14(a). Since the area available for coal leasing and associated reasonable actions was limited, the BLM determined that the best course for its management of this one resource was continuation of present management (the No Action Alternative) rather than a set of “false alternatives” in which the actions were not reasonable. The action included in the RMP is analyzed as part of the EIS and would allow any associated coal leasing action that falls within the scope of the management action to proceed, subject to subsequent NEPA analysis which may be tiered from the RMP-EIS. However, if the public were to have proposed an alternative for coal leasing, the BLM would have considered it as an option for the RMP.
Management Policy in Preferred Alternative, Isn't Legal or Enforceable Page ES-2, last paragraph, 2nd sentence. "For **some** of the surface tracts,	In the case of the Fort Morgan tracts, withdrawal of lands to USFWS would provide for their management as part of the National Wildlife Refuge System,

Public Comment	BLM Response
there would be **conditions placed on the disposal** that development and use of the tract would be consistent with the **resource management objectives and allowable uses** established for the tract" (Bold and underline added for emphasis.) Although it sounds good, how can JFO legally do what's stated in this sentence? Give good, clear, understandable and applicable examples, as to how RMP management conditions (objectives and uses) can be imposed on another federal agency or landowner, for **lands that are no longer subject to BLM planning after they're disposed**. Covenants are included in patents to protect pipelines and power lines. Can a covenant be included, to impose BLM management objectives and allowable uses on the land owner? What happens if they sell the land? Will BLM management objectives and uses be included in future land deeds? How legal and enforceable are RMP conditions, on BLM lands that are (1) transferred to another agency or (2) sold to an individual or company? With JFO's custodial management its lands, how would the JFO know, if RMP **conditions** weren't complied with? Provide information as to how the RMP management conditions will be enforced by JFO staff. What actions can the JFO take against an agency or landowner, if they do something other than what was established in JFO's AL-MS Plan? Does the management or ownership revert back to BLM if the agency or landowner doesn't comply with JFO's RMP conditions? It's stated on page 2-1 that alternatives must be viable. If JFO can't legally impose and enforce RMP management conditions on lands it disposes of this management policy isn't real, legal and enforceable. Drop this policy from Alternative 3. When this text is dropped, are the Lands and Realty sections the same for Alternatives 3 and 4? If so, drop one of the alternatives.	which would be deemed consistent with the management goals and objectives of Alternative 3. In the case of disposal from Federal ownership, Section 208 of the Federal Land Policy and Management Act gives the BLM authority to issue patents or other documents of conveyance with conditions and covenants as deemed necessary to protect the public interest. The conditions would constitute a covenant “running with the land,,” which means it stays with the property after resale. Covenants are legal conditions and the new landowner must comply with the covenants as conditions of ownership. Enforcement of covenants would be completed by the BLM using a compliance program similar to the compliance program used for lands patented under the Recreation and Public Purposes Act. Under this program, there are regular compliance examinations followed by legal action, if necessary.
Cooperating Agency Participation in JFO Plan. It's noted on the Title Page. The AL-MS Plan was prepared in cooperation with The State of Mississippi. Which state agencies were involved and what did they do? What information did they provide JFO staff? When did they provide the information? How was it submitted? How was it used in the preparation of the draft plan? The participation of the State of Mississippi is questioned, especially since JFO did planning on a single tract of BLM land. Of the **5,047 acres** of BLM land in Mississippi, planning was done on **174 acres or 3 percent of the BLM lands in Alabama and Mississippi**. There isn't information in Chapter 5, on the state's involvement and participation as a cooperating agency. If the State of Mississippi didn't participate in this project, remove the cooperating agency notation from (1) the title page and (2) other, similar statements in the draft	At the initiation of the planning process, the BLM invited cooperating agencies, including the State of Mississippi, which accepted the invitation. Part of the acceptance includes the option of sharing information, reviewing drafts, and performing similar duties. The State can decide whether to exercise the option after it has accepted cooperating agency status. During the planning effort, the BLM directly coordinated and/or shared information with several Mississippi State agencies, including the Department of Environmental Quality, the Department of Archives and History, and the Department of Wildlife Fisheries and Parks.

Public Comment	BLM Response
plan.	
1. ES-1, 2nd paragraph. "Within the two States, there are also **8,077 acres** of land with uncertain title. These are public domain lands according to General Land Office records, but may have private claims of ownership. The RMP **will** not **make management decisions on these lands per se;** however, these lands, which are listed in Appendix will be available for **disposal to qualified applicants under the Color-of-Title Act.**" (bold and underline added for emphasis.) a. It's stated "these are public domain lands according to General Land Office records." Where's the information, Eastern States and Jackson staff have on these lands? JFO staff has repeatedly visited these lands, throughout the years. b. What do you mean, "**The RMP will not make management decisions on these lands per se?** " Either you make decisions (1) on a tract-by-tract basis and (2) published them in the Alabama and Mississippi Records of Decision–or you don't. Without the benefit of land use pinning in the draft plan, the **JFO has (1) made decisions on 8,077 acres of public land and (2) published them in the draft RMP-EIS. The JFO decisions, make 8,077 acres**" available for disposal to qualified applicants under the Color-of-Title Act." How often is color-of-title (COT) cases completed by the Eastern States Office? Since few COT cases are ever completed, this management policy (and decision) is worthless and meaningless. Since COT work must be initiated by an applicant, very little work will be done, to resolve these land cases in the next 20 years. As more time passes, the resolution of future COT cases becomes even more difficult, complicated and costly for everyone. And as far the lands that remain in federal ownership, there won't be policy or decisions, as to how these lands will be managed and used for the next 20 years. Just as with the management policy (and decision) for future coal leasing, JFO has dropped 8,077 acres from the draft plan in a single sentence. If the Albuquerque and Farmington (New Mexico) BLM Offices had taken the same approach as the Jackson Office, work would never have been completed on (1) hundreds of Rio Grande and (2) hundreds of Navajo occupancy cases, respectively.	The BLM decided to exclude lands of uncertain title when developing resource management alternatives. These tracts are available for color-of-title disposal under all alternatives. The RMP alternatives, however, do not address BLM management of surface resources, because historic and current indications are that the private claims on most of these lands will prove to be valid and result in their eventual disposal. The BLM Eastern States is currently undertaking a lands identification program to identify potential color-of-title cases and resolve them.
2. Page i, 1st paragraph, 2nd sentence. "Within the two states BLM administers approximately 333 acres of public land surface. . . ." Page 4-35, 4th Paragraph, 1st sentence. "Under Alternative 2, the Coosa River, Fort Morgan Beach, Fowl River, and Geneva tracts **(a total of 114 acres or 71 percent BLM surface ownership in Alabama)…** ." Bold and an underline added for emphasis.	We cannot account for your acreage conclusions, as the acreages in our document do not add up to 10,839. As discussed in Section 1.3, "within the two States combined, the BLM administers approximately 333 acres of public land surface." This does not account for 8,077 acres of lands with uncertain title listed in Appendix B as these are public domain lands, according to General Land Office records, but have private claims of ownership. In the

Public Comment	BLM Response
Based on the information in the previous comment, these sentences are grossly misleading and incorrect. JFO has chosen to do planning on **333 of the 10,839 acres** under its administration in Alabama and Mississippi. **Planning was done on (about) 3 percent of the BLM land** (See **General Comment B5**). Using an estimated 1.5 million-dollar figure, it has cost the government **$4,500 an acre** for land use planning or **$50,000 per well** for minerals planning. (The 1.5 million-dollars are a conservative estimate, for the work performed by BIM and contract staff, from 2001 through October 2007. JFO proposes to complete the plan in 2008.) The **438-page draft RMP-EIS** is the size of many western BLM plans that address (1) millions of acres of BLM land and (2) thousands, if not tens-of-thousands of wells. The fact that 333 acres and 30 wells were addressed in a plan, that's projected to take seven years to write and cost more than 1.5 million-dollars, raises serious questions. What have JFO and Washington Office (WO) and contract staff been doing on this project? How have planning (and non planning) dollars been spent on this project? It's hard to believe one of the top 10 contractors in the world, is working on AL-MS Plan. (This contractor has and is preparing other BLM plans in the west.) This raises further questions, as to **how JFO managed the project**. Did JFO staff check the work submitted by BLM and contract staff to make sure it was complete and correct, i.e., quality control? **The Jackson Field Office has to take full responsibility for this grossly deficient, inaccurate, inadequate and unacceptable document.** JFO is responsible for what goes into the document–not contract staff. JFO is for management of the entire project–schedules and dollars. And last, but not least, JFO is responsible for complying with FLPMA, NEPA and other laws and regulations. JFO needs to do the land use planning, it was supposed to do for this project. They need to prepare another Draft AL-MS RMP-EIS and send it out for a 90-day comment period. It needs be prepared in accordance with (1) FLPMA, NEPA and other laws and regulations and (2) BLM manuals and handbooks. This includes the Bureau's Special Program Guidance for preparing Reasonable Foreseeable Development Scenarios (RFDSs) for oil and gas and coal.	case of the Little River Canyon tract, the area was established as a National Preserve and made a unit of the National Park System by Public Law 102-427 on October 21, 1992. Once it was determined that all of the public domain lands in Little River Canyon are within the boundaries of the National Park Service (NPS) unit, they were dropped from the planning effort. The Little River Canyon tracts are included in the withdrawn lands Appendix I (page I-6). As discussed in Section 2.3.14, lands of uncertain title are claimed by private owners but government land records show that they were not transferred from Federal ownership. Tracts with uncertain titles would be handled on a case-by-case basis in accordance with the Color-of-Title Act, under which claimants may apply for transfer of these tracts and, if qualified, purchase the tracts to obtain title. Appendix B provides a list of lands of uncertain title occurring within the planning area. The RMP alternatives, however, do not address BLM management of surface resources, because historic and current indications are that the private claims on most of these lands will prove to be valid and result in their eventual disposal. As background, the Jackson Field Office was directed to prepare the Alabama-Mississippi RMP-EIS to fulfill the land use planning mandate of the Federal Land Policy and Management Act of 1976. The planning effort addressed the Federal mineral estate (not including National Forest lands) and the scattered public domain surface tracts in this two-State area. It is true that RMPs have become increasingly complex and lengthy documents. The templates being used for most RMPs in the BLM have been refined to meet regulatory needs in an effort to meet legal mandates and to withstand legal challenges.
3. Page 2-7, Standard Management Common to All Alternatives, 2.3.14 Lands and Realty. "After this plan is approved it is expected that some **additional surface tracts** may return to BLM administration after revocation of withdrawals, reversion of R&PP lands and resolution of title. These **additional surface tracts will be managed according to applicable guidance of this plan.**"	This management statement is intended to capture any unforeseen tracts that the BLM must administer by applying the general management theme of the alternative selected to the tracts. Any proposed action would require a determination of consistency with the Approved RMP. If the proposed action is not consistent, plan amendment would be required before the approval of the action could be allowed.

Public Comment	BLM Response
JFO staff knows the resolution of the title, clears up any confusion of the government's (BLM's) ownership of the land–lands which have remained under the administration of the BLM. Is this management policy included, to **avoid planning for land tracts that weren't covered in the draft plan**? Additional BLM lands, would further reduce the amount of land (4 percent) covered in the draft plan. JFO admits it will find additional BLM land tracts, after the AL-MS plan is approved. As per the second sentence, JFO is establishing its own land use planning policy. JFO states, new land tracts will automatically be covered by a plan that didn't address them during the 2001 to 2008 planning. Documentation of new BLM land tracts, and their management and use, will be performed through the BLM's plan maintenance process. As per BLM's planning handbook (H-1601-1), "Maintenance must not expand the scope of resource uses or restrictions or change the terms, conditions, and decisions of the approved plan." New land decisions (and actions) after the AL-MS Plan is approved, **will expand (add to)** the (1) amount of the acreage covered in the plan and (2) resource uses or restrictions on BLM lands and (3) decisions recorded in the Alabama and Mississippi Records of Decision. According to JFO's planning policy on page 2-7, this office doesn't have any intention of complying with one of the most important sections in BLM's planning regulations (see Title 43 Code of Federal Regulations (CFR) Subpart 1601.5-3 **Conformity and implementation**.) (a**) All future resource management authorizations and actions**, as well as budget... shall conform to the approved plan. (c) If a proposed action is not in conformance, and warrants further consideration before a plan revision is scheduled, such consideration shall be through a plan amendment in accordance with the provisions of §1610.5-5 of this title. JFO's policy to manage new surface tracts (1) in accordance with policy and decisions -made for other land tracts and (2) without the benefit of any land use planning–isn't legal. Rewrite it to reflect what's legally required for future planning of BLM land tracts.	
4. Why were the BLM lands, in the Little River Canyon Preserve, omitted from the Draft AL-MS RMP-EIS? There's no mention of the tract in the document. It's not even listed as lands of uncertain title in Appendix B. Is this one of the "**additional surface tracts**" that's **alluded to in Section 2.3.14** on Page 2-7? This tract is essentially the same as the Jordan Lake and Hancock County tracts. It's noted on page 3-63, 4th paragraph. The Hancock County tract was patented to the University of Mississippi in	In the case of the Little River Canyon tract, the area was established as a National Preserve and made a unit of the National Park System by Public Law 102-427 on October 21, 1992. Once it was determined that all of the public domain lands in Little River Canyon are within the boundaries of the National Park Service (NPS) unit, they were dropped from the planning effort. The Little River Canyon tracts are included in the withdrawn lands Appendix I (page I-6).

Public Comment	BLM Response
1961, under the authority of the R&PP Act . . . Under terms of the patent, the tract is to be used only for recreational and research site purposes. The patent contains a clause stating that ownership of the surface estate will **revert to the United States if the land** is **devoted to a use other than that for which the land was conveyed.** The former BLM lands, which are within the Little Canyon River Preserve, reverted back to BLM when DeKalb and Cherokee Counties stopped using them, for the purposes approved and permitted by the BLM. See http://www.nps.gov/archive/liri/Natural/Natural.htm for information on the preserve. This is "**one of the longest and deepest canyons in the eastern United States…dominated by cliff and gorge walls**." It's a premier piece of property, with a wild and scenic river–one that most western BLM offices would covet–and one they would retain and manage intensively. Decisions made by JFO management in 2004 and 2005, were to be presented for this land tract in Section 2.3.14 of the draft plan. Although there was limited text in the document, **the 2,400-acre Little River Canyon tract, was in JFO's 2005 Preliminary Draft AL-MS RMP**. The planning work performed for this tract, is in JFO's process records and contractor project files. Include the Little River Canyon tract and the other BLM lands (8,077 acres) in Chapters 1 through 4. Identify (and analyze) a full range of alternatives for these lands. As for the Little River Canyon tract, an alternative is proposed to (1) provide BLM funding and staff and (2) jointly manage the BLM portion of the Little River Canyon Preserve, with the U.S. Park Service. It's a viable alternative for both agencies, particularly with perpetual budget cuts in program dollars and staff.	
5. The omission of the 2,400-acre Little River Canyon tract from the draft plan, raises serious questions about the lands information in the document. Based on ESO, JFO and General Land Office records, how much BLM land is there in Alabama and Mississippi? How complete and correct are the lands lists in Appendices A, B and I? Isn't there more than one Corps of Engineer (COE) withdrawal in Alabama and two COE withdrawals in Mississippi? The addition of the 2,400-acre Little River Canyon tract changes the 8,439-acre number to 10,839. JFO has chosen to do planning on 333 of the 10,839 acres under its administration in Alabama and Mississippi. **Planning was done on (about) 3 percent of the BLM land.**	The BLM made a concerted effort to identify and include any lands that should be included as part of the RMP effort. If a tract did not reasonably fall within the BLM's administration, the tract was dismissed from further planning. In the case of the Little River Canyon tract, the area was established as a National Preserve and made a unit of the National Park System by Public Law 102-427 on October 21, 1992. Once it was determined that all of the public domain lands in Little River Canyon are within the boundaries of the NPS unit, they were dropped from the planning effort. The Little River Canyon tract is 1,625 acres, not 2,400 acres. We consider that it was proper to develop management alternatives for the 333 acres administered by the BLM identified in the RMP. Lands with uncertain title are addressed in the RMP, but we did not develop the BLM management alternatives because they are claimed by private owners. In addition, the Little River Canyon tract is administered by the NPS, who administers and plans for these lands. (Also see response to your comment regarding planning on 3

Public Comment	BLM Response
	percent of BLM land.)
a. There isn't information, as to whether Alternatives 3 and 4 include the sale of federal land. Does disposal include land sales? If not, include sale in one or both alternatives. Clearly provide information on all the methods of disposal the public can participate in, in obtaining Fort Morgan highway and beach tracts.	This information is included in management common to all alternatives for lands and realty (Draft RMP-DEIS Section 2.3.14). Disposal includes sale, exchange, or Recreation and Public Purposes Act (R&PP) conveyance as defined by FLPMA. The Glossary of the Draft RMP-DEIS defines disposal to include land sale.
b. What is the current assessed value of each of the highway and beach tracts? Provide this information, so the public will have an idea of the fair market value of the lands–an important factor in the sale (or exchange) of federal land. (Based on Baldwin County tax records, the beach tracts are assessed at hundreds-of-thousands of dollars. At one time, one tract was assessed at $300,000 and another at $400,000.) Include this information in the Social and Economic sections of the draft plan.	The RMP provides management direction over the next 20 years, and, as such, land sales or exchanges can occur at any point during that time. Since land value fluctuates, including such information is not deemed necessary to analyze impacts at the RMP-EIS level. Fair market valuation would be part of the process for each disposal action during RMP implementation.
c. Having been to these tracts, there are power lines and pipelines, outbuildings, roads and their uses of Fort Morgan highway and beach tracts. This information is missing from the draft plan. It needs to be included, to (1) address the current uses of BLM land and (2) analyze the effect of JFO land use decisions on these uses. Whether the uses are authorized or unauthorized, include this information for each tract. Include information on the uses occurring on lands adjacent to the BLM tracts. People have to drive across BLM land to get to their homes. Based on what I could see from the highway, they looked like they were expensive homes.	Tract descriptions have been revised to include this information in Sections 3.3.2 and 3.3.3. However, this plan is part of a multi-year process, and the actual situation may differ from the baseline data gathered for the document.
d. If a person wants to buy (or exchange) any of these tracts, how would existing land uses be resolved, to allow for future land sales (or exchanges)? What's the process for resolving unauthorized uses of BLM lands? How long does it take to resolve these problems? Include this information in the draft plan.	Existing land uses and unauthorized uses would be resolved at the time of the sale or exchange. As stated in Draft RMP-EIS Section 2.3.14, “Resolution of unauthorized use would be pursued on a case-by-case basis. Resolution would include termination of use and payment of damages, including reclamation of disturbed land, if needed. In some cases, use may be authorized through ROWs, permits, leases, or land disposal. Valid authorizations would be protected if the land undergoes disposal.”
e. It's stated in Alternative 4 that land would be disposed of without any restrictive covenants. Although this statement is made, wouldn't there be covenants or restrictions to protect power lines, pipelines, legal access, etc.? If so, what would they be? How are the covenants or restrictions written? How long will the landowner be required to comply with covenants?	As stated in Draft RMP-EIS Section 2.3.14, “Valid authorizations would be protected if the land undergoes disposal.” These are not considered restrictive covenants, as was included as part of Alternative 3. Valid authorizations are third party rights protected when a patent is issued. A covenant, in the context of this RMP, would be a use restriction to protect specific resource values or uses.
f. It's stated "Disposal may not be allowed if they would jeopardize Federally-listed species or designated critical habitat." Based on (1) resource data, (2) impact analysis of threatened and endangered species (T&E) and (3)	Chapter 3 identifies tracts that have threatened and endangered (T&E) species or species concerns. We do know which tracts are affected by T&E, but we don’t know if there is a mitigation or offset that could allow disposal

Public Comment	BLM Response
input by the U.S. Fish and Wildlife Service (USFWS), how many of the Fort Morgan tracts won't be available for disposal? Based on the planning and environmental work done for this plan, JFO staff should know which tracts won't be disposed of because of T&E species and habitat. **If none of them will be disposed of, this isn't a real management action (and policy) in Alternative 4**. If that's the case, drop it from Alternative 4.	during implementation. Future disposal actions could include mitigation, offsets, or compensation relative to impacts on T&E species and habitat. These measures would be developed and applied during plan implementation.
g. What mitigating measures can a person submit, with an application for a land sale (or exchange), to mitigate tentative impacts to T&E species? The Endangered Species Act (ESA) allows for actions to proceed, when impacts to species or habitat can be mitigated? Land and homeowners must be complying with this ESA provision, to get approval from the USFWS, for the renovation or new construction of homes and businesses on Fort Morgan Peninsula.	As discussed in Draft RMP-EIS Section 2.3.14," Lands may be exchanged as authorized by Section 206 of FLPMA when the exchange would serve the national interest and benefit the BLM programs or the programs of other Federal agencies." The ESA allows for actions to proceed with mitigation of impacts in consultation with USFWS. The BLM created a suite of alternatives that serves the spirit and intent of FLPMA, as noted in the excerpt above. Mitigation would be developed and consultation would occur with the implementation of disposal actions.
h. It's stated **"Land exchanges to benefit Federally-listed species would be permitted**." Since JFO can only perform land use planning, for the lands under its administration, will this management action (and policy) be implemented by JFO staff? If so, **what lands in Alabama do JFO staff want to acquire that will "benefit Federally-listed (T&E) species**?" It's stated in the same alternative that "Disposal may not be allowed if they would jeopardize Federally-listed species or designated critical habitat." As written, the management actions (and policy) in Alternative 4 don't make any sense. It sounds like gobbledygook. Or worse, **is it a way to avoid stating BLM's real intentions for the Fort Morgan tracts**? 1. Since JFO's preferred alternative is to transfer the lands to the USFWS, was a management action (and policy) put in to supposedly validate future land exchanges, of former BLM land, by the USFWS? **2. Is it the intention of both agencies for the USFWS to** **(a) exchange Fort Morgan lands for other lands it wants,** **(b) apply such restrictive T&E policy to former BLM and USFWS lands and** **(c) essentially retain de facto (governmental) management of the Fort Morgan tracts?** As written, the management actions (and policy) in Alternative 4 are contradictory and cancel each other out. Rewrite or drop them from the alternative.	In the surface tract alternative tables (Table 2-6 through Table 2-12) under the revised Alternative 3, which is the Proposed Plan, none of the Fort Morgan tracts would be available for exchange or other disposal from Federal ownership. In the surface tract alternative tables (Table 2-6 through Table 2-12) under Alternative 4, the BLM does not have particular exchanges in mind, but important values may be identified at a later date. This alternative would allow the BLM to exercise that option.
i. Although not stated as such, is Alternative 4 JFO's Preferred Alternative? Does it accomplish more objectives than Alternative 3? Regardless of which alternative is picked, will both fulfill JFO's perpetual, pre-FLPMA mission, policy	The BLM clearly selected Alternative 3 as the preferred alternative in the Draft RMP-EIS to relay to the public the BLM's chosen intentions for all of the tracts

Public Comment	BLM Response
and work–to continue to dispose of the lands it's mandated to retain and manage under FLPMA? Is Alternative 4, a win-win alternative for (a) one agency that wants to avoid management of its lands and (b) another agency, who covets both the Fort Morgan tracts and other lands in Alabama or another state?	and non-USFS FMO, including the Fort Morgan tracts. Under the revised Alternative 3, which is the Proposed Plan, none of the Fort Morgan tracts would be available for disposal from Federal ownership.
j. Information isn't presented, as to how BLM land would be transferred to the USFWS. A federal law would need to be passed, to give USFWS title to BLM's Fort Morgan land. **Without the title, USFWS wouldn't be able to legally conduct a land exchange with the former BLM lands, on Fort Morgan Peninsula**. Provide information as to the (1) different mechanisms for transferring land to the USFWS, (2) terms of each type of transfer and (3) limitations on what USFWS could do with former BLM lands.	Withdrawal to the USFWS could be completed without legislation. The BLM would administratively transfer the land to the USFWS in a withdrawal (43 CFR 2300). The terms and limitations would be included in the withdrawal language and would follow the goals and objectives as provided in the proposed RMP.
k. Since land exchanges are mentioned in Alternative 4, what's the process for submitting an application to the BLM? (Land exchanges are conducted between members of the public and BLM offices in the west?) Describe the process for conducting a BLM land exchange. Include information as to how an exchange (1) could change (impact) the dynamics of current and future uses of the Fort Morgan tracts and (2) the uses of adjacent lands, homes and businesses.	In the surface tract alternative tables (Table 2-6 through Table 2-12) under the revised Alternative 3, which is the Proposed Plan, none of the Fort Morgan tracts would be available for exchange or other disposal from Federal ownership. In the surface tract alternative tables (Table 2-6 through Table 2-12) under Alternative 4, the BLM does not have particular exchanges in mind, but important values may be identified at a later date. This alternative would allow the BLM to exercise that option. Exchanges are open to members of the public, as well as State or local government. Exchanges would be conducted in accordance with the BLM laws and regulations as outlined in the BLM's Land Use Handbook. The potential impacts associated with the lands and realty actions for each of the tracts under the alternatives are evaluated under cumulative impacts, which is based on a reasonably foreseeable scenario developed by the BLM. Site specific NEPA analysis would evaluate impacts on the uses of adjacent lands, homes, and businesses.
l. What would be the benefits or drawback, of relinquishing federal ownership of the Fort Morgan tracts? How would disposal of Fort Morgan highway tracts, affect (impact) the people that have to drive across BLM land, to get to their homes, a small strip mall and volunteer fire station?	In the surface tract alternative tables (Table 2-6 through Table 2-12) under the revised Alternative 3, which is the Proposed Plan, none of the Fort Morgan tracts would be available for exchange or other disposal from Federal ownership. Thus, existing rights would be maintained and existing uses would be authorized. The potential impacts associated with the lands and realty actions for each of the tracts under the alternatives are evaluated under cumulative impacts, which is based on a reasonably foreseeable scenario developed by the BLM.
n. Western BLM offices address the management of their lands in, near or adjacent to towns. Their RMP decisions are based on public input and the analysis conducted in their RMP's. Is this an instance, where JFO needs to select an alternative to keep (retain) the highway tracts, when it makes	The management of the surface tracts, including those near or adjacent to towns, is included in the Draft RMP-EIS. Alternatives were developed based on professional knowledge and any input provided by the public. Impact analysis was provided in Chapter 4 of the Draft RMP-EIS.

Public Comment	BLM Response
decisions for the AL-MS RMP-EIS?	
1. Page 1-2, footnote 1, last sentence. "In the case of metes and bounds and lot number descriptions, **the acreage reflects that of the entire section** associated with the description, otherwise known as "nominal acreage." (Bold added for emphasis.) Even though 5, 10, 20, 40, 80, or 120 acres may have been leased in the section (nominal acreage)–the entire section (about 640 acres) was included in the total acreage leased for oil and gas development. How many times did JFO staff count the whole section and not the "nominal acreage" that was leased in the section? This approach **inflates the amount of leased acreage presented in the dra**ft **plan**. The question is, by how much? What's the actual acreage that's been leased for BLM oil and gas minerals? How much of a difference is there, between what's actually leased and the numbers used in the draft plan? Change the acreage numbers, to accurately reflect what's currently leased for oil and gas.	The RMP was developed with existing information without additional adjudication of land title records. The aliquot part methodology described in Chapter 1 (Table 1, footnote 1) does tend to inflate acreage, but it does also assure that mineral ownership is accounted for and that potential impacts on resources are identified and considered. This methodology did not affect the number of wells anticipated or amount of disturbance expected.
2. Page 1-2, footnote 1, first sentence. "Where one or more mineral resource categories are Federally-owned, **the acreage is listed as if all minerals are Federally-owned."** See the previous comment. This approach inflates the amount of acreage presented for BLM minerals? Again the question is asked–by how much? Based on this and other statements in the plan, JFO makes a good case for not knowing how much or where their minerals are. Further, how does this approach account for those instances, where BLM owns a percentage of the minerals? In some cases, BLM owns less than 50 percent of the minerals. When the government owns so little of the minerals, why doesn't the BLM dispose of them? Minerals planning needs to be done in the AL-MS Plan, to allow for the future disposal of these minerals. JFO staff knows these mineral leases are. Include information in the document, for these leases. Include management policy, alternatives and impact analysis for the future disposal of these minerals.	All categories of FMO were included, and fractional Federal interests were included. Acreage was not counted more than once. This methodology did not affect the number of wells anticipated or amount of disturbance expected.
3. Page 2-6, 2nd paragraph, 1st sentence. "After this plan is approved it is expected that additional FMO will be identified or acquired." (Bold added for emphasis.) To acknowledge and state that JFO expects to find FMO it has missed, is an **admission of incomplete minerals data in the Draft AL-MS RMP-EIS.** This, by itself raises serious questions, as to how complete and reliable the data is. Add to that, questions about **inflating FMO acreage numbers** in Tables 1-1 and 1-2 and the entire mineral's section is fatally flawed and unusable. If planning wasn't performed for all the FMO, then the corresponding question	The RMP was developed with existing information without additional adjudication of land title records. The aliquot part methodology described in Chapter 1 (Table 1, footnote 1) does tend to inflate acreage, but it does also assure that mineral ownership is accounted for and that potential impacts on resources are identified and considered. This methodology did not affect the number of wells anticipated or amount of disturbance expected. The RMP is a living document and can be modified by maintenance actions and adaptive management, or Plan amendments, if needed, as discussed in

Public Comment	BLM Response
can be asked. How much BLM planning was performed for FMO that doesn't exist?	Appendix K.
4. Page 1-2, Table 1-1, D. Lands of uncertain title. If minerals analysis will be conducted on a statewide basis, why weren't the 3,057 acres included with the **159-acre figure** listed in Table 1-1? As is shown in Table 1-1 and noted in footnote 5, **JFO didn't perform land use planning for 3,057 acres of BLM land (or minerals)** in Alabama. (The same is true for 5,047 acres in Mississippi.) If minerals analysis will be conducted on a statewide basis, include the 3,057 (and 5,047) acres in Tables 1-1 and 1-2. Make the necessary text changes in this and other, sections of the draft plan, preferably in another draft.	The BLM decided to exclude lands of uncertain title when developing resource management alternatives. Historic and current indications are that the private claims on most of these lands will prove to be valid and result in the eventual sale of the tracts under the Color-of-Title Act. Therefore, it is expected that most of this land is not Federal land, and thus should not be included in the RMP-EIS.
5. Page 1-2, Table 1-1, **C. Federal agency…Federal minerals.** JFO didn't include acreage figures, for the federal minerals under each surface managing agency or their special management areas. There's no way to know, how JFO staff came up with the 10,220 acre figure in Table 1-1. The following acreage figures were found for six of the 14 special management areas (SMAs) listed in Table 3-8 (see pages 3-35 and 3-36). Except for the Little River Canyon Preserve, there wasn't information on the amount of federal land in the refuges and military installations. These acreage figures are for the total acreage in the SMA. **Little River Canyon Preserve** **14,000 acres** http://www.nps.gov/archive/liri/Acreage/Acreage.htm Bon Secour National Wildlife Refuge 7,000 acres http://wwvv.fws.gov/bonsecour/ **Wheeler National Wildlife Refuge** **35,000 acres** http://www.fws.gov/wheeler/info/facts.htm **Fort McClellan Military Reservation** **45,679 acres** http://www.globalsecurity.org/military/facility/fort-mcclellan.htm **Anniston Army Depot** **15,000 acres** http://www.anad.army.mil/history.shtml **Redstone Arsenal** **37,910 acres**	The acreage for Federal agency surface land–Federal minerals indicated in Draft RMP-EIS Table 1-1 (10,220 acres) is derived from the acreages contained in Table 3-7 in Chapter 3 of the document, which includes 1,495 Department of Defense (DoD) acres; 3,300 NPS acres; 3,384 USFWS acres; and 2,041 acres for other Federal agencies. Acreage in the tables includes only the confirmed FMO beneath the surface acreage.

Public Comment	BLM Response
http://www.garrison.redstone.army.mil/sites/about/facts.asp Total 154,589 acres Based on the amount of land in these special management areas, there's more than 10,220 acres of federal minerals, under surface managing agency lands. There's **10,338 acres** of federal land in the Little River Canyon Preserve. In addition to the omission of acreage figures, for special management areas, the list in Table 3-8 isn't complete. For example, only two of the 11 national wildlife refuges (NWRs) are listed in Table 3-8. See the attached map, for a list of the surface managing agencies and their special management areas (see http://nationalatlas.gov/printable/images/pdf/ fedlands/al.pdf).	
6. It's noted on page 2-1 "Oil and gas leasing of BLM-administered non-United States Forest Service (USFS) Federal mineral ownership (FMO) could occur anywhere in the state (Alabama); therefore a statewide perspective is needed. . ." If a statewide approach is used, JFO staff needs to compile a complete list of surface managing agencies. Include the (1) federal minerals acreage, for each special management area, (2) Corps of Engineer lands and facilities and (3) each agency's leasing stipulations, for each special management area. Based on **the federal laws that established wildlife refuges, national parks, military installations**, etc., how much of the federal minerals are open or legally closed to leasing and development? How much of the mineral acreage, inside these special management areas, was leased before the refuge, park, installation, etc. was established? The Grand Gay NWR was established in 1992. The Kay Cave NWR was established in 1997. The Cahaba River NWR was established September 25, 2002 and the Mountain Longleaf NWR in May 29, 2003. It's assumed the same type of errors are in Tables 1-2 and 3-17. Just as with the surface managing agencies in Alabama, complete and correct information needs to be presented for Mississippi.	The acreage for Federal agency surface land–Federal minerals indicated in Draft RMP-EIS Table 1-1 (10,220 acres) is derived from the acreages contained in Table 3-7 in Chapter 3 of the document, which includes 1,495 DoD acres; 3,300 NPS acres; 3,384 USFWS acres; and 2,041 acres for other Federal agencies. The same applies for Table 1-2 and Table 3-16 for Mississippi. Acreage closed to leasing is identified in Table 2-3 and Table 2-4.
7. Pages 1-1 and 1-2, Tables 1-1 and 1-2. Pages 2-10 through 2-17, Tables 2-3 and 2-4. A **10,220 acre figure** is presented in Table 1-1, while an **8,179 acre figure** is presented in Table 2-3. Why are the numbers different? Based on the information in the tables, there's no way of knowing what happened to the 2,041 acres. Are there errors, in the numbers used in the tables? Or did JFO staff develop leasing stipulations for 2,041 of the 10,220 acres? If so, there's no way of knowing, which leasing stipulations apply to surface managing agency lands.	The 10,220 acres in Table 1-1 indicate the total acreage for Federal agency surface land–Federal minerals while the 8,179-acre figure in Table 2-3 represents the amount of these lands where leasing is not allowed. The remaining area (2,041 acres) is included as part of the 305,640 acres open to leasing subject to standard lease terms and conditions. The same applies to the acreages for Mississippi indicated in Table 1-2 (116,350 acres) and Table 2-4 (63,004 acres). As part of the planning process, the surface managing agencies were contacted regarding information on mineral leasing on their lands. That information is included in Tables 3-8 and 3-17. Additionally, Section 2.3.12

Public Comment	BLM Response
Did surface managing agencies review, and agree to BLM stipulations developed for their lands? Where are agency leasing stipulations? They need to be included in BLM's draft plan. There's an even bigger discrepancy, for the federal minerals under surface managing agencies in Mississippi. A 116,350 acre figure is presented in Table 1-2, while a **63,004 acre figure** is presented in Table 2-4. Why is there such a big difference in the acreage numbers? Did JFO staff develop leasing stipulations for **53,346** of the 116,350 acres? If so, there's no way of knowing, which leasing stipulations apply to surface managing agency lands. Did surface managing agencies review, and agree to BLM stipulations developed for their lands? Where are agency leasing stipulations? They need to be included in BLM's draft plan. Clearly present the geographic location for each (1) surface managing agency and (2) the areal extent of the leasing stipulations on their lands. Provide information in the text, to distinguish between leasing stipulations for (1) surface managing agency lands and (2) other surface owners, i.e., private, state, Indian, BLM, etc. Also include the number of active, shut in and plugged and abandoned (P&A'd) wells on each special management area.	indicates that "the BLM would apply stipulations to oil and gas leases as determined through this plan; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease approval process."
8. JFO's Reasonable Foreseeable Development Scenario, for oil and gas leasing and development (drilling) in Alabama and Mississippi, doesn't comply with BLM's Special Program Guidance (1624) for preparing RFDSs. As a result, there's very little leasing and development information in the draft plan. Hundreds-of-thousands of acres, of leasing stipulations were developed for Tables 2-3 and 2-4. Based on the type, number and extent of the **wildlife and T&E leasing stipulations**, it looks like they were developed for **an undeveloped oil and gas basin**. Based on the long history of oil and gas development in Alabama and Mississippi, how much unleased, federal mineral acreage is there? How many federal leases are there? Of that number, how many are held by production, i.e., one commercially producing well on the lease? How many of the leases are 10-year leases? When will they expire? Where are the leases located in Alabama? Without this information, there's no way of knowing how much of the federal minerals would be available for leasing, during the 20-year life of the plan. **The development of BLM's proposed, wildlife leasing stipulations are meaningless, if very little of the 705,183 acres will be available for leasing, during the life of the plan.** There's no way to (1) perform impact analysis and (2) assess the effectiveness of the numerous leasing stipulations. **This may have been a paperwork exercise that will have little bearing, if any, on future oil and gas**	The Reasonable Foreseeable Development Scenario (RFDS) is based on 20 years of previous oil and gas activity on Federal mineral estate within the two States. The RFDS was prepared in 2004, and the number of wells drilled on Federal mineral estate continues to be consistent with that RFDS projection, even with the current oil and gas market. The wildlife and T&E stipulations were developed in consultation with USFWS. All acreage was appropriately included in the analysis whether currently or previously leased. Current leases may expire before development occurs. The stipulations would be applicable to new leases.

Public Comment	BLM Response
leasing of federal minerals in Alabama and Mississippi.	
9. Page 3-30, 2nd paragraph, last sentence. "As of April 2005, there were 31 active oil and gas wells on BLM-administered non-USFS FMO according to data from the Automated Fluid Mineral Management System." (Bold added for emphasis.) Based on the problems with the document, how correct is the well number? Since the well information is based on April 2005 data, what's the current active well number? How many wells are shut in? How many wells have been P&A 'd? In addition to AFMMS data, what information is presented in LR 2000? Where is the active, shut and P&A'd wells in the Warrior and Southern Alabama Basins? How many of the active, shut in and P&A'd wells are on surface managing agency lands? Provide this information for each agency's special management area.	April 2005 data were used as baseline information for development of the Draft RMP/EIS and was provided in Chapter 3. This plan is part of a multi-year process and the current situation may differ from the baseline data initially gathered for the document. Current AFMMS data indicates no significant change from the 2005 data. The data will be reevaluated during the 5-year RMP evaluation, and, if changes are necessary, they will be addressed at that time, as discussed in Appendix K. The information on wells that is presented in the RMP-EIS was adequately detailed for the analysis of the alternatives.
1. Abstract, page i, 1st paragraph, 2nd sentence, ". . and 704,850 acres of Federal minerals. . ." Are the 704,850 acres federal oil and gas acreage? If so, say so. The question is raised, because Alabama coal is mentioned in the draft plan. How many acres of BLM coal are there in Alabama?	This acreage includes Federal oil, gas, and coal. Therefore, the use of the broad term “Federal minerals” is appropriate. A description of the coal in Alabama was provided in Chapter 3, Section 3.2.10, of the Draft RMP-EIS. Consideration of Alabama coal leasing in this RMP is limited to the Warrior Coal Field. Within the Warrior Coal Field, the BLM retains 70,610 acres of coal mineral rights.
2. Abstract, page i, 1st paragraph, 2nd sentence, "BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies…” What do you mean, when you say BLM has responsibility for the minerals under surface managing agencies? Is BLM saying it's responsible for the planning work, for the federal minerals under surface managing agency lands? How much involvement have other agencies had in the preparation of BLM's draft plan? Have they supplied information that's been used in the plan? Were they contacted? These questions are raised, because it looks as though there wasn't any input from surface managing agencies. Based on the answers to these questions, make the appropriate text changes in Chapters 1 and 2. Rewrite this sentence, to clearly state what BLM is legally responsible for doing on the 126,570 acres of federal minerals. See **General Comment C5** on the 126,560-acre figure for surface managing agencies.	The BLM administers the mineral estate under other surface-managing agencies, which includes planning for the mineral leasing and permitting oil and gas wells. The surface-managing agencies are responsible for the surface uses. As discussed in Chapter 2, Section 2.3.12, “BLM-administered non-USFS FMO under the jurisdiction of another Federal surface managing agency would be available for exploration and development as directed by the surface managing agency. … the BLM would apply stipulations to oil and gas leases as determined through this plan; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease approval process.” During the planning process, surface managing agencies were contacted to determine mineral leasing restrictions. Information provided from these agencies was included in Tables 3-8 and 3-17. As it relates to management, the BLM would apply stipulations to oil and gas leases as determined through this RMP; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease-approval process (See Section 2.3.12).

Public Comment	BLM Response
3. Abstract, page i, 1st paragraph, 3rd sentence, "For the purposes of this document, RMP mineral leasing decisions will apply to "BLM-administered non-USFS federal mineral ownership (FMO), which refers to BLM-administered Federal minerals where the surface estate is in non-Federal ownership and Federal agencies excluding USFS." (Bold added for emphasis.) This is a very confusing statement. **Can BLM make leasing decisions, for the minerals under surface managing agencies?** Since leasing decisions influence the impacts on surface managing agency lands, don't the agencies make the leasing decisions? Don't the agencies develop their own leasing stipulations? If so, what's done with the leasing-stipulations developed by BLM staff? Did the agencies review BLM's leasing stipulations for the minerals under their lands? Did they get the opportunity to agree or disagree to BLM leasing stipulations, or do they have no say in the matter? Surface managing agency leasing stipulations, need to be included in the draft plan. Based on the answers to these questions, make the appropriate text changes in Chapters 1 and 2. Rewrite this sentence. Clearly state BLM's role and its RMP decisions, in the leasing of federal minerals under surface managing agencies.	The BLM can make leasing decisions considering the recommendations of the surface managing agency. The surface managing agency plans for the surface uses of the lands. During Plan implementation the BLM would consult with the surface managing agency before leases are approved. Both the BLM and surface managing agency stipulations would be applied to the lease.
4. ES-1, 1st paragraph, 4th sentence, "On these lands, oil and gas leasing of Federal minerals is subject to management as directed by the surface managing agency, and the **decisions of this RMP will pertain only to BLM's role in administering the minerals**." (Bold added for emphasis.) See the previous comment. Based on the statement that ". .**oil and gas leasing of Federal minerals is subject to management as directed by the surface managing agency**… ," will each agency make the leasing decisions, for the minerals under their lands? If not, why not? Who makes the decision for leasing minerals under surface managing agencies? What does it mean, when it says ". . .**decisions of this RMP will pertain only to BLM's role in administering the minerals**?" Based on the answers to these questions, make the appropriate text changes in Chapters 1 and 2. Rewrite this sentence. Clearly state how BLM's RMP decisions influence any aspect of the leasing and development, of federal minerals under surface managing agency lands.	As it relates to management, the BLM would apply stipulations to oil and gas leases as determined through this RMP; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease-approval process (See Section 2.3.12). The BLM can make leasing decisions for the minerals with the consent of surface managing agencies. The surface managing agency plans for the surface uses of the lands. During Plan implementation the BLM would obtain consent before leases are approved. Both the BLM and surface managing agency stipulations would be applied to the lease.
5. Page ES-2, paragraph 4, 1st sentence. "There would be 760,452 acres of BLM administered non-USFS FMO that would be open to oil and gas leasing, since an additional 365 acres would be closed to protect habitat for the Federally-listed Alabama beach mouse."	The 365 acres, derived from Natural Heritage Program GIS data, includes all of the Fort Morgan Beach and Highway tracts, and FMO beneath both private surface and the Bon Secour NWR FMO that is Alabama beach mouse suitable habitat or Federally designated critical habitat.

Public Comment	BLM Response
The 365-acre number applies to the federal minerals in Alabama (see Table 2-3). How was the 365-acre number developed? If you subtract 365 from 760,570 acres, the acreage number is 760,205 acres-not 760,452 acres. If the 760,205 acre number is correct, make the appropriate text changes in this and other sections of the draft plan. Where are the 365 acres of land that's closed to oil and gas leasing? How much of the 365 acres have been leased for oil and gas development? If leased, how much is held by production? If 10-year leases were issued, when will they expire? A total of 333 acres of BLM land is analyzed in the draft plan. Of the 333 acres, there are 159 acres of BLM land in Alabama? Are all the Alabama lands closed to leasing, to protect the Alabama beach mouse? If so, where are they? Where are the remaining 206 acres that are closed to oil and gas leasing? Based on the answers to these questions, does the 365 acre number need to be changed? If it does, make the appropriate text change in this and other sections of the draft plan.	The 760,452-acreage figure is correct and is derived from Tables 2-1 and 2-2. Tables 2-3 and 2-4 contain acreage associated with each lease stipulation; however, some of those acreages include overlaps. Because of these overlaps, acreages associated with each individual lease stipulation are not additive (as explained in the footnote in Tables 2-3 and 2-4) and cannot be compared directly to Tables 2-1 and 2-2. In the case of Alabama beach mouse habitat, the closure of Alternative 2 overlaps with USFWS closure that is included in all of the Alternatives. The area open to leasing for this alternative cannot be determined by simply subtracting the Alabama beach mouse habitat of 365 acres from the summary acreage presented under Alternative 1. A clarifying statement regarding the area closed to minerals development was included in the executive summary and Section 2.4 of the Proposed RMP-Final EIS.
6. Page ES-2, last paragraph, last sentence, "Restrictions on use after disposal would be provided in the patent transferring ownership. Valid existing rights and other valid authorizations would be protected if disposal occurred." What are other valid authorizations? Can they legally be included in land patents? Since the public isn't knowledgeable about patents, valid existing rights and **other valid authorizations**, (1) provide information on these terms and (2) the process for restricting uses in patents. Provide information on what can legally be included and enforced in a land patent.	"Other valid authorizations" is intended to be all-inclusive to protect all valid existing uses in case of disposal. Section 208 of FLPMA gives the BLM authority to issue patents or other documents of conveyance with conditions and covenants as deemed necessary to protect the public interest. The conditions would constitute a covenant running with the land, which means it stays with the property after resale. Covenants are legally enforceable, and compliance would be part of plan implementation. Compliance would be similar to the compliance program used for lands patented under the Recreation and Public Purposes Act. Under this program there are regular compliance examinations followed by legal action, if necessary.
7. Page 1-2, Table 1-1, B. **Non-Federal surface land–Federal minerals.** Of the 303,440 acres, how much of the surface is privately owned? Who is the other, **non federal surface owners**? Provide the amount of acreage for each surface owner.	Non-Federal surface ownership includes private, State, county, and similar entities that are not Federal agencies. Most are private individuals. These non-Federal entities were grouped as one category because it was deemed not necessary or relevant for the analysis to further categorize them.
8. Page 1-2, Table 1-1, **E. USFS land-Federal minerals** (585,394 acres). It's repeatedly stated in the draft plan. The USFS is responsible for the land use planning of its minerals–not BLM. Why are this category and acreage included in Tables 1-1 and 1-2? Because they do their own minerals planning, drop USFS information from the table.	Planning for Federal mineral estate is very confusing for many people. The USFS is the only agency where the BLM defers planning for leasing of Federal mineral estate. However, the BLM has the responsibility to issue the leases, as well as post-lease activities, including applications for permit to drill (APDs). USFS acreage was included for disclosure and was considered as part of the cumulative impact analysis.
9. Page 1-3, Table 1-1, footnote 5, ". . At the same time, surface and minerals management actions and development activities anticipated on these lands	The projected well numbers for USFS, as well as non-Federal surface owners, over the next 20 years are included in the cumulative impact analysis in

Public Comment	BLM Response
will be taken into account for purposes of cumulative impact analysis." What are the projected well numbers, each year for the next 20 years, for each national forest in Alabama? How much of the BLM-administered minerals are located near national forests? If the BLM-administered minerals are as scattered as BLM land tracts, is there really a cumulative impact analysis of USFS, BLM and other, federal minerals? Finally, the impacts of **30 wells or 5.30 acres per year** are so negligible. It's not reflected in the cumulative impact analysis. With so few wells and acres of disturbance, BLM's cumulative impact analysis, is an analysis for the future leasing and development of USFS minerals? If BLM is going to do cumulative impact analysis, shouldn't it do it for wells drilled to private, state, Indian, BLM-administered and USFS minerals– adjacent to and within a five-mile radius BLM-administered leases? Drop the cumulative impact analysis for **all** the USFS minerals.	Section 4.4. All anticipated wells within each State (all Federal and non-Federal) were included as part of the cumulative impact analysis.
10. Pages 1-4 and 1-5, Map 1-1 and 1-2. The information presented in these maps can't be seen. The maps are worthless. Consider presenting the information on two maps, one for the northern half of the state and one for the southern half of the state. If the information is still too small to be seen easily and understood, consider other options for visually presenting the information. It's important information and needs to be presented in an easy to read and understandable format.	Unfortunately, statewide planning does not allow for detailed maps. The maps were produced in this fashion in consideration of printing costs and reducing page volume. However, more detailed maps could be made available to the public if requested.
11. Page 2-10, last paragraph, 2nd sentence, "It is expected that 20 wells…(BLM Mineral Report 2005)." Isn't this a 2004 report? Although cited in the text, the report isn't listed in the References section. Make the appropriate text changes in the document.	The full citation, which has been added to the Proposed RMP-FEIS, is "United States Department of the Interior, Bureau of Land Management (BLM), 2004b. Mineral Report: Reasonable Foreseeable Development, Lands Involved: Non-Forest Service Federal Lands in the States of Alabama and Mississippi. BLM, April 6, 2004." The citation in chapter 2 has been changed to 2004b.
12. Page 2-1 and 2-2 and Tables 2-10 and 2-11. How much mineral acreage is addressed in the draft plan? When you add the 704,850 and 126,570 acreage numbers in the Abstract, the total is 831,420 acres. When you add the (total) acreage numbers in Tables 2-1 and 2-2, the total is 831,753 acres. A 704,850 acre number is found on (1) page i of the Abstract, (2) page ES-1 of the Executive Summary and (3) at the bottom of page 1-1. A 760,570 acre number is presented on pages ES-2 and ES-3. Finally, if you subtract the 126,570 acre number from the 831,753 acre number in Tables 2-1 and 2-2, you get a 705,183 acre figure. Which is the correct acreage number? Make the necessary text changes.	The total mineral acreage addressed in this plan is 313,819 acres for Alabama and 517,934 acres for Mississippi. The grand total acreage is 831,753 acres in both States. As stated in the Abstract, "Within the two States combined, the BLM administers approximately 333 acres of public land surface and mineral estate and 704,850 acres of Federal minerals where the surface estate is in non-Federal ownership. The BLM also has responsibility for 126,570 acres of mineral estate where the surface is managed by other Federal agencies (excluding the BLM and U.S. Forest Service [USFS])." If all of the acres in this sentence were added, the final total would equate to 831,753 acres.
13. Page 3-1, 3rd paragraph, 1st sentence. "Oil and gas leasing of BLM-administered non-United States Forest Service (USFS) Federal mineral	The RMP is intended to cover BLM-administered lands throughout both States. Therefore, Statewide perspectives are needed to address the

Public Comment	BLM Response
ownership (FMO) could occur anywhere in the State; therefore, a statewide perspective is needed to cover the full geographic range for the environmental baseline." Future oil and gas leasing is expected to occur in the **Warrior Basin and the Southern Alabama Basin** (see page 3-30). Based on this and the county information presented on Map 3-2, information isn't needed for the entire State of Alabama. BLM and contract staff need to rewrite Chapter 3. Focus on the environment in the **Warrior Basin** and **Southern Alabama Basin**. Make these changes for each section in Chapter 3, preferably in another draft plan. When these changes are made, the Affected Environment section should more accurately reflect, the resources and environment that could be impacted by future oil and gas development.	scattered mineral estate. Focusing the affected environment exclusively on the Warrior Basin and Southern Alabama Basin would not allow for a sufficient baseline for some resources. The analysis, however, does appropriately focus on these areas where most development is anticipated.
14. Page 3-1, 5th paragraph, 1st sentence. "Oil and gas leasing of BLM-administered non-USFS FMO could occur anywhere in the State; therefore, **a statewide perspective** is needed to cover the full geographic range for the environmental baseline." Future oil and gas leasing is expected to occur in the **Salt Basin and Coastal Plain in Mississippi** (see page 3-76). Based on this and the county information presented on Map 3-2, information isn't needed for the entire State of Mississippi. BLM and contract staff need to rewrite Chapter 3. Focus on the environment in the **Salt Basin** and **Coastal Plain in Mississippi**. As with the previous comment, make these changes for each section in Chapter 3, preferably in another draft plan. These changes should more accurately reflect the resources and environment that could be impacted by future oil and gas development.	The RMP is intended to cover BLM-administered lands throughout both States. Therefore, Statewide perspectives are needed to address the scattered mineral estate. Focusing the affected environment exclusively on the Warrior Basin and Southern Alabama Basin would not allow for a sufficient baseline for some resources. The analysis, however, does appropriately focus on these areas where most development is anticipated.
15. Page 3-30, 3rd paragraph and page 3-32, 3rd paragraph, 3rd sentence (BLM 2004). Although cited in the text, this BLM document isn't listed in the References section. What kind of document is it? Who wrote it? How long is the document? How can people get a copy of the document? Make the appropriate text changes.	The full citation, which has been added to the Proposed Plan and Final EIS, is "United States Department of the Interior, Bureau of Land Management (BLM), 2004b. Mineral Report: Reasonable Foreseeable Development, Lands Involved: Non-Forest Service Federal Lands in the States of Alabama and Mississippi. BLM, April 6, 2004." This report summarizes potential mineral development projected for the planning period and can be obtained at the BLM Jackson Field Office.
17. Page 3-35, Table 3-8. Move this table into the minerals section. Give specific information on each surface managing agency and the special management areas listed in the table. Give the size (acreage) of each refuge, park, installation, etc. How much acreage is (1) opened to leasing without any leasing constraints,	This table was included under "Recreation" to analyze impacts to this resource. The information presented is complete and accurate for the purposes of the analysis contained in the RMP-EIS.

Public Comment	BLM Response
(2) opened to leasing with constraints or (3) closed to leasing. Where are the leasing stipulations from other surface managing agencies? How many wells are there on each special management areas? Again, relate all of the minerals information to its location, in the Warrior Basin and Southern Alabama Basin. Do the same for the Salt Basin and Coastal Plain in Mississippi. Drop USFS minerals from this table.	
18. Page 3-44, 5th paragraph, 3rd sentence. "Boardwalks partially destroyed by Ivan may be rebuilt." There are at least two boardwalks on Fort Morgan beach tracts. There isn't any information about them in the draft plan. Where are they located on the beach tracts? How long are they? What's the current condition of the boardwalks? Have they been rebuilt? Since the boardwalks weren't authorized and permitted by JFO staff is JFO staff going to allow unauthorized boardwalks to be rebuilt on the beach tracts? Update this information to correctly present the current situation on the boardwalks.	Boardwalks on the Fort Morgan beach tracts were destroyed by Hurricane Ivan. Reconstruction of a boardwalk on the tract within the Bon Secour Refuge (Lots 73 and 74) was authorized. There are no other boardwalks on the Fort Morgan tracts.
19. Page 3-46, 2nd paragraph, last sentence. "Other than the ROW reserved by the small tract classification, there are no authorized uses on the Fort Morgan beach tracts." In addition to unauthorized boardwalks, there's a small, unauthorized parking area on lot 54 in section 27. Part of a paved road may be within the northern boundary of lots 54 and 55 in section 27. The beach tracts are used by the public for recreational activities. Whether they're authorized or not, include text on the structures and uses on each beach tract.	Tract descriptions have been revised to include more detailed information in Sections 3.3.2 and 3.3.3. However, this plan is part of a multi-year process, and the actual situation may differ from the baseline data gathered for the document.
20. Page 3-48, 3rd paragraph, last sentence. While the BLM plats of survey identified the parkway as separate lots, there is no record that BLM granted any ROW or other authorized uses within the parkway lots." There are power lines and pipelines, outbuildings, roads and other uses of Fort Morgan highway tracts. People have to drive across BLM land to get to their homes, a small strip mall and volunteer fire station? Whether they're authorized or not, include text on the structures and uses on each highway tract. Include text on the structures and uses on the lands adjacent to BLM's highway tracts.	Tract descriptions have been revised to include more detailed information in Sections 3.3.2 and 3.3.3. However, this plan is part of a multi-year process, and the actual situation may differ from the baseline data gathered for the document.
21. Page 3-52, 6th paragraph, last sentence. "By 1960, all of the small tracts had sold, and several small houses of fishing camps, were built on these lots adjacent to the BLM Jordan Lake tract." There are small houses and other structures on the Jordan Lake tract. There are also a paved road and a locked gate that may prevent access to BLM land. **The terrain precludes the construction of homes, fish camps and other**	Available information on the surface tracts was provided in Chapter 3. Cursory field examination or a map reference is not adequate to determine if any structures encroach on the tract. An official boundary survey will be required, but has not yet been completed.

Public Comment	BLM Response
structures on land adjacent to the Jordan Lake tract. See Map 2-6 on page 2-38. Whether they're authorized or not, include text on the structures and uses on the Jordan Lake tract.	
22. Chapter 4, Environmental Consequences. **A 438-page document** has been prepared for the Draft AL-MS RMP. Of that, **122 pages** were devoted to the environmental impacts of (1) transferring the management or disposing of 333 acres and (2) 5.30 acres of oil and gas surface disturbances, each year for 20 years. As per NEPA regulations, document size and the extent of environmental impact analysis, is commensurate with the scope of the proposed action. A 333-acre plan and 30-well drilling program doesn't warrant a 438-page draft RMP-EIS.	RMPs have become increasingly complex and lengthy documents. The templates being used for most RMPs in the BLM have been refined to meet regulatory needs in an effort to meet legal mandates and to withstand legal challenges. We will continue to conduct our planning in an effort to meet applicable requirements and resource management needs.

5.4 DISTRIBUTION OF PROPOSED RMP-FEIS

Copies of the Proposed RMP-FEIS will be made available for public review at local libraries and other information repositories throughout the States of Alabama and Mississippi, as well as at the Jackson Field Office and the BLM-Eastern States Office. Prior to publication of the Proposed RMP-FEIS, a postcard announcing the anticipated date of its availability and how to request a hard copy will be sent to everyone on the project mailing list. The Proposed RMP-FEIS will also be available on CD-ROM and accessible for viewing and downloading from the project website (www.es.blm.gov/AL_MS_RMP). The following agencies, organizations, and individuals have been asked to review the document:

5.4.1 Federal Agencies

- U.S. Army Corps of Engineers, Mobile District
- U.S. Army Corps of Engineers, Vicksburg District
- U.S. Department of Agriculture (USDA) Forest Service, National Forests in Alabama
- USDA Forest Service, National Forests in Mississippi
- USDA Natural Resources Conservation Service, Alabama
- USDA Natural Resources Conservation Service, Mississippi
- U.S. Fish and Wildlife Service, Ecological Office, Daphne, Alabama
- U.S. Fish and Wildlife Service, Ecological Office, Vicksburg, Mississippi
- U.S. Fish and Wildlife Service, Atlanta Regional Office
- Bon Secour National Wildlife Refuge
- National Park Service units in Mississippi
- National Park Service units in Alabama
- National Park Service, Atlanta Regional Office
- Federal Energy Regulatory Commission, Atlanta Regional Office

5.4.2 Alabama State Agencies

- Alabama Forestry Commission
- Alabama Department of Conservation and Natural Resources
- Alabama Department of Environmental Management
- Alabama Indian Affairs Commission
- Alabama State Historic Preservation Officer
- Alabama Natural Heritage Program
- Alabama State Parks Division
- Alabama State Lands Division
- State Oil and Gas Board of Alabama
- Geological Survey of Alabama

5.4.3 Mississippi State Agencies

- Mississippi Development Authority
- Mississippi Department of Archives and History
- Mississippi Department of Environmental Quality
- Mississippi State Historic Preservation Officer
- Mississippi Forestry Commission
- Mississippi Department of Wildlife, Fisheries and Parks
- Mississippi Natural Heritage Commission

5.4.4 Local Governments

Alabama

- All County Governments
- City of Bay Minette
- City of Daphne
- City of Elberta
- City of Fairhope
- City of Foley
- City of Gulf Shores
- City of Loxley
- City of Mobile
- City of Orange Beach
- City of Silverhill
- City of Spanish Fort
- City of Summerdale
- City of Robertsdale

Mississippi

- All County Governments
- City of Bay St. Louis
- City of Waveland
- City of Diamondhead
- City of Kiln

5.4.5 Native American Tribes

- Tunica-Biloxi Tribe
- Mississippi Band of Choctaw Indians
- Poarch Creek Indians
- Eastern Band of Cherokee Indians
- Oklahoma Indians whose homeland was in parts of Mississippi and Alabama
- Choctaw Nation of Oklahoma
- Cherokee Nation of Oklahoma
- United Keetoowah Band of Cherokee Indians
- Chickasaw Nation
- Muscogee (Creek) Nation

5.4.6 U.S. Senate

- Hon. Jeff Sessions (Alabama)
- Hon. Richard Shelby (Alabama)
- Hon. Thad Cochran (Mississippi)
- Hon. Trent Lott (Mississippi)

5.4.7 U.S. House of Representatives

- Hon. Jo Bonner, Alabama 1st
- Hon. Terry Everett, Alabama 2nd
- Hon. Mike Rogers, Alabama 3rd
- Hon. Robert B. Aderholt, Alabama 4th
- Hon. Robert E. Cramer, Alabama 5th
- Hon. Spencer Bachus, Alabama 6th
- Hon. Artur Davis, Alabama 7th

- Hon. Roger F. Wicker, Mississippi 1st
- Hon. Bennie G. Thompson, Mississippi 2nd
- Hon. Charles W. Pickering, Mississippi 3rd
- Hon. Gene Taylor, Mississippi 4th

5.4.8 Organizations/Industry

- Dauphin Island Park and Beach Board
- Blakeley Historic State Park
- The Islander
- Weeks Bay Reserve
- South Alabama Sewer Service
- Dauphin Island Sea Lab
- The Noel Company
- Dauphin Island Sea Lab
- University of South Alabama
- Chickasabogue Park
- Colonial Bank Centre
- MS/AL Sea Grant Consortium
- Mobile Bay National Estuary Program
- Auburn Marine Extension Center
- Martinique on the Gulf
- The Beach Club
- Gulf Shores Plantation
- Alabama Coastal Foundation
- Fort Morgan Paradise Joint Venture
- Coastcom of Mississippi LLC
- Bubba's Beach House LLC
- The Stirling Family Limited Partnership
- Kelley Bros
- J R J TARA INC
- Fort Morgan Volunteer Fire Department
- R & S LLC
- Wolford Brothers Leasing LLC
- Alabama Power Company
- University of Mississippi
- Mississippi Nature Conservancy

5.5 LIST OF PREPARERS

5.5.1 Introduction

The Alabama and Mississippi Proposed RMP-FEIS was prepared by a team of specialists from the BLM Jackson Field Office and a contractor, Booz Allen Hamilton, with support from and review by the BLM-Eastern States Office and the BLM Washington Office.

As required by NEPA regulations (40 CFR 1502.17), this section lists the people who were primarily responsible for preparing this EIS and presents their qualifications (Tables 5–2 and 5–3). Booz Allen Hamilton, a contractor selected to prepare the EIS as directed by the BLM, in accordance with 40 CFR 1506.5(c), has certified that it does not have any financial or other interest in the decisions to be made

pursuant to this EIS. In addition to being responsible for the projects and areas listed, many BLM employees also contributed substantial time consulting with other agency personnel in preparing this EIS (see Section 5.2).

Table 5-2. BLM Preparers

Contributor	Project Role	Qualifications
Ken Adams	Geologist	B.S., Geology, University of Florida Years of experience: 30
Shayne Banks	Public Affairs Specialist	B.A., History, Mississippi State University Years of experience: 18
Bruce Dawson	Field Office Manager	M.S., Natural Resources Management, Humboldt State University Years of experience: 30
Stuart Grange	Mining Engineer	B.S., Mining Engineering, University of Utah M.B.A., University of Nevada, Reno Years of experience: 19
Brian Kennedy	Physical Scientist (Geographic Information System [GIS] Assistance)	B.S., Geographic Information Technology, University of Southern Mississippi Years of experience: 7
Judith Pace	Archaeologist	B.A., History and Anthropology, University of Mississippi, Oxford M.A., Anthropology, University of Mississippi, Oxford Years of experience: 22
Bob Schoolar	GIS Specialist	B.S., Geophysical Science, Old Dominion University Years of experience: 32
Gary Taylor	Planning and Environmental Coordinator (BLM Contracting Officer Representative)	M.A., Management, Webster University Years of experience: 7
Mary Weaver	Realty Specialist	B.S., Business Administration, Florida State University (3.5 years) Business, University of Maryland Years of experience: 33
Duane Winters	Project Manager	M.S., Forest Hydrology, University of Missouri, Columbia Years of experience: 30
Faye Winters	Wildlife Management Biologist	B.A., Biology, William Woods College Years of experience: 31

Table 5-3. Booz Allen Hamilton Preparers

Contributor	Project Role	Qualifications
Erik Anderson	Assistant Project Manager, Minerals/Geology Specialist	B.S., Civil and Environmental Engineering, Utah State University M.S., Environmental Policy and Management, University of Denver (pursuing) Years of experience: 10
Quincy Bahr	Natural and Cultural Resource Specialist	B.S., Natural Resources Management and Planning, University of Utah Years of experience: 9
Michael Ghazizadeh	Minerals Specialist (Coal Screening Report Development)	B.S., Geology, University of Isfahan M.S., Geology, Northeast Louisiana University Ph.D., Geology, University of Tennessee Years of experience: 22
Joel Hanson	GIS and Mapping Specialist	B.S., Geography and Environmental Studies, University of Colorado M.A.S., Environmental Information Management (pursuing), University of Denver Years of experience: 6
Chris Keefe	NEPA Specialist, Technical Review, Soils Sections	B.S., Biology, University of Nebraska Years of experience: 16
Bryan Klyse	Natural Resource Specialist	B.A., Social Science (Environment), San Diego State University M.E.S.M., Environmental Science and Management, University of California, Santa Barbara Years of experience: 9
Melanie Martin	Project Manager, NEPA Lead, Alternatives Development, Technical Review, Natural Resource Specialist	B.S.A., Environmental Protection, West Virginia University M.S., Natural Resource Management, University of Denver Years of experience: 10
Pamela Middleton	Natural Resource Specialist	B.A., Biology (Botany Emphasis), Minor in Environmental Studies and Planning, Sonoma State University M.A.S., Environmental Policy and Management, University of Denver Years of experience: 8
Amanda Pryor	NEPA Specialist, Technical Review	B.A., Biology, Baylor University M.S., Environmental Biology, Baylor University Years of experience: 12
Jason Smiley	GIS and Mapping Specialist	B.S.E.D., Park Administration M.S., Geography Years of experience: 7
Mike Sumner	Document Preparation	B.S., Recreation Resource Management, Utah State University Years of experience: 8

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LIST OF ABBREVIATIONS AND ACRONYMS

ABM	Alabama beach mouse
ACAMP	Alabama Coastal Area Management Program
ACEC	area of critical environmental concern
ACNPCP	Alabama Coastal Nonpoint Source Pollution Control Program
ADEM	Alabama Department of Environmental Management
AFC	Alabama Forestry Commission
AHC	Alabama Historical Commission
AIRFA	American Indian Religious Freedom Act
ANHP	Alabama Natural Heritage Program
APD	application for permit to drill
APLIC	Avian Power Line Interaction Committee
ARPA	Archaeological Resources Protection Act
BA	biological assessment
BEA	Bureau of Economic Analysis
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
BMP	best management practice
BO	biological opinion
B.P.	before present
CBM	coal bed methane
CCP	Comprehensive Conservation Plan
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
cfs	cubic feet per second
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
COA	condition of approval
COD	chemical oxygen demand
CPI	consumer price index
CRMP	Comprehensive Resource Management Plan
CSU	controlled surface use
CWA	Clean Water Act
CWCS	Comprehensive Wildlife Conservation Strategy
CZM	coastal zone management
DM	departmental manual (Department of the Interior)
DMR	Department of Marine Resources
DoD	Department of Defense
DOI	Department of the Interior
EA	Environmental Assessment
EIS	Environmental Impact Statement
EJ	environmental justice
EPA	Environmental Protection Agency
ERMA	extensive recreation management area
ESA	Endangered Species Act
FEIS	Final Environmental Impact Statement
FERC	Federal Energy Regulatory Commission

FLPMA	Federal Land Policy and Management Act of 1976
FMO	federal mineral ownership
FPC	Federal Power Commission
FRL	Fractional
GAO	U.S. Government Accountability Office
GAP	Gap Analysis Program
GHG	greenhouse gas
GIS	geographic information systems
GISS	Goddard Institute for Space Studies
GSA	Geological Survey of Alabama
IB	information bulletins
IM	instruction memoranda
IPCC	Intergovernmental Panel on Climate Change
JFO	Jackson Field Office (BLM)
LBA	lease by application
MAP	Mississippi alluvial plain
mcf	thousand cubic feet
MCPS	Mississippi Coastal Preserve System
MDEQ	Mississippi Department of Environmental Quality
MFC	Mississippi Forestry Commission
mg/L	milligrams per liter
MNHP	Mississippi Natural Heritage Program
MOU	Memorandum of Understanding
MSCZMP	Mississippi Coastal Zone Management Program
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NAS	National Academy of Sciences
NEPA	National Environmental Policy Act of 1969
N.F.	National Forest
NHPA	National Historic Preservation Act of 1966, as amended
NLCD	national land cover data
N_2O	nitrous oxide
NO_2	nitrogen dioxide
NO_X	nitrogen oxides
NOA	Notice of Availability
NOAA	National Oceanic and Atmospheric Administration
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRCS	National Resources Conservation Service
NRHP	National Register of Historic Places
NRI	National Resources Inventory
NSO	no surface occupancy
NWI	national wetland inventory
NWR	National Wildlife Refuge
O_3	ozone
OHV	off-highway vehicle
PAH	polycyclic aromatic hydrocarbons
PCB	polychlorinated biphenyl
$PM_{2.5}$	particulate matter (less than 2.5 microns in diameter)
PM_{10}	particulate matter (less than 10 microns in diameter)

ppm	parts per million
PSD	prevention of significant deterioration
R&PP	Recreation and Public Purposes Act
RCRA	Resource Conservation and Recovery Act
RFDS	reasonably foreseeable development scenario
RMP	Resource Management Plan
ROD	Record of Decision
ROW	right-of-way
S-1	BLM Eastern States sensitive species designated as "critically imperiled"
S-2	BLM Eastern States sensitive species designated as "imperiled"
SARA	Superfund Amendment Reauthorization Act
SHPO	State Historic Preservation Officer
SIP	State Implementation Plan (Air Quality)
SO_2	sulfur dioxide
SRMA	special recreation management area
T&E	threatened and endangered
TDS	total dissolved solids
Tg CO_2 Eq.	teragrams of CO_2 equivalent
TSCA	toxic Substances Control Act
TSS	total suspended solids
TVA	Tennessee Valley Authority
µS/cm	microsiemens per centimeter
USC	United States Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOC	volatile organic compound
VRI	visual resource inventory
VRM	visual resource management
WQA	Water Quality Act
WUI	wildland-urban interface

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GLOSSARY

Activity Plan. A site-specific plan for the management of one or more resources (e.g., allotment management plan, habitat management plan). Activity plans provide the additional detail necessary to implement decisions made in the Resource Management Plan (RMP).

Administrative Use. Official use related to management and resources of the public lands by Federal, State, or local governments or non-official use sanctioned by an appropriate authorization instrument, such as right-of-way, permit, lease, or maintenance agreement.

Aquifer. A geologic formation, group of formations, or part of a formation that contains sufficient saturated, permeable material to be able to yield significant quantities of water to wells and springs.

Archaeological Site. Geographic locale containing structures, artifacts, material remains, and/or other evidence(s) of past human activity.

Area of Critical Environmental Concern (ACEC). An area within the pubic lands where special management attention is required to protect and prevent irreparable damage to important historic, cultural, or scenic values, fish and wildlife resources or other natural systems or processes, or to protect life and safety from natural hazards.

Attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Candidate Species. Candidate species are any species not yet officially listed, but which are undergoing a status review or are proposed for listing according to *Federal Register* notices published by the Secretary of the Interior or the Secretary of Commerce.

Closed. Designated areas, routes, roads, and trails where off-highway vehicle (OHV) use is permanently or temporarily prohibited. Use by emergency vehicles is allowed.

Collocate. To set side by side.

Controlled Surface Use (CSU). A fluid minerals leasing constraint under which use and occupancy are allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.

Critical Habitat. Any habitat that, if lost, would appreciably decrease the likelihood of the survival and recovery of a threatened or endangered species or of a distinct segment of its population. Critical habitat may represent any portion of the present habitat of a listed species and may include additional areas for reasonable population expansion. Critical habitat must be officially designated by the U.S. Fish and Wildlife Service (USFWS) or the National Marine Fisheries Services.

Cultural Resource. The fragile and nonrenewable remains of human activity, occupation, or endeavor reflected in districts, sites, structures, buildings, objects, artifacts, ruins, works of art, architecture, and natural features that were of importance in human events. These resources consist of (1) physical remains, (2) areas where significant human events occurred even though evidence of the event no longer remains, and (3) the environment immediately surrounding the resource.

Cumulative Impact. The impact on the environment which results from the incremental impact of the action when added to past, present, and reasonable foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

Disposal. Transfer of ownership of a tract of public land from the United States to another party.

Dune Walkover. A raised walkway constructed for the purpose of protecting the beach and dune system between mean high tide and the construction control line from damage that may result from anticipated pedestrian traffic to the beach and which is no more than 6 feet in width, constructed without roof or walls, elevated at least 1 foot above the dune, and extends seaward of the seaward vegetation line.

Endangered Species. Any species formally recognized by the USFWS as in danger of extinction throughout all or a significant portion of its range.

Extensive Recreation Management Area (ERMA). A public lands unit identified in land use plans containing all acreage not identified as a Special Recreation Management Area (SRMA). Recreation Management Actions within an ERMA are limited to only those of a custodial nature.

Fault traps. An oil or gas trap in which the closure results from the presence of one or more faults.

Federal Land Policy and Management Act of 1976 (FLPMA). Public Law 94–579, which gives the BLM legal authority to establish public land policy, to establish guidelines for administering such policy, and to provide for the management, protection, development, and enhancement of public land.

Federal Mineral Ownership (FMO). Lands on which either the entire mineral estate or certain mineral rights are owned by the Federal Government.

Flooding. The temporary covering of the soil surface by water from any source. Shallow water standing during or shortly following rain is excluded from the definition of flooding. Marshes and swamps are excluded from the definition of flooding because water is more than a temporary covering.

Ground Water. Water within the earth that supplies wells and springs.

Habitat. A specific set of physical conditions that surround a single species, a group of species, or a large community. In wildlife management, the major components of habitat are considered to be food, water, cover, and living space.

Herbaceous. A plant with little or no woody tissue that dies back at the end of the growing season.

Historic. Refers to period wherein non-native cultural activities, based primarily upon European roots, take place and have no origin in traditional Native American culture(s).

Hydrocarbons. Organic chemical compounds of hydrogen and carbon atoms that form the basis of all petroleum products, including oil and gas.

Interdisciplinary. Characterized by interactive participation or cooperation of two or more disciplines or fields of study.

Intermittent Stream. A stream that does not flow year-round but has some association with ground water for surface or subsurface flows.

Leasable Minerals. Those minerals or materials that can be leased.

Lease (Mineral). A contract between an owner of mineral rights and another, granting the latter the right to search for and produce gas, hydrocarbons, or other mineral substances upon payment of an agreed-upon rental and royalties based on production.

Lease Notice. Provides more detailed information concerning limitations that already exist in law, lease terms, regulations, or operational orders. A lease notice also addresses special items the lessee would consider when planning operations but does not impose new or additional restrictions.

Lease Stipulation. A modification of the terms and conditions on a standard lease form at the time of the lease sale. (See also No Surface Occupancy, Controlled Surface Use, and Seasonal Limitation.)

Limited OHV area. An area restricted at certain times, in certain areas, and/or to certain vehicular use. These restrictions may be of any type, but can generally be accommodated within the following type of categories: numbers of vehicles, types of vehicles, time or season of vehicle use, permitted use only, use on existing roads and trails, use on designated roads and trails, and other restrictions (from the BLM National Management Strategy for OHV Use on Public Lands).

Locatable Minerals. Minerals or materials subject to disposal and development through the Mining Law of 1872, (as amended). Generally includes metallic minerals such as gold and silver and other materials not subject to lease or sale (such as some bentonites, limestone, talc, and some zeolites).

Mesic. Related to conditions of moderate moisture or water supply. Used to describe organisms occupying moist habitats.

National Environmental Policy Act (NEPA) of 1969. Public Law 91–190, which established national environmental policy. Among other items, NEPA requires Federal agencies to consider environmental values in decisionmaking processes.

National Register of Historic Places (NRHP). A register of districts, sites, buildings, structures, and objects, significant in American history, architecture, archaeology, and culture, established by the National Historic Preservation Act of 1966 and maintained by the Secretary of the Interior.

No Surface Occupancy (NSO). A fluid minerals leasing constraint that prohibits occupancy or disturbance on all or part of the lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the leases restricted by this constraint through use of directional drilling from sites outside the NSO area.

Non-attainment Area. Any area not meeting Ambient Air Quality Standards and designated as such by 17-275.410 F.A.C.

Occurrence. A specific record of a single or group of plant or animal species.

Off-Highway Vehicle (OHV). This term replaces “off-road vehicle (ORV) ,” and means any motorized vehicle capable of or designed for travel on or immediately over land, water, or other natural terrain.

Open. Designated areas, routes, roads, and trails where unrestricted OHV use may occur (subject to operating regulations and vehicle standards set forth in BLM Manuals 8341 and 8343 and 161.053 and 161.58 F.A.C.).

Prehistoric. Refers to period wherein Native American cultural activities took place which were not yet influenced by contact with historic non-native cultures.

Prime Farmland. Prime farmland is land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and is available for these uses (the land could be cropland, pastureland, rangeland, forest land, or other land, but not urban builtup land or water).

Public Domain. Public lands that were originally (that is upon the admittance of a State to the United States) owned the Federal Government and have since that time remained in continuous Federal ownership.

Public Domain Leases. Federal mineral leases of mineral interests that were originally (that is upon the admittance of a State to the United States) owned the Federal Fovernment and have since that time remained in continuous Dederal ownership.

Public Lands. Any land and interest in land owned by the United States that are administered by the Secretary of the Interior through the Bureau of Land Management, without regard to how the United States acquired ownership, except for (1) lands located on the Outer Continental Shelf, and (2) lands held for the benefit of Indians, Aleuts, and Eskimos. Includes public domain and acquired lands.

Reasonably Foreseeable Development Scenario (RFDS). A description of anticipated future development of minerals or other resources, used as a basis for assessing the environmental impacts of RMP decisions.

Reserved Lands. Federal lands that are dedicated or set aside for a specific public purpose or program and that are, therefore, generally not subject to disposition under the operation of all of the public land laws. (See also Withdrawal.)

Recreation and Public Purposes (R&PP). Refers to both the Recreation and Public Purposes Act (43 U. S.C. 869(a)) and the uses to be made of public land transferred under the Act. The objective of the R&PP Act is to meet the needs of State and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purposes uses. Examples of uses made of R&PP lands are parks, schools, religious facilities, and camps for youth groups. Transfer of land ownership under the provisions of R&PP Act is referred to as R&PP conveyance.

Right-of-Way. The public or Federal land authorized to be used or occupied pursuant to a right-of-way grant.

Right-of-Way Grant. A document authorizing the use of public or Federal lands for the construction, operation, maintenance, and termination of a project (e.g., utility line, road).

Riparian. Situated on or pertaining to the bank of a river, stream, or other body of water. Normally used to refer to the plants of all types that grow rooted in the water table of streams, ponds, and springs.

Riparian Area. Riparian areas are a form of wetland transition between permanently saturated wetlands and upland areas. These areas exhibit vegetation or physical characteristics reflective of permanent surface or subsurface water influence. Excluded are such sites as ephemeral streams or washes that do not exhibit the presence of vegetation dependent upon free water in the soil.

Salable Minerals. Minerals that may be sold under the Material Sale Act of 1947, as amended. Included are common varieties of sand, stone, gravel, and clay.

Scoping Process. An early and public process for determining the nature, significance, and range of issues to be addressed related to a proposed action.

Seasonal Limitation. A fluid minerals leasing constraint that prohibits surface use during specified time periods to protect identified resource values. The constraint does not apply to the operation and maintenance of production facilities unless analysis demonstrates that such constraints are needed and that less stringent, project-specific constraints would be insufficient.

Sensitive Species. See Special Status Species.

Significance. A high degree of importance as indicated by either quantitative measurements or qualitative judgments. Significance may be determined by evaluating characteristics pertaining to location extent, consequences, and duration.

Soil Association. A mapping unit used on general soil maps in which two or more defined taxonomic units occurring together in a characteristic pattern are combined because the scale of the map or the purpose for which it is being made does not require delineation of the individual soils.

Special Recreation Management Area (SRMA). An area where special management or intensive recreation management is needed. Recreation activity plans are required, and greater managerial investment in facilities or supervision can be anticipated.

Special Status Species. All Federal and state-listed species, proposed or candidates for Federal or State listing, and those species identified by the BLM as sensitive species. The BLM Eastern States policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs, as well as potentially affected bird species included on the USFWS Birds of Conservation Concern and Game Birds Below Desired Condition lists.

Species of Concern. Species that are not yet listed as endangered or threatened, but that are undergoing a status review. This may include species whose populations are consistently and widely dispersed or whose ranges are restricted to a few localities, so that any major habitat change could lead to extinction. A species that is particularly sensitive to some external disturbance factors.

Split-Estate Lands. A given land area where the surface and mineral estates are in different ownerships. Most often split-estate areas occur where the surface is owned by private individuals, corporations, or groups or by State or local government, and the minerals are Federally owned.

Surface Managing Agency. An agency of the Federal Government that has the primary responsibility for management of a particular area of land, such as the Forest Service, National Park Service, the Navy, Air Force, or the BLM.

Surface Tract. An area of land where the BLM has the primary responsibility for the management of its resources that lie on the surface.

Surficial. Pertaining to or lying in or on a surface; the surface of the earth; e.g. "surficial weathering" of a rock, or a "surficial structure" formed by creep.

Surficial Aquifer. These aquifers consist of sand and shell deposits with uppermost layers contiguous with the land surface.

Threatened Species. Any species formally recognized by the USFWS as likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Unique Farmland. Unique farmland is land other than prime farmland that is used for the production of specific high-value food and other fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to economically produce sustained high-quality and/or high yields of a specific crop when treated and managed according to acceptable farming methods. Examples of such crops are citrus, tree nuts, olives, cranberries, fruit, and vegetables.

Valid Existing Rights. Legal "rights" or interest that are associated to a land or mineral estate and that cannot be divested from the estate until that interest expires or is relinquished. Lands within the decision area are subject to various authorizations, some giving "rights" to the holders and some of which could be construed as providing valid, but lesser, interests. Valid existing rights are established by various laws, leases, and filings under Federal law.

Mineral: Authorizations for activities on existing mineral leases and mining claims are governed by valid existing rights. Valid existing rights vary from case to case with respect to oil and gas leases, mineral leases, and mining claims, but generally involve rights to explore, develop, and produce within the constraints of laws, regulations, and policies at the time the lease/claim was established or authorized.

Non-Mineral: There are other situations, unrelated to minerals, in which the BLM has authorized some use of public land or has conveyed some limited interest in public land. The authorization may be valid and existing and may convey some "right" or interest. Many rights-of-way, easements, and leases granted on public land are this type of valid existing right. These types vary from case to case, but the details of each one are specified in the authorizing document. Valid and existing authorizations of this type would continue to be allowed subject to the terms and conditions of the authorizing document.

Access: The presence of non-Federal land within the decision area has implications for valid existing rights because owners of non-Federal land surrounded by public land are entitled to reasonable access to their land. Reasonable access is defined as access that the Secretary of the Interior deems adequate to secure the owner reasonable use and enjoyment of the non-Federal land. Such access is subject to rules and regulations governing the administration of public land. In determining reasonable access, the BLM has discretion to evaluate and would consider such things as proposed construction methods and location, reasonable alternatives, and reasonable terms and conditions as are necessary to protect the public interest and resources of the decision area.

Other: There are a variety of other land use authorizations that do not involve the granting of legal "rights" or interests. Outfitter and guide permits are an example. These permits authorize certain uses of public land for a specified time, under certain conditions, without conveying a right, title, or interest in the land or resources used. If at any time it is determined that an outfitter and guide permit, other such permit, or any activities under those permits, are not consistent with the approved Resource Management Plan, then the authorization would be adjusted, mitigated, or revoked where legally possible. Grazing permits are also in this category. Grazing permits or leases convey no right, title, or interest in the land or resources used. Other applicable laws and regulations govern changes to existing grazing permits and levels of livestock grazing.

Visual Resource Management (VRM). The planning, designing, and implementation of management objectives for maintaining scenic value and visual quality on public lands.

Visual Resource Management (VRM) Classes. Visual resource management classes define the degree of acceptable visual change within a characteristic landscape. A class is based on the physical and sociological characteristics of any given homogeneous area and serves as a management objective. There are four classes. Each class has an objective which prescribes the amount of change allowed in the characteristic landscape, as described below:

Class I: The objective for VRM Class I is to preserve the existing character of the landscape. This class provides for natural ecological changes; it does not preclude very limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II: The objective for VRM Class II is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III: The objective for VRM Class III is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Any changes should repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class IV: The objective for VRM Class IV is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape can be high. These management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the impact of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Warrior Basin. A geologic province comprising parts of the states of Alabama, Mississippi, and Tennessee, including areas of potential coal and coalbed methane production.

Black Warrior Basin. The drainage area of the Black Warrior River.

Wetlands. Areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions.

Withdrawal. Removal or withholding an area of Federal land from settlement, sale, location, or entry, under some or all of the general land laws, for the purpose of limiting activities under those laws in order to maintain other public values in the area or reserving the area for a particular public purpose or program; or transferring jurisdiction over an area of Federal land, other than "property" governed by the Federal Property and Administrative Services Act, as amended (40 U.S.C. 472) from one department,

bureau, or agency to another department, bureau, or agency (from FLPMA, Title 43 Chapter 35 Subchapter I 1702[j]).

Woodland. Forest land on which trees are present but form only an open canopy, the intervening areas being occupied by lower vegetation. Forest lands which produce or are capable of producing no more than 20 cubic feet per acre per year of commercially important tree species.

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APPENDIX A—RECREATION AND PUBLIC PURPOSES ACT LANDS

The following tracts in Alabama and Mississippi are leased under the Recreation and Public Purposes (R&PP) Act of 1926 (43 United States Code [USC] 869[a]). The objective of the R&PP Act is to meet the needs of State and local government agencies and nonprofit organizations by leasing or conveying public land required for recreation and public purpose uses. Examples of uses made of R&PP lands are parks and greenbelts, sanitary landfills, schools, religious facilities, and camps for youth groups. The R&PP Act provides substantial cost-benefits for land acquisition and provides for recreation facilities or historical monuments at no cost.

Table A-1. R&PP Lands in Alabama

Name/County	Legal Description	File Number	Acres
Chilton County Board of County Commissioners Wilderness Park	St. Stephens Meridian T. 23 N., R. 15 E., Sec. 12, NE	AL-BLM-75393	86.10
Chilton County Board of County Commissioners Minoka Park	St. Stephens Meridian T. 24 N., R. 13 E., Sec., Fractional (FRL) NW	AL-ES-000327	160.00
City of Tuscaloosa Tuscaloosa County	Huntsville Meridian T. 20 S., R. 10 W., Sec. 12, FRL SENE	AL-ES-004206	40.00
State of Alabama Department of Natural Resources	St. Stephens Meridian Cleburne County: T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW; Shelby County: T. 19 S., R. 2 W., Sec. 26, S2SE; Sec. 34, SESE; T. 20 S., R. 2 W, Sec. 4, SE; Sec. 8, E2SE	AL-GLO-005700	 399.40 79.84 40.24 160.33 79.88

Name/County	Legal Description	File Number	Acres
State of Alabama	Huntsville Meridian Cherokee County: T. 8 S., R. 9 E., Sec. 1, Lots 1–4; Sec. 2, Lots 1–3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1–6; Sec. 12, Lot 1; Sec. 14, Lots 1–3; Sec. 15, Lots 1–4; Sec. 22, Lots 1–4; Sec. 23, Lots 1–4; Sec. 26, Lots 1, 2; Sec. 27, FRL E2NE; Sec. 27, Lots 1–5; Sec. 28, Lot 1; Sec. 33, Lots 1–4; Sec. 34, Lots 1–2 Dekalb County: T. 8 S., R. 9 E., Sec. 1, Lots 1–4; Sec. 2, Lots 1–3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1–6; Sec. 15, Lots 1–4;	AL-GLO-006108	1,625.19
Total			**2,670.98**

Table A-2. R&PP Lands in Mississippi

Agency/Use	Legal Description	Serial/PLO No.	Acres
City of Pascagoula Jackson County	St. Stephens Meridian T. 9 S., R. 6 W., Sec. 3, Lot 1; Sec. 4, Lot 1	MS-ES-035036	48.92
University of Mississippi Hancock County	St. Stephens Meridian T. 9 S., R. 15 W., Sec. 24, NWSW, N2SWSW, SWSWSW, W2W2SESWSW; Sec. 25, SESE, Lots 2–5; T. 9 S., R. 16 W., Sec. 35, Lot 2	MS-BLM-045650	274.89
Total			**323.81**

APPENDIX B—LANDS OF UNCERTAIN TITLE

For some tracts of land the title is clouded. These tracts are claimed by private owners, but government land records show that they were never transferred from Federal ownership. Claimants may apply for transfer of these tracts under the Color-of-Title Act and, if qualified, purchase the tracts to obtain title. Color-of-Title Act cases will be processed on a case-by-case basis. The following tables list tracts in Alabama and Mississippi that appear to be of uncertain title.

Table B-1. Lands of Uncertain Title in Alabama

County	Legal Description	Acres
Baldwin	St. Stephens Meridian T. 8 S., R. 3 E., Sec. 5, Fractional (FRL) Sec.	 13.96
Barbour	St. Stephens Meridian T. 11 N., R. 24 E., Sec. 27, W2NE	 80.00
Calhoun	Huntsville Meridian T. 13 S., R. 9 E., Sec. 28 SE T. 14 S., R. 5 E., Sec. 13, Lot 1 T. 14 S., R. 6 E., Sec. 18, Lot 1, Lot 2 Sec. 19, Lot 2, Lot 3 T. 14 S., R. 9 E., Sec. 6, SWSE	 160.40 0.04 0.38, 1.32, 0.19, 0.46 40.00
Cherokee	Huntsville Meridian T. 8 S., R. 9 E., Sec. 33, SENW T. 9 S., R. 11 E., Sec. 31, Lot 1 Sec. 32, Lot 2 T. 10 S., R. 8 E., Sec. 32, Lot 1 Sec. 33, Lot 1	 40.00 11.97 1.82 0.24 1.36
Choctaw	St. Stephens Meridian T. 15 N., R. 1 W., Sec. 27, SWSE	 38.89
Clarke	St. Stephens Meridian T. 5 N., R. 5 E., Sec. 4 E2NE T. 12 N., R. 2 E., Sec. 32, SWNE	 80.00 39.95
Clay	Huntsville Meridian T. 22 S., R. 5 E., Sec. 6, E2SW, SENW	 80.00, 39.40
Cleburne	Huntsville Meridian T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW	 160,00, 160.00, 79.40
Coosa	St. Stephens Meridian T. 22 N., R. 16 E., Sec. 5, Lot A, Lot B, Lot C	 51.75, 34.00, 36.60
Etowah	Huntsville Meridian T. 11 S., R. 7 E., Sec. 2, Lot 1 Sec. 11, Lot 1 Sec. 22, Lot 1 Sec. 36, Lot 1	 4.20 2.98 2.33 3.60

County	Legal Description	Acres
Franklin	Huntsville Meridian T. 7 S., R. 10 W., Sec. 6, SESW	 40.00
Hale	St. Stephens Meridian T. 20 N., R. 3 E., Sec. 5, Lot C, Lot F	 68.00, 108.00
Lamar	Huntsville Meridian T. 15 S., R. 15 W., Sec. 14, NWSW Sec. 15, NESE T. 15 S., R. 16 W., Sec. 14, SENE T. 16 S., R. 16 W., Sec. 18, FRL Sec. Sec. 20, NWNE T. 17 S., R. 14 W., Sec. 17, NESW	 40.96 39.84 40.05 17.15 39.95 40.98
Lauderdale	Huntsville Meridian T. 3 S., R. 11 W., Sec. 5, W2SE	 80.00
Lowndes	St. Stephens Meridian T. 12 N., R. 12 E., Sec. 12, NESE	 40.00
Marengo	St. Stephens Meridian T. 13 N., R. 2 E., Sec. 2, SESE Sec. 12, W2NE, E2NW Sec. 18, E2NE Sec. 20, SESE T. 13 N., R. 4 E., Sec. 3, NWNE T. 14 N., R. 2 E., Sec. 25, E2SW Sec. 31, S2NE, S2NENE, NESE Sec. 32, NESE	 40.31 80.00, 79.25 71.88 40.31 40.00 80.02 80.00, 19.83, 40.00 40.05
Mobile	St. Stephens Meridian T. 4 S., R. 4 W., Sec. 12, SENE	 40.00
Monroe	St. Stephens Meridian T. 5 N., R. 5 E., Sec. 4, E2NE T. 9 N., R. 10 E., Sec. 29, W2NW	 80.00 80.02
Morgan	Huntsville Meridian T. 7 S., R. 1 W., Sec. 6, SESW T. 8 S., R. 1 W., Sec. 26, S2NW	 40.00 80.00
St. Clair	Huntsville Meridian T. 18 S., R. 4 E., Sec. 5, S2NENE	 80.00
Shelby	Huntsville Meridian T. 21 S., R. 2 E., Sec. 6, Lot 1 Sec. 7, Lot 1, Lot 2, Lot 3, Lot 4, Lot 5 Sec. 8, Lot 1, Lot 2	 0.20 1.00, 0.70, 1.80, 0.09, 2.14 0.04, 0.50
Sumter	Huntsville Meridian T. 20 S., R. 1 W., Sec. 33	 160.00

County	Legal Description	Acres
Talladega	Huntsville Meridian T. 18 S., R. 3 E., Sec. 26, NWSE T. 18 S., R. 4 E., Sec. 5, S2NE	 40.00 80.00
Winston	Huntsville Meridian T. 10 S., R. 6 W., Sec. 26, NENE	 40.00

Table B-2. Lands of Uncertain Title in Mississippi

County	Legal Description	Acres
Carroll	Choctaw Meridian T. 21 N., R. 2 E., Sec. 19, Lot 13	 3.00
Claiborne	Washington Meridian T. 11 N., R. 3 E., Sec. 16, Lot 1 T. 12 N., R. 1 E., Sec. 2, FRL Sec. T. 12 N., R. 2 E., Sec. 27, FRL Sec. T. 12 N., R. 3 E., Sec. 3, Lot 7 Sec. 4, Lot 8 T. 13 N., R. 3 E., Sec. 55, FRL Sec. T. 13 N., R. 4 E., Sec. 64, W2SE	 150.15 313.00 29.43 24.00 15.00 184.19 82.23
Copiah	Washington Meridian T. 9 N., R. 8 E., Sec. 28 or 33, W2NW T. 9 N., R. 9 E., Sec. 4	 80.00 40.00
Covington	St. Stephens Meridian T. 8 N., R. 14 W., Sec. 4, NENE	 40.75
Franklin	Washington Meridian T. 5 N., R. 4 E., Sec. 36, NW T. 6 N., R. 2 E., Sec. 35, NENW T. 6 N., R. 3 E., Sec. 15, NENE	 160.00 40.00 41.07
Greene	St. Stephens Meridian T. 4 N., R. 7 W., Sec. 5, NENE	38.75
Grenada	Choctaw Meridian T. 22 N., R. 6 E., Sec. 19, NESE	40.00
Holmes	Choctaw Meridian T. 15 N., R. 3 E., Sec. 9, S2 Sec. 15, Lot 19 Sec. 25, SWSW Sec. 36, NWNW T. 16 N., R. 3 E., Sec. 25, NWNW	 318.20 39.36 40.00 40.00 35.02
Jefferson	Washington Meridian T. 8 N., R. 1 E., Sec. 54, Lot 1, Lot 2, Lot 3	 91.05, 130.23, 136.54
Jones	St. Stephens Meridian T. 8 N., R. 14 W., Sec. 4, NENE	 40.75

County	Legal Description	Acres
Kemper	Choctaw Meridian T. 10 N., R. 16 E., Sec. 1, SWSE, SESW	 38.11, 38.11
Lauderdale	Choctaw Meridian T. 5 N., R. 18 E., Sec. 27, NWSE T. 8 N., R. 18 E., Sec. 19, SWSE Sec. 22, NESE	 40.08 39.59 40.00
Lawrence	Washington Meridian T. 9 N., R. 10 E., Sec. 26, E2SE	 80.00
Lowndes	Huntsville Meridian T. 17 S., R. 19 W., Sec. 14, FRL Sec.	 52.25
Montgomery	Choctaw Meridian T. 19 N., R. 7 E., Sec. 30, E2NW, SWNE	 119.77
Neshoba	Choctaw Meridian T. 12 N., R. 10 E., Sec. 18, NENE T. 12 N., R. 12 E., Sec. 19, SWNW	 39.93 40.00
Newton	Choctaw Meridian T. 6 N., R. 12 E., Sec. 10, All Sec. 21, SENE	 639.90 40.00
Quitman	Choctaw Meridian T. 27 N., R. 1 E., Sec. 13, W2SW	 80.00
Rankin	Choctaw Meridian T. 4 N., R. 4 E., Sec. 27, NENE	 40.00
Scott	Choctaw Meridian T. 7 N., R. 9 E., Sec. 5, E2SE Sec. 6, SENE	 85.43 40.00
Smith	Choctaw Meridian T. 4 N., R. 6 E., Sec. 9, Lot 14 T. 2 N., R. 9 E., Sec. 14 SENW	 40.10 40.00
Tallahatchie	Choctaw Meridian T. 23 N., R. 3 E., Sec. 8, Lot 2 T. 26 N., R. 3 E., Sec. 23, NE, SENW, SWNW	 12.69 160.00, 40.00, 37.00
Walthall	Washington Meridian T. 3 N., R. 11 E., Sec. 18, S2SE	 80.00
Warren	Washington Meridian T. 13 N., R. 2 E., Sec. 17 FRL Sec. T. 14 N., R. 1 E., Sec. 30 FRL Sec (island) T. 14 N., R. 3 E., Sec. 12, NW Sec. 18, SE Sec. 27, W2 Sec. 31, NW	 40.00 69.92 155.50 155.50 318.15 153.04
Wayne	St. Stephens Meridian T. 10 N., R. 8 W., Sec. 35, Lot 6	 16.00

County	Legal Description	Acres
Wilkinson	Washington Meridian T. 2 N., R. 4 W., Sec. 33, FRL Sec. T. 3 N., R. 1 E., Sec. 14, SENE	 2.50 40.00
Yalobusha	Choctaw Meridian T. 24 N., R. 6 E., Sec.15, W2NW	 80.74

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APPENDIX C—RELEVANT STATUTES, REGULATIONS, ORDERS, AND GUIDELINES

The following list is representative of statutes, regulations, orders, and guidelines applicable to the Bureau of Land Management (BLM) Proposed Resource Management Plant (RMP) and Final Environmental Impact Statement (FEIS) process. This list is not meant to be all-inclusive.

LAW

- Federal Land Policy and Management Act (FLPMA) of 1976 , as amended, 43 United States Code (USC) 1701 et seq., provides authority for BLM land-use planning. Regulatory guidance is at 43 Code of Federal Regulations (CFR) 1600 et seq. The RMP process is in 43 CFR 1610.4.
- National Environmental Policy Act (NEPA) of 1969, as amended, 42 USC 4321 et seq. BLM guidance on NEPA process is in BLM Manual 1790 and Manual Handbook H-1790-1. Other guidance is *Overview of BLM's NEPA Process* from Course #1620-02, and the Council on Environmental Quality's (CEQ) *40 NEPA Questions*, March 16, 1981.
- Endangered Species Act (ESA) of 1973, as amended, 16 USC 1531 et seq.
- Antiquities Act of 1906, as amended, 16 USC 431-433.
- National Historic Preservation Act (NHPA), as amended, 16 USC 470 et seq.
- American Indian Religious Freedom Act (AIRFA) of 1978, as amended, 42 USC 1996 et seq.
- Recreation and Public Purposes Act (R&PP) of 1926, as amended, 43 USC 869 et seq.
- Federal Coal Leasing Amendments Act of 1976, as amended, 30 USC 201(a)(3)(A)(i).
- Surface Mining Control and Reclamation Act of 1977, 30 USC 1201 et seq.
- Mineral Leasing Act of 1920, as amended, 30 USC 181 et seq.
- Mineral Leasing Act of 1942 (for acquired lands).
- Onshore Oil and Gas Leasing Reform Act of 1987, 30 USC 181 et seq.
- General Mining Law of 1872, as amended, 30 USC 21 et seq.
- Mining and Mineral Policy Act of 1970, as amended, 30 USC 21(a).
- Archeological Resources Protection Act (ARPA) of 1978, as amended, 42 USC 1996 et seq.
- Migratory Bird Conservation Act of 1979, as amended, 16 USC 715 et seq.
- Native American Graves Protection and Repatriation Act (NAGPRA) of 1990, as amended, 25 USC 3001 et seq.
- Energy Policy and Conservation Act Reauthorization of 2000, as amended, Public Law 106-469.
- Energy Policy Act of 2005.
- Clean Air Act of 1963, as amended.
- Coastal Zone Management Act of 1972.
- Clean Water Act (CWA) of 1987, as amended.
- Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980.
- Resource Conservation and Recovery Act (RCRA) of 1976.
- Color of Title Act of 1928.
- Recreation and Public Purposes Act of 1926.
- Federal Water Pollution Control Act of 1948.
- National Ambient Air Quality Standards of 1990.

EXECUTIVE AND SECRETARIAL ORDERS

- Executive Order 12898 (Environmental Justice in Minority and Low-Income Populations)
- Executive Order 13007 (Indian Sacred Sites)

- Executive Order 13084 (Consultation and Coordination with Indian Tribal Governments)
- Executive Order 13112 (Invasive Species)
- Executive Order 11988 (Floodplain Management)
- Executive Order 11990 (Protection of Wetlands)
- Secretarial Order 3175 [Incorporated into Department of the Interior Departmental Manual (DM) at 512 DM 2]
- Secretarial Order 3206 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act)
- Executive Order 13186 (Migratory Birds)
- Executive Order 11514 (Protection and Enhancement of Environmental Quality)
- Executive Order 11738 (Administration of the Clean Air Act and the Federal Water Pollution Control Act with Respect to Federal Contracts, Grants, or Loans)
- Executive Order 12088 (Federal Compliance with Pollution Control Standards)

DEPARTMENT OF THE INTERIOR DEPARTMENTAL MANUAL

- 516 DM 1–15National Environmental Policy Act Revised Implementing Procedures, March 8, 2004 (Volume 69, Number 45) [Page 10865-10887]

BLM MANUAL AND HANDBOOK GUIDANCE

- BLM Manual Sections 1601 and 1613 and Handbooks H-1601 and H-1624-1 and 43 CFR 1600. Planning guidance for implementing FLPMA.
- BLM Manual Section 1790 and Handbook H-1790-1. NEPA. BLM guidance for implementing NEPA.
- BLM Manual Section 6480. Consultation requirements and consideration of Endangered and Special Status Species in the land use planning process.
- BLM Manual Sections 8120 and 8160 and Handbook H-8160-1. Cultural Resources and Native American Consultation Guidance for Land Use Planning.
- BLM Manual Section 8300 and Handbook H-8410-1. Planning Guidance Related to Recreation Activities.
- BLM Manual Sections 6500 and 6720. Consideration of Wildlife and Fisheries Management.
- Handbook H-1553-1. Publication Standards Manual Handbook.

INFORMATION BULLETINS (IB) AND INSTRUCTION MEMORANDA (IM)

- Washington Office IB No. 2002-056. Guidance on the recommended formats for land use plans, records of decision, and supporting Environmental Impact Statements
- Washington Office IB-2003-058. Basic guidance on initial steps in the land use planning process
- Washington Office IB-2003-074. Sample filing plan for land use planning records
- Washington Office IB-2003-020. Guidance on scoping-report format
- Washington Office IB-2002-101. Additional guidance on cultural resource considerations in RMPs.
- Washington Office IM-2002-164. Guidance on environmental justice in planning
- Washington Office IM-2002-167 and BLM Manual Handbook H-1601-1, Appendix D. Additional guidance on the treatment of socioeconomic issues in land use planning
- Washington Office IM-2003-137. Additional guidance on integrating the Energy Policy Conservation Act inventories into land use planning.

- Washington Office IM-2002-100. BLM procedures for internal review of preliminary documents
- Washington Office IM-2003-025. BLM printing standards
- Washington Office IM-2002-080. Guidance on comment content analysis
- Washington Office IM-2003-070. BLM land use plan protest procedures
- Washington Office IM-2002-202. E-government considerations
- Washington Office IM-2002-203 and IM-2002-149. Cooperating agencies in land use planning
- Washington Office IM-2001-202. Interim guidance for data management in land use planning

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APPENDIX D—PROPOSED CONSERVATION MEASURES AND BEST MANAGEMENT PRACTICES

INTRODUCTION

This appendix describes conservation measures to reduce adverse affects caused by surface-disturbing or disruptive activities that are proposed under the action alternatives (Alternatives 2, 3, and 4). The information contained in this appendix would not apply to Alternative 1 (No Action). Most measures are specifically designed to protect sensitive wildlife species and habitats. Although these measures are presented primarily as lease stipulations and Best Management Practices (BMP) for oil and gas operations, they would also be applied to other actions permitted or undertaken by the Bureau of Land Management (BLM).

ALTERNATIVE 3 (PROPOSED ALTERNATIVE) AND ALTERNATIVE 4

Proposed Stipulations

Three types of lease stipulations would be applied, defined as follows:

- **No Surface Occupancy (NSO).** A constraint that prohibits occupancy or disturbance on all or part of a lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the lease surface through use of directional drilling from outside the NSO area.
- **Controlled Surface Use (CSU).** A constraint under which use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.
- **Seasonal (Timing Limitation).** A constraint that prohibits surface use during specified periods to protect identified resource values.

For each stipulation, there are provisions for exception, modification, and waiver. An exception is a one-time exemption to the stipulations, determined on a case-by-case basis. A modification is a change to the provisions of the stipulation, either temporarily or for the term of the lease. A waiver is a permanent exemption to the stipulation. For Federally listed species, exception, modification, and waiver will typically require coordination and possibly formal consultation with the U.S. Fish and Wildlife Service (USFWS).

Bald Eagle

Stipulation (NSO): No surface occupancy or disturbance will be permitted within a 1,500-foot buffer zone around active or inactive bald eagle nests and communal roost sites (primary zone).

> **Objective:** To avoid impact to nesting eagles, including impact to important courtship and nesting behavior, egg laying and incubation, and feeding and fledging activity.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and appropriate State agencies.

Modification: This stipulation may be modified to remain consistent with Federal or State guidelines or if a portion of the stipulated area is no longer within the 1,500-foot buffer zone.

Waiver: This stipulation may be waived if no suitable nest sites are within 1,500 feet of any portion of the leased tract or if the nest site has not been used for at least 5 years.

Stipulation (CSU): BLM-permitted projects will not remove trees suitable for nesting within a 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites (secondary zone).

Objective: To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nests and communal roosting sites.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified to remain consistent with Federal and State guidelines or if a portion of the stipulated area is no longer within the 1.5-mile buffer zone.

Waiver: This stipulation may be waived if no nest or communal roosting site can be identified within 1.5 miles of the leased tract or if the applicant can document that no sites have been used by bald eagles for 5 consecutive years.

Stipulation (Timing Limitation): Surface-disturbing and other activities that are potentially disruptive to nesting bald eagles are prohibited within 1.5 miles of a bald eagle nest or communal roosting site between December 1 and August 1.

Objective: To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nest and roosting sites.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified to remain consistent with Federal and State guidelines or if a portion of the stipulated area is no longer within the 1.5-mile buffer zone.

Waiver: This stipulation may be waived if no nest site can be identified within 1.5 miles of any portion of the leased tract or if the applicant can document that no sites have been used by bald eagles for 5 consecutive years.

Red-Cockaded Woodpecker

Stipulation (NSO): No surface occupancy or disturbance within 0.5 mile of a red-cockaded woodpecker cluster, defined as the area containing all active and inactive cavity trees and a 200-foot buffer zone surrounding that area. Vehicle use is prohibited within a cluster except for through-travel on existing, maintained, paved roads.

Objective: To protect red-cockaded woodpecker nest sites from disturbance and habitat degradation.

Exception: An exception may be granted to allow surface occupancy within 0.5 mile of a cluster if the operator agrees to measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is no longer within the 0.5-mile buffer zone.

Waiver: This stipulation may be waived if no cluster can be identified within 0.5 mile of the leased tract.

Sea Turtles

(Green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle)

Stipulation (NSO): No surface occupancy or disturbance is permitted in suitable sea-turtle nesting habitat.

Objective: To protect sea turtle nesting habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is no longer suitable sea turtle nesting habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable sea turtle nesting habitat.

Gopher Tortoise, Eastern Indigo Snake, Gopher Frog, and Black Pine Snake

Stipulation (CSU): BLM-approved surveys will be required in all suitable gopher tortoise habitat where the tortoise is listed, including: Choctaw, Washington, Sumter, and Mobile counties in Alabama; and Clarke, Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone, Walthall, and Wayne counties in Mississippi. No surface disturbance or activity is permitted within 600 feet of a gopher tortoise burrow.

Suitable habitat includes areas with deep, well-drained and excessively well-drained sandy soils, especially the following U.S. Department of Agriculture (USDA)-National Resource Conservation Service (NRCS) soil series with an open understory with grass and forb groundcover open areas. Suitable soils include Alaga, Bigbee, Eustis, Lakeland, Wadley or Troup, McLaurin, Benndale, Heidel, Bama, Smithdale, Ruston, Lucedale, Lucy, Shubuta, Baxterville, Malbis, Poarch, Saucier, Susquehanna, Boswell, Lorman, Freestone, Freest, Prentiss, Savannah, Basin, and Petal.

Objective: To protect gopher tortoise habitat and commensal species.

Exception: Exceptions may be granted if the proponent agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if suitable gopher tortoise habitat does not exist in the stipulated area and that area does not provide forage habitat for adjacent tortoise

populations. Survey requirements may be modified if current tortoise surveys of the tract are approved by the BLM and USFWS.

Waiver: This stipulation may be waived if suitable gopher tortoise habitat does not exist on the tract and the tract does not provide forage habitat for gopher tortoises in adjacent areas.

Alabama Beach Mouse

Stipulation (NSO): No surface occupancy or disturbance will be permitted within suitable Alabama beach mouse habitat or its Federally designated critical habitat.

Objective: To avoid impacts to suitable Alabama beach mouse habitat and designated critical habitat.

Exception: An exception may be granted if measures are developed and implemented in consultation with USFWS to avoid potential take of the species. These measures must also be coordinated with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is found to be no longer suitable Alabama beach mouse habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable Alabama beach mouse habitat.

Gray Bat, Indiana Bat, Alabama Cave Shrimp, and Alabama Cavefish

Stipulation (NSO): No surface occupancy or disturbance is permitted within 250 feet of caves, fractures, large sinkholes, and perennial or intermittent streams in or adjacent to counties with documented gray bat or Indiana bat populations.

Objective: To prevent any impact to hydrologic networks connected to cave habitats and to protect flight paths and food sources for the bats.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if a portion of the stipulated area is found to be no longer within the 250-foot buffer zone.

Waiver: This stipulation may be waived if no portion of the leased area is within the 250-foot buffer zone.

Stipulation (NSO): No surface occupancy or disturbance is permitted within 0.5 mile of an Indiana bat or gray bat summer roost or gray bat wintering-cave hibernacula.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if the project does not adversely affect Indiana or gray bat hibernacula, with concurrence from USFWS and the appropriate State agencies.

Waiver: This stipulation may be waived if the lease is not within 0.5 mile of an Indiana bat or gray bat hibernacula.

Stipulation (CSU): A BLM-permitted action will not remove shagbark hickory trees or snags within 1.5 miles of an Indiana bat or gray bat hibernacula.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: None.

Waiver: None.

Stipulation (CSU): Injection or disposal of produced water or water withdrawal will not be allowed into identified karstic habitat or any hydrologic network connected to caves used by the bats or other listed cave species.

Objective: To prevent any impact to hydrologic networks connected to bat caves and flight paths, and to protect food sources for the bat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: The stipulation may be modified if a portion of the stipulated area is not in karstic habitat or a hydrologic network connected to caves used by the bats.

Waiver: The stipulation may be waived if none of the lease area is karstic habitat or is not hydrologically connected to caves used by the bats.

Aquatic Habitats

(Habitat for special status species including the Mississippi gopher frog; Alabama red-bellied turtle; flattened musk turtle; yellow-blotched map turtle; ringed map turtle; blue shiner; Gulf sturgeon; slackwater darter; sensitive clam and snail species including the ovate clubshell, southern clubshell, fine-lined pocketbook, and Tulotoma snail; and wood stork)

Stipulation (NSO): No surface occupancy or disturbance, including discharges, are permitted within 250 feet of a river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, brackish marshes, saltmarsh or small, marshy calcareous streams. This buffer may be extended to 600 feet where the slope exceeds 10 percent and to protect vernal pools in southeastern Mississippi between Highways 98 and 59 providing suitable habitat for endangered Mississippi gopher frog.

Objective: To protect the water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to Federal- and State-listed aquatic species.

Exception: An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges; 2) directionally drill under creeks, rivers, and other waters supporting listed species; or 3) implement other measures developed in consultation with USFWS and in coordination with State agencies.

Modification: The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yards downstream of the site, and the results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by the BLM and USFWS.

Waiver: The stipulations may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

Louisiana Black Bear

Stipulation: No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.

Objective: To protect Louisiana black bear denning and foraging habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies.

Modification: Temporary surface use may be permitted if USFWS concurs that the action would not adversely affect Louisiana black bear or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable Louisiana black bear habitat.

Piping Plover, Least Tern

Stipulation: No surface disturbance in piping plover and least tern habitat from the debris wrack line to the low-tide line of coastal beaches.

Objective: To protect wintering piping plover and least terns.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with the USFWS and in coordination with State agencies.

Modification: Temporary surface use may be permitted if USFWS concurs that the action would not adversely affect piping plover or least tern or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable piping plover or least tern habitat.

Sensitive Plant Species

(Including Alabama canebrake pitcher plant, green pitcher plant, Alabama leather flower, Eggert's sunflower, Kral's water-plantain, Mohr's Barbara's buttons, Morefield's leather flower, Price's potato-bean, and harperella)

Stipulation (CSU): All suitable special status plant species habitat will be identified during environmental review of any proposed surface use activity. If field examination indicates that habitat of one or more of these species is present, the BLM will require a survey by a qualified botanist for special status plants during periods appropriate to each species. Operations will not be allowed in areas where sensitive plants would be affected.

> **Objective:** To protect threatened, endangered, candidate, proposed, and BLM sensitive plant species.
>
> **Exception:** An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.
>
> **Modification:** The stipulation may be modified if it is determined that a portion of the lease area does not support sensitive plant species.
>
> **Waiver:** The stipulation may be waived if it is determined that the lease area does not support sensitive plant species.

Hancock County Marshes

Stipulation (NSO): No surface occupancy will be permitted within the component of the Mississippi Coastal Preserve System (MCPS) designated as Hancock County Marshes.

> **Objective:** To promote the preservation of marsh habitat in the MCPS, including the following ecological communities expected or known to occur: estuarine subtidal, 1) large tidal creek; estuarine intertidal, 1) sand shore 2) mesohaline marsh 3) oligohaline marsh; and other shell middens.
>
> **Objective:** For the protection of coastal marshes within this State-designated preserve.
>
> **Exception:** An exception may be allowed if, in consultation with the State agency responsible for the MCPS, it is determined that potential affects of the proposal would be adequately mitigated.
>
> **Modification:** The stipulation may be modified if a portion of the leased area is no longer identified as part of the MCPS.
>
> **Waiver:** The stipulation may be waived if the leased area is no longer identified as part of the MCPS.

BEST MANAGEMENT PRACTICES

BMPs are mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse impacts. They may be incorporated as design features when actions are proposed or may be attached as conditions of approval for BLM-permitted Applications for Permit to Drill (APD) for oil and gas.

The BMPs described below will be considered mandatory in Alternatives 3 and 4, and will be applied to oil and gas operations on new and existing leases. Note that the objective of each BMP is to reduce adverse impacts to specific resources, and that there is some flexibility in implementation. The degree of flexibility will vary. Application of BMPs when there is potential to affect Federally listed, proposed, or candidate species or designated critical habitat will typically require coordination and possibly formal consultation with USFWS. Examples of national environmental BMPs are listed below; other BMPs that could be applied during site-specific evaluation can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book* (BLM 2006) and at http://www.blm.gov/bmp.

- Interim reclamation of the well and access road
- Painting of all facilities to blend into the background
- Design and construct all new roads to a safe and appropriate standard, "no higher than necessary" to accommodate intended vehicular use
- Final reclamation of all disturbed areas, including access roads, to the original or similar contour
- Raptor perch-avoidance devices on powerlines
- Burial of powerlines and flow lines in or immediately adjacent to access roads
- Centralized production facilities
- The use of submersible pumps where feasible
- Below-ground wellheads where feasible
- Multiple wells from a single well pad where feasible
- Noise-reduction techniques to reduce noise from compressors or other motorized equipment
- Seasonal restrictions on public vehicular access where there are wildlife-conflict or road damage/maintenance issues
- Avoidance of production facilities on hilltops and ridgelines

Disposal of Produced Water

Objective: To protect aquatic habitats for and to avoid potential impacts to special status fish, mussels, turtles, snails, plants, and migratory birds.

The preferred method for disposal of produced water will be through reinjection to a permeable formation with total dissolved solids (TDS) content higher than 10,000 milligrams per liter (mg/L) where the aquifer is not hydrologically connected to caves, wetlands, or surface water. In Alabama, the injection of produced water is regulated by the Alabama State Oil and Gas Board. In Mississippi, the injection of produced water is regulated by the Mississippi Department of Environmental Quality (MDEQ) and the Mississippi Oil and Gas Board.

Alabama's Department of Environmental Management (ADEM) prohibits injection of pollutants from Class I Wells below an Underground Source of Drinking Water (USDW); injection of wastes from oil and gas production (Class III Wells) is regulated by the Alabama State Oil & Gas Board; ADEM regulates Class III Wells involving solution mining of certain minerals, such as salt. Class IV Wells are banned national by federal regulations; all others (Class V Wells) comprise about 90% of permitted injection wells in Alabama. EPA regulates all classes of injection wells on Tribal lands in Alabama. For surface water discharges into waters of the U.S., applicants would need State-issued National Pollution Discharge Elimination System (NPDES) permits, or federally-issued NPDES permits if the receiving water were on Tribal lands.

The UIC Program in Mississippi is implemented by the Mississippi Department of Environmental Quality (DEQ) and the Mississippi Oil & Gas Board. The Oil and Gas Board regulates Class II wells, and the DEW Management Support Brand, regulates all other well classes. In addition to Class II injection wells,

Mississippi has Class I hazardous waste injection wells, Class I non-hazardous injection wells, ad Class V injection wells. EPA regulates all classes of injection wells on Tribal lands in Mississippi. For surface water discharges into waters of the U.S., applicants would need State-issued NPDES permits, or federally-issued NPDES permits if the receiving waters were on Tribal lands.

If reinjection is not practicable, closed-containment treatment systems should be used to contain and treat produced water for those contaminants and sediments exceeding State standards or EPA criteria. Salt content of any surface ponds for produced water, pigging pits, or other fluids must be less than 7,500 microsiemens per centimeter (μS/cm). If surface pond salt content is greater than 7,500 μS/cm, if other bird toxicity is present, or if the surface exhibits sheen, then the ponds must be netted or covered with floating balls, or other methods must be used to exclude migratory birds.

Produced waters may be released into an impounded reservoir if there is documentation that the discharge site and affected waters do not support special status species, are not designated critical habitat, and State and Federal water quality standards/criteria are met.

Produced waters may be released into a stream/river if the discharge site and affected waters have been recently surveyed and lack special status species, or if the applicant conducts approved surveys documenting the absence of special status species, State and Federal water quality standards/criteria are met, and a National Pollution Discharge Elimination System (NPDES) permit is obtained. The applicant should be aware that some species can be surveyed only during certain times of the year.

Produced waters may be released into a stream/river if the applicant can document that the produced waters would not adversely affect special status species. Water quality tests would be conducted on stream segment(s) or other locations proposed as discharge points, volumes to be released, and any settling ponds or other treatments proposed to improve wastewater quality. The water quality test data, any monitoring proposed, and other available information about general coalbed methane effluent characteristics (from published or unpublished literature) shall be reviewed by USFWS. Information about timing of the releases in relation to low water and other planned BMPs would also be required. Testing would include analysis of the discharge site and affected waters for chemical oxygen demand (COD), conductivity, total suspended solids (TSS), As, Hg, Se, and polycyclic aromatic hydrocarbons (PAH). Dissolved oxygen and ammonia standards/criteria must be met in bottom waters if they support listed benthic or epibenthic species. If a special status species has been documented to be more sensitive than State/Federal standards/criteria, site-specific standards for that species may be imposed. Calculations would be based on State standards (or Federal CCC criteria for protection of freshwater aquatic life when the State has not determined a standard for these parameters).

Invasive and Non-Native Species

Objective: To discourage the spread of invasive, non-native plants.

Use of native or non-invasive cover plants in seeding mixtures will be encouraged to stabilize disturbed areas and during restoration activities. Construction areas will be surveyed for invasive species prior to ground disturbance. If invasive species are found, the proper control techniques will be used to either eradicate the species from the area or minimize its spread to other areas. If cogongrass is found on site, equipment should be washed before exiting the site to prevent the spread of this highly invasive species to other locations. Post-construction monitoring for cogongrass and other invasive plant species should be conducted to ensure early detection and control. In the case of split-estate land, final seed mixtures will be formulated in consultation with the private landowner.

Migratory Birds and Federally Listed Wildlife

Objective: To protect perch and roosting sites and terrestrial habitats for and to avoid potential impacts to migratory birds and Federally listed wildlife.

Any reserve pit that is not closed within 10 days after a well is completed and that contains water must be netted or covered with floating balls, or another method must be used to exclude migratory birds.

Maximum design speed on all operator-constructed and maintained (non-public) roads shall not exceed 25 miles per hour to minimize the chance of a collision with migratory birds or other listed wildlife species.

All powerlines must be built to protect raptors and other migratory birds, including bald eagles, from accidental electrocution, using methods detailed by the Avian Power Line Interaction Committee (APLIC 2006)[1].

Objective: To avoid or minimize the possibility of the unintentional take of migratory birds during periods of concentrated nesting activity and to provide long-term benefits and improved vegetation community condition.

The BLM or other qualified personnel may be required identify suitable migratory bird nesting habitat within the project site. Opportunities should be evaluated to shift disturbance away from high value migratory bird nesting or foraging habitats, or to replace habitat on or off site.

A Timing Limitation may be imposed on use authorizations to mitigate large-scale vegetative disturbing activities during the primary portion of the nesting season. Dates could be adjusted for the species and environmental conditions.

Perching and Nesting Birds and Bats

Objective: To prevent birds and bats from entering or nesting in or on open vent stack equipment.

Open vent stack equipment, such as heater-treaters, separators, and dehydrator units, will be designed and constructed to prevent birds and bats from entering or nesting in or on such units and, to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and will not be acceptable.

Pesticide Application

Objective: To protect the water quality of watersheds and natural stream substrate and morphology supporting special status species and their host species.

[1] APLIC 2006. *Suggested Practices for Raptor Protection on Power Lines—The State of the Art 2006*. APLIC, Edison Electric Institute, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Any ground application of herbicides or other pesticides, sterilants, or adjuvants within 150 feet of listed species or habitat will require site-specific control measures developed in coordination or formal consultation with USFWS. No aerial application of herbicides or pesticides will be permitted.

ALTERNATIVE 2

The lease stipulations and BMPs implemented under Alternative 2 would be the same as those discussed above for Alternatives 3 and 4, except for the following:

Alabama Beach Mouse. Suitable Alabama beach mouse habitat or its Federally designated critical habitat would be unavailable for lease.

Freshwater Aquatic Habitat. No surface occupancy or disturbance, including discharges, are permitted within 1,000 feet of a river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams.

> **Objective:** To protect water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to Federal and State-listed aquatic species.
>
> **Exception:** An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges; 2) directionally drill under creeks, rivers, and other waters supporting listed species; or 3) implement other measures developed in consultation with USFWS and in coordination with State agencies.
>
> **Modification:** The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yards downstream of the site, and if results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by the BLM and USFWS.
>
> **Waiver:** The stipulations may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

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APPENDIX E—SPECIAL STATUS SPECIES IN ALABAMA AND MISSISSIPPI

This appendix provides information on special status species in the States of Alabama and Mississippi.

E.1. FEDERALLY PROTECTED SPECIES

The U.S. Fish and Wildlife Service (USFWS) provided species lists for Alabama and Mississippi. These lists are presented in the following sections.

E.1.1. Federally Protected Species In Alabama

There are 132 Federally protected species in Alabama as of October 27, 2005. Species in the following sections are coded as follows:

- E Endangered
- T Threatened
- EXPN Experimental Population, Non-essential
- SC Species of Concern
- S/A Similarity of Appearance
- PE Proposed Endangered
- PT Proposed Threatened
- C Candidate Taxon, Ready for Proposal
- **CH** Designated Critical Habitat
- **CH*** Indicates Critical Habitat in AL
- BGEPA Bald and Golden Eagle Protection Act

E.1.1.1. Mammals

E .....Bat, gray (*Myotis grisescens*)
E-**CH**.....Bat, Indiana (*Myotis sodalis*)
E.....Bear, Louisiana black (*Ursus americanus luteolus*), listed in MS, S. AL bears are FL subspecies
E.....Manatee, Florida (*Trichechus manatus*), listed in FL and GA
E-**CH***....Mouse, Alabama beach (*Peromyscus polionotus ammobates*)
E-**CH***....Mouse, Perdido Key beach (*Peromyscus polionotus trissyllepsis*)

E.1.1.2. Birds

E.....Crane, Mississippi sandhill (*Grus canadensis pulla*), listed in MS
EXPN.....Crane, whooping (*Grus americana*)
BGEPA ..Eagle, bald (*Haliaeetus leucocephalus*)
E.....Pelican, brown (*Pelecanus occidentalis*), listed in MS, delisted 1985 in AL, FL, and Atlantic Coast
T-**CH***....Plover, piping (*Charadrius melodus*)
E.....Stork, wood (*Mycteria americana*)
E.....Tern, least (*Sterna antillarum*), listed in MS and TN
E.....Woodpecker, red-cockaded (*Picoides borealis*)

E.1.1.3. Reptiles

T.....Sea turtle, green (*Chelonia mydas*)
E.....Sea turtle, hawksbill (*Eretmochelys imbricata*)
E.....Sea turtle, Kemp's (=Atlantic) ridley (*Lepidochelys kempii*)
T.....Sea turtle, loggerhead (*Caretta caretta*)
T.....Snake, eastern indigo (*Drymarchon corais couperi*)
C.....Snake, black pine (*Pituophis melanoleucus lodingi*)
T.....Tortoise, gopher (*Gopherus polyphemus*), listed in Choctaw, Washington, Mobile Counties only
E.....Turtle, Alabama red-bellied (*Pseudemys alabamensis*)
T.....Turtle, flattened musk (*Sternotherus depressus*)
T.....Turtle, ringed map (=sawback) (*Graptemys oculifera*), listed in MS
T.....Turtle, yellow-blotched map (=sawback) (*Graptemys flavimaculata*), listed in MS

E.1.1.4. Amphibians

PE.....Gopher frog, dusky (*Rana sevosa*), MS only; (*Rana capito*) in AL, not listed
T.....Salamander, Red Hills (*Phaeognathus hubrichti*)
T.....Salamander, flatwoods (*Phaeognathus cingulatum*), not seen for decades
C.....Waterdog, Black Warrior (*Necturus alabamensis*)

E.1.1.5. Snails

T.....Elimia (snail), lacy (*Elimia crenatella*)
C…….Mudalia, black (*Elimia melanoides*)
E.....Lioplax (snail), cylindrical (*Lioplax cyclostomaformis*)
E.....Pebblesnail, flat (*Lepyrium showalteri*)
E.....Riversnail, Anthony's (*Athearnia anthonyi*), NEP below Wilson Dam
T.....Rocksnail, painted (*Leptoxis taeniata*)
E.....Rocksnail, plicate (*Leptoxis plicata*)
T.....Rocksnail, round (*Leptoxis ampla*)
C…….Rocksnail, interrupted (*Leptoxis foremani*)
E.....Snail, tulotoma (=Alabama live-bearing) (*Tulotoma magnifica*)
E.....Snail, armored (*Marstonia [=Pyrgulopsis] pachyta*)
E.....Slender campeloma (*Campeloma decampi*)
C…….Hornsnail, rough (*Pleurocera formani*)

E.1.1.6. Mussels

E-**CH***....Acornshell, southern (*Epioblasma othcaloogensis*), **probably extirpated**
C.....Bean, Choctaw (*Villosa choctawensis*)
E.....Blossom, turgid (pearlymussel) (*Epioblasma turgidula*), **probably extinct**
E.....Blossom, yellow (pearlymussel) (*Epioblasma florentina florentina*), **probably extirpated**
E.....Catspaw (*Epioblasma obliquata obliquata*), **probably extirpated**
E.....Clubshell, black (=Curtus' mussel) (*Pleurobema curtum*), **probably extirpated**
E-**CH***....Clubshell, ovate (*Pleurobema perovatum*)
E-**CH***....Clubshell, southern (*Pleurobema decisum*)
E-**CH***....Combshell, Cumberlandian (*Epioblasma brevidens*), CH in Bear Creek
E.....Combshell, southern (=penitent mussel) (*Epioblasma penita*)

E-**CH***....Combshell, upland (*Epioblasma metastriata*), **probably extirpated**
E.....Fanshell (*Cyprogenia stegaria*)
T.....Heelsplitter, Alabama (=inflated) (*Potamilus inflatus*)
E-**CH***....Kidneyshell, triangular (*Ptychobranchus greenii*), may be split into two species, watch for details
C.....Kidneyshell, southern (*Ptychobranchus jonesi*)
E.....Lampmussel, Alabama (*Lampsilis virescens*)
E.....Lilliput, pale (pearlymussel) (*Toxolasma cylindrellus*)
T-**CH***....Moccasinshell, Alabama (*Medionidus acutissimus*)
E-**CH***....Moccasinshell, Coosa (*Medionidus parvulus*)
E.....Moccasinshell, Gulf (*Medionidus penicillatus*)
E.....Monkeyface, Cumberland (pearlymussel) (*Quadrula intermedia*)
T-**CH***....Mucket, orange-nacre (*Hamiota [Lampsilis] perovalis*)
E.....Mucket, pink (pearlymussel) (*Lampsilis abrupta*)
E-**CH***....Oyster Mussel (*Epioblasma capsaeformis*), NEP in AL below Wilson Dam, CH in Bear Creek
C.....Pearlshell, Alabama (*Margaritifera marrianae*)
E.....Pearlymussel, cracking (*Hemistena lata*)
E.....Pearlymussel, dromedary (*Dromus dromas*), **probably extirpated**
E.....Pearlymussel, littlewing (*Pegias fabula*), **probably extirpated**
C.....Pearlymussel, slabside (*Pleuronaia [Lexingtonia] dolabelloides*)
E-**CH***....Pigtoe, dark (*Pleurobema furvum*)
E.....Pigtoe, fine-rayed (*Fusconaia cuneolus*)
E.....Pigtoe, flat (=Marshall's mussel) (*Pleurobema marshalli*), **probably extirpated**
C.....Pigtoe, fuzzy (*Pleurobema strodeanum*)
E.....Pigtoe, oval (*Pleurobema pyriforme*)
E.....Pigtoe, heavy (=Judge Tait's mussel) (*Pleurobema taitianum*)
E.....Pigtoe, rough (*Pleurobema plenum*)
E.....Pigtoe, shiny (*Fusconaia cor [=edgariana]*)
E-**CH***....Pigtoe, southern (*Pleurobema georgianum*)
E.....Pimpleback, orangefoot (pearlymussel) (*Plethobasus cooperianus*)
E.....Pink, ring (*Obovaria retusa*)
T-**CH***....Pocketbook, finelined (*Hamiota [=Lampsilis] altilis*)
E.....Pocketbook, shinyrayed (*Hamiota [Lampsilis] subangulata*)
T.....Purple Bankclimber (*Plectomerus [=Elliptoideus] sloatianus*)
C.....Sandshell, southern (*Lampsilis australis*)
E.....Stirrupshell (*Quadrula stapes*), **probably extinct**
E.....Wartyback, white (pearlymussel) (*Plethobasus cicatricosus*)

E.1.1.7. Crustaceans

E.....Shrimp, Alabama cave (*Palaemonias alabamae*)

E.1.1.8. Fish

E-**CH***....Cavefish, Alabama (*Speoplatyrhinus poulsoni*)
EXPN…. Chub, spotfin (*Erimonax monachus*) (= *Cyprinella [=Hybopsis] monacha*)
E.....Darter, boulder (=Elk River) (*Etheostoma wapiti*)
T.....Darter, goldline (*Percina aurolineata*)
C.....Darter, rush (*Etheostoma phytophylum*)
E.....Darter, vermilion (*Etheostoma chermocki*)
T-**CH***....Darter, slackwater (*Etheostoma boschungi*), CH in Cypress Creek and tributaries

T.....Darter, snail (*Percina tanasi*)
E.....Darter, watercress (*Etheostoma nuchale*)
T.....Sculpin, pygmy (*Cottus pygmaeus*)
T.....Shiner, blue (*Cyprinella [=Notropis] caerulea*)
E.....Shiner, Cahaba (*Notropis cahabae*)
E.....Shiner, palezone (*Notropis albizonatus*)
E.....Sturgeon, Alabama (*Scaphirhyncus suttkusi*)
T-**CH***....Sturgeon, Gulf (*Acipenser oxyrinchus desotoi*)

E.1.1.9. Plants

T.....Little amphianthus (*Amphianthus pusillus*)
T.....Price's potato-bean (*Apios priceana*)
T.....Braun's rock cress (*Arabis perstellata*), no records in Daphne, AL Geographic Information Systems (GIS)
E.....Morefield's leather-flower (*Clematis morefieldii*)
E.....Alabama leather-flower (*Clematis socialis*)
E.....Leafy prairie-clover (*Dalea [=Petalostemum] foliosa*)
C.....Whorled sunflower (*Helianthus verticillatus*)
T.....Lyrate bladderpod (*Lesquerella lyrata*)
C.....Panhandle lily (*Lilium iridollae*)
E.....Pondberry (*Lindera melissifolia*), not known in AL when listed throughout range
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)
C.....White fringless orchid (*Platanthera integrilabia*)
E.....Harperella (*Ptilimnium nodosum [=fluviatile]*)
T.....Kral's water-plantain (= Little River Arrowhead) (*Sagittaria secundifolia*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
E.....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp. alabamensis*)
E.....American chaffseed (*Schwalbea americana*)
E.....Gentian pinkroot (*Spigelia gentianoides*), (*var. alabamensis*) in Bibb County not protected by Endangered Species Act (ESA)
E.....Relict trillium (*Trillium reliquum*)
E.....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
C.....Georgia Rockcress (*Arabis georgiana*)
C.....Georgia aster (*Aster georgiana*)
C.....Fleshyfruit gladecress (*Leavenworthia crassa*), see Tennessee Valley Authority (TVA) GIS dataset

E.1.1.10. Ferns and Allies

T.....American hart's-tongue fern (*Asplenium scolopendrium var. americanum*)
E.....Louisiana quillwort (*Isoetes louisianensis*)
T.....Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)

E.1.1.11. Insects

E.....Butterfly, Mitchell's Satyr (*Neonympha mitchellii mitchellii*), AL not in listed range but found here
E.....Hine's Emerald Dragonfly (*Sematochlora hineana*), recorded once in 1978, no surveys since

E.1.2. Federally Protected Species List for Mississippi

There are 39 Federally protected species in Mississippi as of December 2000. This list does not include the five endangered whale species that may occasionally be found in Mississippi coastal waters. Species in the following sections are coded as follows:

- E Endangered
- T Threatened
- C Candidate
- S Under Status Review

The following species are exceptions to those listed:

- **Protected Species Due to Similarity of Appearance** (look similar to Federally listed species):
  - American alligator
  - American black bear
- **Extirpated Species** (once lived in Mississippi but are no longer found here):
  - Alabama sturgeon
  - American burying beetle
  - Bachman's warbler
  - Florida panther
  - Ivory-billed woodpecker
  - Red wolf
- **Extinct Species** (gone forever from Mississippi and the world):
  - Carolina parakeet
  - Passenger pigeon
- **Recovered Species** (populations increased so that the species is no longer in danger of going extinct and has been removed from the Endangered Species List):
  - Peregrine falcon, August 1995

E.1.2.1. Mammals

E.....Bat, gray (*Myotis grisescens*)
E.....Bat, Indiana (*Myotis sodalis*)
T.....Bear, Louisiana black (*Ursus americanus luteolus*)
E.....Manatee, West Indian (*Trichechus manatus*)

E.1.2.2. Birds

E.....Crane, Mississippi sandhill (*Grus canadensis pulla*)
T.....Eagle, bald (*Haliaeetus leucocephalus*), proposed for delisting 2001
E.....Pelican, brown (*Pelecanus occidentalis*)
T.....Plover, piping (*Charadrius melodus*)
E.....Tern, least (interior population) (*Sterna antillarum*)
E.....Woodpecker, red-cockaded (*Picoides borealis*)
S……..Wood Stork (*Mycteria americana*)

E.1.2.3. Reptiles

T.....Sea turtle, green (*Chelonia mydas*)

E.....Sea turtle, hawksbill (*Eretmochelys imbricata*)
E.....Sea turtle, Kemp's ridley (=Atlantic) (*Lepidochelys kempii*)
E.....Sea turtle, leatherback (*Dermochelys coriacea*)
T.....Sea turtle, loggerhead (*Caretta caretta*)
T.....Snake, eastern Indigo (*Drymarchon corais couperi*)
T.....Tortoise, gopher (*Gopherus polyphemus*)
T.....Turtle, ringed map (=sawback) (*Graptemys oculifera*)
T.....Turtle, yellow-blotched (=sawback) (*Graptemys flavimaculatata*)

E.1.2.4. Fish

T.....Darter, bayou (*Etheostoma rubrum*)
C…….Darter, pearl (Percina aurora)
T.....Sturgeon, Gulf (*Acipenser oxyrinchus desotoi*)
E.....Sturgeon, pallid (*Scaphirhynchus albus*)

E.1.2.5. Mussels

E.....Clubshell, black (=Curtus' mussel) (*Pleurobema curtum*)
E.....Clubshell, ovate (*Pleurobema perovatum*)
E.....Clubshell, southern (=Penitent shell mussel) (*Pleurobema decisum*)
E.....Combshell, southern (*Epioblasma penita*)
T.....Heelsplitter, inflated (*Potamilus inflatus*)
T.....Moccasinshell, Alabama (*Medionidus acutissimus*)
T.....Mucket, orange-nacre (*Lampsilis perovalis*)
E.....Pigtoe, flat (*Pleurobema marshalli*)
E.....Pigtoe, heavy (=Judge Tait's mussel) (*Pleurobema taitianum*)
E.....Pocketbook, fat (*Potamilus [=Proptera] capax*)
E.....Stirrupshell (*Quadrula stapes*)

E.1.2.6. Insects

E……Mitchell's satyr (*Neonympha mitchelli mitchelli*)

E.1.2.7. Plants

E.....American chaffseed (*Schwalbea americana*)
E.....Louisiana quillwort (*Isoetes louisianensis*)
T.....Price's potato-bean (*Apios priceana*)
E.....Pondberry (*Lindera melissifolia*)

E.1.3. Federally Protected Species in Alabama, by County

There following sections present the occurrence of Federally protected species in Alabama, by county. However, bald eagles (*Haliaeetus leucocephalus*), red-cockaded woodpeckers (*Picoides borealis*), and American peregrine falcons (*Falco peregrinus anatum*) may occur in any county, if suitable habitat exists. Species in the following sections are coded as follows:

- E Endangered Species
- T Threatened Species
- C Candidate Species

- CH Critical Habitat Designated
- (P) Historical Record or Possible Occurrence in County
- PE Proposed Endangered
- PT Proposed Threatened

E.1.3.1. Autauga

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)
E.....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp.alabamensis*)
T.....Price's potato-bean (*Apios priceana*)

E.1.3.2. Baldwin

E.....West Indian manatee (*Trichechus manatus*)
E-CH .....Alabama beach mouse (*Peromyscus polionotus ammobates*)
E-CH .....Perdido Key beach mouse (*Peromyscus polionotus trissylepsis*)
C.....Bachman's sparrow (*Aimophila aestivalis*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Least tern (*Sterna antillarum*)
T-(P)-CH .Piping plover (*Charadrius melodus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
E.....Alabama red-bellied turtle (*Pseudemys alabamensis*)
T.....Loggerhead sea turtle (*Caretta caretta*)
E.....Kemp's ridley sea turtle (*Lepidochelys kempii*)
T-(P).....Green sea turtle (*Chelonia mydas*)
T-(P).....Flatwoods salamander (*Ambystoma cingulatum*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)
E.....American chaffseed (*Schwalbea americana*)
C.....Panhandle lily (*Lillium iridollae*)

E.1.3.3. Barbour

E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.3.4. Bibb

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Cylindrical lioplax snail (*Lioplax cyclostomaformis*)
E.....Flat pebblesnail (*Lepyrium showalteri*)
T.....Round rocksnail (*Leptoxis ampla*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)

E.....Cahaba shiner (*Notropis cahabae*)
T.....Goldline darter (*Percina aurolineata*)
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)
E.....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
C.....Georgia rockcress (*Arabis georgiana*)
E.....Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.5. Blount

T.....Flattened musk turtle (*Sternotherus depressus*)
C.....Black Warrior waterdog (*Necturus alabamensis*)
E.....Plicate rocksnail (*Leptoxis plicata*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Cahaba shiner (*Notropis cahabae*)
T.....Eggert's sunflower (*Helianthus eggertii*)
C.....Georgia aster (*Aster georgianus*)

E.1.3.6. Bullock

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Relict trillium (*Trillium reliquum*)

E.1.3.7. Butler

E.....Wood stork (*Mycteria americana*)
T.....Red Hills salamander (*Phaeognathus hubrichti*)

E.1.3.8. Calhoun

E.....Gray bat (*Myotis grisescens*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Tulotoma snail (*Tulotoma magnifica*)
T.....Painted rocksnail (*Leptoxis taeniata*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)
C.....White fringeless orchid (*Platanthera integrilabia*)

E.1.3.9. Chambers

T.....Little amphianthus (*Amphianthus pusillus*)

E.1.3.10. Cherokee

T.....Bald eagle (*Haliaeetus leucocephalus*)

E.....Coosa moccasinshell mussel (*Medionidus parvulus*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Blue shiner (*Cyprinella caerulea*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
E.....Harperella (*Ptilimnium nodosum*)
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)
E.....Alabama leather-flower (*Clematis socialis*)
T.....Kral's water-plantain (*Sagittaria secundifolia*)
C.....Whorled sunflower (*Helianthus verticillatus*)

E.1.3.11. Chilton

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Wood stork (*Mycteria americana*)
T.....Painted rocksnail (*Leptoxis taeniata*)
E.....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp.alabamensis*)

E.1.3.12. Choctaw

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.13. Clarke

E.....Wood stork (*Mycteria americana*)
C.....Black pine snake (*Pituophis melanoleucus lodingi*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
E-(P).....Heavy pigtoe mussel (*Pleurobema taitianum*) T Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.14. Clay

E.....Tulotoma snail (*Tulotoma magnifica*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Blue shiner (*Cyprinella caerulea*)
C.....Georgia aster (*Aster georgianus*)
C.....White fringeless orchid (*Platanthera integrilabia*)

E.1.3.15. Cleburne

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)

E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook (*Lampsilis altilis*)
C.....White fringeless orchid (*Platanthera integrilabia*)

E.1.3.16. Coffee

E.....Wood stork (*Mycteria americana*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.17. Colbert

E.....Gray bat (*Myotis grisescens*)
E-(P).....Indiana bat (*Myotis sodalis*)
E.....Anthony's riversnail (*Athearnia anthonyi*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....White wartyback pearlymussel (*Plethobasus cicatricosus*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Cumberlandian combshell mussel (*Epioblasma brevidens*)
E.....Ring pink mussel (*Obovaria retusa*)
E.....Turgid blossom pearlymussel (*Epioblasma turgidula*)
E.....Cracking pearlymussel (*Hemistena lata*)
C.....Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.....Fanshell mussel (*Cyprogenia stegaria*)
E.....Alabama cave shrimp (*Palaemonias alabamae*)
E.....Spotfin chub (*Cyprinella* [*=Hybopsis] monacha*)
T.....Lyrate bladder-pod (*Lesquerella lyrata*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)
E.....Leafy prairie-clover (*Dalea foliosa*)

E.1.3.18. Conecuh

E.....Gray bat (*Myotis grisescens*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Red hills salamander (*Phaeognathus hubrichti*)
C.....Alabama pearlshell (*Margaritifera marrianae*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.19. Coosa

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Tulotoma snail (*Tulotoma magnifica*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
T.....Blue shiner (*Cyprinella caerulea*)
T.....Kral's water-plantain (*Sagittaria secundifolia*)

E.1.3.20. Covington

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
T.....Red Hills salamander (*Phaeognathus hubrichti*)
T-(P).....Flatwoods salamander (*Ambystoma cingulatum*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Pondberry (*Lindera melissifolia*)
T-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.21. Crenshaw

E.....Wood stork (*Mycteria americana*)
T.....Red Hills salamander (*Phaeognathus hubrichti*)

E.1.3.22. Cullman

T.....Flattened musk turtle (*Sternotherus depressus*)
C.....Black Warrior waterdog (*Necturus alabamensis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)

E.1.3.23. Dale

T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.24. Dallas

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Southern clubshell mussel (*Leurobema decisum*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.25. De Kalb

E.....Gray bat (*Myotis grisescens*)
E-(P).....Indiana bat (*Myotis sodalis*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Blue shiner (*Cyprinella caerulea*)
T.....Kral's water-plantain (*Sagittaria secundifolia*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
E.....Harperella (*Ptilimnium nodosum*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)

E.1.3.26. Elmore

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Tulotoma snail (*Tulotoma magnifica*)
E.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp.alabamensis*)
C.....Georgia rockcress (*Arabis georgiana*)

E.1.3.27. Escambia

E.....Wood stork (*Mycteria americana*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)

E.1.3.28. Etowah

T.....Flattened musk turtle (*Sternotherus depressus*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
C.....Rush darter (*Etheostoma phytophilum*)
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
E.....Alabama leather-flower (*Clematis socialis*)

E.1.3.29. Fayette

T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Dark pigtoe mussel (*Pleurobema furvum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)

E.1.3.30. Franklin

E.....Gray bat (*Myotis grisescens*)
C.....Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.....Cumberlandian combshell mussel (*Epioblasma brevidens*)
T.....Lyrate bladder-pod (*Lesquerella lyrata*)
E.....Leafy prairie clover (*Dalea foliosa*)
E.....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
T.....Eggert's sunflower (*Helianthus eggertii*)

E.1.3.31. Geneva

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Gentian pinkroot (*Spigelia gentianoides var. gentianoides*)

E.1.3.32. Greene

E.....Wood stork (*Mycteria americana*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
E.....Stirrupshell mussel (*Quadrula stapes*)
E.....Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.33. Hale

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)

E.1.3.34. Henry

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Wood stork (*Mycteria americana*)
E.....Relict trillium (*Trillium reliquum*)

E.1.3.35. Houston

T.....Bald eagle (*Haliaeetus leucocephalus*)
T-(P).....Flatwoods salamander (*Ambystoma cingulatum*)
E.....Gulf moccasinshell mussel (*Medionidus penicillatus*)
E.....Oval pigtoe mussel (*Pleurobema pyriforme*)

E.1.3.36. Jackson

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Anthony's riversnail (*Athearnia anthonyi*)
E.....Shiny pigtoe mussel (*Fusconaia cor [edgariana]*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....Alabama lampmussel (*Lampsilis virescens*)
E.....Pale lilliput pearlymussel (*Toxolasma cylindrellus*)
E.....Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
C.....Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.....Palezone shiner (*Notropis albizonatus*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
T.....American hart's-tongue fern (*Phyllitis scolopendrium var.americana*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)
T.....Price's potato-bean (*Apios priceana*)
C.....White fringeless orchid (*Platanthera integrilabia*)
E-(P).....Hine's emerald dragonfly (*Somatochlora hineana*)

E.1.3.37. Jefferson

T.....Flattened musk turtle (*Sternotherus depressus*)
C.....Black Warrior waterdog (*Necturus alabamensis*)
E.....Plicate rocksnail (*Leptoxis plicata*)
E.....Upland combshell mussel (*Epioblasma metastriata*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Watercress darter (*Etheostoma nuchale*)
E.....Cahaba shiner (*Notropis cahabae*)
T.....Goldline darter (*Percina aurolineata*)
C.....Rush darter (*Etheostoma phytophilum*)
PE.....Vermilion darter (*Etheostoma chermocki*)
E.....Leafy prairie-clover (*Dalea foliosa*)

E.1.3.38. Lamar

E.....Southern combshell mussel (*Epioblasma penita*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)

E.1.3.39. Lauderdale

E.....Gray bat (*Myotis grisescens*)
E-(P).....Indiana bat (*Myotis sodalis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Anthony's riversnail (*Athearnia anthonyi*)
E.....Ring pink mussel (*Obovaria retusa*)
E.....Turgid blossom pearlymussel (*Epioblasma turgidula*)
E.....Cracking pearlymussel (*Hemistena lata*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....White wartyback pearlymussel (*Plethobasus cicatricosus*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Fanshell (*Cyprogenia stegaria*)
T-CH.....Slackwater darter (*Etheostoma boschungi*)
E-CH.....Alabama cavefish (*Speoplatyrhinus poulsoni*)
E.....Spotfin chub (*Cyprinella [=Hybopsis] monacha*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)
C.....Fleshyfruit gladecress (*Leavenworthia crassa*)
C.....Georgia rockcress (*Arabis georgiana*)

E.1.3.40. Lawrence

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalis*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)

T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Dark pigtoe mussel (*Pleurobema furvum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Leafy prairie clover (*Dalea foliosa*)
T.....Lyrate bladder-pod (*Lesquerella lyrata*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)
C.....Fleshyfruit gladecress (*Leavenworthia crassa*)

E.1.3.41. Lee

E.....Ovate clubshell mussel (*Pleurobema perovatum*)
T.....Purple bankclimber (*Eliptoideus sloatianus*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Relict trillium (*Trillium reliquum*)

E.1.3.42. Limestone

E.....Gray bat (*Myotis grisescens*)
E-(P).....Indiana bat (*Myotis sodalis*)
E.....Anthony's riversnail (*Athearnia anthonyi*)
E.....Slender campeloma snail (*Campeloma decampi*)
E.....Armored snail (*Pyrgulopsis pachyta*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Cumberland monkeyface mussel (*Quadrula intermedia*)
E.....Cracking pearlymussel (*Hemistena lata*)
E.....Ring pink mussel (*Obovaria retusa*)
T.....Slackwater darter (*Etheostoma boschungi*)
E.....Boulder darter (*Etheostoma wapiti*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)

E.1.3.43. Lowndes

E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)

E.1.3.44. Macon

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Wood stork (*Mycteria americana*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)

E.1.3.45. Madison

E.....Gray bat (*Myotis grisescens*)
E.....Slender campeloma snail (*Campeloma decampi*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....Shiny pigtoe mussel (*Fusconaia cor [edgariana]*)
E.....Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
C.....Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.....Alabama cave shrimp (*Palaemonias alabamae*)
T.....Slackwater darter (*Etheostoma boschungi*)
E.....Snail darter (*Percina tanasi*)
T.....Price's potato-bean (*Apios priceana*)
E.....Morefield's leather-flower (*Clematis morefieldii*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)

E.1.3.46. Marengo

T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)

E.1.3.47. Marion

T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Southern combshell mussel (*Epioblasma penita*)
C.....White fringeless orchid (*Platanthera integrilabia*)

E.1.3.48. Marshall

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalis*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Flattened musk turtle (*Sternotherus depressus*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....Shiny pigtoe mussel (*Fusconaia cor [edgariana]*)
E.....Fine-rayed pigtoe mussel (*Fusconaia cuneolus*)
E.....Orangefoot pimpleback pearlymussel (*Plethobasus cooperianus*)
C.....Slabside pearlymussel (*Lexingtonia dolabelloides*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Snail darter (*Percina tanasi*)
T.....Price's potato-bean (*Apios priceana*)
E.....Green pitcher-plant (*Sarracenia oreophila*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)

E.1.3.49. Mobile

E.....West Indian manatee (*Trichechus manatus*)
T.....Piping plover (*Charadrius melodus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Least tern (*Sterna antillarum*)

T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus lodingi*)
T.....Gopher tortoise (*Gopherus polyphemus*)
E.....Alabama red-bellied turtle (*Pseudemys alabamensis*)
T.....Loggerhead sea turtle (*Caretta caretta*)
E-(P).....Kemp's ridley sea turtle (*Lepidochelys kempii*)
T-(P).....Green sea turtle (*Chelonia mydas*)
T-(P).....Flatwoods salamander (*Ambystoma cingulatum*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.50. Monroe

E.....Gray bat (*Myotis grisescens*)
T.....Red hills salamander (*Phaeognathus hubrichti*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
C.....Alabama pearlshell mussel (*Margaritifera marrianae*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.51. Montgomery

E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.3.52. Morgan

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalis*)
E.....Pink mucket pearlymussel (*Lampsilis abrupta*)
E.....Ring pink mussel (*Obovaria retusa*)
E.....Rough pigtoe mussel (*Pleurobema plenum*)
E.....Leafy prairie-clover (*Dalea foliosa*)
T.....American hart's-tongue fern (*Asplenium scolopendrium var.americana*)
T-(P).....Eggert's sunflower (*Helianthus eggertii*)
C.....Fleshyfruit gladecress (*Leavenworthia crassa*)

E.1.3.53. Perry

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Cahaba shiner (*Notropis cahabae*)

E.1.3.54. Pickens

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)

T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.....Flat pigtoe mussel (*Pleurobema marshallii*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
E.....Stirrupshell mussel (*Quadrula stapes*)

E.1.3.55. Pike

No listed species.

E.1.3.56. Randolph

T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Little amphianthus (*Amphianthus pusillus*)

E.1.3.57. Russell

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Shinyrayed pocketbook mussel (*Lampsilis subangulata*)
C.....Georgia rockcress (*Arabis georgiana*)

E.1.3.58. St. Clair

E.....Tulotoma snail (*Tulotoma magnifica*)
E.....Southern acornshell mussel (*Epioblasma othcaloogensis*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Upland combshell mussel (*Epioblasma metastriata*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Ovate clubshell (*Pleurobema perovatum*)
E.....Alabama leather-flower (*Clematis socialis*)

E.1.3.59. Shelby

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalist*)
T.....Bald eagle (*Haliaeetus leucocephalus*
T.....Painted rocksnail (*Leptoxis taeniata*)
E.....Cylindrical lioplax (snail) (*Lioplax cyclostomaformis*)
E.....Tulotoma snail (*Tulotoma magnifica*)
E.....Flat pebblesnail (*Lepyrium showalteri*)
T.....Round rocksnail (*Leptoxis ampla*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
E-(P).....Southern acornshell mussel (*Epioblasma othcaloogensis*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)

E.....Cahaba shiner (*Notropis cahabae*)
T.....Goldline darter (*Percina aurolineata*)

E.1.3.60. Sumter

E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Gopher tortoise (*Gopherus polyphemus*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
E.....Stirrup shell mussel (*Quadrula stapes*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)

E.1.3.61. Talladega

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Tulotoma snail (*Tulotoma magnifica*)
T.....Painted rocksnail (*Leptoxis taeniata*)
T.....Lacy elimia (snail) (*Elimia crenatella*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Coosa moccasinshell mussel (*Medionidus parvulus*)
E.....Southern pigtoe mussel (*Pleurobema georgianum*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Triangular kidneyshell (*Ptychobranchus greenii*)

E.1.3.62. Tallapoosa

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)

E.1.3.63. Tuscaloosa

E.....Red-cockaded woodpecker (*Picoides borealis*)
E.....Wood stork (*Mycteria americana*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Flattened musk turtle (*Sternotherus depressus*)
C.....Black Warrior waterdog (*Necturus alabamensis*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
E.....Dark pigtoe mussel (*Pleurobema furvum*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
C.....White fringeless orchid (*Platanthera integrilabia*)
E.....Mitchell's satyr butterfly (*Neonympha mitchellii mitchellii*)

E.1.3.64. Walker

T.....Flattened musk turtle (*Sternotherus depressus*)

C.....Black Warrior waterdog (*Necturus alabamensis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
T.....Mohr's Barbara's buttons (*Marshallia mohrii*)

E.1.3.65. Washington

E.....Wood stork (*Mycteria americana*)
T.....Gopher tortoise (*Gopherus polyphemus*)
C.....Black pine snake (*Pituophis melanoleucus lodingi*)
T.....Alabama heelsplitter mussel (*Potamilus inflatus*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.3.66. Wilcox

T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Wood stork (*Mycteria americana*)
C.....Alabama pearlshell mussel (*Margaritifera marrianae*)
E-(P).....Heavy pigtoe mussel (*Pleurobema taitianum*)
T.....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
E.....Alabama sturgeon (*Scaphirhynchus suttkusi*)
C.....Georgia rockcress (*Arabis georgiana*)

E.1.3.67. Winston

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Flattened musk turtle (*Sternotherus depressus*)
C.....Black Warrior waterdog (*Necturus alabamensis*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.....Coosa moccasinshell mussel (*Medionidus parvulus*)
E.....Dark pigtoe mussel (*Pleurobema furvum*)
E.....Triangular kidneyshell mussel (*Ptychobranchus greenii*)
T.....Finelined pocketbook mussel (*Lampsilis altilis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)
C.....Rush darter (*Etheostoma phytophilum*)
T.....Kral's water-plantain (*Sagittaria secundifolia*)
T.....Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)
C.....White fringeless orchid (*Platanthera integrilabia*)

E.1.4. Federally Protected Species in Mississippi By County

There following sections present the occurrence of Federally protected species in Alabama by county. However, bald eagles (*Haliaeetus leucocephalus*) are proposed to be delisted, and CH designation is proposed for piping plovers (*Charadrius melodus*) on barrier islands and in certain areas of coastal counties. Species in the following sections are coded as follows:

- E Endangered Species
- T Threatened Species
- C Candidate Species

- CH Critical Habitat Designated
- (P) Historical Record or Possible Occurrence in County
- PE Proposed Endangered
- PT Proposed Threatened

E.1.4.1. Statewide

E.....Fat pocketbook mussel (*Potamilus capax*), found in the lower Mississippi River, may occur in side channels

E.1.4.2. Adams

T.....Louisiana black bear (*Ursus americanus luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.3. Amite

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.4. Attala

T.....Louisiana black bear (*Ursus a. luteolus*)

E.1.4.5. Bolivar

E.....Least tern (*Sterna antillarum*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)
E.....Pondberry (*Lindera melissifolia*)

E.1.4.6. Chickasaw

T-(P).....Price's potato-bean (*Apios priceana*)

E.1.4.7. Claiborne

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Bayou darter (*Etheostoma rubrum*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.8. Clarke

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)

E.1.4.9. Clay

T.....Price's potato-bean (*Apios priceana*)

E.1.4.10. Coahoma

E.....Least tern (*Sterna antillarum*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.11. Copiah

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Bayou darter (*Etheostoma rubrum*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.4.12. Covington

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Gopher tortoise (*Gopherus polyphemus*)

E.1.4.13. DeSoto

E.....Least tern (*Sterna antillarum*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.14. Forrest

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C.....Pearl darter (*Percina aurora*), in Pascagoula River System
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.15. Franklin

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.16. George

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C.....Pearl darter (*Percina aurora*), in Pascagoula River System
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.17. Greene

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.18. Grenada

T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.4.19. Hancock

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Brown pelican (*Pelecanus occidentalis*)
T.....Piping plover (*Charadrius melodus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Gopher tortoise (*Gopherus polyphemus*)
E.....Kemp's ridley sea turtle (*Lepidochelys kempii*)
T-(P).....Green sea turtle (*Chelonia mydas*)
T.....Loggerhead sea turtle (*Caretta caretta*)
T.....Inflated heelsplitter mussel (*Potamilus inflatus*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.20. Harrison

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Brown pelican (*Pelecanus occidentalis*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Piping plover (*Charadrius melodus*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
E.....Kemp's ridley sea turtle (*Lepidochelys kempii*)
T-(P).....Green sea turtle (*Chelonia mydas*)
T.....Loggerhead sea turtle (*Caretta caretta*)
PE.....Mississippi gopher frog (*Rana capita sevosa*), proposal under review
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.21. Hinds

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
T.....Bayou darter (*Etheostoma rubrum*)

E.1.4.22. Holmes

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.4.23. Humphreys

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.4.24. Issaquena

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Least tern (*Sterna antillarum*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.25. Itawamba

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Black clubshell mussel (*Pleurobema curtum*)
E.....Southern combshell mussel (*Epioblasma penita*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)

E.1.4.26. Jackson

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Brown pelican (*Pelecanus occidentalis*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E-CH .....Mississippi sandhill crane (*Grus canadensis pulla*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
T.....Piping plover (*Charadrius melodus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Kemp's ridley sea turtle (*Lepidochelys kempii*)
T.....Loggerhead sea turtle (*Caretta caretta*)
C.....Pearl darter (*Percina aurora*), in Pascagoula River System
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.27. Jasper

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)

E.1.4.28. Jefferson

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Fat pocketbook mussel (*Potamilus capax*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.4.29. Jefferson Davis

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.4.30. Jones

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
C.....Pearl darter (*Percina aurora*), in Pascagoula River System
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.4.31. Kemper

T.....Price's potato-bean (*Apios priceana*)

E.1.5. Lafayette

T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.1. Lamar

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Gopher tortoise (*Gopherus polyphemus*)

E.1.5.2. Lauderdale

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.3. Lawrence

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.4. Leake

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)

E.1.5.5. Lee

T.....Price's potato-bean (*Apios priceana*)

E.1.5.6. Lowndes

T.....Louisiana black bear (*Ursus a. luteolus*)

T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.....Heavy Pigtoe mussel (*Pleurobema taitianum*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Ovate clubshell mussel (*Pleurobema perovatum*)

E.1.5.7. Madison

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Ringed map turtle (*Graptemys oculifera*)

E.1.5.8. Marion

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.9. Monroe

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Black combshell mussel (*Pleurobema curtum*)
E.....Southern combshell mussel (*Epioblasma penita*)
E.....Heavy pigtoe mussel (*Pleurobema taitianum*)
E.....Southern clubshell mussel (*Pleurobema decisum*)
T.....Orange-nacre mucket mussel (*Lampsilis perovalis*)
T.....Alabama moccasinshell mussel (*Medionidus acutissimus*)
E.....Ovate clubshell mussel (*Pleurobema perovatum*)

E.1.5.10. Neshoba

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculifera*)

E.1.5.11. Newton

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.5.12. Noxubee

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.13. Oktibbeha

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Price's potato-bean (*Apios priceana*)

E.1.5.14. Panola

T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.15. Pearl River

T.....Louisiana black bear (*Ursus a. luteolus*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Inflated heelsplitter (*Potamilus inflatus*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)
E-(P).....Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.16. Perry

T.....Louisiana black bear (*Ursus a. luteolus*)
E-(P).....Gray bat (*Myotis grisescens*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys favimaculata*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
C.....Camp Shelby burrowing crayfish (*Fallicambarus gordoni*)
C.....Pearl darter (*Percina aurora*), in Pascagoula River System
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.17. Pike

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.5.18. Rankin

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
T.....Ringed map turtle (*Graptemys oculifera*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.19. Scott

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Ringed map turtle (*Graptemys oculifera*)

E.1.5.20. Sharkey

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Pondberry (*Lindera melissifolia*)
E.....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.5.21. Simpson

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
T.....Ringed map turtle (*Graptemys oculiferi*)
T.....Gulf sturgeon (*Acipenser oxyrhynchus desotoi*)

E.1.5.22. Smith

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)

E.1.5.23. Stone

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.24. Sunflower

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Pondberry (*Lindera melissifolia*)

E.1.5.25. Tallahatchie

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Pondberry (*Lindera melissifolia*)

E.1.5.26. Tate

T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.27. Tishomingo

E.....Gray bat (*Myotis grisescens*)
E.....Indiana bat (*Myotis sodalis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.5.28. Tunica

E.....Least tern (*Sterna antillarum*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.5.29. Walthall

T-(P).....Louisiana black bear (*Ursus a. luteolus*)

E.1.5.30. Warren

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Least tern (*Sterna antillarum*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.5.31. Washington

T.....Louisiana black bear (*Ursus a. luteolus*)
E.....Least tern (*Sterna antillarum*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.5.32. Wayne

T-(P).....Louisiana black bear (*Ursus a. luteolus*)
E.....Gray bat (*Myotis grisescens*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
T-(P).....Eastern indigo snake (*Drymarchon corais couperi*)
C.....Black pine snake (*Pituophis melanoleucus ssp. lodingi*)
T.....Gopher tortoise (*Gopherus polyphemus*)
T.....Yellow-blotched map turtle (*Graptemys flavimaculata*)
E.....Louisiana quillwort (*Isoetes louisianensis*)

E.1.5.33. Wilkinson

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.1.6. Winston

E.....Red-cockaded woodpecker (*Picoides borealis*)
T.....Bald eagle (*Haliaeetus leucocephalus*)

E.1.6.1. Yalobusha

T.....Bald eagle (*Haliaeetus leucocephalus*)
E.....Red-cockaded woodpecker (*Picoides borealis*)

E.1.6.2. Yazoo

T.....Louisiana black bear (*Ursus a. luteolus*)
T.....Bald eagle (*Haliaeetus leucocephalus*)
E-(P).....Pallid sturgeon (*Scaphirhynchus albus*)

E.2. S1 AND S2 SPECIES

The following species are listed by the Natural Heritage Programs of Alabama and Mississippi as State imperiled species. The Heritage ranking system was developed by The Nature Conservancy. The State-ranked species are species of concern and will be managed by BLM to prevent any further reduction in species numbers or critical habitat loss. An S1 species as defined by The Nature Conservancy is "critically imperiled in the state because of extreme rarity (five or fewer occurrences of very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state." An S2 species as defined by The Nature Conservancy is "imperiled in the state because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the State."

E.2.1. S1 and S2 Species in Alabama

E.2.1.1. Mammals

S2 .....Black bear (*Ursus americanus*)
S2 .....Rafinesque's big-eared bat (*Corynorhinus rafinesquii*)
S1 .....Northern yellow bat (*Lasiurus intermedius*)
S2 .....Southeastern myotis (*Myotis austroriparius*)
S2 .....Gray bat (*Myotis grisescens*)
S1 .....Eastern small-footed myotis (*Myotis leibii*)
S2 .....Northern myotis (*Myotis septentrionalis*)
S2 .....Indiana bat (*Myotis sodalis*)
S1 .....Appalachian cottontail (*Sylvilagus obscurus*)
S1 .....Alabama beach mouse (*Peromyscus polionotus ammobates*)
S1 .....Perdido Key beach mouse (*Peromyscus polionotus trissyllepsis*)
S2 .....West Indian manatee (*Trichechus manatus*)

E.2.1.2. Birds

Because of the migratory nature of birds, additional ranking systems from The Nature Conservancy are applied here. "SB are regularly occurring migratory and present only during the breeding season. … SN are regularly occurring, usually migratory and typically non-breeding species in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in winter."

S1B-S2N Southeastern snowy plover (*Charadrius alexandrinus tenuirostris*)
S1N .....Piping plover (*Charadrius melodus*)
S1 .....Wilson's plover (*Charadrius wilsonia*)
S2N .....Long-billed curlew (*Numenius americanus*)
S2N .....Wood stork (*Mycteria americana*)
S2N .....Groove-billed ani (*Crotophaga sulcirostris*)
S2 .....Swallow-tailed kite (*Elanoides forficatus*)
S1 .....Ruffed grouse (*Bonasa umbellus*)
S1 .....Appalachian Bewick's wren (*Thryomanes bewickii altus*)
S1 .....Bewick's wren (*Thryomanes bewickii bewickii*)
S2 .....Red-cockaded woodpecker (*Picoides borealis*)

E.2.1.3. Reptiles

S2 .....Mimic glass lizard (*Ophisaurus mimicus*)
S1 .....Eastern indigo snake (*Drymarchon couperi*)
S1-S2.....Prairie kingsnake (*Lampropeltis calligaster calligaster*)
S2 .....Red milk snake (*Lampropeltis triangulum syspila*)
S2 .....Eastern milk snake (*Lampropeltis triangulum triangulum*)
S2 .....Gulf salt marsh snake (*Nerodia clarkii clarkia*)
S2 .....Green water snake (*Nerodia cyclopion*)
S2 .....Florida green water snake (*Nerodia floridana*)
S2 .....Black pine snake (*Pituophis melanoleucus lodingi*)
S2 .....Florida pine snake (*Pituophis melanoleucus mugitus*)
S2 .....Pine woods snake (*Rhadinaea flavilata*)
S2 .....Black swamp snake (*Seminatrix pygaea*)
S1 .....Loggerhead sea turtle (*Caretta caretta*)
S1 .....Green sea turtle (*Chelonia mydas*)
S2 .....Barbour's map turtle (*Graptemys barbouri*)
S2 .....Escambia map turtle (*Graptemys ernsti*)
S2 .....Delta map turtle (*Graptemys nigrinoda delticola*)
S2 .....Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)
S1 .....Alabama red-bellied turtle (*Pseudemys alabamensis*)
S1 .....Razorback musk turtle (*Sternotherus carinatus*)
S2 .....Flattened musk turtle (*Sternotherus depressus*)
S2 .....Gopher tortoise (*Gopherus polyphemus*)
S2 .....Florida softshell (*Apalone ferox*)

E.2.1.4. Amphibians

S2 .....Pine barrens treefrog (*Hyla andersonii*)
S1 .....Little grass frog (*Pseudacris ocularis*)
S2 .....Gopher frog (*Rana capito*)
S1 .....River frog (*Rana heckscheri*)
S2 .....Wood frog (*Rana sylvatica*)
S1 .....Flatwoods salamander (*Ambystoma cingulatum*)
S1 .....One-toed amphiuma (*Amphiuma pholeter*)
S2 .....Hellbender (*Cryptobranchus alleganiensis*)
S2 .....Seepage salamander (*Desmognathus aeneus*)
S2 .....Southern dusky salamander (*Desmognathus auriculatus*)
S2 .....Mountain dusky salamander (*Desmognathus ocoee*)
S2 .....Pale salamander (*Gyrinophilus palleucus palleucus*)
S2 .....Red Hills salamander (*Phaeognathus hubrichti*)
S2 .....Black Warrior waterdog (*Necturus alabamensis*)

E.2.1.5. Snails

S1 .....Slender campeloma (*Campeloma decampi*)
S1 .....Cylindrical lioplax (*Lioplax cyclostomaformis*)
S1 .....Alabama livebearing snail (*Tulotoma magnifica*)
S2 .....Hood ancylid (*Ferrissia mcneili*)
S1 .....Domed ancylid (*Rhodacme elatior*)
S2 .....Knobby ancylid (*Rhodacme hinkleyi*)

S1 .....Manitou snail (*Antrorbis breweri*)
S1 .....Cahaba pebblesnail (*Clappia cahabensis*)
S1 .....Flat pebblesnail (*Lepyrium showalteri*)
S1 .....Angled marstonia (*Marstonia angulobasis*)
S1 .....Coosa pyrg (*Marstonia hershleri*)
S1 .....Armored marstonia (*Marstonia pachyta*)
S1 .....Moss pyrg (*Marstonia scalariformis*)
S2 .....Teardrop snail (*Rhapinema dacryon*)
S1 .....Anthony's river snail (*Athearnia anthonyi*)
S1 .....Acute elimia (*Elimia acuta*)
S1 .....Mud elimia (*Elimia alabamensis*)
S1 .....Ample elimia (*Elimia ampla*)
S1 .....Lilyshoals elimia (*Elimia annettae*)
S1 .....Princess elimia (*Elimia bellacrenata*)
S1 .....Walnut elimia (*Elimia bellula*)
S2 .....Rusty elimia (*Elimia bentoniensis*)
S1 .....Brooch elimia (*Elimia broccata*)
S1-S2.....A freshwater snail (*Elimia bullula*)
S2 .....Prune elimia (*Elimia chiltonensis*)
S1 .....Cockle elimia (*Elimia cochliaris*)
S1 .....Hispid elimia (*Elimia comma*)
S1 .....Lacey elimia (*Elimia crenatella*)
S1 .....Graphite elimia (*Elimia curvicostata*)
S2 .....Cylinder elimia (*Elimia cylindracea*)
S2 .....Fire elimia (*Elimia exusta*)
S2 .....Gladiator elimia (*Elimia hydei*)
S2 .....Sowwater elimia (*Elimia interveniens*)
S1 .....Teardrop elimia (*Elimia lachryma*)
S2 .....Panel elimia (*Elimia laqueata*)
S1 .....Black mudalia (*Elimia melanoides*)
S1 .....Latticed elimia (*Elimia mihalcikae*)
S2 .....Oak elimia (*Elimia mutabilis*)
S1 .....Round-rib elimia (*Elimia nassula*)
S1 .....Caper elimia (*Elimia olivula*)
S1 .....Engraved elimia (*Elimia perstriata*)
S2 .....Spring elimia (*Elimia pybasi*)
S1 .....Compact elimia (*Elimia showalteri*)
S1 .....Auger elimia (*Elimia teretria*)
S1 .....Creek elimia (*Elimia ucheensis*)
S1 .....Cobble elimia (*Elimia vanuxemiana*)
S1 .....Puzzle elimia (*Elimia varians*)
S1 .....Squat elimia (*Elimia variata*)
S2 .....Round rocksnail (*Leptoxis ampla*)
S1 .....Spotted rocksnail (*Leptoxis picta*)
S1 .....Plicate rocksnail (*Leptoxis plicata*)
S1 .....Painted rocksnail (*Leptoxis taeniata*)
S1 .....Armored rocksnail (*Lithasia armigera*)
S1 .....Knobby rocksnail (*Lithasia curta*)
S1 .....Ornate rocksnail (*Lithasia geniculata*)
S1 .....Rustic rocksnail (*Lithasia salebrosa*)
S2 .....Rugged hornsnail (*Pleurocera alveare*)

S2 .....Spiral hornsnail (*Pleurocera brumbyi*)
S1 .....Corpulent hornsnail (*Pleurocera corpulenta*)
S1-S2.....Shortspire hornsnail (*Pleurocera curta*)
S1 .....Rough hornsnail (*Pleurocera foremani*)
S2 .....Noble hornsnail (*Pleurocera nobilis*)
S2 .....Broken hornsnail (*Pleurocera postelli*)
S2 .....Skirted hornsnail (*Pleurocera pyrenella*)
S2 .....Upland hornsnail (*Pleurocera showalteri*)
S2 .....Sulcate hornsnail (*Pleurocera trochiformis*)
S2 .....Brook hornsnail (*Pleurocera vestita*)

E.2.1.6. Mussels

S1 .....Spectaclecase (*Cumberlandia monodonta*)
S1 .....Alabama pearlshell (*Margaritifera marriana*)
S2 .....A mucket (*Actinonaias ligamentina*)
S1 .....Pheasantshell (*Actinonaias pectorosa*)
S1 .....Southern elktoe (*Alasmidonta triangulata*)
S1 .....Slippershell mussel (*Alasmidonta viridis*)
S1 .....Apalachicola floater (*Anodonta heardi*)
S1-S2.....Rayed creekshell (*Anodontoides radiatus*)
S1 .....Fanshell (*Cyprogenia stegaria*)
S2 .....Alabama spike (*Elliptio arca*)
S2 .....Delicate spike (*Elliptio arctata*)
S1 .....Spike (*Elliptio dilatata*)
S2 .....Fluted elephant-ear (*Elliptio mcmichaeli*)
S1 .....Inflated spike (*Elliptio purpurella*)
S1 .....Purple bankclimber (*Elliptoideus sloatianus*)
S1 .....Cumberlandian combshell (*Epioblasma brevidens*)
S1 .....Southern combshell (*Epioblasma penita*)
S1 .....Snuffbox (*Epioblasma triquetra*)
S1 .....Tennessee pigtoe (*Fusconaia barnesiana*)
S2 .....Shiny pigtoe (*Fusconaia cor*)
S1 .....Fine-rayed pigtoe (*Fusconaia cuneolus*)
S2 .....Narrow pigtoe (*Fusconaia escambia*)
S1-S2.....Wabash pigtoe (*Fusconaia flava*)
S1 .....Round ebonyshell (*Fusconaia rotulata*)
S1 .....Long-solid (*Fusconaia subrotunda*)
S2 .....Finelined pocketbook (*Hamiota altilis*)
S1-S2.....Southern sandshell (*Hamiota australis*)
S2 .....Orange-nacre mucket (*Hamiota perovalis*)
S1 .....Shinyrayed pocketbook (*Hamiota subangulata*)
S1 .....Pink mucket (*Lampsilis abrupta*)
S1S2.....Wavy-rayed lampmussel (*Lampsilis fasciola*)
S2 .....Louisiana fatmucket (*Lampsilis hydiana*)
S2 .....Rough fatmucket (*Lampsilis straminea straminea*)
S1 .....Alabama lampmussel (*Lampsilis virescens*)
S2 .....Fluted-shell (*Lasmigona costata*)
S1-S2.....Tennessee heelsplitter (*Lasmigona holstonia*)
S1 .....Slabside pearlymussel (*Lexingtonia dolabelloides*)
S2 .....Black sandshell (*Ligumia recta*)

S1 .....Alabama moccasinshell (*Medionidus acutissimus*)
S1 .....Cumberland moccasinshell (*Medionidus conradicus*)
S1-S2.....Gulf moccasinshell (*Medionidus penicillatus*)
S1-S2.....Southern hickorynut (*Obovaria jacksoniana*)
S1 .....Ring pink (*Obovaria retusa*)
S2 .....Round hickorynut (*Obovaria subrotunda*)
S2 .....Alabama hickorynut (*Obovaria unicolor*)
S1 .....White wartyback (*Plethobasus cicatricosus*)
S1 .....Orangefoot pimpleback (*Plethobasus cooperianus*)
S1 .....Sheepnose (*Plethobasus cyphyus*)
S1 .....Painted clubshell (*Pleurobema chattanoogaense*)
S2 .....Ohio pigtoe (*Pleurobema cordatum*)
S2 .....Southern clubshell (*Pleurobema decisum*)
S1 .....Dark pigtoe (*Pleurobema furvum*)
S1 .....Southern pigtoe (*Pleurobema georgianum*)
S1 .....Tennessee clubshell (*Pleurobema oviforme*)
S1 .....Ovate clubshell (*Pleurobema perovatum*)
S1 .....Rough pigtoe (*Pleurobema plenum*)
S1 .....Oval pigtoe (*Pleurobema pyriforme*)
S1 .....Warrior pigtoe (*Pleurobema rubellum*)
S1 .....Pyramid pigtoe (*Pleurobema rubrum*)
S1 .....Round pigtoe (*Pleurobema sintoxia*)
S2 .....Fuzzy pigtoe (*Pleurobema strodeanum*)
S1 .....Heavy pigtoe (*Pleurobema taitianum*)
S1 .....Inflated heelsplitter (*Potamilus inflatus*)
S1 .....Kidneyshell (*Ptychobranchus fasciolaris*)
S1 .....Triangular kidneyshell (*Ptychobranchus greenii*)
S1 .....Southern kidneyshell (*Ptychobranchus jonesi*)
S1 .....Rabbitsfoot (*Quadrula cylindrica cylindrica*)
S1-S2.....Wartyback (*Quadrula nodulata*)
S1 .....Tapered pigtoe (*Quadrula burkei*)
S1 .....Sculptured pigtoe (*Quincuncina infucata*)
S2 .....Alabama creekmussel (*Strophitus connasaugansis*)
S2 .....Southern creekmussel (*Strophitus subvexus*)
S1 .....Squawfoot (*Strophitus unduluatus*)
S1 .....Southern lilliput (*Toxolasma corvunculus*)
S1 .....Pale lilliput (*Toxolasma cylindrellus*)
S2 .....Purple lilliput (*Toxolasma lividus*)
S2 .....Iridescent lilliput (*Toxolasma paulus*)
S1 .....Deertoe (*Truncilla truncata*)
S2 .....Florida floater (*Utterbackia peggyae*)
S2 .....Choctaw bean (*Villosa choctawensis*)
S2 .....Coosa creekshell (*Villosa vanuxemensis umbrans*)

E.2.1.7. Crustaceans

S1 .....Alabama cave shrimp (*Palaemonias alabamae*)
S1 .....Tuscumbia cave shrimp (*Palaemonias sp.1*)
S2 .....A crayfish (*Cambarus acanthura*)
S1 .....A crayfish (*Cambarus cracens*)
S2 .....A crayfish (*Cambarus hamulatus*)

S2 .....Alabama cave crayfish (*Cambarus jonesi*)
S2 .....A crayfish (*Cambarus ludovicanus*)
S2 .....A crayfish (*Cambarus manningi*)
S2 .....Rusty grave digger (*Cambarus miltus*)
S2 .....A crayfish (*Cambarus unestami*)
S1 .....White Spring Cave crayfish (*Cambarus veitchorum*)
S1 .....Speckled burrowing crayfish (*Fallicambarus danielae*)
S1 .....A crayfish (*Orconectes cooperi*)
S1 .....A crayfish (*Orconectes lancifer*)
S1 .....A crayfish (*Orconectes sheltie*)

E.2.1.8. Fish

S1 .....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
S1 .....Alabama sturgeon (*Scaphirhynchus suttkusi*)
S2 .....Alabama shad (*Alosa alabamae*)
S2 .....River carpsucker (*Carpiodes carpio*)
S2 .....Silver redhorse (*Moxostoma anisurum*)
S2 .....Apalachicola redhorse (*Moxostoma sp. cf. poecilurum*)
S2 .....Bluefin stoneroller (*Campostoma pauciradii*)
S1 .....Blue shiner (*Cyprinella caerulea*)
S2 .....Bluestripe shiner (*Cyprinella callitaenia*)
S1 .....Streamline chub (*Erimystax dissimilis*)
S2 .....Blotched chub (*Erimystax insignis*)
S1 .....Warpaint shiner (*Luxilus coccogenis*)
S2 .....Ribbon shiner (*Lythrurus fumeus*)
S2 .....Cherryfin shiner (*Lythrurus roseipinnis*)
S2 .....River chub (*Nocomis micropogon*)
S1 .....Palezone shiner (*Notropis albizonatus*)
S2 .....Popeye shiner (*Notropis ariommus*)
S2 .....Bigeye shiner (*Notropis boops*)
S2 .....Ghost shiner (*Notropis buchanani*)
S2 .....Cahaba shiner (*Notropis cahabae*)
S1 .....Ironcolor shiner (*Notropis chalybaeus*)
S2 .....Dusky shiner (*Notropis cummingsae*)
S2 .....Highscale shiner (*Notropis hypsilepis*)
S1 .....Tennessee shiner (*Notropis leuciodus*)
S2 .....Highland shiner (*Notropis micropteryx*)
S2 .....Coastal shiner (*Notropis petersoni*)
S1 .....Silver shiner (*Notropis photogenis*)
S2 .....Sawfin shiner (*Notropis sp cf. spectrunculus*)
S1 .....Sand shiner (*Notropis stramineus*)
S2 .....Skygazer shiner (*Notropis uranoscopus*)
S1 .....Channel shiner (*Notropis wickliffi*)
S1 .....Suckermouth minnow (*Phenacobius mirabilis*)
S1 .....Stargazing minnow (*Phenacobius uranops*)
S2 .....Broadstripe shiner (*Pteronotropis euryzonus*)
S2 .....Bluenose shiner (*Pteronotropis welaka*)
S2 .....Banded topminnow (*Fundulus auroguttatus*)
S2 .....Stippled studfish (*Fundulus bifax*)
S2 .....Lowland topminnow (*Fundulus blairae*)

S2 .....Starhead topminnow (*Fundulus dispar*)
S1 .....Saltmarsh topminnow (*Fundulus jenkinsi*)
S1 .....Pygmy killifish (*Leptolucania ommata*)
S1 .....Bluefin killifish (*Lucania goodei*)
S2 .....Alligator gar (*Atractosteus spatula*)
S1 .....Banded sunfish (*Enneacanthus obesus*)
S2 .....Shoal bass (*Micropterus cataractae*)
S1 .....Spring pygmy sunfish (*Elassoma alabamae*)
S1 .....Scaly sand darter (*Ammocrypta vivax*)
S2 .....Warrior darter (*Etheostoma bellator*)
S1 .....Blenny darter (*Etheostoma blennius*)
S1 .....Slackwater darter (*Etheostoma boschungi*)
S1 .....Holiday darter (*Etheostoma brevirostrum*)
S1 .....Bluebreast darter (*Etheostoma camurum*)
S1 .....Vermilion darter (*Etheostoma chermocki*)
S2 .....Lipstick darter (*Etheostoma chuckwachatte*)
S2 .....Crown darter (*Etheostoma corona*)
S1 .....Fringed darter (*Etheostoma crossopterum*)
S1 .....Coldwater darter (*Etheostoma ditrema*)
S2 .....Tuskaloosa darter (*Etheostoma douglasi*)
S1 .....Brighteye darter (*Etheostoma lynceum*)
S1 .....Lollipop darter (*Etheostoma neopterum*)
S1 .....Watercress darter (*Etheostoma nuchale*)
S1 .....Rush darter (*Etheostoma phytophilum*)
S1 .....Upper Coosa darter nr. (*E. ditrema2 Etheostoma sp 1*)
S1 .....Lower Coosa darter nr. (*E. ditrema2 Etheostoma sp 3*)
S2 .....Sipsey darter (*Etheostoma sp. cf. bellator*)
S2 .....Tuscumbia darter (*Etheostoma tuscumbia*)
S1 .....Boulder darter (*Etheostoma wapiti*)
S2 .....Banded darter (*Etheostoma zonale*)
S1 .....Bandfin darter (*Etheostoma zonistium*)
S2 .....Yellow perch (*Perca flavescens*)
S1 .....Goldline darter (*Percina aurolineata*)
S2 .....Southern logperch (*Percina austroperca*)
S2 .....Coal darter (*Percina brevicauda*)
S1 .....Blotchside darter (*Percina burtoni*)
S2 .....Gilt darter (*Percina evides*)
S1 .....Slenderhead darter (*Percina phoxocephala*)
S2 .....Muscadine darter (*Percina sp cf. macrocephala*)
S1 .....Warrior bridled darter (*Percina sp cf. macrocephala*)
S1 .....Snail darter (*Percina tanasi*)
S1 .....Alabama cavefish (*Speoplatyrhinus poulsoni*)
S2 .....Mottled sculpin (*Cottus bairdi*)
S1 .....Pygmy sculpin (*Cottus paulus*)
S2 .....Spotted bullhead (*Ameiurus serracanthus*)
S1 .....Mountain madtom (*Noturus eleutherus*)
S1 .....Highlands stonecat (*Noturus sp. cf. flavus*)
S1 .....Brindled madtom (*Noturus miurus*)
S2 .....Frecklebelly madtom (*Notorus munitus*)
S2 .....Chestnut lamprey (*Ichthyomyzon castaneus*)
S1 .....Mountain brook lamprey (*Ichthyomyzon greeleyi*)

S1 .....American brook lamprey (*Lampetra appendix*)

E.2.1.9. Plants

S1 .....Dwarf burhead (*Echinodorus parvulus*)
S2 .....Slender arrow-head (*Sagittaria isoetiformis*)
S1 .....Little River arrow-head (*Sagittaria secundifolia*)
S1 .....Sweetflag (*Acorus calamus*)
S2 .....Spoon flower (*Peltandra sagittfolia*)
S1 .....Kral's yellow-eyed grass (*Xyris longisepala*)
S1-S2.....Harper's yellow-eyed grass (*Xyris scabrifolia*)
S1 .....Acid-swamp yellow-eyed grass (*Xyris serotina*)
S1 .....Tennessee yellow-eyed grass (*Xyris tennesseensis*)
S1 .....A sedge (*Carex acidicola*)
S1 .....Glomerate sedge (*Carex aggregata*)
S1 .....Baltzell's sedge (*Carex baltzellii*)
S1 .....Bryson's sedge (*Carex brysonii*)
S1 .....Cypress-knee sedge (*Carex decomposita*)
S2 .....Ebony sedge (*Carex eburnea*)
S1 .....Coast sedge (*Carex exilis*)
S1 .....Godfrey's sedge (*Carex godfreyi*)
S1 .....Impressed-nerved sedge (*Carex impressinervia*)
S2 .....Purple sedge (*Carex purpurifera*)
S1 .....Walter's sedge (*Carex striata*)
S1 .....A sedge (*Carex thornei*)
S1 .....Velvety sedge (*Carex vestita*)
S1 .....Twig rush (*Cladium mariscoides*)
S2 .....Granite-loving flatsedge (*Cyperus granitophilus*)
S1 .....Black-fruited spike-rush (*Eleocharis melanocarpa*)
S1 .....Capitate spikerush (*Eleocharis olivacea*)
S1 .....Robbins' spikerush (*Eleocharis robbinsii*)
S1 .....Beaked spikerush (*Eleocharis rostellata*)
S1 .....Wolf s spikerush (*Eleocharis wolfii*)
S1 .....Glade fimbristylis (*Fimbristylis brevivaginata*)
S1 .....Horned beakrush (*Rhynchospora capillacea*)
S1 .....Hairy peduncled beakrush (*Rhynchospora crinipes*)
S1 .....Harper beakrush (*Rhynchospora harperi*)
S1 .....Southern white beakrush (*Rhynchospora macra*)
S1 .....Brown beakrush (*Rhynchospora pleiantha*)
S1 .....Stone Mountain beakrush (*Rhynchospora saxicola*)
S2 .....Chapman beakrush (*Rhynchospora stenophylla*)
S1 .....Thorne s beakrush (*Rhynchospora thornei*)
S1 .....Tracys beakrush (*Rhynchospora tracyi*)
S1 .....Blue maiden-cane (*Amphicarpum muehlenbergianum*)
S1 .....Pine-woods bluestem (*Andropogon arctatus*)
S2 .....Beardgrass (*Andropogon capillipes*)
S1 .....Beardgrass (*Andropogon gyrans var. stenophyllus*)
S1 .....Southern three-awned grass (*Aristida simpliciflora*)
S1 .....Cumberland sandgrass (*Calamovilfa arcuata*)
S1 .....Shiny spikegrass (*Chasmanthium nitidum*)
S1 .....Florida jointgrass (*Coelorachis tuberculosa*)

S2 .....American beakgrain (*Diarrhena americana*)
S1 .....Brazilian luziola (*Luziola bahiensis*)
S1 .....Three-flower melic grass (*Melica nitens*)
S1 .....Cliff muhly (*Muhlenbergia sobolifera*)
S1 .....Swallen's panic grass (*Panicum lithophilum*)
S2 .....Naked-stemmed panic grass (*Panicum nudicaule*)
S1 .....Gulf bluestem (*Schizachyrium maritimum*)
S1 .....Pineland dropseed (*Sporobolus curtissii*)
S1 .....Wire-leaved dropseed (*Sporobolus teretifolius*)
S1 .....Carolina fluff grass (*Tridens carolinianus*)
S2 .....Narrow pipewort (*Eriocaulon lineare*)
S2 .....Texas pipewort (*Eriocaulon texense*)
S2 .....Pineland bogbutton (*Lachnocaulon digynum*)
S1 .....Broad waterweed (*Elodea canadensis*)
S1 .....Georgia rush (*Juncus georgianus*)
S2 .....Naked-fruited rush (*Juncus gymnocarpus*)
S1 .....Stout rush (*Juncus nodatus*)
S1 .....Prairie pleatleaf (*Nemastylis geminiflora*)
S2 .....Little River Canyon onion (*Allium speculae*)
S1 .....Wild leek (*Allium tricoccum*)
S1-S2.....White trout lily (*Erythronium albidum*)
S2 .....Shoals spider-lily (*Hymenocallis coronaria*)
S2 .....Canada lily (*Lilium canadense*)
S1 .....Panhandle lily (*Lilium iridollae*)
S1 .....Michigan lily (*Lilium michiganense*)
S2 .....Turks-cap lily (*Lilium superbum*)
S1 .....Broadleaf bunchflower (*Melanthium latifolium*)
S1-S2.....Small-flowered false hellebore (*Melanthium parviflorum*)
S1 .....Wood s false hellebore (*Melanthium woodii*)
S1-S2.....Rush false-asphodel (*Pleea tenuifolia*)
S1 .....Spotted mandarin (*Prosartes maculate*)
S2 .....Yellow sunnybell (*Schoenolirion croceum*)
S1 .....Texas sunnybell (*Schoenolirion wrightii*)
S1 .....Large-flowered trillium (*Trillium grandiflorum*)
S2 .....Alabama least trillium (*Trillium pusillum var. 1*)
S2 .....Prairie trillium (*Trillium recurvatum*)
S2 .....Relict trillium (*Trillium reliquum*)
S2 .....Toadshade (*Trillium sessile*)
S1 .....Southern red trillium (*Trillium sulcatum*)
S1 .....Florida bellwort (*Uvularia floridana*)
S1 .....Turkeybeard (*Xerophyllum asphodeloides*)
S1 .....Crow-poison (*Zigadenus leimanthoides*)
S2 .....Croomia (*Croomia pauciflora*)
S1 .....Thread-like naiad (*Najas gracillima*)
S1 .....Florida pondweed (*Potamogeton floridanus*)
S2 .....Bluethreads (*Burmannia capitata*)
S2 .....Puttyroot (*Aplectrum hyemale*)
S1 .....Bearded grass-pink (*Calopogon barbatus*)
S1 .....Many-flowered grass-pink (*Calopogon multiflorus*)
S1 .....Oklahoma grass-pink (*Calopogon oklahomensis*)
S2 .....Spring coralroot (*Corallorhiza wisteriana*)

S1 .....Small white lady s-slipper (*Cypripedium candidum*)
S1 .....Southern lady s-slipper (*Cypripedium kentuckiense*)
S2 .....Green-fly orchid (*Epidendrum conopseum*)
S1 .....Michauxs orchid (*Habenaria quinqueseta var. quinqueseta*)
S2 .....Large whorled pogonia (*Isotria verticillata*)
S1 .....Lily-leaved twayblade (*Liparis liliifolia*)
S1-S2.....Large white fringed orchid (*Platanthera blephariglottis var. conspicua*)
S2 .....Yellow fringeless orchid (*Platanthera integra*)
S2 .....White fringeless orchid (*Platanthera integrilabia*)
S2 .....Green-fringed orchid (*Platanthera lacera*)
S1 .....Purple fringeless orchid (*Platanthera peramoena*)
S2 .....Shadow-witch orchid (*Ponthieva racemosa*)
S1 .....Crestless eulophia (*Pteroglossaspis ecristata*)
S1 .....Giant spiral ladies-tresses (*Spiranthes longilabris*)
S1 .....Shining ladies-tresses (*Spiranthes lucida*)
S1 .....Golden canna (*Canna flaccida*)
S1 .....Carolina lilaeopsis (*Lilaeopsis carolinensis*)
S1 .....Eastern bishop-weed (*Ptilimnium costatum*)
S1 .....Harperella (*Ptilimnium nodosum*)
S1 .....Florida water-parsnip (*Sium floridanum*)
S1 .....American spikenard (*Aralia racemosa*)
S2 .....Harper's wild ginger (*Hexastylis shuttleworthii var. harperi*)
S2 .....Harper's heartleaf (*Hexastylis speciosa*)
S1 .....Variable-leaved Indian plantain (*Arnoglossum diversifolium*)
S1 .....Nodding beggar-ticks (*Bidens cernua*)
S2 .....Flyr's brickell-bush (*Brickellia cordifolia*)
S1 .....Godfrey's golden-aster (*Chrysopsis godfreyi*)
S1 .....Swamp thistle (*Cirsium muticum*)
S2 .....Southeastern tickseed (*Coreopsis gladiata*)
S2 .....Tickseed (*Coreopsis grandiflora var. inclinata*)
S1 .....Georgia tickseed (*Coreopsis nudata*)
S2 .....Woodland tickseed (*Coreopsis pulchra*)
S2 .....Pale-purple coneflower (*Echinacea pallida*)
S1 .....Wavy-leaf purple coneflower (*Echinacea simulata*)
S2 .....Coyote-thistle aster (*Eurybia eryngiifolia*)
S2 .....Showy aster (*Eurybia specatabilis*)
S1 .....Creeping aster (*Eurybia surculosus*)
S1 .....Little leaf sneezeweed (*Helenium brevifolium*)
S2 .....Spring sneezeweed (*Helenium vernale*)
S1 .....Eggert's sunflower (*Helianthus eggertii*)
S1-S2.....Longleaf sunflower (*Helianthus longifolius*)
S2 .....Confederate daisy (*Helianthus porteri*)
S2 .....Smith's sunflower (*Helianthus smithii*)
S1 .....Whorled sunflower (*Helianthus verticillatus*)
S1 .....Small-headed marsh-elder (*Iva microcephala*)
S1 .....Mountain dwarf dandelion (*Krigia montana*)
S2 .....Slender blazing-star (*Liatris cylindracea*)
S1 .....A liatris (*Liatris oligocephala*)
S1 .....Pineland false sunflower (*Phoebanthus tenuifolius*)
S1 .....Coastal-Plain golden-aster (*Pityopsis oligantha*)
S1 .....Golden aster (*Pityopsis pinifolia*)

S1-S2.....Barbed rattlesnake-root (*Prenanthes barbata*)
S1 .....Eared coneflower (*Rudbeckia auriculata*)
S2 .....Sun-facing coneflower (*Rudbeckia heliopsidis*)
S1 .....Soft-hair coneflower (*Rudbeckia mollis*)
S2 .....Cumberland rosinweed (*Silphium brachiatum*)
S1 .....Rosinweed (*Silphium glutinosum*)
S1 .....Mohr s rosinweed (*Silphium mohrii*)
S1 .....Rosinweed (*Silphium perplexum*)
S1 .....Prairie-dock (*Silphium pinnatifidum*)
S1 .....A goldenrod (*Solidago arenicola*)
S1 .....Heath aster (*Symphyotrichum ericoides*)
S2 .....Smooth blue aster (*Symphyotrichum laeve var. concinnum*)
S1 .....Sky blue aster (*Symphyotrichum oolentangiense var. oolentangiense*)
S1 .....Barrens silky aster (*Symphyotrichum pretense*)
S1 .....Western silvery aster (*Symphyotrichum sericeum*)
S1-S2.....Boydin's lobelia (*Lobelia boykinii*)
S1 .....Georgia rock-cress (*Arabis georgiana*)
S1 .....Lake cress (*Armoracia lacustris*)
S1 .....Wedgeleaf whitlow-grass (*Draba cuneifolia*)
S2 .....Alabama glade-cress (*Leavenworthia alabamica*)
S1 .....Fleshy-fruit glade cress (*Leavenworthia crassa*)
S1 .....Pasture glade-cress (*Leavenworthia exigua var. lutea*)
S2 .....Michaux leavenworthia (*Leavenworthia uniflora*)
S1 .....Duck river bladderpod (*Lesquerella densipila*)
S1 .....Lyrate bladderpod (*Lesquerella lyrata*)
S1 .....Sessile-leaved warea (*Warea sessilifolia*)
S1 .....Slenderleaf clammy-weed (*Polanisia tenuifolia*)
S2 .....Alabama sandwort (*Minuartia alabamensis*)
S1 .....Coastal plain nailwort (*Paronychia herniarioides*)
S2 .....Yellow nailwort (*Paronychia virginica*)
S1-S2.....Sherry's catchfly (*Silene caroliniana ssp. wherryi*)
S2 .....Ovate catchfly (*Silene ovata*)
S1-S2.....Roundleaf catchfly (*Silene rotundifolia*)
S1 .....Chickweed (*Stellaria corei*)
S2 .....Pale umbrella-wort (*Mirabilis albida*)
S1 .....Carolina spring beauty (*Claytonia caroliniana*)
S2 .....Limestone fameflower (*Talinum calcaricum*)
S1 .....Small-flowered flameflower (*Talinum parviflorum*)
S1 .....Quill fameflower (*Talinum teretifolium*)
S2 .....Serviceberry holly (*Ilex amelanchier*)
S2 .....Climbing bittersweet (*Celastrus scandens*)
S2 .....Mountain bush-honeysuckle (*Diervilla rivularis*)
S1 .....Yellowleaf tinker's-weed (*Triosteum angustifolium*)
S1 .....Limerock arrowwood (*Viburnum bracteatum*)
S1 .....Small-leaf viburnum (*Viburnum obovatum*)
S1 .....Valerian (*Valeriana pauciflora*)
S1 .....Swamp buckthorn (*Sideroxylon thornei*)
S2 .....Silverbell (*Halesia tetraptera var. tetraptera*)
S1 .....Mountain pepper-bush (*Clethra acuminate*)
S2 .....Hairy laurel (*Kalmia hirsute*)
S2 .....Climbing fetter-bush (*Pieris phillyreifolia*)

S2 .....Cumberland rhododendron (*Rhododendron cumberlandense*)
S2 .....Carolina rhododendron (*Rhododendron minus*)
S1 .....Sweet pinesap (*Monotropsis odorata var. odorata*)
S1 .....Elliott's croton (*Croton elliottii*)
S1 .....Florida pine spurge (*Euphorbia inundata*)
S1 .....Water toothleaf (*Stillingia aquatica*)
S2 .....Price's potato-bean (*Apios priceana*)
S1 .....Canadian milk-vetch (*Astragalus canadensis*)
S1 .....Sandhills milk-vetch (*Astragalus michauxii*)
S1-S2.....Tennessee milk-vetch (*Astragalus tennesseensis*)
S2 .....Hoary milk-vetch (*Astragalus villosus*)
S1 .....Blue wild indigo (*Baptisia australis*)
S2 .....Apalachicola wild indigo (*Baptisia megacarpa*)
S1 .....Catbells (*Baptisia perfoliata*)
S1 .....Florida senna (*Chamaecrista deeringiana*)
S2 .....A prairie clover (*Dalea cahaba*)
S1 .....Leafy prairie clover (*Dalea foliosa*)
S1 .....Creamflower tick-trefoil (*Desmodium ochroleucum*)
S1 .....Smooth veiny peavine (*Lathyrus venosus*)
S2 .....Nashville breadroot (*Pediomelum subacaule*)
S1-S2.....Pineland hoary-pea (*Tephrosia mohrii*)
S2 .....Arkansas oak (*Quercus arkansana*)
S1 .....Boynton's sand post oak (*Quercus boyntonii*)
S2 .....Georgia oak (*Quercus georgiana*)
S2 .....Bur oak (*Quercus macrocarpa*)
S2 .....Dwarf live oak (*Quercus minima*)
S1 .....Oglethorpe's oak (*Quercus oglethorpensis*)
S1 .....Swamp post oak (*Quercus similis*)
S1 .....Stiff blue-star (*Amsonia rigida*)
S1 .....Carolina milkweed (*Asclepias cinera*)
S1 .....Red milkweed (*Asclepias rubra*)
S1 .....Southern milkweed (*Asclepias viridula*)
S1 .....Alabama anglepod (*Matelea alabamensis*)
S1 .....Baldwins's milkyvine (*Matelea baldwyniana*)
S2 .....Carolina gentian (*Frasera caroliniensis*)
S1 .....Elliott's gentian (*Gentiana catesbaei*)
S1 .....Short-leaved pink (*Sabatia brevifolia*)
S2 .....Rose gentian (*Sabatia capitata*)
S1 .....Narrow-leaf miterwort (*Mitreola angustifolia*)
S1 .....Gentian pinkroot (*Spigelia gentianoides var. alabamensis*)
S1 .....Gentian pinkroot (*Spigelia gentianoides var. gentianoides*)
S1 .....Giant wood-sorrel (*Oxalis grandis*)
S2 .....Piedmont water-milfoil (*Myriophyllum laxum*)
S1 .....Dwarf witch-alder (*Fothergilla gardenia*)
S2 .....Mountain witch-alder (*Fothergilla major*)
S2 .....Bay starvine (*Schisandra glabra*)
S2 .....Nutmeg hickory (*Carya myristiciformis*)
S1 .....Butternut (*Juglans cinerea*)
S2 .....Alabama marbleseed (*Onosmodium decipiens*)
S2 .....Soft false gromwell (*Onosmodium molle ssp. molle*)
S1 .....Yellow giant hyssop (*Agastache nepetoides*)

S1-S2.....Smooth blephilia (*Blephilia subnuda*)
S2 .....Large-flowered pennyroyal (*Dicerandra linearifolia*)
S2 .....Drummond's pennyroyal (*Hedeoma drummondii*)
S2 .....Basil bee-balm (*Monarda clinopodia*)
S1 .....Virginia mountain mint (*Pycnanthemum virginianum*)
S2 .....Alabama skullcap (*Scutellaria alabamensis*)
S1 .....Glabrous skullcap (*Scutellaria glabriuscula*)
S1 .....Rock skullcap (*Scutellaria saxatilis*)
S1 .....Epling's hedgenettle (*Stachys eplingii*)
S1 .....Guyandotte beauty (*Synandra hispidula*)
S1 .....Pondberry (*Lindera melissifolia*)
S1 .....Bog spicebush (*Lindera subcoriacea*)
S1 .....Flax (*Linum macrocarpum*)
S1 .....Harper's grooved-yellow flax (*Linum sulcatum var. harperi*)
S1 .....Fraser's magnolia (*Magnolia fraseri*)
S2 .....Clustered poppy-mallow (*Callirhoe alcaeoides*)
S1 .....Clustered poppy-mallow (*Callirhoe triangulata*)
S1 .....Brilliant hibiscus (*Hibiscus coccineus*)
S1 .....Elliott's fan-petal (*Sida elliottii*)
S1 .....Awned meadowbeauty (*Rhexia aristosa*)
S1 .....Small-flowered meadowbeauty (*Rhexia parviflora*)
S1 .....Panhandle meadowbeauty (*Rhexia salicifolia*)
S1 .....Willow herb (*Epilobium coloratum*)
S1-S2.....Spathulate seedbox (*Ludwigia spathulata*)
S1 .....Round-leaved sundew (*Drosera rotundifolia*)
S2 .....Green pitcher-plant (*Sarracenia oreophila*)
S1-S2.....Alabama canebrake pitcher-plant (*Sarracenia rubra ssp. alabamensis*)
S1 .....West Florida cowlily (*Nuphar lutea ssp. ulvacea*)
S2 .....Dutchman's breeches (*Dicentra cucullaria*)
S1 .....Celandine poppy (*Stylophorum diphyllum*)
S1 .....Heart-leaved plantain (*Plantago cordata*)
S1 .....Crenate milkwort (*Polygala crenata*)
S1-S2.....Hooker's milkwort (*Polygala hookeri*)
S1 .....Seneca snakeroot (*Polygala senega var. latifolia*)
S1 .....Harper's umbrella plant (*Eriogonum longifolium var. harperi*)
S1 .....Southern jointweed (*Polygonella americana*)
S1 .....Large-leaved jointweed (*Polygonella macrophylla*)
S1 .....French's shooting star (*Dodecatheon frenchii*)
S2 .....Featherfoil (*Hottonia inflate*)
S1 .....Fraser's loosestrife (*Lysimachia fraseri*)
S1 .....Grass-leaf loosestrife (*Lysimachia graminea*)
S2 .....Twinleaf (*Jeffersonia diphylla*)
S1 .....Blue monkshood (*Acontium uncinatum*)
S1 .....Marianna columbine (*Aquilegia canadensis var. australis*)
S1-S2.....Morefield's leather-flower (*Clematis morefieldii*)
S1 .....Alabama leather-flower (*Clematis socialis*)
S1 .....Alabama larkspur (*Delphihium alabamicum*)
S1 .....Prairie larkspur (*Delphinium carolinianum ssp. calciphilum*)
S2 .....False rue-anemone (*Enemion biternatum*)
S2 .....Golden seal (*Hydrastis canadensis*)
S1 .....Yellow water-crowfoot (*Tanunculus flabellaris*)

S2 .....Granite gooseberry (*Ribes curvatum*)
S1-S2.....Prickly gooseberry (*Ribes cynosbati*)
S2 .....Incised groovebur (*Agrimonia incisa*)
S1 .....Ash's hawthorn (*Crataegus ashei*)
S2 .....Three-flowered hawthorn (*Crataegus triflora*)
S1 .....Rough avens (*Geum laciniatum*)
S2 .....Pale avens (*Geum virginianum*)
S2 .....Alabama snow-wreath (*Neviusia alabamensis*)
S1 .....Allegheny blackberry (*Rubus allegheniensis*)
S1 .....Piedmont barren strawberry (*Waldsteinia lobata*)
S1 .....Brook saxifrage (*Boykinia aconitifolia*)
S1 .....Long-flower alumroot (*Heuchera longiflora*)
S1 .....Miterwort (*Mitella diphylla*)
S2 .....Kidneyleaf grass-of-parnassus (*Parnassia asarifolia*)
S1 .....Large-leaved grass-of-parnassus (*Parnassia grandifolia*)
S1 .....Torrey's wild licorice (*Galium lanceolatum*)
S1 .....Florida willow (*Salix floridana*)
S1 .....Bastard-toadflax (*Comandra umbellate*)
S2 .....Nestronia (*Nestronia umbellula*)
S2 .....Buffalo-nut (*Pyrularia pubera*)
S2 .....American smoke-tree (*Cotinus obovatus*)
S1 .....Northern prickley ash (*Zanthoxylum americanum*)
S1 .....Oblon-leaved dyschoriste (*Dyschoriste oblongifolia*)
S1 .....Night-flowering wild-petunia (*Ruellia noctiflora*)
S1-S2.....Chapman's butterwort (*Pinguicula planifolia*)
S1-S2.....Florida bladderwort (*Utricularia floridana*)
S1-S2.....Swollen bladderwort (*Utricularia inflate*)
S1 .....Piedmont bladderwort (*Utricularia olivacea*)
S1-S2.....Northeastern bladderwort (*Utricularia resupinata*)
S2 .....One-flowered broomrape (*Orobanche uniflora*)
S2 .....Leafless false-foxglove (*Agalinis aphylla*)
S1 .....Pineland false-foxglove (*Agalinis divaricata*)
S2 .....Thin-stemmed false-foxglove (*Agalinis filicaulis*)
S1 .....Georgia false-foxglove (*Agalinis georgiana*)
S2 .....Prairie false-foxglove (*Agalinis heterophylla*)
S2 .....Flax-leaf false-foxglove (*Agalinis linifolia*)
S1 .....Ridge-stem false-foxglove (*Agalinis oligophylla*)
S1 .....Shinners' false-foxglove (*Agalinis pseudaphylla*)
S1 .....Granite pool sprite (*Amphianthus pusillus*)
S1 .....Spreading false-foxglove (*Aureolaria patula*)
S1 .....Scarlet Indian paintbrush (*Castilleja coccinea*)
S2 .....An Indian paintbrush (*Castilleja kraliana*)
S1 .....Pink turtlehead (*Chelone lyonii*)
S2 .....Flame flower (*Macranthera flammea*)
S1 .....Many-flower beardtongue (*Penstemon multiflorus*)
S1 .....Small's beardtongue (*Penstemon smallii*)
S1 .....Chaffseed (*Schwalbea americana*)
S1 .....Culver's root (*Veronicastrum virginicum*)
S1 .....Creeping morning-glory (*Evolvulus sericeus var. sericeus*)
S1 .....Water dawnflower (*Stylisma aquatica*)
S1 .....Pickering's morning-glory (*Stylisma pickeringii var. pickeringii*)

S2 .....Harper's dodder (*Cuscuta harperi*)
S1-S2.....Phacelia (*Phacelia dubia var. dubia*)
S2 .....Outcrop small-flower phacelia (*Phacelia dubia var. georgiana*)
S1-S2.....Christmas berry (*Lycium carolinianum*)
S1 .....Carpenter's ground-cherry (*Physalis carpenteri*)
S1 .....Horse-nettle (*Solanum carolinense var. hirsutum*)
S1 .....Lloyd St. Johnswort (*Hypericum lloydii*)
S2 .....Carolina St. Johnswort (*Hypericum nitidum*)
S2 .....Pretty St. Johnswort (*Hypericum nudiflorum*)
S2 .....Atlantic St. Johnswort (*Hypericum reductum*)
S1 .....Loblolly bay (*Gordonia lasianthus*)
S1 .....Coastal-sand frostweed (*Helianthemum arenicola*)
S2 .....Canada violet (*Viola canadensis*)
S1 .....Eggleston's violet (*Viola egglestonii*)
S1 .....Ground juniper (*Juniperus communis*)
S2 .....Sand pine (*Pinus clausa*)
S1 .....Pond pine (*Pinus serotina*)

E.2.1.10. Ferns and Allies

S2 .....Bradley's spleenwort (*Asplenium bradleyi*)
S1 .....Single-sorus spleenwort (*Asplenium monanthes*)
S2 .....Wall rue spleenwort (*Asplenium ruta-muraria*)
S1 .....American hart's-tongue fern (*Asplenium scolopendrium var. americanum*)
S1 .....Scott's spleenwort (*Asplenium x ebenoides*)
S2 .....Tennessee bladderfern (*Cystopteris tennesseensis*)
S1 .....Log fern (*Dryopteris celsa*)
S1 .....Southern woodfern (*Dryopteris x australis*)
S1 .....Gorge filmy fern (*Hymenophyllum tayloriae*)
S2 .....Dwarf filmy fern (*Trichomanes petersii*)
S1 .....Hybrid cloak fern (*Astrolepis x integerrima*)
S2 .....Climbing fern (*Lygodium palmatum*)
S1 .....Alabama streak-sorus fern (*Thelypteris pilosa var. alabamensis*)
S2 .....Hairy maiden fern (*Thelypteris quadrangularis*)
S1 .....American pillwort (*Pilularia americana*)
S1 .....Alabama grapefern (*Botrychium jenmanii*)
S1 .....Appalachian quillwort (*Isoetes appalachiana*)
S2 .....Butler s quillwort (*Isoetes butleri*)
S1 .....Southern quillwort (*Isoetes flaccida*)
S1 .....Louisiana quillwort (*Isoetes louisianensis*)
S1 .....Blackfoot quillwort (*Isoetes melanopoda*)
S2 .....Piedmont quillwort (*Isoetes piedmontana*)
S2 .....Riddell's spikemoss (*Selaginella arenicola ssp. riddellii*)
S1-S2.....Gulf spike-moss (*Selaginella ludoviciana*)
S2 .....Shining clubmoss (*Huperzia lucidula*)
S1 .....Rock clubmoss (*Huperzia porophila*)
S1-S2.....Nodding clubmoss (*Lycopodiella cernua*)
S1 .....Tree clubmoss (*Lycopodium obscurum*)
S1 .....Deep-root clubmoss (*Lycopodium tristachyum*)
S1 .....Whiskfern (*Psilotum nudum*)
S2 .....Feid horsetail (*Equisetum arvense*)

E.2.2. S1 and S2 Species in Mississippi

E.2.2.1. Mammals

S1 .....Black bear (*Ursus americanus*)
S1 .....Louisiana black bear (*Ursus americanus luteolus*)
S1 .....Meadow jumping mouse (*Zapus hudsonius*)

E.2.2.2. Birds

Because of the migratory nature of birds, additional ranking systems from The Nature Conservancy are applied here. "SB are regularly occurring migratory and present only during the breeding season." "SN are regularly occurring, usually migratory and typically non-breeding species in the state; this category includes migratory birds, bats, sea turtles, and cetaceans which do not breed in the state but pass through twice a year or may remain in winter."

S1N .....Golden eagle (*Aquila chrysaetos*)
S2B.....Swallow-tailed kite (*Elanoides forficatus*)
S1B-S2N Bald eagle (*Haliaeetus leucocephalus*)
S1 .....Mississippi sandhill crane (*Grus canadensis pulla*)
S2N .....Yellow rail (*Coturnicops noveboracensis*)
S2N .....Black rail (*Laterallus jamaicensis*)
S2N .....American white pelican (*Pelecanus erythrorhynchos*)
S1N .....Brown pelican (*Pelecanus occidentalis*)
S1 .....Red-cockaded woodpecker (*Picoides borealis*)
S1N .....Burrowing owl (*Athene cunicularia*)

E.2.2.3. Reptiles

S2 .....Mimic glass lizard (*Ophisaurus mimicus*)
S1 .....Eastern indigo snake (*Drymarchon corais couperi*)
S2 .....Rainbow snake (*Farancia erytrogramma*)
S2 .....Black pine snake (*Pituophis melanoleucus lodingi*)
S1N .....Kemp's ridley sea turtle (*Lepidochelys kempii*)
S2 .....Yellow-blotched map turtle (*Graptemys flavimaculata*)
S2 .....Black-knobbed map turtle (*Graptemys nigrinoda*)
S2 .....Ringed map turtle (*Graptemys oculifera*)
S2 .....Mississippi diamondback terrapin (*Malaclemys terrapin pileata*)
S1 .....Mississippi redbelly turtle (*Pseudemys pop 1*)
S2 .....Gopher tortoise (*Gopherus polyphemus*)

E.2.2.4. Amphibians

S1 .....River frog (*Rana heckscheri*)
S1 .....Dark gopher frog (*Rana sevosa*)
S1 .....Tiger salamander (*Ambystoma tigrinum*)
S1 .....One-toed amphiuma (*Amphiuma pholeter*)
S1 .....Hellbender (*Cryptobranchus alleganiensis*)
S1 .....Green salamander (*Aneides aeneus*)
S1 .....Cave salamander (*Eurycea lucifuga*)
S1 .....Spring salamander (*Gyrinophilus porphyriticus*)

S1-S2.....Four-toed salamander (*Hemidactylium scutatum*)
S2 .....Southern zigzag salamander (*Plethodon ventralis*)

E.2.2.5. Snails

S1 .....Big black rocksnail (*Lithasia hubrichti*)

E.2.2.6. Mussels

S1 .....Mucket (*Actinonaias ligamentina*)
S2 .....Rayed creekshell (*Anodontoides radiatus*)
S2 .....Rock pocketbook (*Arcidens confragosus*)
S1 .....Purple wartyback (*Cyclonaias tuberculata*)
S1 .....Delicate spike (*Elliptio arctata*)
S1 .....Spike (*Elliptio dilatata*)
S1 .....Cumberlandian combshell (*Epioblasma brevidens*)
S1 .....Southern combshell (*Epioblasma penita*)
S1 .....Snuffbox (*Epioblasma triquetra*)
S1 .....Tennessee pigtoe (*Fusconaia barnesiana*)
S1 .....Orange-nacre mucket (*Lampsilis perovalis*)
S1 .....Slabside pearlymussel (*Lexingtonia dolabelloides*)
S2 .....Black sandshell (*Ligumia recta*)
S1 .....Alabama moccasinshell (*Medionidus acutissimus*)
S2 .....Southern hickorynut (*Obovaria jacksoniana*)
S2 .....Round hickorynut (*Obovaria subrotunda*)
S1 .....Sheepnose (*Plethobasus cyphyus*)
S1-S2.....Southern clubshell (*Pleurobema decisum*)
S1 .....Ovate clubshell (*Pleurobema perovatum*)
S1 .....Pyramid pigtoe (*Pleurobema rubrum*)
S2 .....Pink heelsplitter (*Potamilus alatus*)
S1 .....Fat pocketbook (*Potamilus capax*)
S1 .....Kidneyshell (*Ptychobranchus fasciolaris*)
S1 .....Rabbitsfoot (*Quadrula cylindrica cylindrica*)
S2 .....Ridged mapleleaf (*Quadrula rumphiana*)
S1 .....Alabama creekmussel (*Strophitus connasaugaensis*)
S2 .....Southern creekmussel *Strophitus subvexus*)
S2 .....Tapered pondhorn (*Uniomerus declivis*)

E.2.2.7. Crustaceans

S2 .....Least crayfish (*Cambarellus diminutus*)
S2 .....A crayfish (*Cambarellus lesliei*)
S2 .....A crayfish (*Cambarus girardianus*)
S2 .....Burris' burrowing crawfish (*Fallicambarus burrisi*)
S2 .....Speckled burrowing crayfish (*Fallicambarus danielae*)
S1 .....Camp Shelby burrowing crawfish (*Fallicambarus gordoni*)
S2 .....Pearl rivulet crayfish (*Hobbseus attenuatus*)
S1 .....Oktibbeha rivulet crayfish (*Hobbseus orconectoides*)
S2 .....Tombigbee rivulet crayfish (*Hobbseus petilus*)
S1 .....Choctaw rivulet crayfish (*Hobbseus valleculus*)
S2 .....A crayfish (*Orconectes hartfieldi*)

S2 .....Jackson Prairie crayfish (*Procambarus barbiger*)
S1 .....Mississippi flatwoods crayfish (*Procambarus cometes*)
S2 .....Spiny-tailed crayfish (*Procambarus fitzpatricki*)
S1 .....Lagniappe crayfish (*Procambarus lagniappe*)
S2 .....Mobile crayfish (*Procambarus lecontei*)
S2 .....Shutispear crayfish (*Procambarus lylei*)
S1 .....Bearded red crayfish (*Procambarus pogum*)

E.2.2.8. Fish

S1 .....Gulf sturgeon (*Acipenser oxyrinchus desotoi*)
S1 .....Pallid sturgeon (*Scaphirhynchus albus*)
S1 .....Alabama sturgeon (*Scaphirhynchus suttkusi*)
S2 .....Broadstripe topminnow (*Fundulus euryzonus*)
S1 .....Alabama shad (*Alosa alabamae*)
S1 .....Silver redhorse (*Moxostoma anisurum*)
S1 .....Black redhorse (*Moxostoma duquesnei*)
S1 .....Shorthead redhorse (*Moxostoma macrolepidotum*)
S2 .....Rosyside dace (*Clinostomus funduloides*)
S2 .....Alabama shiner (*Cyprinella callistia*)
S2 .....Spotfin shiner (*Cyprinella spiloptera*)
S2 .....Rosefin shiner (*Lythrurus fasciolaris*)
S1 .....Bigeye shiner (*Notropis boops*)
S2 .....Silverside shiner (*Notropis candidus*)
S2 .....Ironcolor shiner (*Notropis chalybaeus*)
S1 .....Fluvial shiner (*Notropis edwardraneyi*)
S1-S2.....Blackmouth shiner (*Notropis melanostomus*)
S1 .....Rosyface shiner (*Notropis rubellus*)
S1 .....Suckermouth minnow (*Phenacobius mirabilis*)
S2 .....Southern redbelly dace (*Phoxinus erythrogaster*)
S1 .....Blacknose dace (*Rhinichthys atratulus*)
S2 .....Alligator gar (*Atractosteus spatula*)
S1 .....Rock bass (*Ambloplites rupestris*)
S1 .....Western sand darter (*Ammocrypta clara*)
S1 .....Crystal darter (*Crystallaria asprella*)
S1 .....Black darter (*Etheostoma duryi*)
S2 .....Fantail darter (*Etheostoma flabellare*)
S2 .....Stripetail darter (*Etheostoma kennicotti*)
S2 .....Blackfin darter (*Etheostoma nigripinne*)
S2 .....Yazoo darter (*Etheostoma raneyi*)
S1 .....Bayou darter (*Etheostoma rubrum*)
S2 .....Redline darter (*Etheostoma rufilineatum*)
S1 .....Backwater darter (*Etheostoma zonifer*)
S2 .....Bandfin darter (*Etheostoma zonistium*)
S1 .....Pearl darter (*Percina aurora*)
S1 .....Gilt darter (*Percina evides*)
S2 .....Freckled darter (*Percina lenticula*)
S1 .....Slenderhead darter (*Percina phoxocephala*)
S1 .....Banded sculpin (*Cottus carolinae*)
S1 .....Slender madtom (*Noturus exilis*)
S2 .....Frecklebelly madtom (*Noturus munitus*)

S1 .....Northern madtom (*Noturus stigmosus*)

E.2.2.9. Plants

S2 .....Atlantic white cedar (*Chamaecyparis thyoides*)
S2 .....Southern red cedar (*Juniperus silicicola*)
S1 .....Sand pine (*Pinus clausa*)
S2 .....Virginia pine (*Pinus virginiana*)
S2 .....San antonio false-foxglove (*Agalinis homalantha*)
S2 .....Shinners' false-foxglove (*Agalinis pseudaphylla*)
S1 .....Pale false foxglove (*Agalinis skinneriana*)
S1-S2.....Wood anemone (*Anemone quinquefolia*)
S1 .....Price's potato-bean (*Apios priceana*)
S1-S2.....Wild columbine (*Aquilegia canadensis*)
S1 .....Spreading rockcress (*Arabis patens*)
S1-S2.....Lake cress (*Armoracia aquatica*)
S2 .....Prairie milkweed (*Asclepias hirtella*)
S1 .....Purple milkweed (*Asclepias purpurascens*)
S2 .....White heath aster (*Aster ericoides*)
S1 .....Barrens silky aster (*Aster pratensis*)
S1 .....Purple-stemmed aster (*Aster puniceus*)
S2 .....Rattle-vetch (*Astragalus canadensis*)
S1 .....Engelman's bent milk-vetch (*Astragalus distortus var. engelmannii*)
S1 .....Great Indian-plantain (*Cacalia muehlenbergii*)
S1-S2.....Clustered poppy-mallow (*Callirhoe triangulata*)
S1 .....Scarlet Indian-paintbrush (*Castilleja coccinea*)
S1 .....Florida senna (*Chamaecrista deeringiana*)
S1 .....Pink turtlehead (*Chelone lyonii*)
S2 .....Spotted wintergreen (*Chimaphila maculata*)
S1-S2.....Black bugbane (*Cimicifuga racemosa*)
S2 .....Yellowwood (*Cladrastis kentukea*)
S1 .....Vase-vine leather-flower (*Clematis beadlei*)
S1 .....White-leaved leather-flower (*Clematis glaucophylla*)
S1 .....Seaside balm (*Conradina canescens*)
S1-S2.....Georgia tickseed (*Coreopsis nudata*)
S2 .....Alternate-leaf dogwood (*Cornus alternifolia*)
S1 .....Ashe hawthorn (*Crataegus ashei*)
S1 .....Gallion hawthorn (*Crataegus meridionalis*)
S1 .....Three-flowered hawthorn (*Crataegus triflora*)
S2 .....Dwarf larkspur (*Delphinium tricorne*)
S1-S2.....Pepper-root (*Dentaria diphylla*)
S1 .....Creamflower tick-trefoil (*Desmodium ochroleucum*)
S1 .....Dutchman's breeches (*Dicentra cucullaria*)
S2 .....Eastern leatherwood (*Dirca palustris*)
S2 .....Shootingstar (*Dodecatheon meadia*)
S1-S2.....American dragonhead (*Dracocephalum parviflorum*)
S1 .....Marsh eryngo (*Eryngium aquaticum*)
S1-S2.....Hooker's eryngo (*Eryngium hookeri*)
S1 .....Tall prairie-gentain (*Eustoma exaltatum*)
S1 .....Bighead pygmycudweed (*Evax prolifera*)
S1 .....Upland swamp privet (*Forestiera ligustrina*)

S2 .....Blue ash (*Fraxinus quadrangulata*)
S1 .....Sticky hedge-hyssop (*Gratiola brevifolia*)
S2 .....Kentucky coffee-tree (*Gymnocladus dioicus*)
S1 .....Drummond pennyroyal (*Hedeoma drummondii*)
S1-S2.....Gulf rockrose (*Helianthemum arenicola*)
S1 .....Giant alumroot (*Heuchera villosa var. macrorhiza*)
S1 .....Large-flowered heartleaf (*Hexastylis shuttleworthii*)
S2 .....Brillant hibiscus (*Hibiscus coccineus*)
S1 .....Rattlesnake hawkweed (*Hieracium venosum*)
S1-S2.....Featherfoil (*Hottonia inflata*)
S2 .....Green violet (*Hybanthus concolor*)
S1 .....Golden seal (*Hydrastis canadensis*)
S1 .....Appendaged waterleaf (*Hydrophyllum appendiculatum*)
S1 .....Large-leaf waterleaf (*Hydrophyllum macrophyllum*)
S2 .....Myrtle-leaved St. Johnswort (*Hypericum myrtifolium*)
S2 .....Dahoon holly (*Ilex cassine*)
S2 .....White walnut (*Juglans cinerea*)
S2 .....Spreading bladder-pod (*Lesquerella gracilis*)
S1-S2.....Nondo lovage (*Ligusticum canadense*)
S2 .....Pondberry (*Lindera melissifolia*)
S2 .....Bog spice bush (*Lindera subcoriacea*)
S2 .....Large fruited flax (*Linum macrocarpum*)
S1 .....Boykin's lobelia (*Lobelia boykinii*)
S1 .....Sessile-leaved bugleweed (*Lycopus amplectens*)
S1-S2.....Umbrella magnolia (*Magnolia tripetala*)
S1-S2.....Virginia bluebells (*Mertensia virginica*)
S1-S2.....Square-stem monkey flower (*Mimulus ringens*)
S1 .....Narrowleaf miterwort (*Mitreola angustifolium*)
S1 .....Loose watermilfoil (*Myriophyllum laxum*)
S1-S2.....Nestronia (*Nestronia umbellula*)
S1 .....Alabama snow-wreath (*Neviusia alabamensis*)
S1-S2.....Floating-heart (*Nymphoides cordata*)
S1 .....Large-flowered evening-primrose (*Oenothera grandiflora*)
S1 .....Small palafoxia (*Palafoxia callosa*)
S2 .....Large-leaved grass-of-parnassus (*Parnassia grandifolia*)
S1-S2.....Beach sand-squares (*Paronychia erecta*)
S1-S2.....Eastern eulophus (*Perideridia americana*)
S1 .....Fernleaf phacelia (*Phacelia bipinnatifida*)
S1-S2.....Sandhill bean (*Phaseolus sinuatus*)
S1 .....Hairy mock-orange (*Philadelphus hirsutus*)
S2 .....Odorless mock-orange (*Philadelphus inodorus*)
S1 .....Carpenter's ground-cherry (*Physalis carpenteri*)
S1 .....Climbing fetter-bush (*Pieris phillyreifolia*)
S2 .....Chapman's butterwort (*Pinguicula planifolia*)
S1 .....Heartleaf plantain (*Plantago cordata*)
S1-S2.....Slender-leaf clammy-weed (*Polanisia tenuifolia*)
S1-S2.....Hooker's milkwort (*Polygala hookeri*)
S1 .....Georgia milkwort (*Polygala leptostachys*)
S2 .....Prairie parsley (*Polytaenia nuttallii*)
S2 .....Rough rattlesnake-root (*Prenanthes aspera*)
S1 .....Awned mountain-mint (*Pycnanthemum setosum*)

S2 .....Bur oak (*Quercus macrocarpa*)
S1 .....Dwarf live oak (*Quercus minima*)
S2 .....Lance-leaved buckthorn (*Rhamnus lanceolata*)
S1 .....Smooth azalea (*Rhododendron arborescens*)
S1 .....Rough coneflower (*Rudbeckia grandiflora*)
S1 .....Sweet coneflower (*Rudbeckia subtomentosa*)
S2 .....Night-flowering ruellia (*Ruellia noctiflora*)
S2 .....Tiny-leaved buckthorn (*Sageretia minutiflora*)
S1-S2.....Florida soapberry (*Sapindus marginatus*)
S1 .....Rose pitcher-plant (*Sarracenia rosea*)
S1 .....Wherry's pitcher-plant (*Sarracenia rubra ssp. wherryi*)
S1 .....Rock stonecrop (*Sedum pulchellum*)
S2 .....Wood stonecrop (*Sedum ternatum*)
S1-S2.....Ovate catchfly (*Silene ovata*)
S1 .....Eared goldenrod (*Solidago auriculata*)
S1-S2.....Appalachian goldenrod (*Solidago flaccidifolia*)
S1-S2.....False goldenrod (*Solidago sphacelata*)
S1 .....Mountain camellia (*Stewartia ovata*)
S1 .....Water southern morning-glory (*Stylisma aquatica*)
S1 .....Patterson's bindweed (*Stylisma pickeringii var. pattersonii*)
S1 .....Yellow pimpernell (*Taenidia integerrima*)
S1-S2.....Southern meadow-rue (*Thalictrum debile*)
S1 .....Stiff greenthreads (*Thelesperma filifolium*)
S2 .....Heart-leaved foam-flower (*Tiarella cordifolia*)
S1 .....Earleaf false-foxglove (*Tomanthera auriculata*)
S1 .....Carolina tassel-rue (*Trautvetteria caroliniensis*)
S1 .....Piedmont bladderwort (*Utricularia olivacea*)
S2 .....Gale-leaf blueberry (*Vaccinium tenellum*)
S1 .....Maple-leaf viburnum (*Viburnum acerifolium*)
S1-S2.....Smooth yellow violet (*Viola pubescens var. eriocarpon*)
S1 .....Green-flower yeatesia (*Yeatesia viridiflora*)
S1 .....Pinewoods-lily (*Alophia drummondii*)
S1 .....Puttyroot (*Aplectrum hyemale*)
S1 .....Southern three-awned grass (*Aristida simpliciflora*)
S1 .....Many-flower grass-pink (*Calopogon multiflorus*)
S1 .....Oklahoma grass-pink (*Calopogon oklahomensis*)
S1 .....Golden canna (*Canna flaccida*)
S1 .....Baltzell's sedge (*Carex baltzellii*)
S1 .....Bristly sedge (*Carex comosa*)
S2 .....Coast sedge (*Carex exilis*)
S1 .....Southern few-fruited sedge (*Carex impressinervia*)
S1-S2.....Nebraska sedge (*Carex jamesii*)
S1 .....Loose-flowered sedge (*Carex laxiflora var. laxiflora*)
S1 .....Eastern few-fruit sedge (*Carex oligocarpa*)
S1 .....Drooping sedge (*Carex prasina*)
S1-S2.....Separated sedge (*Carex seorsa*)
S1-S2.....Walter's sedge (*Carex striata*)
S2 .....Uptight sedge (*Carex stricta*)
S1 .....Twig rush (*Cladium mariscoides*)
S1 .....Pitted jointgrass (*Coelorachis cylindrical*)
S1 .....Small yellow lady's-slipper (*Cypripedium parviflorum*)

S1-S2.....Wright's witchgrass (*Dichanthelium wrightianum*)
S1 .....Erect burhead (*Echinodorus rostratus*)
S1 .....Dwarf burhead (*Echinodorus tenellus var. parvulus*)
S1 .....Slim spike-rush (*Eleocharis elongate*)
S1 .....Black-fruited spike-rush (*Eleocharis melanocarpa*)
S2 .....Robbins spikerush (*Eleocharis robbinsii*)
S1 .....Beaked spikerush (*Eleocharis rostellata*)
S2 .....Green-fly orchid (*Epidendrum conopseum*)
S2 .....White dog's tooth violet (*Erythronium albidum*)
S1-S2.....Yellow dog's tooth violet (*Erythronium americanum*)
S1-S2.....Beaked dog's tooth violet (*Erythronium rostratum*)
S1-S2.....Smooth-lipped eulophia (*Eulophia ecristata*)
S1 .....Downy rattlesnake-plantain (*Goodyera pubescens*)
S1 .....Engelmann's sea-grass (*Halophila engelmannii*)
S2 .....Herbertia (*Herbertia lahue ssp. caerulea*)
S2 .....Crested coralroot (*Hexalectris spicata*)
S2 .....Pineland bogbutton (*Lachnocaulon digynum*)
S1-S2.....Michigan lily (*Lilium michiganense*)
S1-S2.....Slender muhly (*Muhlenbergia tenuiflora*)
S2 .....Prairie-iris (*Nemastylis geminiflora*)
S1 .....Showy orchis (*Orchis spectabilis*)
S2 .....Naked-stemmed panic grass (*Panicum nudicaule*)
S2 .....Large white fringed orchid (*Platanthera blephariglottis*)
S1 .....White fringeless orchid (*Platanthera integrilabia*)
S1-S2.....Green fringed-orchid (*Platanthera lacera*)
S1 .....Creekgrass (*Potamogeton epihydrus*)
S1 .....Hairy-peduncled beakrush (*Rhynchospora crinipes*)
S1 .....Curtiss's beakrush (*Rhynchospora curtissii*)
S1 .....Swamp-forest beakrush (*Rhynchospora decurrens*)
S1 .....Fernald's beakrush (*Rhynchospora fernaldii*)
S1 .....Small's beakrush (*Rhynchospora globularis var. pinetorum*)
S1 .....Harper beakrush (*Rhynchospora harperi*)
S1 .....Thorne's beakrush (*Rhynchospora thornei*)
S1 .....Tracy's beakrush (*Rhynchospora tracyi*)
S1 .....Slender arrow-head (*Sagittaria isoetiformis*)
S1 .....Spring-tape arrowhead (*Sagittaria kurziana*)
S1 .....Reticulated nutrush (*Scleria reticularis*)
S1 .....Florida ladies'-tresses (*Spiranthes brevilabris var. floridana*)
S1-S2.....Eastern featherbells (*Stenanthium gramineum*)
S1 .....Powdery thalia (*Thalia dealbata*)
S1 .....Palmer's spiderwort (*Tradescantia ernestiana*)
S1 .....Drooping trillium (*Trillium flexipes*)
S1 .....Dwarf trillium (*Trillium pusillum*)
S1 .....Southern bellwort (*Uvularia floridana*)
S2 .....Drummond's yellow-eyed grass (*Xyris drummondii*)
S1-S2.....Harper's yellow-eyed grass (*Xyris scabrifolia*)

E.2.2.10. Ferns and Allies

S1-S2.....Field horsetail (*Equisetum arvense*)
S2 .....Southern maidenhair-fern (*Adiantum capillus-veneris*)

S1 .....Lobed spleenwort (*Asplenium pinnatifidum*)
S1 .....Black-stem spleenwort (*Asplenium resiliens*)
S1-S2.....Walking-fern spleenwort (*Asplenium rhizophyllum*)
S1 .....Maidenhair spleenwort (*Asplenium trichomanes*)
S2-S3.....Glade fern (*Athyrium pycnocarpon*)
S2-S3.....Silvery spleenwort (*Athyrium thelypterioides*)
S1 .....Alabama lipfern (*Cheilanthes alabamensis*)
S2 .....Hairy lipfern (*Cheilanthes lanosa*)
S1 .....Southern shield wood-fern (*Dryopteris ludoviciana*)
S1 .....Southern wood fern (*Dryopteris x australis*)
S1-S2.....Hairy water-fern (*Marsilea mucronata*)
S1-S2.....Purple-stem cliff-brake (*Pellaea atropurpurea*)
S1 .....Bristle-fern (*Trichomanes boschianum*)
S1 .....Dwarf filmy-fern (*Trichomanes petersii*)
S1-S2.....Appalachian quillwort (*Isoetes engelmannii*)
S2 .....Louisiana quillwort (*Isoetes louisianensis*)
S2 .....Blackfoot quillwort (*Isoetes melanopoda*)
S2 .....Nodding clubmoss (*Lycopodium cernuum*)
S1 .....Limestone adder's-tongue (*Ophioglossum engelmannii*)

APPENDIX F—SOILS

SOILS WITHIN ALABAMA AND MISSISSIPPI BUREAU OF LAND MANAGEMENT–ADMINISTERED NON–U.S. FOREST SERVICE FEDERAL MINERAL OWNERSHIP

Tables F-1 and F-2 provide erosion potential and prime farmland information for areas in Alabama and Mississippi Bureau of Land Management (BLM)-administered, non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO) that are considered high potential for either oil and gas or coal exploration and development. Data are available in spatial format.

Table F-1. Soils Descriptions for Areas Within Alabama Non-USFS FMO

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Baldwin	Coastal beaches	None	No
Baldwin	Leon sand	Slight	No
Baldwin	St. Lucie–Leon–Muck complex	Slight	No
Cherokee	Allen fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Cherokee	Hartsells fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Cherokee	Hartsells fine sandy loam, 6 to 10 percent slopes	Moderate	No
Cherokee	Hartsells–rock outcrop association, steep	Very Severe	No
Cherokee	Hector–Hartsells–rock outcrop complex, 2 to 10 percent slopes (Gorgas–Hartsells–rock outcrop)	Moderate	No
Cherokee	Linker fine sandy loam, 6 to 10 percent slopes	Slight to Moderate	No
Cherokee	Toccoa soils	Slight	No
DeKalb	Crossville rocky loam, rolling	Unavailable	No
DeKalb	Hartsells fine sandy loam, eroded, rolling	Moderate	No
DeKalb	Hartsells fine sandy loam, eroded, rolling, shallow	Moderate	No
DeKalb	Hartsells fine sandy loam, eroded, undulating	Slight to Moderate	Yes
DeKalb	Hartsells fine sandy loam, eroded, undulating, shallow	Slight to Moderate	No
DeKalb	Hartsells fine sandy loam, rolling, shallow	Moderate	No
DeKalb	Muskingum stony fine sandy loam, hilly	Very Severe	No
DeKalb	Muskingum stony fine sandy loam, rolling	Very Severe	No
DeKalb	Philo loam	Slight	Yes
DeKalb	Rockland, sandstone, rolling	Very Severe	No
DeKalb	Rockland, sandstone, steep	Very Severe	No
Fayette	Barfield–rock outcrop complex, steep	Very Severe	No
Fayette	Gorgas–rock outcrop complex, 8 to 15 percent slopes	Very Severe	No
Fayette	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Fayette	Hanceville–urban land complex, 2 to 8 percent slopes	Slight to Moderate	No
Fayette	Holston–urban land complex, 2 to 8 percent slopes	Unavailable	No
Fayette	Nauvoo and Nectar fine sandy loams, 2 to 6 percent slopes	Slight to Moderate	Yes
Fayette	Nauvoo–urban land complex, 8 to 15 percent slopes	Unavailable	No
Fayette	Sunlight-Sipsey complex, 15 to 40 percent slopes	Very Severe	No
Fayette	Sunlight-Townley complex, 15 to 45 percent slopes	Very Severe	No
Jefferson	Docena complex, 0 to 4 percent slopes	Slight	No
Jefferson	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No
Jefferson	Hanceville–urban land complex, 2 to 8 percent slopes	Slight to Moderate	No
Jefferson	Montevallo-Nauvoo association, steep	Very Severe	No
Jefferson	Nauvoo fine sandy loam, 8 to 15 percent slopes	Unavailable	No
Jefferson	Palmerdale complex, steep	Unavailable	No
Jefferson	Sullivan-State complex, 0 to 2 percent slopes	Slight	Yes
Jefferson	Townley-Nauvoo complex, 8 to 15 percent slopes	Severe	No
Mobile	Pactolus loamy sand, 0 to 2 percent slopes	Moderate	No
Shelby	Allen loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Shelby	Allen loam, 6 to 10 percent slopes	Moderate	No
Shelby	Allen–Quitman–urban land complex, 0 to 10 percent slopes	Slight to Moderate	No
Shelby	Choccolocco loam, occasionally flooded	Slight	Yes
Shelby	Choccolocco-Sterrett association, frequently flooded	Slight	No
Shelby	Decatur silt loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Shelby	Decatur silt loam, 6 to 10 percent slopes	Moderate	No
Shelby	Etowah silt loam, 6 to 10 percent slopes	Moderate	No
Shelby	Minvale-Fullerton complex, 6 to 15 percent slopes	Severe	No
Shelby	Nauvoo-Sunlight complex, 15 to 25 percent slopes	Severe	No
Shelby	Nella-Mountainburg association, steep	Very Severe	No
Shelby	Quitman loam, 0 to 4 percent slopes	Slight to Moderate	Yes
Shelby	Sterrett silt loam	Slight	No
Shelby	Townley silt loam, 12 to 18 percent slopes	Very Severe	No
Shelby	Townley silt loam, 4 to 12 percent slopes	Severe	No
Shelby	Townley-Sunlight complex, 12 to 35 percent slopes	Very Severe	No
Shelby	Tupelo loam, frequently flooded	Unavailable	No
Tuscaloosa	Adaton silt loam	Slight	No
Tuscaloosa	Augusta-Amy complex, frequently flooded	Slight	No
Tuscaloosa	Bama fine sandy loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Bama fine sandy loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Tuscaloosa	Boswell loam, 4 to 10 percent slopes	Severe	No

County	Soil Description	Erosion Potential [1]	Prime Farmland [1]
Tuscaloosa	Choccolocco silt loam	Slight	Yes
Tuscaloosa	Ellisville silt loam, frequently flooded	Slight	No
Tuscaloosa	Falkner silt loam	Slight	Yes
Tuscaloosa	Iuka-Mantachie complex, frequently flooded	Slight	No
Tuscaloosa	Luverne-Smithdale complex, 4 to 10 percent slopes	Severe	No
Tuscaloosa	Montevallo-Nauvoo association, steep	Very Severe	No
Tuscaloosa	Montevallo-Nauvoo complex, 15 to 45 percent slopes	Very Severe	No
Tuscaloosa	Nauvoo fine sandy loam, 4 to 10 percent slopes	Moderate	No
Tuscaloosa	Palmerdale very gravelly loam, 6 to 45 percent slopes	Very Severe	No
Tuscaloosa	Palmerdale very shaly loam, 6 to 45 percent slopes	Very Severe	No
Tuscaloosa	Ruston fine sandy loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Ruston fine sandy loam, 2 to 6 percent slopes	Slight	Yes
Tuscaloosa	Shatta silt loam, 0 to 2 percent slopes	Slight	Yes
Tuscaloosa	Shatta silt loam, 2 to 6 percent slopes	Slight to Moderate	Yes
Tuscaloosa	Smithdale association, hilly	Very Severe	No
Tuscaloosa	Smithdale fine sandy loam, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale fine sandy loam, 6 to 15 percent slopes	Severe	No
Tuscaloosa	Smithdale-Flomaton complex, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale-Luverne association, hilly	Severe	No
Tuscaloosa	Smithdale-Luverne complex, 15 to 35 percent slopes	Very Severe	No
Tuscaloosa	Smithdale-Pikeville association, hilly	Very Severe	No
Walker	Brilliant and Palmerdale extremely channery loams, 6 to 60 percent slopes	Very Severe	No
Walker	Hanceville fine sandy loam, 8 to 15 percent slopes	Severe	No
Walker	Izagora-Annemaine association, moderately undulating	Unavailable	No
Walker	Montevallo channery silt loam, 30 to 60 percent slopes	Very Severe	No
Walker	Nauvoo and Nectar fine sandy loams, 2 to 6 percent slopes	Slight to Moderate	Yes
Walker	Nauvoo and Sipsey soils, 6 to 12 percent slopes	Severe	No
Walker	Nauvoo-Townley complex, 4 to 20 percent slopes	Very Severe	No
Walker	Sipsey-Bankhead complex, 15 to 45 percent slopes	Very Severe	No
Walker	Spadra-Whitwell complex, 0 to 3 percent slopes, occasionally flooded	Unavailable	Yes
Walker	Sunlight-Sipsey complex, 15 to 40 percent slopes	Very Severe	No
Walker	Sunlight-Townley complex, 15 to 45 percent slopes	Very Severe	No
Walker	Townley silt loam, 2 to 6 percent slopes	Moderate	No
Walker	Townley silt loam, 6 to 15 percent slopes	Very Severe	No

1 Erosion potential and prime farmland classification data collected from National Resources Conservation Service (NRCS) Soil Data Mart (http://soildatamart.nrcs.usda.gov/).

Table F-2. Soils Descriptions for Areas Within Mississippi Non-USFS FMO

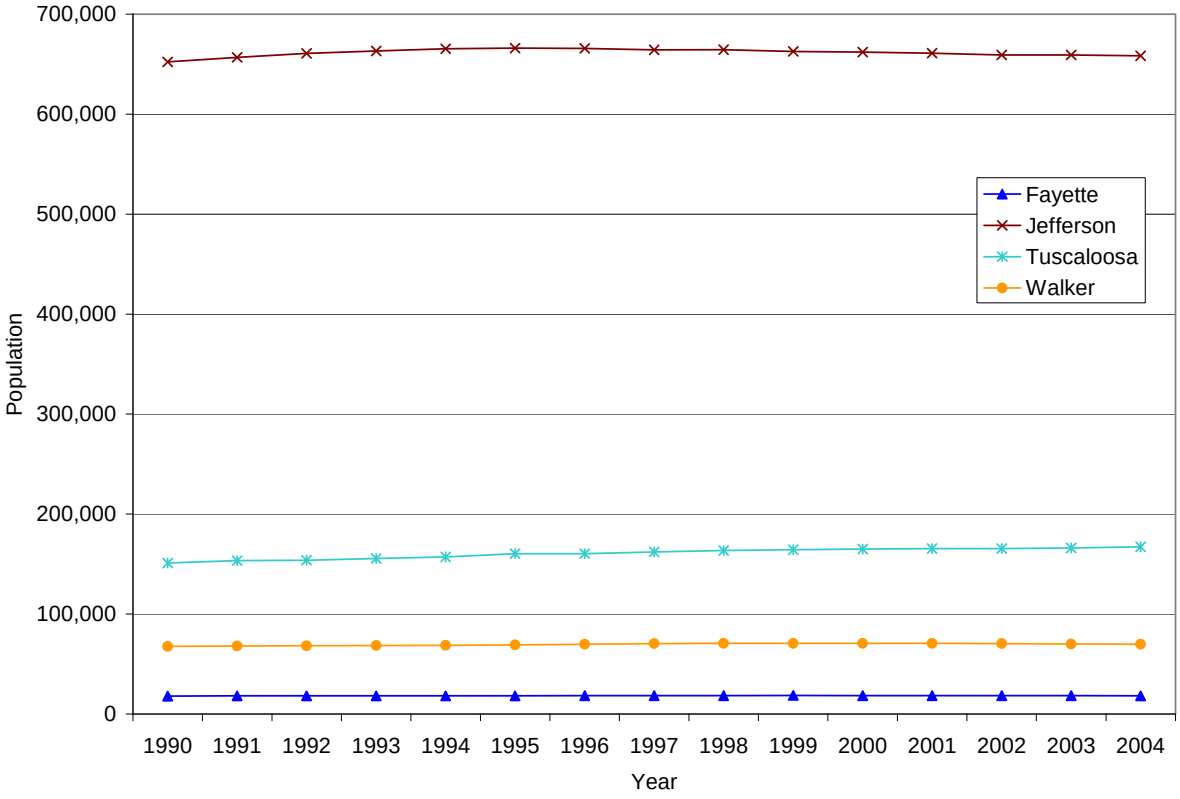
County	Soil Description	Erosion Potential [1]	Prime Farmland
Forrest	Bassfield fine sandy loam, 0 to 2 percent slopes	Low to Moderate	Yes
Forrest	Benndale fine sandy loam, 2 to 5 percent slopes	Low to Moderate	Yes
Forrest	Benndale fine sandy loam, 5 to 8 percent slopes	Low to Moderate	Yes
Forrest	Cahaba sandy loam, 0 to 2 percent slopes	Moderate	Yes
Forrest	Malbis loam, 2 to 5 percent slopes	Moderate	Yes
Forrest	McGauran loamy sand, 2 to 5 percent slopes	Low	Yes
Forrest	Poarch fine sandy loam, 2 to 5 percent slopes	Low to Moderate	Yes
Forrest	Poarch fine sandy loam, 5 to 8 percent slopes	Low to Moderate	Yes
Forrest	Prentiss loam, 0 to 2 percent slopes	Moderate	Yes
Forrest	Prentiss loam, 2 to 5 percent slopes	Moderate	Yes
Forrest	Bassfield–urban land complex, occasionally flooded	Unavailable	No
Forrest	Benndale fine sandy loam, 8 to 12 percent slopes	Low to Moderate	No
Forrest	Bibb silt loam	Moderate	No
Forrest	Bibb and Jena soils, frequently flooded	Moderate	No
Forrest	Cadeville variant silt loam, 15 to 60 percent slopes	Moderate to High	No
Forrest	Faulkner–Susquehanna–urban land complex, 2 to 5 percent slopes	Moderate	No
Forrest	Heidel sandy loam, 12 to 30 percent slopes	Low to Moderate	No
Forrest	Jena-Nugent association, frequently flooded	Low	No
Forrest	McLaurin loamy sand, 5 to 8 percent slopes	Low	No
Forrest	McLaurin-Benndale association, rolling	Moderate	No
Forrest	Pamlico-Dorovan association	Low	No
Forrest	Petal-Susquehanna-Benndale association, rolling	Moderate	No
Forrest	Pits	Moderate	No
Forrest	Poarch-Saucier association, undulating	Moderate	No
Forrest	Prentiss–urban land complex	Moderate	No
Forrest	Susquehanna silt loam, 5 to 12 percent slopes	Moderate	No
Forrest	Troup loamy fine sand, 0 to 8 percent slopes	Low	No

1 Erosion potential was estimated based on K factors (susceptibility of a soil to sheet and rill erosion by water) provided by the NRCS. Erosion hazard estimation as provided for Alabama were not available for Mississippi.

APPENDIX G—SOCIOECONOMIC FIGURES

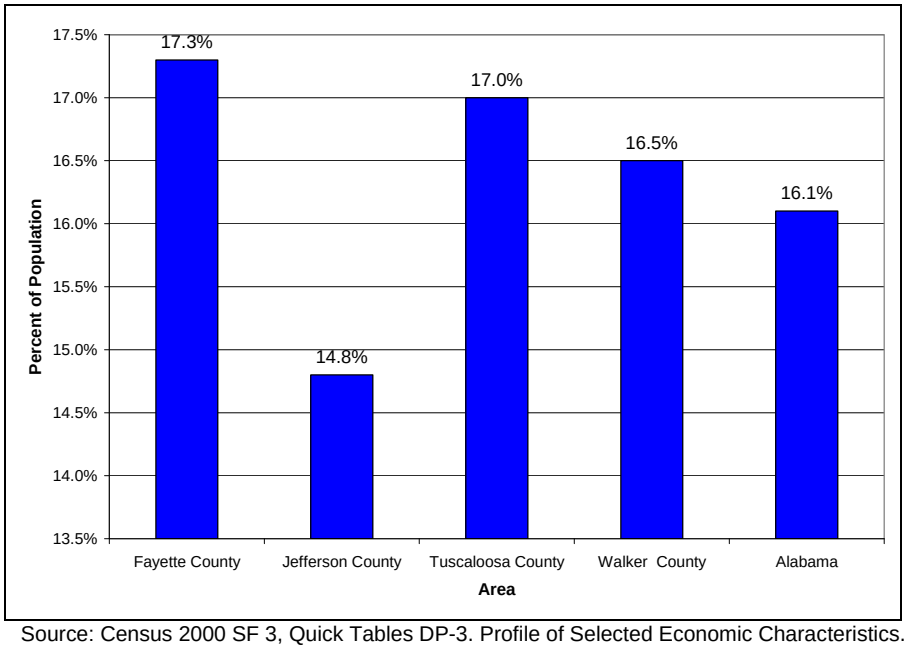
The following figures represent socioeconomic trends for Bureau of Land Management (BLM)-administered, non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO) study areas in Mississippi and Alabama. Socioeconomic study areas for non-USFS FMO were developed for areas with high potential for mineral development, as discussed in Chapter 3.

Figure G-1. Population Trends for BLM-Administered, Non-USFS FMO Study Area in Alabama (1990–2002)



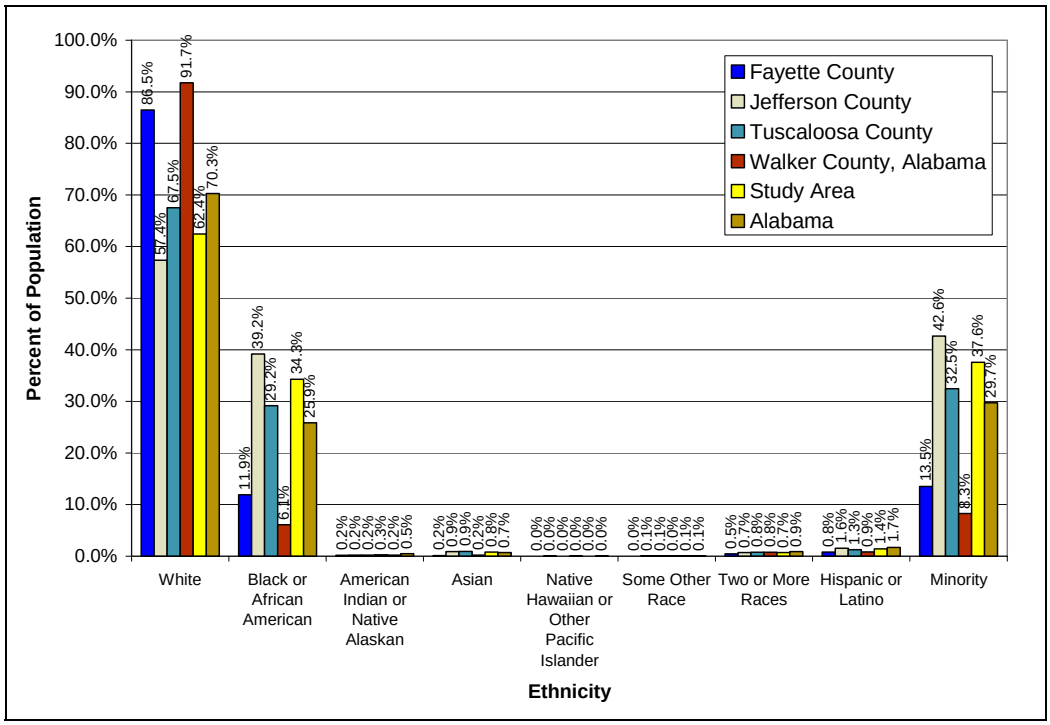
Source: Bureau of Economic Analysis (BEA) Regional Economic Accounts, Table CA1-3-Population, 2007.

Figure G-2. Poverty Rate for BLM-Administered, Non-USFS FMO Study Area in Alabama



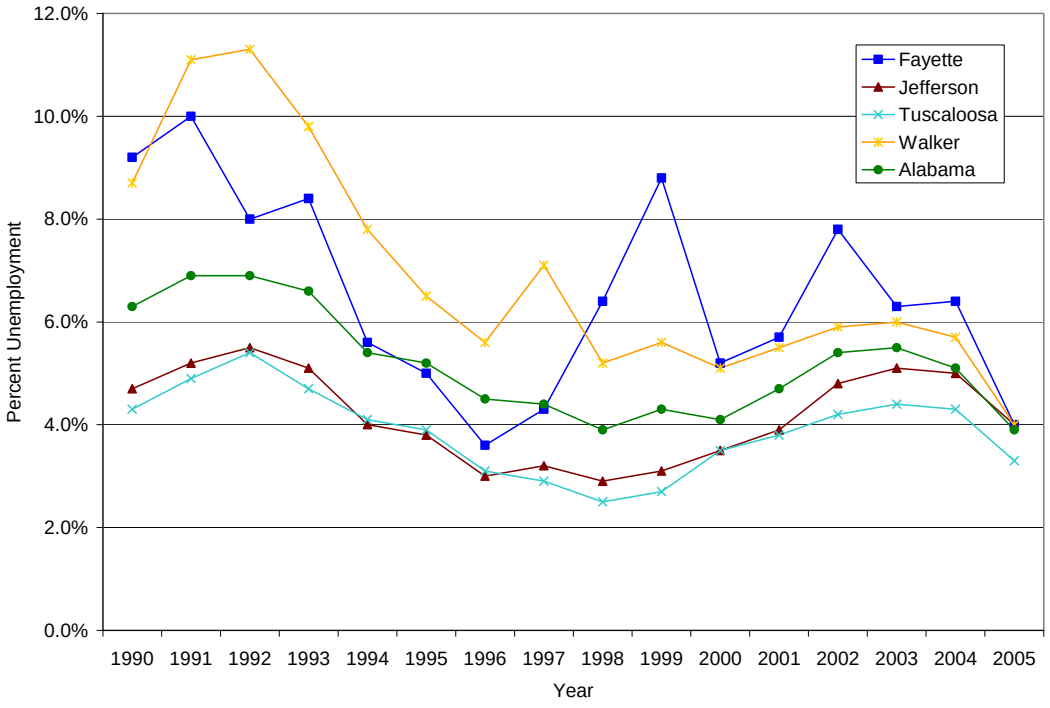
Source: Census 2000 SF 3, Quick Tables DP-3. Profile of Selected Economic Characteristics.

Figure G-3. Ethnicity for BLM-Administered, Non-USFS FMO Study Area in Alabama



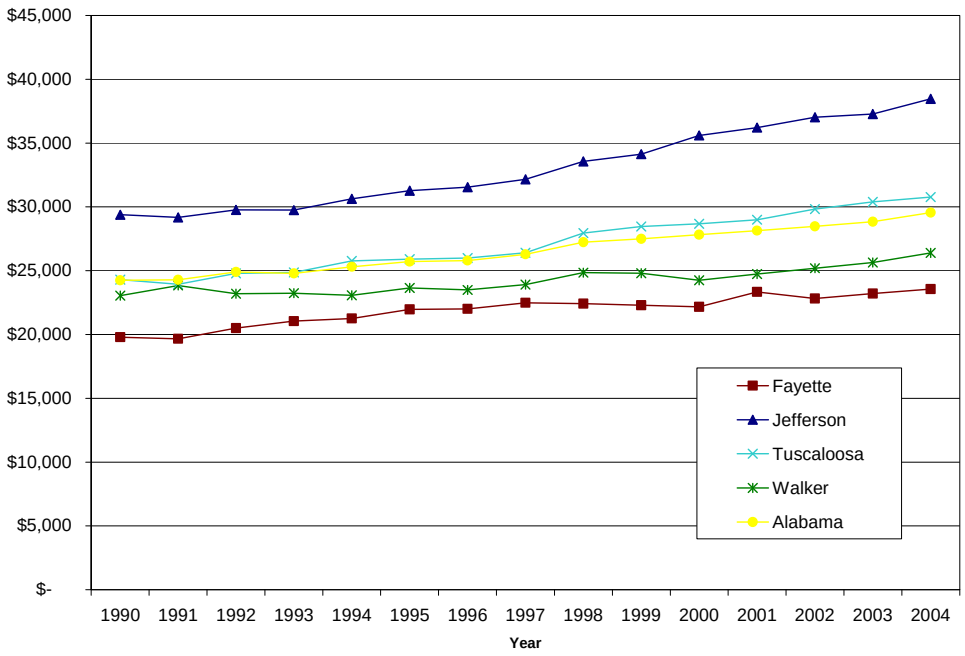
Source: Census 2000 SF 1, Quick Tables QT-P4. Profile of Selected Economic Characteristics.

Figure G-4. Unemployment Trends for BLM-Administered, Non-USFS FMO Study Area in Alabama (1990–2005)



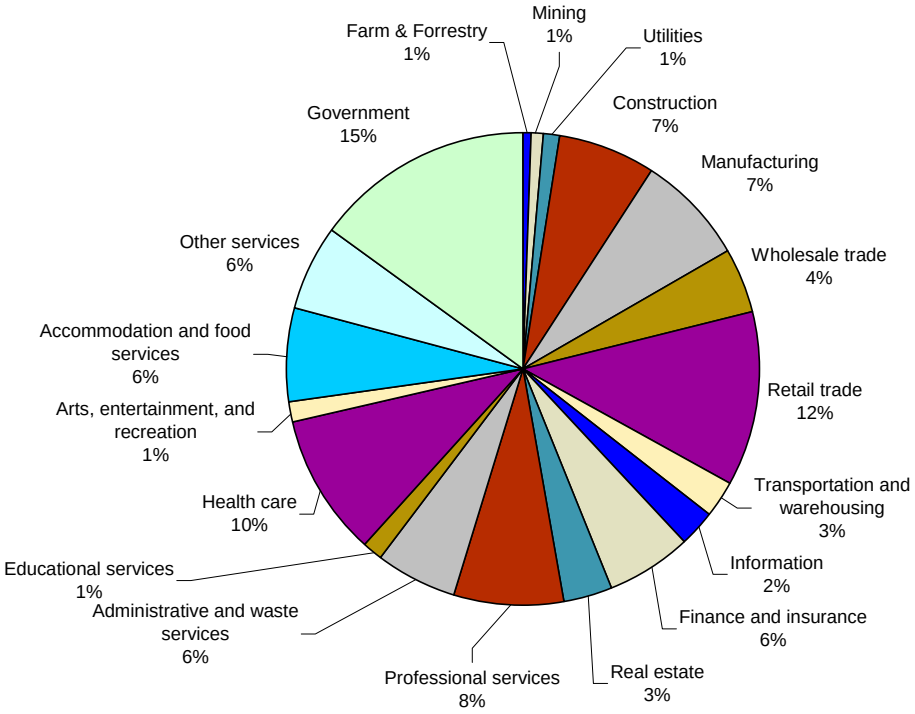
Source: Bureau of Labor Statistics (BLS), Local Area Unemployment Statistics—Not Seasonally Adjusted, 2007.

Figure G-5. Per Capita Income Trends for BLM-Administered, Non-USFS FMO Study Area in Alabama (1990–2004)



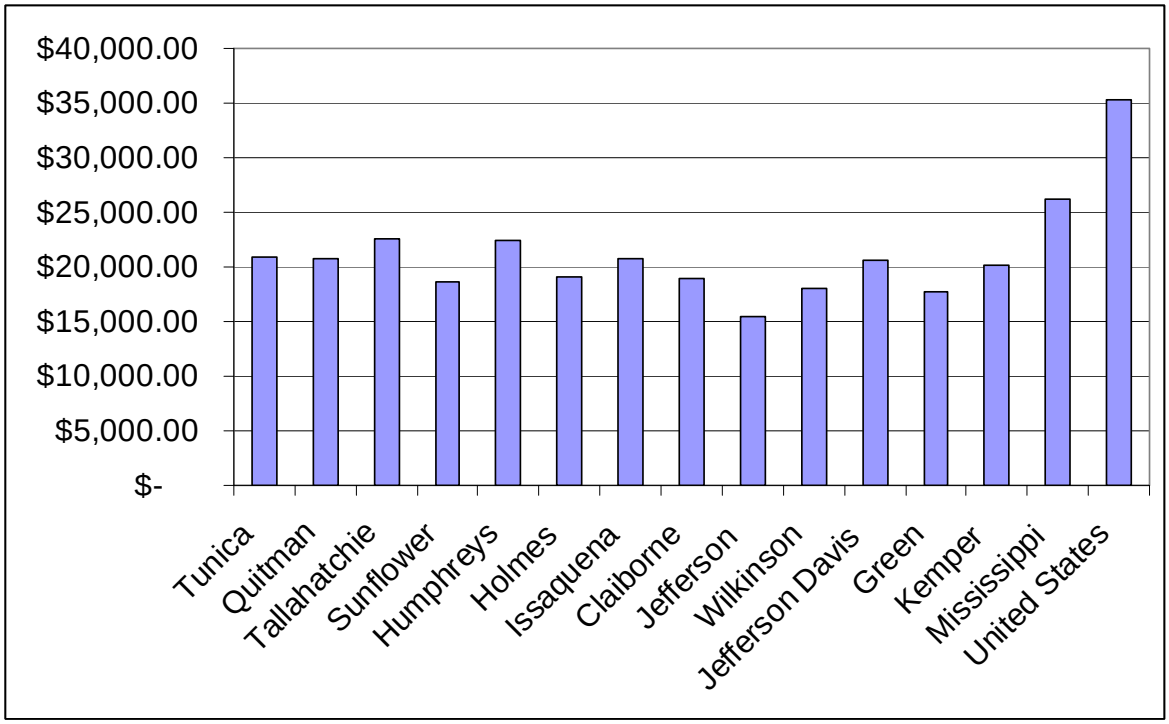
Source: BEA, 2007, adjusted to 2006$ with the BLS Consumer Price Indexes (CPI).

Figure G-6. Employment by Industry for BLM-Administered, Non-USFS FMO Study Area in Alabama (2004)



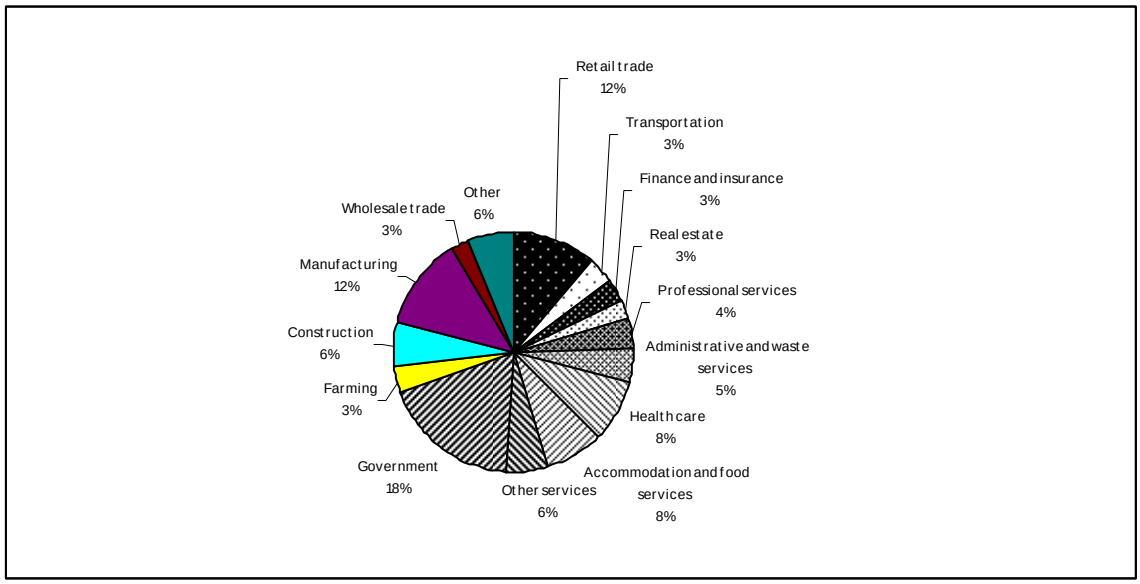
Source: BEA, 2007.

Figure G-7. Personal Income Per Capita in Mississippi (2006$)



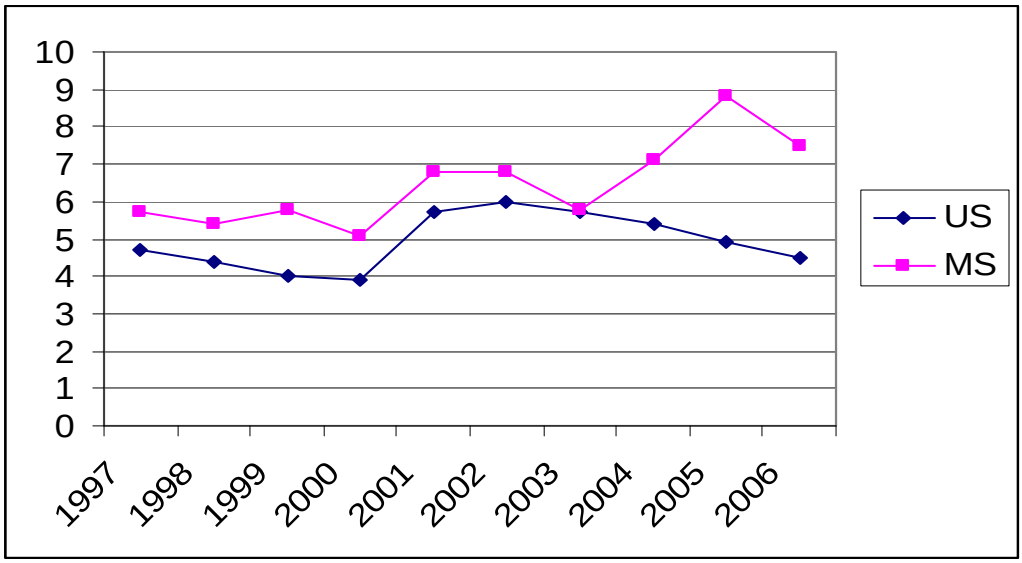
Source: Bureau of the Census, reported in 2004$, adjusted to 2006$ with the BLS CPI.

Figure G-8. Employment by Industry for Mississippi (2005)



Source: BLS.

Figure G-9. Unemployment Rate for Mississippi and United States (1997–2006)



Source: BLS.

Figure G-10. Mississippi Unemployment Rates by County

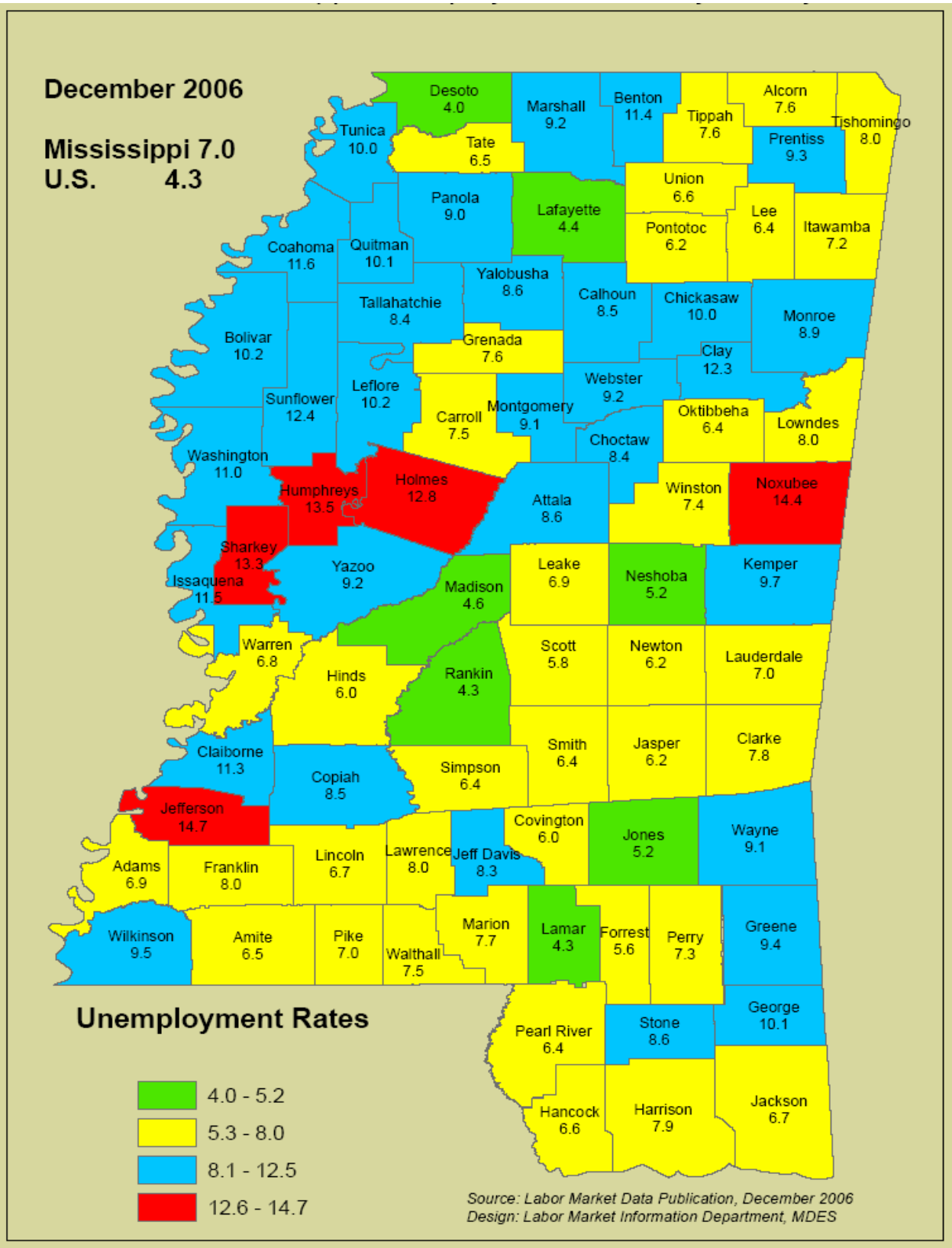
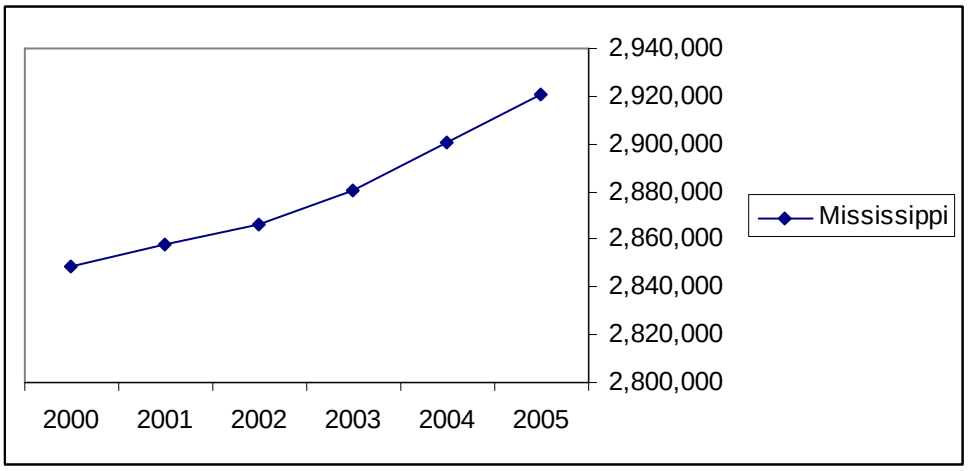
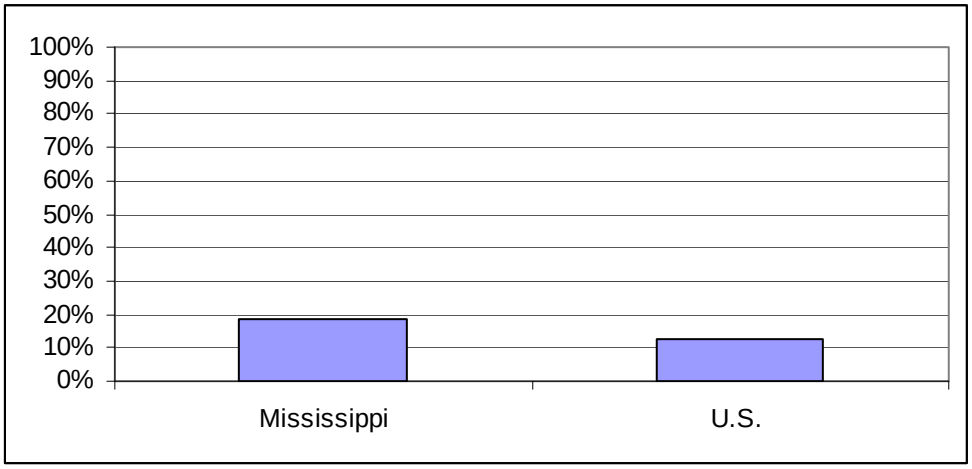


Figure G-11. Mississippi Population



Source: Bureau of the Census

Figure G-12. Poverty Rate for Mississippi and United States (2003)



Source: Bureau of the Census

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APPENDIX H—WATER RESOURCES

The following table lists river miles and areas of water bodies in Alabama and Mississippi that cross non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO).

Table H-1. River Miles and Areas of Water Bodies Crossing Non-USFS Federal Mineral Ownership

Non–USFS FMO	River Miles (miles)	Area if Water Bodies (acres)
Mississippi	48.41	33,140
Alabama	26.54	2,190

Bureau of Land Management (BLM)-administered surface tracts and FMO occur within river basins throughout Alabama and Mississippi. There are a total of 14 river basins in the State of Alabama: the Tennessee, Upper Tombigbee, Lower Tombigbee, Black Warrior, Coosa, Cahaba, Tallapoosa, Chattahoochee, Choctawhatchee, Chipola, Perdido-Escambia, Alabama, Mobile, and Escatawpa River Basins (Alabama Department of Environmental Management [ADEM] 2004). In the State of Mississippi there are a total of 10 river basins: the Big Black River, Coastal Streams, Mississippi River, North Independent Streams, Pascagoula River, Pearl River, South Independent Streams, Tennessee River, Tombigbee River, and Yazoo River Basins (Mississippi Department of Environmental Quality [MDEQ] 2005). A brief description of each of these major river basins follows.

STATE OF ALABAMA

Tennessee River Basin

The Tennessee River Basin is one of the largest river systems passing through Alabama. Parts of this river basin occupy seven states in the southeastern United States. The Alabama portion of the Tennessee River Basin is located along what is known as the "Great Bend," which is an Indian term that early settlers used to describe the southern bend of the Tennessee River as it reached into Alabama. The Tennessee River Basin in Alabama drains roughly 13 percent of the state's 51,705 square miles. The basin is home to the Alabama cavefish, a rare freshwater fish (Rivers of Alabama 2005).

The Tennessee River begins near Holston and French Broad Rivers near Knoxville, Tennessee. After flowing along a 652-mile course, the river empties into the Ohio River near Paducah, Kentucky. The Tennessee River cuts westward across northern Alabama as it flows through the Cumberland Plateau physiographic province to Muscle Shoals in northwestern Alabama. The river falls 137 feet in 37 miles at Muscle Shoals, which serves as the dividing line between the Upper and Lower Tennessee. In 1933, the Tennessee Valley Authority (TVA) constructed the Wilson Dam on the river near Muscle Shoals (Rivers of Alabama 2005). There are 10 locks and dams located along the Tennessee River (TVA 2005).

Upper Tombigbee/Lower Tombigbee River Basin

The Tombigbee River begins in Prentiss and Tishomingo Counties in northeastern Mississippi. The Upper Tombigbee flows through Mississippi to Alabama and crosses the state line at Aliceville Lake in Pickens County. The river then continues in a southeasterly direction to Demopolis, Alabama, and merges with the Black Warrior River, one of its largest tributaries. The Upper Tombigbee River Basin occupies

approximately 9,000 square miles and includes sections of the Fall Line Hills, Pontotoc Ridge, and Black Prairie districts of the East Gulf Coastal Plain physiographic province (Rivers of Alabama 2005).

The Lower Tombigbee River Basin is the portion of the basin below the confluence with the Black Warrior River. This section of the basin flows 175 miles and drains 4,659 square miles in seven Alabama counties before merging with the Alabama River to form the Mobile River (Rivers of Alabama 2005).

Black Warrior River Basin

The Black Warrior River Basin drains approximately 6,276 square miles of land in Alabama. The principal forks of the Black Warrior River are the Sipsey, Mulberry, and Locust, which begin in northern Alabama and converge to form the Black Warrior. The Black Warrior River falls across large shoals before reaching Tuscaloosa, Alabama. The Black Warrior River mainstem occupies five counties in Alabama: Jefferson, Walker, Tuscaloosa, Hale, and Greene (Rivers of Alabama 2005).

The river flows across the fall line, a geologic barrier separating the high and hilly Cumberland Plateau from the flat and loping East Gulf Coastal Plain. The Upper Black Warrior River is above the fall line and flows through sandstones, shales, and limestones of the Cumberland Plateau and streambeds. The elevations range from 1,100 feet on the northern slopes to 600 feet near Tuscaloosa and the Fall Line Hills. The Lower Black Warrior River flows below the fall line through the upper Coastal Plain, with elevations between 150 and 300 feet. Approximately 75 percent of the Black Warrior River Basin is above the fall line, and approximately 25 percent flows below the fall line. The river ends at the east bank of the Tombigbee River just north of Demopolis (Rivers of Alabama 2005).

The Sipsey Fork, a National Wild and Scenic River, is a tributary of the Black Warrior River. Approximately 61 miles of the river within the William B. Bankhead National Forest are permanently protected (Rivers of Alabama 2005).

Coosa River Basin

The Coosa River Basin begins in northwestern Georgia before flowing to and entering the State of Alabama. The main tributaries of the Coosa River include the Conasauga, Coosawattee, Oostanaula, and Etowah Rivers. The Coosa River's mainstem flows for approximately 286 miles before arriving north of Montgomery. Approximately 255 miles of the Coosa River's mainstem—89 percent of the total river miles—rests in Alabama. The Coosa River watershed covers about 10,200 square miles, of which about 4,500 square miles (46 percent) are in Georgia and 5,400 square miles (53 percent) are in Alabama (Rivers of Alabama 2005).

The Coosa River Basin occupies five physiographic regions. The majority of the Coosa River Basin is split between the Valley and Ridge and Piedmont provinces. Approximately 34 percent of the river basin occurs in the Valley and Ridge physiographic province, with altitudes ranging from 600 to 1,600 feet; 34 percent is in the Piedmont province; 4 percent is in the Blue Ridge province; 8 percent is in the Cumberland Plateau in Alabama, with altitudes of 1,500 to 1,800 feet; and 2 percent is in the Coastal Plain province (Rivers of Alabama 2005).

Cahaba River Basin

The Cahaba River is one of the longest free-flowing rivers in the State of Alabama. The Cahaba flows for about 190 miles and occupies approximately 1,163,574 acres. The Cahaba River Basin flows through

portions of eight counties: Jefferson, St. Clair, Shelby, Bibb, Perry, Dallas, Tuscaloosa, and Chilton (Rivers of Alabama 2005).

The Cahaba River begins at the Cahaba Mountain northeast of Birmingham, at an elevation of approximately 1,200 feet. The Cahaba River has an average slope of 15 feet per mile for the first 25 to 30 miles, then drops to a slope of 2.5 feet per mile for about 44 miles, and finally flattens to a slope of 0.6 foot per mile. Elevation in the Cahaba River Basin ranges from 1,100 feet in Shelby County to 100 feet at the confluence with the Alabama River (Rivers of Alabama 2005).

The Cahaba River Basin is located in two physiographic regions of the State of Alabama. The Upper Cahaba River Basin lies in the Valley and Ridge province, and the Lower Cahaba River Basin lies in the East Gulf Coastal Plain province. The majority of the basin (84 percent) lies within the Valley and Ridge province. The remainder of the basin (14 percent) lies in the East Gulf Coastal Plain Province (Rivers of Alabama 2005).

Tallapoosa River Basin

The Tallapoosa River originates in Paulding County, Georgia, which is located 40 miles west of Atlanta. Originating at an elevation of about 1,145 feet, the river flows southwest for about 195 miles into Alabama and then flows west after meeting Uphapee Creek for 40 miles to join the Coosa River near Wetumpka. The 235-mile river drains a basin area of 4,680 square miles. Approximately 3,960 square miles lie in the State of Alabama, accounting for 85 percent of the land area (Rivers of Alabama 2005).

The Tallapoosa River falls at a rate of 12 feet per mile for its first 15 miles. The river then descends to 3.4 feet per mile. From Thurlow Dam to its mouth, the Tallapoosa River falls at a rate of 1.6 feet per mile. The Tallapoosa River's width varies from 250 feet to 700 feet along its course, and the river has banks that are 20-feet high along the floodplain (Rivers of Alabama 2005).

Approximately 71 percent of the Tallapoosa River Basin lies in the Piedmont physiographic province. Another 29 percent of the river basin lies in the Coastal Plain province, with elevations between 50 and 850 feet (Rivers of Alabama 2005).

Chattachoochee River Basin

The Chattahoochee River begins in the Blue Ridge Mountains of Georgia. The Chattahoochee River mainly flows southwest through Georgia until it reaches Alabama. From the towns of Lannett, Alabama and West Point, Georgia, the Chattahoochee River is shared between the two states on a river course toward the Gulf of Mexico. The river flows along Alabama's boundary for 160 miles until it reaches the southeastern corner of the state before flowing into Florida (Rivers of Alabama 2005).

The Chattahoochee River Basin has a total drainage area of 8,770 square miles. The Alabama portion of the Chattahoochee River covers an area of 2,830 square miles, or 32 percent of the total Chattahoochee River Basin. This section of the Chattahoochee River Basin is about 35 miles across at its widest point. Principal tributaries are the Uchee, Cowikee, and Abbie Creeks. There are 13 hydroelectric dams in the Chattahoochee River Basin; however, all the tributaries to the Chattahoochee are free-flowing. Major aquifers in the Alabama portion of the Chattahoochee River Basin are the Libson, Nantafalia-Clayton, Providence-Ripley, and Tuscaloosa (Rivers of Alabama 2005).

Principal cities in Alabama located along the Chattahoochee River are Lanett, Phenix City, Eufala, and Dothan. The watershed of the Chattahoochee River flows through counties in Alabama: Chambers, Lee, Russell, Barbour, Henry, Houston, Randolph, Macon, and Bullock (Rivers of Alabama 2005).

The Chattahoochee River Basin occupies three physiographic regions. In the upper Chattahoochee River Basin, the headwaters occupy the Blue Ridge Province and then flow into the Piedmont Province. At the Alabama/Georgia border, the Piedmont Province transitions into the Southern Coastal Plain Province (Rivers of Alabama 2005).

Choctawhatchee River Basin

The Choctawhatchee River begins in Dale County near Newton, Alabama. The river flows for approximately 138 miles and empties into Choctawhatchee Bay in Florida. The Choctawhatchee River Basin encompasses approximately 4,748 square miles. The majority of the basin, about 66 percent or 3,400 square miles, occurs in Alabama. About 50 miles of the mainstem of the river is located in Alabama. The Alabama portion of the Choctawhatchee River Basin comprises 2 million acres and lies in portions of 10 Alabama counties: Bullock, Barbour, Coffee, Geneva, Covington, Houston, Crenshaw, Dale, Henry, and Pike. The entire Choctawhatchee River Basin lies within the physiographic region of the East Gulf Coastal Plain Province, which drains about 25 percent of the state (Rivers of Alabama 2005).

Chipola River Basin

The Chipola River flows through Alabama and Florida. Its total length is 125 miles through the two states. The Chipola River Basin is part of the Chattahoochee watershed (allrefer.com 2005).

Perdido-Escambia River Basin

The Perdido-Escambia River Basin flows through Baldwin and Escambia Counties in Alabama and Escambia County, Florida. The Perdido River forms the boundary between Alabama and Florida. This river basin encompasses a total area of 1,250 square miles. Before flowing into the Gulf of Mexico, the Perdido River forms Perdido Bay. The Perdido River flows approximately 44 miles before reaching Perdido Bay just north of Lillian, Alabama. Major cities within the Perdido-Escambia River Basin are Perdido, Bay Minette, Robertsdale, and Summerdale. The Escambia River also flows through Alabama and Florida. The Escambia River flows into Escambia Bay, an arm of Pensacola Bay. Large tributaries of the Escambia River include Patsaliga Creek, Big Escambia Creek, and the Sepulga River (Rivers of Alabama 2005).

Alabama River Basin

The Alabama River is formed by the confluence of the Coosa and Tallapoosa Rivers, 15 miles north of the city of Montgomery. The Alabama River begins at the fall line, and the Alabama River Basin lies almost entirely within the flat topography of the Coastal Plain Province. At the City of Montgomery, the Alabama River slopes at 0.82 foot per mile; below the fall line the slope is approximately 0.34 foot per mile. The Alabama River's total length is 315 miles; it drains approximately 22,168 square miles. The Alabama River Basin comprises an area of 6,023 square miles (Rivers of Alabama 2005).

Much of the Alabama River has been altered by three U.S. Army Corps of Engineers dam projects that were constructed in the 1960s and 1970s. Approximately 233 miles of the river are impounded by the Robert F. Henry, Millers Ferry, and Claiborne lock and dams (Rivers of Alabama 2005).

Large tributaries of the Alabama River include Turkey, Little River, Pintlala, Limestone, Pursley, Pine Barren, Mulberry, Boguechitto, Cedar, Big Swamp, and Catoma Creeks. The river has a carrying capacity of 100,000 to 150,000 cfs. The Alabama River flows through nine Alabama counties: Elmore, Autauga, Montgomery, Lowndes, Dallas, Wilcox, Monroe, Baldwin, and Clarke (Rivers of Alabama 2005).

Mobile River Basin

The area where the Mobile River meets Mobile Bay can be described as a delta. The land area between the Mobile River on the west edge of the delta and the Tensaw River on the east edge is marshland. About one-third of the area also is a vast network of waterways and river basins. More than 250 separate waterways, such as rivers, bays, creeks, bayous, lakes, cutoffs, branches, and sloughs, have been identified and charted (Rivers of Alabama 2005).

Mobile Bay is the receiving basin for the sixth largest river system in the United States. The river drains the fourth largest watershed in the United States in terms of flow volume. Approximately 65 percent of Alabama's land area drains its waters into Mobile Bay. Mobile Bay is approximately 32 miles long and 23 miles wide. The average depth of the Bay is about 10 feet (Rivers of Alabama 2005).

Escatawpa River Basin

The Escatawpa River Basin is approximately 15 miles wide and 100 miles long. The length of the Escatawpa River is 80 miles. The Escatawpa River begins in southwestern Alabama, less than 1 mile from the Alabama/Mississippi border in Washington County, Alabama. The Escatawpa River flows south from Alabama into Mississippi. The main tributaries of the Escatawpa River flow through Washington and Mobile Counties in Alabama (Rivers of Alabama 2005).

STATE OF MISSISSIPPI

Big Black River Basin

The Big Black River Basin is approximately 155 miles in length and 22 miles in width and is located in west-central Mississippi. The river basin covers an area of approximately 3,400 square miles. The Big Black River Basin has approximately 6,638 total miles of perennial and intermittent rivers and streams. The Big Black River flows entirely within Mississippi; it begins in Webster County and flows southwest for approximately 300 miles to its mouth at the Mississippi River near Vicksburg (MDEQ 2004).

Tributaries to the Big Black River include Big Bywy Ditch, Zilpha Creek, Apookta Creek, Doaks Creek, Bear Creek, Bogue Chitto Creek, and Fourteen Mile-Bakers Creek. The Big Black River Basin occupies 13 counties and 24 municipalities. According to the 2000 census, about 220,000 people live in the Big Black River Basin. Larger cities in the basin include Jackson, Clinton, and Canton (MDEQ 2004).

Coastal Streams Basin

The Coastal Streams Basin is located in southern Mississippi. The basin begins in Lamar County and extends south, with Pearl River as its western boundary and the eastern boundary consisting mainly of the Alabama state line. The Coastal Streams Basin drains an area of about 1,545 square miles and empties into the Gulf of Mexico. A total of 2,442 miles of perennial and intermittent rivers and streams occur in the basin (MDEQ 2004).

The Coastal Streams Basin includes the Mississippi Sound and the following barrier islands: Cat, Ship, Deer, Horn, Round, and Petit Bois. The topography of the Coastal Streams Basin ranges from pine forests and low, rolling hills in the upper part to low-lying flatlands and salt marsh along the coast (MDEQ 2004).

Major cities located in the basin include Biloxi, Gulfport, Bay St. Louis, Pass Christian, Ocean Springs, and Pascagoula. The Coastal Streams Basin's population is estimated at 426,231. The Coastal Streams Basin is mainly rural, with an average population density of 137 people per square mile (MDEQ 2004).

Mississippi River Basin

The Mississippi River Basin is a large river system, comprised of 2,350 river miles, that drains 31 states before reaching the Gulf of Mexico. The Mississippi River Basin consists of 1.2 million square miles. Approximately 12 million people live in the river basin, in approximately 125 counties along the river (EPA 2003).

The Mississippi Alluvial Plain (MAP) encompasses the land on the banks of the Mississippi River in six states and is the original floodplain of the Mississippi River. The part of the MAP system that lies within the State of Mississippi extends the entire length of the state. Just south of Memphis, Tennessee, the plain fans out to encompass all the land between the Mississippi and Yazoo Rivers. In northwestern Mississippi, the flat lowland area located in the MAP region and known as the Delta is widely recognized as a fertile and productive farmland. This region of the Mississippi River Basin is mostly a flat, broad floodplain. Land in the Delta comprises alluvial deposits of sand and clay (MDEQ 2004).

North Independent Streams Basin

The North Independent Streams Basin is located in northern Mississippi. The basin consists of streams that drain mainly into Tennessee. The North Independent Streams Basin occupies seven counties in northern Mississippi. Major streams in the North Independent Streams Basin include the Tuscumbia River, Horn Lake Creek, Muddy Creek, the Wolf River, and the Hatchie River. The basin comprises a total of 1,956 miles of perennial and intermittent rivers and streams (MDEQ 2004).

The North Independent Streams Basin is composed of portions of four physiogeographic subregions: the Loess Bluffs, Red Clay Hills, Flatwoods, and Pontotoc Ridge. Most of these regions are made up of low to high rolling hills, mainly forested (MDEQ 2004).

The two major cities located in the North Independent Streams Basin are Southhaven, Tennessee, and Corinth, Alabama. The population of the counties within the basin was estimated in 2000 at approximately 182,000 (MDEQ 2004).

Pascagoula River Basin

The Pascagoula River Basin is the second-largest basin in the State of Mississippi. It is approximately 164 miles long and 84 miles wide. The basin has a total of approximately 14,777 miles of perennial and intermittent rivers and streams. The Leaf and Chickasawhay Rivers are the two main headwater streams in the Pascagoula River Basin. The Pascagoula River Basin occupies 22 counties and drains an area of approximately 9,600 square miles before draining into the Gulf of Mexico. The Pascagoula River system is the last unimpeded large river system in the lower 48 states. The Black Creek, which is located in the Pascagoula River Basin, is the only National Wild and Scenic River in the State of Mississippi (MDEQ 2004).

Near the Gulf Coast, the topography of the Pascagoula River Basin is low-lying flatlands, forested wetlands, and marshlands. Inland, the Pascagoula River Basin consists of gently rolling hills and broad, flat floodplains. The major urban areas in the basin are Meridian, Laurel, Hattiesburg, and Pascagoula.

The Pascagoula River Basin has an estimated population of 716,925. The Pascagoula River Basin is mainly rural, with an average population density of about 75 people per square mile (MDEQ 2004).

Pearl River Basin

The Pearl River Basin is located in east-central and southwest Mississippi and southeastern Louisiana. The river basin starts in Philadelphia, Mississippi, and extends through central Mississippi to the coast. The Pearl River is approximately 490 miles long and drains an area of 8,760 square miles. The Pearl River Basin occupies 24 counties in east-central and southern Mississippi. The river basin has a total of approximately 16,300 miles of perennial and intermittent rivers and streams (MDEQ 2004).

Major tributaries to the Pearl River include the Yockanookany River, Bogue Chitto River, and Strong River. The Pearl River originates in Neshoba County by the confluence of Bogue Chitto, Nanawaya, and Tallahaga Creeks. The Pearl River flows southwest for approximately 146 miles to the Ross Barnett Reservoir in Jackson, Mississippi, and then flows 217 miles in a southerly direction to the West Pearl and Pearl Rivers. These channels continue for 44 and 48 miles, respectively, and empty into Lake Borgne in Louisiana and the Mississippi Sound. The West Pearl River flows entirely within the State of Louisiana. The lower 61 miles of the Pearl River form part of the boundary between the States of Mississippi and Louisiana (MDEQ 2004).

Much of the upper part of the Pearl River Basin consists of gently rolling to hilly terrain. In the southern part of the basin, the land is flatter as low, rolling, forested hills give way to lowlands and marshes near the coast. The only large urban area in the Pearl River Basin is Jackson, Mississippi (MDEQ 2004).

South Independent Streams Basin

The South Independent Streams Basin is located in southwestern Mississippi. The Basin consists of streams that drain into the Mississippi River below the Big Black River and streams that drain into Louisiana, west of the Pearl River Basin. The South Independent Streams Basin occupies 4,418 square miles and comprises 11 counties in Mississippi. There are 7,499 miles of perennial and intermittent rivers and streams in the basin. Major streams in the South Independent Streams Basin include the Homochitto River, Bayou Pierre, the Tangipahoa River, and the Amite River (MDEQ 2004).

Most of the South Independent Streams Basin region is made up of low, rolling hills and is largely forested. On the western side of the basin, high bluffs dominate the topography as the land meets the Mississippi River. The two largest cities in the basin are Natchez and Vicksburg, which are located on the Mississippi River. The population within the South Independent Streams Basin was estimated in 2000 at 439,933 (MDEQ 2004).

Tennessee River Basin

The Tennessee River Basin covers an area of 417 square miles in northeastern Mississippi. The Tennessee River Basin is composed of Pickwick Lake, a portion of the Tennessee River, a portion of Bear Creek, and the Yellow Creek segment of the Tennessee-Tombigbee Waterway. Other smaller water bodies in the Tennessee River Basin include Indian Creek, Cripple Deer Creek, and Little Cripple Deer Creek. The Tennessee River Basin has a total of 646 miles of perennial and intermittent rivers and streams in Mississippi (MDEQ 2004).

The Mississippi portion of the Tennessee River Basin lies within the Fall Line Hills of the East Gulf Coastal Plain. The topography of the basin is gently rolling hills, sharp ridges, and broad alluvial

floodplains over rocks of sedimentary origin. Portions of the basin landscape are in Tishomingo State Park and are characterized by rock formations and fern-filled crevices (MDEQ 2004).

The only major urban area of the basin is the city of Iuka. The Tennessee River Basin occupies four counties in Mississippi: Alcorn, Itawamba, Prentiss, and Tishomingo. The Tennessee River Basin is sparsely populated, with fewer than 30,000 persons inhabiting the area. According to the 2000 census, approximately 27,630 people live in the river basin within Mississippi's boundaries (MDEQ 2004).

Tombigbee River Basin

The Tombigbee River Basin is located in northeastern Mississippi. The Tombigbee River Basin covers approximately 6,100 square miles in Mississippi and 7,600 square miles in Alabama. The Mississippi portion of the Tombigbee River Basin consists of 56 watersheds and is approximately 190 miles in length and 48 miles in width. The Tombigbee River begins in Itawamba County, Mississippi, from the convergence of Big Brown Creek and Mackeys Creek. A significant hydrologic feature of the Tombigbee River Basin is the Tennessee-Tombigbee Waterway. The waterway uses a series of dams and manmade canals to connect the Tennessee River in Tennessee to Mobile Bay in Alabama. The Tombigbee River Basin in Mississippi has approximately 11,690 miles of perennial and intermittent rivers and streams. Major tributaries to the Tombigbee River and the waterway include Town Creek, Chuquatonchee Creek, Chiwapa Creek, Luxapallila Creek, and the Buttahatchee, Sucarnoochee, and Noxubee Rivers (MDEQ 2004).

The topography of the Tombigbee River Basin ranges from hilly to gently rolling, with elevations from 500 to 600 feet above sea level in the headwaters, to flat and gently rolling topography with elevations from 100 to 300 feet in the central and southern portion. The Tombigbee River Basin is mostly forested. The major urban populations in the basin are in Tupelo, Columbus, and Aberdeen. The Tombigbee River Basin occupies 19 counties in Mississippi. According to the 2000 census, approximately 382,109 people live in the basin (MDEQ 2004).

Yazoo River Basin

The Yazoo River Basin is located in the northwest and west-central part of Mississippi. The basin covers 13,355 square miles in 30 counties. The basin is approximately 200 miles long and approximately 100 miles wide. The Yazoo River Basin eventually drains the Yazoo River into the Mississippi River near Vicksburg, Mississippi. The Yazoo River Basin has 24,554 miles of rivers and streams. The Yazoo River begins in Leflore County from the convergence of its main headwater tributaries, the Tallahatchie River and the Yalobusha River. Major rivers in the Yazoo River Basin include the Coldwater, Little Tallahatchie, Tallahatchie, Yocona, Yalobusha, Big Sunflower, and Yazoo Rivers (MDEQ 2004).

The Delta portion of the Yazoo River Basin is a geographic feature and is part of the alluvial plain of the Mississippi River. The only outlet to the Mississippi River for the basin is the Yazoo River mainstem at Vicksburg in central Mississippi. The Yazoo River Basin includes a hilly upland in north and north-central Mississippi and an extensive, flat lowland area in the north and west. Major cities in the Yazoo River Basin include Grenada, Batesville, Oxford, Holly Springs, and New Albany. The Yazoo River Basin has an estimated population of 625,524 and encompasses approximately one-fifth of Mississippi's population. The river basin is mainly rural, with an average population density of approximately 45 persons per square mile (MDEQ 2004).

APPENDIX I—WITHDRAWN LANDS

Withdrawn lands are public lands administered by other Federal or State agencies. Withdrawals are generally for a specific purpose, such as a reclamation project or wildlife refuge. When the agency to which the withdrawal is granted ceases to use the land for the specified purpose, the withdrawal will be re-evaluated and, if appropriate, the management of that area will revert to the Bureau of Land Management (BLM). These lands are withdrawn from settlement, location, sale, or entry and are reserved for use by the designated agency. The following tables list tracts in Alabama and Mississippi that have been withdrawn to management by other Federal agencies.

Table I-1. Withdrawn Lands in Alabama

Agency/Use	Legal Description	Serial/PLO No.	Acres
Federal Energy Regulatory Commission (FERC) Hydro Power	St. Stephens Meridian T. 22 N., R. 6 E., Sec. 1 (see case file)	AL-ES-032320	1.00
FERC Hydro Power	St. Stephens Meridian T. 21 N., R. 16 E., Sec. 14, Fractional (FRL), W. of Coosa River, Lots 1–12	AL-ES-035022	66.16
FERC Hydro Power	St. Stephens Meridian T. 21 N., R. 17 E., Sec. 30, W2NW, FRL, W. of Coosa River Sec. 32, C East of Coosa River	AL-ES-035023	111.85
FERC Hydro Power	T. 8 S., R. 9 E., Sec. 1, Lots 1–4; Sec. 2, Lots 1–3; Sec. 10, Lots 1–2; Sec. 11, Lots 1–6; Sec. 12, Lot 1; Sec. 14, Lots 1–3; Sec. 15, Lots 1–4; Sec. 22, Lots 1–4; Sec. 23, Lots 1–4; Sec. 26, Lots 1–2; Sec. 27, Lots 1–5, E2NE; Sec. 28, Lot 1; Sec. 33, Lots 1–3, Sec. 34, Lot 1	AL-ES-035024	1,545.41
FERC Hydro Power	T. 6 S., R. 10 E., Sec. 34, N2SW, SWSW	AL-ES-035025	112.50
Tennessee Valley Authority (TVA)	Huntsville Meridian T. 4 S., R. 7 E., Sec. 28, NWNW	AL-ES-036757	40.00
TVA—Tennessee River	Lands bordering the Tennessee River, and all islands and towheads in the river in legal subdivisions described in Executive Orders 2246 and 8059	AL-ES-36760	1,500.00
TVA	T. 6. S., R. 1 E., Sec. 26, SE (FRL, north of Tennessee River); T. 6 S., R. 2 E., Sec. 31, NWSW	AL-ES-36762	92.00

Agency/Use	Legal Description	Serial/PLO No.	Acres
U.S. Forest Service (USFS) Bankhead National Forest (N.F.) Sipsey River	Huntsville Meridian T. 9 S., R. 8 W., Sec. 8, S2NE	AL-ES-36763	80.00
USFS Bankhead N.F. Kinlock Camp Recreation Area	T. 8 S., R. 9 W., Sec. 32, E2SESWNW	"	5.00
USFS Bankhead N.F. and FERC Power Project 2165	T. 9 S., R. 8 W., Sec. 33 NENE; Sec. 35, S2SW; T. 10 S., R. 6 W., Sec. 19, NESW; Sec. 30, N2SE; Sec. 31, N2SW; T. 10 S., R. 7 W., Sec. 23, SWNW; Sec. 24, W2NE, NESW; Sec 25, SESE; T. 11 S., R. 5 W., Sec. 17, SENE; T. 11 S., R. 6 W., Sec. 5, SWSE; Sec. 7, NWNW; Sec. 11, NWNE; Sec. 21, SENE; Sec. 22, NENW, E2SW; Sec. 23 SESE; Sec. 25, N2NW; Sec. 27, SWNE, NENW; Sec. 32 SWNW; T. 11 S., R. 7 W., Sec. 12, W2SW; Sec. 14, SESE; Sec. 22, NESW; Sec. 23, NWSE T. 12 S., R. 6 W., Sec. 2 NESE; Sec. 10, SESW; Sec. 13, SENE; T. 12 S., R. 7 W., Sec. 18, NESE; T. 12 S., R. 8 W., Sec. 13 SENE, SENW; Sec. 14 SWNW	"	1,560.00
USFS Bankhead N.F.	Huntsville Meridian T. 7 S., R. 6 W., Sec. 31, FRL	"	39.34
USFS Bankhead N.F.	T. 7 S., R. 7 W., Sec. 30, FRL	"	36.55

Agency/Use	Legal Description	Serial/PLO No.	Acres
USFS Bankhead N.F.	T. 7 S., R. 8 W.,		
	Sec. 23, FRL		39.00
	Sec. 24, FRL		156.66
	Sec. 25, FRL		164.43
	Sec. 26, FRL, 77.05; FRL, 39.51:		116.56
	Sec. 27, FRL	"	40.10
	Sec. 31, FRL		443.87
	Sec. 32, FRL, 154.78; FRL, 158.52:		313.30
	Sec. 33, FRL		77.83
	Sec. 34, FRL		39.31
	Sec. 36, FRL		39.37
USFS Bankhead N.F.	T. 7. S., R. 9 W.,		
	Sec. 19, FRL		37.86
	Sec. 29, FRL		38.17
	Sec. 33, FRL, 82.16; FRL, 78.43; FRL, 41.25:	"	201.84
	Sec. 34, FRL		41.99
	Sec. 35, FRL		42.71
	Sec. 36, FRL		315.78
USFS Bankhead N.F.	T. 7 S., R. 10 W.,		
	Sec. 8, FRL		40.98
	Sec. 13, FRL	"	41.72
	Sec. 24, FRL		37.07
	Sec. 27, FRL		40.01
USFS Bankhead N.F.	T. 8 S., R. 6 W.,		
	Sec. 2, FRL		41.31
	Sec. 4, FRL		84.41
	Sec. 14, FRL		41.56
	Sec. 15, FRL, 10.23; FRL, 82.93:		93.16
	Sec. 17, FRL, 37.91; FRL 40.51; FRL, 40.17:		118.59
	Sec. 18, FRL	"	39.64
	Sec. 20, FRL		40.12
	Sec. 22, FRL		38.33
	Sec. 29, FRL		40.17
	Sec. 30, FRL, 41.96: FRL, 40.67:		82.63
	Sec. 32, FRL		40.04
	Sec. 34, FRL		42.21

Agency/Use	Legal Description	Serial/PLO No.	Acres
	T. 8 S., R. 7 W.,		
	Sec. 3, FRL, 124.87; FRL, 40.61; FRL, 40.90:		206.83
	Sec. 5, FRL, 40.25; FRL, 77.84:		118.09
	Sec. 6, FRL, 80.23; FRL, 38.45:		118.68
	Sec. 7, FRL, 41.56; FRL, 39.26:		80.82
	Sec. 8, FRL		40.16
	Sec. 9, FRL		40.04
USFS	Sec. 14, FRL	"	43.88
Bankhead N.F.	Sec. 17, FRL		163.79
	Sec. 18, FRL		36.00
	Sec. 19, FRL		284.67
	Sec. 21, FRL		42.61
	Sec. 24, FRL, 39.47; FRL, 37.75:		77.22
	Sec. 31, FRL		154.56
	Sec. 32, FRL, 40.74; FRL, 83.09:		123.83
	Sec. 35, FRL		41.03
	T. 8 S., R. 8 W.,		
	Sec. 1, FRL		120.40
	Sec. 2, FRL		163.27
	Sec. 5, FRL, 76.85; FRL, 122.91:		199.86
	Sec. 6, FRL, 241.80; FRL, 80.88:		322.68
	Sec. 7, FRL, 38.53; FRL, 37.93; FRL, 82.24:		158.70
	Sec. 8, FRL		158.10
	Sec. 9, FRL		42.33
	Sec. 10, FRL		39.42
	Sec. 12, FRL		37.83
	Sec. 14, FRL		243.52
USFS	Sec. 18, FRL, 39.64; FRL, 197.99:	"	237.63
Bankhead N.F.	Sec. 19, FRL		197.41
	Sec. 20, FRL, 40.25; FRL, 231.16:		271.41
	Sec. 22, FRL		41.09
	Sec. 23, FRL		37.87
	Sec. 24, FRL, 84.74; FRL, 40.18:		124.92
	Sec, 26, FRL, 37.08; FRL, 40.62; FRL, 42.98:		120.68
	Sec. 28, FRL,		41.36
	Sec. 29, FRL, 41.03; FRL, 156.98		198.01
	Sec. 30, FRL, 39.86; FRL, 200.70:		240.56
	Sec. 32, FRL		402.50
	Sec. 33, FRL		236.76
	Sec. 34, FRL		272.02
	T. 8 S., R. 9 W.,		
	Sec. 2, FRL		44.32
USFS	Sec. 3, FRL	"	39.77
Bankhead N.F.	Sec. 4, FRL		36.18
	Sec. 8, FRL		117.14
	Sec. 10, FRL		157.95

Agency/Use	Legal Description	Serial/PLO No.	Acres
	Sec. 11, FRL		280.05
	Sec. 12, FRL		328.29
	Sec. 13, FRL		410.12
	Sec. 14, FRL		487.80
	Sec. 15, FRL, 41.61; FRL, 39.53; FRL, 41.05:		122.19
	Sec. 17, FRL		39.64
	Sec. 21, FRL, 41.02; FRL, 39.42:		80.44
	Sec. 23, FRL		41.77
	Sec. 24, FRL, 80.60; FRL, 201.11:		281.71
	Sec. 25, FRL		205.45
	Sec. 26, FRL		406.41
	Sec. 27, FRL		78.53
	Sec. 28, FRL		121.78
	Sec. 29, FRL		39.72
	Sec. 30, FRL, 39.98; FRL, 36.81; FRL, 80.48:		157.27
	Sec. 31, FRL		39.60
	Sec. 32, FRL, 38.77; FRL, 39.35:		78.12
	Sec. 33, FRL		39.00
	Sec. 34, FRL, 117.89; FRL, 40.67:		158.56
	Sec. 36, FRL, 41.11; FRL, 240.78:		281.89
TVA—Elk River	Huntsville Meridian T. 3 S., R. 7 W., Sec. 34 – Parcel 1, Metes and Bounds (Lock B) Sec. 35 – Parcel 2, Metes and Bounds (Lock A)	AL-ES-36765	 19.50 29.41
TVA	Huntsville Meridian T. 6 S., R. 5 E., Sec. 6, Lot 1	AL-ES-36766	 2.90
Army Corp of Engineers (COE)	Huntsville Meridian T. 15 S., R. 8 E., Sec. 24, SESE	AL-ES-49553	 1,160.00
USFS Talladega N.F.	Huntsville Meridian T. 13 S., R. 9 E., Sec, 28, SE; T. 17 S., R. 8 E., Sec. 34, NE, SW, S2NW	AL-ES-52032 PLO 7605	 559.48

Agency/Use	Legal Description	Serial/PLO No.	Acres
National Park Service (NPS)	Huntsville Meridian Cherokee County: T. 8 S., R. 9 E., Sec. 1, Lots 1–4; Sec. 2, Lots 1–3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1–6; Sec. 12, Lot 1; Sec. 14, Lots 1–3; Sec. 15, Lots 1–4; Sec. 22, Lots 1–4; Sec. 23, Lots 1–4; Sec. 26, Lots 1, 2; Sec. 27, FRL E2NE; Sec. 27, Lots 1–5; Sec. 28, Lot 1; Sec. 33, Lots 1–4; Sec. 34, Lots 1–2 Dekalb County: T. 8 S., R. 9 E., Sec. 1, Lots 1–4; Sec. 2, Lots 1–3; Sec. 10, Lots 1, 2; Sec. 11, Lots 1–6; Sec. 15, Lots 1–4	PL 102-427	1,625.19

Table I-2. Withdrawn Lands in Mississippi

Agency/Use	Legal Description	Serial/PLO No.	Acres
FERC		ES-2740 WR	8.17
FERC		ES-2843 WR	2,708.30
COE—Improvement of Black Warrior and Tombigee Rivers		ES-36758 WR	63.00
Army—Camp McClellan Military Reservation		ES-36759 WR	840.00
Abandoned—Military Reserve		ES-36761 WR	296.50
NPS—Horn Island		BLM-044621 WR	2,514,00
NPS—Petit Bois		BLM-045555 WR	748.00

Agency/Use	Legal Description	Serial/PLO No.	Acres
USFS—Harrison Experimental Forest		BLM-046329 WR	40.00
COE—Flood Control (Big Black River)	See file M&B	ES-36892 WR	0.29
U.S. Fish and Wildlife Service (USFWS)—Noxubee		ES-36893 WR	52,620.00
NPS—Ackia Battleground National Monument		ES-36894 WR	49.15
USFS—Holly Springs		BLM-062875 WR	39.48

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APPENDIX J—SUMMARY OF THE REASONABLY FORESEEABLE DEVELOPMENT SCENARIO

EXPECTED DISTURBANCE FROM OIL AND GAS

The expected level of disturbance from the projected oil and gas wells was determined by using reasonable assumptions about a generic well site and access needs. Typically, 2 to 5 acres are cleared for construction of a well pad. However, depending on the topography of the well site and access area, this construction may require the creation of cut slopes and fill areas, which may disturb additional acres. Constructed roads typically have a width of approximately 30 feet. The length of the road is dependent on the well site location in relation to existing roads or highways. The average length of roads per well is 1/3 of a mile. Pipelines or flow lines will be constructed in conjunction with road construction to minimize additional disturbance. Pipeline rights-of-way are generally 30 feet wide, but widths could vary depending on ground conditions. Pipeline depth must be at least 48 inches. When possible, a common collection point will be established to minimize the number of production sites. The producing well sites will be reduced to a maximum long-term disturbance area of 1/4 acre (10,000 square feet) after the well is put into production.

The Reasonably Foreseeable Development Scenario (RFDS) projects the number of wells anticipated to be drilled over the next 20 years. The following is a summary RFDS for Alabama and Mississippi.

ALABAMA

In Alabama, the Bureau of Land Management (BLM) projects that 20 wells accessing non-U.S. Forest Service Federal Mineral Ownership (non-USFS FMO) would be drilled over the next 20 years. The BLM projects that the 20 wells would disturb approximately 105 acres. Table J-1 displays the RFDS and associated surface disturbance for Alabama, by mineral and surface ownership.

Table J-1. RFDS for Alabama

Mineral/Surface Owners	Number of Wells	Total Acres Disturbed
Federal/non-USFS	20	105
Federal/USFS	12	61
Non-Federal/non-Federal	3,988	20,750
Total	**4,020**	**20,916**

Oil and gas development on the Alabama surface tracts is not expected. This is a function of the high potential of the beach and highway tracts on the Fort Morgan Peninsula to have commercial development when combined with adjacent lands. These tracts can be developed by wells drilled in the nearby offshore waters. Also, the engineering problems presented by the river tracts with the associated increase in costs preclude the surface use of those tracts because the mineral estate can be more inexpensively developed from adjacent lands.

MISSISSIPPI

In Mississippi, the BLM projects that 10 wells accessing non-USFS FMO would be drilled over the next 20 years. The BLM projects that the 10 wells would disturb approximately 55 acres. Table J-2 displays the RFDS and associated surface disturbance for Mississippi, by mineral and surface ownership.

Table J-2. RFDS for Mississippi

Mineral/Surface Owners	Number of Wells	Total Acres Disturbed
Federal/non-USFS	10	55
Federal/USFS	350	1,925
Non-Federal/non-Federal	11,650	57,820
Total	**12,010**	**59,800**

Oil and gas development on the Mississippi surface tract is not expected. The engineering problems presented by this low-lying marshland tract and the associated increase in costs preclude the surface use of this tract for mineral development. The mineral estate may be more inexpensively developed from adjacent lands.

APPENDIX K—PROPOSED RESOURCE MANAGEMENT PLAN

INTRODUCTION

The Bureau of Land Management (BLM) has the discretion to select an alternative in its entirety or to combine aspects of the various alternatives presented in the Draft Resource Management Plan and Environmental Impact Statement (RMP-EIS) to develop the Proposed RMP. Below is the description of the Proposed RMP.

PLAN IMPLEMENTATION, MONITORING AND EVALUATION

When an approved land use plan decision document (i.e., record of decision [ROD]) is signed, most of the land use plan decisions are effective immediately and require no additional planning or National Environmental Policy Act (NEPA) analysis. Some programs have specific requirements that must be taken in order to make certain decisions effective. Upon approval of the land use plan, subsequent implementation decisions are put into effect by developing implementation (project-specific) plans. Implementation decisions are made with the appropriate level of NEPA analysis along with any procedural and regulatory requirements for individual programs.

The regulations in 43 CFR 1610.4-9 require that land use plans establish intervals and standards for monitoring and evaluations, based on the sensitivity of the resource decisions involved. Land use plan monitoring is the process of (1) tracking the implementation of land use planning decisions (implementation monitoring) and (2) collecting data/information necessary to evaluate the effectiveness of land use planning decisions (effectiveness monitoring).

The BLM field offices must determine what management actions are needed to implement those decisions. Sometimes actions occur just once, e.g., the development of an implementation plan; or actions occur on a fairly regular basis, e.g., steps taken to repair a damaged watershed. Monitoring is the process of following up on these management actions and documenting the BLM's progress toward full implementation of the land use plan and the achievement of desired outcomes. Field offices are encouraged to involve state and local governments and the public if they express an interest in participating in this process.

Evaluation is the process of reviewing the land use plan and the periodic plan monitoring reports to determine whether the land use plan decisions and NEPA analysis are still valid and whether the plan is being implemented. Land use plans are evaluated to determine if: (1) decisions remain relevant to current issues, (2) decisions are effective in achieving (or making progress toward achieving) desired outcomes, (3) any decisions need to be revised, (4) any decisions need to be dropped from further consideration, and (5) any areas require new decisions. In making these determinations, the evaluation should consider whether mitigation measures are satisfactory, whether there are significant changes in the related plans of other entities, and whether there is new data of significance to the plan.

The plan should be periodically evaluated (at a minimum every 5 years) as documented in an evaluation schedule. Plan evaluations should also be completed prior to any plan revisions and/or major plan amendments. Special or unscheduled evaluations may also be required to review unexpected management actions or significant changes in the related plans of other Federal agencies, and state and local governments, or to evaluate legislation or litigation that has the potential to trigger an RMP amendment or

revision. Evaluations may identify resource needs and means for correcting deficiencies and addressing issues through plan maintenance, amendments, or new starts. They should also identify where new and emerging resource issues and other values have surfaced. Evaluations may also identify new and innovative practices that improve effectiveness and efficiency so that other offices may benefit.

PROPOSED RESOURCE MANAGEMENT DECISIONS

Standard Management Common to All Alternatives

Air Quality

The goals and objectives for air quality are to comply with local, State, and Federal air quality regulations, requirements, and implementation plans.

Actions authorized on BLM-administered lands and non-USFS FMO would need to be conducted so as to comply with Clean Air Act requirements, including the applicable National Ambient Air Quality Standards (NAAQS) (Section 109); the State Air Quality Implementation Plan (SIP) (Section 110); control of pollution from Federal facilities (Section 118); prevention of significant deterioration (PSD), including visibility impacts to mandatory Federal Class I areas (Section 160 et seq.); and conformity analyses and determinations (Section 176(c)). Section 118 of the Clean Air Act requires Federal agencies to comply with all Federal, State, and local air pollution requirements. Section 176(c) prohibits Federal agencies from taking any actions that contribute to a new violation of Ambient Air Quality Standards, increase the frequency or severity of an existing violation, or delay the attainment of a Standard. It also requires Federal agencies to conform to SIPs. BLM policy provides requirements to minimize air quality impacts. For example, prescribed burns must comply with BLM Manual 9214 for air quality maintenance requirements, to minimize air quality impacts from particulates such as smoke.

Soil Resources

The goals and objectives for soil resources are to maintain or improve soil conditions and prevent or minimize accelerated soil erosion.

Standards and goals under the Clean Water Act (CWA) require measures to minimize non-point source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of best management practices (BMP). Examples of soil BMPs can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book (BLM 2006)* and at http://www.blm.gov/bmp.

Unique and Prime Farmland

The goals and objectives for unique and prime farmland are to minimize the impact of BLM-authorized activities on the unnecessary and irreversible conversion of farmland to nonagricultural uses and comply with State and local government policies to protect farmland.

Before any decision authorizing surface disturbance, a determination would be made as to if prime or unique farmland as defined by the Farmland Protection Policy Act (7 U.S.C. 4201 et seq.) is in an area that may be affected by a proposed action. If prime or unique farmland is present, then an appropriate level of analysis would be prepared to determine if the proposed action may have an adverse effect and

identify appropriate mitigation measures to minimize any unnecessary and irreversible conversion of farmland to nonagricultural uses.

Water Resources

The goals and objectives for water resources are to maintain water quality where it presently meets Environmental Protection Agency (EPA)-approved State water quality standards and improve water quality on public lands where it does not meet standards as defined by Section 303(d) of the CWA.

Standards and goals under the CWA and water quality management objectives developed by the States, as required by the 1987 Water Quality Act Amendments to the Federal Water Pollution Control Act, were created to protect the quality of States' waters and to prevent, abate, and control water pollution. Any water discharged on the surface by industry is controlled through National Pollutant Discharge Elimination System (NPDES) permits. Actions authorized on BLM lands must also comply with the mitigation requirements defined by the Office of Surface Mining regulations for coal leasing and by the U.S. Army Corps of Engineers Section 404 permit requirements. Management actions would be conducted in conformance with the various regulations in the CWA, the State regulations, and the Federal Lands Policy and Management Act of 1976 (FLPMA) to achieve the water quality classifications and standards for surface and ground waters developed by the States. Management actions would be conducted in a manner conforming to water quality management objectives developed by the States. Standards and goals under the CWA require measures to minimize non-point source pollution and soil erosion. Measures for minimizing accelerated soil erosion would continue to be made on a site-specific basis through evaluation of management actions and implementation of BMPs. Examples of soil BMPs can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book* (BLM 2006) and at http:// www.blm.gov/bmp.

The Coastal Zone Management Act of 1972 established a national policy of protecting, and, where possible, restoring and enhancing coastal areas. The National Coastal Zone Management Program fosters an effective partnership among federal, state, and local governments. For proposed actions on tracts that are within coastal areas, the BLM would recognize and comply with the requirements of the state coastal area management program.

Vegetative Communities

The goals and objectives for vegetative communities are to manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities and control noxious and invasive plant species.

The BLM's role in the management of vegetative communities is to provide habitats that support desired plants and animals. The BLM would manage for desired outcomes of vegetative communities, including control of noxious and invasive species, that incorporate the conservation actions identified in the approved State comprehensive conservation strategies. Unless otherwise specified in an alternative, vegetation manipulation (e.g., prescribed burning, mechanical alteration, chemical treatment, manual, biological) would be allowed if needed to meet resource management objectives.

Fish and Wildlife

The goals and objectives for fish and wildlife are to manage vegetative communities to protect, preserve, or enhance habitat for fish and wildlife species.

The BLM's role in the management of fish and wildlife is to provide habitats that support desired animal species. The BLM would support and coordinate with the State and other partners on habitat improvements and protection in compliance with approved comprehensive State fish and wildlife conservation strategies. This may include actions such as control of invasive plant species, use of prescribed fire, and wetland enhancements. Hunting regulations and game management are under the authority of the State fish and wildlife agency.

Special Status Species

The goals and objectives for special status species are to protect, preserve, or enhance Federally listed and other special status species and their habitat.

Special status species include all Federal and State-listed species, proposed or candidates for Federal or State listing, and those species identified by the BLM as sensitive species. BLM Eastern States policy designates as "BLM sensitive" those additional species that are considered to be critically imperiled (S-1) or imperiled (S-2) by the State Natural Heritage programs.

The BLM would avoid jeopardizing the continued existence of any Federally listed, State listed, or proposed species; actively promote species recovery; and work to improve the status of candidate and sensitive species. If a Federally listed species may be affected by a proposed management action, there would be consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act of 1973 (ESA), as amended (16 United States Code [USC] 1531 *et seq*.). If a proposed management action might impact a State-listed species, there would be consultation with the appropriate State game and fish agency. Harvesting of any sensitive species would be prohibited, except when explicitly authorized for scientific purposes by an appropriate State and/or Federal agency.

If a proposed activity could affect candidate or sensitive species or their habitat, the BLM would avoid activities that would contribute to a need to list such species or their habitat. Thus, the BLM could require modifications to or reject a proposed activity that could jeopardize the continued existence of a proposed or listed threatened or endangered species or that could result in destruction or adverse modification of a designated or proposed critical habitat. The BLM would not approve any surface-disturbing activity that may affect any such species or critical habitat until obligations are met under applicable requirements of ESA, as amended, including completion of any required procedure for conference or formal consultation.

Wildland Fire Ecology and Management

The goals and objectives for wildland fire ecology and management are to manage fire and fuels to protect life, firefighter safety, property, and critical resource values.

Unless a separate, site-specific plan is in place, wildfires would be suppressed. Agreements, as needed, would be pursued with Federal, State, and local government fire protection agencies for fire suppression. Prescribed burning would be allowed on a case-by-case basis if needed to meet vegetative communities or fish and wildlife habitat management objectives.

Cultural Resources

The goals and objectives for cultural resources are to identify, preserve, and protect significant cultural resources and ensure that they are available for appropriate uses by present and future generations (FLPMA, Section 103 (c), 201(a) and (c); National Historic Preservation Act (NHPA), as amended (16 USC 470), Section 110(a); Archaeological Resources Protection Act (ARPA), Section 14(a)). In addition, to seek to reduce imminent threats and resolve potential conflicts from natural or human-caused

deterioration, or potential conflict with other resource uses (FLPMA Sec. 103(c), NHPA 106, 110 (a) (2)) by ensuring that all authorizations for land use and resource use will comply with the NHPA Section 106.

Management actions would comply with the NHPA, which provides protection for significant cultural resources. An appropriate level of inventory would be conducted for all actions with a potential to affect these resources, in compliance with the requirements of Section 110 of the NHPA. Actions would require additional consultation with the State Historic Preservation Officer (SHPO), in compliance with Section 106 of NHPA, and/or the Advisory Council on Historic Preservation (36 Code of Federal Regulations [CFR] 800).

Cultural resources would be identified and protected on a case-by-case basis, according to site-specific needs. Any significant sites discovered would be available for scientific, conservation, traditional, or interpretation uses. A site that is not significant (as determined by the BLM with SHPO consultation) would be released from management concerns.

Cultural resource surveys conducted prior to 1996, when the Alabama Historical Commission (AHC) cultural resource assessment standards were established, will have to be resurveyed. Because of this, consultation with the Alabama SHPO will occur prior to any property disposal or mineral leasing to determine if a cultural resource survey was conducted prior to 1996.

Paleontological Resources

The goals and objectives for paleontological resources are to protect their important scientific values.

Significant paleontological sites are protected under FLPMA. FLPMA charges the BLM to (1) manage public land so as to protect the quality of scientific and other values and (2) see that land and resources are periodically and systematically inventoried. Known paleontological resources would be managed according to the BLM 8270 *Handbook* and the BLM *Manual for the Management of Paleontological Resources*.

If discovered, paleontological resources would be managed to protect their important scientific values. Area closures, restrictions, or other mitigation requirements for the protection of paleontological values would be determined on a case-by-case basis. Collecting of scientifically significant vertebrate and invertebrate fossils by qualified paleontologists would be allowed by permit only.

Visual Resources

The goals and objectives for visual resources are to protect scenic values while providing for overall multiple use and quality of life for local communities and visitors to public lands.

Because of their small size, the surface tracts are a relatively small component of the visual landscape. Consequently, they have not been the subject of a traditional BLM visual resource management (VRM) inventory and are not assigned VRM classes (defined in Section 3.2.9). Case-by-case processing of land use and mineral development proposals would consider impacts to visual resources where these have been identified as public concerns. Interim visual management classes would be assigned in accordance with VRM Manual 8400 and Visual Resource Inventory Handbook H-8410-1. All surface tracts would be managed as VRM Class III, except for the Coosa River tracts in Alabama and the Hancock County tract in Mississippi, which would be managed as VRM Class II.

Minerals

The goals and objectives for minerals are to provide for leasing, exploration, and development of BLM-administered, non-USFS FMO, while protecting other resource values.

Federal mineral estate would be available for conveyance to owners of the surface estate as provided in Section 209 of FLPMA. Section 209 provides for this conveyance if there are no known mineral values in the land or if reservation of the mineral rights to the United States is interfering with or precluding appropriate surface development of the land and such development is a more beneficial use of the land. The BLM would retain the FMO with known mineral value.

As discussed in Section 1.3, BLM-administered, non-USFS FMO in the planning area includes Federal mineral estate underlying lands of BLM or other Federal surface management agencies (excluding USFS) and split-estate whereby the Federal Government owns all or a portion of the mineral estate, but the surface estate is State-owned or privately owned (i.e., non-Federal). BLM-administered, non-USFS FMO under the jurisdiction of another Federal surface managing agency would be available for exploration and development as directed by the surface managing agency. Split-estate (i.e., non-USFS FMO underlying private or State-owned surface lands) would be subject to stipulations deemed necessary to protect existing surface improvements or use. The BLM would apply stipulations to oil and gas leases as determined through this plan; however, surface management agencies may provide their own stipulations that would be attached to a lease during the lease-approval process.

After this plan is approved, it is expected that additional FMO tracts will be identified or acquired through mineral leasing applications. If these tracts are similar in resource values and within the environmental issues analyzed in this plan, the new FMO tracts will be managed according to the guidance of this plan and incorporated into the plan through plan maintenance.

Coal leasing potential within the planning area is limited to the Warrior Basin[1] in Alabama because of the distinctive presence of the appropriate geological conditions (e.g., continuity of coalbeds, thickness of coal, quality of coal seams) and existing infrastructure (e.g., existing subsurface mining operations and access roads) for development of coal resources. BLM-administered, non-USFS FMO available for coal leasing is located in Walker, Fayette, Jefferson, and Tuscaloosa Counties. Coal is also present to a lesser degree in Marion and Winston Counties, but the development of Federal coal in these counties is unlikely. Non-USFS FMO in the Warrior Basin would be available for further coal leasing consideration and limited to underground mining methods. BMPs would be applied as appropriate when processing a Lease by Application (LBA).

Recreation

The goals and objectives for recreation are to allow recreation use and travel compatible with other resource management objectives.

The BLM surface tracts are open to dispersed recreational use, including hunting, fishing, hiking, and nature study. Case-by-case processing of land use and mineral development proposals would consider impacts to recreation where it has been identified as a public concern. Due to the scattered nature of the small surface tracts and lacking recreation interest, special recreation management areas (SRMA) would not be designated within this RMP, and all surface tracts would be managed as extensive recreation management areas (ERMA).

1 *The term "Warrior Basin" is a geologic province. The Black Warrior Basin is the drainage area of the Black Warrior River.*

Lands and Realty

The goals and objectives for lands and realty are to manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values. In addition, to make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

All land use proposals would be evaluated for conformance with plan objectives and land use decisions. Case-by-case processing would include analysis of environmental impacts through the NEPA compliance process. Land disposals would be conducted to meet the requirements identified under applicable authorities. To be considered suitable for disposal through sale, lands must meet the following criteria outlined in Section 203 of the FLPMA:

> (1) Such tract, because of its location or other characteristics, is difficult and uneconomic to manage as part of the public lands and is not suitable for management by another Federal department or agency
>
> (2) Such tract was acquired for a specific purpose, and the tract is no longer required for that or any other Federal purpose
>
> (3) Disposal of such tract will serve important public objectives, including, but not limited to, expansion of communities and economic development, which cannot be achieved prudently or feasibly on land other than public land and which outweigh other public objectives and values, including, but not limited to, recreation and scenic values, which would be served by maintaining such tract in Federal ownership.

Lands may be exchanged as authorized by Section 206 of the FLPMA when the exchange would serve the national interest and benefit BLM programs or the programs of other Federal agencies. Lands may be conveyed to State and local government agencies and other qualified organizations under the Recreation and Public Purposes Act of 1926 (R&PP), as amended. Under R&PP, lands may be conveyed or leased only for an established or proposed project for which there are development and management plans, as well as adequate funding by the R&PP applicant to complete the development and a reasonable timetable of development.

Specific surface tracts identified for disposal under the various management alternatives would be evaluated for the presence of significant resource values before such action. Resources to be evaluated would include minerals, recreation, cultural resources, wetlands, and special status species. This evaluation would also be applied before disposal of any additional BLM-administered surface tracts that are identified or verified after approval of the RMP.

Some tracts may have uncertain titles. These are cases in which the tracts are claimed by private owners but government land records show that they were not transferred from Federal ownership. Tracts with uncertain titles would be handled on a case-by-case basis in accordance with the Color-of-Title Act, under which claimants may apply for transfer of these tracts and, if qualified, purchase the tracts to obtain title. Appendix B provides a list of lands of uncertain title occurring within the planning area.

Existing withdrawals (listed in Appendix I) would be subject to review to determine if they are serving their intended purpose. The BLM has the authority to revoke, modify, extend, or change withdrawals in accordance with the provisions and limitations of Section 204 of FLPMA.

After this plan is approved, it is expected that some additional surface tracts may return to BLM administration after revocation of withdrawals, reversion of R&PP lands, and resolution of title. These additional surface tracts will be managed according to applicable guidance of this plan.

This plan does not identify specific utility corridors because of fragmented BLM surface land ownership within the planning area and uncertainties in demand. Right-of-way (ROW) avoidance areas, established for protection of sensitive resources and tracts that may be suitable for corridors, are identified in the management alternatives presented in Section 2.4. Tracts identified as available for disposal through sale or exchange would be managed as avoidance areas if granting of an ROW might adversely affect tract marketability, unless otherwise specified in the alternatives.

Resolution of unauthorized use would be pursued on a case-by-case basis. Resolution would include termination of use and payment of damages, including reclamation of disturbed land, if needed. In some cases, use may be authorized through ROWs, permits, leases, or land disposal. Valid authorizations would be protected if the land undergoes disposal.

Hazardous Materials

The goals and objectives for hazardous materials are to minimize or eliminate the potential for intentional or accidental releases of hazardous materials or wastes from BLM-authorized actions.

Proposed activities on BLM-administered surface tracts and non-USFS FMO would be evaluated for their potential to release hazardous materials into the environment. Authorized use of hazardous materials must comply with the Resource Conservation and Recovery Act (RCRA). Disposal of hazardous materials is prohibited. Discovery of hazardous materials that have not been permitted would be handled in accordance with the reporting, removal, and remediation requirements of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA).

MANAGEMENT OF NON-USFS FMO

The discussion of proposed management of mineral leasing and development of BLM-administered, non-USFS FMO presented in this section is limited to oil and gas leasing. Non-USFS FMO includes mineral ownership underlying BLM-administered surface tracts. Proposed management for coal leasing is presented in the Standard Management Section of this appendix. Where non-USFS FMO is concerned, decisions of this RMP will pertain only to the BLM's role in administering the minerals.

There are four oil and gas leasing categories. Following is a description of each.

- **Open to leasing, subject to standard lease terms and conditions.** Includes areas in which standard lease terms and conditions are determined to be sufficient to protect other land uses or resource values.
- **Open to leasing, subject to minor constraints.** Comprises areas in which moderately restrictive lease stipulations such as timing limitations or distance setbacks are required to mitigate impacts to other land uses or resource values. Such constraints are often referred to as Controlled Surface Use (CSU).
- **Open to leasing, subject to major constraints.** Encompasses areas in which highly restrictive lease stipulations, such as No Surface Occupancy (NSO), are required to mitigate impacts to other land uses or resource values.

- **Closed to leasing.** Designated for areas where other land uses or resource values cannot be adequately protected by even the most restrictive lease stipulations. Appropriate protection can be ensured only by closing the lands to leasing.

The acreage of BLM-administered, non-USFS FMO available for oil and gas leasing in Alabama and Mississippi, by alternative, is shown in Table 1 and Table 2. Federal oil and gas leases contain standard lease terms that are included on the lease form, many of which are designed to protect natural resources. As described previously, special stipulations can be attached to a lease to respond to specific environmental or resource concerns for a particular lease area. Special stipulations are developed during the land use planning process, such as this RMP. Stipulations are attached to and made part of the lease and modify standard lease terms or the manner in which operations may be conducted. The variation of acreage by alternative for leasing stipulations associated with oil and gas potential in Alabama and Mississippi is shown in Table 3 and Table 4. Conservation measures, including stipulations and BMPs, are provided in Appendix D.

Reasonably Foreseeable Development Scenario for Minerals

Alabama and Mississippi have been classified as having high occurrence potential for oil and gas resources, based on the Reasonably Foreseeable Development Scenario (RFDS) prepared by the BLM. It is estimated that 20 wells would be drilled on non-USFS FMO in Alabama and 10 wells would be drilled on non-USFS FMO in Mississippi over the next 20 years (BLM 2004). These actions are expected to disturb a total of 105 acres in Alabama and 55 acres in Mississippi.

Table 1. Oil and Gas Leasing Categories in Alabama

Oil and Gas Leasing Category	Proposed Plan (Acres)
Open to leasing, subject to standard lease terms and conditions	144,895
Open to leasing, subject to minor constraints	117,506
Open to leasing, subject to major constraints	43,239
Closed to leasing	8,179
TOTAL	**313,819** [a]

Notes:
a Represents all BLM-administered, non-USFS FMO within the State of Alabama.

Table 2. Oil and Gas Leasing Categories in Mississippi

Oil and Gas Leasing Category	Proposed Plan (Acres)
Open to leasing, subject to standard lease terms and conditions	359,640
Open to leasing, subject to minor constraints	3,021
Open to leasing, subject to major constraints	92,269
Closed to leasing	63,004
TOTAL	**517,934** [a]

Notes:
a Represents all BLM-administered, non-USFS FMO within the State of Mississippi.

Proposed Stipulations

Three types of lease stipulations would be applied, defined as follows:

- **No Surface Occupancy (NSO).** A constraint that prohibits occupancy or disturbance on all or part of a lease surface to protect special values or uses. Lessees may exploit the fluid mineral resources under the lease surface through use of directional drilling from outside the NSO area.
- **Controlled Surface Use (CSU).** A constraint under which use and occupancy is allowed (unless restricted by another stipulation), but identified resource values require special operational limitations that may modify lease rights.
- **Seasonal (Timing Limitation).** A constraint that prohibits surface use during specified periods to protect identified resource values.

For each stipulation, there are provisions for exception, modification, and waiver. An exception is a one-time exemption to the stipulations, determined on a case-by-case basis. A modification is a change to the provisions of the stipulation, either temporarily or for the term of the lease. A waiver is a permanent exemption to the stipulation. For Federally listed species, exception, modification, and waiver will typically require coordination and possibly formal consultation with the U.S. Fish and Wildlife Service (USFWS).

Bald Eagle

Stipulation (NSO): No surface occupancy or disturbance will be permitted within a 1,500-foot buffer zone around active or inactive bald eagle nests and communal roost sites (primary zone).

Objective: To avoid impact to nesting eagles, including impact to important courtship and nesting behavior, egg laying and incubation, and feeding and fledging activity.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and appropriate State agencies.

Modification: This stipulation may be modified to remain consistent with Federal or State guidelines or if a portion of the stipulated area is no longer within the 1,500-foot buffer zone.

Waiver: This stipulation may be waived if no suitable nest sites are within 1,500 feet of any portion of the leased tract or if the nest site has not been used for at least 5 years.

Stipulation (CSU): BLM-permitted projects will not remove trees suitable for nesting within a 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites (secondary zone).

Objective: To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nests and communal roosting sites.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified to remain consistent with Federal and State guidelines or if a portion of the stipulated area is no longer within the 1.5-mile buffer zone.

Waiver: This stipulation may be waived if no nest or communal roosting site can be identified within 1.5 miles of the leased tract or if the applicant can document that no sites have been used by bald eagles for 5 consecutive years.

Stipulation (Timing Limitation): Surface-disturbing and other activities that are potentially disruptive to nesting bald eagles are prohibited within 1.5 miles of a bald eagle nest or communal roosting site between December 1 and August 1.

Objective: To protect foraging habitat, promote nest fidelity, and maintain habitat integrity around bald eagle nest and roosting sites.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified to remain consistent with Federal and State guidelines or if a portion of the stipulated area is no longer within the 1.5-mile buffer zone.

Waiver: This stipulation may be waived if no nest site can be identified within 1.5 miles of any portion of the leased tract or if the applicant can document that no sites have been used by bald eagles for 5 consecutive years.

Red-Cockaded Woodpecker

Stipulation (NSO): No surface occupancy or disturbance within 0.5 mile of a red-cockaded woodpecker cluster, defined as the area containing all active and inactive cavity trees and a 200-foot buffer zone surrounding that area. Vehicle use is prohibited within a cluster except for through-travel on existing, maintained, paved roads.

Objective: To protect red-cockaded woodpecker nest sites from disturbance and habitat degradation.

Exception: An exception may be granted to allow surface occupancy within 0.5 mile of a cluster if the operator agrees to measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is no longer within the 0.5-mile buffer zone.

Waiver: This stipulation may be waived if no cluster can be identified within 0.5 mile of the leased tract.

Sea Turtles

(Green sea turtle, hawksbill sea turtle, Kemp's ridley sea turtle, leatherback sea turtle, and loggerhead sea turtle)

Stipulation (NSO): No surface occupancy or disturbance is permitted in suitable sea-turtle nesting habitat.

Objective: To protect sea turtle nesting habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is no longer suitable sea turtle nesting habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable sea turtle nesting habitat.

Gopher Tortoise, Eastern Indigo Snake, Gopher Frog, and Black Pine Snake

Stipulation (CSU): BLM-approved surveys will be required in all suitable gopher tortoise habitat where the tortoise is listed, including: Choctaw, Washington, Sumter, and Mobile counties in Alabama; and Clarke, Covington, Forrest, George, Greene, Hancock, Harrison, Jackson, Jones, Lamar, Marion, Pearl River, Perry, Stone, Walthall, and Wayne counties in Mississippi. No surface disturbance or activity is permitted within 600 feet of a gopher tortoise burrow.

Suitable habitat includes areas with deep, well-drained and excessively well-drained sandy soils, especially the following U.S. Department of Agriculture (USDA)-National Resource Conservation Service (NRCS) soil series with an open understory with grass and forb groundcover open areas. Suitable soils include Alaga, Bigbee, Eustis, Lakeland, Wadley or Troup, McLaurin, Benndale, Heidel, Bama, Smithdale, Ruston, Lucedale, Lucy, Shubuta, Baxterville, Malbis, Poarch, Saucier, Susquehanna, Boswell, Lorman, Freestone, Freest, Prentiss, Savannah, Basin, and Petal.

Objective: To protect gopher tortoise habitat and commensal species.

Exception: Exceptions may be granted if the proponent agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: This stipulation may be modified if suitable gopher tortoise habitat does not exist in the stipulated area and that area does not provide forage habitat for adjacent tortoise populations. Survey requirements may be modified if current tortoise surveys of the tract are approved by the BLM and USFWS.

Waiver: This stipulation may be waived if suitable gopher tortoise habitat does not exist on the tract and the tract does not provide forage habitat for gopher tortoises in adjacent areas.

Alabama Beach Mouse

Stipulation (NSO): No surface occupancy or disturbance will be permitted within suitable Alabama beach mouse habitat or its Federally designated critical habitat.

Objective: To avoid impacts to suitable Alabama beach mouse habitat and designated critical habitat.

Exception: An exception may be granted if measures are developed and implemented in consultation with USFWS to avoid potential take of the species. These measures must also be coordinated with State agencies.

Modification: This stipulation may be modified if a portion of the stipulated area is found to be no longer suitable Alabama beach mouse habitat.

Waiver: This stipulation may be waived if it is determined that none of the leased area is suitable Alabama beach mouse habitat.

Gray Bat, Indiana Bat, Alabama Cave Shrimp, and Alabama Cavefish

Stipulation (NSO): No surface occupancy or disturbance is permitted within 250 feet of caves, fractures, large sinkholes, and perennial or intermittent streams in or adjacent to counties with documented gray bat or Indiana bat populations.

Objective: To prevent any impact to hydrologic networks connected to cave habitats and to protect flight paths and food sources for the bats.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if a portion of the stipulated area is found to be no longer within the 250-foot buffer zone.

Waiver: This stipulation may be waived if no portion of the leased area is within the 250-foot buffer zone.

Stipulation (NSO): No surface occupancy or disturbance is permitted within 0.5 mile of an Indiana bat or gray bat summer roost or gray bat wintering-cave hibernacula.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: This stipulation may be modified if the project does not adversely affect Indiana or gray bat hibernacula, with concurrence from USFWS and the appropriate State agencies.

Waiver: This stipulation may be waived if the lease is not within 0.5 mile of an Indiana bat or gray bat hibernacula.

Stipulation (CSU): A BLM-permitted action will not remove shagbark hickory trees or snags within 1.5 miles of an Indiana bat or gray bat hibernacula.

Objective: To prevent fatal disturbance during summer nursery roosting or winter hibernation.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: None.

Waiver: None.

Stipulation (CSU): Injection or disposal of produced water or water withdrawal will not be allowed into identified karstic habitat or any hydrologic network connected to caves used by the bats or other listed cave species.

Objective: To prevent any impact to hydrologic networks connected to bat caves and flight paths, and to protect food sources for the bat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies. Formal consultation with USFWS may be required if determined necessary to protect species and associated habitat.

Modification: The stipulation may be modified if a portion of the stipulated area is not in karstic habitat or a hydrologic network connected to caves used by the bats.

Waiver: The stipulation may be waived if none of the lease area is karstic habitat or is not hydrologically connected to caves used by the bats.

Aquatic Habitats

(Habitat for special status species including the Mississippi gopher frog; Alabama red-bellied turtle; flattened musk turtle; yellow-blotched map turtle; ringed map turtle; blue shiner; Gulf sturgeon; slackwater darter; sensitive clam and snail species including the ovate clubshell, southern clubshell, fine-lined pocketbook, and Tulotoma snail; and wood stork)

Stipulation (NSO): No surface occupancy or disturbance, including discharges, are permitted within 250 feet of a river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, brackish marshes, saltmarsh or small, marshy calcareous streams. This buffer may be extended to 600 feet where the slope exceeds 10 percent and to protect vernal pools in southeastern Mississippi between Highways 98 and 59 providing suitable habitat for endangered Mississippi gopher frog.

Objective: To protect the water quality of watersheds and natural stream substrate and morphology and to avoid potential impacts to Federal- and State-listed aquatic species.

Exception: An exception may be granted if the operator agrees to 1) span creeks and floodplains by attaching pipelines to bridges; 2) directionally drill under creeks, rivers, and other waters supporting listed species; or 3) implement other measures developed in consultation with USFWS and in coordination with State agencies.

Modification: The buffer may be reduced if the adjacent waterway has been surveyed for 100 yards upstream and 300 yards downstream of the site, and the results document the lack of suitable/occupied habitat for special status species within the mixing zone downstream of the project, as determined by the BLM and USFWS.

Waiver: The stipulations may be waived if it is determined that the lease area has no hydrological connection to habitat of sensitive aquatic species.

Louisiana Black Bear

Stipulation: No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.

Objective: To protect Louisiana black bear denning and foraging habitat.

Exception: An exception may be granted if the operator agrees to implement measures developed in coordination with USFWS and appropriate State agencies.

Modification: Temporary surface use may be permitted if USFWS concurs that the action would not adversely affect Louisiana black bear or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable Louisiana black bear habitat.

Piping Plover, Least Tern

Stipulation: No surface disturbance in piping plover and least tern habitat from the debris wrack line to the low-tide line of coastal beaches.

Objective: To protect wintering piping plover and least terns.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with the USFWS and in coordination with State agencies.

Modification: Temporary surface use may be permitted if USFWS concurs that the action would not adversely affect piping plover or least tern or suitable habitat.

Waiver: This stipulation may be waived if the tract does not contain suitable piping plover or least tern habitat.

Sensitive Plant Species

(Including Alabama canebrake pitcher plant, green pitcher plant, Alabama leather flower, Eggert's sunflower, Kral's water-plantain, Mohr's Barbara's buttons, Morefield's leather flower, Price's potato-bean, and harperella)

Stipulation (CSU): All suitable special status plant species habitat will be identified during environmental review of any proposed surface use activity. If field examination indicates that habitat of one or more of these species is present, the BLM will require a survey by a qualified botanist for special status plants during periods appropriate to each species. Operations will not be allowed in areas where sensitive plants would be affected.

Objective: To protect threatened, endangered, candidate, proposed, and BLM sensitive plant species.

Exception: An exception may be granted if the operator agrees to implement measures developed in consultation with USFWS and in coordination with State agencies.

Modification: The stipulation may be modified if it is determined that a portion of the lease area does not support sensitive plant species.

Waiver: The stipulation may be waived if it is determined that the lease area does not support sensitive plant species.

Hancock County Marshes

Stipulation (NSO): No surface occupancy will be permitted within the component of the Mississippi Coastal Preserve System (MCPS) designated as Hancock County Marshes.

Objective: To promote the preservation of marsh habitat in the MCPS, including the following ecological communities expected or known to occur: estuarine subtidal, 1) large tidal creek; estuarine intertidal, 1) sand shore 2) mesohaline marsh 3) oligohaline marsh; and other shell middens.

Objective: For the protection of coastal marshes within this State-designated preserve.

Exception: An exception may be allowed if, in consultation with the State agency responsible for the MCPS, it is determined that potential affects of the proposal would be adequately mitigated.

Modification: The stipulation may be modified if a portion of the leased area is no longer identified as part of the MCPS.

Waiver: The stipulation may be waived if the leased area is no longer identified as part of the MCPS.

Best Management Practices

BMPs are mitigation measures applied on a site-specific basis to reduce, prevent, or avoid adverse impacts. They may be incorporated as design features when actions are proposed or may be attached as conditions of approval for BLM-permitted Applications for Permit to Drill (APD) for oil and gas.

The BMPs described below will be considered mandatory in Alternatives 3 and 4, and will be applied to oil and gas operations on new and existing leases. Note that the objective of each BMP is to reduce adverse impacts to specific resources, and that there is some flexibility in implementation. The degree of flexibility will vary. Application of BMPs when there is potential to affect Federally listed, proposed, or candidate species or designated critical habitat will typically require coordination and possibly formal consultation with USFWS. Examples of national environmental BMPs are listed below; other BMPs that could be applied during site-specific evaluation can be found in the *Surface Operating Standards and Guidelines for Oil and Gas Exploration and Development, Gold Book* (BLM 2006) and at http://www.blm.gov/bmp.

- Interim reclamation of the well and access road
- Painting of all facilities to blend into the background

- Design and construct all new roads to a safe and appropriate standard, "no higher than necessary" to accommodate intended vehicular use
- Final reclamation of all disturbed areas, including access roads, to the original or similar contour
- Raptor perch-avoidance devices on powerlines
- Burial of powerlines and flow lines in or immediately adjacent to access roads
- Centralized production facilities
- The use of submersible pumps where feasible
- Below-ground wellheads where feasible
- Multiple wells from a single well pad where feasible
- Noise-reduction techniques to reduce noise from compressors or other motorized equipment
- Seasonal restrictions on public vehicular access where there are wildlife-conflict or road damage/maintenance issues
- Avoidance of production facilities on hilltops and ridgelines

Disposal of Produced Water

Objective: To protect aquatic habitats for and to avoid potential impacts to special status fish, mussels, turtles, snails, plants, and migratory birds.

The preferred method for disposal of produced water will be through reinjection to a permeable formation with total dissolved solids (TDS) content higher than 10,000 milligrams per liter (mg/L) where the aquifer is not hydrologically connected to caves, wetlands, or surface water. In Alabama, the injection of produced water is regulated by the Alabama State Oil and Gas Board. In Mississippi, the injection of produced water is regulated by the Mississippi Department of Environmental Quality (MDEQ) and the Mississippi Oil and Gas Board.

Alabama's Department of Environmental Management (ADEM) prohibits injection of pollutants from Class I Wells below an Underground Source of Drinking Water (USDW); injection of wastes from oil and gas production (Class III Wells) is regulated by the Alabama State Oil & Gas Board; ADEM regulates Class III Wells involving solution mining of certain minerals, such as salt. Class IV Wells are banned national by federal regulations; all others (Class V Wells) comprise about 90% of permitted injection wells in Alabama. EPA regulates all classes of injection wells on Tribal lands in Alabama. For surface water discharges into waters of the U.S., applicants would need State-issued National Pollution Discharge Elimination System (NPDES) permits, or federally-issued NPDES permits if the receiving water were on Tribal lands.

The UIC Program in Mississippi is implemented by the Mississippi Department of Environmental Quality (DEQ) and the Mississippi Oil & Gas Board. The Oil and Gas Board regulates Class II wells, and the DEW Management Support Brand, regulates all other well classes. In addition to Class II injection wells, Mississippi has Class I hazardous waste injection wells, Class I non-hazardous injection wells, ad Class V injection wells. EPA regulates all classes of injection wells on Tribal lands in Mississippi. For surface water discharges into waters of the U.S., applicants would need State-issued NPDES permits, or federally-issued NPDES permits if the receiving waters were on Tribal lands.

If reinjection is not practicable, closed-containment treatment systems should be used to contain and treat produced water for those contaminants and sediments exceeding State standards or EPA criteria. Salt content of any surface ponds for produced water, pigging pits, or other fluids must be less than 7,500 microsiemens per centimeter (μS/cm). If surface pond salt content is greater than 7,500 μS/cm, if other bird toxicity is present, or if the surface exhibits sheen, then the ponds must be netted or covered with floating balls, or other methods must be used to exclude migratory birds.

Produced waters may be released into an impounded reservoir if there is documentation that the discharge site and affected waters do not support special status species, are not designated critical habitat, and State and Federal water quality standards/criteria are met.

Produced waters may be released into a stream/river if the discharge site and affected waters have been recently surveyed and lack special status species, or if the applicant conducts approved surveys documenting the absence of special status species, State and Federal water quality standards/criteria are met, and a National Pollution Discharge Elimination System (NPDES) permit is obtained. The applicant should be aware that some species can be surveyed only during certain times of the year.

Produced waters may be released into a stream/river if the applicant can document that the produced waters would not adversely affect special status species. Water quality tests would be conducted on stream segment(s) or other locations proposed as discharge points, volumes to be released, and any settling ponds or other treatments proposed to improve wastewater quality. The water quality test data, any monitoring proposed, and other available information about general coalbed methane effluent characteristics (from published or unpublished literature) shall be reviewed by USFWS. Information about timing of the releases in relation to low water and other planned BMPs would also be required. Testing would include analysis of the discharge site and affected waters for chemical oxygen demand (COD), conductivity, total suspended solids (TSS), As, Hg, Se, and polycyclic aromatic hydrocarbons (PAH). Dissolved oxygen and ammonia standards/criteria must be met in bottom waters if they support listed benthic or epibenthic species. If a special status species has been documented to be more sensitive than State/Federal standards/criteria, site-specific standards for that species may be imposed. Calculations would be based on State standards (or Federal CCC criteria for protection of freshwater aquatic life when the State has not determined a standard for these parameters).

Invasive and Non-Native Species

Objective: To discourage the spread of invasive, non-native plants.

Use of native or non-invasive cover plants in seeding mixtures will be encouraged to stabilize disturbed areas and during restoration activities. Construction areas will be surveyed for invasive species prior to ground disturbance. If invasive species are found, the proper control techniques will be used to either eradicate the species from the area or minimize its spread to other areas. If cogongrass is found on site equipment should be washed before exiting the site to prevent the spread of this highly invasive species to other locations. Post-construction monitoring for cogongrass and other invasive plant species should be conducted to ensure early detection and control. In the case of split-estate land, final seed mixtures will be formulated in consultation with the private landowner.

Migratory Birds and Federally Listed Wildlife

Objective: To protect perch and roosting sites and terrestrial habitats for and to avoid potential impacts to migratory birds and Federally listed wildlife.

Any reserve pit that is not closed within 10 days after a well is completed and that contains water must be netted or covered with floating balls, or another method must be used to exclude migratory birds.

Maximum design speed on all operator-constructed and maintained (non-public) roads shall not exceed 25 miles per hour to minimize the chance of a collision with migratory birds or other listed wildlife species.

All powerlines must be built to protect raptors and other migratory birds, including bald eagles, from accidental electrocution, using methods detailed by the Avian Power Line Interaction Committee (APLIC 2006)[2].

Objective: To avoid or minimize the possibility of the unintentional take of migratory birds during periods of concentrated nesting activity and to provide long-term benefits and improved vegetation community condition.

The BLM or other qualified personnel may be required identify suitable migratory bird nesting habitat within the project site. Opportunities should be evaluated to shift disturbance away from high value migratory bird nesting or foraging habitats, or to replace habitat on or off site.

A Timing Limitation may be imposed on use authorizations to mitigate large-scale vegetative disturbing activities during the primary portion of the nesting season. Dates could be adjusted for the species and environmental conditions.

Perching and Nesting Birds and Bats

Objective: To prevent birds and bats from entering or nesting in or on open vent stack equipment.

Open vent stack equipment, such as heater-treaters, separators, and dehydrator units, will be designed and constructed to prevent birds and bats from entering or nesting in or on such units and, to the extent practical, to discourage birds from perching on the stacks. Installing cone-shaped mesh covers on all open vents is one suggested method. Flat mesh covers are not expected to discourage perching and will not be acceptable.

Pesticide Application

Objective: To protect the water quality of watersheds and natural stream substrate and morphology supporting special status species and their host species.

Any ground application of herbicides or other pesticides, sterilants, or adjuvants within 150 feet of listed species or habitat will require site-specific control measures developed in coordination or formal consultation with USFWS. No aerial application of herbicides or pesticides will be permitted.

Table 3. Leasing Stipulations in Alabama [a]

Area	Total non-USFS FMO (Acres) [a, b]
NO LEASE	
Other Surface-Management Agency Lands	
USFWS	3,384
Department of Defense (DoD—Maxwell Air Force Base)	1,495
National Park Service (NPS)	3,300
Total Affected Area [b]	**8,179**

[2] APLIC 2006. *Suggested Practices for Raptor Protection on Power Lines—The State of the Art 2006*. APLIC, Edison Electric Institute, and the California Energy Commission. Washington, D.C. and Sacramento, CA.

Area	Total non-USFS FMO (Acres) [a, b]
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Bald eagle nests (1,500-foot buffer around active or inactive nests and communal roost sites)	30
Red-cockaded woodpecker (0.5-mile cluster plus a 200-foot buffer zone surrounding that area)	888
Sea turtle suitable nesting habitat (100-foot buffer from the mean high-tide line of coastal beaches)	513
Gray bat, Indiana bat, Alabama cave shrimp, Alabama cavefish (600-foot buffer around caves, fractures, large sinkholes or 250-foot buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	12,898
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	3,044
Freshwater aquatic species (250-footbuffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 feet if slope exceeds 10 percent)	38,111
Piping plover/least tern habitat (from the debris rack line to the low-tide line of coastal beaches)	2,200
Alabama beach mouse suitable habitat or Federally designated critical habitat	365
Total Affected Area[b]	**58,049**
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	1,000
Gopher tortoise burrow (600-foot buffer)	ND
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	11,573
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	112,368
Sensitive plant species habitat	103
Total Affected Area[b]	**125,044**
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	1,299
Total Affected Area[b]	**1,299**
OPEN TO LEASING, SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area[b]	**144,895**

Notes:
a All Federal mineral estate in Alabama has high potential for oil and gas resources.
b Total acres under each alternative do not represent accurate totals shown in Table 1 because of the overlap of land resources and land use restrictions.
ND No habitat data available to estimate affected area.

Table 4. Leasing Stipulations in Mississippi [a]

Area	Total non-USFS FMO (Acres) [a,b]
NO LEASE	
Other Surface Management Agency Lands	
USFWS	60,207
NPS	2,797
Total Affected Area[b]	**63,004**
NO SURFACE OCCUPANCY/NO SURFACE DISTURBANCE	
Hancock County Marsh	1,810
Bald eagle nests (1,500-foot buffer around active or inactive nests and communal roost sites)	1,089
Red-cockaded woodpecker (0.5-mile cluster plus a 200-foot buffer zone surrounding that area)	11,710
Sea turtle suitable nesting habitat (100-foot buffer from the mean high-tide line of coastal beaches)	997
Gray bat, Indiana bat (600-foot buffer around caves, fractures, sinkholes or 250-foot buffer around perennial or intermittent streams in or adjacent to counties with documented populations)	2,564
Gray bat or Indiana bat summer roost or gray bat wintering cave hibernacula (0.5-mile buffer)	7,073
Freshwater aquatic species (250-foot buffer around river, stream, wetland spring, headwaters, wet meadows, wet pine savannas, pond, tributary, lake, coastal slough, sand bars, vernal pools on granite outcrops, calcareous seepage marshes, or small, marshy calcareous streams; buffer may be extended up to 600 feet if slope exceeds 10 percent)	68,656
Louisiana black bear (1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats)[c]	ND
Piping plover/least tern habitat (from the debris rack line to the low tide line of coastal beaches)	4,237
Total Affected Area[b]	**98,136**
CONTROLLED SURFACE USE	
Bald eagle nests (no tree removal within 1.5-mile buffer zone around active or inactive bald eagle nests and communal roost sites)	8,917
Gopher tortoise burrow (600-foot buffer)	122
Gray bat/Indiana bat hibernacula (1.5-mile buffer)	1
Identified karstic habitat or any hydrologic network connected to caves used by listed bat species or other listed cave species	ND
Sensitive plant species habitat	ND
Total Affected Area[b]	**9,040**
SEASONAL LIMITATIONS	
Bald eagle nest or communal roosting sites (timing restriction within 1.5 miles between December 1 and August 1)	13,742
Total Affected Area[b]	**13,742**

Area	Total non-USFS FMO (Acres) [a,b]
OPEN TO LEASING, SUBJECT TO STANDARD LEASE TERMS AND CONDITIONS	
Total Affected Area[b]	**359,640**

Notes:
a All Federal mineral estate in Mississippi has high potential for oil and gas resources.
b Total acres under each alternative do not represent accurate totals shown in Table 2 because of the overlap of land resources and land use restrictions.
c No habitat data available to estimate affected area. No surface disturbance, including removal of potential den trees, is permitted within a 1,500-foot buffer around den trees in occupied bottomland hardwood and floodplain forest habitats.
ND No habitat data available to estimate affected area.

MANAGEMENT OF SURFACE TRACTS

For the purposes of this plan, the surface tracts were grouped on the basis of geographic proximity and similar management needs. The surface tract groups to be discussed in this section include the Coosa River Tracts, Fort Morgan Beach Tracts, Fort Morgan Highway Tracts, Fowl River Tract, Geneva Tract, and Jordan Lake Tract in Alabama and the Hancock County Tract in Mississippi. These surface tracts and their associated acreage, county, and legal description are listed in Table 5. Proposed planning decisions for each surface tract grouping are detailed later in this appendix and are accompanied by maps depicting the tract locations (Maps 1–7).

Table 5. Surface Tracts in Alabama and Mississippi

Name of Tract Group	Acres	County	Legal Description[a]
Alabama			
Coosa River Tracts			
			St. Stephens Meridian
Foshee Islands	9.58	Coosa	T. 22N, R. 16E, Sec. 5, Lots 1, 2, and 5
	3.25	Coosa	T. 22N, R. 16E, Sec. 8, Lot 1
Little Rock Island	0.45	Coosa	T. 22N, R. 16E, Sec. 5, Lot 3
Big Rock Island	6.09	Coosa	T. 22N, R. 16E, Sec. 5, Lot 4
Gilchrist Island	4.38	Coosa	T. 23N, R. 16E, Sec. 32, Lot C
			Huntsville Meridian
Unnamed Island	0.07	Calhoun	T. 14S, R. 5E, Sec. 24, Lot 2
Smith Island	5.58	Shelby	T. 20S, R. 2E, Sec. 24, Lot 1
Prince Island	12.74	Talladega	T. 20S, R. 2E, Sec. 24, Lot 2
			T. 20S, R. 2E, Sec. 13, Lot 1
			T. 20S, R. 3E, Sec. 18, Lot 1
Total Acreage of Tract Group	**42.14**		
Fort Morgan Beach Tracts			
			St. Stephens Meridian
Fort Morgan Beach Tract	0.84	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 24
Fort Morgan Beach Tract	5.32	Baldwin	T. 9S, R. 1E, Sec. 26, Lots 13 and14

Name of Tract Group	Acres	County	Legal Description[a]
Fort Morgan Beach Tract	10.60	Baldwin	T. 9S, R. 2E, Sec. 27, Lots 54 and 55
Fort Morgan Beach Tract	11.94	Baldwin	T. 9S, R. 2E, Sec. 25, Lots 73 and 74
Total Acreage of Tract Group	**28.70**		
Fort Morgan Highway Tracts			
			St. Stephens Meridian
Fort Morgan Highway Tract	20.16	Baldwin	T. 9S, R. 1E, Sec. 25, Lot 5
			T. 9S, R. 1E, Sec. 26, Lot 15
Fort Morgan Highway Tract	8.88	Baldwin	T. 9S, R. 2E, Sec. 28, Lot 43
Fort Morgan Highway Tract	12.24	Baldwin	T. 9S, R. 2E, Sec. 27, Lot 56
			T. 9S, R. 2E, Sec. 28, Lot 44
Total Acreage of Tract Group	41.28		
Fowl River Tract			
			St. Stephens Meridian
Fowl River Tract	41.73	Mobile	T. 7S, R. 2W, Sec. 25, Lots 2–5
Geneva County Tract			
			Tallahassee Meridian
East Fork Choctawhatchee River Tract	0.95	Geneva	T. 7N, R. 16W, Sec. 22, Lot 4
Jordan Lake Tract			
			St. Stephens Meridian
Jordan Lake Tract	4.3	Chilton	T. 21N, R. 16E, Sec. 14, Lot 1
Total Surface Estate in Alabama	**159.10**		
Mississippi			
Hancock County Tract			
			St. Stephens Meridian
Hancock County	174.25	Hancock	T. 9S, R. 15W, Sec. 25, Lots 2–5, SESE
Total Surface Estate in Mississippi	**174.25**		

a The legal description is abbreviated according to a rectangular survey system in which T. 22N, R. 16E, Sec. 5, Lot 1 means that the area is located at Lot 1 of Section 5 in Township 22 North, Range 16 East, in the meridian specified above. Townships are divided into 36 numbered sections. A standard section comprises 1 square mile or 640 acres of land and consists of aliquot parts of sections (e.g., half section of 320 acres, quarter section of 160 acres, 16th section of 40 acres). The township number indicates how far in a given direction (north or south) of a surveyed parallel the township is located. The range number indicates how far in a given direction (east or west) of a surveyed meridian the township is located.

Coosa River Tracts (Maps 1a, 1b, 1c)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

- Protect mature stands of mixed hardwood/pine overstory and a diversity of understory species.

Allowable Uses and Management Actions

- Remove invasive species, such as mimosa (*Albizia julibrissin Durazz L.*) by hand and with selective, hand application of herbicide.
- Conduct baseline inventories for special status plants.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.

Allowable Uses and Management Actions

- Monitor fledgling success of active bald eagle nests.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-foot buffer from aquatic habitats, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use and travel compatible with other resource management objectives.
- Support water-based recreation opportunities consistent with the Coosa River Recreation Plan (Federal Energy Regulatory Commission [FERC] Project Nos. 2146, 082, and 618).

Allowable Uses and Management Actions

- The tracts would be open to recreation use including fishing, picnicking, rest stops of boaters and canoeists, and wildlife observation.
- The tracts would be designated as closed.

Lands and Realty

Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.
- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tracts would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative.
- In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.
- These island tracts would be avoidance areas for ROWs to protect native vegetative communities and adjacent aquatic habitat.

Map 1a

Mississppi - Alabama RMP-EIS

Coosa River Tracts (42.14 total acres)
Unnamed Island (0.07 acres)
Calhoun County, AL

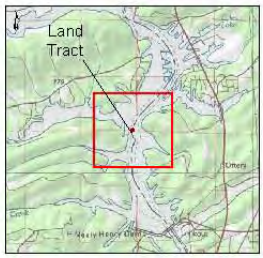
T. 14 S, R. 5 E,
Sec. 24, Lot 2

Huntsville Meridian

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Public Domain Lands

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Research Institute
TOPO!, 2003 National Geographic Maps



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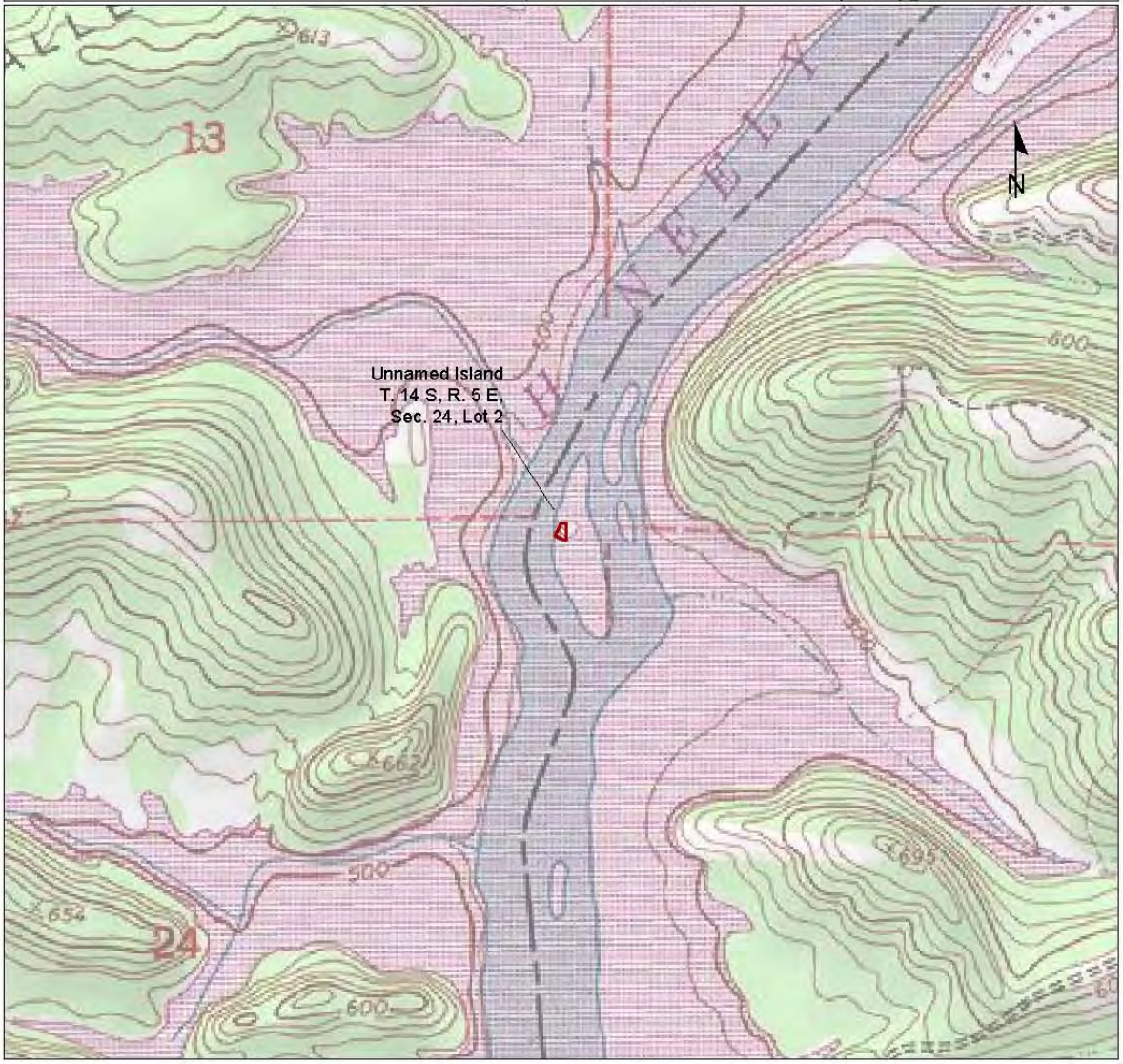

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No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

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Miles

0 250 500 1,000 1,500 2,000
Feet

Map 1b

Alabama and Mississippi RMP-EIS

Coosa River Tracts (42.14 total acres)
Coosa County, AL

Big Rock Island (6.09 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 4

Foshee Islands (12.83 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 1
T. 22 N, R. 16 E, Sec. 5, Lot 2
T. 22 N, R. 16 E, Sec. 5, Lot 5
T. 22 N, R. 16 E, Sec. 8, Lot 1

Gilchrist Island (4.38 acres)
T. 23 N, R. 16 E, Sec. 32, Lot C

Little Rock Island (0.45 acres)
T. 22 N, R. 16 E, Sec. 5, Lot 3

St. Stephens Meridian

Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

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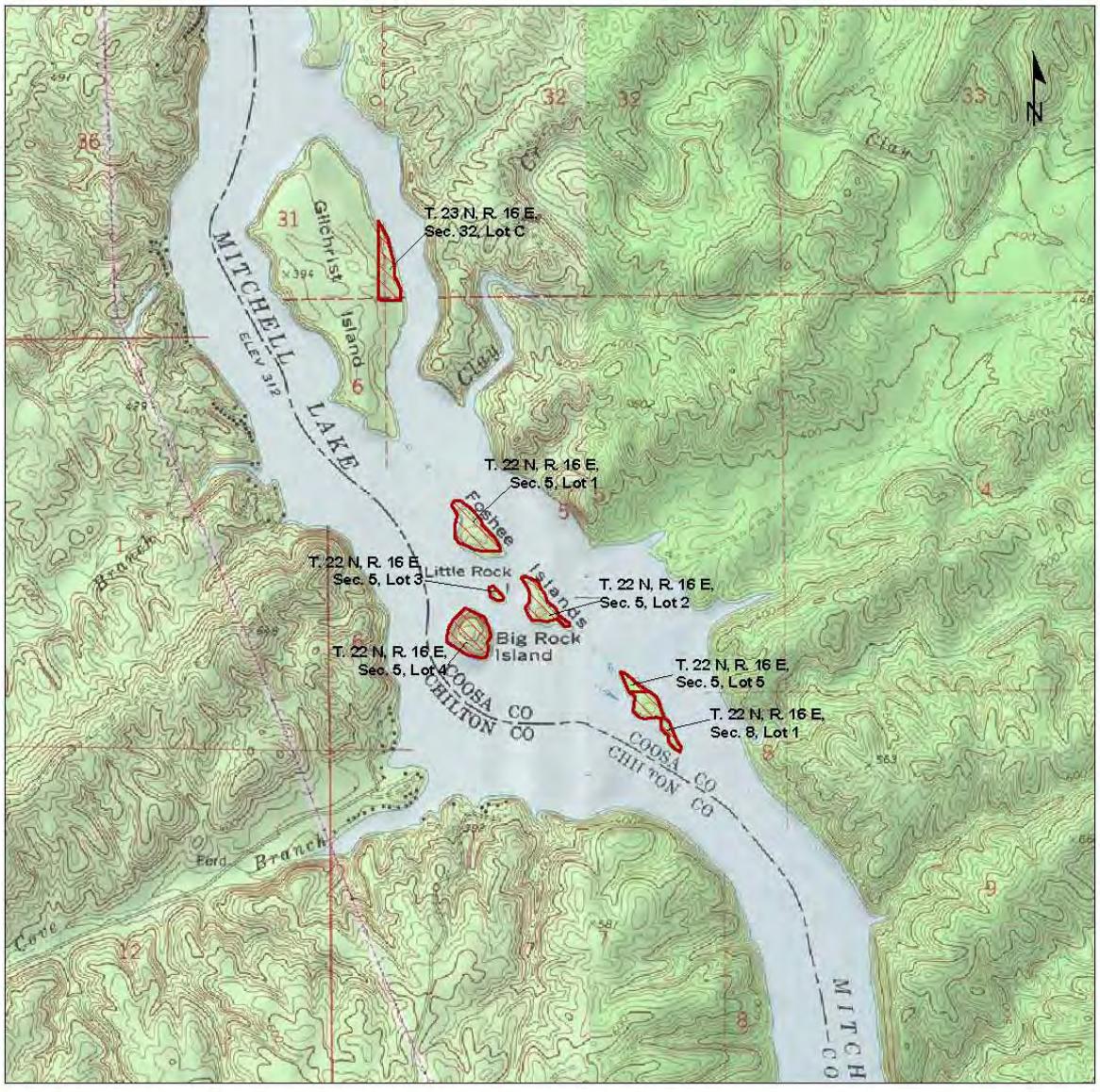

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Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Map 1c

Alabama and Mississippi RMP-EIS

Coosa River Tracts (42.14 total acres)

Shelby County, AL
Smith Island (5.58 acres)
T. 20 S, R. 2 E, Sec. 24, Lot 1

Talladega County, AL
Prince Island (12.74 acres)
T. 20 S, R. 2 E, Sec. 13, Lot 1
T. 20 S, R. 2 E, Sec. 24, Lot 2
T. 20 S, R. 3 E, Sec. 18, Lot 1

Huntsville Meridian

Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

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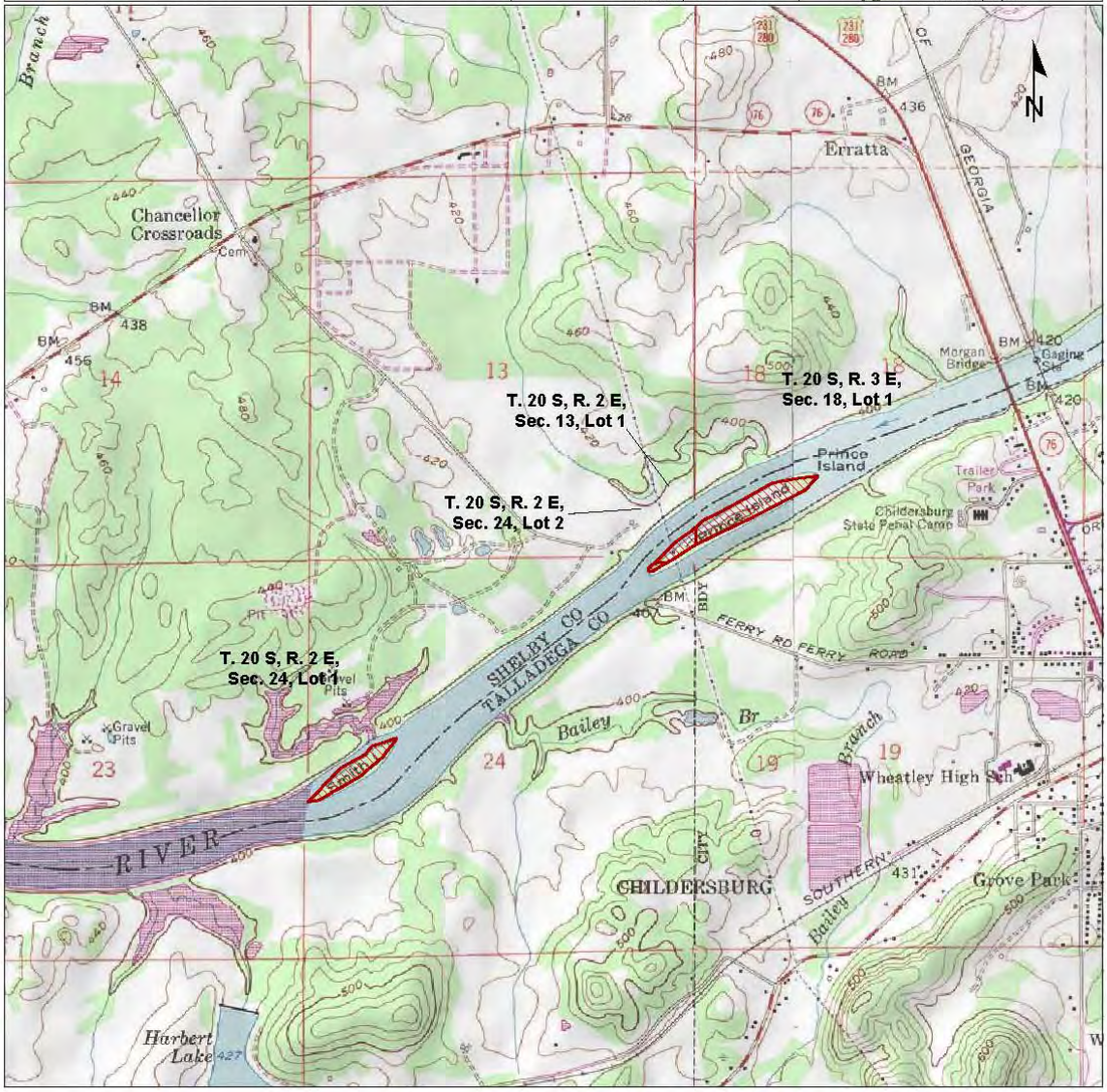

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Miles

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Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Fort Morgan Beach Tracts (Map 2)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

Allowable Uses and Management Actions

- Promote establishment and retention of native coastal-dune vegetative communities by planting native species and installing sand fencing to protect existing dune habitat.
- Control invasive species through hand pulling, as needed.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.
- Maintain existing fish and wildlife habitat diversity. Actively promote the recovery of Federally listed species, such as Alabama beach mouse, piping plover, least turn, nesting sea turtles.

Allowable Uses and Management Actions

- Construct protective, two-dune walk-over structures (approx. 300 feet each) and install sand fencing to enhance and protect existing dune habitat.
- Reintroduce Alabama beach mice in suitable unoccupied habitat.
- Monitor sea turtle nesting and mark active nests for protection to maximize nestling survivorship.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse, piping plover, least tern, and sea turtle nesting habitat.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use, beach access, and travel compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tracts would be open to recreation compatible with habitat management, including use of the beach and saltwater fishing.
- The tracts would be designated as closed.

Lands and Realty

Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.
- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) (Table 1 and Map 2) would be available for transfer to the Bon Secour National Wildlife Refuge (NWR).
- If the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts.
- Lots 24 (Section 25), 13 and 14 (Section 26), and 54 and 55 (Section 27) would be avoidance areas for ROWs because of the presence of listed species and designated critical habitat.
- Lots 73 and 74 would be transferred to USFWS as part of the Bon Secour NWR because they occur within the boundaries of the refuge.

Map 2

Alabama and Mississippi RMP-EIS

Ft. Morgan - Beach Tracts (28.70 total acres)

Baldwin County, AL

T. 9 S, R. 1 E, Sec. 25, Lot 24
T. 9 S, R. 1 E, Sec. 26, Lot 13
T. 9 S, R. 1 E, Sec. 26, Lot 14
T. 9 S, R. 2 E, Sec. 25, Lot 73
T. 9 S, R. 2 E, Sec. 25, Lot 74
T. 9 S, R. 2 E, Sec. 27, Lot 54
T. 9 S, R. 2 E, Sec. 27, Lot 55

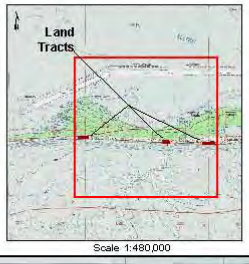
St. Stephens Meridian

Public Domain Lands

Bon Secur National Wildlife Refuge

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps



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Miles

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Feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Fort Morgan Highway Tracts (Map 3)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

Allowable Uses and Management Actions

- Remove invasive species such as cogon grass and Chinese tallow by using an integrated program of hand removal and selective, hand application of herbicide.
- Establish baseline inventories of special status plant species.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.
- Maintain existing fish and wildlife habitat diversity. Actively promote the recovery of the Federally listed Alabama beach mouse and other endemic species, particularly migratory songbirds and raptors, using the flatwood, scrub, and wetland habitats occurring on these tracts.

Allowable Uses and Management Actions

- Incorporate Lots 5 and 15 (29 acres) into future prescribed burns conducted on adjacent Bon Secour NWR land to improve habitat values for migratory birds and scrub endemics as needed, depending on resource conditions, and in cooperation with USFWS.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tracts would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) to protect habitat for Alabama beach mouse and a 250-foot buffer from wetlands and aquatic habitat.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tracts would be open to recreation compatible with habitat management, including sightseeing and hiking.
- The tracts would be designated as closed.

Lands and Realty

Management Goals and Objectives

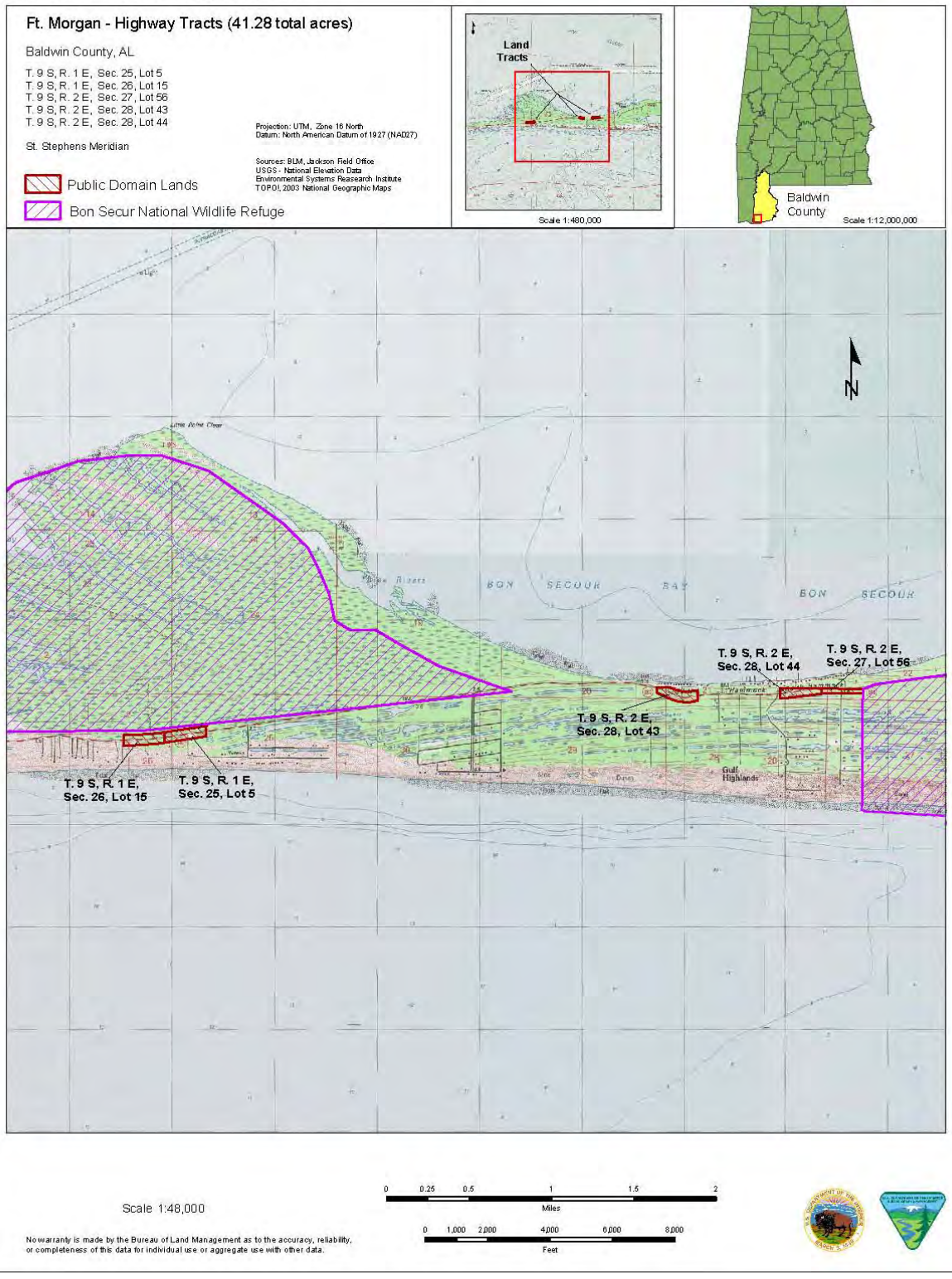
- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.
- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tracts would be available for transfer to the Bon Secour NWR.
- If the tracts are not transferred to the Bon Secour NWR, the BLM will retain the tracts.
- Existing facilities within the highway ROW corridor would be allowed. New disturbance would be avoided because of the presence of Federally listed species and designated critical habitat.

Map 3

Alabama and Mississippi RMP-EIS



Fowl River Tract (Map 4)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.
- Promote establishment and retention of native wetland and flatwood plant communities.

Allowable Uses and Management Actions

- Remove invasive species such as mimosa (*Albizia julibrissin Durazz L.*) by hand and with selective, hand application of herbicide.
- Establish baseline inventories to monitor plant communities.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.

Allowable Uses and Management Actions

- Monitor fledgling success of active bald eagle nests.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation of a 250-foot buffer from wetlands and aquatic habitat, and stipulations to protect bald eagle nesting and roosting habitat, as described in Appendix D.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tract would be open to recreation use including access for fishing, canoeing, and kayaking.
- The tract would be designated as closed.

Lands and Realty

Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.

- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tract would be available for disposal under the condition that uses would be consistent with the resource management goals and objectives and allowable uses and management actions established under this alternative.
- In the case of R&PP conveyance, use after disposal would be controlled through approval of and compliance with the plan of development. In the case of FLPMA disposal (e.g., sale), restrictive covenants would be required to protect sensitive resources.
- The tract would be an avoidance area for ROWs to protect native vegetative communities and adjacent wetland/aquatic habitat.

Map 4

Alabama and Mississippi RMP-EIS

Fowl River Tract (41.73 total acres)
Mobile County, AL

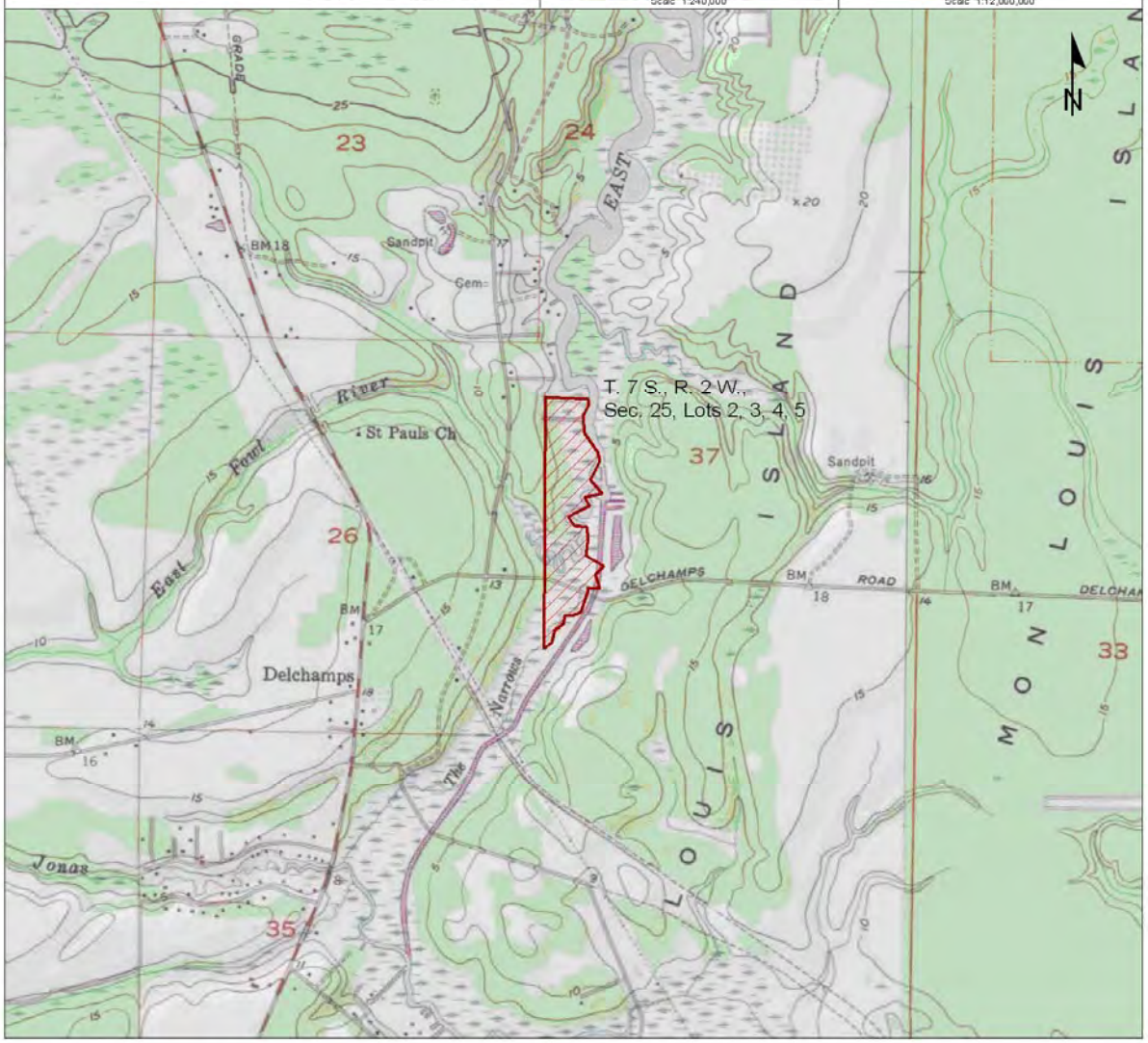
T. 7 S., R. 2 W.,
Sec. 25, Lots 2, 3, 4, 5

St. Stephens Meridian

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Public Domain Lands

Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Research Institute
TOPO!, 2003 National Geographic Maps



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Miles
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Feet
1 inch equals 2,000 feet

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Geneva Tract (Map 5)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

Allowable Uses and Management Actions

- No specific actions are proposed.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.

Allowable Uses and Management Actions

- No specific actions are proposed.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-foot buffer from aquatic habitat.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tract would be open to recreation use including canoeing, kayaking, and fishing.
- The tract would be designated as closed.

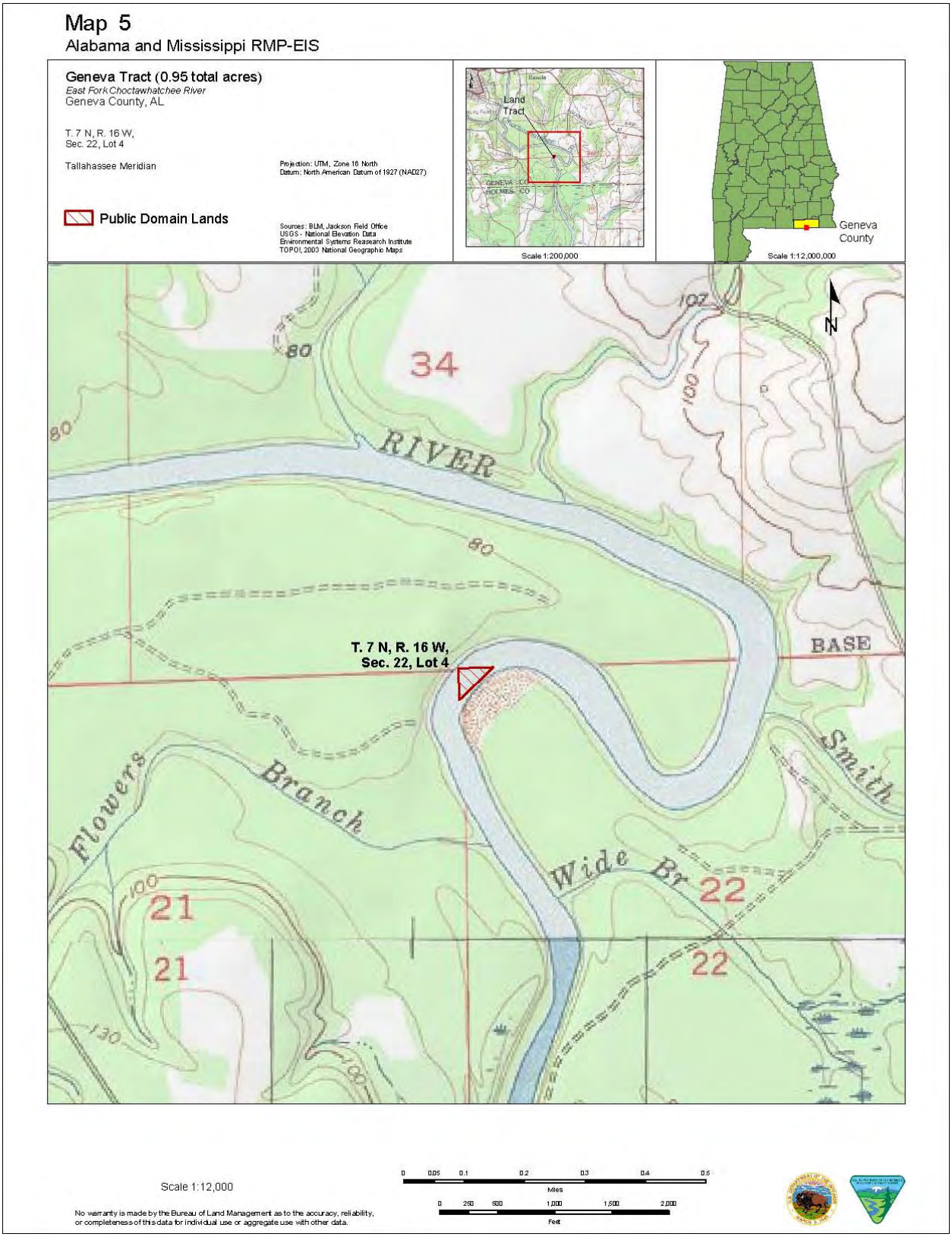
Lands and Realty

Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.
- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tract would be available for disposal from Federal ownership.
- The tract would be a ROW avoidance area because it is in a floodplain and is critical habitat for Gulf sturgeon.


Map 5
Alabama and Mississippi RMP-EIS
Geneva Tract (0.95 total acres)
East Fork Choctawhatchee River
Geneva County, AL
T. 7 N, R. 16 W,
Sec. 22, Lot 4
Tallahassee Meridian
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Public Domain Lands
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tract
Scale 1:200,000
Geneva County
Scale 1:12,000,000
N
34
RIVER
80
T. 7 N, R. 16 W,
Sec. 22, Lot 4
BASE
Flowers
Branch
Smith
Wide Br
21
22
Scale 1:12,000
0 0.05 0.1 0.2 0.3 0.4 0.6
Miles
0 250 500 1,000 1,500 2,000
Feet
No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of this data for individual use or aggregate use with other data.

Jordan Lake Tract (Map 6)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

Allowable Uses and Management Actions

- No specific actions are proposed.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.

Allowable Uses and Management Actions

- No specific actions are proposed.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) of a 250-foot buffer from aquatic habitat.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tract would be open to recreation use including access to Jordan Lake for swimming and fishing.
- The tract would be designated as limited. Motorized vehicle use would be limited to State- or county-maintained roads or other transportation routes specifically designated by a BLM-issued ROW. Other motorized vehicle access would be limited to administrative use and emergency response.

Lands and Realty

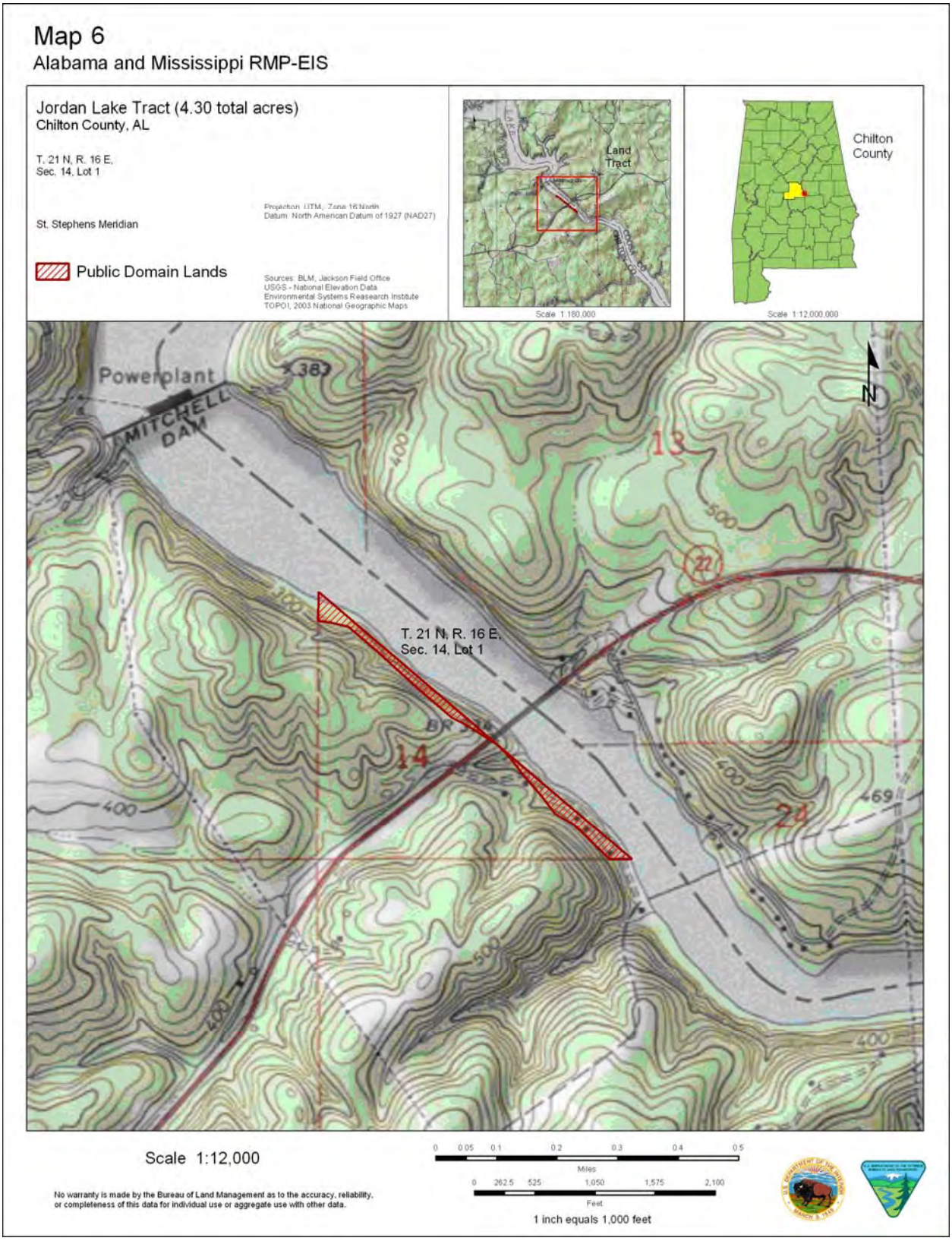
Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.

- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tract would be available for disposal from Federal ownership.
- The tract would be open for ROWs because of adjacent development and uses. ROWs would be collocated if possible.


Map 6
Alabama and Mississippi RMP-EIS
Jordan Lake Tract (4.30 total acres)
Chilton County, AL
T. 21 N., R. 16 E.,
Sec. 14, Lot 1
St. Stephens Meridian
Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)
Public Domain Lands
Sources: BLM, Jackson Field Office
USGS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps
Land Tract
Scale 1:180,000
Chilton County
Scale 1:12,000,000
Powerplant
MITCHELL DAM
T. 21 N., R. 16 E.,
Sec. 14, Lot 1
N
Scale 1:12,000
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Miles
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Feet
1 inch equals 1,000 feet
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Hancock County Tract, Mississippi [3] (Map 7)

Vegetative Communities

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status plant species and imperiled plant communities.
- Control noxious and invasive plant species.

Allowable Uses and Management Actions

- Monitor for early detection of invasive plant species such as cogon grass and Chinese tallow. If detected, invasive species would be removed by hand or through selective, hand application of herbicide.

Fish and Wildlife Habitat

Management Goals and Objectives

- Manage vegetative communities to protect, preserve, or enhance Federally listed and other special status fish and wildlife species and their habitat.
- Protect and enhance the estuarine coastal wetland marshes in support of the Mississippi Coastal Preserve System (MCPS).

Allowable Uses and Management Actions

- Prescribed burns would be used as needed, depending on resource conditions and in cooperation with the State of Mississippi, to promote marsh health.

Minerals

Management Goals and Objectives

- Provide for leasing, exploration, and development of BLM-administered, non-USFS FMO while protecting other resource values.

Allowable Uses and Management Actions

- The tract would be open to leasing and subject to standard lease terms and conditions and BMPs, except for an NSO stipulation (as described in Appendix D) for protection of Hancock County Marshes.

Recreation and Travel Management

Management Goals and Objectives

- Allow recreation use compatible with other resource management objectives.

Allowable Uses and Management Actions

- The tract would be open to recreation use including fishing and waterfowl hunting.
- The tract would be designated as limited to motorized boats in areas of open water. Other motorized vehicle use would be limited to administrative use and emergency response.

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3 *These allowable uses and management actions would not occur unless the R&PP patent were to revert to BLM.*

Lands and Realty

Management Goals and Objectives

- Manage the land ownership pattern, withdrawal, and use of public lands to promote efficiency of management and protect important resource values.
- Make public lands available for purposes such as transportation routes or utilities, when consistent with other resource goals.

Allowable Uses and Management Actions

- The tract would be retained by the BLM. The BLM would pursue opportunities to manage the tract in partnership with other agencies and organizations.
- The tract would be an avoidance area for ROWs to protect wetland habitat.

Map 7

Alabama and Mississppi RMP-EIS

Hancock County Tract (174.25 total acres)
Hancock County, MS

T. 9 S, R. 15 W, Sec. 25,
Lots 2, 3, 4, 5
T. 9 S, R. 15 W, Sec. 25,
SESE

St. Stephens Meridian

Public Domain Lands

Projection: UTM, Zone 16 North
Datum: North American Datum of 1927 (NAD27)

Sources: BLM, Jackson Field Office
US GS - National Elevation Data
Environmental Systems Reasearch Institute
TOPO!, 2003 National Geographic Maps

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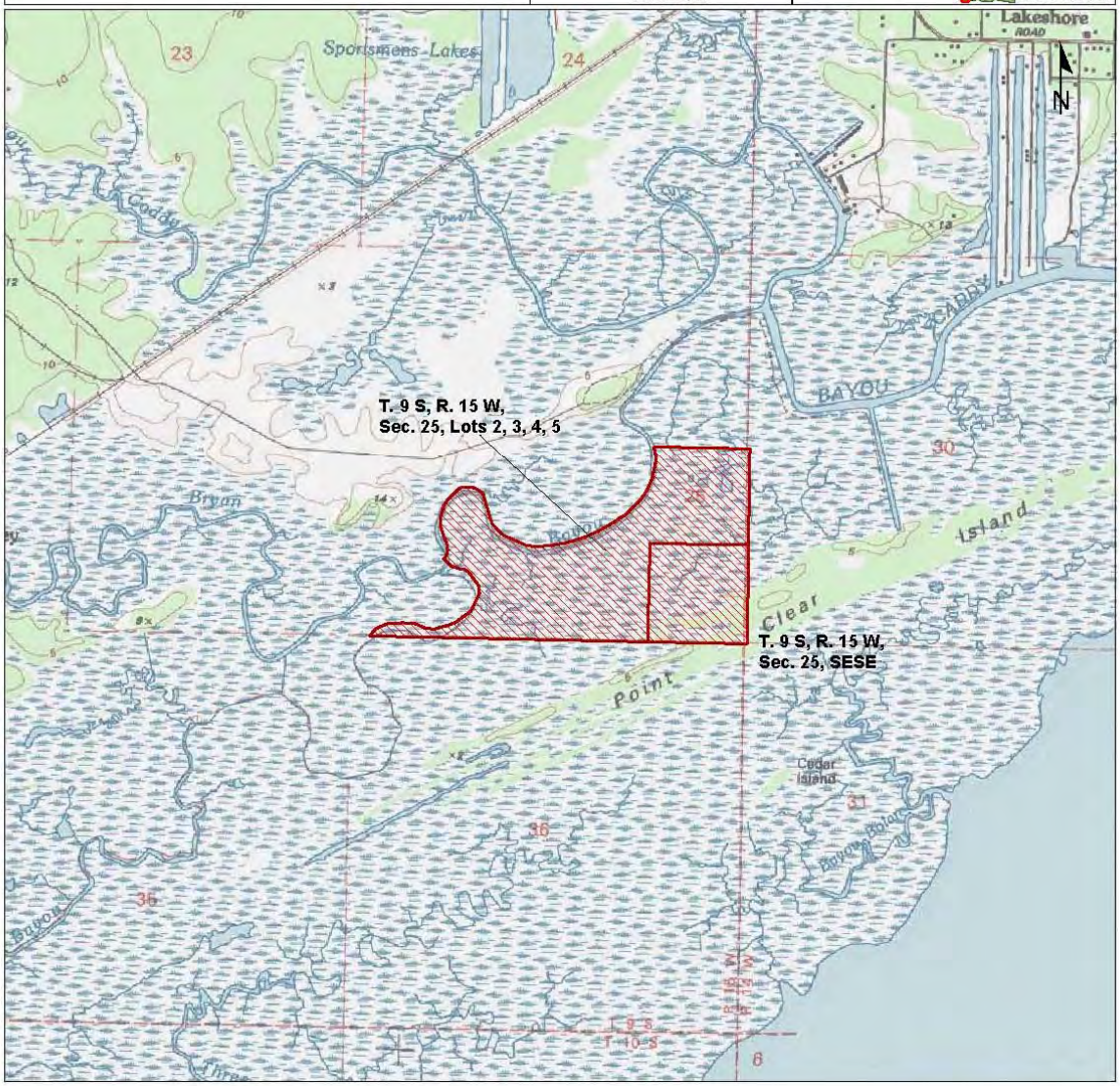
Scale 1:12,000,000



Scale 1:24,000

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Miles

0 600 1,000 2,000 3,000 4,000
Feet

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