

**FINAL ENVIRONMENTAL IMPACT STATEMENT  
FOR HYDROPOWER LICENSE**

Martin Dam Hydroelectric Project—FERC Project No. 349-173

Alabama



Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Licensing  
888 First Street, NE  
Washington, D.C. 20426

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FEDERAL ENERGY REGULATORY COMMISSION

WASHINGTON, D.C. 20426

OFFICE OF ENERGY PROJECTS

To the Agency or Individual Addressed:

**Reference: Final Environmental Impact Statement**

Attached is the final environmental impact statement (EIS) for the relicensing of the Martin Dam Hydroelectric Project (No. 349-173), located on the Tallapoosa River in Tallapoosa, Coosa, and Elmore Counties, Alabama.

This final EIS documents the views of governmental agencies, non-governmental organizations, affected Indian tribes, the public, the license applicant, and Federal Energy Regulatory Commission (Commission) staff. It contains staff evaluations of the applicant's proposal and the alternatives for relicensing the Martin Dam Project.

Before the Commission makes a licensing decision, it will take into account all concerns relevant to the public interest. The final EIS will be part of the record from which the Commission will make its decision. The final EIS was sent to the U.S. Environmental Protection Agency and made available to the public on or about April 2, 2015.

Copies of the final EIS are available for review in the Commission's Public Reference Branch, Room 2A, located at 888 First Street, N.E., Washington, D.C. 20426. The final EIS also may be viewed on the Internet at [www.ferc.gov/docs-filing/elibrary.asp](http://www.ferc.gov/docs-filing/elibrary.asp). Please call (202) 502-8222 for assistance.

Attachment: Final Environmental Impact Statement



## COVER SHEET

- a. Title: Relicensing the Martin Dam Hydroelectric Project, FERC Project No. 349-173.
- b. Subject: Final Environmental Impact Statement (EIS)
- c. Lead Agency: Federal Energy Regulatory Commission
- d. Abstract: On June 8, 2011, Alabama Power Company (Alabama Power) filed an application to relicense the existing Martin Dam Hydroelectric Project, located on the Tallapoosa River in Tallapoosa, Coosa, and Elmore Counties, Alabama. The project consists of Martin Dam, which impounds about 31 miles of the Tallapoosa River, forming Lake Martin (or Martin reservoir), a 41,150-acre reservoir. The project has a current installed capacity of 182.5 megawatts and occupies 1.39 acres of federal lands. Currently, the project is operated as a multi-purpose facility for hydropower generation, limited flood control, municipal and industrial water supply, aquatic flow maintenance, and navigation flow support.
- Alabama Power proposes to relicense the project and continue to operate in a peaking mode, while implementing certain reservoir operational changes in the fall and winter and various protection, mitigation, and enhancement measures related to water quality, fisheries, wildlife, nuisance aquatic vegetation control, recreation, and cultural resources.
- The staff's recommendation is to relicense the project with all but one of the protection, mitigation, and enhancement measures proposed by Alabama Power, along with some modifications by staff.
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f. Transmittal: This final EIS to relicense the existing Martin Dam Hydroelectric Project is being made available to the public on or about April 2, 2015, as required by the National Environmental Policy Act of 1969<sup>1</sup> and the Commission's Regulations Implementing the National Environmental Policy Act (18 C.F.R., Part 380).

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<sup>1</sup> National Environmental Policy Act of 1969, as amended (Pub. L. 91-190. 42 United States Code [U.S.C.] 4321-4347, January 1, 1970, as amended by Pub. L. 94-52, July 3, 1975, Pub. L. 94-83, August 9, 1975, and Pub. L. 97-258, §4(b), September 13, 1982).

## FOREWORD

The Federal Energy Regulatory Commission (Commission or FERC), pursuant to the Federal Power Act (FPA)<sup>2</sup> and the U.S. Department of Energy (DOE) Organization Act<sup>3</sup> is authorized to issue licenses for up to 50 years for the construction and operation of non-federal hydroelectric developments subject to its jurisdiction, on the necessary conditions:

That the project adopted...shall be such as in the judgment of the Commission will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for the use or benefit of interstate or foreign commerce, for the improvement and utilization of water power development, for the adequate protection, mitigation, and enhancement of fish and wildlife (including related spawning grounds and habitat), and for other beneficial public uses, including irrigation, flood control, water supply, and recreational and other purposes referred to in Section 4(e)...<sup>4</sup>

The Commission may require such other conditions not inconsistent with the FPA as may be found necessary to provide for the various public interests to be served by the project.<sup>5</sup> Compliance with such conditions during the licensing period is required. The Commission's Rules of Practice and Procedure allow any person objecting to a licensee's compliance or noncompliance with such conditions to file a complaint noting the basis for such objection for the Commission's consideration.<sup>6</sup>

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<sup>2</sup> 16 U.S.C. §791(a)-825r, as amended by the Electric Consumers Protection Act of 1986, Public Law 99-495 (1986), the Energy Policy Act of 1992, Pub. L. 102-486 (1992), and the Energy Policy Act of 2005, Pub. L. 109-58 (2005).

<sup>3</sup> Pub. L. 95-91, 91 Stat. 556 (1977).

<sup>4</sup> 16 U.S.C. § 803(a).

<sup>5</sup> 16 U.S.C. § 803(g).

<sup>6</sup> 18 C.F.R. § 385.206 (2012).





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## ACRONYMS AND ABBREVIATIONS

ACT Basin	Alabama-Coosa-Tallapoosa River Basin
Alabama DCNR	Alabama Department of Conservation and Natural Resources
Alabama DEM	Alabama Department of Environmental Management
ADROP	Alabama Drought Response Operating Proposal
Alabama Power	Alabama Power Company
APE	area of potential effects
BA	biological assessment
BLM	U.S. Bureau of Land Management
BMP	best management practices
°C	degrees Celsius
cfs	cubic feet per second
Commission	Federal Energy Regulatory Commission
Corps	U.S. Army Corps of Engineers
CRWG	Cultural Resources Work Group
CZMA	Coastal Zone Management Act
dbh	diameter at breast height
DO	dissolved oxygen
EA	environmental assessment
EIS	environmental impact statement
ESA	Endangered Species Act
°F	degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FIMS	Fishery Information Management Systems
FPA	Federal Power Act
FWS	U.S. Fish and Wildlife Service
Georgia EPD	Georgia Environmental Protection Division
HPMP	Historic Properties Management Plan
HSI	habitat suitability index
Interior	U.S. Department of Interior
kW	kilowatt
Lake Martin HOBO	Lake Martin Home Owners & Boat Owners Association
Lake Martin RA	Lake Martin Resource Association, Inc.
LIDAR	light detection and ranging
ug/L	micrograms per liter
mg/L	milligrams per liter
mgd	million gallons per day
ml	milliliters
msl	mean sea level
MW	megawatt
MWh	megawatt-hour
National Register	National Register of Historic Places

NERC	North American Electric Reliability Corporation
NTU	nephelometric turbidity unit
NWS	National Weather Service
O&M	operation and maintenance
PA	Programmatic Agreement
PMF	probable maximum flood
RM	river mile
SERC-SE	southeast subregion of the Southeast Reliability Corporation region of the NERC
SERFC	Southeast River Forecast Center
SHPO	State Historic Preservation Officer
SMP	Shoreline Management Plan
U.S.C.	U.S. Code
USDA	U.S. Department of Agriculture
USGS	U.S. Geological Survey
WMP	Wildlife Management Program
WQC	water quality certification

## **EXECUTIVE SUMMARY**

### **Proposed Action**

On June 8, 2011, Alabama Power Company (Alabama Power) filed an application for a new license to operate and maintain its 182.5-megawatt (MW) Martin Dam Hydroelectric Project, located at river mile 60.6 on the Tallapoosa River near the cities of Alexander City and Dadeville, Alabama, in Tallapoosa, Elmore, and Coosa Counties. The project occupies 1.39 acres of federal land administered by the U.S. Bureau of Land Management. Alabama Power proposes no new capacity and no new construction.

### **Project Description**

The existing project consists of: (1) the Lake Martin reservoir, with a surface area of 40,000 acres at a normal full pool elevation of 491 feet mean sea level (msl); (2) a 2,000-foot-long concrete gravity dam and earth dike section that includes a gated spillway section with twenty vertical lift spillway gates, non-overflow sections, and an intake structure; (3) four steel penstocks and intake gates fitted with trashracks; (4) a 307-foot-long, 58-foot-wide, and 99-foot-high brick and concrete, steel-frame powerhouse; (5) four vertical Francis turbines that power four generating units, with a total installed capacity of 182.5 MW; (6) two, 450-foot-long transmission lines leading from the powerhouse to the Martin switchyard; and (7) appurtenant facilities. The project generates about 375,614 megawatt-hours (MWh) per year.

The Martin Dam Project operates as a peaking project and typically operates to maintain elevations in Lake Martin between the bounds of a flood control curve and an operating curve. On a seasonal basis, water levels in Lake Martin can fluctuate by as much as 10 feet between elevations 481 and 491 feet msl. Project benefits include hydroelectric power; limited seasonal flood control during the winter when the reservoir is drawn down; recreation, municipal, and industrial water supply; aquatic flow maintenance; and navigation flow support.

### **Proposed Environmental Measures**

Alabama Power proposes to continue to operate the project in a peaking mode. The following modifications to project operation are proposed to ensure that Lake Martin reaches its summer pool level by the end of May each year, provide higher reservoir levels for recreation during the winter and fall, and facilitate seawall and boat dock maintenance: (1) raise the winter flood pool by 3 feet and the operating curve and drought curve proportionately during the same timeframe; (2) implement a conditional fall extension of the flood control curve to elevation 491 feet from September 1 to October 15; and (3) lower the reservoir elevation during the winter months to 481 feet every 6 years. In addition, Alabama Power proposes to implement the Tallapoosa portion of the Alabama Drought Response Operating Proposal, or ADROP, a regionally coordinated drought management plan that would guide operation of the project during low inflow or drought conditions.

Alabama Power also proposes the following, non-operational environmental measures to protect or enhance aquatic, terrestrial, recreation, and cultural resources:

- implement the measures of the Alabama Department of Environmental Management's (DEM) water quality certification, filed with the Commission on May 9, 2011, which requires maintaining the state standard for dissolved oxygen (DO) when the project is generating, and monitoring water temperature and DO in the tailrace;
- develop a reservoir water quality monitoring plan in consultation with the Alabama DEM prior to implementing the proposed 3-foot increase in the winter flood pool;
- finalize and implement a draft study of the distribution and abundance of American eels in the Tallapoosa River from the project tailrace to the mouth of the river;
- implement a new Wildlife Management Program (WMP) filed with the Commission on December 9, 2011;
- finalize a Nuisance Aquatic Vegetation and Vector Control Management Program filed with the Commission on June 8, 2011, to include a plan to monitor potential increases in nuisance aquatic vegetation in Lake Martin resulting from the proposed 3-foot increase in the winter pool;
- implement an updated Shoreline Management Plan (SMP) filed with the Commission on June 8, 2011;
- implement an updated Recreation Plan filed with the Commission on December 9, 2011;
- modify the project boundary to: add 991.4 acres to include existing project recreation facilities, correct a mapping error, and include the Martin Small Game Hunting Area; and remove 499.2 acres of project land not needed for project purposes, resulting in a net increase of 492.2 acres of land within the project boundary;<sup>7</sup>
- implement an updated Public Education and Outreach Plan, filed on December 9, 2011, to inform shoreline landowners and the public about protecting the Lake Martin shoreline; and
- develop and implement a new Historic Properties Management Plan (HPMP) as part of implementing a Programmatic Agreement (PA) executed on June 12, 2012.
- implement the Tallapoosa River portion of the Alabama Drought Response Operations Plan (ADROP) as filed with the Commission on August 13, 2013.

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<sup>7</sup> The area within the project boundary would be modified from 8,602 acres to 9,094 acres.

## **Public Involvement**

Before filing its license application, Alabama Power conducted pre-filing consultation under the Commission's Integrated Licensing Process. The intent of the Commission's pre-filing process is to initiate public involvement early in the project planning process and to encourage citizens, governmental entities, tribes, and other interested parties to identify and resolve issues prior to an application being formally filed with the Commission.

Before preparing this Environmental Impact Statement (EIS), staff conducted scoping to determine what issues and alternatives should be addressed. On August 5, 2008, staff distributed a scoping document to interested parties, soliciting comments, recommendations, and information on the project. Staff conducted an environmental site review on September 10, 2008 and held a scoping meeting on September 11, 2008. Based on discussions during the site visit, comments at the scoping meeting, and written comments filed with the Commission, staff issued a revised scoping document on November 14, 2008. On February 8, 2012, staff issued a notice that the application was ready for environmental analysis and requested conditions and recommendations. On June 6, 2013, the Commission staff issued a draft EIS, with comments on the draft EIS due August 13, 2013. On July 17, 2013, Commission staff held a public meeting in Alexander City, Alabama, which was attended by over 600 members of the public. The meeting was transcribed and is part of the public record. In addition, over 753 written comments were received from the public, as well as comments from Alabama Power and the resource agencies. All written comments filed on the draft EIS and made at the public meeting are addressed in the appropriate sections of this EIS, and are summarized in Appendix D.

## **Alternatives Considered**

This final environmental impact statement (EIS) considers the following alternatives: (1) Alabama Power's proposal, as outlined above; (2) no action, meaning that Alabama Power would continue to operate the project with no changes; and (3) staff's alternative. The staff alternative includes all but one of Alabama Power's proposed measures with some modifications or additions as described below. Staff's recommended modifications and additional environmental measures include, or are based on, recommendations made by federal and state resource agencies that have an interest in resources that may be affected by operation of the proposed project.

The staff alternative includes the following modifications or additions: (1) adjustments to Alabama Power's proposed changes to flood control gate operations to ensure continuation of the current level of coordination with U.S. Army Corps of Engineers (Corps) on flood management; (2) a review of the Corps' regulation manuals, once finalized, for consistency with the Tallapoosa River portions of ADROP, and filing a report of the findings along with any recommendations for modifying the aforementioned portions of ADROP to be consistent with the finalized manuals; (3)

revision of the proposed Nuisance Aquatic Vegetation and Vector Control Management Program to include specific protocols to conduct lake-wide surveys and to control nuisance aquatic vegetation; (4) revision of the Recreation Plan to require (a) a detailed description of the 19 project recreation sites and associated enhancements and (b) a provision to file a Recreation Monitoring Report concurrent with the filing of the FERC Form 80 that discusses recreational use and demand, associated project-related resource effects, and any additional measures or modifications to the project recreation sites that may be needed and a schedule for implementing such changes; and (5) revision of the SMP to include; (a) a provision to limit construction of new seawalls to instances where riprap and vegetation are not sufficient to protect shoreline habitat from erosion, (b) a description of the existing Dredging Permit Program to ensure coordination with other nearshore and shoreline activities, (c) a Shoreline Permitting Program specific to the Martin Dam Project instead of one general to all of Alabama Power's hydroelectric projects, (d) a provision to monitor project lands for unpermitted structures to protect project lands and waters, and (e) a provision to file Geographic Information System (GIS) maps of the project resources and land classifications to facilitate Commission oversight of the license.

The staff alternative does not include implementing a study of the distribution and abundance of American eels in the Tallapoosa River from the project tailrace to the mouth of the Tallapoosa River because eels do not reach the Martin Project and the proposed eel study would not inform passage requirements at the Martin Project. The staff alternative does not include the proposal to remove 373.1 acres of land from the project boundary because the lands that Alabama Power proposes to remove still serve project purposes for public access to project lands and water and protection of natural resources.

Under the no-action alternative, the project would continue to operate under the terms and conditions of the existing license, and no new environmental protection, mitigation, or enhancement measures would be implemented.

### **Environmental Impacts and Measures of the Staff Alternative**

The primary issues associated with relicensing the Martin Dam Project are regulation of the reservoir elevation, downstream flooding, drought releases, invasive species control, recreational opportunities, shoreline management, and protection of cultural resources. Below we summarize the environmental effects associated with staff's alternative and the measures recommended to address those effects.

#### *Geology and Soils*

Natural factors (e.g., wind) and near-shore activities (e.g., adjacent landowner lawn maintenance) results in some ongoing erosion and sedimentation around the reservoir. Implementing the provisions of the proposed SMP would reduce and control erosion and sedimentation at Lake Martin by promoting the use of best management practices and protecting a 30-foot strip of vegetation around the reservoir.



### *Aquatic Resources*

Raising the winter pool elevation by three feet could cause a decline in reservoir water quality. Water quality monitoring in Lake Martin would monitor for any negative effects on water quality in the impoundment, and continued water quality monitoring in the project tailrace would ensure that project releases continue to meet current state water quality standards.

Raising the winter pool elevation could improve habitat and growing conditions for nuisance aquatic vegetation. Implementing a Nuisance Aquatic Vegetation and Vector Management Program would provide a mechanism for determining if modifications to the reservoir pool elevation lead to increases in nuisance aquatic vegetation and, if so, developing strategies to control the nuisance vegetation

Drought conditions create competing demands on lake levels, stream flow requirements (including navigational releases), water supply, power generation, recreation, and other resources, at the project and in the Alabama, Coosa, and Tallapoosa River basin. Implementing the Tallapoosa portion of ADROP would provide a coordinated basin approach to system management to minimize the effects of drought on these resources.

### *Terrestrial Resources*

Alabama Power manages about 5,883 acres of longleaf habitat within the project boundary for wildlife and recreation. Implementing Alabama Power's WMP would enhance habitat for longleaf pine-dependent species, develop opportunities for public hunting, and protect bald eagles. Revising the SMP to keep the project lands that have been proposed for removal from the project boundary would better ensure that those lands continue to protect water quality and provide wildlife habitat.

### *Threatened and Endangered Species*

No federally listed threatened or endangered species are known to occur within the project affected area. However, habitat enhancement for longleaf pine-dependent species as part of the WMP could benefit red-cockaded woodpeckers by providing more suitable habitat in the project area. By letter filed with the Commission on July 25, 2013, the U.S. Fish and Wildlife Service concurred that relicensing the Martin Dam Project would not likely adversely affect any listed species.

### *Recreation Resources and Land Use*

In some drought years it has been difficult to reach the full summer pool elevation of 490 feet msl. Also, lowering the pool in winter has limited winter recreational opportunities for lake users, including shoreline residents. Increasing the winter flood control curve and operating guideline by three feet would improve the probability of reaching full summer pool in dry years and allow greater reservoir access and navigability for recreation in winter.

Implementing the increase in winter pool would reduce opportunities for sea wall and dock maintenance previously available during the lower water level conditions in the winter. Lowering the reservoir to an elevation at least as low as 481 feet msl in the winter once every six years would provide a predictable opportunity for repairs and maintenance of sea walls and docks.

Alabama Power begins lowering lake levels on September 1 to capture winter high flows. Lowering the lake level from 491 to 481 feet msl reduces recreation opportunities for residents and the public during the mild, fall weather by limiting dock access and exposing boating hazards. The conditional fall extension would maintain the summer lake level of 491 feet msl to as late as October 15, when there is adequate water available to avoid stress on other water users in the Tallapoosa River basin.

Alabama Power's initial modeling of the effect of raising the winter pool on downstream flooding indicated that flood elevations might increase sufficiently to affect structures and roads. Subsequent modeling indicates that the risk of any increased flooding is very small from raising the winter pool and even smaller from the conditional fall extension.

Implementing Alabama Power's Recreation Plan would continue to provide recreation at a total of 19 project recreation sites and enhance recreation by: (1) improving boat ramps; (2) adding two bank fishing sites; (3) improving parking areas; (4) continuing to provide for trash removal from the project recreation sites; and (5) reserving one site, Ponder Camp (Stillwaters Area Boat Ramp), for future recreation development. Two of the project recreation sites, Madwind Creek Ramp and Smith Landing, would be brought into project boundary as proposed by Alabama Power, ensuring that these facilities and associated public access are operated and maintained by Alabama Power over the term of a new license. Revising the Recreation Plan would improve recreation opportunities at the project and facilitate Commission oversight of the project recreation.

#### *Shoreline Management*

Intense and diverse use of the shoreline from residential, commercial, recreational, and other activities has the potential to severely impact water quality in Lake Martin. Implementing a revised SMP would protect project lands and waters by guiding the type and extent of development that occurs along the shoreline. A Public Education and Outreach Program would inform people of measures they can take to protect water quality in Lake Martin and inform them of requirements for shoreline management.

#### *Cultural Resources*

Potential project-related effects on cultural resources could occur under a new license. Developing an HPMP as part of implementing a PA would ensure protection of cultural resources.

## **Conclusions**

Based on our analysis, we recommend relicensing the project with the environmental, recreation, and cultural resource measures proposed by Alabama Power with staff modifications and additional measures.

In section 4.2 of the final EIS, staff estimated the likely cost of alternative power for each of the three alternatives identified above. Staff's analysis shows that, under the no-action alternative, project power would cost about \$45,109,387, or about \$120.10 per MWh, less than the likely alternative cost of power. Under the proposed action alternative, project power would cost about \$45,021,959, or about \$119.45/MWh, less than the likely alternative cost of power. Under the staff alternative, project power would cost about \$45,017,149, or about \$119.44/MWh, less than the likely alternative cost of power.

The staff alternative is the preferred alternative because: (1) the project would provide a dependable source of electrical energy for the region (376,903 MWh annually); (2) the 182.5 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; and (3) the recommended environmental measures proposed by Alabama Power, as modified by staff, would adequately protect and enhance environmental resources affected by the project.



# **FINAL ENVIRONMENTAL IMPACT STATEMENT**

Federal Energy Regulatory Commission  
Office of Energy Projects  
Division of Hydropower Licensing  
Washington, D.C.

## **Martin Dam Hydroelectric Project FERC Project No. 349-173--Alabama**

### **1.0 INTRODUCTION**

#### **1.1 APPLICATION**

On June 8, 2011, Alabama Power Company (Alabama Power) filed an application for new license for the existing Martin Dam Hydroelectric Project with the Federal Energy Regulatory Commission (Commission or FERC). The 182.5-megawatt (MW) project is located at river mile (RM) 60.6 on the Tallapoosa River near the cities of Alexander City and Dadeville, Alabama, in Tallapoosa, Elmore, and Coosa Counties (figure 1-1). The project occupies 1.39 acres of federal land administered by the U.S. Bureau of Land Management (BLM) and generates an average of about 375,614 megawatt-hours (MWh) of energy annually. Alabama Power proposes no new capacity and no new construction.

#### **1.2 PURPOSE OF ACTION AND NEED FOR POWER**

##### **1.2.1 Purpose of Action**

The purpose of the Martin Dam Project is to continue to provide a source of hydroelectric power. Therefore, under the provisions of the Federal Power Act (FPA), the Commission must decide whether to issue a license to Alabama Power for the Martin Dam Project and what conditions should be placed on any license issued. In deciding whether to issue a license for a hydroelectric project, the Commission must determine that the project will be best adapted to a comprehensive plan for improving or developing a waterway. In addition to the power and developmental purposes for which licenses are issued (such as flood control, irrigation, or water supply), the Commission must give equal consideration to the purposes of: (1) energy conservation; (2) the protection of, mitigation of damage to, and enhancement of fish and wildlife resources; (3) the protection of recreational opportunities; and (4) the preservation of other aspects of environmental quality.

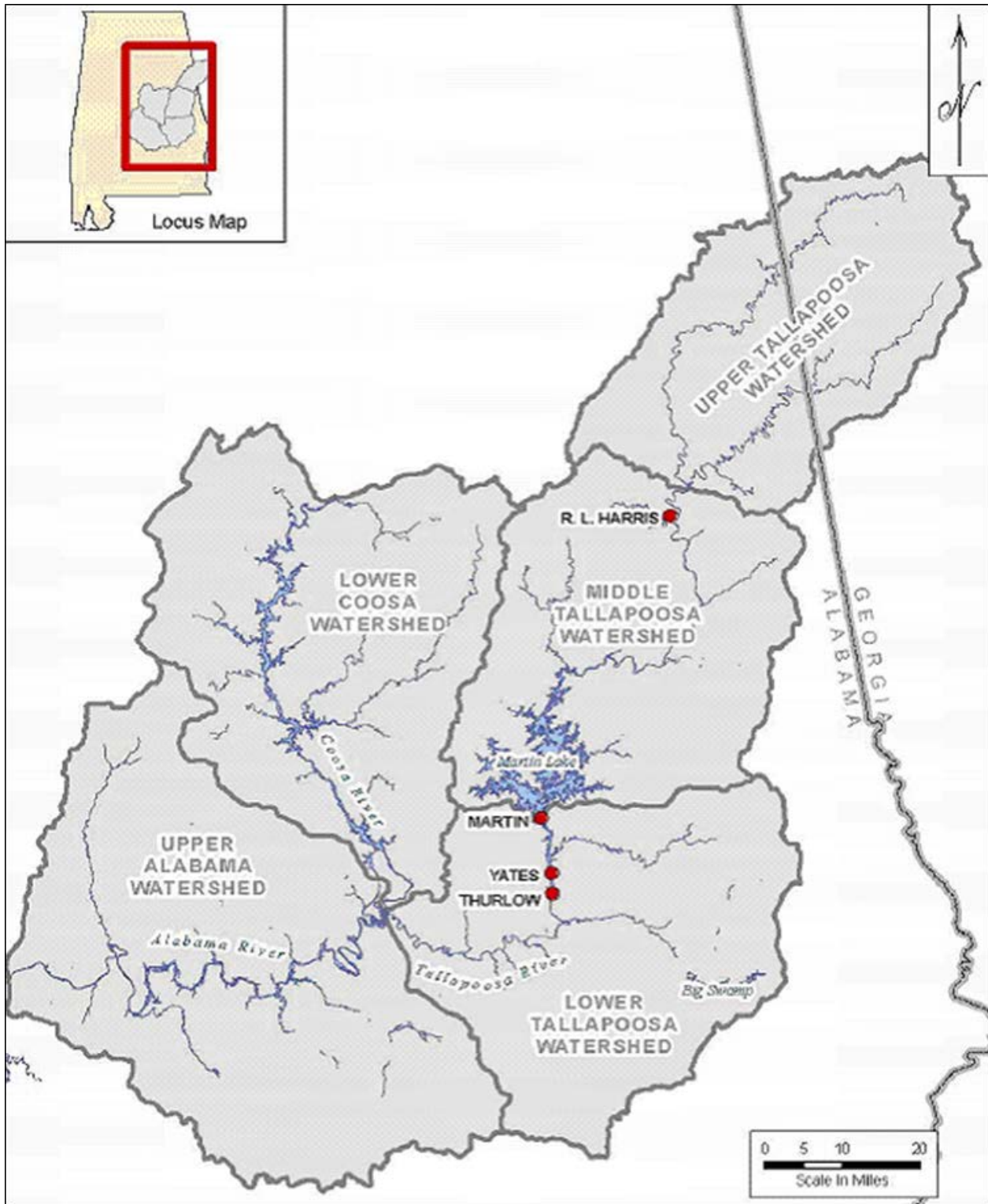


Figure 1-1. Location of Martin Dam Hydroelectric Project (Source: Alabama Power, 2008, as modified by staff).

Issuing a new license for the Martin Dam Project would allow Alabama Power to generate electricity for the term of a new license, making electrical power from a renewable resource available to its customers.

This final environmental impact statement (EIS) assesses the effects associated with operation of the project and alternatives to the proposed project. It also includes recommendations to the Commission on whether to issue a new license, and if so, recommends terms and conditions to become a part of any license issued.

In this final EIS we assess the environmental and economic effects of continuing to operate the project: (1) as proposed by the applicant, and (2) with our recommended measures. We also consider the effects of the no-action alternative. Important issues that are addressed include water quality, reservoir operations, downstream flow releases, fish passage, terrestrial resources, federally listed species, recreation resources, and cultural resources.

### **1.2.2 Need for Power**

The Martin Dam Project provides hydroelectric generation to meet part of Alabama's power requirements, resource diversity, and capacity needs. The project has an installed capacity of 182.5 MW and generates about 375,614 MWh per year.

The North American Electric Reliability Corporation (NERC) annually forecasts electrical supply and demand nationally and regionally for a 10-year period. The Martin Dam Project is located in the Southeast Reliability Corporation (SERC) region of NERC, in the southeast sub-region (SERC-SE), which covers portions of Alabama, Georgia, Mississippi, and Florida. In the SERC region, the average annual growth rate for peak energy demand over the last 10-year period (2004-2013) has been 1.91 percent per year. The projected growth rate for peak energy demand for the next 10-year period (2014-2023) is 1.33 percent per year. Over the next 10 years the demand for peak energy in the SERC region is projected to increase by 6,918 MW and SERC estimates that additional capacity will be needed to maintain reliability.

We conclude that power from the Martin Dam Project would help meet a need for power in the SERC, both short and long term. The project provides low-cost power that displaces generation from non-renewable sources. Displacing the operation of non-renewable facilities may avoid some power plant emissions, thus creating an environmental benefit.

## **1.3 STATUTORY AND REGULATORY REQUIREMENTS**

A license for the Martin Dam Project is subject to numerous requirements under the FPA and other applicable statutes. The major regulatory requirements are summarized in table 1-1 and described below.

Table 1-1. Major statutory and regulatory requirements for the Martin Dam Hydroelectric Project (Source: staff).

<b>Requirement</b>	<b>Agency</b>	<b>Status</b>
Section 18 of the FPA (fishway prescriptions)	U.S. Department of the Interior (Interior)	By letter filed April 6, 2012, Interior reserved its authority to prescribe fishways during the term of any license issued for the project.
Section 10(j) of the FPA	Interior	Interior provided section 10(j) recommendations on April 5, 2012.
Clean Water Act—water quality certification	Alabama Department of Environmental Management (Alabama DEM)	Alabama DEM issued water quality certification on May 9, 2011.
Endangered Species Act Consultation	U.S. Fish and Wildlife Service	By letter dated July 19, 2013, FWS concurred that relicensing of the project would not likely adversely affect any listed species.
Coastal Zone Management Act Consistency	Alabama Coastal Area Management Program	By letter dated February 10, 2011, Alabama DEM concluded that the Martin Dam Project is outside of Alabama’s coastal zone and is therefore not subject to coastal zone review.
National Historic Preservation Act	Advisory Council on Historic Preservation; Alabama State Historic Preservation Officer (Alabama SHPO)	A final Programmatic Agreement was executed by Commission staff and the Alabama SHPO on June 12, 2012. Alabama Power, the Poarch Band of



Requirement	Agency	Status
		Creek Indians, and the Alabama-Coushatta Tribe of Texas concurred.

### 1.3.1 Federal Power Act

#### 1.3.1.1 Section 18 Fishway Prescriptions

Section 18 of the FPA states that the Commission is to require construction, operation, and maintenance by a licensee of such fishways as may be prescribed by the Secretaries of Commerce or Interior. Interior, by letter dated April 5, 2012, requests that a reservation of authority to prescribe fishways under section 18 be included in any license issued for the project.

#### 1.3.1.2 Section 10(j) Recommendations

Under section 10(j) of the FPA, each hydroelectric license issued by the Commission must include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, or enhancement of fish and wildlife resources affected by the project. The Commission is required to include these conditions unless it determines that they are inconsistent with the purposes and requirements of the FPA or other applicable law. Before rejecting or modifying an agency recommendation, the Commission is required to attempt to resolve any such inconsistency with the agency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency.

Interior timely filed, on April 6, 2012, recommendations under section 10(j), as summarized in table 5-2, in section 5.4, *Fish and Wildlife Agency Recommendations*. Interior's comments on the draft EIS, filed on August 13, 2013, requested a modification of one of its recommendations. In section 5.4, we also discuss how we address the agency recommendations and compliance with section 10(j).

### 1.3.2 Clean Water Act

Under section 401 of the Clean Water Act, a license applicant must obtain certification from the appropriate state pollution control agency verifying compliance with the Clean Water Act. On May 10, 2010, Alabama Power applied to the Alabama Department of Environmental Management (DEM) for 401 water quality certification (WQC) for the Martin Dam Project. Alabama DEM received this request on May 11, 2010. Alabama DEM timely issued the section 401 WQC on May 9, 2011 (letter from G.L. Dean, Chief, Water Division, Alabama DEM, Montgomery, Alabama, to M. Godfrey, Manager, Environmental Compliance, Alabama Power, Birmingham, Alabama,

May 9, 2011). The conditions of the certification are described under section 2.2.4, *Modifications to Applicant's Proposal—Mandatory Conditions*.

### **1.3.3 Endangered Species Act**

Section 7 of the Endangered Species Act (ESA) requires federal agencies to ensure that their actions are not likely to jeopardize the continued existence of endangered or threatened species or result in the destruction or adverse modification of the critical habitat of such species. Four mussel species, two fish species, two plant species, and one avian species are listed as threatened, endangered, or candidate species under the ESA could potentially occur within the project affected area. This includes the Alabama moccasinshell, ovate clubshell, finelined pocketbook, and southern clubshell; the Gulf sturgeon and the Alabama sturgeon; little amphianthus and Georgia Rockcress; and the red-cockaded woodpecker. No federally listed species or candidate species are known to occur within the project boundary of the Martin Dam Project (letter from J. Stanley, Regional Environmental Protection Assistant, Office of the Secretary, U.S. Department of the Interior, Atlanta, Georgia, to Kimberly Bose, Secretary, FERC, Washington, D.C., April 6, 2012). Although no occupied habitat currently occurs within the project boundary, the applicant proposes to enhance existing habitat for the federally listed, endangered red-cockaded woodpecker, which could benefit the species. Our analyses of project effects on threatened and endangered species are presented in section 3.3.4, *Threatened and Endangered Species*. Our recommendations are presented in section 5.2, *Comprehensive Development and Recommended Alternative*.

We conclude that relicensing of the Martin Dam Project, as proposed with staff-recommended measures, would have no effect on the Alabama moccasinshell, the ovate clubshell, finelined pocketbook, southern clubshell, the Gulf sturgeon, and the Alabama sturgeon, little amphianthus, and Georgia Rockcress because these species are not known to be located in the area affected by project operation. We conclude that relicensing of the Martin Dam Project, as proposed with staff-recommended measures, is not likely to adversely affect the federally listed endangered red-cockaded woodpecker.

By letter dated July 19, 2013, FWS indicated that it concurred with FERC's determination that relicensing of the Martin Dam Project, as proposed with staff-recommended measures, would not likely adversely affect the Alabama moccasinshell, ovate clubshell, finelined pocketbook, southern clubshell, Gulf sturgeon, Alabama sturgeon, little amphianthus, Georgia rockcress, or the red-cockaded woodpecker.

### **1.3.4 Coastal Zone Management Act**

Under section 307(c)(3)(A) of the Coastal Zone Management Act (CZMA), 16 U.S.C. § 1456(3)(A), the Commission cannot issue a license for a project within or affecting a state's coastal zone unless the state CZMA agency concurs with the license applicant's certification of consistency with the state's CZMA program, or the agency's concurrence is conclusively presumed by its failure to act within 180 days of its receipt of the applicant's certification.

The project is not located within the state-designated Coastal Management Zone, which extends inland to the continuous 10-foot elevation contour in Baldwin and Mobile Counties. The project is located more than 160 miles inland from this zone, and it would not affect Alabama's coastal resources. Therefore, the project is not subject to Alabama's coastal zone program review, and no consistency certification is needed for the action. By letter dated February 10, 2011, Alabama DEM concurred with this determination.

### **1.3.5 National Historic Preservation Act**

Section 106 of the National Historic Preservation Act requires that every federal agency "take into account" how each of its undertakings could affect historic properties. Historic properties are districts, sites, buildings, structures, traditional cultural properties, and objects significant in American history, architecture, engineering, and culture that are eligible for inclusion in the National Register of Historic Places (National Register).

To meet the requirements of section 106, we executed a Programmatic Agreement (PA) with the Alabama State Historic Preservation Officer (SHPO) on June 12, 2012, and invited Alabama Power, the Poarch Band of Creek Indians, Alabama-Coushatta Tribe of Texas, Alabama-Quassarte Tribal Town, Kialegee Tribal Town of the Muscogee (Creek) Nation, Thlopthlocco Tribal Town, and BLM to concur with the stipulations of the PA. Alabama Power, the Poarch Band of Creek Indians, and Alabama-Coushatta Tribe of Texas concurred. The terms of the PA ensure that Alabama Power addresses and treats all historic properties identified within the project's area of potential effects (APE) through development and implementation of a Historic Properties Management Plan (HPMP).

## **1.4 PUBLIC REVIEW AND COMMENT**

The Commission's regulations (18 C.F.R., sections 5.1–5.16) require that applicants consult with appropriate resource agencies, tribes, and other entities before filing an application for a license. This consultation is the first step in complying with the Fish and Wildlife Coordination Act, the ESA, the National Historic Preservation Act, and other federal statutes. Pre-filing consultation must be complete and documented according to the Commission's regulations.

### **1.4.1 Scoping**

Before preparing this EIS, we conducted scoping to determine what issues and alternatives should be addressed. A scoping document was distributed to interested agencies and others on August 5, 2008. It was noticed in the Federal Register on August 11, 2008. Two scoping meetings, both advertised in the *Montgomery Advertiser* (August 14, 2008), were held on September 11, 2008, in Alexander City, Alabama, to request oral comments on the project. A court reporter recorded all comments and statements made at the scoping meetings, and these are part of the Commission's public record for the

project. In addition to comments provided at the scoping meetings, the following entities provided written comments:

<u>Commenting Entity</u>	<u>Date Filed</u>
American Rivers and Alabama Rivers Alliance	October 10, 2008
World Wildlife Fund, Inc.	October 13, 2008
Lake Martin Home Owners & Boat Owners Association	October 13, 2008
Lake Martin Resource Association, Inc.	October 13, 2008
James K. Lanier	October 14, 2008
State of Georgia	October 10, 2008
Alabama Department of Conservation and Natural Resources	October 10, 2008, and October 1, 2008
U.S. Department of the Interior	October 2, 2008
Lake Wedowee Property Owners Association	October 10, 2008

A revised scoping document, addressing these comments, was issued on November 14, 2008.

#### **1.4.2 Interventions**

On February 8, 2012, the Commission issued a notice that Alabama Power had filed an application to relicense the Martin Dam Project. This notice set April 9, 2012, as the deadline for filing protests and motions to intervene. In response to the notice, the following entities filed motions to intervene:

<u>Intervenor</u>	<u>Date Filed</u>
U.S. Department of the Interior	March 15, 2012
Alabama Department of Conservation and Natural Resources	April 6, 2012
Alabama Rivers Alliance	April 6, 2012
American Rivers <sup>a</sup>	April 6, 2012

<u>Intervenor</u>	<u>Date Filed</u>
Downstream Landowners <sup>8</sup>	April 6, 2012
Lake Martin Resource Association, Inc.	April 6, 2012
World Wildlife Fund, Inc.	April 6, 2012
Atlanta Regional Commission <sup>a</sup>	April 9, 2012
Georgia Environmental Protection Division	April 9, 2012
Lake Martin Home Owners & Boat Owners Association	April 9, 2012

<sup>a</sup> Intervention in opposition.

### 1.4.3 Comments on the Application

A notice requesting conditions and recommendations was issued on February 8, 2012. The following entities commented:

<u>Commenting Agency and Other Entity</u>	<u>Date Filed</u>
Alabama-Coushatta Tribe of Texas	March 29, 2012
U.S. Department of the Interior	March 30, 2012 and April 6, 2012
Alabama Rivers Alliance	April 6, 2012
American Rivers	April 6, 2012
Downstream Landowners	April 6, 2012
World Wildlife Fund, Inc.	April 6, 2012
Atlanta Regional Commission	April 9, 2012
Georgia Environmental Protection Division	April 9, 2012
Lake Martin Home Owners & Boat Owners	April 9, 2012

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<sup>8</sup> The Downstream Landowners include the following 19 landowners, farmers, and businesses: Euel A. Screws, Jr.; W. Thomas Dozier III; W. T. Dozier Farm, Inc.; Parmer G. Jenkins; R. Shepherd Morris, Sr.; Morris & Morris Farms, Inc.; Daniel G. Taylor; Mark B. Taylor; Carl E. Taylor; Milstead Farm Group, Inc.; Dale M. Taylor; Jimmy M. Dozier; Judy P. Bryan; Auttossee Plantation; L. A. Wisener; Howard T. Weir, III; Anne Weir; Charles E. Herron, Jr.; and Rock Springs Land & Timber, Inc.

<u>Commenting Agency and Other Entity</u>	<u>Date Filed</u>
Association	
Lake Martin Resource Association, Inc.	April 9, 2012
U.S. Army Corps of Engineers	April 9, 2012
Coosa River Paddling Club	May 10, 2012
State of Alabama Office of Water Resources	May 23, 2012
Lake Martin Resource Association, Inc.	May 24, 2012
Alabama Rivers Alliance and American Rivers	June 6, 2012

The applicant filed reply comments on May 23, 2012.

#### **1.4.4 Comments on the Draft Environmental Impact Statement**

On June 6, 2013, we issued a draft EIS for the relicensing of the Martin Dam Project. Comments on the draft EIS were due on August 13, 2013. On July 17, 2013, we held a public meeting in Alexander City, Alabama, for the purpose of summarizing our recommendations in the draft EIS and discussing and receiving comments on the draft EIS. Over 600 members of the public attended the meeting, of which 37 spoke on the public record. In addition, over 753 written comments were filed.

The following entities filed written comments:

<b>Commenting Entity</b>	<b>Date Filed</b>
Over 753 individuals with an interest in Lake Martin Recreation Resources	7/5/2013 – 8/13/2013
State of Georgia	8/13/2013
Atlanta Regional Commission	8/13/2013
Alabama Office of Water Resources	8/12/2013
Alabama Department of Conservation and Natural Resources	8/13/2013
Alabama Historical Commission	8/21/2013
Robert Bentley, Governor of the State of Alabama	8/14/2013
Senator Richard Shelby C. Shelby	8/29/2013
Congressman Mike Rogers, 3rd District, Alabama	8/12/2013
Euel Screws and Thomas Dozier	7/31/2013, 8/7/2013, 8/13/2013

Lake Martin HOBOS - Dave Heinzen	8/12/2013
Lake Martin HOBOS - Jesse Cunningham	8/13/2013
Lake Watch of Lake Martin - Kathryn Braund	8/14/2013
Lake Martin Resource Association - Steve Forehand	8/13/2013
Conservation Groups	8/13/2013
U.S. EPA, Region 4	8/20/2013
U.S. Department of Interior	8/13/2013
U.S. Army Corps of Engineers	8/12/2013
Mark Stirling, Auburn, AL	8/5/2013
William K. Haynes, Dadeville, AL	8/5/2013





## 2.0 PROPOSED ACTION AND ALTERNATIVES

### 2.1 NO-ACTION ALTERNATIVE

The no-action alternative is the baseline from which to compare the proposed action and all action alternatives that are assessed in the environmental document. Under the no-action alternative, the project would continue to operate under the terms and conditions of the current license. Thus, the no-action alternative would include the existing facilities and current project operation.

#### 2.1.1 Existing Project Facilities

Martin dam impounds about 31 miles of the Tallapoosa River, forming Lake Martin reservoir (Lake Martin), a 41,150-acre reservoir when at a normal full pool elevation of 491 feet mean sea level (msl)<sup>9</sup> with: (1) 880 miles of shoreline; (2) a gross storage capacity of 1,622,000 acre-feet; and (3) active storage of 1,381,077 acre-feet at 45.5 feet of drawdown.

The existing project consists of: (1) Lake Martin reservoir; (2) an approximately 2,255-foot-long concrete gravity dam and earth dike section that includes (a) a 720-foot-long gated spillway section with twenty, 30-foot-wide by 16-foot-high vertical lift spillway gates, (b) a 280-foot-long concrete gravity intake structure, (c) a 255-foot-long concrete gravity non-overflow section on the right abutment, and (d) an approximately 1,000-foot-long earth embankment on the left abutment; (3) headworks containing four steel penstocks and twelve, 9-foot-wide by 24-foot-high intake gates fitted with trashracks; (4) a 307-foot-long, 58-foot-wide, and 99-foot-high brick and concrete, steel-frame powerhouse; (5) four vertical Francis turbines that power four generating units, with installed capacities of 45.8 MW, 41.0 MW, 40.5 MW, and 55.2 MW, for a total installed capacity of 182.5 MW; (6) two, 450-foot-long transmission lines leading from the powerhouse to the Martin switchyard; and (7) appurtenant facilities. The project generates about 375,614 MWh per year.

The project boundary, which includes about 49,752 acres of land,<sup>10</sup> generally follows the 491-foot msl elevation contour line around the reservoir. In addition to the reservoir, the project boundary encompasses the project dam, powerhouse, switchyard, transmission lines, and 12 existing project recreation sites (Anchor Bay Marina, Camp Alamisco, Camp ASCCA, DARE Boat Landing, DARE Power Park, Kamp Kiwanis,

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<sup>9</sup> For consistency throughout this draft EIS, elevations are provided in msl. In some documents associated with the license application, however, elevations are given in Martin Datum, which is 1-foot lower than msl.

<sup>10</sup> Out of 49,752 acres of land within the project boundary, 41,150 acres are inundated by the reservoir.

Maxwell Gunter AFB Recreation Area, Parker Creek Marina, Pleasure Point Park and Marina, Real Island Marina and Campground, Scenic Overlook, and Union Ramp). Alabama Power has flood easements for the entire length of the shoreline up to the 491-foot contour, and on some lands above that elevation.

### **2.1.2 Project Safety**

The project has been operating for more than 85 years under the existing and previous licenses. During this time, we have conducted operational inspections focusing on the continued safety of the structures, identification of unauthorized modifications, efficiency and safety of operations, compliance with the terms of the license, and proper maintenance. In addition, the project has been inspected and evaluated every 5 years by an independent consultant, and a consultant's safety report has been submitted for Commission review.

As part of the relicensing process, we would evaluate the continued adequacy of the proposed project facilities under a new license. Special articles addressing project safety would be included in any license issued, as appropriate. We would continue to inspect the project during the new license term to ensure continued adherence to Commission-approved plans and specifications, special license articles relating to construction (if any), operation and maintenance (O&M), and accepted engineering practices and procedures.

### **2.1.3 Existing Project Operation<sup>11</sup>**

The Martin Dam Project operates as a peaking project using a multi-purpose storage reservoir (Lake Martin). On a seasonal basis, water levels in Lake Martin fluctuate by as much as 10 feet between elevations 481 and 491 feet. Project benefits, as identified in the original project license include hydroelectric power; limited seasonal flood control when the reservoir is in drawdown condition; recreation, municipal and industrial water supply; and navigation flow support.

The project typically generates power Monday through Saturday to meet peak power demands. During generation, the four turbines release a flow of up to about 17,900 cubic feet per second (cfs). Hours of generation each day depend principally on reservoir inflows that can vary substantially between wet and dry periods of the year. During the wetter periods (normally December through April), the project usually generates 8 to 12 hours daily on weekdays and 5 to 7 hours on Saturday. The project does not typically generate on Sunday. During the drier periods (normally May through

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<sup>11</sup> This section identifies operation measures that are currently being implemented by Alabama Power and does not necessarily describe all measures required by the current license.

November), daily generation is typically reduced to 4 to 6 hours Monday through Saturday with little or no generation on Sundays.

Releases from the Martin Dam Project are made directly into the 2,000-acre reservoir of the Yates development.<sup>12</sup> The 45.5-MW Yates powerhouse has a hydraulic capacity of about 12,400 cfs. Releases from Yates pass directly into the 574-acre reservoir of the Thurlow development. The 85.0-MW Thurlow powerhouse has a hydraulic capacity of about 13,200 cfs. Thus, the entire river from the Martin Dam Project to Thurlow dam is impounded. Downstream of Thurlow dam, the Tallapoosa River flows 49.7 miles before reaching the confluence with the Coosa River to form the Alabama River.

Alabama Power uses three guide curves to guide operations for the Martin Dam Project (figure 2-1): (1) a flood control curve, (2) an operating curve, and (3) a drought curve.<sup>13</sup> Details of these curves are provided below.

### **Flood Control Gate Operation**

The flood control curve (upper curve in figure 2-1) reflects the maximum elevation at which the lake is normally maintained in the interest of flood control. During the winter months, a 10-foot-drawdown (from 491 feet to 481 feet) provides storage capacity in the reservoir to be used to control floods. On January 1, the curve is at elevation 481 feet and remains at this elevation until February 17. On this date, the curve rises until it reaches elevation 491 feet on April 28. The curve remains at this elevation until September 1, and is gradually lowered 10 feet to elevation 481 feet by December 31. It remains at that elevation until filling begins on February 17.

Alabama Power generally has fee interests on lands up to elevation 491 feet; thus the project is operated to never exceed elevation 491 feet. At times when the reservoir is below elevation 491 feet, Alabama Power has the ability to store floodwater to help control high river flow events. In order to restore flood storage capacity, after flood flows recede, Alabama Power lowers the lake elevation to, or below, the flood control curve elevation for that time of year.

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<sup>12</sup> The Yates and Thurlow developments are licensed to Alabama Power as Project No. 2407. 66 FERC ¶ 62,068 (1994).

<sup>13</sup> Both the flood control and operating curves are included in the current license for the project. The drought curve is not a license requirement, but has served as a guide to addressing recent drought concerns.

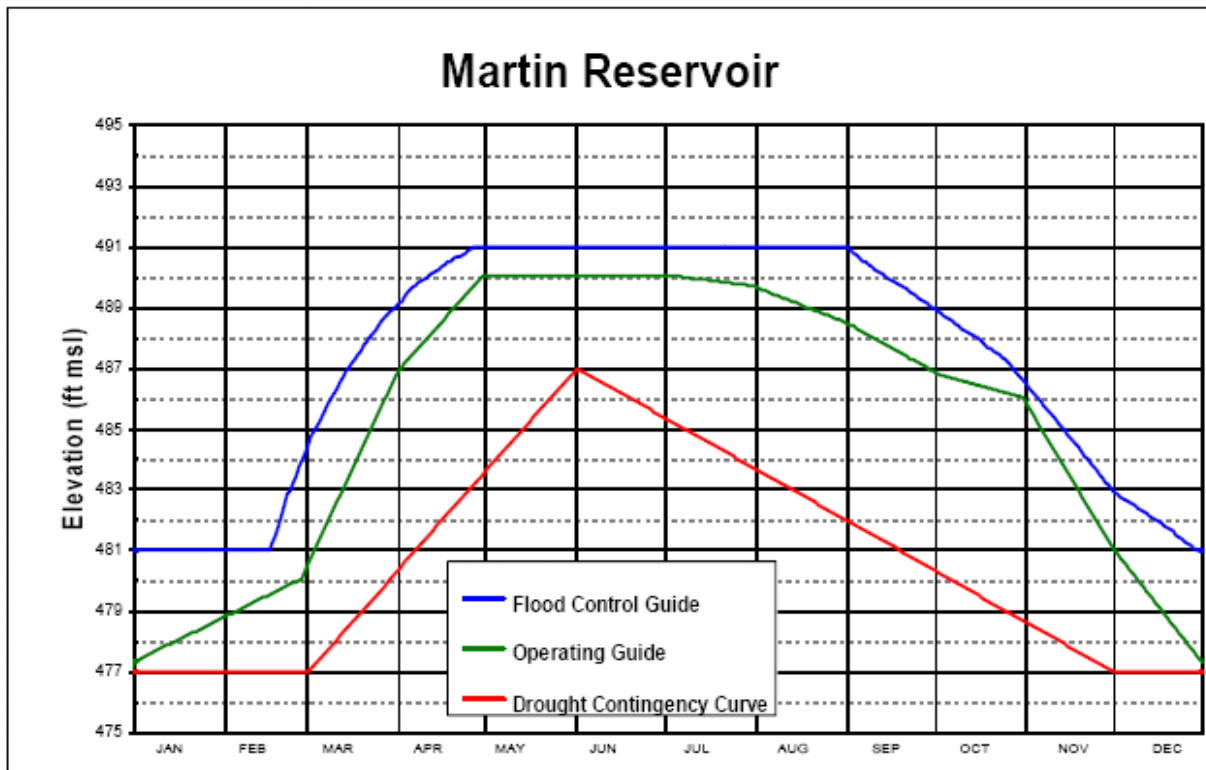


Figure 2-1. Existing guide curves for the Martin Dam Project (Source: Alabama Power, 2008).

The current license states that flood control operations are set forth in Alabama Power’s revised Exhibit H dated January 12, 1973, as amended November 16, 1978. As described in Exhibit H, when the inflow to the reservoir causes the Lake Martin elevation to exceed the flood curve, the plant is operated in the following manner:

1. Between elevations 481 and 486 feet, the turbines at Martin dam are operated to provide a continuous outflow from Thurlow dam of a volume at least equal to the hydraulic capacity of the turbines at Yates dam.
2. Between elevations 486 and 489 feet, the turbines at Martin dam are operated to provide continuous outflow from Thurlow dam of a volume at least equal to the plant hydraulic capacity at Thurlow dam.
3. Above elevation 489 feet, the turbines at Martin dam are operated as in #2 above and further, if required to avoid the water level rising above elevation 491 feet, the turbines are operated to provide a volume of outflow from Martin dam at least equal to the discharge from all available turbine units operating at full gate (approximately 17,900 cfs). In addition, gates are raised so that the reservoir does not exceed elevation 491 feet, although the reservoir level may increase after all gates are raised if inflow exceeds the gate capacity. At elevation 491 feet, the spillway has a discharge capacity of approximately 133,000 cfs.

Exhibit H further requires coordination with the U.S. Army Corps of Engineers (Corps). Exhibit H states,

“During flood periods, communications will be maintained with the Weather Bureau’s River Forecast Center, Atlanta, Georgia, and the Corps of Engineers, and if greater flood control benefits can be attained through increased coordination of operations at Tallapoosa and Coosa River dams, and increased coordination with the Corps of Engineers’ downstream Alabama River dams than would be attained through use of the above flood control procedures, then these procedures will be modified as mutually agreed to verbally by the Corps of Engineers and Alabama Power Company.”

### **Normal Flow Operation**

The middle curve shown in figure 2-1 is the operating curve.<sup>14</sup> The area between the flood curve and the operating curve represents the range in which Alabama Power operates the Martin Dam Project under normal flow conditions. Alabama Power tries to maintain water levels at or near the upper end of this operating range<sup>15</sup> to optimize project benefits and to maintain a higher likelihood of being able to refill the lake to near full pool (i.e., 491 feet) each summer.

Exhibit H requires Alabama Power to submit a report to the Commission and Lake Martin Resource Association, Inc. (Lake Martin RA) when the reservoir is at or below 487 feet for 7 days, June 1 through Labor Day, and 2 feet below the operating curve for 7 days, Labor Day through May 31. During such an event, discharges are restricted to those that are necessary to fulfill requirements that include critical electrical system

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<sup>14</sup> The operating curve was developed in the 1970s through discussions with homeowner and boat owner groups who desired a higher pool elevation with less seasonal fluctuation than had been experienced historically. Under the original license issued in 1923, Alabama Power often operated the project in a manner that lowered the lake 20 or more feet below elevation 491 feet. During relicensing in the 1970s (the license was issued in 1975, with an amendment in 1978), Alabama Power and certain stakeholders agreed to change the operation of the project so that a higher pool elevation could be maintained during normal project operations.

<sup>15</sup> During a recent court case before the Supreme Court of Alabama, brought by the Downstream Landowners (2009 WL 153932 [Ala.]), an Alabama Power representative testified that, beginning in 1989, Alabama Power has been maintaining Lake Martin at 0.5-foot below the full-pool level (490.5 feet) during the summer months, to provide 0.5-foot of storage for flood control and other purposes. This mode of operation, however, has been voluntary and is not a requirement of the current license.

needs, downstream flow augmentation for navigation, water quality, fish and wildlife, and municipal/industrial water supply purposes.

### **Low Flow Operations**

The lower curve on figure 2-1 is the drought curve, which provides an indication of impending hydrologic drought conditions. During the 1990s, Alabama Power developed drought curves for each of its hydroelectric projects, including the Martin Dam Project.<sup>16</sup> The intent of the curves is to provide notification when the reservoirs are in drought conditions, rather than to dictate operations. The drought curve is used as one of several factors in evaluating drought reservoir operations. The curve was developed based on drought conditions that occurred in 1986 and in 1988.

In the recent droughts of 2000 and 2007, reservoir operations (i.e., releases from the project) did not change immediately when Lake Martin fell below the drought curve, but the drought curve was one of several factors used in planning reservoir operations in coordination with Alabama Power's other reservoirs in the Alabama-Coosa-Tallapoosa River Basin (ACT Basin). In addition, Alabama Power has modified the flood curve and releases, after temporary amendments to its license, in response to drought conditions. Specifically, Alabama Power filed for, and was granted by the Commission, three temporary amendments to its flood curve to operate Lake Martin at a 3-foot-higher winter pool from November 20 to January 15, with refilling of the reservoir to begin on January 15 instead of February 17, due to drought conditions.<sup>17</sup> These variances occurred in the winter of 2007, 2009, and 2011. The temporary amendments also granted Alabama Power permission to reduce the minimum flow downstream of Thurlow dam, from 1,200 cfs to as low as 350 cfs, depending on flows in the downstream Alabama River.

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<sup>16</sup> The development of drought curves for Alabama Power's projects was prompted by a comprehensive study of the ACT Basin, conducted by the states of Alabama, Georgia, and Florida as part of an ongoing water rights dispute among the three states. As part of the study, reservoir simulation models were developed for the Corps' and Alabama Power's projects in the ACT Basin. These simulation models needed criteria for decision logic on how and when releases would be made from reservoirs under drought conditions. Alabama Power prepared these drought curves for Alabama Power's projects as part of this modeling effort.

<sup>17</sup> See *Alabama Power Company*, Order Granting Temporary Amendment to Rule Curve, 121 FERC ¶ 62,129, November 20, 2007; Order Granting Temporary Amendment to Rule Curve, 126 FERC ¶ 62,104, issued February 11, 2009; and Order Granting Temporary Amendment to Rule Curve, 134 FERC ¶ 62,067, January 24, 2011.

## **2.1.4 Additional Operation Measures for the Martin Dam Project**

### **Minimum Flows**

The current license for the Martin Dam Project has no minimum flow requirement. However, the project is operated in a manner to provide flows necessary to meet minimum flow requirements at the Thurlow development of Alabama Power's downstream Yates and Thurlow Project No. 2407. Flows immediately downstream of the Martin Dam Project typically range from leakage<sup>18</sup> to approximately 17,900 cfs. Alabama Power operates the Yates and Thurlow developments as run-of-river, with limited re-regulating capacity for the peaking releases from Martin dam,<sup>19</sup> thus flows downstream of Yates and Thurlow largely reflect the releases from Martin dam. Article 401 of the 1994 license for the Yates and Thurlow Project, requires Alabama Power to provide a continuous 1,200-cfs minimum flow release from the Thurlow powerhouse, as measured immediately downstream of Thurlow dam. The minimum flow protects aquatic resources including water quality and aquatic habitat in the downstream riverine reach. Releases from Martin dam are necessary to meet the 1,200-cfs minimum flow requirement at the Thurlow development, except during periods of high local inflow. There are procedures in the Yates and Thurlow license that allow reduction of the minimum flow requirement at Thurlow dam whenever inflows to the Yates and Thurlow Project (i.e., releases from Martin dam) are abnormally low. Alabama Power has generally met the 1,200-cfs minimum flow requirement. However, during periods of extreme drought, such as in 2007, 2009, and 2011, the minimum flow was reduced to as little as 350 cfs for a portion of those years, after variances were approved by the Commission.

### **Navigation Flows**

Standard article 12 of the current license for the Martin Dam Project requires Alabama Power to release water from the project reservoir as the Corps may prescribe in the interest of navigation. Alabama Power entered into an agreement with the Corps on April 18, 1972. The agreement specifies flows needed from both the Tallapoosa River and Coosa River to provide for navigation on the Alabama River. The navigation flow in the agreement is based on the estimated 7Q10 flow for the Alabama River in the Montgomery area. The navigation release is measured at the Montgomery flow gage and provides a 9-foot navigation channel depth and an 8,500 cfs flow below the Claiborne

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<sup>18</sup> The amount of leakage is difficult to estimate because the Yates impoundment is immediately downstream of Martin dam.

<sup>19</sup> Impoundment fluctuations in the Yates and Thurlow impoundments are limited to 3.5 feet and 1-foot, respectively. Because the impoundments are small, such fluctuations provide limited storage capacity.

lock and dam on the Alabama River, about 240 miles downstream of the confluence of the Coosa and Tallapoosa Rivers. The 1972 agreement specifies a combined release from Bouldin/Jordan and Thurlow dams as follows:<sup>20</sup>

- A continuous minimum 7-day average release of not less than 4,640 cfs, as measured at the USGS Montgomery flow gage on the Alabama River.<sup>21</sup>
- In January 1980, Alabama Power agreed to provide at least 2,667 cfs during any consecutive 3-day period. This would eliminate periods of little or no flow and more evenly distribute the required 7-day total flow.

Since 1972, there have been several occasions during droughts (1986, 1988, and 2007) when the 4,640-cfs navigation flow has been reduced after agreement with the Corps. A July 2007 environmental assessment (EA) prepared by the Corps concluded that the 4,640 cfs navigation flow would be adequate to protect environmental resources (and navigation), and that under extreme drought conditions, a 20-percent reduction to 3,712 cfs would result in no significant adverse environmental impact. Accordingly, a temporary reduction to 3,712 cfs was approved by the Corps and implemented by Alabama Power.

### **2.1.5 Existing Environmental Measures**

Alabama Power maintains Lake Martin near full-pool levels during most of the summer recreation season (see figure 3.5). As stated previously, Alabama Power makes releases from Martin dam to meet a 1,200-cfs continuous minimum flow downstream of Thurlow dam, as required by the Yates and Thurlow Project No. 2407 license.

Other environmental measures provided by Alabama Power include:

- controlling noxious weeds and invasive plants as part of a Nuisance Aquatic Vegetation and Vector Control Management Program;
- operating and maintaining 12 existing project recreation sites, that provide boat ramps, bank fishing sites, campsites, parking areas, and picnic areas;

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<sup>20</sup> The 1972 agreement specifies a 7-day average release of 4,640 cfs from the combined Coosa and Tallapoosa Rivers. The agreement does not specify releases for each individual basin; however, based on a ratio of drainage areas for each basin (10,059 square miles for the Coosa River Basin and 4,680 square miles for the Tallapoosa River Basin), the Coosa River's portion of the navigation requirement would be 3,166 cfs (68 percent), and the Tallapoosa River's portion would be 1,475 cfs (32 percent).

<sup>21</sup> The Montgomery flow gage is about 10 miles downstream of the confluence of the Coosa and Tallapoosa Rivers. Because there is little intervening flow, this gage approximates the combined releases from both river basins.



- implementing a SMP to protect project lands and waters, including a Shoreline Permitting Program to guide development of non-project structures such as a boat dock, to protect the associated resources; and
- implementing a Public Education and Outreach Plan to inform shoreline landowners and the public about protecting the Lake Martin shoreline.

## **2.2 APPLICANT'S PROPOSAL**

### **2.2.1 Proposed Project Facilities**

Alabama Power is not proposing any changes to project structures or to the project generating capacity. However, Alabama Power proposes to add 991.4 acres to, and remove 499.2 acres from, the project boundary, resulting in an increase of 492.2 acres of project land. The project boundary, therefore, would be modified from 8,602 acres to 9,094 acres.

### **2.2.2 Proposed Project Operation**

Alabama Power proposes to continue to operate the project in a peaking mode, but with modifications to other aspects of project operations as discussed below.

#### **Modify Flood Curve and Operating Curve**

Alabama Power proposes to modify the flood curve by implementing a 3-foot increase in the winter pool (to elevation 484 feet). Alabama Power also proposes to change the operating curve and drought curve proportionately during the same timeframe (figure 2-2).

#### **Lower Reservoir for Maintenance and/or Construction of Structures**

Alabama Power proposes, approximately every 6 years, to lower the reservoir elevation to at least 481 feet in the winter to facilitate non-project seawall and boat dock maintenance and/or construction and other non-project activities that could benefit from lower lake levels. This measure would only be necessary if the Commission adopts Alabama Power's proposed 3-foot increase in the winter pool noted above.

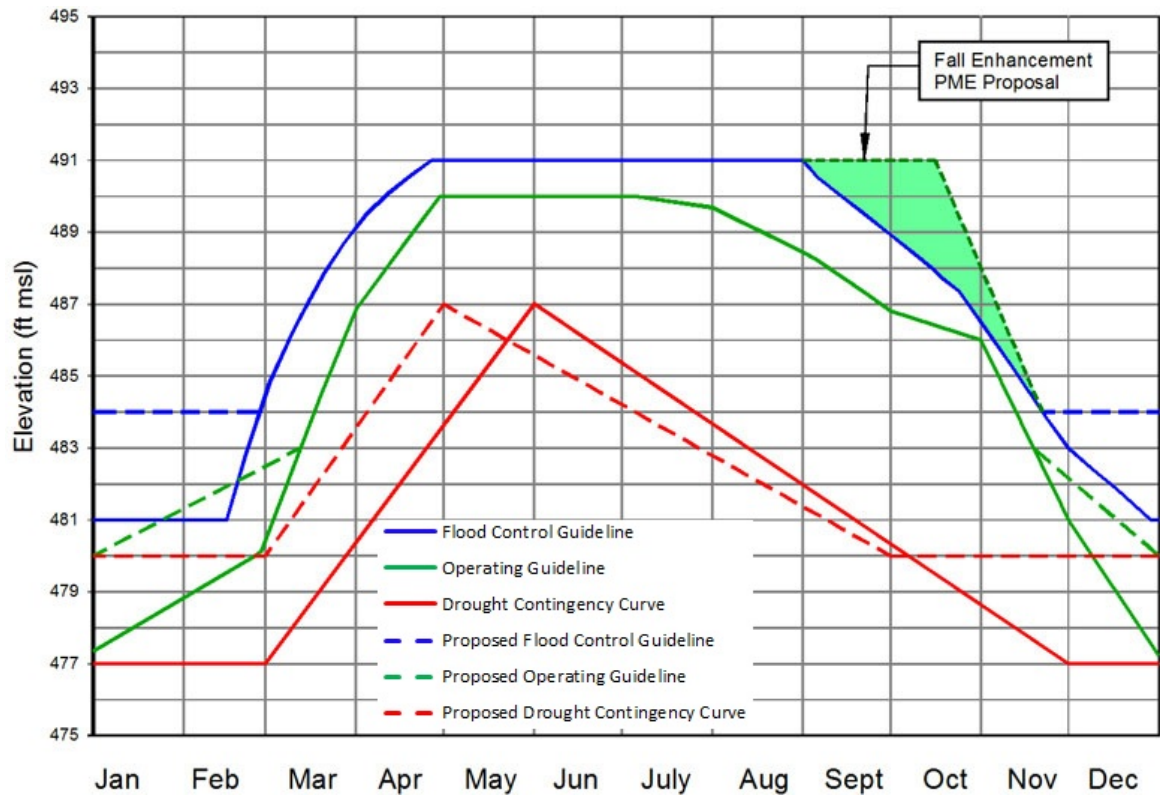


Figure 2-2. Proposed guide curves for the Martin Dam Project (Source: Alabama Power, 2011a).

### Proposed Flood Control Gate Operation

Alabama Power proposes to continue operations for flood control as described in section 2.1.3, *Existing Project Operation*, but with the following changes and additions to Exhibit H noted in **bold** below:

- 1) When the reservoir is above the flood control curve and between elevations **484** and 486 feet, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam that is at least equal to the hydraulic capacity of the turbines at Yates dam (approximately 12,400 cfs).
- 2) When the reservoir is above the flood control curve and between elevations 486 and 489 feet:
  - a. With **increasing** inflows, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam of at least equivalent to the hydraulic capacity of the turbines at **Thurlow dam (approximately 13,200 cfs)**.

- b. With **decreasing** inflows, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam of at least equivalent to the hydraulic capacity of the turbines at **Yates dam (approximately 12,400 cfs)**.
- 3) When the reservoir is above the flood control curve and above elevation 489 feet, the turbines at Martin dam would be operated as in (2) a above, and further if required to avoid rising above elevation 491 feet, turbines would be operated to provide an outflow from Lake Martin at least equivalent to all turbine units operating at full gate (17,900 cfs), and spillway gates would be raised. An exception to this would be that the reservoir may continue to rise after all gates are raised and inflow exceeds the gate capacity, **which would be beyond the control of Alabama Power.**<sup>22</sup> At elevation 491 feet, the spillway would have an outflow capacity of approximately 133,000 cfs.
- 4) **During periods when inflow exceeds the total hydraulic capacity of the turbines, the 3-hour average outflow rate from the reservoir would not exceed the concurrent 3-hour average inflow rate, except to evacuate accumulated surcharge storage subsequent to the predicted time of peak inflow. This would ensure that the outflow from the reservoir is lower than the inflow.**
- 5) **Alabama Power would continue its current practice to notify the National Weather Service (NWS) when spillway gate operation is used in flood control operations and would continue to share data with the NWS' Southeast River Forecast Center (SERFC), and the Corps.**

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<sup>22</sup> Provision 3 is an update to step 3 of Alabama Power's request for revised exhibit H dated November 16, 1978.

## Conditional Fall Extension

To enhance recreation uses at Lake Martin, Alabama Power proposes to modify the flood control curve during the fall months by extending the curve to elevation 491 feet from September 1 through October 15, provided that certain hydrologic and operational conditions are met. Extending the flood curve would provide an opportunity for higher reservoir elevations during this period, assuming adequate flows are available for the project's other uses. Each September, Alabama Power would conduct daily evaluations to determine the feasibility of implementing higher pool levels, based on the following conditions:

1. Lake Martin is above its operating curve during September (487 to 488.5 feet);
2. the rolling 7-day average total basin inflow<sup>23</sup> on the Tallapoosa River, calculated at Thurlow dam, is at or higher than the median flow;<sup>24</sup>
3. the rolling 7-day average total basin inflow on the Coosa River, calculated at Jordan dam, is at or higher than the median flow; and
4. the elevations at the Weiss, H. Neely Henry, and Logan Martin developments on the Coosa River and the Harris Project on the Tallapoosa River must all be within 1 foot of their respective operating curves.

If all these conditions are met, Alabama Power would operate the project by targeting an elevation above the flood curve, which drops from an elevation of 491 on September 1 to an elevation of about 488 on October 15, but no greater than elevation 491 feet for a period not to exceed October 15 (i.e., the zone shaded in green on figure 2-2), at which point drawdown would resume to meet the proposed winter pool elevation of 484 feet. Once the conditional fall extension is initiated, Alabama Power would continue to monitor the Coosa and Tallapoosa river systems to determine if any change in conditions would affect continuation of the conditional fall extension. If reservoir and hydrological conditions changed after the fall extension has started, Alabama Power would suspend the fall extension. At the end of September, if all the above conditions were not met and the conditional fall extension was not implemented, Alabama Power would notify the Commission. Regardless of the outcome of the evaluation, Alabama Power would provide notice to Lake Martin RA and post up-to-date status notifications to the Alabama Power lakes and recreation website (<https://lakes.alabamapower.com/>).

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<sup>23</sup> The 7-day rolling average of total basin inflow is the average of the total daily basin inflow for the previous 7 days recalculated on a daily basis for a given period of time.

<sup>24</sup> The "median flow" in this instance is the median of the recorded daily flows over the period of record for the particular day of interest.

Alabama Power also proposes to abide by all downstream minimum flow and other operational requirements while implementing its proposed extension.

### **Drought Operations/Low Flow Management**

Recent responses to drought conditions have included temporary amendments to water level requirements at Lake Martin, such as maintaining Lake Martin at a 3-foot-higher winter pool, and reductions in the minimum flow from Thurlow dam, as described in section 2.1.3, *Project Operation, Low Flow Operations*.

Alabama Power proposes to implement a drought response plan known as the Alabama Drought Response Operating Proposal (ADROP). ADROP is the basis of a plan to manage Alabama Power's water resources within the Alabama portion of the ACT Basin during drought conditions. As described above, project releases provide support for the Thurlow Project minimum flows, as well as flows required to support navigation in the Alabama River. The ADROP uses specific drought indicators to describe the magnitude, duration, severity, and extent of the drought which may affect normal operating conditions and the Martin Dam Project's ability to support the Thurlow minimum flow and/or Corps required navigation releases to the Alabama River. One of those indicators is the Lake Martin drought curve described above. When the indicators meet specified criteria, Alabama Power and the appropriate state and federal agencies would closely monitor the river system to determine when drought response measures should be triggered and how aggressive those measures should be. Each of the three levels of drought conditions identified in the ADROP is tied to a compounding trigger system. As more of the criteria are met, more intense drought response measures would be triggered. When criteria triggering a more intense level of drought response are met, the hydropower project releases to support minimum instream flows and navigation flows in the Alabama River would be reduced. Reducing the volume of water released to the Alabama River would allow a decrease in flow from the Coosa or Tallapoosa River system, or both. How changes in releases would be allocated between river systems would be dependent on the conditions within each basin and the season.

### **2.2.3 Proposed Environmental Measures**

- Implement the measures of the 401 WQC, which requires maintaining the state standard for dissolved oxygen (DO) when the project is operating, and monitoring water temperature and DO in the tailrace;
- develop a reservoir water quality monitoring plan in consultation with Alabama DEM prior to implementing the proposed 3-foot increase in the winter pool elevation to detect substantial effects of the change on water quality;
- implement the Tallapoosa River portion of the ADROP, which uses specific drought indicators to determine when drought response measures should be triggered and how aggressive those measures should be;

- finalize and implement a study of American eels, in consultation with the U.S. Fish and Wildlife Service (FWS), from the project tailrace to the mouth of the Tallapoosa River, and complete the study by 2016;
- implement a Wildlife Management Program (WMP) for project lands;
- implement the Nuisance Aquatic Vegetation and Vector Control Management Program, and prepare a plan to monitor potential increases in nuisance aquatic vegetation in Lake Martin resulting from the proposed 3-foot increase in the winter pool elevation;
- implement a Shoreline Management Plan (SMP), filed June 8, 2011, which provides guidance for management actions within the project boundary; a redefined shoreline classification system; a Shoreline Permitting Program; and best management practices (BMPs) for controlling shoreline erosion and providing a 30-foot control strip;
- implement a Recreation Plan, filed December 9, 2011, which includes measures for a total of 19 developed and undeveloped recreation sites that provide boat ramps, docks, parking areas, bank fishing sites, campsites, and fishing piers;
- as part of the Recreation Plan, evaluate the need for additional bank/pier fishing areas within the Martin Dam Project boundary and develop such a facility in consultation with Alabama DCNR;
- modify the project boundary to add 991.4 acres to, and remove 499.2 acres from, the project boundary, resulting in an increase of 492.2 acres of land; and reclassify land uses on 1,294.4 acres within the project boundary to be consistent with existing land use or other project purposes;<sup>25</sup>
- implement a Public Education and Outreach Plan to inform shoreline landowners and the public about protecting the Lake Martin shoreline; and
- develop and implement a HPMP as part of implementing a PA.

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<sup>25</sup> The project boundary would be modified from 8,602 acres to 9,094 acres.

## **2.2.4 Modifications to Applicant’s Proposal—Mandatory Conditions**

The following mandatory conditions have been provided and are evaluated as part of the applicant’s proposal.

### **Water Quality Certification Conditions**

The conditions of the WQC are provided in appendix B and summarized below:

- Within 18 months of the effective date of a new license, begin DO monitoring in the project tailrace for a three-year period, followed by a report assessing the adequacy of the project to meet the state standard. If monitoring results do not indicate compliance with the state standard, which is 4.0 mg/L in the tailrace when the project is generating, Alabama Power would be required to develop and implement measures, through structural or operational modifications, to meet the state standard.
- The monitoring location for determining compliance with the state standard would be in an area immediately downstream of the Martin dam, at an existing monitoring station located at about latitude 32.679350N and longitude 85.911648W. The monitor would record DO and water temperature at 30-minute intervals during periods of hydroelectric generation following one continuous hour of generation from June 1 through October 31. During flood events, the monitoring may be temporarily discontinued until tailrace elevations return to normal. The monitoring program would continue for a period of three years.
- The monitoring equipment would be appropriately operated, maintained, and calibrated.
- DO and temperature monitoring reports would be submitted annually to the Alabama DEM, within 90 days following the end of the monitoring period in electronic format compatible with Microsoft Excel and Word software. The monitoring reports would specify whether turbines were in operation at the time of the DO and temperature measurements and the discharge rate of water flow passing through each turbine.

## **2.3 STAFF ALTERNATIVE**

The staff-alternative includes most of Alabama Power’s proposed operational and environmental measures as described in sections 2.2.2 and 2.2.3. The staff alternative also includes all the conditions of the WQC described in 2.2.4.

In addition, this alternative would include the following measures:

- revise operations for flood control as described by Alabama Power with minor modifications by staff;
- revise, in consultation with FWS and Alabama Department of Conservation and Natural Resources (Alabama DCNR), the Nuisance Aquatic Vegetation and

Vector Control Management Program, to include specific information on Alabama Power's protocol for conducting lake-wide surveys, including: (1) methods (i.e., the frequency, timing, and locations of surveys) for identifying areas where nuisance aquatic vegetation could create a public health hazard, affect power generation facilities, restrict recreational use, or pose a threat to the ecological balance of the reservoir; (2) methods for monitoring increases in nuisance aquatic vegetation; (3) methods for controlling nuisance aquatic vegetation; and (4) schedules for implementation of control measures and monitoring;

- revise the Recreation Plan to include: (1) a detailed description of only the 19 project recreation sites and proposed enhancements, and (2) a provision to file a Recreation Monitoring Report concurrent with the filing of the FERC Form 80 that discusses recreational use and demand, associated project-related resource effects, and any additional measures or modifications to the project recreation sites that may be needed and a schedule for implementing such changes; and
- revise the SMP to include: (1) staff's recommended project boundary modifications; (2) a provision to limit construction of a new seawall to instances where riprap and vegetation are not sufficient to protect land and property from erosion; (3) a description of the Dredging Permit Program; (4) a Shoreline Permitting Program specific to the Martin Dam Project; and (5) a provision to address unpermitted structures on project lands and waters.

The staff alternative does not include finalizing and implementing an eel study plan and does not recommend the removal of 373.1 acres from the project boundary.

## **2.4 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS**

We considered several alternatives to the applicant's proposal, but eliminated them from further analysis because they are not reasonable in the circumstances of this project. They are: (1) issuing a non-power license; (2) federal government takeover of the project; and (3) retiring the project.

### **2.4.1 Issuing a Non-Power License**

A non-power license is a temporary license that the Commission will terminate when it determines that another governmental agency will assume regulatory authority and supervision over the lands and facilities covered by the non-power license. At this point, no agency has suggested a willingness or ability to do so. No party has sought a non-power license, and we have no basis for concluding that the project should no longer be used to produce power. Thus, we do not consider issuing a non-power license a realistic alternative to relicensing in this circumstance.



#### **2.4.2 Federal Government Takeover of the Project**

We do not consider federal takeover to be a reasonable alternative. Federal takeover and operation of the project would require Congressional approval. While that fact alone would not preclude further consideration of this alternative, there is no evidence to indicate that federal takeover should be recommended to Congress. No party has suggested federal takeover would be appropriate, and no federal agency has expressed an interest in operating the project.

#### **2.4.3 Retiring the Project**

Project retirement could be accomplished with or without dam removal. Either alternative would involve denial of the relicense application and surrender or termination of the existing license with appropriate conditions. No participant has suggested that dam removal would be appropriate in this case, and we have no basis for recommending it. Dam removal is considered unreasonable because the reservoir serves other important purposes, including recreation, municipal water supply, and flood control, regardless of whether power is produced. Thus, dam removal is not a reasonable alternative to relicensing the project with appropriate protection, mitigation, and enhancement measures.

The second project retirement alternative would involve retaining the dam and disabling or removing equipment used to generate power. Project works would remain in place and could be used for historic or other purposes. This would require us to identify another government agency with authority to assume regulatory control and supervision of the remaining facilities. No agency has stepped forward, and no participant has advocated this alternative. Nor have we any basis for recommending it. Because the power supplied by the project is needed, a source of replacement power would have to be identified. In these circumstances, we do not consider removal of the electric generating equipment to be a reasonable alternative.



### 3.0 ENVIRONMENTAL ANALYSIS

In this section, we present: (1) a general description of the project vicinity; (2) an explanation of the scope of our cumulative effects analysis; and (3) our analysis of the proposed action and other recommended environmental measures.<sup>26</sup> Sections are organized by resource area (aquatic, recreation, etc.). Under each resource area, current conditions are described first. The existing condition is the baseline against which the environmental effects of the proposed action and alternatives are compared, including an assessment of the effects of proposed mitigation, protection, and enhancement measures, and any potential cumulative effects of the proposed action and alternatives. Staff's conclusions and recommended measures are discussed in section 5.2, *Comprehensive Development and Recommended Alternative*, of the EIS.

#### 3.1 GENERAL DESCRIPTION OF THE RIVER BASIN

The Tallapoosa River drains about 4,675 square miles of east central Alabama and a part of western Georgia and joins the Coosa River downstream of Jordan dam creating the Alabama River. The Alabama River then flows into Mobile Bay. The headwaters of the Tallapoosa and Little Tallapoosa Rivers begin in Paulding and Carroll Counties, Georgia, and enter Alabama in Randolph County southwest of Atlanta to form the main stem of the Tallapoosa River. From this point, the Tallapoosa meanders southwesterly through four Alabama Power hydroelectric developments (R.L. Harris, Martin, Yates, and Thurlow). The Tallapoosa River watershed includes the Little Tallapoosa River, which has a drainage area of 605 square miles in Georgia and Alabama. Other major tributaries include the Sougahatchee, Sandy, Uphapee, and Hillabee Creeks in Alabama.

The Tallapoosa River Basin includes narrow valleys, rolling hills, flat plateaus, meandering flood plains, and gently rolling terrain. Almost 70 percent of the basin is covered by forests, and forestry-related activities account for part of the river basin's economy. The primary land use is agriculture, including livestock rearing and production of other agricultural products.

The climate of the Tallapoosa River Basin is moist and temperate, characterized by long, warm, and humid summers with relatively short winters. Precipitation is highest in the spring, but otherwise is generally evenly distributed throughout the year with average annual precipitation ranges between about 46 and 64 inches. Natural river flow normally peaks during the winter and early spring with flood events recorded at different times throughout the year but most common in the winter and spring.

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<sup>26</sup> Unless noted otherwise, the sources of our information are the license application (Alabama Power, 2011a), and additional information filed by Alabama Power (2011b).

Average monthly temperatures within the basin vary from 40 degrees Fahrenheit (°F) to 55°F in January and from 75° to 80°F in July. Winter temperatures occasionally fall below 32°F and summer temperatures often exceed 90°F with relatively high humidity.

### **3.2 SCOPE OF CUMULATIVE EFFECTS ANALYSIS**

According to the Council on Environmental Quality's regulations for implementing National Environmental Policy Act (40 C.F.R. section 1508.7), cumulative effect is the impact on the environment that results from the incremental impact of the action when 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 taking place over a period of time, including hydropower and other land and water development activities.

Based on our review of the license application and agency and public comments, we have identified aquatic and fishery resources as having the potential to be cumulatively affected by the proposed project in combination with other past, present, and future activities. Aquatic and fishery resources were selected because the operation of the Martin Dam Project, in association with other projects in the river basin, has affected and would continue to affect wastewater releases, consumptive water withdrawals, navigation, water quality, water quantity, fish habitat, fish movements, and fish production in the Tallapoosa and Alabama Rivers.

We also have identified water quantity as being cumulatively affected by changes in operations at Martin Dam. We selected water quantity because project operation modifications in combination with changes in Corps and Alabama Power operations in the Coosa River Basin, particularly the raising of the winter pool at Lake Neely Henry could affect flood levels in the Alabama River. Similarly, proposals for changes to storage practices in the Coosa River Basin in combination with Martin Dam operations could affect low flows in the Alabama River.

The effects of other actions occurring in the river basin relative to existing project resources can be derived from the following environmental documents prepared by the Commission staff or the Corps, which are incorporated by reference per 40 C.F.R., section 1508.28:

- Yates and Thurlow Hydroelectric Project (FERC No. 2407), final EA issued February 3, 1994;
- Coosa River Hydroelectric Project (FERC No. 2146), final EA issued December 31, 2009; and
- Final EIS for Updates to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin, and draft Master Water Control Manual for the

### **3.2.1 Geographic Scope**

The geographic scope of analysis defines the physical limits or boundaries of the proposed action's effects on the resources. Because the proposed action would affect the resources differently, the geographic scope for each resource may vary.

The geographic scope for aquatic and fishery resources and water quantity is the entire Alabama River and the Tallapoosa River from its mouth upstream to and including the Martin Dam Project. We chose this geographic scope because the operation of the Martin Dam Project in combination with the other Alabama Power hydropower projects and the Corps impoundments could cumulatively affect the resources listed above.

### **3.2.2 Temporal Scope**

The temporal scope of analysis includes a discussion of the past, present, and reasonably foreseeable future actions and their effects on aquatic resources. Based on the term of the proposed license, we will look 30 to 50 years into the future, concentrating on the effects on the above resources from reasonably foreseeable future actions. The historical discussion is limited to the amount of available information. We identified the present resource conditions based on the license application, agency comments, and comprehensive plans.

## **3.3 PROPOSED ACTION AND ACTION ALTERNATIVES**

In this section, we discuss the effect of the project alternatives on environmental resources. For each resource, we first describe the affected environment, which is the existing condition and baseline against which we measure effects. We then discuss and analyze the specific cumulative and site-specific environmental issues.

Only the resources that would be affected, or about which comments have been received, are addressed in detail in this EIS. Based on this, we have determined that geology and soils, aquatic, terrestrial, threatened and endangered species, recreation, and cultural resources may be affected by the proposed action and action alternatives. There are some economic issues addressed as subcomponents of other topics analyzed in this EIS, but there are no substantive, stand-alone socio-economic issues associated with the proposed action. Therefore, we do not include a separate section on socioeconomics in this EIS. We have not identified any substantive issues related to aesthetic resources associated with the proposed action, and, therefore, aesthetic resources are not assessed in the EIS. Land use is addressed in the recreation resources section. We present our recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*.

### **3.3.1 Geologic and Soil Resources**

#### **3.3.1.1 Affected Environment**

##### **Geography and Topography**

The Tallapoosa River Basin lies within three physiographic provinces, the Valley and Ridge, Piedmont, and the Eastern Gulf Coastal Plain. Lake Martin occurs within the Piedmont Province, which is characterized by well-dissected uplands developed over metamorphic and igneous rocks. In the northern portion of the province, elevations generally range from 500 to 1,100 feet. Cheaha Mountain, the State of Alabama's highest point at 2,407 feet, is on the northeastern end of a prominent northeast-trending ridge in this province, and is located about 50 miles north of Lake Martin. Shoreline steepness around Lake Martin varies from areas with less than 15 percent slope, to vertical drops associated with rocky outcrops. The project is underlain by igneous and metamorphosed rocks of late Proterozoic to Paleozoic in age (570 to 240 million years ago). Lake Martin and surrounding project lands are located within the Piedmont Upland region. The dominant geographic features in the area are northeast-trending. The linear ridges to the northwest and northeast of the Martin dam site are a result of tectonic movement about 500 million years ago. Triassic dikes were intruded into the area approximately 200 million years ago and show no sign of any movement since that time.

This region is divided into the Northern, Inner, and Southern Piedmont Upland districts but there are no project lands within Southern Piedmont Upland district. Common rock types within the Northern Piedmont region, which includes most of the western shoreline of Lake Martin in Tallapoosa, Coosa, and Elmore Counties, include resistant quartzite and quartz-rich schists. The Inner Piedmont Upland district is developed on metamorphic rock (schist and gneiss). Topographic features within this area are not prominent, other than incision by tributaries.

##### **Soils**

Soils within the project area were generally derived from weathering of the metamorphic and igneous bedrock. Soil types range from fine (clay) to coarse (sand and gravel) with loamy sand being the most common soil type within the project boundary (Natural Resources Conservation Service, 2007 and 2008; Soil Conservation Service, 1955). In general, soil productivity has been reduced over much of the area because of poor farming practices in the 1800s and early 1900s. Many areas of depleted soils have reverted to forest, but productivity is often low. The resulting loamy, depleted soils dominant within the project boundary have moderate to high potential for soil erosion.

##### **Erosion within the Project Boundary**

Alabama Power identified, mapped, and photographed erosion hot spots on Lake Martin, and made an assessment of the source of the erosion at each site (see figures 3-1 and 3-2) (Alabama Power, 2010h). The survey was conducted by boat using visual inspection. Alabama Power attributed the observed erosion to either wave action or land

use (boating, shoreline clearing, home construction, etc.). In some instances, Alabama Power concluded that land use was the initiating factor of the erosion process with other factors accelerating the process. While Alabama Power observed mild to moderate erosion at many sites, the company reported that severe erosion was uncommon or “atypical” in relation to the total length of project shoreline. Using field observations and Natural Resources Conservation Service soils maps (Alabama Power, 2010h), Alabama Power observed that the bedrock underlying the loams at each erosion site began at or near an elevation of 486 feet to 486.5 feet.



Figure 3-1. An example of severe erosion from Alabama Power’s study (Source: Alabama Power, 2010h).





Figure 3-2. The locations of severe erosion sites observed by Alabama Power on Lake Martin (Source: Alabama Power, 2010h).

### **Erosion Downstream of the Project Boundary**

Similar to the land on the shoreline above the dam, the land along the Tallapoosa River downstream of Thurlow dam is dominated by loamy soils with a moderate to high potential for soil erosion. Traveling by boat, Alabama Power visually inspected the shoreline from the base of Thurlow dam south to the Highway 229 Bridge, covering the first 10 miles of shoreline along the Tallapoosa River (Alabama Power, 2010h). Alabama Power inspected erosion and surveyed three sites twice annually during 2006 and 2007 and once during 2009. An additional 14 sites were visually monitored at the same frequency. Alabama Power did not observe erosion at these sites during a period of minimum flow (1,200 cfs) up to full generation flows (17,900 cfs). Alabama Power did observe erosion at these sites in 2009 when a spill event had occurred. Alabama Power interpreted their observations to indicate that the channel is most affected by “spill events,” which occur when flows rise above 17,900 cfs.



### **Sedimentation within the Project Boundary**

Alabama Power identified 19 sedimentation sites within the project boundary using light detection and ranging (LIDAR)<sup>27</sup> and aerial photography, as well as visual inspection by boat (Alabama Power, 2010h). Based on the location of the sediment in deltas formed at the tributary creek mouths, Alabama Power's interpretation was that lake sedimentation was caused predominantly by sediment entering the lake in tributary stream flow and settling in the relatively still waters of the reservoir.

#### **3.3.1.2 Environmental Effects**

##### **Erosion within the Project Boundary**

Alabama Power concludes that the effects of raising the winter flood pool on erosion within the project boundary would be negligible.<sup>28</sup> Alabama Power predicts that wave action would likely increase if the number of recreation user-days increased and that increased wave action could result in a modest increase in erosion. Overall, however, Alabama Power comments that the changes in shoreline erosion directly associated with the proposed 3-foot increase in the winter pool would have a negligible effect on the 15 sites identified for erosion-monitoring on Lake Martin. However, sediment plumes and depositional patterns may not change.<sup>29</sup> Alabama Power notes that bedrock was present at all of the 15 erosion hot spots, presumably providing a grade control to limit the amount of erosion that could occur. Therefore, none of the proposed elevation changes would have significant erosion effects within the project boundary.<sup>30</sup> Based on the results of its study, Alabama Power does not propose any measures or further monitoring to address erosion within the project boundary.

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<sup>27</sup> LIDAR is an optical remote sensing technology that measures the distance to a feature or target, or other properties, by using light to illuminate a target.

<sup>28</sup> Issues related to localized erosion and sedimentation associated with recreational use and shoreline management are addressed in section 3.3.5, *Recreation Resources and Land Use*.

<sup>29</sup> Issues related to the potential establishment of nuisance aquatic vegetation are addressed in section 3.3.3, *Terrestrial Resources*.

<sup>30</sup> Alabama Power did note that the erosion might be nominally higher at the 486-foot contour associated with a 5-foot winter pool increase because of irregularities it observed in the topography at this elevation.

### *Our Analysis*

Staff finds that an increase in the lake levels and associated effects on erosion would not be significant in proportion to the surface area and volume of the reservoir. Alabama Power's observations of severe erosion are not widespread. Alabama Power's mapping indicates that the areas of severe erosion are almost exclusively located on northwest-facing shores with substantial open water (or fetch), which are the areas subject to the greatest potential for wind and wave action. The presence of bedrock near the elevation of the potential erosion should limit the amount of erosion. Also, based on its make-up of loam and gravel and only a modest amount of clay, most of the eroded material should settle within Lake Martin rather than deposit downstream and potentially affect riverine habitat. Sedimentation from bank erosion was not identified as notable in the reservoir deposition study as was sediment deposition from tributary sources. If operations did not change, erosion patterns would continue as they do under existing conditions.

### **Erosion Downstream of the Project Boundary**

Stating that erosion downstream of Thurlow dam is partly an ongoing natural and historical process, Alabama Power discusses the potential effect of its proposal to raise winter lake levels on erosion and sedimentation in the Tallapoosa River downstream of Thurlow dam (Alabama Power, 2010a). The potential increase in the number of days with higher than historical spill (flows above 17,900 cfs) for the entire 67 years of record was modeled.<sup>31</sup> Using its HydroBudget model and approximating the 100-year storm event, Alabama Power estimates that a 3-foot increase in winter pool would increase the number of days of spill by 23 days over 67 years of record (Alabama Power, 2010b). Because of the limited storage capacity of the Yates and Thurlow impoundments, the increase in the spill associated with a 3-foot increase in the winter pool would carry through the two impoundments and into the river below. Alabama Power concludes that it would expect to see increased erosion from the tailrace of Thurlow dam to the Montgomery Water Works. Alabama Power proposes no measures or monitoring to address any effect of this increase relative to background erosion rates.

World Wildlife Fund and Alabama Rivers commented on erosion occurring downstream of Thurlow dam. World Wildlife Fund notes that increasing the winter pool at Lake Martin could increase the frequency of spill events associated with erosion. World Wildlife Fund stated that increased erosion and resulting increased sediment loads could have several negative effects including reducing water quality by making the water

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<sup>31</sup> The hydraulic capacity of the turbines at Martin Dam is approximately 17,900 cfs. Above 17,900 cfs, Martin dam will spill water. That spillage will convey through the Yates and Thurlow developments to the reach of the Tallapoosa River below.

more turbid, increasing water treatment cost, and degrading spawning habitat for fish requiring clean gravel for spawning, such as paddlefish (Jenkins and Burkhead, 1993).

### *Our Analysis*

Increasing the winter pool level could cause additional spill events. Increased spill could increase erosion and in turn turbidity and sedimentation downstream of Thurlow dam. However, the study indicated an increase in spill events of 23 days over the 67-year period for a 3-foot increase in winter levels, and 52 days over the 67-year period for a 5-foot increase. Those changes would equal a 0.1 percent increase in days of spill for the 3-foot increase and a 0.2 percent increase in days for the 5-foot increase. Under the existing condition spill occurs less than 1 percent of the time making an increase of 0.1 to 0.2 percent potentially substantial. Given that Alabama Power associates downstream erosion with spill events and that an increase in winter pool elevation could increase the occurrence of spill events, the raising of the winter pool could increase downstream erosion.

Additional spill could be induced by the conditional fall extension, but probably only to a very small degree. The conditional fall extension would occur every few years rather the every year, reducing the chances of increasing spill. Also, the fall is the time of year of the lowest natural flows,<sup>32</sup> which also reduces the chances that conditional fall extension would lead to substantially more spill. Because the conditional fall extension would have only a small effect on spill, it would have only a small effect on downstream erosion.

## **3.3.2 Aquatic Resources**

### **3.3.2.1 Affected Environment**

#### **Water Quantity**

##### *Tallapoosa River*

The Martin Dam Project uses the waters of the Tallapoosa River to generate power at the dam. The Tallapoosa River Basin drains parts of northern Georgia and east central Alabama. The total drainage area at the project dam is about 3,000 square miles. Alabama Power operates two other hydroelectric projects on the Tallapoosa River under licenses granted by the Commission: the Harris Project and the Yates and Thurlow Project<sup>33</sup> (figure 3-3). Table 3-1 provides operation, drainage area, surface area, and storage volume data for all three Alabama Power Tallapoosa River hydroelectric projects.

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<sup>32</sup> See section 3.3.2.1, table 3-3 and table 3-4.

<sup>33</sup> As its name implies, the Yates and Thurlow Project is one licensed project consisting of two developments: Yates and Thurlow.

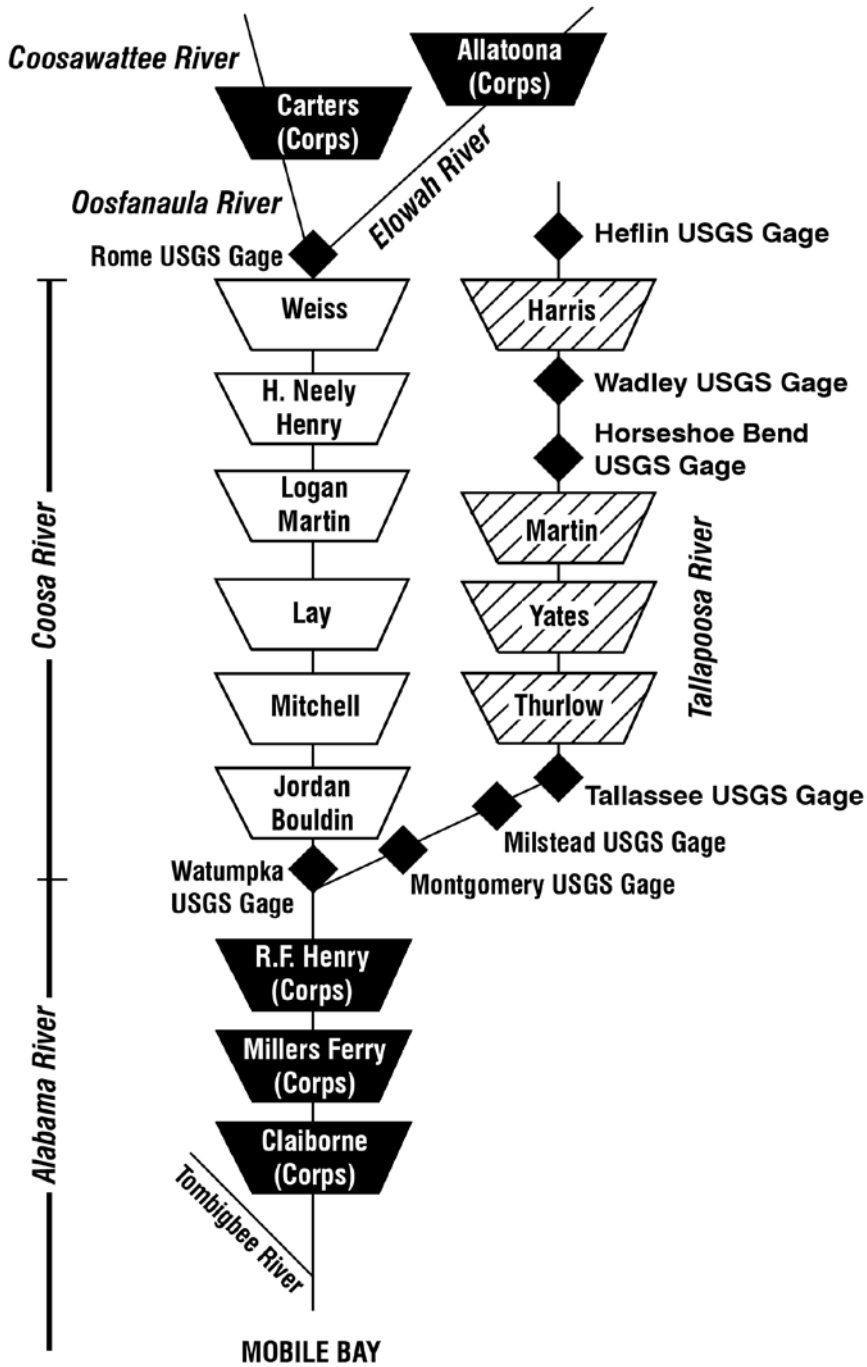


Figure 3-3. Tallapoosa River and Coosa River schematic (Source: Corps, 1998, as modified by staff).

Table 3-1. Alabama Power hydropower developments on the Tallapoosa River  
(Source: Corps, 2008.

<b>Reservoir</b>	<b>FERC Project Number</b>	<b>Construction Date</b>	<b>River Mile</b>	<b>Drainage Area (square miles)</b>	<b>Surface Area (acres)</b>	<b>Total Storage (acre-feet)</b>	<b>Operation</b>
Harris	P-2628	1982	139.1	1,453	10,600	425,700	Storage
Martin	P-349	1926	60.6	3,000	44,000	1,622,000	Storage
Yates	P-2407	1928	52.7	3,250	2,000	54,000	Run-of-river
Thurlow	P-2407	1930	49.7	3,300	574	18,250	Run-of-river

Note: Data in table are as reported by Corps, 2008b, and may differ slightly from data reported elsewhere in this draft EIS.

Alabama Power operates the Harris Project, about 79 miles upstream of Martin dam, as a storage facility and for hydropower generation. The Tallapoosa River upstream of Lake Martin (RM 92 to 139) is an upper-basin-type stream with steep slopes and narrow floodplains that include rapids. It also contains two currently operating U.S. Geological Survey (USGS) gage sites: Wadley and Horseshoe Bend (table 3-2 and figure 3-3). The Wadley gage has 86 years of daily flow and stage data, and Horseshoe Bend has 24 years of daily flow and stage data. The stream channel is characterized by rock outcrops and a few sand bars and is crossed by four highway bridges and two railroad bridges. The largest community along this reach of the river is the City of Wadley at RM 125.3. Data from both of these USGS gages indicate that, during low flow periods, the effects of peaking releases from Harris dam govern the flow regime at the locations of the gages (figure 3-3). The Horseshoe Bend gage, which can be used to characterize flows immediately upstream of Lake Martin, recorded a peak instantaneous daily flow of 132,000 cfs on May 9, 2003 (USGS, 2012). Table 3-3 shows monthly mean, maximum, and minimum flow statistics for this gage.

Table 3-2. USGS gages on the Tallapoosa River (Source: USGS, 2012; Alabama Power, 2011a).

<b>Gage</b>	<b>Full Name</b>	<b>River Mile</b>	<b>River Mile Distance from Martin Dam</b>
Heflin	USGS gage no. 02412000 Tallapoosa River near Heflin	186.8	126.2 (upstream)
Wadley	USGS gage no. 02414500 Tallapoosa River at Wadley	125.3	64.7 (upstream)
Horseshoe Bend	USGS gage no. 02414715 Tallapoosa River near Horseshoe Bend	95.5	34.9 (upstream)
Tallassee	USGS gage no. 02418500 Tallapoosa River below Tallassee	47.98	12.62 (downstream)
Milstead	USGS gage no. 02419500 Tallapoosa River at Milstead	39.8	20.8 (downstream)
Montgomery Water Works	USGS gage no. 02419890 Tallapoosa River near Montgomery Water Works	12.9	47.7 (downstream)
Montgomery	USGS gage no. 02419988 Alabama River downstream of the confluence of Coosa and Tallapoosa Rivers		70 (downstream)

### *Lake Martin*

Lake Martin is located on the Tallapoosa River from about RM 60 to 92. Although the primary purpose of Martin dam is hydropower generation, it is also used for limited seasonal flood control; recreation, municipal and industrial water supply; aquatic flow maintenance; and navigation flow support. Lake Martin has a surface area of 40,000 acres at a normal full pool elevation of 491 feet and a shoreline of about 880 miles. It receives inflows from the Tallapoosa River, representing 2,131 square miles of drainage, and local inflows from an additional 853 square miles of tributaries that flow directly into the lake. The gross storage capacity of Lake Martin at maximum pool (elevation 491 feet) is 1.6 million acre-feet. Active storage in the available 45.5-foot drawdown is 1.2 million acre-feet (minimum elevation of 445.5 feet). According to Alabama Power, spill over the dam occurred less than 1 percent of the time during the period from 1940 to 2007.

Alabama Power manages the water level of Lake Martin, with an operating curve at elevation 490 feet from May 1 to September 1, decreasing to a low at elevation 477 feet on January 1 (see figure 2-1). Figure 3-5 shows historical reservoir levels for 1990 to 2011, along with the existing guide curves for Lake Martin. This figure shows that lake levels have generally been between the operating curve and the flood curve, except in the late fall to early spring period when lake levels have often exceeded the flood curve in response to high inflows, but have not exceeded elevation 491 feet. The average elevation closely matches the flood curve from late fall to spring, but then closely matches the operating curve from spring into the fall. Lake levels were reported to be below the drought curve only during the latter half of 2007 and the early part of 2008.

Outflows from Martin dam are discharged directly to the Yates reservoir. Figure 3-6 shows historic reservoir levels at Martin, Yates, and Thurlow and discharges from Martin. Discharges from Martin dam are shown to generally remain between 100 cfs and 10,000 cfs, although higher and lower flows are not uncommon. Lake Martin elevations (the top line on figure 3-6) vary more than those of the Yates and Thurlow reservoirs, reflecting the seasonal drawdown at Martin and run-of-river operations at Yates and Thurlow.

Table 3-3. Monthly flow data for USGS gage no. 02414715 Horseshoe Bend, characterizing flows immediately upstream of Lake Martin (Source: Alabama Power, 2011a).

<b>Month</b>	<b>Mean Discharge (cfs)</b>	<b>Maximum Discharge (cfs)</b>	<b>Minimum Discharge (cfs)</b>
January	3,980	8,191	550
February	5,160	12,880	2,270
March	6,090	16,230	1,785
April	3,500	7,210	800
May	3,130	16,870	549
June	2,420	6,704	545
July	2,480	8,755	600
August	1,620	3,886	427
September	1,440	3,636	377
October	1,610	7,270	266
November	2,630	7,601	216
December	2,970	7,959	349

Note: The period of record is 1985 to 2009.

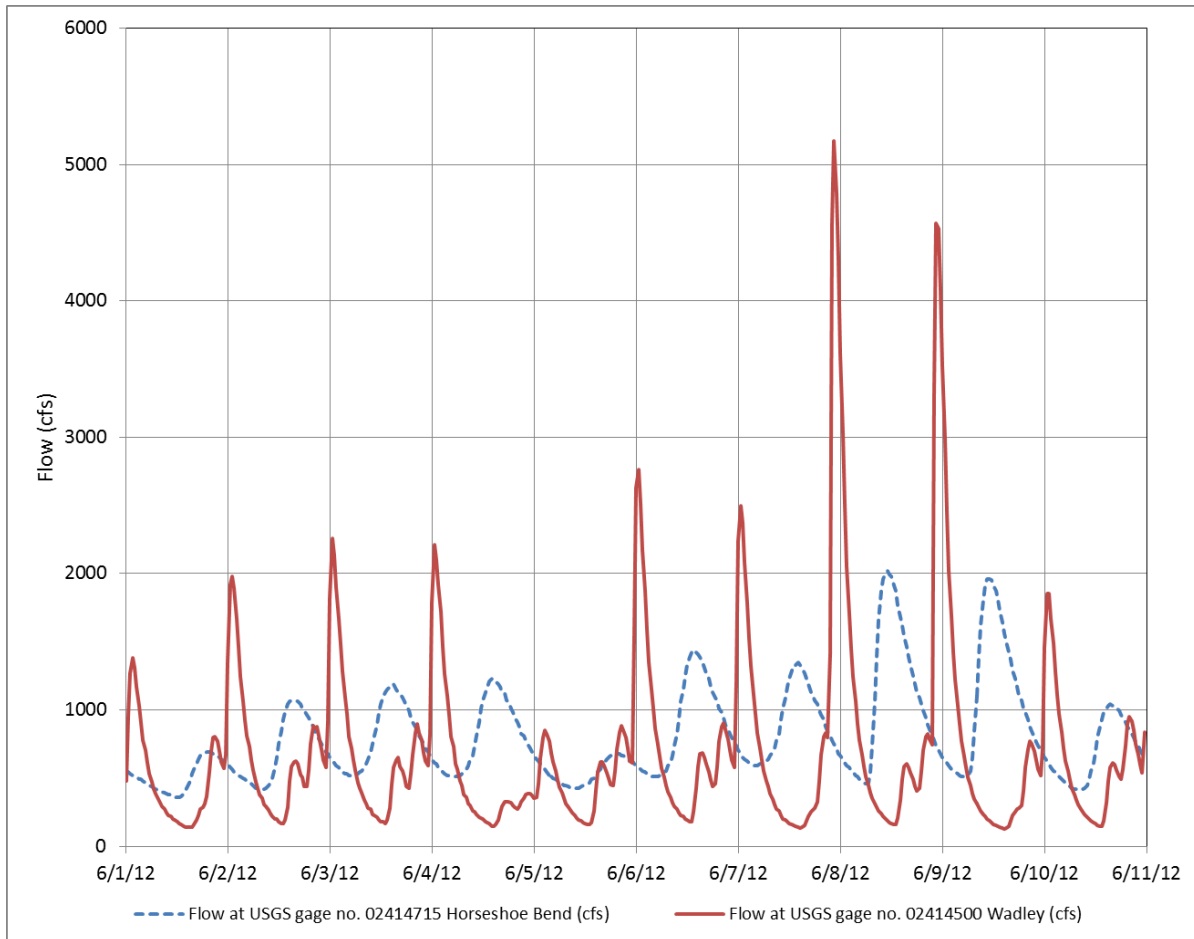


Figure 3-4. Low flow regime graphic for Tallapoosa River at the Horseshoe Bend and Wadley USGS gages, located upstream of Lake Martin (Source: USGS, 2012, as modified by staff).

Flooding has occasionally occurred downstream of Martin dam, including in 1979, 1990, 2003, 2009, and 2010. Based on data from Alabama Power, the maximum 1-day outflow from Martin dam was 105,884 cfs on March 17, 1990. Table 3-4 shows calculated flood frequency flows for unimpaired conditions at Martin dam,<sup>34</sup> and actual flood flow data at Martin dam and downstream at the Tallassee gage. This table shows that Martin dam has been operating in a manner that has decreased the flood flows to rates lower than the unimpaired conditions. The table also demonstrates that flood flows even a short distance downstream at the Tallassee USGS gage are influenced by tributary inflow.

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<sup>34</sup> Unimpaired conditions means conditions without the dams in place, and no influence of storage and flow regulation.



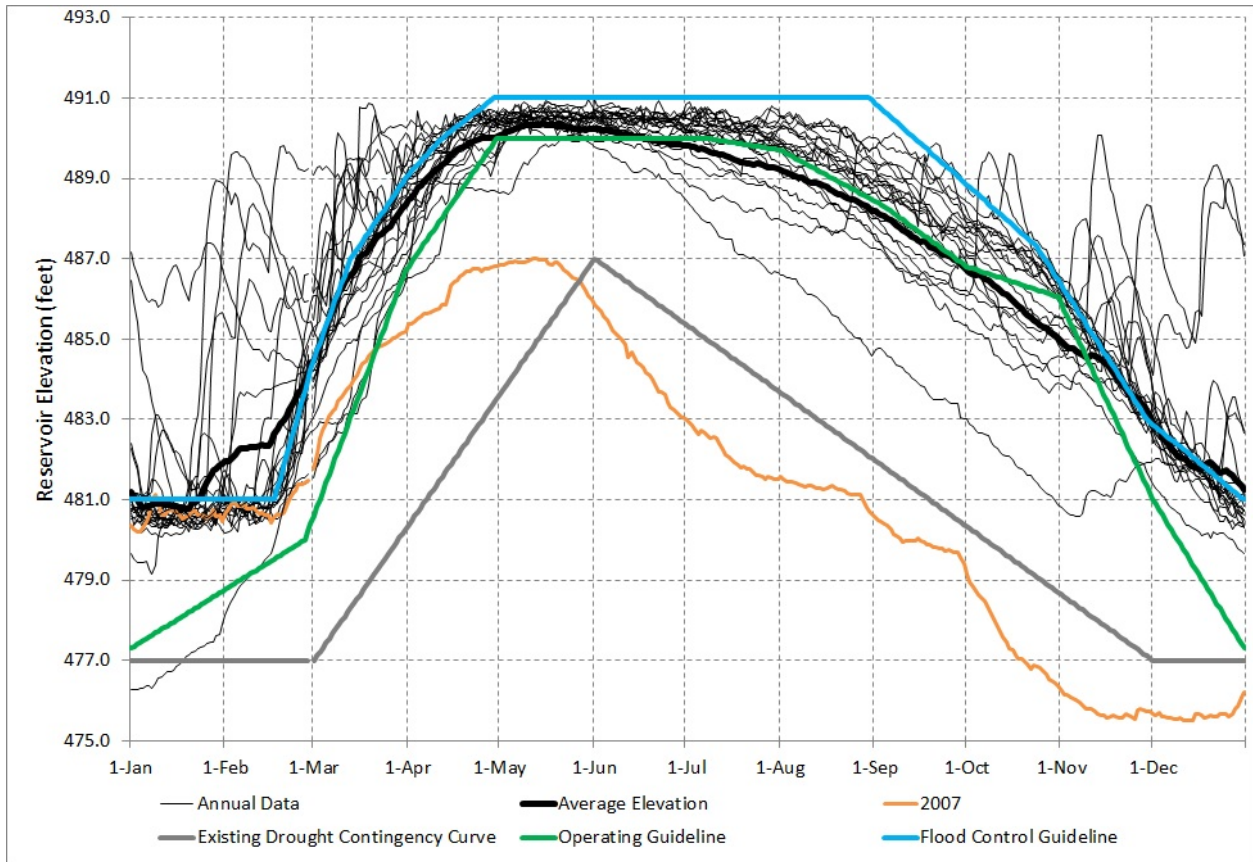


Figure 3-5. Historical reservoir levels from Lake Martin reservoir for 1990 to 2011 (Source: Alabama Power, 2011a, as modified by staff).

Table 3-4. Calculated flood frequency flows (in cfs) for Martin dam and historical flood flows (in cfs) at Martin dam and the Tallassee gage located 12 miles downstream of Martin dam (Source: Alabama Power, 2010f; Alabama Power, 2011a; USGS, 2012).

<b>Calculated Unimpaired Flows at Martin Dam</b>								
Avg. Flow	2-Year	5-Year	10-Year	50-Year	100-Year	500-year	April 1979	March 1990
1-day	48,000	72,000	87,000	118,000	130,000	156,000	114,551	125,019
3-days	NA	NA	66,400	91,400	102,000	125,000	92,446	103,610
5-days	NA	NA	51,800	71,700	80,100	99,600	68,262	78,483
<b>Historical Recorded Flows from Martin Dam</b>								
Avg. Flow			March 1990	May 2003	July 2003			
1-day			105,884	96,035	59,038			
3-days			75,665	66,522	47,945			
5-days			59,141	47,236	36,200			
<b>Historical Recorded Flows from the Tallassee Gage downstream of Martin Dam</b>								
Average Flow	April 1979	March 1990	May 2003	July 2003				
1-day	110,000	125,000	94,000	68,900				
3-days	76,433	85,667	62,967	51,133				
5-days	59,240	66,940	45,800	39,580				

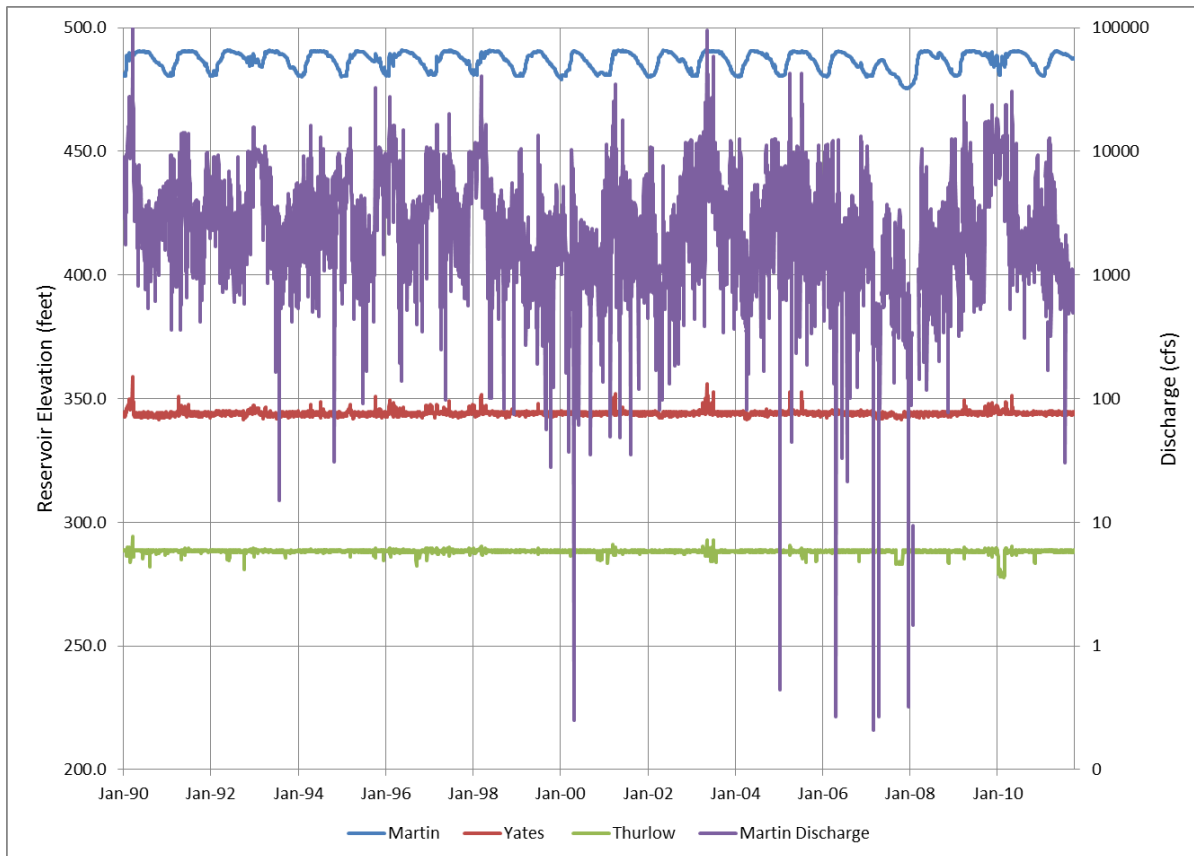


Figure 3-6. Historical reservoir levels for Martin, Yates, and Thurlow, and releases from Lake Martin reservoir for 1990 to 2011 (Source: Alabama Power, 2011b, as modified by staff).

#### *Flows Downstream of Thurlow*

The Martin Dam Project operates in a peaking mode as described in section 2.1.3, *Existing Project Operation*, but with the objective of maintaining a 1,200-cfs minimum flow from Thurlow dam. The normal operational flows below Thurlow dam range from about 1,200 to 17,900 cfs. River flows below Thurlow dam are measured at the Tallassee USGS gage no. 02418500 on the Tallapoosa River below Tallassee, located at RM 47.98 about 2 miles downstream from Thurlow dam (table 3-5). These monthly flow data show flows lower than the 1,200-cfs minimum flow from Thurlow dam, because Alabama Power is allowed to reduce the minimum flow under drought conditions, as described in section 2.1.3.

Table 3-5. Monthly flow statistics downstream of Thurlow dam at the Tallassee USGS gage no. 02418500, Tallapoosa River, below Tallassee, Alabama, 1992 to 2011 (Source: USGS, 2012).

	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Mean	3,370	4,965	5,726	5,401	5,594	6,274	4,042	3,806	3,187	3,449	2,570	2,583
Median	2,380	4,055	4,935	4,430	4,085	4,165	2,560	2,240	2,115	1,995	1,980	2,055
Max.	36,200	23,400	19,000	18,300	25,600	40,800	51,200	94,000	26,100	68,900	11,400	18,300
Min.	80	356	368	365	387	390	241	281	810	536	175	448
10% Exceed.	5,762	10,610	11,910	10,910	12,100	13,910	8,691	6,974	6,501	6,613	5,180	4,265
90% Exceed.	1,300	1,310	1,370	1,320	833	703	653	1,270	1,270	1,270	879	1,190

Note: Data shown in this table are for 1992 to 2011. The drainage area at this gage is 3,328 square miles.

#### *Lower Tallapoosa River*

The reach of river below Thurlow dam (the lowermost dam on the lower Tallapoosa River) has widening floodplains and much flatter slopes as compared to the reach above Lake Martin. There are recent records for two USGS gage sites in this reach in addition to the Tallassee gage:

- USGS gage no. 02419500 Tallapoosa River at Milstead at RM 39.8; and
- USGS gage no. 02419890 Tallapoosa River near the Montgomery Water Works at RM 12.9.

The Tallapoosa and Coosa Rivers merge near Montgomery to form the Alabama River. At this location, 68 percent (about 10,161 square miles) of the drainage area is from the Coosa River and the remainder, about 4,675 square miles, is from the Tallapoosa River. Flows from the Coosa River enter the Alabama River from Alabama Power's Coosa River Project. Alabama Power supplies water for navigation on the Alabama River from the projects on both the Coosa and Tallapoosa Rivers.

Downstream of the confluence of the Coosa and Tallapoosa Rivers on the Alabama River, the Corps operates the Robert F. Henry lock and dam, Millers Ferry lock and dam, and the Claiborne lock and dam. Two are operated for navigation purposes, hydropower, and recreation, and one is operated for navigation purposes and recreation (see figure 3-3). These three facilities have small day-to-day water level fluctuations along their long and narrow impoundments. The Robert F. Henry lock and dam, which

has an 82-MW hydropower generation facility, is located about 77 river miles downstream of Jordan dam and normally controls the water level upstream to the tailwater area downstream of Jordan dam. Millers Ferry lock and dam, which has a 90-MW hydropower generation facility, is located about 103 river miles downstream of the Robert F. Henry lock and dam. Claiborne lock and dam has no hydropower facility, is located about 60 miles downstream of Millers Ferry lock and dam, and about 118 miles upstream from Mobile Bay, which receives flow from the Alabama and Tombigbee Rivers. The Tombigbee River joins the Alabama River about 72 river miles downstream of Claiborne lock and dam.

### Water Use

Under the current license, Alabama Power has given approval for reservoir withdrawals totaling about 36 million gallons per day (mgd) (Alabama Power, 2010c). On average about half of that, or 18 mgd, is withdrawn from Lake Martin (table 3-6).

Table 3-6. Approved water withdrawals from Lake Martin, Tallapoosa River (Source: Alabama Power, 2010c).

Owner	Facility Name	Source	Average Daily Withdrawal (mgd)	Alabama Power Permit (mgd)
Russell Lands, Inc.	Willow Point Golf & Country Club	Lake Martin	0.85	<1
City of Alexander City	Adams Water Treatment Plant	Lake Martin	10.6	24
Central Elmore Water and Sewer Authority	Central Elmore Water and Sewer Authority Water Treatment Plant	Lake Martin	6.7	10
Still Waters Resort	Beaver Lake Replenishment Pump Station	Lake Martin	<0.1	<1

### Water Quality

Alabama DEM classified Lake Martin as either mesotrophic or oligotrophic, meaning that nutrient levels and primary productivity are relatively low, based on long-term monitoring of the lake. Alabama DEM also classified the entire extent of Lake Martin as supporting both the swimming, and fish and wildlife classifications. The upper section of Lake Martin (upstream of U.S. Highway 280) also is classified as public water supply. The tailrace also was classified as public water supply, swimming, and fish and wildlife. All areas in Lake Martin currently meet their use classifications (table 3-7), and Alabama DEM did not include Lake Martin or any of the waters of the sub-basin in its

2010 303(d) list as impaired (EPA, 2008). The Tallapoosa River between Yates dam and Martin dam is listed under Category 2B, which indicates that although available data do not satisfy minimum data requirements, there is low potential for use impairment based on the limited data.

Table 3-7. Water quality standards applicable to the Martin Dam Project (Source: Alabama Power, 2011a).

<b>Variable</b>	<b>Standard for Fish, Wildlife, and Swimming</b>	<b>Standard for Public Water Supply</b>
pH	Between 6.5 and 8.5	Between 6.0 and 8.5
Dissolved oxygen (DO)	Not less than 5.0 milligrams per liter (mg/L) at a depth of 5 feet. Not less than 4.0 mg/L for hydroelectric turbine discharges.	Not less than 5.0 mg/L at a depth of 5 feet. Not less than 4.0 mg/L for hydroelectric turbine discharges.
Water temperature	Not greater than 90°F (32.2 degrees Celsius [°C])	Not greater than 90°F
Turbidity	Not greater than 50 nephelometric turbidity units (NTUs)	Not greater than 50 NTUs
Bacteria	Not more than 1,000 colonies/100 milliliters (ml) (for fish & wildlife) or 200 colonies/100 ml (for swimming)	Not more than 1,000 colonies/100 ml
Chlorophyll- <i>a</i>	Not greater than 5 micrograms per liter (ug/L)	Not greater than 5 ug/L

Lake Martin thermally stratifies in the spring, creating a surface layer of well-mixed, warm, higher DO water (the epilimnion) and a bottom layer of colder, denser, lower DO water (the hypolimnion). Separating the two layers is a zone called the metalimnion or thermocline, where water temperature decreases rapidly with depth. Lake Martin typically stratifies in April or May, and turns over (loses its stratification) in the fall, usually in late October or November.

Alabama Power’s existing water quality monitoring program has included chemical analyses of water samples (about 50 parameters) collected at the 5-foot depth at

seven sites: in the Martin forebay and tailrace areas as well as at locations of 4, 12, 16, 20, and 24 miles upstream of the dam. Key parameters monitored in this program from 1993 until 2009 include DO, temperature, biochemical oxygen demand, pH, turbidity, nitrogen,<sup>35</sup> total phosphorus, orthophosphate, and various metals. In general, all parameters monitored were normally in compliance with the state of Alabama standards. In a data set from the Lake Martin forebay:

- temperatures ranged from 10.5°C to 31.6°C; and
- DO levels ranged between 3.8<sup>36</sup> and 10.7 mg/L with an average of 7.83 mg/L at all seven sites.

Alabama DEM and the Montgomery Water Works and Sanitary Board have also collected extensive water quality data throughout the Tallapoosa drainage basin including the project area. Both sets of data as summarized in the final license application indicated generally acceptable water quality in the project area. Data collected by Alabama DEM between 1994 and 2005 from Lake Martin, indicated maximum coliform levels of 33 colonies per 100 ml, substantially below the standards shown in table 3-7. Based on data collected by Alabama DEM in the same time period in Lake Martin, chlorophyll *a* averaged 8.52 ug/L, and had a maximum of 98.41 ug/L, both above the 5.0 ug/L standard shown in table 3-7.

Nutrient data for Lake Martin collected by the Lake Watch of Lake Martin indicated that nutrient levels in Lake Martin have been increasing over time. As part of the preparation of the license application, Alabama Power conducted a nutrient study during 2009 and 2010. As a part of this study, nutrient and basic water quality data were collected monthly at 16 sites from April to October 2009 and at 8 stations during the winter months from November 2009 to March 2010. During April to October, the average chlorophyll *a* value of the 16 sites was about 4.8 ug/L with a maximum of 31 ug/L measured at the upper end of Lake Martin.

As described earlier, the flow in the Tallapoosa River downstream of Thurlow dam fluctuates based on generation flows at the Martin Dam Project, with only a small effect caused by the limited storage capacity at the Yates and Thurlow developments. Alabama Power conducted extensive temperature and DO monitoring of the tailrace between June 1 and October 31 from 2002 through 2009. This monitoring included tailrace readings every 30 minutes in the 2002 to 2005 period and every hour in 2006 to 2009. The DO and temperature data are summarized in table 3-8. The data show that the water quality of the discharge from Lake Martin generally met or exceeded the minimum state water quality standard for DO of 4.0 mg/L for hydropower discharges.

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<sup>35</sup> Nitrogen ammonia, nitrogen nitrate, nitrogen nitrite, and nitrogen total kjeldahl.

<sup>36</sup> The second lowest reading was 5.3 mg/L.

Table 3-8. Summary of the Martin dam tailrace sampling data (Source: Alabama Power, 2011a).

	Temperature (°C)		DO (mg/L)	
	2002-2005	2006-2009	2002-2005	2006-2009
Minimum	12.06	12.7	3.46	4.17
Maximum	25.44	31.1	9.78	9.54
Average	19.11	18.05	5.91	5.72
Number of Measurements	7795	2529	7795	2529
Percent of Time > 4 mg/L	-	-	99.9	100

In the 2002 to 2005 time period, there were only two events recorded with DO below 4.0 mg/L and Alabama Power provided these explanations:

- on October 28, 2002, when Unit 4 experienced a scheduled outage to dry out the generator, resulting in a temporary shutdown of the turbine aeration system, the deviation from the state standard lasted 2.5 hours; and
- on July 8, 2005, when the DO dropped below 4.0 mg/L during a flood event and the high water level in the tailrace resulted in the DO monitor measuring DO levels not representative of discharges from the powerhouse (manual DO readings downstream of the dam during the event verified that DO levels exceeded 4.0 mg/L in project releases).

Alabama Power continues to collect hourly DO and temperature values in the tailrace during generation from June 1 through October 31 of each year as part of its long-term monitoring program required by its existing FERC license.

### **Fishery Resources**

Lake Martin has clear, low productivity waters with generally good water quality. Because of the depth (maximum depth of 155 feet) and relatively long water retention time of the reservoir,<sup>37</sup> thermal and chemical stratification occur annually. The extensive shoreline littoral zone and multiple tributaries provide excellent habitat for warmwater centrarchid species (sunfish and basses). The deeper open water areas of the reservoir

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<sup>37</sup> The retention time, or average amount of time for water that has flowed into the reservoir to flow out, estimated to be about 194 days (Alabama Power, 2011a).



also provide excellent habitat for open water (pelagic) species such as striped bass, and threadfin and gizzard shad.

Although Lake Martin has relatively low fertility (i.e., low levels of nutrients), the fishery resources are healthy and extremely popular with anglers. At least 75 species have been reported in the project vicinity (Alabama Power, 2011a). Predominant recreational fish species include spotted and largemouth bass, striped bass, white bass, black crappie, and bluegill. Although spotted bass exhibit good production and survival, they grow more slowly, because of the lower fertility of the lake. Populations of black crappie, bluegill, and white bass remain healthy. Gizzard and threadfin shad provide the forage base for the fishery. There are currently no fish consumption advisories for Lake Martin or the area immediately downstream of the dam (Yates reservoir). Thurlow reservoir has an advisory for largemouth bass for mercury, and the lower Tallapoosa has an advisory for spotted bass, also for mercury (ADPH, 2011).<sup>38</sup>

Lake Martin supports a striped bass population, which Alabama DCNR supplements by stocking. Stocking has occurred annually using Gulf-strain striped bass. Though the fishery is generally stable, the population is under some stress. High water temperatures and low DO during the summer months have been reported to result in periodic deaths of adult striped bass. Radiotelemetry studies have shown that striped bass move to different parts of the lake, likely trying to find water with suitable temperatures and DO levels.

Studies have been conducted to determine the amount of total striped bass habitat (area where the water temperature is less than 25°C and the DO concentration is greater than 1.6 mg/L) and quality striped bass habitat (area the water temperature is less than 21°C and the DO concentration is greater than 3.2 mg/L) (Sammons, 2011). In 2009 and 2010, striped bass habitat generally decreased from spring into late-summer, and gradually increased in the fall as water temperatures cooled.

Alabama Power conducted an entrainment study to estimate the numbers of fish that may be entrained and killed during passage through the Martin dam powerhouse, emphasizing effects on striped bass and largemouth bass. This study was a combination of a desktop assessment and field hydroacoustic data collections. The study produced the following key results:

- entrainment estimates range up to 6.5 million fish annually;
- most entrainment occurs during the winter months;
- clupeids (threadfin and gizzard shad) compose the majority of fish entrained; most fish entrained were less than 4 inches in length; and

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<sup>38</sup> The advisory recommends no consumption for women of child-bearing age and for small children, and no more than one meal per month for all others.

- the number of larger game species, such as striped bass and largemouth bass, entrained is small.

Releases from the project are relatively cool (bottom or hypolimnetic discharge) and infertile. The discharge flows directly into the Yates development reservoir. The Thurlow development is immediately downstream of the Yates development. Alabama Power conducted periodic fisheries monitoring from 1993 to 2009 as part of the Yates and Thurlow license requirements. The species composition downstream of Thurlow dam is similar to Lake Martin and includes spotted and largemouth bass, striped bass, white bass, black crappie, bluegill, red-ear sunfish, channel catfish, and yellow perch. Surveys found a total of 66 species, indicating a diverse riverine fishery. Species of particular interest that were collected only downstream of Thurlow include the paddlefish, a species of concern for Alabama DCNR, and the American eel.

Paddlefish spawn in the Tallapoosa River downstream of Thurlow dam during March and April. Upstream spawning movements are believed to be linked to an increase in water temperature. Spawning is likely triggered by higher flow events. Hubert et al. (1984) state that spawning occurs at water temperatures greater than 10°C (50°F) and that a rapid increase in river discharge, resulting in an increase in the river elevation by “several meters,” is the trigger for spawning. The habitat suitability index (HSI) curves presented by Hubert et al. (1984) assign a rise in river stage of 3 meters (about 9.8 feet) and higher, above the average mid-winter flow level, a suitability index of 1.0 (meaning the highest suitability). They assign a river stage increase of 1.5 meters (about 5 feet) a suitability index of 0.5 (meaning moderate suitability). The HSI curves also indicate that higher river stages need to exist for 10 days, to allow for successful egg incubation and hatching. Paddlefish eggs are adhesive to the river substrate and would be dewatered and killed if river flow decreased soon after spawning. Alabama Power (2011a) identifies that an increase in river flow to 6,000 cfs as a key factor in triggering paddlefish spawning events in the Tallapoosa River. A review of hydropower operational records found that outflows from Thurlow dam commonly meet this 6,000-cfs threshold during the spring spawning period. Flows from Thurlow dam during 1992-2007 (including drought years), reached or exceeded 6,000 cfs a total of 19 days during the months of March and April. In addition, pulsing of flows, related to peaking operations, well above 6,000 cfs occurred on a regular basis during the same time period.

While the paddlefish completes its lifecycle within the freshwater system, catadromous species, like the American eel, live most of their lives in freshwater environments and, upon reaching sexual maturity, migrate to the ocean to spawn. The juvenile offspring migrate to the estuaries and mouths of rivers and move upstream to freshwater habitat to live until adulthood. American eels were collected downstream of Thurlow dam, but not immediately downstream of the project. It appears that their upstream migration is blocked by the downstream dams.

Anadromous species migrate from the ocean into freshwater habitat to spawn. Historically, there were several species that migrated from the Gulf of Mexico to inland

Alabama rivers (including the Tallapoosa River) to spawn. Striped bass are anadromous by nature, but the striped bass above Thurlow are not able to move in and out of the ocean, because of the dams. No other anadromous species currently occur in the Tallapoosa River immediately downstream of the Martin Dam Project. Again, upstream passage on the Tallapoosa River is blocked by the downstream Yates and Thurlow dams, as well as the three Corps dams on the Alabama River. However, some upstream fish passage may occur at the Corps dams via the navigation locks. Two anadromous species, the Alabama shad and striped bass, are thought to occur downstream of Thurlow dam. The Alabama shad, however, was not found by Alabama Power during sampling conducted as part of the Thurlow license requirements. Striped bass have been collected downstream of Thurlow dam, but these fish could be fish that had dropped down from Lake Martin, and may not have been upstream migrants from the Gulf.

The lipstick darter was found in tributaries to Lake Martin, including Kowalgia, Timbergut, and Hillabee Creeks. Alabama Power also reports the lipstick darter as being observed in unspecified tributaries to the Tallapoosa River below Thurlow dam. The lipstick darter is an insectivorous riffle fish of small to moderate streams. It is endemic to the Tallapoosa River and listed as endangered by the State of Alabama. Alabama Power mollusk surveys from 2006 to 2010 found several species of the mostly commonly occurring freshwater mussels and snails in Lake Martin, its tributaries, and downstream of Thurlow dam. Six native mussel species were collected in Lake Martin and its tributaries, including the: little spectaclecase, flat floater, giant floater, yellow sandshell, paper pondshell, and fragile paper shell. The non-native Asiatic clam was also commonly collected in Lake Martin. Diversity was somewhat greater downstream of Thurlow dam, with the collection of live, dead, or empty shells of nine unionid mussel species, including the: Alabama orb, southern pocketbook, Alabama heelsplitter, threehorn wartyback, bleufer, pistolgrip, yellow sandshell, fragile papershell, and giant floater. Five snail species were collected in Lake Martin or in the Martin dam tailrace including the: yellow elimia, cylinder campeloma, marsh rams-horn, two-ridge rams-horn, and unidentified species of the genus *Physella*. Previous sampling downstream of Thurlow dam during minimum flow studies found the Tallapoosa pebblesnail about 0.5 miles downstream of the dam. The Tallapoosa pebblesnail is a species of moderate conservation concern in Alabama, but it is not federally listed.

### **Aquatic Vegetation**

The following species are known to occur in the Tallapoosa basin and pose a concern for expansion into Lake Martin: hydrilla, Eurasian milfoil, milfoil, naiads, creeping water primrose, alligator weed, coontail, pondweeds, Canadian elodea, fanwort, and bladderwort.

Alabama Power identified 20 sites, totaling 858 acres, where potential changes in operations could affect aquatic vegetation. Because these areas are generally shallower than 6 feet deep, they are completely dewatered and exposed during the current winter drawdown conditions. The current rule curve has annually exposed the shorelines to

freezing temperatures as well as soil drying and compaction, which helped to minimize or eliminate aquatic vegetation growth along the exposed shorelines. The proposed higher water levels during the winter could increase the ability of shoreline vegetation to survive the winter months. In addition, the water table will remain higher reducing the total area of soils exposed to compaction and desiccation.

### **3.3.2.2 Environmental Effects**

#### **Water Quantity**

##### *Effects of Increased Winter Pool Elevation on Upstream and Downstream Flooding*

Water levels of Lake Martin affect a wide range of aquatic and recreational resources and have the ability to partially control high flow events on the Tallapoosa River. Flood storage within the reservoir, and adjusting project releases, prevents flooding around the reservoir and helps to limit the effects of flooding downstream of the dam along the Tallapoosa River. Alabama Power proposes to change the regulation of Lake Martin by raising the winter flood curve by 3 feet beginning in mid-November through mid-February, as described in greater detail in section 2.2.2, *Proposed Project Operation*, and as shown in figure 2-2.

Lake Martin RA recommends a 4-foot increase in the winter lake level because of potential economic benefits associated with increased use of the lake for recreation during the winter. Lake Martin RA believes that there would not be a substantial increase in downstream flooding. Lake Martin Home Owners & Boat Owners Association (Lake Martin HOB) recommended a 5-foot increase in the winter lake level.

The Downstream Landowners assert that Alabama Power studies have been inadequate in evaluating and addressing flood damage that may occur to downstream property, lands, farms, timber, historical Indian artifacts, and wildlife. Specifically, they express concern regarding flood damage to their lands near or adjacent to the Tallapoosa River because of mismanagement of releases from the Martin dam. They mentioned two floods (both smaller than the 100-year flood) in 2003, which they claim caused about \$2.1 million in damages to crops and production losses. The Downstream Landowners are concerned that a higher winter reservoir level would limit the seasonal flood control capacity of the Martin Dam Project and increase the flooding downstream along the Tallapoosa River.

The Atlanta Regional Commission expresses concern that the proposed flood curve changes at Lake Martin would increase the reliance on Lake Altoona for flood control in the basin and therefore affect its water supply capability. They assert that the cumulative effects of the projects in the Alabama, Coosa, and Tallapoosa River Basins have not been adequately considered and that the supply capability of Lake Allatoona may be adversely affected. Georgia Environmental Protection Division

(Georgia EPD) raises similar concerns and makes several criticisms of Alabama Power's modeling analyses. Georgia EPD states that there was a lack of computer modeling of:

- current operations to be used as the baseline for the analysis of proposed operations;
- proposed drought operations or changes to the flood control operations; and
- the combined effects of its operation on the Coosa and Tallapoosa Rivers.

#### *Our Analysis*

As part of the license application development process, Alabama Power conducted modeling studies of the upstream river reaches, Lake Martin reservoir, and downstream river reaches and reservoirs to assess the short-term and long-term effects on potential flooding that would result from a range of proposed reservoir level alternatives. This modeling approach (discussed below) provided an initial assessment of potential effects from raising the winter pool elevation. Based on potential flooding concerns we identified in the Draft EIS, Alabama Power conducted additional, more refined modeling analysis, which is discussed later.

Alabama Power's general modeling approach was to use the Corps software program HEC-RAS to evaluate river reaches, the Alabama Power Project Routing Model (described below) to evaluate the Lake Martin reservoir, and the HEC-ResSim model to analyze daily normal operations during non-flood conditions. Models were calibrated and verified using historical flow hydrograph and stage data, and flood effects were simulated using a 100-year design flood. The results of these pre-filing studies are discussed immediately below.

For the flood modeling related to areas upstream of the Martin Dam pool a HEC-RAS unsteady-state flow model was developed for the reach extending from the toe of Harris dam to the upstream face of Martin dam. The model was calibrated using a May 2003 flood event and verified using a March 1990 flood that approximated a 100-year return event. Effects in Lake Martin that would result from the proposed higher winter pool were evaluated using a design flood and the Alabama Power Project Routing Model. These effects were then evaluated using the upstream HEC-RAS model. The results indicate that the increased water level in Lake Martin would result in an upstream effect that would decline from about a 0.5-foot increase in flood level immediately upstream of Lake Martin to less than a 0.3-foot increase about 30 miles upstream of Lake Martin, to a negligible increase at about 70 miles upstream of the lake near the tailwaters of Harris dam (see figures 3-7 and 3-8).

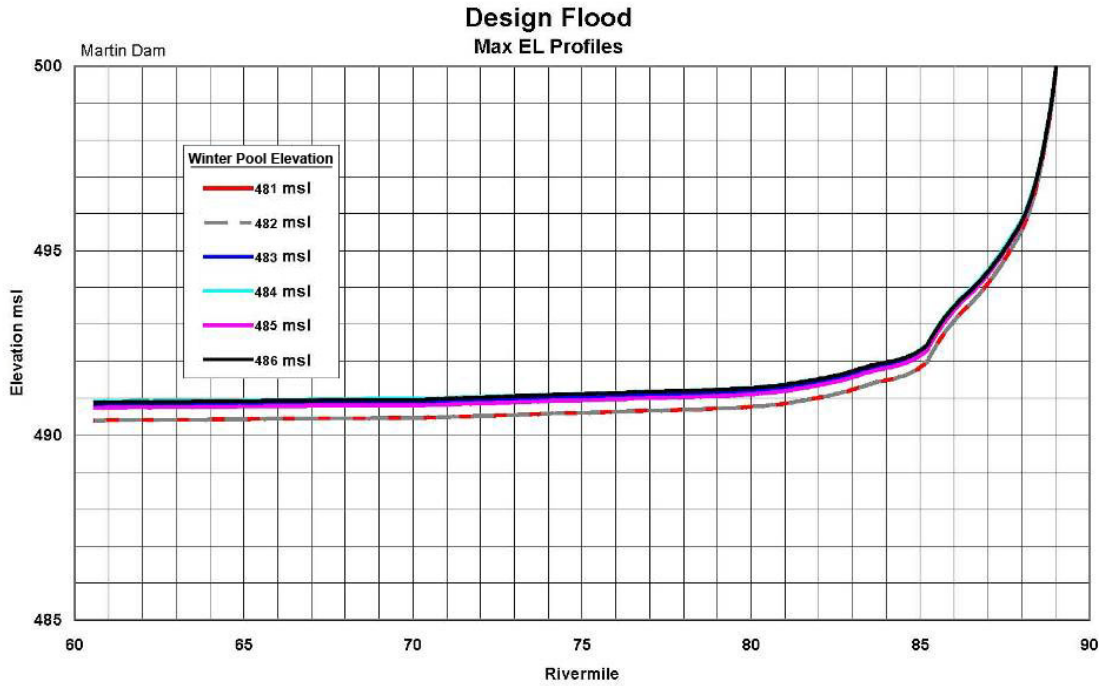


Figure 3-7. Design flood profiles upstream of Martin dam to Harris dam at alternative winter pool elevations (Source: Alabama Power, 2010f).

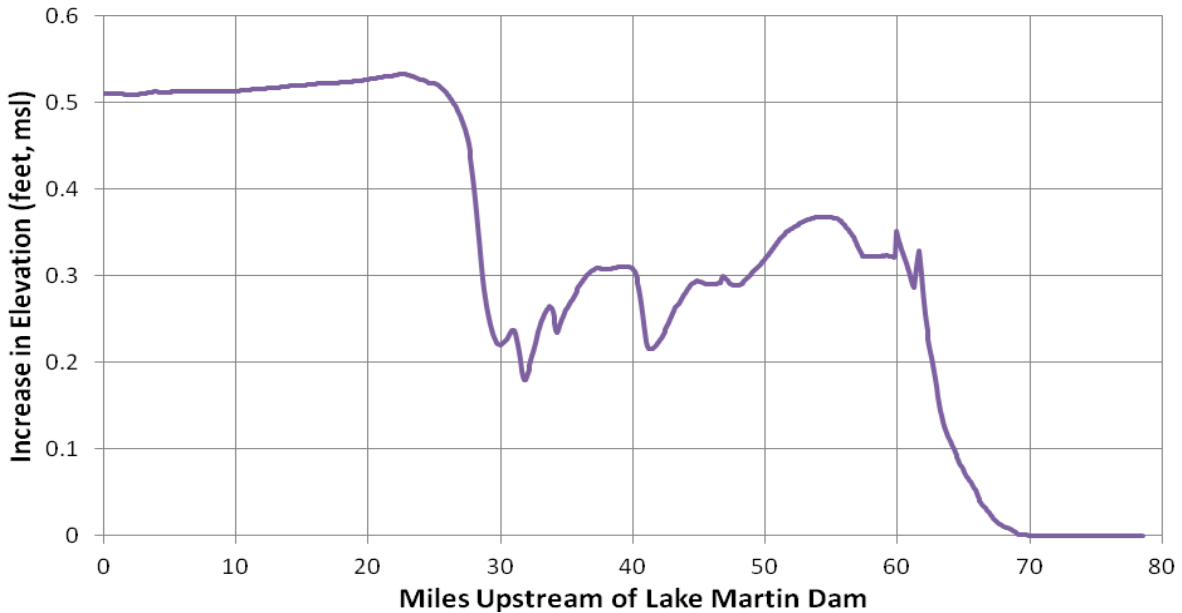


Figure 3-8. Computed increase in 100-year flood levels due to proposed change in flood control curve (3-foot increase in Lake Martin winter pool) (Source: Alabama Power, 2010f, as modified by staff).

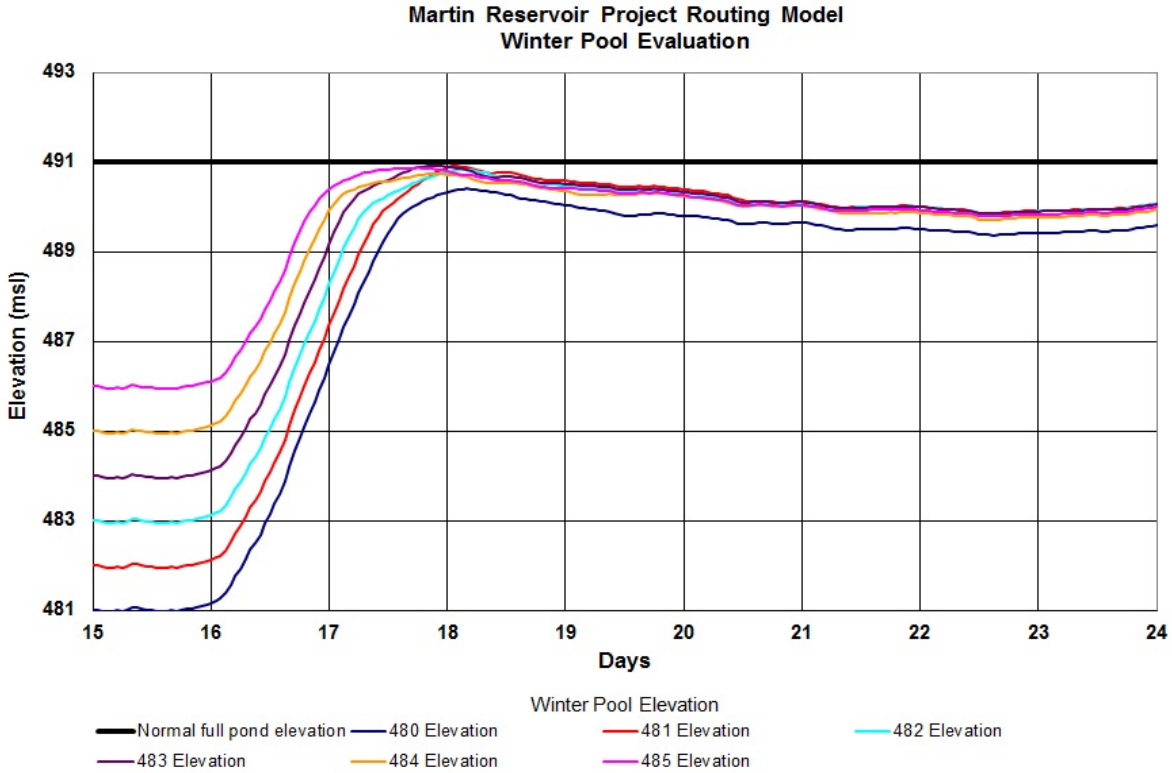


Figure 3-9. Lake Martin 100-year flood elevations under different winter pool elevations (Source: Alabama Power, 2010f, as modified by staff).

Flood modeling within the Lake Martin pool was conducted by routing the 100-year design flood using the Alabama Power Project Routing Model, a spreadsheet based model. This model was calibrated to the March 1990 flood event and then used to predict the reservoir flood levels that could occur as a result of the proposed flood control guideline. The flood elevations estimated for the impoundment influenced both the upstream and downstream flood models.

Lake Martin flood modeling results, shown in figure 3-9 for six different winter pool elevations, indicated that there would be about a 0.5-foot increase in the peak 100-year flood elevations by increasing the winter pool from elevation 481 feet to elevation 484 feet, but they would not rise above the 491-foot flood control curve. Similar results would occur with a winter pool elevation of 485 feet. The model also showed that the discharge hydrograph from Lake Martin would have an increased peak and greater volume of flow as a result of the proposed flood control curve, which we discuss below under the effects on downstream flooding.

From a location starting about 1.6 miles downstream of Thurlow dam,<sup>39</sup> Alabama Power used a HEC-RAS model to simulate the downstream flood effects that would result from the proposed higher flood curves,<sup>40</sup> under the conditions of the 100-year design flood. Downstream flood level increases were computed to be between 0.75 and 2.3 feet resulting from a 3-foot increase in the winter pool, as measured at cross sections of the HEC-RAS model, with greater increases in the upper section of the river. Table 3-9 shows the estimated changes in elevation at three downstream gages. The modelling estimate that the 3-foot-higher winter pool proposed by Alabama Power could result in flood levels slightly below the Southeast River Forecast Center's (SERFC) moderate flood stage at the Milstead gage (199.6 feet vs. 200 feet). However, farther downstream at the Montgomery Water Works gage, the 3-foot higher winter pool elevation could result in a flood level that is 0.1-foot below the major flood stage. Under existing conditions, the 100-year flood was modeled to be well within the moderate flood stage at Montgomery Water Works. Table 3-9 also shows resulting flood levels modelled for a 5-foot-higher Lake Martin winter pool, which could rise to 0.7 to 1.1 feet higher than levels associated with the 3-foot-higher winter pool, placing the flood into the major flood stage category at Montgomery Water Works.

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<sup>39</sup> Alabama Power did not conduct flood modeling in the first 12 river miles downstream of Martin dam because this reach is impounded by the Yates and Thurlow developments and because the developments provide little attenuation of flood flows.

<sup>40</sup> Alabama Power calibrated and verified the model to the 2003 and 2009 flood events to observed stage values, but had difficulty in matching the corresponding gage flow values. Reportedly this was due to the dynamic effects computed by the unsteady-state flow HEC-RAS simulation, compared to the static relationship between stage and flow assumed by USGS at the gaging stations used for model calibration and verification. According to Alabama Power, USGS and Alabama Power agreed that the more important parameter for flood modeling was stage rather than flow. Subsequent analysis of downstream effects by Alabama Power focused on flood levels and not flows. We agree that calibrating to stage is more important than flow due to the effects on flood levels downstream of the project. However, the lack of calibration requires broad interpretation of the model results.



Table 3-9. Initial modeled downstream flood levels at USGS gage sites, as a result of the increase in the Lake Martin winter pool elevation (Source: Alabama Power, 2010f).

	<b>Computed Existing 100-year Flood Elevation – 481 feet msl Winter Pool</b>	<b>Computed 100-year Flood Elevation – Proposed 484 feet msl Winter Pool</b>	<b>Increase in Computed Flood Level for 3-foot increase in Winter Pool (feet)</b>	<b>Increase in Computed Flood Level for 5-foot increase in Winter Pool (feet)</b>	<b>SERFC Low Flood Stage (feet msl)</b>	<b>SERFC Moderate Flood Stage (feet msl)</b>	<b>SERFC Major Flood Stage (feet msl)</b>
Tallassee Gage (12.6 miles downstream of Martin dam)	204.8	207.1	2.3	3.1			
Milstead Gage (20.8 miles downstream)	198	199.6	1.6	2.3	194	200	207
Montgomery Water Works Gage (47.7 miles downstream)	165.4	166.9	1.5	2.6	154	161	167

Note: SERFC - Southeast River Forecast Center

Using LIDAR and aerial photography, Alabama Power created topographical and land use maps of downstream areas that could be affected by flooding both in existing and proposed conditions based upon the initial HEC-RAS model predictions. These maps were used to identify land area and structures that are currently affected by flooding and could be affected by proposed higher winter lake levels. Figure 3-10 shows an example map for a location about 4 miles upstream from the Montgomery Water Works gage. The shading that makes up a small portion of the figure shows additional areas that could be affected by increased flooding.

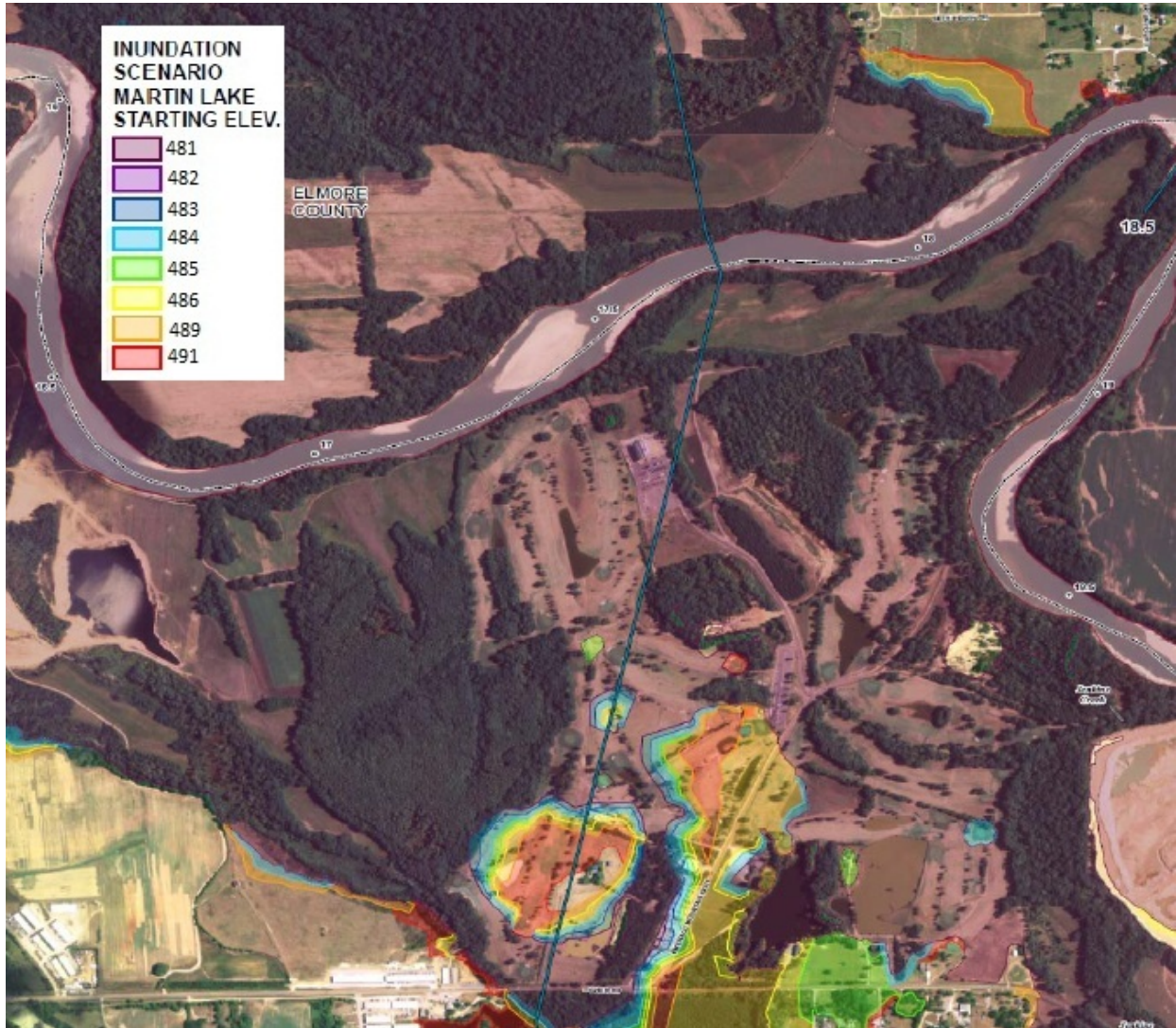


Figure 3-10. Flooding inundation map near RM 17 (Source: Alabama Power, 2010f).

Table 3-10 shows estimates of the currently affected area and the area that could be affected by different initial modeling scenarios. The proposed winter pool elevation of 484 feet could flood an additional 2,119 acres (3.31 square miles) of land, including:

- 2,041 acres of agricultural land;
- 30 acres of industrial land;
- 23 acres of commercial land; and
- 23 acres of residential land.

Table 3-10. Downstream acres of land potentially affected by flooding associated with alternative winter pool levels, at the 100-year flood level (Source: Alabama Power, 2010f).

<b>Model Scenario (Winter Pool elev. feet msl)</b>	<b>Inundated Area (acres)</b>	<b>Inundated Area (acres) by Land Use Category</b>			
		<b>Agricultural</b>	<b>Industrial</b>	<b>Commercial</b>	<b>Residential</b>
481 (existing)	19,924	17,733	448	385	23
482	20,256	18,063	449	385	23
483	20,568	18,354	459	393	25
484 (Alabama Power)	22,043	19,774	478	408	46
485 (Lake Martin RA)	22,500	20,097	491	496	79
486 (Lake Martin HOB0)	23,277	20,752	581	513	94
489	24,353	21,499	607	560	1,230

Table 3-11 shows estimates of the currently affected structures and the number of additional structures that could be affected by different initial modeling scenarios. Additional flooding from the higher winter lake level proposed by Alabama Power could affect an additional 10 commercial structures and 13 residential structures. At winter lake levels recommended previously by Lake Martin HOB0, additional affected structures include one industrial structure, 13 commercial structures, and 19 residential structures as compared to existing conditions.

Table 3-11. Number of downstream structures potentially affected by flooding associated with alternative winter pool levels, at the 100-year flood level based on initial modeling (Source: Alabama Power, 2010f).

Model Scenario (Winter Pool elev. feet msl)	Affected Structures	Inundated Structures by Land Use Category		
		Industrial	Commercial	Residential
481 (Existing)	18	3	11	4
482	18	3	11	4
483	27	3	20	4
484 (Alabama Power)	41	3	21	17
485 (Lake Martin RA)	47	4	22	21
486 (Lake Martin HOBO)	50	4	24	22

Our analyses, using the initial modeling files provided by Alabama Power in its application, indicated that increases in the downstream flood stages associated with changes in the winter pool elevations would be proportionately smaller with smaller flood events relative to the 100-year flood event. This is related to the greater influence of the Lake Martin storage capacity, even with higher winter water levels, and the greater effect of tributary inflow downstream of Martin dam. In flood events larger than the 100-year storm, storage effects associated with Lake Martin become less of a factor, and downstream flood levels are more similar to existing conditions.

With the proposed higher Lake Martin winter elevation, in the winter months, there would also be an increase in frequency of spillage at Martin dam (from one or more of the 20 spillway gates), because the project could not use its full storage volume to retain small magnitude flood events. Spillage of any volume, based on historical operations from 1940 to 2007, has occurred infrequently, about 0.85 percent of the time. Based on modeling conducted by Alabama Power, with a 5-foot increase in the winter pool, spillage would occur about 1 percent of the time. With a 3-foot increase in winter pool elevation, spillage would occur about 0.95 percent of the time. At higher volumes (above 20,000 cfs) the frequency of spillage would increase slightly from about 0.14 percent to 0.15 percent of the time.

In summary, these initial studies showed that an increase in the winter pool elevation would slightly increase spillage at Martin dam, and could increase water elevations at downstream locations during flood conditions. The proposed higher winter pool elevation would reduce the useable flood storage volume by about 94,000 acre-feet, or 47,500 cfs-days during the winter. Our preliminary analysis showed that, for minor flood events, less than the 100-year flood, the effects on downstream flooding would be

small. However, flood levels during a 100-year flood event during the winter or early spring could be between 0.75 and about 2.3 feet higher in some downstream locations. Compared to existing conditions, such an increase in flood levels could affect an additional 2,119 acres of land and 23 structures under the Alabama Power proposal, and an additional 4,429 acres and 32 structures under the Lake Martin HOB0 recommendation.

Alabama Power conducted additional modeling to further evaluate the potential downstream impacts of the proposed changes in the flood control guideline. For this analysis, Alabama Power (1) assembled stream gage data from several historic high flow events, (2) simulated the routing of the water through the dam based on reservoir operation during the events, (3) simulated the flow releases downstream for events that showed possible differences in reservoir releases between reservoir elevation scenarios, and (4) performed a return frequency analysis using the results.<sup>41</sup> The events analyzed were historical annual peak flow events, with extensive stream gage records, covering the period between mid-November and February. As with the initial modeling, Alabama Power used its reservoir simulation routing model to route the water through the dam. The reservoir routing was performed for the operational scenarios assuming that the winter pool was at elevation 481 feet (existing) and again assuming an elevation of 484 feet (proposed). The results of the two simulations were compared. If the results of the routing model differed, a HEC-RAS simulation of the downstream flows and elevations was carried out for (1) historical releases, (2) releases based on a flat 481-foot msl pool, and (3) releases based on a flat 484 feet msl pool. In this step, intervening flows were estimated from existing gage data. The results of the simulations were put into HEC-SSP to generate stage-frequency relationships at the Montgomery Water Works.

Of the ten events that met the minimum criteria for analysis, all but one had a return frequency between one and two years. The February 26, 1961 high flow event had a return frequency of 24.9 years. However, the reservoir inflow data needed for the routing model were not available for this event and therefore, the 1961 high flow event was eliminated from the analysis.

Of the remaining nine events, two showed differences between the results of the routing model under the 481-foot msl and the 484-foot msl reservoir pool elevation scenarios. These were the high flow events of February 5, 1982 and November 27, 1992. For the remaining seven routed high flow events, the peak release from the dam did not change significantly between the two scenarios and/or the reservoir did not spill under either starting elevation scenario. Therefore, downstream flow simulations were performed for the February 5, 1982 and November 27, 1992 high flow events. Downstream flow simulations were also performed on the February 18, 1992 high flow

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<sup>41</sup> See Alabama Power's Response to Schedule A of Additional Information Request for the Martin Dam Project (FERC No. 349-173), filed on July 14, 2014.

event because its peak flow was modest, and its duration resulted in a high, overall volume of water going through the system. Ultimately, the analysis considered flow events with a return frequency of one to two years, which were characteristics of flows in the area from mid-November through February, the period for which the proposed higher winter pool elevation would be in effect.

The estimates of downstream flows resulting from the routing model were combined with the intervening flows observed at existing stream flow gages on contributing rivers to simulate river stage downstream. The peak elevation estimate for the 484 feet msl scenario was 0.54 feet higher than the estimate for the 481 feet msl elevation scenario at the Montgomery Water Works gage. It was 5.44 feet higher at the Tallassee gage. However, Alabama Power observed that under all model scenarios, at both gages, the river water level remained within its banks. For the November 27, 1992 event the maximum difference under the two scenarios was 0.07 feet. The February 18, 1992 high flow event simulation indicated no increase in stage for the 484 feet msl scenario. Changes in the peak stage elevation at any given return frequency, when compared between the 481 feet msl and 484 feet msl starting elevation scenarios, were indistinguishable in magnitude from random error.

The initial modeling of the change in winter pool level impacts did not consider the effects of the intervening downstream flows. The additional modeling was limited to flow events with a return frequency of one to two years, which is characteristic of flows in the area from mid-November through February, the period for which the proposed higher winter pool elevation would be in effect.

Based on the above modeling results, Alabama Power concluded there would be little to no increase in peak water level elevations downstream of the project at the Montgomery Water Works Gage. Consequently, Alabama Power concluded that no additional structures or land would be affected. While Alabama Power's initial, worst-case modeling suggested the possibility of increased flooding and potential damage to structures and roads, the company's subsequent, more refined analysis indicated little potential for a 3-foot increase in the winter flood pool elevation to increase peak water elevations downstream.

#### *Conditional Fall Extension*

During low water levels at Lake Martin, recreational activity could be affected adversely because of reduced access to boat ramps and greater exposure to submerged hazards such as rocks and tree stumps. Alabama Power proposes to evaluate the potential for higher lake levels from September 1 to October 15, primarily to benefit recreation and other uses of Lake Martin into the fall. Each September, Alabama Power would conduct an evaluation each day to determine the feasibility of keeping the flood curve at 491 feet for as long as an additional 1.5 months (September through mid-October), based on four hydrologic and project operational criteria as described in detail in section 2.2.2, *Proposed Project Operation*.

Alabama Power proposes to notify Lake Martin RA and post up-to-date status notifications to its lakes and recreation website (<https://lakes.alabamapower.com/>), whether or not the conditional fall extension is being implemented. Alabama Power also proposes to abide by all downstream minimum flow commitments and other operational commitments. Thus, the measure is intended to be implemented only in years when there are adequate flows and reservoir elevations to meet such needs.

Both Lake Martin RA and Lake Martin HOBO recommend the fall extension. Lake Martin RA, however, recommends that the fall extension be triggered if the Harris reservoir on the Tallapoosa River is within 2 feet of its rule curves, instead of 1 foot as proposed by Alabama Power. Lake Martin RA states that this would allow the measure to be implemented more frequently.

*Our Analysis*

Higher lake levels generally enhance recreational use and associated economic activity in the area. However, such levels also can decrease flood storage capacity and, during reservoir filling, affect the amount of flow available for downstream releases, including for minimum releases and power generation.

Alabama Power analyzed the ability to increase fall lake levels by reviewing historical data on stream flows and lake levels from 1983 to 2010 (the 29 years since Harris dam began operating). Alabama Power then carried out HEC-ResSim modeling for 1940 to 2007, with the inclusion of its proposed winter lake elevation of 484 feet. Table 3-12 shows the percent of time that the four criteria would be met under different hydrologic and operational conditions. Harris reservoir stands out as a limiting factor.<sup>42</sup>

Table 3-12. Number of years criteria were met for the conditional fall extension (Source: Alabama Power, 2011b).

Criteria <sup>a</sup>	Number of years criteria met	
	Historical Data (1983-2010)	Modeled Data (1940-2007)
1	21 (72%)	59 (87%)
2	24 (83%)	about 50 percent
3	25 (86%)	about 50 percent
4 Harris (within 1 foot)	4 (14%)	22 (32%)
4 Weiss (within 1 foot)	21 (72%)	55 (81%)

<sup>42</sup> This observation is true for both the 1-foot trigger proposed by Alabama Power and Lake Martin HOBO, and the 2-foot trigger proposed by Lake Martin RA.

Criteria <sup>a</sup>	Number of years criteria met	
	Historical Data (1983-2010)	Modeled Data (1940-2007)
4 H. Neely Henry (within 1 foot)	22 (76%)	65 (96%)
4 Logan Martin (within 1 foot)	21 (72%)	54 (79%)
4 Cumulatively (within 1 foot)	Not Provided	22 (32%)
4 Harris (within 2 feet)	11 (38%)	58 (85%)
4 Weiss (within 2 feet)	27 (93%)	64 (94%)
4 H. Neely Henry (within 2 feet)	27 (93%)	66 (97%)
4 Logan Martin (within 2 feet)	26 (90%)	65 (96%)
4 Cumulatively (within 2 feet)	22 (76%)	57 (84%)
1, 2, 3, and 4 (within 1 foot) cumulatively	4 (14%)	22 (32%)
1, 2, 3, and 4 (within 2 feet) cumulatively	11 (38%)	57 (84%)

<sup>a</sup> See section 2.2.2, *Proposed Project Operation*, for a description of the four criteria.

While these data show that many of the reservoir level criteria may be met a relatively high percentage of the time, there may not always be enough inflow (criteria 2 and 3) to ensure that the proposed fall extension can be implemented. The combined historical data for all criteria indicate that the fall extension could be implemented about 14 percent of the years with the 1-foot rule curve criteria and about 38 percent of the years for the 2-foot rule curve requirement. Modeled data indicate the fall extension could occur more frequently, about 32 percent of the time for the 1-foot rule curve criteria, and about 84 percent of the time for the 2-foot criteria. The longer period of record for the modeled data that avoids over emphasis on the droughts in the late 1980s, 2000, and 2007/2008, suggests that the modeled data percentages are more representative of future conditions than the observed data.

Alabama Power evaluated the effect of the conditional fall extension on downstream flooding based on a 100-year flood event. The probability of a 100-year flood event in September and October is less than 0.2 percent, thus Alabama Power concluded the effect on downstream flooding would be minimal. However, in the draft EIS we identified rapid increases in Lake Martin's water level (a sudden 3.5-foot rise



from 486 feet to 489.5 feet) in 2 years between 1990 and 2011 (see figure 3-5), which indicate the potential for increased downstream flooding under some conditions.

These events occurred in October 1995 and September 2004. In its comments on the draft EIS, Alabama Power provided additional data to explain the rapid increases in Lake Martin's water level that we identified. Alabama Power stated that (1) both events were the result of hurricanes; (2) the conditional fall extension would not have been in place for either event, because the conditions would not have been met prior to the date of the hurricane; (3) in the 1995 event, if the conditional fall extension had been in place, the peak spillage would not have increased (though the period of spill would have been extended one day); and (4) in the 2004 event, if the conditional fall extension had been in place, peak spillage would have increased by 3,000 cfs, a small volume of flow under hurricane conditions.<sup>43</sup> Also, the late summer and early fall is the time of year of the lowest overall base flows. The likelihood of a significant increase in flooding caused by higher lake levels in the relatively low flow fall period is very small. Additional discussion of the potential effects of the conditional fall extension on recreation is included in section 3.3.5, *Recreation Resources and Land Use*.

As noted above, applying Lake Martin RA's proposed 2-foot criterion at Lake Harris would allow the fall extension to be invoked more frequently. However, it would also cause the extension to occur when water supply conditions in the system are likely to be more stressed and available flows are important for other purposes, including maintaining flows in the Tallapoosa River for environmental purposes and to support the Corps' navigation facilities on the Alabama River. Such a decision could have a substantial effect on system storage and resilience to drought, negatively affect conditions in the Tallapoosa River and the Alabama River, and present challenges in implementing the ADROP.

#### *Flood Control Gate Operations*

To allow more efficient operation at the downstream Yates development of the Yates and Thurlow Hydroelectric Project (FERC No. 2407), Alabama Power proposes to make minor changes to flood control operations (letter from James F. Crew, Hydro Services Manager, Alabama Power Company, Birmingham, Alabama, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 13, 2013). The company proposes to raise the minimum elevation at which they must meet or exceed the hydraulic capacity of the Yates development from 481 to 484 feet msl. They also propose to change the manner in which they operate when the reservoir elevation is above 489 feet msl. They would continue to release water at a rate equal to or greater than the hydraulic capacity of the Thurlow development (13,200 cfs) during the rising limb of the stormflow curve. However, they propose to change the minimum release from Martin Dam during the

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<sup>43</sup> See section 3.3.1.2, discussion of *Erosion Downstream of the Project Boundary*.

falling limb of the stormflow curve from the hydraulic capacity of the Thurlow development (13,200 cfs) to the hydraulic capacity of the Yates development (12,400 cfs). Alabama Power also proposes to match reservoir outflow to inflow under certain conditions when the hydraulic capacity of the Martin Dam turbines is exceeded. More detail is provided in section 2.2.2, *Proposed Project Operation*.

Alabama Power also proposes to add the phrase, “which would be beyond the control of Alabama Power,” to the condition under which gate capacity is exceeded and the spillway is in use. Finally, Alabama Power proposes to change the communication requirement from, “maintaining communications,” with the Corps during a flood to, “sharing data.”

#### *Our Analysis*

The changes involve relatively small differences in a flood context, apply when the reservoir elevation is at least two feet below spillway capacity, and occur on the falling limb of the stormflow curve and therefore would not have any negative effect on flood management.

Alabama Power provides no explanation for adding the phrase “beyond the control of Alabama Power” to the flood control operation description. The phrase does not recognize Alabama Power’s responsibilities for maintenance of the spillway. Therefore, there appears to be a slight loss of information and no benefit to the addition of the phrase.

Regarding, Alabama Power’s proposed consultation requirements with the Corps, “maintaining communications” includes “sharing data,” but implies the exchange of more nuanced information and professional judgment as well. Limiting interactions to “sharing data” could reduce the effectiveness real-time communication with the Corps during flood events.

#### *Lower Spring and Summer Lake Martin Elevations on Downstream Flooding*

The Downstream Landowners requested that flood control be a higher priority at the Martin Dam Project. The Downstream Landowners assert that Alabama Power’s studies have been inadequate in evaluating and addressing downstream flooding, flood damage, and operation of the project for flood control. The Downstream Landowners identify two options which could provide flood control at Martin dam: (1) operate to pre-evacuate the pool when weather reports predict impending heavy rainfall events and (2) require flood control as a project purpose and operate with dedicated flood control storage on a year-round basis.

### *Our Analysis*

Alabama Power did not evaluate operating the project with dedicated storage on a year-round basis. Alabama Power's studies focused only on the period in which changes in the flood curve were proposed (i.e., mid-November through mid-March). We conducted an independent analysis of the Downstream Landowners' recommendations, which is presented in appendix C of this EIS. Our conclusions and recommendations on the Downstream Landowners' proposals are discussed in section 5.0, *Conclusions and Recommendations*.

The Downstream Landowners recommended lower reservoir elevation for flood control could negatively affect operations during drought conditions because the lower reservoir levels would not allow Alabama Power to maintain water storage that could be used in a drought scenario. The Downstream Landowners' request could trigger drought operations earlier and more often. As can be seen in figure 3-12, Lake Martin has normally reached and remained between elevations 490.0 and 491.0 feet between about May 1 and August 1 during most years for the 1990 to 2011 period. Lower water levels occurred in 2007 and to a much lesser extent during 1999 and 2000, all of which were periods that were defined as droughts of at least a 25-year recurrence interval. On May 1, 2000, Lake Martin water elevations were at 490.41 feet. Had Lake Martin been maintained at a lower elevation of about 488.0 feet on May 1, 2000 (i.e., providing 3 feet of storage), with historical water releases, the reservoir would have dropped enough to trigger drought operations by July of that year.

Doing so could impact Alabama Power's ability to manage flows during droughts. Their key requests were for pre-evacuation (lowering the reservoir in advance of a forecasted storm to provide flow storage) or dedicated storage for flood control on a year-round basis. The Atlanta Regional Commission expressed concern regarding the effect that operational changes to Lake Martin reservoir could have on Lake Allatoona, specifically with respect to imposing additional burdens upon that lake as a result of a reduction in minimum releases from Lake Martin. The Atlanta Regional Commission suggested that drought operations had not been adequately considered for the Coosa-Tallapoosa system as a whole and this could adversely affect the primary water supply for more than 500,000 people who rely upon Lake Allatoona. Georgia EPD had similar comments, stating that it was concerned that Alabama Power's proposed operations for its Martin Dam Project in combination with the Coosa River Project would require the Corps to release more water from the Allatoona and Carters reservoirs in the upper Coosa River Basin.

Lower reservoir elevations in the summer can also affect the ability of the project to support the minimum flow requirements at Thurlow. In Lake Martin, every foot of storage represents about 40,000 acre-feet or enough water to supply the Thurlow minimum flow of 1,200 cfs for about 17 days. Thus, a 3-foot drawdown would be equivalent to about 51 days of providing the 1,200 cfs minimum flow.

### *Reservoir Levels under Drought Conditions*

Alabama Power proposes raising the drought curve by 3 feet in January, February, and December and modifying the drought curve for the remainder of the year as shown in figure 2-2. Operations during drought conditions would also be affected by the proposed higher operating and flood curves (see figure 2-2). As discussed in section 2.1.3, Alabama Power applied for and was granted three temporary amendments (for 2007, 2009, and 2011) to operate Lake Martin at a 3-foot-higher winter pool from November 20 to January 15, with refilling of the reservoir to begin on January 15 instead of February 17, due to drought conditions. The variances also included approval to reduce the minimum flow downstream of Thurlow dam to as low as 350 cfs, depending on flows in the downstream Alabama River.

The Corps expressed concern regarding navigational releases for the Alabama River, especially during low flow and drought conditions. Interior recommended that the Tallapoosa River portion of the ADROP<sup>44</sup> be used when assessing drought operations.

Lake Martin HOB0 recommends that the winter pool level should be raised by 5 feet to elevation 486 feet to prevent the circumstances that occurred during the drought of 2007 when the lake did not refill after the winter drawdown. Lake Martin HOB0 stated that with a higher winter pool, it would require much less inflow to reach the normal summer pool elevation.

In comments on the draft EIS, Alabama Power proposes to implement the Tallapoosa River portion of the (ADROP). Alabama Power included, in Attachment B of its August 13, 2013 comment letter, a copy of ADROP, Version 3.3.3, dated July 12, 2013. The FWS recommends implementing the Tallapoosa River portion of the ADROP.

### *Our Analysis*

To evaluate how project operations could be affected during droughts, we analyzed the drought recurrence intervals during the past 25 years in the Tallapoosa and Coosa river basins. We investigated the 61-year period of record for the USGS gage no. 02412000 Tallapoosa River near Heflin, Alabama (1952 to 2012). This gage has one of

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<sup>44</sup> The ADROP is Alabama Power's draft plan to manage Alabama Power's water resources within the Alabama River basin during drought conditions. The ADROP includes rain and stream flow indicators to determine drought conditions. When these indicators reach specified levels, drought response measures would be triggered resulting in reduced flow into the Alabama River based on drought intensity conditions within both the Tallapoosa and Coosa basins. When the basins are observed to be recovering from drought conditions, a consensus would be sought among Alabama Power and the federal and state agencies before a return to normal operations at Alabama Power's projects located on the Tallapoosa and Coosa Rivers.

the largest unregulated watersheds in the Tallapoosa and Coosa river basins. We used Dflow3.1b,<sup>45</sup> with data from USGS gage no. 02412000 (near Heflin, Alabama) upstream of both the Martin and Harris projects to produce figure 3-11. We conclude that droughts similar to years 1986, 1987, and 1988 would occur about once every 10 years; droughts similar to year 2000 would occur once every 25 to 50 years; and droughts similar to 2007 would occur once about every 50 years or more.

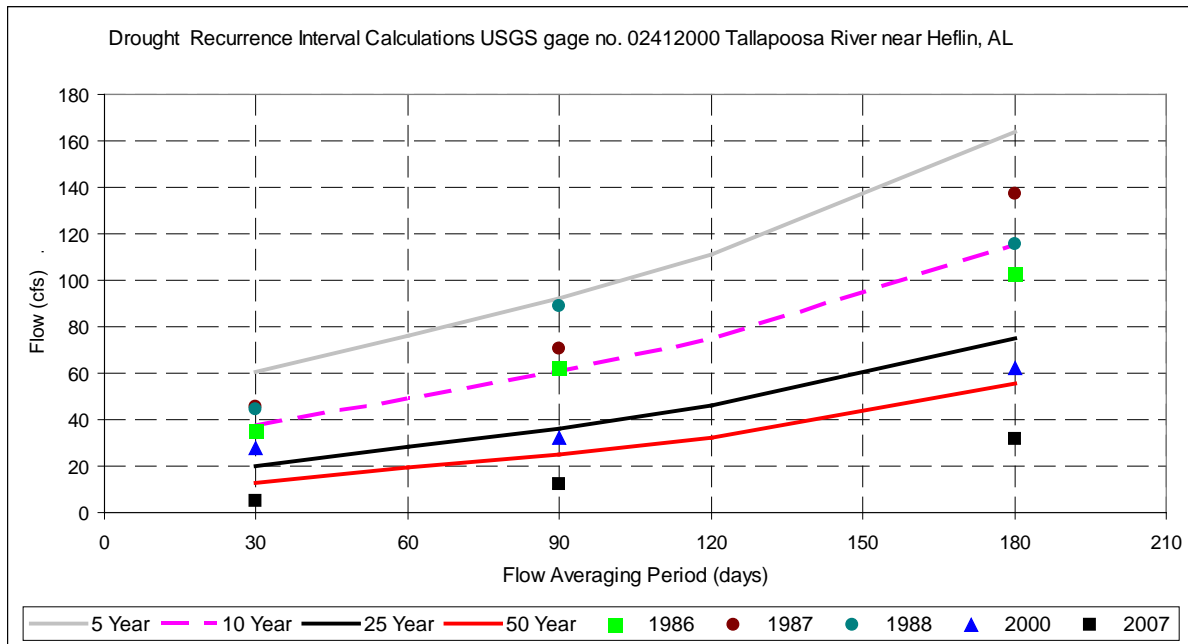


Figure 3-11. Drought recurrence intervals for USGS gage no. 02412000 (Source: USGS, 2012, as modified by staff).

Alabama Power did not model drought conditions directly as part of its relicensing studies. Our analysis using historical reservoir levels and outflows and the HEC-ResSim model showed that under moderate and severe drought conditions, Lake Martin water levels could fall below the current and proposed drought curves. However, these conditions would occur less frequently than once in every 10 years. Meeting minimum flow requirements and navigational releases could be problematic during severe drought conditions, and would not be achieved under some drought conditions, either existing or proposed. The proposed higher winter reservoir levels could help limit the reservoir level reduction associated with droughts such as those with a recurrence interval of less than 10 years and to a lesser extent during moderate or extreme droughts. For example as shown

<sup>45</sup> Dflow3.1b is a U.S. Environmental Protection Agency recurrence interval estimation program for streamflow.

in figure 3-12, in 2007, the lake level in January and February was near elevation 481 feet (near the existing flood control curve) but because of very low inflows, the lake level still fell to about elevation 475.5 feet by November. In addition, the lake level was in the elevation 481-foot range (about 10 feet below normal) during most of the July through September period. A higher flood control curve, as proposed by Alabama Power, would result in about 94,000 acre-feet of extra storage or about 47,500 cfs-days. This amount of storage could supply an added outflow of about 500 cfs for 3 months. However, based on data from 2007 and using the same amount of historical outflow, water levels of Lake Martin would still fall to an elevation in the 483 to 484-foot range by the end of the summer even with proposed higher curves.

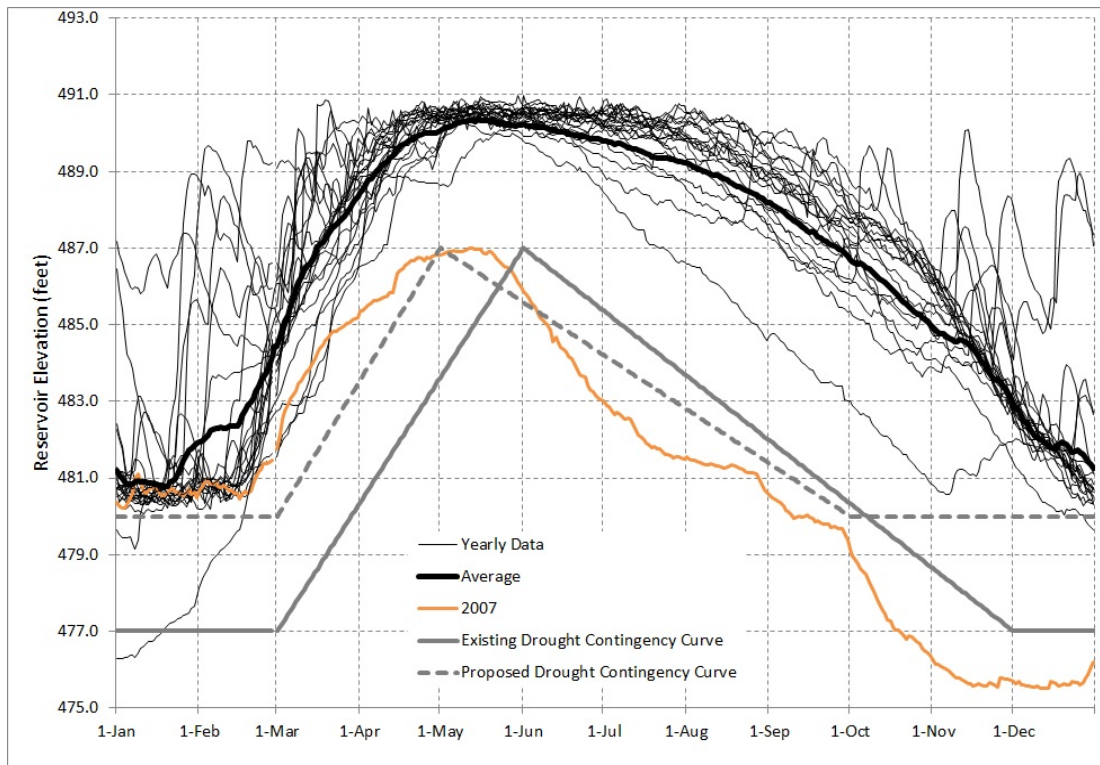


Figure 3-12. Historical Lake Martin water levels (1990 to 2011) and the existing and proposed drought curves (Source: Alabama Power, 2011b, as modified by staff).

During a severe drought such as occurred in 2007, the entire Tallapoosa and Coosa river basins were stressed, and reservoir levels and lake levels in many areas fell to historic lows. During that time Alabama Power, the Corps, and other agencies developed measures to minimize the effect of the drought on lake levels, stream flow requirements (including navigational releases), water supply, power generation, recreation and other resources.

When reservoir levels reach the drought curve value, Alabama Power would consult with the Corps to determine the best possible measures to respond to the drought conditions to limit the effects of the drought on navigation. For example in July 2007

during worsening drought conditions, the Corps prepared an EA (Corps, 2007) to evaluate how navigation could be affected by drought-induced flow reductions proposed by Alabama Power. The EA concluded with a Finding of No Significant Impact (Corps, 2007). As described in the Corps' EA, cutbacks of 10 percent initially, and possibly increasing up to 20 percent contingent upon worsening drought conditions, could be supported by its Finding of No Significant Impact.

Alabama Power's proposed drought curve identifies only that drought conditions exist but does not specify procedures for how project operations would be managed when a drought is evident. A more detailed operating protocol is necessary to identify how the project would be operated during droughts, such as that described in the draft ADROP filed by Alabama Power for informational purposes on February 4, 2009 ADROP does improve upon the current drought curves by specifying that additional indicators of drought conditions would be used in the final plan. For example, meteorological and hydrologic variables would be considered in addition to the drought curves. Some of the detailed operational responses in the final ADROP may also include measures similar to the decreased minimum flows and higher winter pool levels and an earlier start to refilling of the reservoir as occurred under the three recent temporary amendments to the operating curves received by Alabama Power in 2007, 2009, and 2012.

ADROP includes provisions to manage all Alabama Power's reservoirs within the Alabama, Coosa, and Tallapoosa River Basins during drought conditions. ADROP requires monitoring rainfall and stream flow within the ACT Basin. When drought indicators reach specified levels, operations responses are triggered, resulting in pre-determined incremental reductions or increases in flow released from reservoirs in the Alabama, Coosa, and Tallapoosa River Basins.

The license for the Coosa River Project No. 2146<sup>46</sup> requires Alabama Power to implement the Coosa River portion of ADROP. Thus implementing the Tallapoosa River portion of the plan would provide for coordinated implementation of ADROP and long-term benefits to water supply, fish and wildlife resources, and power generation during drought years.

The Corps is currently updating its reservoir regulation manuals to provide a comprehensive management plan for the Coosa, Tallapoosa, and Alabama River Basins that would include drought management. On October 31, 2014, the Corps issued the "Final Environmental Impact Statement for Updates to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin." The Corps also issued a draft Master Water Control Manual for the Alabama-Coosa-Tallapoosa River basin (draft ACT Water Control Manual), which is scheduled for final approval in December 2014. The Corp's final EIS and draft ACT Water Control Manual include implementing ADROP, which

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<sup>46</sup> 143 FERC ¶ 61,249 (2013).

has flow criteria and operational responses for the Alabama, Coosa, and Tallapoosa Rivers.

#### *Proposed Periodic Drawdown*

Alabama Power proposes to lower the reservoir to at least 481 feet every 6 years in coordination with weather conditions to facilitate seawall and boat dock construction and maintenance and other activities benefiting from lower lake levels.

#### *Our Analysis*

Under current conditions, the Lake Martin flood curve is at elevation 481 feet during January and the first half of February and the operating curve is below elevation 480 feet during the same time period (see figure 2-1). As shown in figure 3-12, over the last 20 years Lake Martin has been able to recover from 481 feet during the winter to its normal summer pool elevation of between 490 to 491 feet every year, other than during the severe drought of 2007. Our analysis, as discussed in *Reservoir Levels in Drought Conditions*, determined that the drought of 2007 would occur about once every 50 years or more. In addition, Lake Martin was able to recover to its normal summer pool in 2000 during a drought that we calculated would normally occur once every 25 to 50 years.

If the proposed periodic drawdown is initiated when the basin is not in drought conditions and hydrological conditions of the basin are at least normal conditions and forecasts for the spring precipitation are for average or higher amounts, the reservoir should reach its normal summer pool elevations. Additional discussion on the recreation and land use effects of this proposed periodic drawdown is provided in section 3.3.5, *Recreation Resources and Land Use*.

### **Water Quality**

#### *Effects of Proposed Rule Curve Changes on Water Quality*

Alabama Power proposes to increase the winter pool elevation by 3 feet, and implement a conditional fall extension of summer reservoir levels into early fall, if specific conditions are met. The increase in the winter pool elevation would be on an annual basis, while the conditional fall extension as proposed by Alabama Power would be infrequent and may occur from 14 to 32 percent of the years. Lake Martin RA recommends a 4-foot increase in the winter pool, and Lake Martin HOB0 recommends a 5-foot winter pool increase and a fall extension of the higher summer pool elevation to October 15, which may occur in 38 to 84 percent of years.

To address water quality issues at the Martin Dam Project, Alabama Power proposes to continue the water quality monitoring as required in the 401 WQC that was issued in May 2011 and to develop and implement structural or operational measures if the results do not indicate compliance. Alabama Power proposes to monitor water quality within the reservoir to detect effects of an increase in the winter pool elevation or of a conditional fall extension. Alabama Power also proposes measures to monitor water quality in the tailrace.



Alabama Power proposes to monitor aquatic vegetation, implement the Nuisance Aquatic Vegetation and Vector Control Management Program, and implement water quality and erosion related BMPs with the SMP. These measures are discussed in other sections.

### *Our Analysis*

Both the higher winter pool levels and the fall extension could have some effects on water quality. The winter pool level increase would maintain higher water levels in late November through February. The fall extension would maintain higher reservoir levels in some years from September 1 through October 15, immediately following the peak summertime conditions of typically the lowest river flow, highest water temperature, and lowest DO levels.

Modeling conducted by Alabama Power indicated that for the 67 years modeled, there would be a higher number of days with spill events at Martin dam as a result of the higher winter pool levels and the conditional fall extension, as summarized below:

- winter pool increase: 3-foot increase - 23 additional spill days; and 5-foot increase - 52 additional spill days;
- fall extension: 3-foot increase - 29 additional spill days; and 5-foot increase - 58 additional days; and
- if both measures implemented: 52 to 110 additional spill days over the 67 years modeled.

These increases in the number of spill days while very small (0.4 percent if both measures were implemented with a 5-foot increase), would result in higher spillage flows downstream on average for one to two days per year. Higher spillage could have beneficial effects on DO as a result of increased aeration, but could also increase downstream erosion and turbidity levels, particularly downstream of Thurlow dam. Thurlow dam has a lower hydraulic capacity than Martin dam, so increased flows from Martin dam would result in higher spillage at Thurlow, into a riverine reach that is not backwatered, unlike immediately below Martin dam where flows discharge into the Yates reservoir.

The increase in the winter pool elevation and the fall extension would result in a small increase in both the depth of the reservoir and the retention time. However, expert opinions gathered by Alabama Power (the Water Quality Expert Panel) suggested that this change would have limited effects on DO levels or water temperatures in the discharge from the Martin Dam Project. This prediction is based upon the large size of the reservoir, the existing lake level fluctuation because of varying inflows, and the existing DO and temperature conditions meeting state water quality standards.

Alabama Power's current proposal to maintain a 3-foot-higher winter pool from mid-November through January is similar to 2008 and 2009 operations, when Alabama

Power was granted temporary amendments to its flood curve to operate Lake Martin at a 3-foot-higher winter pool from November 20 to January 15, with refilling of the reservoir to begin on January 15 instead of February 17, because of drought conditions.<sup>47</sup> In 2007, the Commission issued an EA on the proposed 2008 operations (FERC, 2007) and an order approving them.<sup>48</sup> The order required Alabama Power to monitor water quality during the period that Lake Martin would be maintained at a higher elevation. The 2007 EA concluded that the higher lake levels would result in “no material adverse impacts to water quality in Lake Martin or the Tallapoosa River” (FERC, 2007, page 11). Similarly, the results of water quality monitoring from December 2007 through May 2008 indicated that there was no evidence that the operation of Lake Martin during the flood curve variance had any impact on water quality (temperature, DO, specific conductance, pH, chlorophyll-a, dissolved reactive phosphorus, and other water quality parameters). The monitoring results were submitted to FWS, Alabama DEM, and Alabama DCNR, and the agencies’ responses indicated that they had no concerns regarding effects on water quality because of the flood curve variance, which included a 3-foot-higher winter pool. This is further basis for concluding that the current proposal for a 3-foot-higher winter pool would have no measurable effect on water quality.

While direct effects on water quality would likely be minor, aquatic vegetation may become more established because of the higher winter pool (reduced desiccation of the littoral zone), longer retention time, increased photic (light penetrating zone of plant growth) and littoral zones, increased sedimentation in the shallow areas, and stabilization of the lake level. While these changes would have a beneficial effect on aquatic habitat in the littoral zone, they might also indirectly increase the nutrient concentrations in Lake Martin. Increased nutrients could result from additional plant growth that could affect the nutrient cycling in the lake by the release of phosphorous to the lake when the plants die in the fall and winter, although this effect likely would also be minor. Alabama Power’s proposal to monitor water quality in the reservoir would help address the remaining uncertainty about the effects of raising the winter pool and extending the summer pool on the growth of aquatic vegetation and nutrient cycling.

Alabama DEM issued the 401 WQC for the Martin Dam Project on May 9, 2011, with conditions based on proposed activities included in Alabama Power’s license application. WQC conditions are as follows:

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<sup>47</sup> See Order Granting Temporary Amendment to Rule Curve, *Alabama Power Company*, 121 FERC ¶ 62,129 (2007), and Order Granting Temporary Amendment to Rule Curve, *Alabama Power Company*, 126 FERC ¶ 62,104 (2009).

<sup>48</sup> See Order Granting Temporary Amendment to Rule Curve 121 FERC ¶ 62,129(2007).

- monitor the Martin dam tailrace for DO and temperature during generation at 30-minute intervals from June 1 to October 31 for a period of 3 years;
- provide DO and temperature monitoring reports to Alabama DEM within 90 days of the end of the annual monitoring; and
- if monitoring does not show compliance with the 4.0 mg/L DO standards, Alabama Power would be required to implement measures to ensure compliance.

Based on current and expected conditions in Lake Martin and in the tailrace, three years of monitoring should be sufficient to determine if Alabama Power is successful in maintaining DO concentrations consistent with state standards downstream of Martin dam. Recent monitoring data have demonstrated that Martin dam releases have DO concentrations within the state standard nearly 100 percent of the time. Additional measures and monitoring past the initial three years may be needed if, based on the monitoring results, Alabama Power is required to implement additional measures to improve DO in the project tailwaters. Alabama Power's proposed measures to monitor water quality in the reservoir, monitor and control aquatic vegetation, and implement water quality-related BMPs as discussed in section 3.3.3, *Terrestrial Resources*, and section 3.3.5, *Recreation Resources and Land Use*, would help to detect and limit any possible effects.

Compliance with Alabama DEM's 401 WQC requirements would provide adequate DO for downstream communities, particularly given that the Martin Dam Project flows into the Yates project, maintaining lentic (lake) habitat conditions immediately downstream of the Martin dam. Such habitat is not conducive to use by the species of mussels and fish most sensitive to low DO.

## **Fishery Resources**

### *Effects of the Proposed Rule Curve Changes on Striped Bass Thermal Refugia and Habitat*

As previously described, striped bass habitat in Lake Martin is characterized by relatively rapid seasonal changes. Water with suitable temperature and DO becomes depleted in late summer and fall. Periodic summer deaths of adult striped bass have been reported in the past, a result of the depletion of suitable habitat. Alabama Power has not proposed any specific measures to address this issue, nor have the resource agencies or other stakeholders made any recommendations related to striped bass habitat in Lake Martin. The only reservoir operational changes proposed by Alabama Power are an increase in the winter pool elevation by 3 feet, and the conditional fall extension of summer reservoir levels into the fall, if specific conditions are met. Lake Martin RA recommends a 4-foot increase in the winter lake level, and Lake HOB0 recommends a 5-foot increase in the winter pool.

### *Our Analysis*

Radiotelemetry studies on Lake Martin have been used to investigate striped bass movements and track habitat use in the lake. During the summer months, most of the striped bass use the layer of cooler water during the daytime, while foraging near the boundary where the layer of warmer (less dense) water is separated from the layer of cooler (more dense) water beneath. During the late summer and fall period, striped bass display reduced movement rates, greater use of deeper water, and may use areas with higher water temperatures and lower DO levels (Sammons, 2011). The occasional summer mortalities have often been associated with heavy rains that have occurred following long periods of above average temperatures.

Alabama Power's proposed operational changes to the winter pool elevation would likely have little effect on reservoir water quality and in-turn little effect on striped bass. The increase in the winter pool would occur during a portion of the year when the reservoir is not stratified and is well mixed, with suitable temperatures and DO throughout the water column. Suitable striped bass habitat would be found throughout the lake, and increasing the lake level would result in a small increase in aquatic habitat. Raising the winter pool by 3 feet would increase the overall area of Lake Martin bottom habitat by about 413 acres, while a 5-foot increase would result in additional 631 acres of bottom habitat.

The conditional fall extension, as pointed out by Alabama DCNR (letter from J. Chris Greene, Assistant Chief of Fisheries, Alabama DCNR, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 13, 2013), could have a beneficial effect on striped bass. If the conditional fall extension was adopted, lake levels would be maintained up to about 4 feet higher than current levels from September 1 to October 15. At this time of year striped bass depend upon habitat in colder, deeper water, which is at its smallest volume of the year. Because water is released from Lake Martin from the colder, deeper layer of water, such releases directly drain and further reduce the striped bass habitat. Holding back those releases to extend the higher reservoir elevation into the fall would preserve the better habitat for striped bass into the fall, improve conditions for striped bass, and reduce fish kills.

### *Effects on Fish Passage*

Historically, anadromous species (Alabama shad and striped bass) occurred in the Tallapoosa River. No anadromous species now occur immediately below the Martin Dam Project (Alabama Power, 2011c). Migration from the Gulf of Mexico is blocked by the Yates and Thurlow dams, and, at least partially, by three Corps' lock and dams on the Alabama River.

The catadromous American eel is native to the Tallapoosa River system and has been documented below Thurlow dam. Alabama Power proposes to implement a three-phased American eel sampling study in the Tallapoosa River from the Project tailrace to RM 12.9 over a six year period in consultation with FWS.<sup>49</sup> The phases would include: (1) a reconnaissance period for developing sampling plans, methods, and refining collection and tagging techniques; (2) sampling and tagging of eels in the Tallapoosa River; and (3) summarization of the results of the efforts. Alabama Power states that the American eel Study could benefit the catadromous American eel fishery by providing additional information on current populations and identifying potential restoration activities.

### *Our Analysis*

In the draft EIS we proposed an alternative eel study focused on surveillance for the presence of eels at Martin Dam. Staff's preliminary findings were based on the argument that such an effort would help to determine when eels were present at the Martin Dam and thus inform a decision as to whether passage was needed. Interior, Alabama DCNR and Alabama Power all requested that staff reconsider and recommend the three-phase study originally proposed by Alabama Power. They argue that a holistic approach to studying the eels would be more effect and that a trapping effort at Martin dam would be costly and provide limited information about the potential to pass eels at Martin dam or approaching Martin dam.

Alabama Power argues that the fact that eels are blocked by two dams below Martin dam (Yates and Thurlow dams) makes surveillance trapping at Martin inefficient. Alabama Power reports regular collection of American eels below Thurlow dam. However, there is no indication that American eels currently occupy the area between Martin and Thurlow dams or above Martin dam. Therefore they argue that "an eel trap with some degree of permanence" would not be justified given the current lack of eels at Martin Dam. Though our preliminary finding was based on the concept and cost of a very modest program of surveillance without the use of permanent traps, we agree that few, if any, eels would be found through surveillance unless passage was provided at the downstream dams.

Interior comments that, in order to provide upstream and downstream passage at Martin dam, the range of extent of eel distribution in the Tallapoosa River must be studied. Staff agrees that in order to pass eels at Martin Dam, issues related to passage at Yates and Thurlow dams must be understood as well. However, as proposed, the study would be limited to information on current population, which exists 11 miles and two

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<sup>49</sup> "Sampling American Eel in the Tallapoosa River Drainage," Final Study Plan filed by James F. Crew, Manager Hydro Services, Alabama Power Company, February 27, 2012.

dams downstream of the project. The study includes no information related directly to the Martin Project.

Interior comments that the timing and duration of flows released from Martin Dam are factors in the whether eels reach the Martin tailrace and justify the three-phase eel study. We agree that timing and volume of river flow are commonly factors in fish passage. However, in this case there is no indication that flow is a limiting factor in this system. The minimum release at Thurlow Dam of 1,200 cfs occurs about ten percent or more of the time. Alabama Power's application contains existing data on the collection of eels that reached Thurlow Dam and there is no information available indicating a flow-related fish passage problem below Thurlow Dam. Further, the study methods described by Alabama Power focus on locating eels and observing their movements below Thurlow dam with no indication that data are to be gathered on habitat or passage factors influenced by the operation of the Martin Dam Project (such as the flow, temperature, or quality of water). We conclude that the record does not show that Alabama Power's proposed, three-phase eel study relates to the operation of the Martin Dam Project, effects of the Martin Dam Project on fish passage below Thurlow Dam, or fish passage at Martin Dam.

*Effects of Proposed Rule Curve Change on Downstream Fishery Resources, Including Paddlefish*

The primary area of concern for aquatic resources downstream of Martin dam is the reach downstream of Thurlow, because it is riverine and contains the paddlefish. The paddlefish has been the focus of studies in the downstream reach, because it is a species of concern for Alabama DCNR, and has been an important sport and commercial species. Taking a broader view, monitoring studies have found a diverse fish community downstream of Thurlow dam, with a total of 66 species collected.

Alabama Power conducted a desktop analysis of the effects of flow releases downstream of Martin dam (Alabama Power, 2010e), which included an evaluation of effects on paddlefish spawning downstream of Thurlow dam. In that analysis Alabama Power concluded that current project operations provide spawning opportunities for paddlefish, except in drought years, but that some changes in the rule curves for Lake Martin could result in increased spawning opportunities downstream of Thurlow dam. As previously discussed, Alabama Power is proposing to increase the winter pool elevation by 3 feet, and implement a conditional fall extension of summer reservoir levels into early fall, if specific conditions are met. The conditional fall extension would have no effect on spawning flows for paddlefish, because paddlefish spawn in the spring (March and April). Increasing the winter pool by 3 feet would affect downstream flow releases in the spring, resulting in increased discharges. Alabama Power (2010e) reports that a flow of 6,000 cfs would trigger and support paddlefish spawning downstream of Thurlow dam, based on previous studies, but a major increase in river stage was also cited as an important factor in triggering spawning. Alabama Power (2010e) estimated that increasing the winter pool by 3 feet would increase the number of days (in March

and April) that river flows exceed 6,000 cfs downstream of Thurlow dam by about 5 days per year, suggesting that paddlefish spawning could be enhanced by this rule curve change.

None of the entities providing comments in response to the ready for environmental analysis notice made specific recommendations regarding downstream flow releases to protect or enhance paddlefish spawning. However, Alabama Rivers Alliance, American Rivers, and the World Wildlife Fund commented that the studies and information provided by Alabama Power in its final license application and in responses to our additional information requests were insufficient or inadequate and that additional information would be required for us to complete our analysis of this issue. Regarding paddlefish spawning, these stakeholders commented that, while Alabama Power did describe preferred habitat and conditions for paddlefish during each life stage, it failed to relate that information to proposed operational changes, or failed to recognize the importance of sequential high-flow days for successful paddlefish spawning. The World Wildlife Fund also stated that an 8- to 9-foot increase in river stage may be a more important trigger for upstream spawning migrations than a pulse flow on the order of 6,000 cfs.

The Downstream Landowners requested flood protections from the Martin dam particularly in the spring and summer months. We evaluated a lower elevation of 2 to 3 feet below the existing flood control curve in the spring and summer period to provide flood storage.

#### *Our Analysis*

Previous studies cited by Alabama Power (2010e) have indicated that paddlefish appear to prefer spawning in the lower Tallapoosa River, compared to the lower Coosa River. Alabama DCNR staff has also indicated that Mobile River Basin paddlefish populations appear to be stable, especially downstream of Robert F. Henry lock and dam.<sup>50</sup> Paddlefish populations in the area have increased since the implementation of the state-wide paddlefish harvest moratorium.<sup>51</sup> As previously discussed, on average, flows from Thurlow dam reach or exceed 6,000 cfs on a total of 19 days annually during March and April (about 31 percent of the days in March and April), providing flow and stage levels that have been cited as a requirement for paddlefish spawning. At USGS gage no. 02418500, located on the Tallapoosa River below Tallassee, Alabama (located

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<sup>50</sup> The Corps operates the Robert F. Henry lock and dam, which is located downstream of the confluence of the Coosa and Tallapoosa Rivers on the Alabama River.

<sup>51</sup> Email from N. Nichols, Assistant Chief of Fisheries, Alabama Division of Wildlife and Freshwater Fisheries, to A. Anderegg, Environmental Affairs, Alabama Power Company, November 29, 2010; included in Alabama Power (2010e).

about 2 miles below Thurlow dam), flows in excess of 6,000 cfs are common in March and April, with a mean flow of 6,274 cfs in March and 10 percent exceedance flows of 13,910 and 8,691 cfs, in March and April, respectively (see table 3-5).

Because a major increase in river stage is a likely trigger for paddlefish spawning, we examined the flow record in March and April for USGS gage no. 02418500 for 2001 through 2011 (figure 3-13). We identified all stage increases of at least 50 percent of the base flow just prior to the stage increase as, “major stage increases.” We then identified all major stage increases that resulted in flows equal to or greater than 6,000 cfs. Finally, we identified stage increases that were followed by periods of 10 days where flows were maintained at or above 6,000 cfs. According to Hubert et al. (1984), 10 days of sustained high stage are required for incubation of paddlefish eggs.

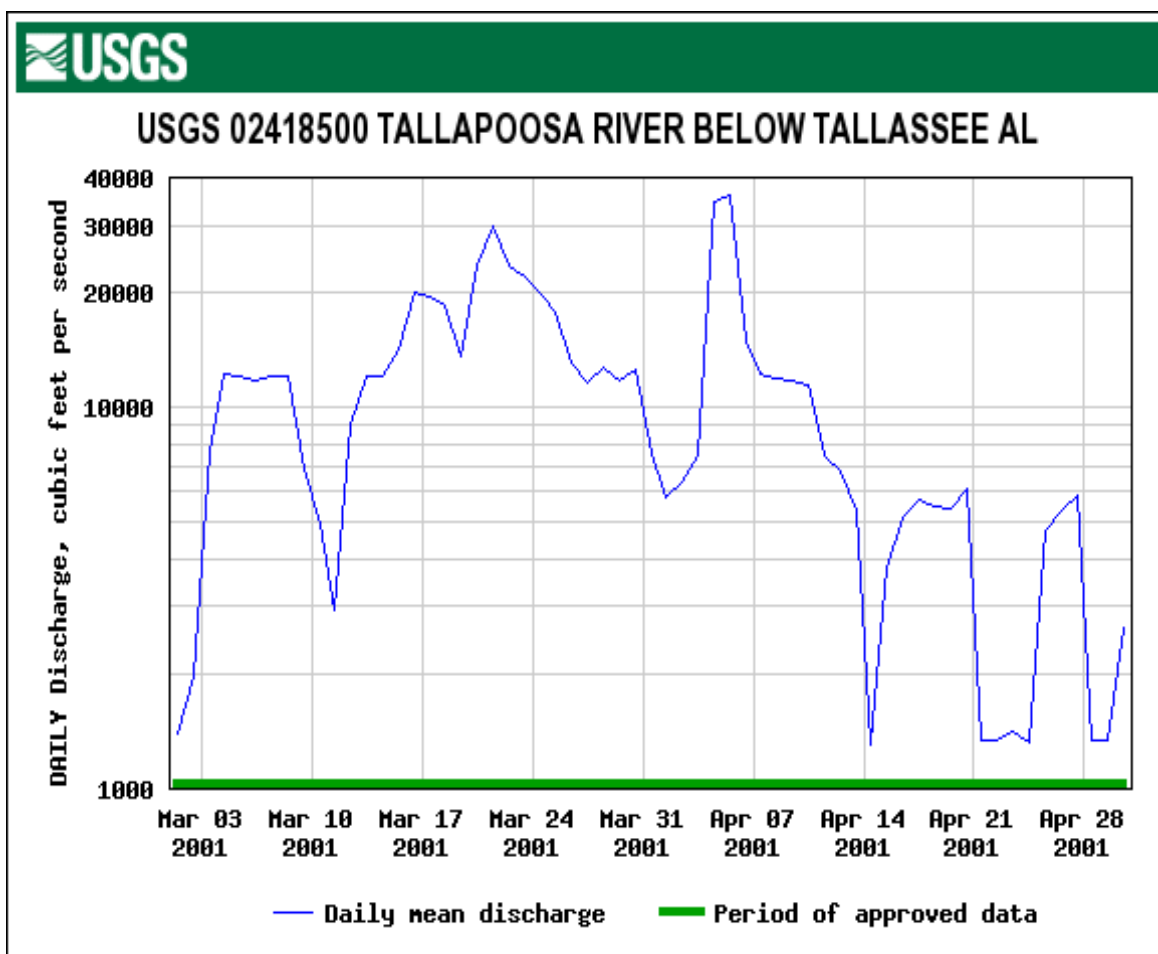


Figure 3-13. Example hydrograph for March and April 2001, used in assessment of paddlefish spawning downstream of Thurlow dam (Source: USGS, 2012).



Major stage increases occurred in all years, including the drought year of 2007 (table 3-13). Flows resulting in major stage increases reached 6,000 cfs in seven of the 11 years examined. Of the seven years that major stage increases reached 6,000 cfs or greater, 10-day periods with flows of at least 6,000 cfs following those stage increases occurred in five of those seven years. In addition, in the 11 years examined, there were multiple stage increases followed by at least 7 days of flows greater than 6,000 cfs, which would offer some protection for incubating eggs. Although it appears that optimum spawning conditions may not have occurred in every year, suitable spawning conditions occurred in most of the years examined.

Some research has reported that female paddlefish spawn about every 3 years, while males may spawn every 2 years (Montana Natural Heritage Program and Montana Fish, Wildlife and Parks, 2012). However, much of this research was conducted in the Missouri and Mississippi River systems. In a study by Lein and DeVries (1998), some female paddlefish captured in the Alabama River system in consecutive years were found to be egg bearing and were observed on the spawning grounds under perceived good spawning conditions in consecutive years, suggesting the capability to spawn annually. Other studies have shown that male paddlefish can spawn every year (Lein and DeVries 1998). Given that females produce many eggs, and that it appears some spawners of both sexes can be on the spawning grounds when conditions are appropriate, the frequency of occurrence of those conditions may be the primary variable in spawning success rather than the biological readiness to spawn.<sup>52</sup>

In addition to stage and flow, temperature is a major spawning factor. Because the reservoir would be well mixed in the early spring, downstream temperature and DO should not be altered significantly by the higher lake levels.

If lake levels were not raised in the winter, the paddlefish would not benefit from the spawning season flows and existing conditions would continue.

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<sup>52</sup> Lein and DeVries (1998) found the number of eggs per female to range from 208,587 to 525,990.

Table 3-13. Results of staff analysis of the number of stage increases providing for paddlefish spawning in the Tallapoosa River downstream of the Thurlow dam, March and April 2001 to 2011 (Source: USGS, 2012, as modified by staff).

<b>Year</b>	<b>Major stage increases<sup>a</sup></b>	<b>Major stage increases reaching 6,000 cfs or greater</b>	<b>Major stage increases to 6,000 cfs followed by a flow of 6,000 cfs or greater for a minimum of 10 days</b>
2001	6	6	3
2002	3	0	0
2003	9	6	0
2004	6	0	0
2005	7	5	2
2006	7	3	0
2007	2	0	0
2008	5	1	0
2009	7	7	1
2010	5	3	1
2011	7	2	1

<sup>a</sup> A major stage increase was defined as a river flow increase of at least 50 percent of the base flow occurring just prior to the stage increase.

Available information indicates that paddlefish populations are stable or are increasing in the Alabama River just downstream of Thurlow dam (email from Nick Nichols, Assistant Chief of Fisheries, Alabama Division of Wildlife and Freshwater Fisheries, to Angela Anderegg, Environmental Affairs, Alabama Power Company, November 29, 2010; included in Alabama Power [2010e]). No entities have recommended any specific operational changes for paddlefish. Alabama Power's proposal to increase the winter pool by 3 feet would, however, increase the number of days (in March and April) that river flows exceed 6,000 cfs downstream of Thurlow by 5 days. The proposal would have a modest, positive effect on paddlefish spawning relative to existing operations. Raising the winter pool 4 or 5 feet would provide greater benefits for paddlefish spawning than the 3-foot proposal. Lowering the summer pool for flood storage would have little effect on the paddlefish. Overall, the proposed changes to the

flood curve would have moderate effects, which, to the degree they existed, would be positive.

### *Lipstick Darter*

In comments on the draft EIS, American Rivers and Alabama Rivers Alliance request additional discussion of the state endangered lipstick darter, which has been collected in three tributaries to Lake Martin and is reported to be in tributaries to the Tallapoosa River below Thurlow Dam.

### *Our Analysis*

The primary threats identified for the lipstick darter are from new impoundments and deforestation upstream of riffle habitats (Freeman et al., 2009). The Martin Project is an existing impoundment and there is no project-related activity that we are aware of that would cause deforestation of the tributary watershed and affect riffle habitat. Though state-listed as endangered, the lipstick darter is not federally listed under the ESA. For these reasons, no further analysis of the lipstick darter is included in this final EIS.

### **Aquatic Vegetation**

As discussed in section 3.3.1, *Geologic and Soil Resources*, the proposed modifications in operations could potentially cause additional erosion and sedimentation. Additional sedimentation in Lake Martin, combined with increased winter pool elevations could result in increases in submerged aquatic vegetation, including increased abundance of invasive species.

Alabama Power (2011a) identified 20 sites, totaling 858 acres, which have a high probability of establishing aquatic vegetation. Alabama Power did not measure the total possible increase in emergent vegetation around the entire shoreline perimeter of Lake Martin, only those areas that were most likely to have an increase or have been problematic in the past. There may still be other suitable areas that were not evaluated. In addition, the potential change in sedimentation areas with an increase in the winter pool is not quantified in this analysis. Finally, an increase in nutrient availability may lead to an increase in submerged and emergent aquatic vegetation, but this effect was not quantifiable. As such, Alabama Power's analysis provides a very conservative estimate of the general risk for total increases in aquatic vegetation. The 3-foot or 5-foot winter pool increases could result in a new estimated acreage total of 1,271 and 1,489 acres, respectively, where establishing aquatic vegetation could be affected.

In addition to the effects of an increase in the winter pool elevation, implementing the conditional fall extension could increase the growing season for aquatic plants. Alabama Power estimates that the conditional fall extension could add an additional 45 days in the growing season.

Alabama Power proposes to continue to implement its current Nuisance Aquatic Vegetation and Vector Control Management Program. As part of this program, Alabama

Power performs lake-wide surveys to identify areas of aquatic plant infestation at a minimum of once per year. Throughout each year Alabama Power also reviews, on a case-by-case basis, requests from the public, state and federal agencies, and Alabama Power employees to treat nuisance aquatic vegetation. Alabama Power identified criteria for determining when it treats nuisance aquatic vegetation that:

- creates a potential public health hazard by providing mosquito breeding habitat;
- poses a threat to power generation facilities or water withdrawal structures;
- restricts recreational use of the reservoir; and/or
- poses a threat to the ecological balance of the reservoir.

In the event that the Commission approves changes in the flood curve, Alabama Power proposes to develop and implement an additional component of its Nuisance Aquatic Vegetation and Vector Control Management Program. As a component of the program, Alabama Power proposes to develop and implement a plan to monitor aquatic vegetation to identify any increases in nuisance aquatic vegetation and the cause of increased vegetation. Alabama Power proposes to consult with pertinent resource and regulatory agencies to develop the plan, which would become a component of the current Nuisance Aquatic Vegetation and Vector Control Management Program, and to file the revised Nuisance Aquatic Vegetation and Vector Control Management Program within 6 months of the issuance of the new license.

#### *Our Analysis*

Changes in the flood curve, including an increase in the winter pool elevation and the conditional fall extension would increase suitable habitat for aquatic vegetation and aquatic invasive species. The conditional fall extension would extend the growing season for terrestrial invasive species occurring along the shoreline, as well as wildlife diversity and species richness, through habitat alteration and degradation. Without control measures in place, increases in nuisance aquatic vegetation would be moderate. Such increases could adversely affect the composition and structure of habitat. Additionally, increases in nuisance aquatic vegetation could reduce recreational use of the reservoir, increase public health hazard through increased vectors, and affect water withdrawal structures.

Neither Alabama Power's current Nuisance Aquatic Vegetation and Vector Control Management Program, nor its proposal to revise the program to include a plan to monitor increases in nuisance aquatic vegetation, provide details about the methods for surveying and monitoring aquatic vegetation, such as the frequency, timing, and locations of surveys and monitoring events. Potential effects of increased nuisance aquatic vegetation would be minimized if Alabama Power revised the Nuisance Aquatic Vegetation and Vector Control Management Program to include a plan to monitor and treat increased nuisance aquatic vegetation.

### 3.3.2.3 Cumulative Effects

We identified aquatic and fishery resources as resources that could be cumulatively affected by the relicensing of the Martin Dam Project, in association with the operation of other projects in the Tallapoosa and Coosa river basins in both Georgia and Alabama. We also included both high and low flows. Cumulatively these impoundments affect flow regimes in the Tallapoosa, Coosa, and Alabama Rivers, including moderating flood peaks, which could influence aquatic and fishery habitats and use.

Regarding high flows, increasing the winter pool elevation at both the Martin Project and the H. Neely Henry development on the Coosa River Hydroelectric Project No. 2146 (Coosa Project), as authorized in the new license for the Coosa Project (FERC, 2013), would reduce winter flood storage; however, the combined minor changes are not expected to result in an increase in flooding in the Alabama River. As explained in the FERC (2001) environmental assessment, the Commission and the Corps staff found that the change in the rule curve at the H. Neely Henry development would not have affected the peak flood elevation in any of four historic floods analyzed, and there was no evidence of problems following 10 years of implementing the modified operations (starting in 2002) (letter from Stephen J. Roemhildt, Colonel and District Commander, Department of the Army, Mobile District, Corps of Engineers, Mobile, Alabama, to Kimberly Bose, Secretary, FERC, Washington, D.C., November 3, 2011). As described above in section 3.3.2.2, *Water Resources*, of this final EIS, the proposed operational changes for the Martin Project are not expected to result in additional flooding, and there have been no problems during three years of implementation (2007, 2009, and 2011). In addition, active weather and stream flow gaging and coordination with the Corps would continue to permit Alabama Power and the Corps to coordinate operations within the basin to prevent flooding. Finally, multiple factors serve to dampen the effects of any increase in flooding from reduced storage at H. Neely Henry and Martin Dams including: (1) the large basins of the Coosa and Tallapoosa Rivers (10,156 and 4,687 square miles respectively) relative to the basins of the Henry Neely and Martin impoundments (6,596 and 2,984 square miles respectively); (2) the relatively long distances to the confluence of the Coosa and Tallapoosa River from Henry Neely and Martin Dams (about 150 and 70 miles respectively), and (3) the temporary storage effects of multiple impoundments between each dam and the Alabama River. Given the minor effects of the changes in flood storage individually, opportunities for flood management actions to avoid cumulative flooding effects, and the dampening effects at the basin scale, there is little chance that the reduction in winter flood storage capacity at H. Neely Henry and Martin Dams would result in a noticeable cumulative effect.

There are no applications at this time to raise the winter pools of other projects in the basin. If such a proposal is considered in the future, it will receive thorough review, including NEPA analysis, from the Commission and the Corps.

Operations during drought conditions require the balancing of minimum flow requirements, including water for navigation on the Alabama River, hydropower generation, and maintenance of water supply. Neither raising the winter pool elevation nor continuing existing operations would adversely affect the ability to provide flow requirements during drought conditions. The implementation of the ADROP, developed using the Corps', Alabama, Coosa, Tallapoosa, basin-wide hydrology model, will help to manage cumulative effects on drought flows based on its drought stage indicators and drought planning protocols.

The presence of the Martin Dam Project and other projects on the Tallapoosa and Coosa River has created a series of slackwater impoundments over a large portion of both rivers. Because these reservoirs capture nutrients from upstream sources and because of the volume and depths of the reservoirs, DO stratification occurs in all of the reservoirs. Low DO levels develop at depth, resulting in the release of lower DO waters into the next downstream reservoir. With the lack of riverine reaches between the Martin Dam Project and Thurlow dam, there is little opportunity for natural reaeration of waters, as would occur through natural falls and riffles. However, DO and temperature standards are normally met at monitoring locations downstream of Martin dam. As part of the WQC, there would be continuation of water quality monitoring, and Alabama Power would develop a plan to increase DO levels if standards were not met under the new license conditions. As a result, there would be no change in or a slight improvement in DO levels in the Tallapoosa River.

Fisheries could be cumulatively affected by the relicensing of the Martin Dam Project, in association with the operation of other projects in the Alabama River Basin. Both migratory and resident species would accrue modest benefits from Alabama Power's proposals for habitat and water quality improvements and from the proposal for drought management. Paddlefish would benefit slightly from increased spawning season flows associated with Alabama Power's proposal to raise the winter pool at Martin dam, but would not gain this benefit if the license does not include the winter pool elevation increase. Changes in reservoir regulation and potential fisheries enhancements would be unlikely to have any effect on other reservoirs or the remaining unimpounded reaches in the Tallapoosa and Alabama Rivers.

### 3.3.3 Terrestrial Resources

#### 3.3.3.1 Affected Environment

##### Vegetation

Natural vegetation for the project area is predominantly oak-hickory forests that dominate dry-mesic ridges and slopes. Mixed hardwood forests are present closer to the river. However, much of the natural vegetation in the area has been converted to agriculture (primarily forestry, cattle, and row crops), residential and commercial land use, resulting in a patchwork of mostly second growth forests, cleared land, and various stages of ecologic succession from primary to climax communities. Few old growth stages are present within the project area. Table 3-14 presents acreages of timber stands on project lands.

Table 3-14. Timber stand composition on Martin Dam Project lands (Source: Alabama Power, 2011a).

<b>Stand Type</b>	<b>Percent Cover</b>	<b>Acreage</b>
Mixed pine-hardwood	36	3,249
Natural longleaf pine	15	1,381
Natural pine	14	1,243
Upland hardwood	16	1443
Planted pines	8	741
Other	11	1,037
<b>Total</b>	<b>100</b>	<b>9094</b>

Upland oaks, hickories, and pines dominate the canopy in the older second-growth forests. Commonly abundant oaks include white, black, southern red, rock chestnut, post, scarlet, blackjack, and willow oaks. Hickories tend to be less important, although sand and mockernut hickories frequently occur. Loblolly, scrub, shortleaf, and longleaf pines are also common. Other locally important canopy and subcanopy species include sweetgum, black cherry, blackgum, persimmon, sourwood, black locust, hop hornbeam, hornbeam, hackberry, cucumber magnolia, sassafras, possum haw, box elder, hawthorn, crabapple, flowering dogwood, sumac, chalk maple, devil's walking stick, and fringe-tree. The primary components of the shrub/small tree stratum are lowbush blueberry, sparkleberry, deerberry, mountain laurel, St. John's-wort, wax myrtle, sweet shrub, oakleaf hydrangea, witch-hazel, and blackberry. Vines in these areas include poison ivy,

catbrier, Virginia creeper, muscadine, fox grape, yellow jessamine, cross vine, and cow-itch vine are common. Common herbs include bracken fern, Christmas fern, resurrection fern, needle grass, spike grass, fragrant goldenrod, goldenrod, sweet Betsy, and other aster species (Alabama Power, 2009a). Within hardwood forest communities most (57 percent) of the substrate is composed of bare ground. Grasses account for 6 percent while forbs contribute another 4 percent cover. Legumes comprise less than 1 percent of the understory. Seedlings of canopy species contribute about 5 percent. Vines, in their creeping form, have about 28 percent cover. Within pine hardwood forests, the herb stratum is rather thin with about 71 percent being leaf litter and open ground devoid of vegetation. Vines form most of the vegetation cover (20 percent) with forbs contributing another 5 percent. Grasses are infrequent on the site (completely absent from the survey). Seedlings of woody vegetation account for 4 percent of the ground cover.

### **Wetlands**

According to the National Wetland Inventory maps, approximately 444 acres of wetlands occur within the project boundary, including palustrine, lacustrine, and riverine wetland types. The dominant wetland types within the project boundary are palustrine forest, lacustrine littoral unconsolidated shore, and palustrine emergent wetlands, which account for approximately 45.3, 27.3, and 10.3 percent, respectively, of the total wetland acreage. The remaining 75.9 acres are composed of a mix of various palustrine, lacustrine and riverine wetland types accounting for approximately 9.6, 7.1, and 0.4 percent, respectively (table 3-15). Seasonal changes in lake elevation likely result in little variability in the quantity of wetlands surrounding the project due to the steeply banked nature of the reservoir shoreline.

### **Invasive Plants**

In the final license application, Alabama Power identified eight species as being the primary invasive flora potentially occurring in the project area: brittle/spiny leaf naiad, silk tree (mimosa), Japanese honeysuckle, kudzu, Chinese privet, giant cut grass (millet), torpedo grass, and golden bamboo. Giant cutgrass has proven especially invasive in littoral habitats in the upper portion of Lake Martin, primarily in cove backwaters between Hillabee Creek and the Lake Martin headwaters.

### **Wildlife**

Lake Martin is within the Piedmont physiographic region of Alabama. The Martin impoundment and surrounding woodland, agricultural, and residential areas provide high quality habitat for a variety of upland and semi-aquatic wildlife species. In addition to typical southeastern species, such as gray fox, white-tailed deer, Virginia opossum, and gray squirrel, the area supports species characteristic of the Piedmont region, such as the wood frog and copperhead. Birds typical of project uplands include game species such as bobwhite quail, wild turkey, and mourning dove. Resident songbirds include downy woodpecker, American robin, eastern bluebird, and eastern meadowlark. An abundance of neotropical migrants including numerous warblers, vireos, and hummingbirds also



occur in the Lake Martin area. Raptors known to occur in the project area include osprey, American kestrel, broad-winged and red-tail hawks, bald eagle, and barred, great horned, and screech owls. Typical small mammals include least and short-tailed shrews, southern flying squirrel, eastern wood rat, and eastern red and big brown bats. Reptiles and amphibians include American and eastern spade foot toads; marbled and slimy salamanders; the green anole; the southern fence lizard; five-lined and broad-headed skinks; copperhead, black racer, and gray rat snakes; and eastern box turtle.

Table 3-15. Area and percentages of wetland types in the project boundary (Source: Alabama Power, 2011a).

<b>Wetland Type</b>	<b>Area<sup>a</sup> (Acres)</b>	<b>Percent of Total (%)</b>
Lacustrine Littoral Rock Bottom	30.7	6.9
Lacustrine Littoral Rocky Shore	0.7	0.16
Lacustrine Littoral Unconsolidated Shore	121.6	27.34
Palustrine Emergent	45.8	10.32
Palustrine Forest	201.4	45.28
Palustrine Scrub-Shrub	42.5	9.55
Palustrine Unconsolidated Bottom	0.2	0.04
Riverine Lower Perennial Rock Bottom	1.8	0.4
<b>Total</b>	<b>444.7</b>	<b>100</b>
Lacustrine	153.0	34.4
Palustrine	289.9	65.2
Riverine	1.8	0.4
<b>Total</b>	<b>444.7</b>	<b>100</b>

<sup>a</sup> Based on National Wetlands Inventory data for the following USGS 1:24,000 Quadrangles: Brassell, AL; La Place, AL; Shorter, AL; Tallassee, AL; Willow Springs, AL; Red Hill, AL; Alexander City, AL; Buchanan, GA; Buttson, AL; Dadeville, AL; Draketown, GA; Dudleyville, AL; Fruithurst, AL; Hightower, AL; Jacksons Gap, AL; Micaville, AL; Our Town, AL; Ofelia, AL; Ponders, AL; Rockmart South, GA; Ross Mountain, AL; Tallapoosa North, GA; Tallapoosa South, GA; Wadley North, AL; Wadley South, AL.

Palustrine forested wetlands, which account for almost half of project wetlands, encompass what are commonly referred to as “hardwood bottomlands.” These bottomlands likely represent the most diverse and productive wildlife habitat in the project area, harboring a wide range of species including barred owl, red-shouldered hawk, white-tailed deer, fox squirrel, and red and gray fox. Bottomlands are of particular value as stopover habitat for warblers and other migrating songbirds and for cavity nesting species such as the prothonotary warbler, wood duck, and red-bellied woodpecker. The emergent and lacustrine littoral habitats provide important amphibian breeding areas; spawning and rearing habitat for fish; habitat for semi-aquatic mammals such as river otter, mink, and beaver; and refuge and feeding areas for resident and migratory waterfowl and wading birds including mallard, hooded merganser, common loon, great blue heron, green heron, and great egret.

Although limited, Lake Martin’s littoral zone provides habitat for river otter, mink, muskrat, and beaver, as well as seasonal and year-round habitat for a number of waterfowl and wading birds including the mallard, gadwall, wood duck, hooded merganser, common loon, great blue heron, green heron, and great egret. Birds such as the ring-billed gull, osprey, purple martin, and belted kingfisher are also common in areas of open water. Littoral areas also provide potential breeding habitat for a number of aquatic and semi-aquatic amphibian species including red-spotted and central newts, northern red and northern dusky salamanders, bullfrog, southern cricket frog, spring peeper, and southern leopard frog. Reptile species typical of the littoral zone include eastern cottonmouth and red- and yellow-bellied water snakes, the snapping turtle, Alabama map turtle, river cooter, and red-eared pond slider.

### ***Sensitive Wildlife and Sensitive Resources***

During preparation of the license application, Alabama Power consulted with FWS and Alabama DCNR to identify species protected under state laws and federal laws other than the ESA. Two terrestrial species considered sensitive wildlife were identified: the alligator snapping turtle and the bald eagle (Alabama Power, 2011a).

The bald eagle (*Haliaeetus leucocephalus*) was delisted under the ESA in 2007 (FWS, 2012e), but it remains federally protected under the Bald and Golden Eagle Protection Act. Bald eagles forage near large aquatic ecosystems such as lakes, reservoirs, or free flowing rivers. Nests are typically located in crowns of large trees, close to foraging areas (FWS, 2012f). Alabama DCNR has monitored bald eagle nests in the project area. The most recent data available was recorded in 2006, when three active bald eagle nests were documented along the shoreline of Lake Martin, and a fourth located on the Tallapoosa River about 5 miles downstream from Martin dam (Alabama Power, 2011b).

The alligator snapping turtle (*Macrolemys temminckii*) is a state-listed species (Mirachi et al., 2004) that is also under review for federal listing (FWS, 2012d). The

alligator snapping turtle spends most of its time in water, generally only coming onto land for nesting. Preferred habitat consists of deep water of rivers, sloughs, oxbows, and canals or lakes associated with rivers. Usually it occurs in waters with a mud bottom and some aquatic vegetation, but it may use sand-bottomed creeks (NatureServe, 2012b). Populations have declined throughout its range due to exploitation, habitat loss from dredging, and pollution induced habitat degradation. The current population status in Alabama is unknown (Mirachi et al., 2004).

As part of the SMP, Alabama Power proposes to develop a Sensitive Resources geographic information systems data layer which would include locations of rare, threatened, and endangered species, as well as sensitive habitats. Alabama Power proposes to provide the data regarding Sensitive Resources to Alabama DCNR, FWS, and the Commission. For further discussion, see section 3.3.5, *Recreation Resources and Land Use*.

### **3.3.3.2 Environmental Effects**

#### **Vegetation**

Proposed changes in the winter pool level and timing of fall operation would cause changes in the timing, duration, and depth of inundation around the lake perimeter, which in turn could affect the distribution and species composition of vegetation communities. Alabama Power proposes to increase the winter pool elevation by 3 feet and evaluate the potential for extending the summer full pool period to as late as October 15 on an annual basis. As discussed in section 3.3.2, *Aquatic Resources*, and section 3.3.5, *Recreation Resources and Land Use*, other stakeholders recommend a 4-foot or a 5-foot increase in winter lake level to provide the ability of Lake Martin to refill by the following.

Implementation of the proposed SMP would guide vegetation management and development (such as a boat ramp) on project lands and waters, potentially affecting vegetation composition in these areas. Implementation of the WMP would include vegetation planting and forest management prescriptions that could influence forest composition and structure.

#### *Our Analysis*

Species composition of existing vegetation around the lake perimeter is largely a result of past operations that influence water availability and inundation frequency. These factors select for species that can live and reproduce under the site-specific conditions. Changing these conditions by increasing the winter pool and altering the timing of fall operations could favor species more adapted to wetter conditions.

Modifying project operations that result in an increase in the winter pool elevation and the timing of spring and fall water level fluctuations would alter existing micro-habitat conditions in areas below the 491-foot full pool elevation, and in higher elevation areas where reservoir levels are a dominant factor in vegetation root zone water availability. In most instances these changes would affect wetland vegetation (discussed

below). Proposed changes in operations would increase inundation periods in some areas, but would not flood new areas above the full pool elevation. Additionally, increases associated with the proposed conditional fall extension are only expected to occur once every 5 to 6 years and are not likely to have lasting effects. As such these changes would have little effect on upland vegetation.

Implementation of the proposed SMP would protect and enhance shoreline vegetation by encouraging vegetated buffers. Implementation of the WMP would improve forest stand composition and structure on project lands through management prescriptions and planting.

### **Wetlands**

As discussed above, proposed modifications to project operations could alter the timing, duration, and depth of inundation in wetland areas. These changes could influence vegetation species composition and wetland function.

#### *Our Analysis*

Implementing an increase in winter pool elevation would affect wetlands around the perimeter of Lake Martin. These modifications to site hydrology would likely result in some changes in vegetation community composition in these areas. Although the water increases would occur in the winter, during the non-growing season, some areas that are currently dewatered during the winter drawdowns would be permanently inundated. This would create anoxic condition in the soils, altering soil chemistry and microbial communities. Wetland and aquatic plants suited to these conditions would persist, replacing species that cannot survive under these conditions. Over time wetland species composition would shift toward more hydrophilic (water-loving) species at lower elevations influenced by increases in the winter pool elevation. In some areas, emergent wetlands would likely be converted to submerged aquatic vegetation, with emergent wetland habitat types moving further upslope. These effects would occur over a greater area with the 5-foot increase as compared to the 3-foot increase. Table 3-16 identifies the acreage of wetland vegetation, by wetland type, within the areas inundated by the 3-foot and 5-foot increases.

Table 3-16. Wetland acreages, by wetland type inundated by the 3-foot and 5-foot increases in winter pool elevation (Source: Alabama Power, 2011a).

Wetland Type	Total Acres in Project Boundary	Inundated with 3-foot increase	Percent Total	Inundated with 5-foot increase	Percent Total
Lacustrine Littoral Rock Bottom	30.7	5.6	18.3	15.4	50.2
Lacustrine Littoral Rocky Shore	0.7	0.6	81.8	0.7	100
Lacustrine Littoral Unconsolidated Shore	121.6	31.2	25.7	71.6	58.9
Palustrine Emergent	45.8	6.5	14.2	14.6	31.9
Palustrine Forest	201.4	2.5	1.2	8.2	4.1
Palustrine Scrub-Shrub	42.5	0.1	0.2	2.2	5.2
Palustrine Unconsolidated Bottom	0.2	0	0	0	0.0
Riverine Lower Perennial Rock Bottom	1.8	0.4	22.2	0.8	44.4
<b>Total</b>	<b>444.7</b>	<b>46.9</b>	<b>10.5</b>	<b>113.6</b>	<b>25.5</b>
Lacustrine	153	37.3	24.4	87.9	57.5
Palustrine	289.9	9.2	3.2	24.9	8.6
Riverine	1.8	0.4	22.2	0.8	44.4
<b>Total</b>	<b>444.7</b>	<b>46.9</b>	<b>10.5</b>	<b>113.6</b>	<b>25.5</b>

Similar changes in wetland community structure would occur in areas where early spring filling and/or delays in fall drawdowns alter local site hydrology. However, these effects would be of lower magnitude than the effects of raising the winter pool elevations because the timing of the spring and fall operations would vary from year to year. Most areas that would be affected by the early spring fill or fall extension would continue to see wetting and drying on an annual basis. Although additional water availability would

likely favor hydrophilic species, there is minimal potential for conversion to submerged aquatic vegetation associated with modifications to the spring or fall operations.

Implementation of the 3-foot increase in winter pool elevation would affect about 10.5 percent of wetlands in the project area. Implementation of the 5-foot winter pool increase would affect about 25.5 percent of project wetlands. Because there would be no increase in summer full pool elevation, there would be no conversion of existing uplands to wetlands to offset these effects and potential for on-site mitigation is low. Fall pool extensions would only occur once every 5 to 6 years and are not likely to have a lasting effect on wetland vegetation. Therefore, effects on wetlands would be moderate.

## **Wildlife**

### *Sensitive Wildlife and Sensitive Resources*

No alligator snapping turtles were observed in the study of the influence of shoreline modification on aquatic and semi-aquatic species (Alabama Power, 2009b). Because the study focused broadly on aquatic and semi-aquatic species, and no project related study specifically focused on the alligator snapping turtle, there is not enough evidence to determine either the presence or the absence of the alligator snapping turtle within the project affected area. However, based on the best available information, it seems likely that the alligator snapping turtle occurs within Lake Martin or its tributaries.

Alabama Power (2009b) concluded that neither seawalls nor rip-rap offer suitable habitat that allow turtles to exit the water to access nesting habitat, and even some of the undeveloped shorelines along Lake Martin are undercut from erosion such that turtles could not exit the water. However, no agencies raised concerns about project-related effects on the alligator snapping turtle.

Concerning wildlife other than turtles, Alabama Power (2009b) concluded that most wildlife species are not adapted to using the low quality habitat provided by reservoir shoreline and erosion control structures found along reservoir shorelines. Habitat beyond reservoir shorelines is often low quality due to the presence of lawns. The only high quality habitat found along the shoreline of Lake Martin occurs where unaltered shorelines exist in conjunction with natural forests.

Interior recommends that no new seawalls be constructed unless absolutely necessary to protect land and property. Interior also recommends that Alabama Power encourage shoreline developments to maintain the 30-foot control strip within the project boundary and to increase the total buffer width to at least 100 feet.

Fischer and Martin (1998) note that the operation of hydro projects can affect habitat and cause alteration to the riparian zone and that those effects can be detrimental in the absence of buffer strips. Buffer strips protect water quality by intercepting non-point source pollutants, and also provide numerous other benefits that improve water quality, such as erosion control and bank stabilization, the input of organic matter, and temperature control through shading (Fischer et al., 2000 and Wenger, 1999).

Undoubtedly, such improvements to water quality positively affect aquatic and semi-aquatic wildlife species using riparian habitat. All wildlife species, including those using upland habitats, also directly benefit from buffer strips, because buffer strips provide wildlife habitat, corridors for wildlife movement, and connectivity among isolated habitats (Fischer et al., 2000). Therefore, buffer strips provide habitat for a disproportionately high number of wildlife species despite the small proportion of the landscape, (Fischer and Martin, 1998) and thus are known as unique ecological features of the landscape they occupy (Fischer et al., 2000). Concerning dimensions of buffer strips, Fischer and Martin (1998) note that buffer strip width is often positively related to species richness and density. Fischer et al. (2000) discuss the placements and dimensions of buffer strips in more detail, and conclude that buffer strips over 15 m should be promoted for water quality benefits and buffer strips over 100 m should be promoted for benefits associated with wildlife and their habitats.

### *Our Analysis*

Limiting the construction of seawalls, rip-rap, and shoreline development would protect habitat for aquatic and semi-aquatic wildlife species. Maintaining a natural shoreline would benefit wildlife by maintaining existing habitat to which wildlife species are adapted.

Maintaining the existing 30-foot control strip would benefit all wildlife species by providing habitat and corridors to facilitate movement of wildlife among isolated habitats. Increasing buffer widths to 100 feet, as recommended by Interior, could further enhance wildlife species and their habitats by providing a greater amount of habitat and larger corridors. Because large buffer widths are often associated with increased species richness and density as discussed above, increased buffer widths around Lake Martin could benefit state and federally listed species.

Concerning Alabama Power's proposal to develop Sensitive Resources data and provide it to Alabama DCNR, FWS, and the Commission, developing a Sensitive Resources data base would help Alabama Power and the resource agencies consider the needs of sensitive resources in permitting development activities along the shoreline. The Sensitive Resources layer in conjunction with other project land use classifications as identified in the SMP is discussed in section 3.3.5, *Recreation Resources and Land Use*.

### *Wildlife Management Program*

During preparation of the license application, Alabama Power consulted with FWS and Alabama DCNR to develop its proposed WMP. The WMP designates two management areas on project lands: a longleaf pine "Primary Management Area," a 3,166 acre tract along the eastern shore of Lake Martin, and a "Secondary Management Area," a 2,717 acre tract near the Lake Martin headwaters. The specific wildlife management objectives goals of the WMP include:

- the enhancement of available habitat for longleaf pine-dependent species on project lands;
- the management of project natural/undeveloped lands adjacent to the Irwin Shoals Area (Secondary Management Area) in the upper reaches of Lake Martin for maintenance of water quality and wildlife habitat;
- the development of public hunting opportunities in or near the project boundary;
- the continuation of bald eagle monitoring and management on project lands; and
- the implementation of BMPs on project lands to protect water quality and wildlife habitat surrounding Lake Martin.

Regarding the continued monitoring and management of bald eagles on project lands, Alabama Power proposes to continue conducting annual surveys for overwintering bald eagles. Alabama Power proposes to include the locations of bald eagle nests in a geographic information system data layer identified as Sensitive Resources in the SMP, and provide the nest locations including a Global Positioning System waypoint to Alabama DCNR, FWS, and the Commission (Alabama Power, 2011b). For further discussion, see section 3.3.5, *Recreation Resources and Land Use*.

Alabama Power's proposed wildlife management activities would occur primarily on the Primary Management Area, a 3,166-acre tract that contains the majority of longleaf pine stands existing on project lands. Under the WMP, Alabama Power would manage the Primary Management Area toward a desired forest condition consistent with good quality foraging habitat for the federally endangered red-cockaded woodpecker, as defined in the recovery plan for this species (FWS, 2003a).

The Red-Cockaded Woodpecker Recovery Plan (FWS, 2003a) describes good quality foraging habitat as generally having large old pines, low densities of small and medium pines, sparse or no hardwood midstory, and groundcover consisting of bunchgrasses and forbs. Alabama Power estimates that approximately 325 acres of habitat within the Primary Management Area currently meets the definition of good quality foraging habitat. The proposed WMP includes a number of specific management strategies for longleaf pine stands on the Primary Management Area to enhance good quality foraging habitat. Management strategies included in the plan are described below.

Timber management would consist of an uneven-aged management scheme with a cutting cycle of 25 years and an overall forest rotation of 80 years; a selective cutting to achieve a forest condition consistent with good quality foraging habitat; and a reasonable effort to leave a residual stand with the following characteristics:

- a minimum basal area of 4.6 m<sup>2</sup>/ha (20 feet<sup>2</sup>/ac) for pines > 60 years in age and > 35 cm (14 in) diameter at breast height (dbh);



- a basal area between 0 and 9.2 m<sup>2</sup>/ha (0 and 40 feet<sup>2</sup>/ac) for pines 25.4 – 35 cm (10 – 14 in) dbh;
- a basal area below 2.3 m<sup>2</sup>/ha (10 feet<sup>2</sup>/ac) for pines < 25.4 cm (< 10 in) dbh; and
- a minimum basal area of 9.2 m<sup>2</sup>/ha (40 feet<sup>2</sup>/ac) for all pines > 25.4 cm (10 in).

Prescribed burns would be implemented on approximately 350 acres annually, such that one third of the Primary Management Area would be burned annually on a 3-year burn rotation. To ensure management practices are having the desired effect on stand structure, Alabama Power proposes to conduct stand inventories on a minimum 6-year interval. Following each inventory, Alabama Power would prepare a report that would be submitted to Alabama DCNR and FWS for review and filed with the Commission.

Alabama Power's proposed WMP also includes planting of an approximately 98-acre tract with containerized longleaf pine seedlings. This area is currently non-project land, but is included in the approximately 367.8 acres proposed for inclusion in the project boundary as part of the Martin Small Game Hunting Area, further discussed in section 3.3.5, *Recreation Resources and Land Use*. Once established, Alabama Power would manage longleaf pine stands on this site similarly to longleaf stands located on the Primary Management Area. Specifically, Alabama Power would use an uneven-aged management scheme with a cutting cycle of 25 years and an overall forest rotation of 80 years. After the 98-acre longleaf stand reaches at least 3 years of age, Alabama Power would implement a burning program to maintain the stand. The entirety of the 98 acres would be burned a minimum of every 5 years.

Interior recommends that within the Core Management Area in the WMP, Alabama Power should manage towards a desired forest condition consistent with the good quality foraging habitat for the federally endangered red-cockaded woodpecker, a species dependent on longleaf pine ecosystems.

#### *Our Analysis*

Implementing Alabama Power's proposed WMP would consolidate wildlife management activities within specified management areas for which specific objectives are defined. Broadly speaking, implementing the objectives of the WMP on specified areas would enhance wildlife habitat for all species. The proposed prescribed burns, in conjunction with timber stand inventories and selective timber harvest, would support forest composition and structure indicative of healthy longleaf pine ecosystems and therefore enhance habitat for longleaf pine-dependent species. Maintaining existing natural/undeveloped lands and continuing to implement BMPs would benefit wildlife through improved water quality, providing shoreline habitat, and providing upland habitat and movement corridors among isolated habitats.

Implementation of the proposed WMP would provide long-term benefits to terrestrial plant and wildlife communities within the project boundary and compliment

the objectives contained in the SMP. Because one of the objectives of the WMP involves enhancement of habitat for longleaf pine-dependent species, such as the federally endangered red-cockaded woodpecker, Alabama Power's proposed WMP addresses Interior's recommendation.

### **3.3.4 Threatened and Endangered Species**

FWS initially provided a list of five federally listed species potentially occurring in the project affected area, which it later expanded to ten species (Alabama Power, 2012b). None of the federally listed species were documented during the surveys for rare, threatened, and endangered species. Interior, in response to the Commission's notice requesting comments, recommendations, terms and conditions, and prescriptions, stated that no federally listed species are known to occur within the project boundary (letter from J. Stanley, Regional Environmental Protection Assistant, Office of the Secretary, U.S. Department of the Interior, Atlanta, Georgia, to Kimberly Bose, Secretary, FERC, Washington, D.C., filed on April 6, 2012).

#### **3.3.4.1 Affected Environment**

##### **Action Area**

The action area, or project-affected area, for the aquatic rare, threatened, and endangered species includes the Lake Martin reservoir, tailrace, and the Tallapoosa River from Thurlow dam downstream to RM 12.9.<sup>53</sup> The action area, or project affected area, for the terrestrial rare, threatened, and endangered species includes project lands encompassed by the project boundary.<sup>54</sup>

##### **Aquatic Threatened and Endangered Species**

The FWS list of potentially occurring species provided to Alabama Power for its studies of rare, threatened, and endangered species included six aquatic species. The mussel species included the threatened Alabama moccasinshell (*Medionidus acutissimus*) and the endangered ovate clubshell (*Pleurobema perovatum*), finelined pocketbook (*Hamiota (=Lampsilis) altilis*), and southern clubshell (*Pleurobema decisum*). The fish species included the threatened Gulf sturgeon (*Acipenser oxyrinchus desotoi*) and the endangered Alabama sturgeon (*Scaphirhynchus suttkusi*).

The historic range of the four threatened and endangered mussel species included most rivers, and associated tributaries, of the Mobile River Basin (FWS, 2004). Extant

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<sup>53</sup> See the Commission's Clarification to Study Plan Determination, issued on May 1, 2009.

<sup>54</sup> See the Commission's Study Plan Determination issued on April 17, 2009.

populations are localized, and uncommon to rare, throughout the current ranges (Mirachi, 2004). FWS (2000) published a recovery plan for a suite of aquatic species occurring in the Mobile River Basin. The recovery plan includes the Alabama moccasinshell, ovate clubshell, finelined pocketbook, and southern clubshell. FWS designated critical habitat for 11 mussels, including the aforementioned species, in the Mobile River Basin. Although the critical habitat designation does include portions of the Tallapoosa River drainage, no critical habitat occurs within the project affected area (FWS, 2004).

Alabama Power consulted with FWS and Alabama DCNR to determine appropriate sampling locations within the action area and methods for the mussel species surveyed. Alabama Power conducted surveys for mussels in the project affected area between May and November 2009, and May and June 2010. No federally listed mussels were found to occur in the project affected area.

The federally listed threatened Gulf sturgeon historically occurred in most major rivers from the Mississippi River to the Suwannee River, and marine waters of the central and eastern Gulf of Mexico to Florida Bay. No information is available about population levels of the Gulf sturgeon in other rivers. Documentation of occurrences of the Gulf sturgeon in rivers of the Mobile Basin are rare and incidental (FWS and Gulf States Marine Fisheries Commission, 1995). FWS designated critical habitat for the Gulf sturgeon, but the Tallapoosa River is not included in the designation (FWS, 2003b).

The federally listed endangered Alabama sturgeon historically occurred in the Mobile Basin. Records are extremely rare and indicate the species could be near extinction. FWS recently published a draft recovery plan for the species (FWS, 2012a). FWS designated critical habitat for the Alabama sturgeon, but the Tallapoosa River is not included in the designation (FWS, 2009).

Alabama Power consulted with FWS and Alabama DCNR to determine appropriate sampling locations within the action area and methods for the fish species surveyed. Fish surveys were conducted between July 2009 and June 2010. No federally listed fish species were found in the project affected area.

### **Terrestrial Threatened and Endangered Species**

FWS' list of potentially occurring species provided to Alabama Power for its studies of rare, threatened, and endangered species included three terrestrial species. The two plants included were the federally listed threatened little amphianthus (*Amphianthus pusillus*) and the candidate Georgia Rockcress (*Arabis georgiana*). The avian species included was the federally endangered red-cockaded woodpecker (*Picoides borealis*).

Little amphianthus, also called pool sprite, is a federally listed threatened species that was probably historically rare due to its specialized habitat in temporary pools in depressions of granitic outcrops (FWS, 1993). Extant populations are known to occur in five Alabama counties including Tallapoosa County (FWS, 2008; FWS, 2012b). FWS published a recovery plan for three granite outcrop plants including little amphianthus (FWS, 1993). No critical habitat has been designated for this species.

Georgia Rockcress is a candidate species for federal listing under the ESA. Georgia rockcress occurs along eroding river banks and in dry conditions associated with rocky bluffs and outcrops (FWS, 2011) and slopes along water courses, including sandy loam along eroding riverbanks (NatureServe, 2012a). Currently, 16 populations are known to exist in Georgia and Alabama (FWS, 2011). In Alabama it is known to occur in Tallapoosa County (FWS, 2012c). No recovery plan has been published and no critical habitat has been designated for this candidate species.

Alabama Power conducted surveys for little amphianthus and Georgia Rockcress during June and July, 2009. No suitable habitat for little amphianthus was observed within the project boundary during this study and no observations of suitable habitat were documented during previous visits to the project site. While suitable habitat was observed for Georgia rockcress, no individuals were documented during the surveys (Alabama Power, 2009a).

The federally endangered red-cockaded woodpecker requires open, old growth pine forests and savannahs for nesting and roosting habitat. For foraging habitat, the red-cockaded woodpecker requires pine forests with little to no hardwood or pine midstory, little or no hardwood overstory, and the presence of native bunchgrasses and forbs. Because of habitat loss, alteration, and degradation, it is estimated that red-cockaded woodpeckers currently occur at only 3 percent of the species' historic abundance (FWS, 2003a). FWS (2003a) published a recovery plan for the species, as well as a 5-year review (FWS, 2006). No critical habitat has been designated for this species. During 2006, Alabama Power conducted extensive surveys in the longleaf pine forests within the project boundary. No active colonies of red-cockaded woodpeckers were documented (Alabama Power, 2011g).

### **3.3.4.2 Environmental Effects**

#### **Aquatic Threatened and Endangered Species**

Alabama Power's studies of aquatic rare, threatened, and endangered species showed that no federally listed mussels or fish occur within the project affected area. The results of Alabama Power's studies are consistent with Interior's statement, by letter filed April 6, 2012, that no federally listed species are currently known to occur within the Martin Dam Project boundary. In its biological assessment (BA) Alabama Power determined that its continued project operations would have no effect on federally listed aquatic species (Alabama Power, 2012b). Alabama Power also determined that no critical habitat for these federally listed aquatic species occurs in the area, and therefore, the proposed project would have no effect on critical habitats for aquatic species. Alabama Power also concluded that formal consultation pursuant to section 7 of the ESA would be unnecessary for aquatic species (Alabama Power, 2012b).

On June 6, 2012, Alabama Rivers Alliance and American Rivers filed comments on Alabama Power's BA. They state that surveys are inadequate and do not provide enough information to make a consultation determination, and that Alabama Power's BA

is deficient. Alabama Rivers Alliance and American Rivers further state that several aquatic species, including the finelined pocketbook, ovate clubshell, southern clubshell, and Alabama sturgeon have been known to occur in the lower Tallapoosa River and Alabama River. Alabama Rivers Alliance and American Rivers recommend that the BA include an assessment of effects on all listed species that may occur in the area, regardless of Alabama Power's survey results.

#### *Our Analysis and Finding*

Alabama Power's Study Plan 5 was developed in consultation with FWS and Alabama DCNR and was approved by the Commission in April 2009. None of the species on the species list provided by FWS for the rare, threatened, and endangered species study were collected. No agencies raised concerns about federally listed species or critical habitats occurring within the project affected areas, and no agencies raised concerns about the study results.

Because no federally listed aquatic species and no designated critical habitats are known to occur within the project affected area, we find that continued operation of the Martin Dam Project would have no effect on the federally listed mussels including the Alabama moccasinshell, ovate clubshell, finelined pocketbook, and federally listed fish species including the Gulf sturgeon and Alabama sturgeon. Therefore, no further consultation is necessary for these species.

#### **Terrestrial Threatened and Endangered Species**

Alabama Power concluded that no suitable habitat for little amphianthus occurs within the project boundary. Although suitable habitat for Georgia rockcress does occur within the project boundary, no individual plants were documented during the surveys (Alabama Power, 2009a). Interior's letter, filed April 6, 2012, substantiates Alabama Power's conclusion that no federally listed plant species are known to occur within the project boundary. In its BA, Alabama Power found that its continued project operations would have no effect on little amphianthus and Georgia Rockcress (Alabama Power, 2012b).

#### *Our Analysis and Finding*

Because neither little amphianthus nor its habitat occurs within the project boundary, and because Georgia Rockcress is not known to occur within the project boundary, we find that continued operation of the Martin Dam Project would have no effect on the federally listed little amphianthus and candidate Georgia Rockcress. Therefore, no further consultation is necessary for these species.

#### **Red-cockaded Woodpecker**

The results of Alabama Power's surveys of longleaf pine forests showed that no active colonies of red-cockaded woodpeckers occur within the project boundary. Alabama Power's conclusion is consistent with Interior's statement, by letter filed April

6, 2012, that no federally listed species are currently known to occur within the Martin Dam Project boundary. However, longleaf pine forests do occur on project lands. As part of the WMP, Alabama Power proposes to manage the longleaf pine forests toward mature, open stands of longleaf pines that provide good quality foraging habitat suitable for red-cockaded woodpeckers. Interior, by letter filed April 6, 2012, recommends managing the Core Management Area of the WMP toward a desired forest condition consistent with the good quality foraging habitat indicative of healthy longleaf pine ecosystems. In its BA, Alabama Power concluded that the Martin Dam Project, including Alabama Power's proposed 3-foot increase in the winter pool would likely affect, but not adversely affect, the red-cockaded woodpecker.

#### *Our Analysis and Finding*

Although no red-cockaded woodpeckers are known to occur within the project boundary, longleaf pine forests do occur within the project boundary. As part of its WMP, Alabama Power proposes to manage longleaf pine forests toward good quality foraging habitat for red-cockaded woodpeckers. Because, forest management for good quality foraging habitat could ultimately lead to colonization by red-cockaded woodpeckers, issuing a new license for the Martin Dam Project could provide long-term benefits for the red-cockaded woodpecker. Therefore, issuing a new license for the project may affect, but is not likely to adversely affect, the red-cockaded woodpecker.

### **3.3.5 Recreation Resources and Land Use**

#### **3.3.5.1 Affected Environment**

##### **Regional Recreation Resources and Land Use**

The Tallapoosa River and its tributaries offer a wide range of recreation opportunities. Regional recreation opportunities located within an approximately 50-mile radius of the Martin Dam Project include two state parks - Cheaha and Chewacla - which offer bank fishing, cabins, campsites, picnic areas, swimming areas, playgrounds, and hiking and biking trails. The approximately 11,000-acre Tuskegee National Forest, administered by the U.S. Forest Service, is located about 40 miles southeast of the project. The forest offers bank fishing, primitive campsites, approximately 29 miles of hiking and biking trails (including 8.5 miles of the Bartram National Recreation Trail),<sup>55</sup> a horseback riding trail, and picnic areas.

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<sup>55</sup> The approximate 115-mile-long Bartram National Recreation Trail is named after the 18<sup>th</sup> Century botanist/artist William Bartram who traveled, between 1773 and 1776, through eight states in the southeast region and documented plants.

Other regional recreation resources include Lake Walter F. George, Lake Harding, Harris Reservoir (Lake Wedowee), Lake Jordan/Bouldin, Lay Lake, Mitchell Lake, H. Neely Henry Lake, Logan Martin Lake, and West Point Lake, which provide boat launches, marinas, restaurants, picnic areas, and campsites.

The Horseshoe Bend National Military Park, administered by the National Park Service, is located about 10 miles upstream of the project and offers an overlook, a visitor center, and about 3 miles of hiking trails. The park preserves the site of the Battle of the Creek War (1813-1814), which was part of the War of 1812.

The 1,445-acre Wind Creek State Park is located on the northeastern shore of Lake Martin, with land-based activities located outside of the project boundary. The park offers 626 campsites, cabins, restrooms, a marina, six boat launches, a fishing pier, a dock, hiking trails, two playgrounds, picnic areas, and trash receptacles. From May 1 through September 3, 2007, Alabama Power (2008) estimated 100,311 recreation user-days<sup>56</sup> at Wind Creek State Park. Ricks (2006) notes a significant amount of participation in black bass tournaments occurs at Wind Creek State Park. At least one black bass tournament occurs nearly every weekend from February through May, and from September through November. Ricks (2006) cites to other studies whereby researchers found the tournament attracts non-resident anglers and provides substantial economic benefit to local communities.

Downstream of the Martin Dam Project on the Tallapoosa River, Alabama Power operates and maintains the existing Yates and Thurlow Project No. 2407. The Yates dam is located at RM 52.7, which is 7.9 miles downstream of Martin dam. Similarly, the Thurlow dam is located at RM 49.7, which is 3 miles downstream of Yates dam. The Yates and Thurlow developments provide access to the respective reservoirs, and to the river downstream of Thurlow dam. There are three access sites on Yates reservoir and one on Thurlow reservoir.

Downstream of the dams, the river exhibits natural bedrock outcroppings between RM 49 and RM 47. Within this river segment, the river channel drops 9 feet in elevation (Alabama Power, 2011a) and provides whitewater boating opportunities, varying in whitewater class from Class II to Class IV on the International Scale of River Difficulty.<sup>57</sup> The Thurlow dam put-in is located downstream of Thurlow dam on the Tallapoosa River at RM 49.5, and the Tallapoosa take out is located at RM 48.0. Flows

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<sup>56</sup> A recreation user-day is a visit to an area for recreational purposes during any portion of a 24-hour period.

<sup>57</sup> The International Scale of River Difficulty defines six classes of whitewater: Class I-Easy; Class II-Novice; Class III-Intermediate; Class IV-Advanced; Class V-Expert; and Class VI-Extreme.

downstream of Thurlow dam typically range from 1,200 to 18,000 cfs. For further discussion on flows, see section 3.3.2, *Aquatic Resources*.

### **Recreation Sites**

Recreation sites along the project shoreline offer day-use, campsites, fishing, picnic areas, swimming, and boat launches. There are 58 recreation sites providing access to project lands and waters that include 21 public sites, 14 commercial sites, six quasi-public sites, and 17 private sites. Of the 58 recreation sites, 26 recreation sites are located entirely, or partially, within the existing Martin Dam Project boundary. The remaining 32 recreation sites are located entirely outside of the project boundary. The 26 recreation sites provide an estimated 195 picnic tables, six swimming areas, 19 hard surfaced boat launches with 24 lanes, two gravel or carry-in boat launches, 120 recreation vehicle sites, 40 cabin sites, 23 tent sites, and six primitive campsites.

In accordance with the proposed final Recreation Plan for the Martin Dam Project, filed December 9, 2011, Alabama Power considers 19 of the 26 recreation sites as project recreation sites because Alabama Power owns, operates, and maintains the recreation sites, although it may delegate O&M of the site to another entity. Of these 19 recreation sites, table 3-17 only identifies 12 existing project recreation sites included in the current project license.

### **Recreation Use**

Alabama Power (2008 and 2010g) conducted recreation studies to identify and characterize recreation use within, or adjacent to, the project boundary. Visitor use was estimated using visitor counts in conjunction with on-site interviews with visitors throughout the study area and mail-back questions. The 2008 study identified the study area as the major arms and tributaries of Lake Martin (e.g., Kowaliga arm, Blue Creek, Sandy Creek, and Manoy Creek) from Irwin Shoals to Martin dam, a distance of approximately 27 miles. Recreational use at the 57 public, commercial, and private sites identified in the study was estimated at 1,058,670 recreation days. The 2010 study identified the study area as: (1) the reservoir; (2) 11 public, commercial, and private recreation sites located at Lake Martin; and (3) the tailwater of Martin dam, as defined from Martin dam to 0.25 mile downstream of the dam. Recreational use for this study is discussed below.

Alabama Power (2010g) estimated 370,538 recreation user-days for the combined recreational use at Lake Martin and the tailwater area, with most recreational use attributed to visitors and seasonal landowners (263,060 recreation user-days), and the remainder attributed to permanent residents (105,114 recreation user-days). Most recreation occurs from April through August, with a noticeable increase in recreational use during July, and a considerable decrease in September and October (table 3-18).

Of the total 370,538 recreation user-days, Alabama Power (2010g) estimates use of the project tailwater area at 2,365 recreation user-days annually, with recreational use



Table 3-17. Existing project recreation sites included in the current project license (Source: Alabama Power, 2011a, as modified by staff).

<b>Site Name</b>	<b>Type of Facility</b>	<b>Acres</b>	<b>Minimum Elevation That Boat Ramp Is Useable (feet msl)</b>
Anchor Bay Marina	Commercial/Day Use	6.4	480*/484#
Camp Alamisco	Quasi- public/Campground/campsites	51.5	486
Camp ASCCA (Dadeville Campus)	Quasi-public/Campground/campsites	22.8	483#
DARE Boat Landing	Public/Day Use	2.5	482#
DARE Power Park	Public/Day Use	218.2	N/A
Kamp Kiwanis	Quasi-public/Campground/campsites	890.5	486
Maxwell Gunter AFB Recreation Area	Quasi-public/Campground/campsites	45.3	479*
Parker Creek Marina	Commercial/Day Use	9.7	481*
Pleasure Point Park and Marina	Commercial/ Campground/campsites	6.6	481*
Real Island Marina and Campground	Commercial/Day Use	9.6	482#
Scenic Overlook	Public/Day Use	1.5	N/A
Union Ramp	Public/Day Use	11.4	483#

Notes: \* provides access during current winter operations to elevation 481 feet msl.

# would provide access during proposed winter operations to elevation 484 feet msl.

Table 3-18. Estimated recreation use (in recreation user-days) at the Martin Dam Project from June 1, 2009, to June 13, 2010 (Source: Alabama Power, 2010g, as modified by the staff).

Month	Average Weekday Use	Total Weekday Use	Average Weekend Use	Total Weekend Use	Average Holiday Use	Total Holiday Use	Total
January	144	3,014	103	1,027	0	0	4,041
February	170	3,393	173	1,386	0	0	4,779
March	462	10,630	410	3,283	0	0	13,913
April	502	11,042	2,117	16,933	0	0	27,974
May	824	16,482	1,635	13,082	358	1,074 <sup>a</sup>	30,638
June	1,230	27,052	3,502	28,014	0	0	55,065
July	3,206	70,537	11,269	67,616	3,468	10,405	148,558
August	811	17,031	2,307	23,069	0	0	40,099
September	435	9,145	1,592	9,552	1,641	4,922	23,619
October	256	5,625	378	3,400	0	0	9,025
November	179	3,757	453	4,076	0	0	7,833
December	71	1,632	125	996	0	0	2,628
Subtotal	695	179,339	1,760	172,433	1,822	16,401	368,173
Tailwater <sup>b</sup>	6	1,516	8	812	4	37	2,365
<b>Total</b>	<b>701</b>	<b>180,855</b>	<b>1,768</b>	<b>173,245</b>	<b>1,826</b>	<b>16,438</b>	<b>370,538</b>

<sup>a</sup> Lake use on Memorial Day during the study year was adversely affected by inclement weather.

<sup>b</sup> Tailwater use is annual estimate only.

attributed to visitors and seasonal landowners (1,690 recreation user-days), and the remainder attributed to permanent residents (675 recreation user-days).

Pleasure boating is the most popular activity at Lake Martin, accounting for more than one-half (52 percent) of all recreational activity. Recreational boating use indicates that boating is concentrated in the main portion of Lake Martin, as well as in the Blue Creek arm of the lake, which is most likely due to Wind Creek State Park and to the

numerous public boat launches at the lake. The second most popular activity is spending time at the lake with “no primary activity” (9.6 percent) (Alabama Power, 2010g; 2008). Including water-skiing/tubing and fishing, three of the five primary recreation activities at the lake are related to boating.

With regard to recreational use at the Martin Dam Project, Alabama Power filed, on April 1, 2009, the most recent Licensed Hydropower Development Recreation Report (Form 80)<sup>58</sup> data for the project. These 2008 data indicate annual daytime visitation of 2,955,600 and annual nighttime visitation of 620,700. The Form 80 data indicates the swimming area (69 percent occupancy), parks (designated areas which usually contain multiple facilities (e.g., picnic sites, boat ramps) (54 percent occupancy), and campsites (47 percent occupancy) are popular recreation sites.

As discussed in section 3.3.2, *Aquatic Resources*, some of the predominant recreational fish species in Lake Martin include spotted and largemouth bass, black crappie, and bluegill. Striped bass are stocked by Alabama DCNR on an annual basis to provide an additional game fishery (Sammons, 2011; CH2MHill, 2005; Gulf States Marine Fisheries Commission, 2006). Greene et al. (2008) note that bass tournament data collected for the B.A.I.T. program indicate that Lake Martin ranked second out of 22 reservoirs statewide in angler percent success, but twenty-first in average weight. Greene et al. (2008) find that the high angler success rate is primarily due to the abundance of small fish.

As discussed in section 3.3.3, *Terrestrial Resources*, a variety of wetland types occur within the project boundary. Studies (Bergstrom, et al., 1996; Henderson, et al., 2001) show that anglers generally prefer increased aquatic vegetation because it provides food and cover for fish and other species. In addition, the studies show that anglers’ visitation decreased as the amount of aquatic vegetation decreased. Non-anglers displayed a ‘mirror-image’ visitation trend of anglers. Visitation from non-anglers increased as aquatic vegetation decreased.

Future projections of recreation use at the project indicate an increase of 24 percent over current recreation use by the year 2050 (table 3-19). Activities with the highest growth potential (in percent) by the year 2050 include wildlife observation (88 percent), sightseeing (76 percent), and picnicking (64 percent). Activity growth with the highest potential increase in the total number of recreation user-days by the year 2050 at the project includes pleasure boating (30,618 more recreation user-days) and “no primary

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<sup>58</sup> To evaluate recreation resources at the project, the Commission requires the licensee to prepare and submit a Form 80 every 6 years (*see* 18 C.F.R. section 8.11). Each Form 80 must identify the project’s recreation facilities and the level of public use of these facilities.

activity” (18,813 more recreation user-days). Hunting is projected to decrease by 19 percent by the year 2050.

Table 3-19. Projected recreation use at the Martin Dam Project by activity type from 2010-2050 (Source: Alabama Power, 2011d, final Recreation Plan, as modified by staff).

<b>Activity</b>	<b>2010</b>	<b>2020</b>	<b>2030</b>	<b>2040</b>	<b>2050</b>	<b>Projected Growth (%)</b>
Pleasure Boating, Waterskiing, Jetskiing	243,840	248,717	256,032	268,223	282,854	16
No primary activity/Other activities	39,139	43,836	48,924	54,423	59,883	53
Fishing	35,722	38,579	41,080	42,153	42,153	18
Swimming/Beach use/Non-pool swim	29,574	31,348	33,419	36,080	39,333	33
Sailing	5,458	5,676	6,113	6,877	8,078	48
Sightseeing	2,884	3,374	3,893	4,470	5,076	76
Camping (Developed & Primitive)	5,014	5,841	6,744	7,671	8,649	72
Wildlife observation	429	545	656	746	807	88
Hunting	320	310	298	278	259	-19
Canoeing, Kayaking, Windsurfing	7,871	8,186	8,816	9,918	11,649	48
Picnicking	288	325	369	418	472	64
<b>Total</b>	<b>370,539</b>	<b>386,737</b>	<b>406,344</b>	<b>431,257</b>	<b>459,213</b>	<b>24</b>

### **Land Use**

Section 3.3.3, *Terrestrial Resources*, discusses the vegetative cover types and distributions that contribute to the land use.

The Tallapoosa River Basin is rural with agriculture and forest products as the primary land uses. Agriculture includes livestock, corn, wheat, soybeans, grains, and hay. The U.S. Department of Agriculture Census of Agriculture (USDA, 2012) estimates the combined market value of agricultural products sold in Tallapoosa, Elmore, and Coosa Counties totaled \$39 million. Other economic sectors include the automotive

industry, manufacturing, retail trade, and public service (Alabama Development Office, 2011).

The Natural Resources Conservation Service (2007; 2008) recognizes a recent trend in land use has been, in some areas, the loss of prime farmland to industrial and urban areas. By the year 2030, the land use pattern in the Tallapoosa River Basin is projected to change significantly. Agricultural land is projected to decline by 70 percent, and undeveloped land is projected to decline by 50 percent. In general, land use is expected to change from open space and agriculture to residential.

The project is located in east central Alabama near Alexander City, Dadeville, and Jacksons Gap in Coosa, Elmore, and Tallapoosa Counties, Alabama. Central Alabama Regional Planning and Development Commission (2007) notes Elmore County is ranked as the third highest growing county in Alabama. Table 3-20 shows population and business data for Coosa, Elmore, and Tallapoosa Counties. While Lake Martin provides numerous recreation opportunities and local businesses supply the demand for recreation-related products associated with recreation at the lake (e.g., lodging, restaurants, sporting goods, marine sales) the three-county region provides for non-recreation businesses across a variety of industries. Alabama Power (2010g) estimated that recreationists spent \$9.8 million on trip-related purchases associated with their visits to Lake Martin during the 12-month study period. Visitors and seasonal residents account for approximately two-thirds of trip-related spending.

Alexander City, Alabama, located on U.S. Highway 280 adjacent to the northwest part of Lake Martin, is the largest municipality with a population of 14,876. The percent decrease in population of Alexander City between 2010 and 2012 was 0.8 percent (U.S. Census Bureau, 2010d). Similar data is unavailable for Dadeville and Jacksons Gap, Alabama. For Coosa, Elmore, and Tallapoosa Counties, the projections (from 2010 to 2040) for the population 65 years and older predict percent increases of 64.3 percent, a 163.9 percent, and a 50.9 percent change, respectively (U.S. Census Bureau and The University of Alabama, 2010).

Currently, project lands encompass 8,602 acres, including 1.39 acres of federal lands administered by BLM. Alabama Power manages these lands and waters for the project facilities and issuances of permits and leases to other entities and individuals for non-project use and occupancy of project lands or waters consistent with project operation.

There are 6,901 privately owned shoreline parcels adjacent to, or near, Lake Martin, which encompass the three affected counties. With regard to these parcels, 456 parcels are located in Coosa County, 2,037 parcels are located in Elmore County, and 4,408 parcels are located in Tallapoosa County (Alabama Power, 2010g). Over the next 35 years, the City of Alexander City et al. (2009) project 6,211 housing units adjacent to, or near, Lake Martin.

Table 3-20. Population and business data for Coosa, Elmore, and Tallapoosa Counties (Source: U.S. Census Bureau, 2013a, b, c, as modified by staff).

	Coosa County	Elmore County	Tallapoosa County
Square miles	650.93	618.49	716.52
Population, 2013 estimate	10,898	80,902	41,203
Persons under 18 years, percent, 2013	18.9	23.2	21.4
Population density	17.7 persons/sq. mile	128.2 persons/sq. mile	58.1 persons/sq. mile
Total non-farm establishments, 2012	98	1,122	753
Primary industries	Agriculture, forestry, fishing, and hunting; construction; health care; retail trade	Construction; health care; retail trade; accommodation and food services	Agriculture, forestry, fishing, and hunting; health care; retail trade; manufacturing
Total non-farm employment, 2012	955	14,382	10,348
Non-farm employment, percent change, 2011-2012	3.7	2.0	7.0

Alabama Power’s existing Comprehensive Recreation Plan, or Exhibit R of the current license, identifies land uses within the project boundary. Alabama Power owns lands within the entire length of the shoreline to the 491-foot contour, and some lands above the 491-foot contour. The Comprehensive Recreation Plan characterizes existing project lands into eight classifications, including Unclassified Lands (see table 3-21):

- Prohibited Access – consists of areas where visitors are not allowed in order to protect them from hazardous areas and prevent damage to operational facilities.
- General Public Use – is reserved for development of parks, boat ramps, concessionaires’ facilities, and other public recreation facilities.
- Natural/Undeveloped – remains undeveloped to serve as buffer zones around public recreational areas, to protect environmentally sensitive areas, to prevent

overcrowding of partially developed shoreline areas, to maintain the natural aesthetic qualities of certain visible areas, for nature study, and for primitive camping.

- Potential Residential – includes areas where lots for cottage construction can be developed by Alabama Power and made available to the public under restrictive lease provisions.
- Quasi-public Recreation – leased to quasi-public organizations (e.g., Camp ASCCA, the U.S. Department of Defense [Maxwell Gunter AFB Recreation Area], Camp Alamisco, and Kamp Kiwanis [Girl Scouts]) as needed.
- Commercial Recreation – includes existing concessionaire-operated public marinas and recreational areas that provide a wide variety of recreational services to the public on a fee basis.
- 30-foot Buffer – Defines a strip of land along the shoreline in certain areas of the reservoir. This 30-foot buffer is located on land once owned by Alabama Power. When sold, Alabama Power retained a 30-foot strip to act as a buffer and prohibit certain activities (e.g., habitable structures).

Table 3-21. Current land use classifications within the Martin Dam Project boundary (Source: Alabama Power, 2011a).

<b>Classifications</b>	<b>Total Area (Acres)</b>	<b>Shoreline Length (Miles)</b>
Prohibited Access	279.8	3.5
General Public Use	781.2	20
Natural/Undeveloped	6203.1	127.8
Potential Residential	329.6	16.1
Quasi-public Recreation	261.6	6.3
Commercial Recreation	62.9	3.9
30-Foot Buffer	683.8	193.3
Unclassified	n/a	510.1
<b>Total</b>	<b>8,602.0</b>	<b>879.5<sup>a</sup></b>

<sup>a</sup> 1.5 miles of shoreline classified as Prohibited Access occur in the Martin tailrace and are not included in the amount of shoreline miles.

## **Shoreline Permitting Program**

As part of the current Shoreline Permitting Program, Alabama Power administers a program that addresses specific use and occupancy of the Lake Martin shoreline not tied to project purposes. The shoreline permitting program provides a process for a landowner or a commercial developer who proposes to construct or modify a pier, a boat dock, or shoreline stabilization materials, such as a seawall, on lands within the Martin Dam Project boundary. Alabama Power monitors activities along the shoreline to ensure that those activities are permitted and consistent with conditions as outlined in the permit.

The Corps has given Alabama Power the authority to manage certain permitting on the lake that ordinarily would be subject to Corps permitting. Thus, Alabama Power holds a Programmatic General Permit, issued by the Corps, that authorizes certain types of work, minor structures and activities in or affecting waters of the United States, including navigable waters of the United States. The permit allows Alabama Power to expedite authorization of work within the Martin Dam Project boundary and contains provisions to protect the environment.<sup>59</sup>

In a letter filed March 14, 2012, Alabama Power provided an updated summary of its progress for implementing its Shoreline Compliance Program at its eight hydroelectric projects, including the Martin Dam Project. The Shoreline Compliance Program establishes a framework primarily to address unpermitted structures (e.g., a satellite dish) on project lands and waters consistent with Alabama Power's Shoreline Permitting Program and the Commission's standard land use article. The Shoreline Compliance Program comprises six components including: (1) Shoreline Permitting Program; (2) Structure Identification, Assessment and Resolution; (3) Public Education and Communication; (4) Surveillance Program; (5) Shoreline Litigation; and (6) Shoreline Preservation Initiatives.

By letter issued August 17, 2012, we acknowledged Alabama Power's above letter regarding its progress implementing its Shoreline Compliance Program for its eight hydroelectric projects, including the Martin Dam Project. In our letter, we determined, among other items, that Alabama Power must monitor project property to ensure that no unauthorized uses and occupancies occur within the project boundary. Alabama Power is required to file annual status reports on activities under its Shoreline Compliance Program, including an overview of its progress in resolving the unpermitted structures.

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<sup>59</sup> See Alabama Power's Response to Additional Information Request No. 26, filed December 9, 2011.



### 3.3.5.2 Environmental Effects

#### Project Operations and Lake Management

Alabama Power currently operates the project according to three curves. See figure 2-1 and section 3.3.2, *Aquatic Resources*, for further discussion of project operations. To enhance recreation and other related environmental resources, Alabama Power proposes to increase the winter pool elevation by 3 feet to elevation 484 feet, and change the operating and drought curves. Alabama Power also proposes a conditional fall extension of the summer reservoir elevation. See section 3.3.2, *Aquatic Resources*, for discussion of these conditions.

Should the 3-foot winter pool elevation be implemented, Alabama Power proposes to lower the reservoir elevation to 481 feet every 6 years, dependent on weather conditions, to facilitate maintenance and/or construction activities of shoreline properties, such as a boat dock.

Lake Martin RA recommends a 4-foot increase in the winter pool elevation to 485 feet, and a trigger for the fall extension when other reservoirs are within 2 feet of their operating curves instead of 1 foot as proposed by Alabama Power (one of the criteria for triggering the fall extension). With its recommended 4-foot increase, Lake Martin RA comments that the risk of downstream flooding is not substantially increased over the proposed 3-foot increase in the winter pool elevation to 484 feet.

Lake Martin HOBO, in an effort to reduce the effects of any future region-wide drought on the ability of Lake Martin to refill by the following spring, recommends a 5-foot increase in winter pool elevation to 486 feet. Lake Martin HOBO also recommends extending the summer pool elevation (491 feet) from September 1 to October 15 to improve recreation opportunities at the lake, and that the Commission direct Alabama Power to treat Lake Martin HOBO, Russell Lands and/or Lake Martin RA equally in consultations related to lake operations.

The Downstream Landowners, concerned about damages to their property from flood events, comment that summer flooding events could be reduced if Alabama Power were to provide storage in Lake Martin for flood control.

In comments on the draft EIS, both the Lake Martin RA and Lake Martin HOBO support Alabama Power's proposed 3-foot increase in the winter pool elevation and the conditional fall extension. Both entities state that the proposed action will provide significant economic benefits, such as a projected \$27 million increase in additional sales taxes in the three counties around Lake Martin. Numerous entities provide similar comments, both orally and in writing, supporting the proposed action based on associated economic benefits derived from recreational use at Lake Martin.

### *Our Analysis*

Higher fall and winter lake levels could enhance recreation resources and associated economic activity in the project area by extending the season in which access for boats is available, while at the same time providing some assurance that the reservoir would refill the following spring. However, higher lake levels can decrease flood storage capacity and the amount of flow available for downstream releases, including power generation. Reduced flood storage capacity could have an effect on the frequency and magnitude of floods downstream, potentially affecting public access at Yates and Thurlow reservoirs and whitewater boating opportunities below Thurlow dam, although recreational use is usually limited during flood events. Lower summer lake levels could compromise lake based recreation resources, by restricting boat access and reducing navigability. For further discussion related to potential effects on flooding and downstream releases, see section 3.3.2, *Aquatic Resources*. We discuss the effects of the potential reservoir changes on recreation below.

### **Higher Winter Lake Levels**

Raising the winter pool elevation by 3 feet, to 484 feet (see figure 2-2), as proposed by Alabama Power, could have a direct effect on boating at the project. Currently, seven boat ramps within (see table 3-17) or proposed to be within (see table 3-26) the project boundary provide access to the winter pool (useable boat ramp elevation of 481 feet or less).<sup>60</sup> An increase in winter pool elevation of 3 feet to 484 feet as proposed by Alabama Power would allow an additional six boat ramps to be useable within the current project boundary. Bakers Bottom Landing is the only site proposed for inclusion in the project boundary that would not provide boater access at elevation 484 feet. As such, non-resident visitors to the area would have access at winter lake levels via these public boat launches at both the existing and proposed 3-foot-higher winter pool.

Approximately 28.6 percent of annual recreational use at Lake Martin is shoreline landowners. From June 1, 2009, through June 13, 2010, Alabama Power (2010g; 2011b) surveyed 688 shoreline landowners on Lake Martin and at shoreline recreation sites. Lake Martin is generally at elevation 487 feet by the end of September, and survey results indicated that 8 percent of respondents find it impractical to moor their boat at their dock at that elevation. Survey results also indicate the following. At elevation 481 feet, 92 percent of survey respondents indicated it was impractical to moor their boat at their dock. At the proposed 3-foot higher winter pool elevation of 484 feet, 71 percent of

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<sup>60</sup> Of the seven boat ramps, the boat ramps at Anchor Bay Marina, Maxwell Gunter AFB Recreation Area, Parker Creek Marina, Paces Point Ramp, and Pleasure Point Park and Marina are located within the project boundary. Alabama Power proposes to make the boat ramps at Madwind Creek Ramp and Smith Landing project facilities and bring them into the project boundary.

survey respondents indicated it was impractical to moor their boat at their dock. If Lake Martin was raised 4 feet in the winter to elevation 485 feet, as previously recommended by Lake Martin RA, 56 percent of survey respondents indicated it was impractical to moor their boat at their dock. If the lake was raised 5 feet higher in the winter to elevation 486 feet, as previously recommended by Lake Martin HOB0, 24 percent of survey respondents find it impractical to moor their boat at their dock. While lower lake levels may strand privately owned boat docks around Lake Martin, there are several boat ramps available to the public that provide access to the lake under the varied lake levels. Thus, raising the winter pool elevation, as previously recommended by the Lake Martin RA or Lake Martin HOB0, would primarily benefit shoreline landowners and their private docks.

Approximately 71.4 percent of the annual recreational use at Lake Martin is visitors and seasonal landowners (Alabama Power, 2010g) and two-thirds of the total visitation occurs in June, July, and August. The local businesses supported by recreational spending experience highly seasonal patterns. Alabama Power (2010g) survey results indicate that people would use the lake more often if lake levels were higher; however, it is not clear whether a higher lake level would be for the public because access is not a limiting factor, with the public boat ramps providing access on the lake under current conditions (winter pool of elevation 481 feet).

Any increase in recreation usage would likely be modest given the higher winter level would primarily benefit shoreline landowners during the off-season not typically associated with boating and water-based recreation activities. To those boaters that do use the reservoir during the winter, higher lake elevations may allow boaters to access certain areas of the reservoir for fishing or other recreation activities that may have been difficult to access, or inaccessible under existing conditions during this time of year. The higher reservoir elevation could improve navigation by creating safer boating conditions by decreasing the chance of collision with submerged objects that would be deeper under higher reservoir levels.

The winter season is typically cold and uncomfortable to participate in boating. Therefore, an increase in recreational use and associated expenditures would likely be modest. Given this is the coldest time of the year, improved access for shoreline residents would also likely only result in a modest increase in recreational boating during the winter.

### ***Conditional Fall Extension***

Alabama Power's proposal to implement a conditional fall extension of the summer lake level could benefit recreation at the project by increasing recreation use during the fall, resulting in increased recreation-related spending. Figure 3-12 in section 3.3.2, *Aquatic Resources* (historical and average lake elevations), shows that, on average, the reservoir elevation is about 488 feet on September 1, 486 feet by October 15, and 485 feet on November 1. Given that the majority of public boat ramps are still useable at

these elevations as discussed above, the public is provided access to Lake Martin until at least November 1 (or later) under current conditions. So, similar to the higher winter water levels, the greatest benefit would be to shoreline residents who access the lake via private docks that tend to be at higher elevations.

Several studies have been conducted to evaluate the overall economic impact of lake tourism and recreation on their surrounding regions (Allen et al., 2010). Hatch and Hanson (2001) cite several studies whereby results indicate that maintaining higher water levels for longer periods during the summer and fall resulted in considerable gains in estimated recreational benefits. Other data find higher water levels added value to homes surrounding a lake and increased the recreational and aesthetic values of the residential lot. The authors note, however, their study did not include agriculture, municipalities, industry, and navigation uses of water. The authors also note that to determine the effect of a resource change on all of these potential users would be a large undertaking.

Platt and Munger (1999) and Platt (2000) find the quality of the recreation experience influences the number of recreation trips taken, which can be affected by many factors including reservoir elevation. The authors note lake management practices influence housing prices, recreation, and aesthetic values. The authors find if other recreation sites occur nearby, which would be unaffected by a lake drawdown, it is likely recreationists would move to those recreation sites. If a lake drawdown occurs within a previous range, recreationists may have adapted to, and be willing to accept, a certain level of fluctuations in reservoir elevations.

Sammons (2011) finds that because Lake Martin has a high degree of residential development along its shorelines, and water levels are kept at full pool throughout the summer, Alabama Power must generate large volumes of water through Martin dam during periods of high rainfall to reduce flooding effects. In the study, Sammons cites to another study whereby its authors find changes in water levels within Lake Martin have economic impacts on property owners that must be taken into account when trying to manage for striped bass habitat.

Alabama Power (2010g) assessed the potential benefits of a conditional fall extension and concluded that this measure would offer a greater potential for increased recreational activity than the proposed winter pool increase. Water temperatures would still be warm enough for water sports in the fall, and an extended summer pool into the middle of October would improve the usability of the shorefront docks. Reservoir elevations can have a direct role in the amount of potential recreation available to shoreline landowners. As the reservoir level decreases, private docks and piers become unusable, as described above. Study results indicate that about 8 percent of property owners find it impractical to moor their boats at their dock by the end of September (at elevation 487 feet), and by the end of October (at elevation 485 feet), the number of property owners that find it impractical to moor their boats rises to more than one-half (56 percent).

Overall, higher fall reservoir elevations could provide more opportunities to access Lake Martin in that public boat ramps and private docks would continue to be accessible; however, the amount of recreation that would be expected to occur during the conditional fall extension period is likely modest. Given that two-thirds of the visitation occurs in June, July, and August, and that 71.4 percent are visitors and seasonal landowners (Alabama Power, 2010g), the demand for recreation is likely to be lower after Labor Day weekend because people, generally speaking, would return to school and have limited vacation time once school begins. This demand would be further diminished because any fall extension would be conditional, based on hydrological and project operational criteria. Review of table 3-12 indicates the four criteria required to implement the fall extension would only be expected to be met 32 percent of the time under Alabama Power's proposal. As such, it would be difficult for potential visitors interested in boating to make decisions ahead of time (e.g., lodging reservations) at Lake Martin due to the majority of years the conditional fall extension may not occur.

Utilization of a 2-foot trigger (one of the criteria related to how close the Tallapoosa and Coosa River reservoirs are to their guide curves - Alabama Power is proposing a 1-foot trigger) as recommended by Lake Martin RA would increase the probability that a conditional fall extension would occur about 84 percent of the time, and would provide more certainty to visitors making decisions related to recreating at the lake (table 3-12). As proposed by Alabama Power, the conditional fall extension would only occur *if* all four criteria are met, which would be monitored by Alabama Power on a daily basis throughout September. Implementing the conditional fall extension with a 1-foot trigger could also include a provision for informing the public that there would be an effort to maintain higher lake levels into mid-October in most years, providing more certainty that boating opportunities could be available. The hydrologic implications of the 2-foot trigger are discussed in section 3.3.2, *Aquatic Resources*.

### ***Lower Summer Reservoir Elevations***

While lower summer Lake Martin levels could offer some protection to downstream resources from flooding (discussed in section 3.3.2, *Aquatic Resources*), lake based recreation resources could be adversely affected. Although all public boat ramps would continue to be accessible should the lake elevation be lowered by 2 to 3 feet (between elevations 488 and 486 feet), boaters could be exposed to risks from submerged hazards (e.g., rocks and tree stumps) in the backwater and shallower areas of the reservoir. This would pose the greatest risk to the boating type activities such as water skiing, which are common during the peak summer recreation season, and could reduce the area of the lake where such activities could safely occur. A lower summer lake level would also have an effect on accessibility to private docks that are not constructed at elevations as low as the public boat ramps.

A 2 to 3-foot decrease in the summer pool could result in some changes in accessibility or the character of shoreline locations used by boaters, or for picnicking, swimming, and other shore/land based activities. In some locations, lower summer lake

levels could affect the aesthetics of the area (a wider “bath-tub ring” of shoreline between the water and the tree/vegetation line would be visible). Although the overall effects on recreational use and economic activity associated with that use would be difficult to predict, these lower lake levels would occur during the peak recreation season, and may have the potential to have a noticeable effect on some activities (including potentially increased shoreline/beach based uses). Overall, lower lake levels may not significantly affect the overall use of the reservoir, as most of the major recreational facilities (such as a public boat ramp) would still be available and accessible.

### ***Reservoir Drawdown to Elevation 481 feet***

Alabama Power proposes to draw down the reservoir every 6 years to elevation 481 feet, which would benefit shoreline landowners and commercial property owners by providing them the opportunity to perform maintenance and repairs to docks and shoreline structures. Notification of this drawdown to local residents, shoreline owners, and to the public in advance would minimize conflicts with recreational activities and visitor use. Having a regularly scheduled drawdown could allow landowners and commercial property owners to schedule any required repairs with contractors, and the recreating public could plan visits accordingly in order to avoid drawdown periods.

### ***Downstream Flows***

Changes in project operation and reservoir elevations discussed above could affect recreation opportunities and lands downstream of Martin dam. Alabama Power proposes to operate the Martin Dam Project in accordance with a new flood curve, including an increase in the winter pool level and a conditional fall extension. For further discussion, see section 2.2, *Proposed Project Operation*. Alabama Power would also operate the project so that the downstream Thurlow dam continues to meet its minimum flow requirement of 1,200 cfs. Any changes in reservoir operations could affect downstream flows, due to seasonal changes in reservoir storage or modifications in the timing of releases from the project.

Alabama Rivers Alliance and American Rivers state that Alabama Power’s final license application and supplemental filing in response to the Commission’s additional information request do not provide the necessary information for us to adequately assess Alabama Power’s proposals.

As discussed above in section 3.3.2, *Aquatic Resources*, and appendix C, the Downstream Landowners recommend the project should be operated with a greater emphasis on flood control.

### ***Our Analysis***

Alabama Power’s proposed operational changes designed to benefit recreation on the reservoir could alter the frequency and magnitude of floods downstream. Alabama Power (2010f) used a number of data sources including LIDAR and hydrological modeling results to examine flood frequency and magnitudes in relation to five recreation

access points downstream of Martin dam to RM 12.9 on the Tallapoosa River. As described in section 3.3.2, *Aquatic Resources*, 100-year flood events during September and October, when the conditional fall extension would be implemented, are predicted to occur less than 0.2 percent of the time. Furthermore, any changes in flood characteristics as a result of the conditional fall extension would be infrequent because all four hydrologic and operational criteria would have to be met to initiate the conditional fall extension. As described above, the four criteria would only be met about 32 percent of the time under Alabama Power's proposal but 84 percent of the time under Lake Martin RA's recommendation.

Should the conditional fall extension and/or the higher winter reservoir pool conditions be implemented as described under Alabama Power's proposal, flood modeling results indicate that there would be no change to access at the downstream Yates Dam Boat Ramp, Tallassee Park, and the Tallapoosa Take Out. The remaining three downstream sites, Gold Mine Road, Coon Creek Ramp, and Thurlow Dam Put-in, would experience some changes in access over the baseline; however, under all modeling scenarios, the maximum number of days these three sites would be inaccessible would be an additional 3 days over the entire 67-year period of record used in the analysis.

In addition to examining access to the above sites, the effects of the various flood curve alternatives, on flows in the Tallapoosa River downstream of Thurlow dam, were compared to flow descriptions for the quality of whitewater boating, published by the Alabama Whitewater Paddling Guide. Table 3-22 summarizes the paddling guide's classification of the flows at the six whitewater features on the Tallapoosa River. According to the paddling guide, the classification of the flows at these six features is rated as follows: minimum = 1,200 cfs, low = 5,000 cfs, good = 10,500 cfs, and great = 11,500 - 13,000 cfs. The paddling guide also indicates that if the Thurlow Project releases flows (e.g. 1,277 cfs) over the continuous minimum flow (1,200 cfs) boaters are able to make the run; however, it is a "scrape with almost no play."

Table 3-22. Classification of flows below Thurlow dam according to the Alabama whitewater paddling guide at six whitewater features on the Tallapoosa River (Source: Alabama Power, 2010f, as modified by staff).

<b>Cfs</b>	<b>Two Class I Shoals</b>	<b>Sticky Hole</b>	<b>Breaking Wave Holes</b>	<b>Big O</b>	<b>The Falls</b>	<b>Bionic Wave</b>
1,200	Scrape	- <sup>a</sup>	-	-	Fun	-
5,000	Good	-	-	-	Extra caution	-
10,500	Good	Great	-	-	Awesome	-
11,500-13,000	Great	Great	Great	-	Awesome	-
18,000	Washed out	Good	-	-	Washed out	-
50,000	Washed out	Good	Washed out	Washed out	Washed out	Washed out

<sup>a</sup>Not all features evaluated at all flow levels.

Generally, as flows increase, hydraulics at different features change so some spots become better destinations for wave features or safe passage while others wash out (whitewater features no longer exist). For example, at 18,000 cfs, a feature known as Sticky Hole may be rated good, while another feature, Two Class I Shoals, may be washed out. At 50,000 cfs Sticky Hole is the only feature rated good, while the rest of the river is washed out. Table 3-23 summarizes the estimated number of days within specified flow ranges in the Tallapoosa River downstream of Thurlow dam for a dry, normal, and wet year.



Table 3-23. Estimated number of days within specified flow ranges by water year type for the Tallapoosa River downstream of Thurlow dam under baseline conditions (Source: Alabama Power, 2010f, as modified by staff).

<b>Flow Range (cfs)</b>	<b>Dry</b>	<b>Normal</b>	<b>Wet</b>
1,200	152	8	0
1,201-5,000	206	237	172
5,001-10,000	8	92	123
10,001 – 13,000	0	22	29
13,001-18,000	0	6	20
>18,000	0	3	16

Alabama Power modeled changes in flows for the Tallapoosa River downstream of Thurlow dam under various operational scenarios for dry, normal and wet conditions to better understand potential effects downstream. The change in available storage within the reservoir would require changes in the releases out of Martin dam to maintain the proposed higher winter pool elevations and the conditional fall extension, if implemented. Flow frequencies would be altered, but the extent of the flow changes, considering overall precipitation throughout the basin, would likely be small compared to the baseline condition.

According to the model results, the various winter pool alternatives would result in a reduction in the total number of days within preferred flows for whitewater boating (flows in the 10,000 to 13,000 cfs range). Tables 3-24 and 3-25 summarize the results. Modeling results show that in a normal year, flows in the range of 5,001 to 10,000 cfs were reduced, while flows in the range of 1,201 to 5,000 cfs were increased (result of passing smaller flows more frequently to accommodate a lower storage capacity). For each winter pool alternative, there was an increase in the number of days the flow would average 13,001 to 18,000 cfs.

Table 3-24. Estimated changes in the number of days within observed flow ranges downstream of Thurlow dam: Winter pool elevations (Source: Alabama Power, 2010f, as modified by staff).

Flow Range (cfs)	484 foot winter pool			485 foot winter pool			486 foot winter pool		
	Dry	Normal	Wet	Dry	Normal	Wet	Dry	Normal	Wet
1,200				-7			-9		
1,201 - 5,000				10	13	10	11	19	13
5,001 - 10,000	-5	8	13	-4	-11	-10	-4	-18	-13
10,001 – 13,000	-3	-12	-15	1	-7	-2	1	-6	-3
13,001-18,000		4	2		5	2	1	5	1
>18,000				1			2		

Table 3-25. Estimated changes in the number of days from existing conditions that specific flow ranges would be observed downstream of Thurlow dam (Source: Alabama Power, 2010f, as modified by staff).

Flow Range (cfs)	Fall Extension			484 and Fall Extension			485 and Fall Extension			486 and Fall Extension		
	Dry	Normal	Wet	Dry	Normal	Wet	Dry	Normal	Wet	Dry	Normal	Wet
1,200	-1	3	2	-6	3	2	-8	3	2	-10	3	2
1,201-5,000	1	-4	-8	8	4	5	11	9	2	12	13	5
5,001-10,000		-1	6	-3	-5	-9	-4	-11	-4	-4	-16	-8
10,001 – 13,000		2		1	-6	1	1	-6	-2	1	-5	-2
13,001-18,000					4	1		5	2	1	5	1
>18,000							1			2		

In a wet year, winter pool levels of 484 feet or higher would increase the number of days flows would average in the 10,000 to 13,000 cfs range. Lake Martin RA's and Lake Martin HOBOS recommendations would result in more days in the 10,000- to 13,000-cfs range than Alabama Power's proposed winter pool elevation. However, all proposals would reduce the number of days from current conditions in this particular range. Incorporating the conditional fall extension would decrease the number of days in this range for Alabama Power, Lake Martin RA, and Lake Martin HOBOS winter pool scenarios with Alabama Power's proposal resulting in a reduction of days of flows in the 10,000 to 13,000 cfs range. The conditional fall extension would be implemented much more often under Lake Martin RA's recommended 2-foot trigger as described above, and not every flow is optimal for every whitewater boating feature although opportunities would be available at every flow.

Finally, modeling results suggested that most of the flow changes described above occur during the period of November through March. Alabama Power (2010d) states there were no differences between the baseline number of flow days for flows in the broad preferred range for whitewater boating (5,000 to 17,999 cfs) and any of the winter pool alternatives during the months of April through October. Model results further estimated one additional day within this range when the conditional fall extension was included. Even though Alabama Power states there is no change in the number of days over the broad range of whitewater boating flows, there would likely be changes within the narrower ranges similar to those summarized in tables 3-24 and 3-25, and within the more typical flows (at the lower end between 1,200 and 5,000 cfs).

The conditional fall extension would mainly affect flows below 10,000 cfs according to model results. Flow changes in dry years were minimal. In a normal flow year, most of the effects would be an increase in the average number of days at the minimum flow, with some increase in flows in the boater-preferred range of 10,001 to 13,000 cfs. Wet years would experience a reduction in flows in the less preferred range of 1,201 to 5,000 cfs, with most of this flow getting shifted to a flow range of 5,001 to 10,000 cfs. Again, the frequency of these changes altogether would depend on the four criteria laid out for implementation of the conditional fall extension (as described in section 3.3.2, *Aquatic Resources*).

Alabama Power (2010d) finds that other recreation activities below Thurlow dam may benefit from the potential flow changes. Fishing is the most common use occurring in the Tallapoosa River downstream of Thurlow dam, with most of the anglers fishing from the riverbank. Alabama Power (2010d), citing FIMS (1989), indicated that 49 percent of anglers interviewed in the section of the Tallapoosa River below Thurlow dam preferred "high water," 44 percent preferred "low water." However, 7 percent had no preference for water levels. These qualitative descriptors were not defined in the Alabama Power report (2010d). Other activities, such as swimming, could benefit from lower flows downstream for safety and accessibility of the rocks. However, because these proposals are targeted for the fall and winter months

when water temperatures are cooler, the number of swimmers potentially affected would be expected to be low.

Maintaining a lower reservoir elevation in the summer, as we analyzed to address the concerns of the Downstream Landowners could have an effect on the whitewater boating opportunities downstream. According to the Alabama Whitewater Paddling Guide, as flows increase, some whitewater features become better destinations for boaters. This suggests that boaters rely on operational releases or rain events, conditions that result in flows above the minimum releases from Thurlow. Table 3-23 indicates that boaters are more likely to experience flows in the 1,200 to 5,000 cfs range than any other range, as flows in this range occur about 65 percent of the time (during a normal year). Very few days each year have flows greater than 10,000 cfs (less than 10 percent of the time during a normal year). The hydrological records from a USGS gage located a short distance below Thurlow dam (USGS gage no. 02418500, Tallapoosa River, below Tallassee, Alabama) show the majority of these events occur during the late winter/early spring (table 3-5).

As described in section 3.3.2 *Aquatic Resources*, lower summer reservoir elevations would reduce the potential for summer rainfall events to result in higher flows downstream (by design), reducing the opportunities within this season for boating flows above the minimum Thurlow releases of 1,200 cfs. To achieve lower reservoir elevations in the summer, Alabama Power would have to release more water throughout the spring period, thereby contributing to the number of potential boating days downstream during this season. Daily operational interests should dictate the timing of the releases to provide greatest benefit to boaters, because releases from the Martin Dam Project (and subsequently Yates and Thurlow Project) made after sunset would diminish any potential benefit to boaters looking to take advantage of releases.

To address the potential flood risk to downstream property owners, Alabama Power examined a range of potential reservoir elevations using analytical tools such as the HEC-RAS model. The results of our analysis of the downstream flooding issue are found in section 3.3.2, *Aquatic Resources*.

### **Recreation Plan**

Alabama Power proposes to implement its Recreation Plan (filed on December 9, 2011) for the Martin Dam Project. The plan was developed in consultation with interested entities during the relicensing process and includes: (1) a general description of recreation sites that are owned and operated by either Alabama Power or another entity; (2) a discussion of methodology used in the development of the plan; (3) proposed recreational enhancements and associated implementation schedules; (4) a discussion of other specific recreation-related issues or potential improvements; and (5) proposed measures for annual consultation and addendum/update to the plan.

In addition to including the 12 existing project recreation sites under the current license, as previously discussed, Alabama Power proposes to add six recreation sites

and reserve one site, Ponder Camp (Stillwaters Area Boat Ramp), for future recreation development. Of the six recreation sites, Madwind Creek Ramp and Smith Landing are not located within the project boundary, and therefore, would be made project facilities and brought into the project boundary (see table 3-26). In total, there would be 19 project recreation sites, which the final Recreation Plan identifies.

Table 3-26. Proposed project recreation sites and the minimum elevations that the boat ramps are useable (Source: Alabama Power, 2011b).

<b>Proposed Project Recreation Sites</b>	<b>Type of facility</b>	<b>Acres</b>	<b>Minimum Elevation That Boat Ramp Is Usable (feet msl)</b>
Bakers Bottom Landing	Public/Day Use	1.9	485
Jaybird Landing	Public/Day Use	19.9	484
Madwind Creek Ramp	Public/Day Use	5.8	480
Paces Point Ramp	Public/Day Use	8.7	480
Paces Trail	Public/Campground/ Campsites and Day Use	24.1	N/A
Smith Landing	Public/Day Use	4.2	480
Ponder Camp (Stillwaters Area Boat Ramp)	Public/Day Use	36.4	N/A

As part of the Recreation Plan, Alabama Power proposes the following measures at three project recreation sites:

Jaybird Landing

- Replace the existing boat ramp, construct two bank fishing sites on the south side of the Tallapoosa River, and construct a gravel parking area within 1 year of license issuance.

Ponder Camp

- Retain 36.4 acres for future recreation. When usage demonstrates a need, and in cooperation with Tallapoosa County, Alabama Power proposes to construct a 300-foot-long paved access road, single-lane boat ramp, parking area for 46 vehicles with trailers, and courtesy pier.

Smith Landing and Madwind Creek Ramp

- Expand the parking area, as needed and in consultation with Alabama DCNR.

Alabama Power proposes annual O&M at DARE Boat Landing, DARE Power Park, Scenic Overlook, Union Ramp, Bakers Bottom Landing, Pace Point Ramp, Pace Trail, Jaybird Landing, Madwind Creek Ramp, Ponder Camp, and Smith Landing.

Alabama Power proposes to meet annually with Alabama DCNR to assess progress of the Recreation Plan and public access at the project. As part of this consultation, Alabama Power proposes to file a yearly addendum with the Commission as a separate document to include meeting minutes, scheduling changes, photographs, as-built drawings of recreation facility components, and a description of any changes that occurred in the preceding year, and reasons for the change. Specifically within the first year after license issuance, Alabama Power proposes to meet with Alabama DCNR to consult about the need for additional bank/pier fishing opportunities at the project.

In comments on the draft EIS, Alabama DCNR recommends that Alabama Power upgrade the existing Kowaliga (Highway 63) Launch site or develop an alternative site to improve public access at the lower section of Lake Martin. The approximate 2-acre Kowaliga (Highway 63) Launch site, located outside of the project boundary, is owned, operated, and maintained by the Alabama DCNR and includes a parking area and boat ramp.

#### *Our Analysis*

The Recreation Plan would continue to guide current and future management of project recreation resources and provide a framework for Alabama Power's implementation of the site improvements and coordination with associated measures, such as improvements to boat ramps and construction of bank fishing facilities. The proposed facility improvements would ensure that public access and recreation needs are met, enhance the physical condition of project-related recreation facilities, and reduce recreation-related adverse effects on environmental resources. Boating is the most popular recreational activity at Lake Martin; therefore, improving the recreation sites that provide boat launches and public access to Lake Martin (i.e., Jaybird Landing) would be beneficial. Alabama Power's proposal to reserve land at Ponder Camp for future recreation development would accommodate a projected increase in recreational use at the project.

The proposed annual O&M by Alabama Power would ensure each project recreation site would be operated and maintained for the public. Consequently, the measures would benefit the local economy by providing recreational opportunities that would not otherwise be available nearby. The additional spending associated with implementing the recreation measures would provide some additional employment during the construction and monitoring.

The proposed annual meeting between Alabama Power and Alabama DCNR would establish a schedule and procedure for evaluating recreation trends and updating the Recreation Plan as necessary. The annual addendum to the Recreation Plan would summarize progress made in the preceding year, and could possibly include

recommendations for future improvements, after consultation with interested entities. Periodically consolidating these changes in an updated Recreation Report would better facilitate Commission oversight of the license requirements. Coordinating the reporting with the Commission's Form 80 would improve efficiency and the accuracy of the reporting requirements.

However, Alabama Power's Recreation Plan, as proposed, does not include specific details for project recreation measures that Alabama Power would be responsible for at the Martin Dam Project. In particular, section 3.1, Site Descriptions, does not reflect the updated information included in appendix D of the plan, entitled "As-Built/Concept Design Drawings/Maps of Project Recreation Sites." We note that Appendix D contains drawings labeled Sheet D-1 through Sheet D-19 that clearly show the type of recreation facility, its location in relation to the project boundary, and the amenities, such as the number of parking spaces.

During the relicensing process, Alabama Power and the stakeholders discussed the possibility of improving public access at the lower section of Lake Martin. One of the recreation sites considered included Alabama DCNR's existing Kowaliga (Highway 63) Launch site. However, no one recommended improving the site in the application or in response to our ready for environmental analysis. In comments on the draft EIS, Alabama DCNR recommends that Alabama Power upgrade the existing Kowaliga (Highway 63) Launch site or develop an alternative site. However, the agency does not provide any details about what these upgrade would include or explain why such upgrades are needed, including current or projected recreational use. Further, the Kowaliga (Highway 63) Launch site is state-owned, which we assume the state will continue to own, operate, and maintain throughout a new license term. Therefore, access will continue to be provided in the lower portion of the lake.

### **Shoreline Management Plan**

Alabama Power (2011e) proposes to implement its final SMP for the Martin Dam Project that includes: (1) long-term shoreline management goals to provide guidance for existing and future management actions within the project boundary; (2) a redefined shoreline classification system; (3) updated shoreline permitting program; (4) other policies related to activities that may affect the shoreline (e.g., dredging, bank stabilization, channelization); (5) BMPs; and (6) an implementation plan and review process for the SMP.

The general goals of the SMP are to provide for reasonable public access, protect fish and wildlife habitat, protect cultural resources, protect operational needs, facilitate compliance with license articles, minimize adverse effects on water quality and aesthetic resources, minimize erosion, and guide shoreline development. Specific components of Alabama Power's proposed SMP are described below.



### *Shoreline Land Use Classifications*

Alabama Power proposes to implement a land use classification system to guide current and future shoreline management and permitting activities within the Martin Dam Project boundary. Further, Alabama Power proposes to develop a Sensitive Resources layer in conjunction with other project land use classifications, such as Natural/Undeveloped. In comments on the draft EIS, Alabama Power clarified and revised its land use classifications that now include:

Project Operations – Lands would be reserved for current and potential future operational activities. This includes project lands used for hydroelectric generation, switchyards, transmission facilities, right-of-way areas, security lands, and other operational uses. There would be 279.8 acres of land under this classification.

Recreation – Lands owned by Alabama Power for existing and/or future recreational use. This includes land developed for recreation with provisions for public access, recreation, open space, and future recreation development. There would be 334 acres of land under this classification.

Quasi-public – Lands would be reserved to provide a natural, outdoor, recreational setting for the enjoyment of non-profit groups. Organizations interested in the use of these lands would be required to submit detailed plans to Alabama Power for facilities they propose to construct and lease, along with details of how the proposed facilities would be maintained by that organization on a long-term basis. There would be 237.2 acres of lands within this classification.

Commercial Recreation – Lands would contain existing concessionaire-operated public marinas and recreational areas that provide a wide variety of recreational services to the public on a fee basis. There would a total of 32.3 acres of lands within this classification.

Natural/Undeveloped – Lands would remain undeveloped for specific project purposes including to: protect environmentally sensitive areas; maintain aesthetic qualities; serve as buffer zones around public recreational areas; and prevent overcrowding of partially developed shoreline areas. This classification would allow for public hiking trails, nature studies, primitive camping, wildlife management (excluding hunting), and forestry management practices. This classification would total 6,992.4 acres.

Martin Small Game Hunting Area – This area is a sub-classification under the Natural/Undeveloped Lands Classification. This 528.2-acre area would be managed according to the Martin Dam Project WMP.

30-foot Control Strip – This classification addresses project lands held within an easement retained by Alabama Power on properties where adjacent lands were previously owned by the company but have been removed from the project. Alabama Power prohibits certain activities (e.g., habitable structures) within this classification. There would be 690.2 acres of land within this classification.

Alabama Power also proposes to reclassify the shoreline at the following recreation sites (currently classified as General Public Use) to the Recreation classification: DARE Boat Landing, DARE Power Park, Scenic Overlook, and Union Ramp. Alabama Power also proposes to reclassify the shoreline at General Public Use Site #2 from General Public Use to Natural/Undeveloped classification.

### ***Shoreline Permitting Program***

The proposed SMP contains a Shoreline Permitting Program. This program describes the following: (1) levels of permitting and reviewing entities; (2) permit process; (3) guidelines; (4) supporting documentation; (5) permit enforcement; (6) permit transferability; (7) permit revocation; and (8) substandard and non-conforming structures.

The Shoreline Permitting Program allows Alabama Power to respond to shoreline landowners' permitting needs.

Private shoreline property is subject to permitting by Alabama Power. The Shoreline Permitting Program provides an ongoing plan for shoreline development by private landowners, commercial developers, and other entities who may request Alabama Power's approval for constructing piers, boat launches, seawalls, or other structures on Alabama Power-owned lands within the Martin Dam Project boundary. Private and commercial owners are provided a copy of Alabama Power's guidelines for recreational development and a copy of Alabama Power's permitting program and permit application. Alabama Power schedules on-site meetings with the entity to review the placement of structures and specific issues that must be addressed prior to Alabama Power's approval.

Alabama Power proposes to continue to implement its Shoreline Permitting Program to manage development of non-project use of project lands, and thereby protect the scenic, recreational, and environmental resources at the project. Alabama Power proposes to implement riprap guidelines and specifications for seawalls through the permitting program. Further, Alabama Power would encourage landowners to establish or maintain a 15-foot naturally vegetated buffer on privately owned shoreline lands located outside of the project boundary. Similarly, Alabama Power proposes to continue to retain a 30-foot Control Strip on any project lands removed from the project boundary. Alabama Power would encourage the use of BMPs by landowners through a combination of permits and its public education and outreach efforts, as discussed under *Public Education and Outreach Plan*.

### ***Shoreline Management Policies***

Alabama Power developed policies for five shoreline management permit requests. The five shoreline management policies include:

Bank Stabilization – Alabama Power encourages the use of alternative bank stabilization techniques other than seawalls, including riprap, bioengineering

techniques, vegetation with riprap, and gabions. Alabama Power proposes to require, as a condition of a permit, that any future seawall proposals include the placement of riprap for fish habitat and increased stability in front of the seawall. If Alabama Power found riprap would not be an effective measure for bank stabilization, or it would be not economically feasible, then Alabama Power would permit a seawall without riprap.

Dredging – Alabama Power would allow dredging, consistent with the Corps’ Programmatic General Permits, except that dredging would be restricted in and around the shoreline designated as Sensitive Resource. Alabama Power (2011b) proposes to manage individual applications for dredging activities in accordance with its Dredge Permit Program approved by the Commission on July 6, 2011.<sup>61</sup> The program establishes the process and procedures for permittees seeking to obtain direct authorization from Alabama Power for dredging activities (below the full pool elevation) at the project, and would ensure that such activities would not interfere with project operations, and are consistent with the scenic, recreational, and other values of the project.

Channelization – Alabama Power would prohibit channelization on Lake Martin, including channelization proposals by both private and commercial interests.

Water Withdrawals – Alabama Power would evaluate each application for permission to withdraw water from its project reservoir, and seek Commission authorization. In accordance with the provisions of its license, Alabama Power would charge reasonable compensation for water withdrawals based on the replacement cost of energy lost as a result of the withdrawal, and the replacement cost of the storage in the reservoir allocated to the withdrawer. Adjacent single-family home uses, such as lawn/garden watering or other similar non-commercial uses would be excluded from this policy.

Causeways – Alabama Power would prohibit the creation of causeways on Lake Martin to connect islands to the mainland or to other islands, to protect the integrity of the existing project features and shoreline, as well as fish habitat, navigation, and project operations.

### ***SMP Review and Update***

Alabama Power proposes to conduct a review of the SMP every 6 years, with input from interested entities. Alabama Power states that the review process would provide the means for the permitting program to change, if necessary, or for additional BMPs to be adopted or replaced as their effectiveness is tested. Alabama Power also states that any information related to Sensitive Resources designation (e.g., rare,

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<sup>61</sup> 136 FERC ¶ 62,012 (2011).

threatened, and endangered species locations and habitats) would be updated as new information arises. Alabama Power proposes to advertise the review process in various media formats (e.g., the SMP website, the *Shorelines* newsletter, and contact with homeowner associations) one month before the review process begins. In addition, Alabama Power proposes to issue a report, every 6 years, through various outlets (e.g., the SMP website, the *Shorelines* newsletter) with the number of permits it has processed within each shoreline land use classification at Lake Martin.

Alabama Power also proposes to host public workshops to address SMP questions, especially with regard to permitting, during the six-year review process. By December 31 of the fifth year of the 6-year cycle, Alabama Power proposes to meet with interested entities to determine the progress of implementing the SMP and any suggested modifications to the SMP.

Interior recommends that no new seawalls be constructed unless absolutely necessary to protect land and property. Alabama Power states in response that prohibiting seawalls entirely would be impractical, but confirms their awareness that riprap provides a better alternative for fish densities. Alabama Power states that use of the proposed permitting program, including BMPs and riprap guidelines, would improve water quality and aquatic habitat. Interior also recommends that Alabama Power encourage shoreline developments to maintain the 30-foot-wide Control Strip within the project boundary, and increase the total buffer width to at least 100 feet.

In response to Interior, Alabama Power stated that it could not increase the control strip to at least 100 feet, as recommended by Interior, because it did not have control of privately owned land located outside of the project boundary. By letter filed August 31, 2013, Interior modified the recommendation for Alabama Power to work with Alabama DCNR and develop a restoration plan for habitat and species. Interior states that a restoration plan would minimize habitat fragmentation by restoring habitat and species within the project area.

#### *Our Analysis*

Implementation of Alabama Power's proposed SMP would provide shoreline management guidelines, clarify and revise shoreline land use classifications, and establish an overall framework for managing project lands at the Martin Dam Project. The shoreline land use classifications would provide a framework for specific shoreline management activities and measures within designated areas. Rare, threatened, and endangered species, as discussed in section 3.3.3, *Terrestrial Resources*, and 3.3.4, *Threatened and Endangered Species*, would be protected by the permitting activity for lands under the Natural/Undeveloped Lands classification. Cultural resources, as discussed in section 3.3.6, *Cultural Resources*, would also be protected under this classification. The classification of Natural/Undeveloped Lands would protect undeveloped areas while allowing for public hiking trails, nature study, primitive camping, and wildlife and forestry management activities.

Alabama Power's proposal to reclassify 91 acres of project lands from the Natural/Undeveloped classification to the Recreation classification would be consistent with existing uses as the acreage comprises eight recreation sites<sup>62</sup> that are currently used for recreation. Alabama Power also proposes to reclassify any recreation sites under the General Public Use classification to the Recreation classification. Similar to the Natural/Undeveloped classified sites, all of these General Public Use sites to be reclassified as Recreation are currently being used for recreation. Alabama Power proposes to reclassify General Public Use Area #2, which is an informal recreation area located within the project boundary, and other areas currently classified under Potential Residential to the Natural/Undeveloped classification because these areas are undeveloped or receive minimal recreation use. The reclassifications would result in an increase in lands classified as Natural/Undeveloped, compared to current classifications. Reclassification of the project lands to more accurately describe their use is appropriate for management practices.

Geographic Information System (GIS) mapping technology is much improved over traditional mapping uses. Incorporating GIS data regarding the Lake Martin area along with the shoreline management classifications would permit the Commission to track shoreline resources and uses, and facilitate future reviews of the SMP. We, therefore, included this provision in draft Article 413, which contains the details and filing specifications for the GIS data.

Alabama Power's Shoreline Permitting Program would protect the Lake Martin shoreline during construction, operation, and maintenance of non-project structures, such as docks. It is the intent of the Shoreline Permitting Program to continue to ensure consistency of non-project use of project lands and waters with other project purposes.

Alabama Power is responsible for ensuring project lands are protected and maintained for their designated project purposes, such as O&M, flowage, recreation, public access, protection of environmental resources, and shoreline control. Alabama Power proposes to address unpermitted structures at each of its project reservoirs, including the Martin Dam Project.<sup>63</sup> As Alabama Power modifies the project boundary, there may be unpermitted structures on lands brought into the boundary. Identifying existing encroachments and resolving the encroachments would protect the project's

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<sup>62</sup> The eight recreation sites are: (1) Madwind Creek Ramp (5.8 acres); (2) Smith Landing (4.2 acres); (3) Union Ramp (7.0 acres); (4) Bakers Bottom Landing (1.9 acres); (5) Jaybird Landing (19.9 acres); (6) Paces Point Ramp (8.7 acres); (7) Paces Trail (24.1 acres); and (8) Ponder Camp (36.4 acres).

<sup>63</sup> See Alabama Power's filing of March 14, 2012. This document was filed to update the Commission on Alabama Power's progress in implementing its Shoreline Compliance Program at its eight projects, including the Martin Dam Project.

scenic, recreational, and environmental values, as well as ensure adherence to SMP policies.

Adherence to the SMP policies would protect the project shoreline and associated recreational, scenic, and environmental resources by restricting dredging within Sensitive Resources areas and prohibiting channelization and causeways on project waters. Alabama Power's policy to encourage the use of alternative bank stabilization techniques, such as riprap, bioengineering techniques, vegetation with riprap, and use of gabions, would promote the use of shoreline structures that by design provide greater benefits to aquatic resources than the use of seawalls.

In a study, Purcell et al. (2011) find shoreline development type did affect the abundance and community composition of juvenile and adult fishes. The authors find fish abundances were highest at sites containing riprap while both species richness and species diversity tended to be highest at undeveloped sites versus any of the developed sites. The authors find fish abundance can be enhanced by providing some degree of structure with interstitial spaces, such as riprap.

Interior's recommendation to prohibit the construction of any new seawalls unless necessary would be consistent with Alabama Power's proposal to encourage the use of alternative bank stabilization techniques, BMPs, and permitting guidelines before the construction of seawalls. However, Alabama Power does not describe under what circumstances a seawall without riprap would be permitted. Additionally, a seawall without riprap may exacerbate the rate of shoreline erosion and is effective if maintained. Defining such circumstances would ensure shoreline erosion is controlled while providing benefits to aquatic resources.

Alabama Power's proposed SMP review and update would provide a forum to consult with interested parties on shoreline development, effectiveness of permit programs, and any need for changes to shoreline management policies and implementation strategies. Alabama Power could present updated information about the number of new seawalls constructed to Interior and other consulted agencies, thus providing agencies the chance to provide comments and recommendations on the adequacy of the bank stabilization policy included in any final SMP.

Consultation during this update and review process would ensure a coordinated effort among Alabama Power and the interested parties with respect to other project-related plans to protect and enhance the environmental resources. Provision of a SMP update, filed with the Commission every 6 years, would ensure implementation of shoreline management guidelines, policies, and an overall framework for management of project lands.

The establishment of vegetated buffers around the reservoir would maintain or improve water quality by trapping and removing various non-point source pollutants. Interior's recommendation for a 30-foot-wide Control Strip within the project boundary, and previous recommendation for increasing the total buffer width to 100 feet likely

would be more effective at improving water quality and provide more wildlife habitat (Fischer et al., 2000).

Through its proposed Public Education and Outreach Program Plan, Alabama Power (2011b) proposes to: (1) develop a brochure, and publish in its *Shorelines* newsletter and/or Lake Magazine, that would contain information to assist shoreline landowners on how to protect and enhance the Lake Martin shoreline; (2) consult with the appropriate agencies to develop techniques for informing and educating boaters and shoreline landowners on methods to prevent or minimize shoreline erosion and sedimentation; and (3) publish periodic articles in its *Shorelines* newsletter and/or Lake Magazine regarding invasive aquatic vegetation. With these proposed measures, a public awareness could be realized for protecting the Lake Martin shoreline, within, and adjacent to, the project boundary.

### **Project Boundary Modifications**

The existing project boundary for the Martin Dam Project encompasses 8,602 acres. These lands are used by Alabama Power primarily for the O&M of the Martin Dam Project under the terms of its current license.

Alabama Power proposes to add 991.4 acres to, and remove 499.2 acres from, the project boundary, resulting in an increase of 492.2 acres of land within the Martin Dam Project boundary. Alabama Power proposes to reclassify land use on 1,294.4 acres within the project boundary. The project boundary, therefore, would be modified from 8,602 acres to 9,094 acres (Alabama Power, 2011a). The 1.39 acres of federal lands would remain within the project boundary.

With regard to the total 991.4 acres to be added, Alabama Power proposes to add 17 acres of non-project lands that include: 5.8 acres for the existing boat launch, courtesy dock, and parking area at Madwind Creek Ramp; 4.2 acres for the existing boat launch, courtesy dock, and parking area at Smith Landing; and 7 acres to correct a mapping error at Union Ramp. Alabama Power proposes to add 606.7 acres that it owns in fee and 367.8 acres to be designated as the Martin Small Game Hunting Area. For further discussion, see section 3.3.3, *Terrestrial Resources*.

With regard to the total 499.2 acres to be removed, Alabama Power proposes to remove 25.8 acres of project land at Pleasure Point Park and Marina, but retain 6.6 acres of land within the project boundary. These 6.6 acres of land have rental cabins, a marina, and a boat ramp that provide public access to Lake Martin. Alabama Power proposes to remove 24.2 acres of Lake View Park, classified as Quasi-public from the project boundary, because the site is not needed for project purposes, is under a lease agreement with Lake View Park, and therefore, managed accordingly. Alabama Power proposes to remove 373.1 acres designated as Natural/Undeveloped and 75.9 acres proposed for private development (designated as Potential Residential) from the project boundary. Alabama Power (2011b) finds the lands are not necessary for project purposes or is inconsistent with Commission policy of public use of project lands.

Alabama Power, however, would retain a 30-foot Control Strip in front of all lands proposed for removal.

Alabama Power proposes to reclassify 1,294.4 acres either as Natural/Undeveloped or as Recreation, which would be consistent with the use occurring at those sites. Alabama Power proposes to reclassify certain lands as Recreation that include: 1.9 acres for the boat launch and parking area at Bakers Bottom Landing; 19.9 acres for the boat launch and proposed improvements that include two bank fishing sites and a gravel parking area at Jaybird Landing; 8.7 acres for the boat launch, courtesy pier, and parking area at Pace Point Ramp; and 36.4 acres at Ponder Camp (Stillwater Area Boat Ramp) for future recreation development.

Alabama Power (2011b) proposes to maintain 32.3 acres as Commercial Recreation, which is consistent with the use occurring at the sites. These lands include: Anchor Bay Marina (6.4 acres), Parker Creek Marina (9.7 acres), Pleasure Point Park and Marina (6.6 acres) and Real Island Marina and Campground (9.6 acres).

#### *Our Analysis*

According to the Commission's regulations at 18 C.F.R. section 4.51(h), in part, a project boundary must enclose only those lands necessary for operation and maintenance of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources.

Parcels to be brought into the project boundary are currently being used by Alabama Power, and would continue to be used, for project purposes, including three recreation sites at Smith Landing, Madwind Creek Ramp, and Union Ramp. Additionally, certain recreation facilities at four recreation sites – Bakers Bottom Landing, Jaybird Landing, Pace Point Ramp, and Paces Trail – would be included within the project boundary. Because the above-described parcels are currently, and would continue, serving project purposes (recreation), it would be appropriate for these parcels to be brought into the project boundary. Furthermore, a previous mapping error in acreage at Union Ramp would be resolved.

There would be no adverse environmental effects associated with the proposed project boundary modifications. Alabama Power's (2011b) proposal to remove acreage from the project boundary includes an area within Pleasure Point Park and Marina currently being used for seasonal cabins. Consistent with Commission policy, the cabins are neither necessary for operation of the project nor serve a project purpose. At the site, 6.6 acres include a the marina, boat ramp, and rental cabins, which currently meet the Commission requirement to provide public access to Lake Martin, and would be included in the project boundary. Alabama Power also proposes to remove the Lake View Park from the current project boundary and retain a 30-foot Control Strip (buffer) to protect the shoreline. This park is managed by a private entity and part of a residential community via a lease agreement. The lands at Pleasure Point Park and Marina and Lake View Park are not needed for project purposes, and removal of the



acreage would be appropriate. Reservation of the 30-foot Control Strip would ensure management decisions are consistent with Alabama Power's SMP policies.

Alabama Power proposes to remove 373.1 acres (about 12 separate parcels) designated as Natural/Undeveloped from the project boundary to better distribute and maintain the Natural/Undeveloped lands more evenly at the project. For further discussion, see section 5.0, *Conclusions and Recommendations*.

### **Public Education and Outreach Program Plan**

As part of the Public Education and Outreach Program Plan, Alabama Power (2011f) proposes to enhance its existing website to include specific information on shoreline management and the proposed Shoreline Permitting Program. The website enhancements would include, at a minimum, permit guidelines for shoreline landowners; BMPs; alternative and example designs (particularly for bank stabilization); useful links and other related information; sample permit applications; contact information; and information on the Longleaf Pine Legacy Program. Alabama Power also proposes to incorporate information on its "carry in, carry out" policy in their brochures and on the updated Alabama Power website.

Instead of signage, Alabama Power proposes to prepare an article for the *Shorelines* newsletter on a tri-annual basis to inform shoreline landowners and the public about the effects of domestic livestock on terrestrial resources, particularly on the islands in Lake Martin. Alabama Power also proposes to develop a brochure about the Longleaf Pine Legacy Program.

#### *Our Analysis*

An objective in the Tallapoosa River Basin Management Plan is to educate the public on shoreline protection (CH2MHill, 2005). The Alabama Statewide Comprehensive Outdoor Recreation Plan (Alabama Department of Economic and Community Affairs, 2012) focuses on public education and outreach and uses multiple methods to present public information on water supply and watershed management. We find Alabama Power's proposed measures in its draft Public Education and Outreach Program Plan, and discussed below, would complement the goals and objectives for public education and outreach.

Improving the website and including articles in the *Shorelines* newsletter, as proposed, would be an effective means of communicating information. Information about the permitting guidelines, BMPs, alternative and example designs for bank stabilization, sample permit applications, and information about the Longleaf Pine Legacy Program would continue to foster an awareness of the public and shoreline landowners on these initiatives.

Although Alabama Power included in its Public Education and Outreach Program Plan a provision for a "carry-in, carry-out" policy for the public, we find the policy would be more appropriate as part of the revised Recreation Plan because

Alabama Power proposes to identify and remove certain existing trash receptacles and install containers with appropriately-sized bags at identified project recreations sites.

Alabama Power's proposal to provide information about the effects of domestic livestock on terrestrial resources could inform the public about this issue and as a result, minimize adverse effects on terrestrial resources. Alabama Power's proposal to provide brochures and information online and in hard copy would make the information available to the public and shoreline landowners.

### **3.3.5.3 Unavoidable Adverse Impacts**

Construction of, and improvements to, project recreation facilities would cause temporary, minor disturbance in local areas. Implementation of soil erosion control measures and revegetation of disturbed areas, where appropriate, would minimize soil erosion and associated effects on aquatic and terrestrial resources.

### **3.3.6 Cultural Resources**

#### **3.3.6.1 Affected Environment**

Section 106 of the National Historic Preservation Act of 1966, as amended, requires the Commission to evaluate potential effects on properties listed or eligible for listing in the National Register prior to an undertaking. An undertaking means a project, activity, or program funded in whole, or in part, under the direct or indirect jurisdiction of a federal agency, including, among other things, processes requiring a federal permit, license, or approval. In this case, the undertaking is the proposed issuance of a new license for the project. Potential effects associated with this undertaking include project-related effects associated with day-to-day O&M of the project after issuance of a new license.

Historic properties are defined as any district, site, building, structure, or object that is included in or eligible for inclusion in the National Register. Traditional cultural properties are a type of historic property eligible for the National Register because of their association with cultural practices or beliefs of a living community that: (1) are rooted in that community's history; or (2) are important in maintaining the continuing cultural identity of the community. In this final EIS we also use the term "cultural resources" to include properties that have not been evaluated for eligibility for listing in the National Register. In most cases, cultural resources less than 50 years old are not considered eligible for the National Register.

Section 106 also requires that the Commission seek concurrence with the Alabama SHPO on any finding involving effects or no effects on historic properties, and allow the Advisory Council on Historic Preservation an opportunity to comment on any finding of effects on historic properties. If Native American properties have been identified, section 106 also requires that the Commission consult with interested Native American tribes that might attach religious or cultural significance to such properties.

## **Area of Potential Effects**

Pursuant to section 106, the Commission must take into account whether any historic property could be affected by issuance of a new license within a project's APE. The APE is defined as the geographic area or areas which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. In this case, the Cultural Resources Work Group (CRWG), including the Commission staff, defined the APE for the project as lands above 491 feet enclosed by the project boundary which encompass a 41,150-acre reservoir (Lake Martin), a dam, a spillway, a powerhouse, a tailrace, two 450-foot-long transmission lines, project recreation sites, and appurtenant facilities (Alabama Power, 2012a). In its December 9, 2011, response to the Commission's Additional Information Request, Alabama Power stated that the Alabama SHPO concurred with the project's APE.

## **Prehistoric and Historic Background**

Climatic changes occurring around 8,000 BC resulted in changes in human subsistence strategies. The Archaic (8,000-1,200 BC) was marked by a decrease in the abundance of large game associated with the Pleistocene. Hunter-gatherers diversified, and began to focus on regional and seasonal food sources. During the early Archaic, projectile points became smaller and other tools such as knives, adzes, and end scrapers became common. The use of the atlatl was a major technological milestone that allowed spears to be thrown greater distances and with greater speed and accuracy. Fibers were also woven to create baskets and nets. By the middle Archaic, regional variation increased, and there is evidence of greater sedentism and reliance on river resources. Typical Archaic sites are small camp sites, but larger sites containing midden development, hearth features, and storage pits are also found. Middle Archaic toolkits included smaller specialized implements such as awls, needles, atlatl hooks, and ornamental items including beads and gorgets. During the late Archaic, seasonal weather patterns stabilized, and riverine sites expanded. Trade networks for raw materials and goods were established, and burial mounds suggest a social hierarchy. Late Archaic sites may contain a greater number of house floors, hearths, and other features. Soapstone bowls and other storage containers also indicate a greater reliance on horticulture and plant domestication. Many Archaic sites have been recorded in the Tallapoosa River Basin.

During the Gulf Formational stage (1,200-300 BC), pottery made with clay tempered with fibers, grit, sand, and crushed shell became prevalent. There are many sites in the Tallapoosa Basin that are represented by such plain ceramics. However, ceramics became more stylized during the later Woodland stage (300 BC-AD 1000) and reflected regional decorative patterns and techniques. The introduction of the bow and arrow during this time resulted in smaller projectile points being used as time markers for identifying Woodland archaeological sites. However, temporally diagnostic ceramics became more important in analyzing site chronology. During this time,

populations increased their reliance on agriculture, with corn and squash as prime food crops. Many Woodland sites have been recorded in the Tallapoosa River Basin.

Mississippian populations (AD 1000-1500) lived in large village sites with an agrarian economy. Villages were marked by increased social hierarchy under a ruling class. Specialized workers created goods for an expanding trade network. Mississippian archaeological sites often contain large earth mounds that were central to society. Such sites are not typical for the Tallapoosa River Basin, although several sites have been documented.

Spanish explorers, including Hernando de Soto, were the first Europeans to arrive in southeastern Alabama, but the French were the first to establish long-term contact with indigenous populations. Fort Toulouse was established in 1717 at the confluence of the Tallapoosa and Coosa Rivers. By the beginning of the 18<sup>th</sup> century, British traders arrived.

Following the creation of a Federal Road from Washington D.C. to New Orleans, the area, now known as the Mississippi Territory, became unstable resulting in an 1813-1814 war between Native Americans and the United States government. Battles took place throughout the territory including what was later to become the Lake Martin area. Following the relocation of the Native Americans to Oklahoma on the Trail of Tears, American settlers occupied the area and developed a number of mills on rivers and streams. This development continued until the Civil War in 1861, when activity slowed until 1885. After the war, agriculture and industries flourished.

Construction of Martin dam, first known as Cherokee Bluffs Dam, began in July 1923 and was completed in December 1926. It was the first of four dams built on the Tallapoosa River. The dam originally had three generating units, but a fourth was installed in 1952. The three original generators were upgraded between 2001 and 2004 to increase generating capacity. The fourth generator has not been ungraded since its installation.

### **Archaeological and Historic-era Properties**

According to a record search conducted by Alabama Power, 15 cultural resources studies have been undertaken in the vicinity of the project APE (Alabama Power, 2012a). These efforts include Phase I and Phase II archaeological studies of eight locations proposed for recreational improvements. Additionally, the University of Alabama, Office of Archaeological Research (University of Alabama) conducted surveys in 1995 and 1996.

These studies resulted in the identification of 22 cultural resource sites (Alabama Power, 2012a; University of Alabama, 2006). Eleven of these sites were recorded during the University of Alabama studies. Table 3-27 provides a summary of all prehistoric and historic resources identified to date within, or adjacent to, the project boundary APE.

Table 3-27. Previously recorded archaeological and historic resources within, or adjacent to, the project boundary APE (Source: University of Alabama, 2006, as modified by staff; Alabama Historical Commission, 2013).

<b>Resource Number</b>	<b>Description</b>	<b>Impacts/Recommendations</b>
1Cs93	Prehistoric “creek” site with pits, hearths, ceramics	Inundated by Lake Martin. Potentially eligible for the National Register due to features present during winter draw down
1Cs151	Multicomponent site; Prehistoric lithic and tool scatter and historic stone chimney and artifact scatter	Not eligible for the National Register due to high disturbance at the site
1Cs152	Ceramic and sparse lithic scatter	Undetermined eligibility for the National Register due to lack of information
1Cs153	Lithic scatter	Undetermined eligibility for the National Register
1Cs154	Lithic and ceramic scatter	Not eligible for the National Register due to high disturbance at the site
1Cs155	Multicomponent site; Prehistoric lithic and ceramic scatter, historic “Creek” site	Inundated most of the year but exposed during the winter. “Near 100 percent eroded.” Not eligible for the National Register due to high disturbance at the site
1Ee33	“Creek” site	Inundated most of the year. Undetermined eligibility for the National Register due to lack of information
1Ee433	Small lithic scatter (all artifacts reported collected)	Not eligible for the National Register due to high disturbance at the site, but Boy Scout Camp Talisi is nearby.
1Tp3	Small lithic and tool scatter	Intact. Potentially eligible for the National Register due to intact subsurface deposits.
1Tp4	Small lithic scatter	Not eligible for the National Register due to high disturbance at the site.
1Tp31	Historic artifact scatter	Not eligible for the National Register due to high disturbance at the site.
1Tp32	Multi-component; historic chimney and artifact scatter; prehistoric lithic scatter	Not eligible for the National Register due to high disturbance at the site
1Tp33	Historic artifact scatter	Not eligible for the National Register due to high disturbance at the site
1Tp34	Multi-component; historic	Erosion. Not eligible for the National

<b>Resource Number</b>	<b>Description</b>	<b>Impacts/Recommendations</b>
1Tp35	chimney feature and artifact scatter, prehistoric artifacts Burned out house and storage shed complex	Register due to high disturbance at the site Unknown impacts; further research recommended
1Tp38	Lithic scatter	Normally inundated. Not eligible for the National Register due to high disturbance at the site
1Tp86	Lithic scatter	Logging. Not eligible for the National Register due to high disturbance at the site and no indication of undisturbed sub-surface soils
1Tp125	Multi-component; historic Umphrees Family Cemetery and lithic scatter	Surface lithic materials collected. Not eligible for the National Register due to high disturbance for the Native American portion of the site and the re-location of the Umphrees Cemetery.
1Tp130	Possible historic house and artifact scatter	Erosion
1Tp131	Multicomponent; Historic artifact scatter, prehistoric projectile point fragment	Not eligible for the National Register due to only surface finds
1Tp133	Lithic scatter	Not eligible for the National Register due to high disturbance at the site and no subsurface finds
1Tp134	Portion of historic Savannah and Memphis Railroad	Undetermined eligibility due to lack of information

Alabama Power has not completed the surveys within the project's APE and acknowledges that other cultural resource sites may be present. The Alabama SHPO reviewed the 22 previously recorded identified sites in the project's APE and provided the status of the sites (letter from Greg Rhinehart, Alabama Historical Commission, Montgomery, Alabama to William Gardner, Alabama Power Company, Birmingham, Alabama, filed August 21, 2013). See table 3-27. In its application, Alabama Power states that the project facilities, including the powerhouse, dam, and associated features represent an important engineering development in the State of Alabama. However, Alabama Power identified only the Martin powerhouse as eligible for listing on the National Register (Alabama Power, 2012a). The Martin Construction Camp/Project Village was also identified as potentially eligible for its contribution to the eligibility of the powerhouse.

In comments on the draft EIS, the Alabama SHPO states that the Martin Construction Camp/Project Village site could yield valuable information about the people living there, the hierarchy of those living there, and their lifestyle. The site could also yield information on the interaction and relationship with the workers and the construction of the Martin dam and powerhouse.

### **Traditional Cultural Properties**

Alabama Power identified 14 federally recognized tribes with traditional ties to lands within the project APE. The Alabama-Quassarte Tribal Town, the Thlopthlocco Tribal Town, the Choctaw Nation of Oklahoma, the Poarch Band of Creek Indians, the Alabama-Coushatta Tribe of Texas, the Muscogee (Creek) Nation of Oklahoma, the Kialegee Tribal Town of the Muscogee Creek, the Seminole Tribe of Florida, the Chickasaw Nation, the Coushatta Indian Tribe, and the Tunica-Biloxi Tribe did not report any potential traditional cultural properties within the project APE. Three additional tribes chose not to participate in relicensing consultation: the Mississippi Band of Choctaw Indians, the Jena Band of Choctaw Indians, and the Seminole Nation of Oklahoma.

#### **3.3.6.2 Environmental Effects**

Effects on historic properties within the APE can result from project-related activities, such as reservoir operations, project-related ground disturbance, and recreational activities. Effects can also result from wind and soil erosion, vandalism, and private and commercial development. However, the final license application focuses primarily on the potential effects of changing reservoir levels on shoreline resources.

For cultural resources within the project boundary, Alabama Power states that reservoir inundation provides an overall positive effect on cultural resources (Alabama Power, 2011a). In its response to the Commission's August 11, 2011, Additional Information Request regarding further analysis and support of this conclusion, Alabama Power cites a study undertaken in 1981 that stated under sufficient depth of water, cultural resources are protected from erosion, deposition, decomposition, human impacts, and floral and faunal impacts (Alabama Power, 2012a). Alabama Power also states that, while exposure to high flow events could have an adverse effect on archaeological resources on the Tallapoosa River downstream from Martin dam, these impacts would be located outside of the APE for cultural resources (Alabama Power, 2011a; 2012a). For those reasons, Alabama Power states that no further analysis of cultural resources affected by high flow events is required.

In comments on the draft EIS, the Alabama SHPO determined that the Martin powerhouse, Martin dam, and the stilling basin are eligible for listing in the National Register under Criteria A and Criteria C (letter from Elizabeth Ann Brown, Deputy State Historic Preservation Officer, Alabama Historical Commission, Montgomery, Alabama, to William Gardner, Alabama Power Company, Birmingham, Alabama, filed

August 21, 2013). The Alabama SHPO also determined that the fourth generating unit is not eligible for listing in the National Register and falls under the list of activities exempt from section 106 reviews (letter from Amanda McBride, Alabama Historical Commission, Montgomery, Alabama, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 21, 2013).<sup>64</sup> The Alabama SHPO finds that, at the time of its impoundment, Lake Martin was the largest man-made lake in the world. Archaeological sites of significance or potential significance within the project boundary (if determined so) would be eligible for listing in the National Register under Criteria D (letter from Elizabeth Ann Brown, Deputy State Historic Preservation Officer, Alabama Historical Commission, Montgomery, Alabama, to William Gardner, Alabama Power Company, Birmingham, Alabama, filed, August 21, 2013).

### **Historic Properties Management Plan**

Alabama Power filed, and initially proposed to implement, a February 2012 draft HPMP to manage cultural resources within the project APE. The draft HPMP describes standards to be applied during project activities that have the potential to affect historic properties. Therefore, to discuss the provisions of the draft HPMP and cultural resources at the project, we established a CRWG consisting of Alabama Power, Alabama SHPO, the Alabama-Quassarte Tribal Town, the Thlopthlocco Tribal Town, the Poarch Band of Creek Indians, the Alabama Coushatta Tribe of Texas, the Muscogee (Creek) Nation of Oklahoma, the Kialegee Tribal Town of the Muscogee (Creek) Nation, BLM, and Commission staff.

Alabama Power's proposal changed on June 12, 2012, when Alabama Power signed the final PA as a concurring party, thereby agreeing to develop and implement a final HPMP within one year of license issuance. In comments on the draft EIS, Alabama Power clarified that it intends to determine if the structures at the Martin Construction Camp/Project Village are a contributing element with respect to the Martin Dam complex. The executed PA requires Alabama Power to document the Martin Construction Camp/Project Village (148 acres) and determine whether it is eligible for listing in the National Register, as part of the final HPMP.

#### *Our Analysis*

Alabama Power defined the project APE in consultation with the CRWG. A provision of a final HPMP would require Alabama Power to include a map or maps that depict the boundary of the APE in relation to the project boundary. Any project-related, ground-disturbing activities that might be necessary within the APE as defined would be subject to the requirements of section 106.

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<sup>64</sup> The final HPMP must contain these two letters of documentation of consultation with the Alabama SHPO.



Alabama Power's February 2012 draft HPMP provides for Alabama Power to complete the cultural resources survey of selected sites (807 acres) in a segmented manner by the 20<sup>th</sup> year of the new license. Dependent upon the length of a new license term, the proposed timeframe to complete these surveys would mean that cultural resources sites within the APE may remain unprotected from potential project effects for a substantial period of time.

Following discussions with the CRWG, Alabama Power and the CRWG agreed that the additional surveys could be completed after license issuance as provision of a final HPMP. Implementing the survey would provide the necessary cultural resources inventory data. In the draft EIS, we recommended completing these surveys within 5 years of the issuance date of the license to ensure that all resources are identified, and that appropriate protection and mitigation measures for unavoidable adverse effects on historic properties are determined and implemented in a timely manner (i.e., stabilization, data recovery). In comments on the draft EIS, the Alabama SHPO concurred with the reduced survey time. In comments on the draft EIS, Alabama Power agreed to this schedule and proposes to survey on average 161 acres per year.

Effects on cultural resources within the APE can include, but are not limited to, inundation of areas due to project operation, recreational use of Lake Martin and associated project lands, project-induced shoreline erosion, and modifications or repairs to project facilities. The type and level of effects on cultural resources can vary, depending upon site location and setting, features and attributes, visibility of the resource, and public knowledge and access to a resource.

Alabama Power's February 2012 draft HPMP provides a process for evaluating and assessing the effects of future project-related actions on cultural resources and historic properties. This plan requires consultation with the Alabama SHPO and interested tribes if impacts to cultural resources as a result of project activity are unavoidable. We note, however, that BLM should be included in the consultation. However, for current potential impacts, Alabama Power's application and HPMP primarily focus on impacts associated with reservoir operation. While a single report cited by Alabama Power implies that inundation of cultural sites under hydroelectric reservoirs is beneficial overall (Alabama Power, 2012a), this report is greater than 30 years old and more recent studies indicate that this conclusion may not be warranted in all cases.

Alabama Power is correct that inundation can protect cultural sites from vandalism and recreational use. However, in 1975, four federal agencies, including the National Park Service, Bureau of Reclamation, Corps, and Soil Conservation Service, completed an intensive 5-year study of the effects of freshwater reservoir inundation on cultural resources. The resulting two-volume National Reservoir Inundation Study was summarized in a 1989 Corps report (Ware, 1989). The National Reservoir Inundation Study found that archaeological sites can be adversely affected by inundation, particularly those that are located in shoreline fluctuation zones. The summary report

states that while some researchers claim that inundation is an effective option to preserve archaeological data, “the long-term mechanical and biochemical effects of deep water burial are poorly understood” and suggested that this idea is “untenable unless one can demonstrate the feasibility and practicality of future data withdrawals” (Ware, 1989:31). Additionally, our own independent review of hydroelectric project license applications has allowed us to examine numerous examples of the effects of reservoir operation and inundation on submerged archaeological sites, and we have found that inundation can result in a high degree of sorting, redistribution, and erosion of cultural materials. These disturbances can be adverse because they can affect the integrity of sites that may otherwise meet the criteria for inclusion in the National Register.

Each individual site within a project’s APE should be examined, evaluated for listing on the National Register, and evaluated for potential project effects in the particular context in which it is located; some sites may see little disturbance while others may be impacted. The HPMP would include a provision that requires Alabama Power to: (1) evaluate currently inundated sites within the APE for listing on the National Register *if and when they become exposed*, and any sites that may be inundated in the future; (2) assess the effects of inundation on all eligible resources in accordance with 36 C.F.R. section 800.5; and (3) implement appropriate treatment measures. These actions would ensure that cultural resources would be addressed in accordance with section 106.

Other potential project effects on cultural resources could occur from recreational use. The Martin Dam Project is a popular destination for shoreline landowners who reside adjacent to, or near, the project and for the public. As discussed in section 3.3.5, *Recreation Resources and Land Use*, Alabama Power (2010g) estimates 370,538 recreation user-days for the combined recreational use at Lake Martin and the tailwater area (from Martin dam to 0.25 mile downstream). We find that the potential effects of recreational use could be taken into account through a provision in a final HPMP, which would require Alabama Power to provide public interpretation of the historic and archeological properties at the project. However, any additional mitigation measures for unavoidable project-related recreational impacts would be developed in consultation with the Alabama SHPO, interested tribes, and BLM in accordance with a provision in a final HPMP.

The February 2012 draft HPMP states that the project powerhouse has been recommended as eligible for listing in the National Register. While the February 2012 draft HPMP addresses potential changes, repairs, and modifications to the exterior of the structure, three of the four generators date to the late 1920s and one generator dates to the early 1950s. The original three generators were upgraded between 2001 and 2004. Since this equipment no longer retains its original integrity, it does not contribute to the eligibility of the powerhouse. However, the fourth generator is more than 50 years old and may contribute to the eligibility of the powerhouse. The February 2012 draft HPMP also does not address the potential historic nature of the dam itself. The

project was constructed in 1926, and Martin dam was the first of four dams constructed on the Tallapoosa River. The final HPMP, however, would provide for identification and evaluation of historic properties, as well as determination of effects and identification of ways to avoid, minimize, or mitigate adverse effects. This provision would also entail implementation of appropriate treatment that would minimize or mitigate unavoidable adverse effects on historic properties.

Alabama Power has not identified proposals for major changes, repairs, or modifications to potentially historic project structures, and appendix B of the February 2012 draft HPMP provides a list of activities that Alabama Power believes should be exempt from section 106 review because these activities would have little or no potential effect on historic properties. Among general maintenance activities to the hydroelectric structures, these include changes, repair, or replacement of the four powerhouse generators. Should future changes to any project structures be proposed, including changes to any associated equipment that may contribute to a structure's National Register eligibility, Alabama Power would need to prepare a treatment plan for Commission and Alabama SHPO review prior to receiving approval for actions that may have adverse effects on National Register-eligible properties. Any major repairs or modification to National Register-eligible historic project structures conducted during the new license would be performed after consultation with the Alabama SHPO, and in accordance with the Secretary of the Interior's Standards for the Treatment of Historic Properties.

To meet the requirements of section 106, we issued a draft PA on February 29, 2012. The Alabama SHPO, the Choctaw Nation of Oklahoma, and the Alabama-Coushatta Tribe of Texas commented on the draft PA, and their comments were addressed in the final PA issued for signature on June 4, 2012. The Commission and the Alabama SHPO executed the final PA on June 12, 2012. Alabama Power, the Poarch Band of Creek Indians, and the Alabama-Coushatta Tribe of Texas concurred. Implementation of the PA would ensure that Alabama Power addresses all historic properties identified within the project's APE through the finalization of the draft HPMP after consultation with the Alabama SHPO, the interested tribes, and BLM.

### **3.4 NO-ACTION ALTERNATIVE**

Under the no-action alternative the project would continue to operate as it has in the past. None of Alabama Power's proposed measures or the resource agencies' recommendations and mandatory conditions would be required. Lake Martin would continue to support extensive recreational usage and an important lake fishery. The proposed changes to the reservoir rule curve, however, would not occur, and winter reservoir levels would continue at about a 10-foot drawdown from full pool. The shoreline littoral zone would continue to be dewatered during the winter months and aquatic habitat within the drawdown zone would not be protected. Enhancement of recreational use would not occur during the winter months, nor during the early fall as a

result of the conditional fall extension of summer reservoir levels to October 15, which would occur under the proposed action.

## 4.0 DEVELOPMENTAL ANALYSIS

In this section, we look at the Martin Dam Project's use of the Tallapoosa River for hydropower purposes to see what effect various environmental measures would have on the project's costs and power generation. Under the Commission's approach to evaluating the economics of hydropower projects, as articulated in *Mead Corp.*,<sup>65</sup> the Commission compares the current project cost to an estimate of the cost of obtaining the same amount of energy and capacity using a likely alternative source of power for the region (cost of alternative power) without consideration of future escalation of fuel prices in valuing the hydropower project's power benefits.

For each of our licensing alternatives, our analysis includes: (1) an estimate of the cost of individual measures considered for the protection, mitigation, and enhancement of environmental resources affected by the project; and (2) an estimate of the project power benefits for each of the licensing alternatives. To determine the net annual power benefit for each of the licensing alternatives, we compare project costs to the value of the power output as represented by the cost of a likely alternative source of power in the region. For any alternative, a positive net annual power benefit indicates that the project power costs less than the current cost of alternative generation resources and a negative net annual power benefit indicates that project power costs more than the current cost of alternative generation resources. This estimate helps to support an informed decision concerning what is in the public interest with respect to a proposed license. However, project economics is only one of many public interest factors the Commission considers in determining whether, and under what conditions, to issue a license.

### 4.1 POWER AND ECONOMIC BENEFITS OF THE PROJECT

Table 4-1 summarizes the economic assumptions and economic information we use in our analysis. Most of the information was provided by Alabama Power in its license application. We find that the values provided by Alabama Power are reasonable for the purposes of our analysis. Cost items common to all alternatives include taxes and insurance costs; net investment (the total investment in power plant facilities remaining to be depreciated); estimated future capital investment required to maintain

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<sup>65</sup> See *Mead Corporation, Publishing Paper Division*, 72 FERC ¶ 61,027 (July 13, 1995). In most cases, electricity from hydropower would displace some form of fossil-fueled generation, in which fuel cost is the largest component of the cost of electricity production.

and extend the life of plant equipment and facilities; relicensing costs; normal O&M cost; and Commission fees.

Table 4-1. Parameters for the economic analysis of the Martin Dam Project

<b>Assumption</b>	<b>Value</b>	<b>Source</b>
Period of economic analysis (years)	30	Staff
Current net investment (2015 dollars) <sup>a</sup>	\$15,345,734	Alabama Power
Current annual costs including O&M, and FERC fees (2015 dollars) <sup>b</sup>	\$3,085,000	Alabama Power
Relicense application costs (2015 dollars) <sup>c</sup>	\$9,407,016	Alabama Power
Term of financing (years)	20	Staff
Cost of capital (percent) <sup>d</sup>	12.72	Alabama Power
Discount rate (percent) <sup>e</sup>	8	Staff
Energy rate (\$/MWh) <sup>f</sup>	72.5	Alabama Power
Capacity rate(\$/kilowatt-year) <sup>f</sup>	145.5	Alabama Power

<sup>a</sup> The net investment value of the project as of December 31, 2010 (\$19,182,170), was provided by Alabama Power in its December 9, 2011, Additional Information Request response, Revised Exhibit D, section 2.2. This value has been adjusted by staff to 2015 dollars.

<sup>b</sup> Annual costs (\$2,850,030) were derived from Alabama Power's Additional Information Request response dated December 9, 2011, Question 2c. This value has been adjusted to 2015 dollars by staff.

<sup>c</sup> The cost to develop the license application (\$8,400,000) was provided by Alabama Power in its December 9, 2011, response to a Commission Additional Information Request response (revised Exhibit D, section 5). This cost has been adjusted to 2015 dollars by staff.

<sup>d</sup> The cost of capital was in Alabama Power's Additional Information Request response dated December 9, 2011, Question 2a.

<sup>e</sup> The discount rate was not provided in the license application, and was therefore approximated by staff.

<sup>f</sup> The energy rate and capacity rate were provided in Alabama Power's Additional Information Request response dated December 9, 2011, Question 3.

## 4.2 COMPARISON OF ALTERNATIVES

Table 4-2 compares the annual costs and annual power benefits for the three alternatives considered in this final EIS: no action, Alabama Power’s proposal, and the staff alternative.

### 4.2.1 No-action Alternative

Under the no-action alternative, the project would continue to operate as it does now. The project would have an installed capacity of 182,456 kilowatt (kW), and generate an average of 375,614 MWh of electricity annually valued at \$53,277,090, or about \$141.84/MWh. The average annual project cost would be \$8,167,703, or about \$21.74/MWh. Overall, the project would produce power at a cost that is \$45,109,387, or about \$120.10/MWh less than the cost of alternative power.

Table 4-2. Summary of annual costs and annual power benefits for the alternatives for the Martin Dam Project (Source: staff).

	No Action	Alabama Power’s Proposal	Staff Alternative <sup>b</sup>
Authorized installed capacity (kW)	182,456	182,456	182,456
Dependable capacity (kW)	179,000	179,000	179,000
Annual generation (MWh)	375,614	376,903	376,903
Annual power value <sup>a</sup> (\$/MWh)	\$53,277,090 141.84	\$53,459,922 141.84	\$53,459,922 141.84
Annual costs in 2015 dollars(\$/MWh)	\$8,167,703 21.74	\$8,437,963 22.39	\$8,442,773 22.40
Power benefit (i.e., power value minus costs) (\$/MWh)	\$45,109,387 120.10	\$45,021,959 119.45	\$45,017,149 119.44

<sup>a</sup> The power value includes the energy rate of \$72.50/MWh and the dependable capacity rate of \$145.50/kilowatt-year.

<sup>b</sup> The Staff Alternative includes operating the project as proposed by Alabama Power and some additional staff measures which have minor costs.

### 4.2.2 Alabama Power’s Proposal

Under Alabama Power’s proposal, the project would have total installed capacity of 182,456 kW, a dependable capacity of 179,000 kW, and an average annual generation of 376,903 valued at \$53,277,090, or about \$141.84/MWh. The average

annual project cost would be \$8,437,963, or about \$22.39/MWh. Overall, the project would produce power at a cost which is \$45,021,959, or about \$119.45/MWh, less than the cost of alternative power.

#### **4.2.3 Staff Alternative**

The staff alternative has the same capacity and energy attributes as Alabama Power's proposal. Table 4-3 shows the staff-recommended additions, deletions, and modifications to Alabama Power's proposed environmental protection and enhancement measures and the estimated cost of each. Based on a total installed capacity of 182,456 kW, a dependable capacity of 179,000 kW, and an average annual generation of 377,161 MWh valued at \$53,459,922, or about \$141.84/MWh. The average annual project cost would be \$8,442,773 or about \$22.40/MWh. Overall, the project would produce power at a cost which is \$45,017,149, or about \$119.44/MWh, less than the cost of alternative power.

### **4.3 COST OF ENVIRONMENTAL MEASURES**

Table 4-3 shows the costs for each of the environmental mitigation and enhancement measures considered in the analysis. We convert all costs to equal annual (levelized) values over a 30-year period of analysis to give a uniform basis for comparing the benefits of a measure to its cost.



Table 4-3. Cost of environmental mitigation and enhancement measures considered in assessing the environmental effects of continuing to operate the Martin Dam Project (Source: Alabama Power, 2011b, as modified by staff).

<b>Enhancement/Mitigation Measures</b>	<b>Entities</b>	<b>Capital Cost (2015\$)<sup>a,c</sup></b>	<b>Annual Cost (2015\$)<sup>a,c</sup></b>	<b>Levelized Annual Cost (2015\$)<sup>b,c</sup></b>
<b>Aquatic Resource Measures</b>				
1. Implement the proposed 3-foot increase in winter pool elevation.	Alabama Power, Staff	\$0	- (1,547 MWh gained generation)	
2. Implement the proposed conditional fall extension.	Alabama Power, Staff	\$0	\$11,200 (243 MWh of generation gained each year the fall pool level is extended))	\$11,200
3. Implement drawdowns to elevation 481 feet msl every 6 years.	Alabama Power, Staff	\$0	\$2,240	\$2,240
4. Implement a 4-foot increase in winter pool elevation.	Lake Martin RA	\$0	(2,116 MWh gained generation)	-\$153,410 <sup>d</sup>
5. Implement a 5-foot increase in winter pool elevation.	Lake Martin HOBO	\$0	- (2,684 MWh gained generation)	-\$194,590
6. Implement alternative operation of Lake Martin for downstream flood control. Summer lake level at 488 feet msl.	Downstream Landowners	\$0	(8,800 MWh lost generation), plus loss in dependable capacity	\$630,000

<b>Enhancement/Mitigation Measures</b>	<b>Entities</b>	<b>Capital Cost (2015\$)<sup>a,c</sup></b>	<b>Annual Cost (2015\$)<sup>a,c</sup></b>	<b>Levelized Annual Cost (2015\$)<sup>b,c</sup></b>
7. Implement alternative operation of Lake Martin for downstream flood control. Summer lake level 486 feet msl.	Downstream Landowners	\$0	(8,100 MWh lost generation), plus loss in dependable capacity	\$587,000
8. To manage project operations during drought, implement the Tallapoosa River portion of the ADROP	Alabama Power, Staff	\$0	\$0	\$0 <sup>e</sup>
9. Monitor water quality in the tailrace as per the conditions of the 401 WQC	Alabama Power, Staff	\$0	\$11,200	\$11,200 <sup>f</sup>
10. Develop plan and monitor water quality in Lake Martin as a result of 3-foot winter pool increase	Alabama Power, Staff	\$0	\$26,090	\$26,090
11. Implement a study to estimate the population and distribution of eels from Martin dam through the unimpounded reach of the Tallapoosa River downstream of Thurlow dam.	Alabama Power		\$7,840	\$7,840 <sup>c</sup>

<b>Enhancement/Mitigation Measures</b>	<b>Entities</b>	<b>Capital Cost (2015\$)<sup>a,c</sup></b>	<b>Annual Cost (2015\$)<sup>a,c</sup></b>	<b>Levelized Annual Cost (2015\$)<sup>b,c</sup></b>
12. Implement the Nuisance Aquatic Vegetation and Vector Control Management Program and prepare a plan to monitor increases in aquatic vegetation resulting from the proposed 3-foot increase in the winter pool elevation.	Alabama Power, Staff	\$0	\$11,570	\$11,570
13. Staff recommendation for eel study (no study recommended)	Staff	\$0	\$0	\$0
14. Revise and implement the Nuisance Aquatic Vegetation and Vector Control Management Program, in consultation with FWS and Alabama DCNR, to include information on Alabama Power's protocol for conducting lake-wide surveys and monitoring nuisance aquatic vegetation, such as the such as the frequency, timing, and locations of surveys and monitoring events and the implementation schedules.	Staff	\$5,600	\$0	\$784

**Terrestrial Resource Measures**

15. Implement the Wildlife Management Program (WMP)	Alabama Power, Staff	\$50,390	\$23,070	\$30,118
16. Within the Core Management Area of the WMP, manage toward a desired forest condition consistent with the good quality foraging habitat for the federally listed endangered red-cockaded woodpecker.	Interior, Staff	\$0	\$0	\$0 <sup>h</sup>
17. Continue Alabama Power’s support of aquatic restoration within the Mobile Basin and work with Interior and Alabama DCNR to identify suitable habitats (primarily tributaries) for species reintroduction within the project boundaries.	Interior	\$0	\$0	\$0 <sup>h</sup>

**Recreation Resource Measures**

18. Implement the Recreation Plan.	Alabama Power, Staff	\$879,110	\$2,830	\$125,799
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19. Develop and implement a revised Recreation Plan to (a) describe the amenities at the 19 project recreation sites, including a map or maps of the project recreation sites in relation to the project boundary, (b) include an implementation schedule, and (c) include a provision for periodic updates of the plan.	Staff	\$16,800	\$8,960	\$11,300 <sup>i</sup>
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**Land Use Measures**

20. Implement the SMP.	Alabama Power, Staff	\$83,990	\$5,530	\$17,278
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21. Develop and implement a revised SMP to include (a) a discussion of the project boundary modifications; (b) a discussion of the Dredging Permit Program; (c) a discussion of the Shoreline Permitting Program; (d) a provision to limit construction of new seawalls; (e) a provision to address unpermitted structures at the project; and (f) Geographic Information System (GIS) data regarding the Lake Martin area.	Staff	\$28,000	\$0	\$3,917 <sup>j</sup>
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22. Educate local landowners on the value of natural shorelines; prohibit construction of a new seawall unless it is absolutely necessary to protect land and property.	Interior, Staff	\$0	\$0	\$0 <sup>h</sup>
23. Encourage shoreline developments to maintain 30-foot wide control strip within the project boundary and also increase the total buffer width to at least 100 feet.	Interior	\$0	\$0	0 <sup>h</sup>
24. Develop and implement a final Public Education and Outreach Plan.	Alabama Power, Staff	\$0	\$1,900	\$1,900

**Cultural Resource Measures**

25. Develop and implement a final HPMP to include the requirements specified in the PA executed on June 12, 2012.	Alabama Power, Staff	\$61,590 <sup>k</sup>	\$13,050	\$21,665
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**Fisheries**

<b>26. Funding for fisheries enhancements</b>	Alabama Power	\$0	\$3,360	\$3,360
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<sup>a</sup> Annual costs typically include operational and maintenance costs and any other costs which occur on a yearly basis.

<sup>b</sup> All capital and annual costs are converted to equal annual costs over a 30-year period to give a uniform basis for comparing costs.

<sup>c</sup> Original 2010 costs provided by Alabama Power in its December 2011 Additional Information Request response (revised exhibit D) have been adjusted to 2015 dollars.

- <sup>d</sup> We interpolated the cost based on the cost of the 3-foot pool increase and the 5-foot increase.
- <sup>e</sup> We have not estimated a cost to implement this plan, because it would involve an unknown number of future meetings and consultations among Alabama Power, the Corps, and other state and federal agencies.
- <sup>f</sup> Alabama Power estimated the cost of monitoring water quality in Lake Martin at \$23,300/year and the project tailrace at \$10,000/year for a combined cost of \$33,300/year. Staff adjusted these costs to 2015 dollars.
- <sup>g</sup> Cost estimated by staff.
- <sup>h</sup> We anticipate that no additional cost would be incurred to implement the measure.
- <sup>i</sup> We added \$16,800 to the proposed capital cost to finalize the plan and \$60,000 per year in years 8, 14, 20, and 26 (\$8,960 annual equivalent) for recreation monitoring.
- <sup>j</sup> We added \$28,000 to the proposed capital cost to finalize the SMP and consult with agencies.
- <sup>k</sup> We added \$5,000 cost to finalize the plan and \$50,000 cost to implement the measures recommended by staff, which combined adds \$61,590 (2015) capital costs to Alabama Power's proposed measure.





## 5.0 CONCLUSIONS AND RECOMMENDATIONS

### 5.1 COMPARISON OF ALTERNATIVES

In this section we compare the development and non-developmental effects of Alabama Power’s proposal, Alabama Power’s proposal as modified by staff, and the no-action alternative.

We estimate the annual generation of the project under the three alternatives identified above. Our analysis shows that the annual generation would be 375,614 MWh for the no-action alternative and 376,903 MWh<sup>66</sup> for the staff alternative.

We summarize the environmental effects of the different alternatives in table 5-1.

Table 5-1. Comparison of alternatives for the Martin Dam Hydroelectric Project (Source: staff).

<b>Resource</b>	<b>No-action Alternative</b>	<b>Proposed Action</b>	<b>Staff–Recommended Alternative</b>
Generation	375,614 MWh	376,903 MWh	376,903 MWh
Water Resources	No measures required for drought management	Drought management regionally coordinated through implementing Tallapoosa River portion of ADROP	Same as Proposed Action
Aquatic Resources	Maintain existing release of low DO water to tailrace during some periods of generation	DO improvement in tailrace during generation  Some improvement in conditions for paddlefish spawning from more flow in	Same as proposed action except no eel data from below Thurlow Dam.

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<sup>66</sup> This generation estimate is based on an annual 1,547 MWh gain in generation by implementing the three-foot increase in the winter pool, a 1,547 MWh loss in generation every 6th year when the winter drawdown is to 481 feet, and a negligible increase due to the conditional fall extension.

<b>Resource</b>	<b>No-action Alternative</b>	<b>Proposed Action</b>	<b>Staff–Recommended Alternative</b>
		<p>spawning season</p> <p>Information collected on eel occurrence and abundance in Tallapoosa River below Thurlow Dam</p>	
Terrestrial Resources	No changes to shoreline vegetation or wetlands	<p>Protection of water quality and wildlife habitat through maintenance of a control strip around the reservoir</p> <p>Habitat enhancement for longleaf pine-dependent species, including the endangered red-cockaded woodpecker</p>	Same as proposed action
Recreation Resources	Operate and maintain 12 existing project recreation sites	<p>Continue to operate and maintain 12 existing project recreation sites. Six additional sites are made project recreation sites and one site is reserved for future recreation</p> <p>Higher winter pool level and conditional fall extension could increase recreational opportunities at Lake Martin</p> <p>Expansion of the parking areas at</p>	Same as proposed action with details on nature and schedule of improvements provided in revised Recreation Plan

<b>Resource</b>	<b>No-action Alternative</b>	<b>Proposed Action</b>	<b>Staff–Recommended Alternative</b>
		Smith Landing and Madwind Creek Ramp, as needed, would cause short-term increases in soil erosion	
		Construction of two bank fishing sites and a gravel parking area at Jaybird Landing would improve access but cause short-term increases in soil erosion	
		Evaluation of additional bank/pier fishing opportunities within the Martin Dam Project boundary	
Shoreline Management	Existing shoreline permitting program, including public access and protection of environmental and cultural resources would continue	Same as No-Action Alternative except that the existing project boundary modified to encompass project recreation sites, add 991.4 acres, and reclassify land use on 1,294.4 acres to be consistent with existing land use or other project purposes	Same as proposed action except that 373.1 acres of land classified Natural/Undeveloped would remain within the project boundary and continue to be used for project purposes. Include Geographic Information System (GIS) data regarding the Lake Martin area that would facilitate Commission administration of license
		Removal of 373.1 acres of land from the project boundary that are classified Natural/Undeveloped	

<b>Resource</b>	<b>No-action Alternative</b>	<b>Proposed Action</b>	<b>Staff–Recommended Alternative</b>
Cultural Resources	Eligible sites protected under the current license	Development of a HPMP in accordance with the PA would avoid, minimize, and mitigate adverse effects on historic properties	Same as proposed action

## **5.2 COMPREHENSIVE DEVELOPMENT AND RECOMMENDED ALTERNATIVE**

Sections 4(e) and 10(a)(1) of the FPA require the Commission to give equal consideration to the power development purposes and to the purposes of energy conservation; the protection, mitigation of damage to, and enhancement of fish and wildlife; the protection of recreational opportunities; and the preservation of other aspects of environmental quality. Any license issued shall be such as in the Commission’s judgment will be best adapted to a comprehensive plan for improving or developing a waterway or waterways for all our recommendations for relicensing the Martin Dam Project. We weigh the costs and benefits of our recommended alternative against other proposed measures.

Based on our independent review of agency and public comments filed on this project and our review of the environmental and economic effects of the proposed project and its alternatives, we select all of Alabama Power’s proposed operation and environmental measures but one, with some staff-recommended modifications, as the preferred alternative. We recommend this alternative because: (1) issuing a new license for the project would allow Alabama Power to continue to operate its project and provide a beneficial and dependable source of electrical energy; (2) the 182.5 MW of electric capacity comes from a renewable resource that does not contribute to atmospheric pollution; (3) the staff alternative would not likely increase flooding on residential and commercial structures and public roads downstream of Martin dam; (4) the staff alternative includes defined measures that can be predicted to provide benefits; and (5) the recommended measures would protect fish and wildlife resources, improve recreational opportunities, and protect cultural resources at the project.

In the following section, we make recommendations as to which environmental measures proposed by Alabama Power or recommended by agencies or other entities should be included in any license issued for the project. In addition to Alabama Power’s proposed environmental measures, we recommend additional staff-recommended environmental measures to be included in any license issued for the project, and we describe these requirements in the draft license articles in appendix A.

### **5.2.1 Measures Proposed by Alabama Power**

Based on our environmental analysis of Alabama Power's proposal in section 3, and the costs presented in section 4, we conclude that the following environmental measures proposed by Alabama Power would protect and enhance environmental resources and would be worth the cost. Therefore, we recommend including these measures in any license issued for the project.

#### **Aquatic Resources**

- Implement the requirements of the 401 WQC, which requires maintaining DO concentrations consistent with the state standard when the project is generating, and monitoring water temperature and DO in the tailrace.
- Develop a plan to monitor water quality in Lake Martin.
- Modify the flood curve by implementing a 3-foot increase in the winter pool (to elevation 484 feet), and change the operating curve and drought curve proportionally during the same time frame.
- Modify the flood control curve during the fall months by extending the curve to elevation 491 feet from September 1 through October 15, provided that certain hydrological and operational conditions are met.
- Lower the reservoir elevation to at least 481 feet every 6 years to facilitate seawall and boat dock construction, and maintenance and other activities benefiting from lower lake levels.
- Implement the Tallapoosa River portion of ADROP for managing project operations during drought.

#### **Terrestrial Resources**

- Implement a WMP for project lands.
- Implement the Nuisance Aquatic Vegetation and Vector Control Management Program.

#### **Recreation Resources**

- Develop and implement a Public Education and Outreach Plan.

#### **Land Use**

- Modify the project boundary to add 991.4 acres to, and remove 499.2 acres from, the project boundary, resulting in an increase of 492.2 acres of land; reclassify

land use on 1,294.4 acres within the project boundary to be consistent with existing land use or other project purposes.

### **Cultural Resources**

- Develop and implement a HPMP as part of implementing a PA, executed on June 12, 2012.

#### **5.2.2 Measures Recommended by Staff**

We recommend the measures described above, with the following additional staff measures or modifications: (1) revise the Nuisance Aquatic Vegetation and Vector Control Management Program to include more specific information on Alabama Power's protocol for conducting lake-wide surveys and controlling nuisance aquatic vegetation; (2) revise the Recreation Plan to require (a) a description of only the 19 project recreation sites, including a map or maps that identify the project recreation sites located within the modified project boundary, and (b) a provision to file a Recreation Monitoring Report concurrent with the filing of the FERC Form 80 that discusses recreational use and demand, associated project-related resource effects, and any additional measures or modifications to the project recreation sites that may be needed and a schedule for implementing such changes; and (3) revise the SMP to reflect the project boundary modifications. Below, we discuss our recommended measures for project operation, and our additional staff-recommended measures. We do not recommend Alabama Power's proposed implementation of an eel study in collaboration with FWS or the removal of 373.1 acres from the project boundary.

#### **Increase in Lake Martin Winter Pool**

To enhance recreation, Alabama Power proposes to modify the flood curve by implementing a 3-foot increase in the winter pool (from elevation 481 feet to elevation 484 feet). Lake Martin RA recommends a 4-foot increase in the winter lake level. Lake Martin HOB0 recommends a 5-foot increase in the winter lake level.

Higher winter lake levels could enhance recreation resources and associated economic activity in the project area by extending the season in which access for boats is available. These conditions could also provide some assurance that the reservoir would refill the following spring. Higher winter lake levels could also result in a modest improvement to spring spawning conditions for paddlefish in the Tallapoosa River below Thurlow Dam because the higher volume water stored through the winter would not have to be captured during the spring. Thus, more water would flow downstream and be available for spring paddlefish spawning.

While an increase in winter lake level may enhance reservoir recreation and paddlefish spawning conditions and reduce vulnerability to summer drought, it also would reduce flood storage within the reservoir and could potentially cause an increase in flood levels downstream of the project and, to a lesser degree, upstream of the

project. As described in section 3.3.2.2, *Effects of Increased Winter Pool Elevation on Upstream and Downstream Flooding*, Alabama Power's initial studies filed with the license application concluded that an increase in flooding would be modest, but could affect an additional 13 residential structures, 10 commercial structures, and public roads.<sup>67</sup> Alabama Power's initial studies examined potential effects on the 100-year flood event without consideration of intervening downstream flows. These studies suggested that a 3-foot increase in the winter pool level could increase the 100-year flood elevation in the Tallapoosa River below Martin dam from 0.75 to 2.3 feet, with the greater increases in the upper section of the river. This increase in the 100-year flood level<sup>68</sup> could increase the flood area by about 10 percent under the Alabama Power proposal, by about 12 percent under the Lake Martin RA-proposed 4-foot increase in the winter pool, and by about 16 percent under the Lake Martin HOBOPROPOSED 5-foot increase.

Based on these considerations, we concluded in the draft EIS that the benefits of increasing the winter pool elevation by 3, 4, or 5 feet did not justify the potential increase in risk of flooding to residential and commercial structures as well as public roads downstream. Therefore, the staff alternative in the draft EIS did not include the recommendations from Alabama Power, Lake Martin RA, or Lake Martin HOBOPROPOSED for increased winter pool elevations.

Subsequently, Alabama Power conducted additional modelling to refine the assessment of downstream effects of the proposed 3-foot increase in the winter pool, and to evaluate whether the proposed changes could affect dam safety up to the probable maximum flood (PMF). Alabama Power's additional modeling evaluated the effect of operations on peak flood stages at the Montgomery Water Works Gage (located about 70 miles downstream of Martin Dam) for nine historical, high flow events. The modeling showed that only two of the nine events would have resulted in higher peak releases from the dam with a winter pool at 484 feet msl and both of those increases were contained in the river channel banks. Alabama Power's additional analysis also showed no effects on the safety of Martin dam for floods up to the PMF.

A higher winter pool level would improve boating access on Lake Martin during the winter months, help ensure that full pool is reached by May each year, and provide

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<sup>67</sup> The flood model was validated to flood stage, but not flood volume. While stage is the more important variable, the uncertainty in the modeling requires us to assume that if there was error in the estimation, the actual effects would have been more severe.

<sup>68</sup> These increases are based on a 100-year storm event occurring during a period when the reservoir would be at the proposed or recommended higher winter pool elevation as compared to the existing winter pool level of elevation 481 feet.

some additional economic benefit to the area from a longer recreation season. Currently, seven project boat ramps are usable at a winter pool elevation of 481 feet. An increase in winter pool elevation by 3 feet, as proposed by Alabama Power, would make an additional six boat ramps usable during the winter.

Higher lake levels also would improve shoreline landowner's access to their private boat docks. Survey results (Alabama Power, 2010g; 2011b) indicate that at an elevation of 481 feet, 92 percent of survey respondents found it impractical to moor their boat at their dock. At the proposed 3-foot higher winter pool elevation of 484 feet, the percentage of survey respondents unable to moor their boats would drop to 71 percent. If Lake Martin was raised 4 feet in the winter to elevation 485 feet, as previously recommended by Lake Martin RA, the percentage of survey respondents would drop to 56 percent. If the lake was raised 5 feet higher in the winter to elevation 486 feet, as previously recommended by Lake Martin HOB0, only 24 percent of survey respondents would find it impractical to moor their boat at their dock. While lower lake levels may strand privately owned boat docks around Lake Martin, there are several boat ramps available to the public that provide access to the lake under current conditions.

Staff also finds that a higher winter pool level would likely increase spring spill events at Martin dam and downstream water levels below Thurlow dam, which would enhance spawning conditions for paddlefish. At the winter lake level of 481 feet, there was an average of 19 days of the March and April spawning season per year above 6,000 cfs, the flow that provides the necessary depth for paddlefish spawning, from 2002 through 2007. The number of days above 6,000 cfs during those months would increase during the spawning season by about five days (from 19 to 24) at a winter lake level of 484. At the level of 485 feet proposed previously by Lake Martin RA, the number of days above 6,000 cfs would double (from 19 to 38). At the level of 486 feet proposed previously by Lake Martin HOB0, the number of days above 6,000 cfs would increase by 53 (from 19 to 72). With an increasing number of days, the possibility of 10 consecutive days of sustained flow over 6,000 cfs, considered good for paddlefish spawning, would increase. Indications are that paddlefish spawning is occurring under existing conditions.

Alabama Power's proposed 3-foot increase in the winter pool would result in an annual 1,547 MWh net gain in energy generation valued at \$219,426. Slightly higher energy gains would occur with Lake Martin RA's previously recommended 4-foot increase (2,116 MWh) and Lake Martin HOB0's previously recommended 5-foot increase (2,684 MWh). Because holding the winter pool 3 feet higher is not likely to increase flooding, may improve paddlefish spawning conditions, and could enhance recreation use, we recommend that the winter flood pool level be increased to 484 feet. We do not recommend holding the winter pool any higher because of additional associated flood risk indicated in Alabama Power's initial flood analysis and mostly incremental improvement in the benefits associated with the 5-foot option versus the 3-foot option.



### Conditional Fall Extension

Alabama Power typically holds the reservoir within about 0.5 feet of full pool (i.e., 490.5 feet) during the summer for recreation and flood control purposes. To further enhance recreation, Alabama Power proposes to extend the period that the flood rule curve (i.e., full pool) would be maintained at elevation 491 feet for an additional 1.5 months (September 1 through October 15), but only in the years that each of the following four operational conditions are met:

1. Lake Martin is above its operating curve during September (487 to 488.5 feet);
2. the rolling 7-day average total basin inflow<sup>69</sup> on the Tallapoosa River, calculated at Thurlow dam, is at or higher than the median flow;<sup>70</sup>
3. the rolling 7-day average total basin inflow on the Coosa River, calculated at Jordan dam, is at or higher than the median flow; and
4. the elevations at the Weiss, H. Neely Henry, and Logan Martin developments on the Coosa River and the Harris Project on the Tallapoosa River must all be within 1 foot of their respective operating guide curves.

Alabama Power would determine if the four operational conditions are being met by examining hydraulic and operational conditions daily during the month of September. Alabama Power would abide by all downstream minimum flow and other operational commitments. Thus the measure would be implemented only in years when there are adequate flows and reservoir elevations to meet such needs. Normal fall drawdown would occur at any time that the operating conditions are not being met.

Based on historic hydrologic and operating conditions, the fall extension would occur infrequently, likely less than 1 in 3 years. Further, recreation use decreases significantly after Labor Day. Given that the public boat ramps are still useable until at least November 1 under current operations, the public will continue to have access to Lake Martin to until at least November. Consequently, there would be a small public recreational benefit from implementing the fall extension.

Comments on the draft EIS make it clear that the public recognize that all of the conditions are likely to align infrequently, but that they support the fall extension anyway because of the benefits higher lake levels may at least occasionally provide.

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<sup>69</sup> The 7-day rolling average of total basin inflow is the average of the total daily basin inflow for the previous 7 days recalculated on a daily basis for a given period of time.

<sup>70</sup> The “median flow” in this instance is the median of the recorded daily flows over the period of record for the particular day of interest.

These benefits include a potentially longer recreation season with higher lake levels and longer periods for shoreline owners having full access to their docks.

The fall extension is not likely to have significant impacts on downstream flow needs because the measure only would be implemented during above average flow years when adequate flows are available throughout the Tallapoosa and Coosa River Basins. The measure would slightly increase project generation by 243 MWh each year the extension is actually implemented. Over a 30-year period, staff concludes the gain in generation would be negligible. The cost for determining whether to initiate the fall extension each year of the conditional fall extension would be about \$11,200 per year. Even though the recreating public could not rely on the higher lake levels every year, the minor recreational benefit and absence of any adverse effect on aquatic resources justifies implementing the measure.

Lake Martin RA recommends that the Lake Harris criterion be modified to be within 2 feet of its guide curve rather than one foot as proposed by Alabama Power. The 2-foot criterion at Lake Harris, however, could trigger the conditional fall extension in times of drought stress, which could exacerbate environmental stressors, complicate the management of flows for navigation and other purposes in the Alabama River basin during low flow conditions, and potentially conflict with the implementation of the ADROP. Therefore we recommend that the conditional fall extension be established using the 1-foot criterion at Lake Harris.

### **Operation for Flood Control**

Alabama Power proposes to continue operating for flood control as described in section 2.1.3, *Existing Project Operation*, with the changes noted in **bold** below:

- 1) When the reservoir is above the flood curve and between elevations **484** and 486 feet, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam that is at least the hydraulic capacity of the turbines at Yates dam (about 12,400 cfs).
- 2) When the reservoir is above the flood curve and between elevations 486 and 489 feet:
  - a. With **increasing** inflows, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam that is at least the hydraulic capacity of the turbines at **Thurlow dam (about 13,200 cfs)**.
  - b. With **decreasing** inflows, turbines at Martin dam would be operated to provide for an outflow from Thurlow dam that is at least the hydraulic capacity of the turbines at **Yates dam (about 12,400 cfs)**.
- 3) When the reservoir is above the flood curve and above elevation 489 feet msl, the turbines at Martin dam would be operated as in (2) a above, and further if required to avoid rising above elevation 491 feet, turbines would be operated to provide an outflow from Lake Martin at least equivalent to all turbine units

operating at full gate (17,900 cfs), and spillway gates would be raised. An exception to this would be that the reservoir may continue to rise after all gates are raised and inflow exceeds the gate capacity, **which would be beyond the control of Alabama Power.** At elevation 491 feet, the spillway would have an outflow capacity of approximately 133,000 cfs.

- 4) **During periods when inflow exceeds the total capacity of the hydraulic turbines, the 3-hour average outflow rate from the reservoir would not exceed the concurrent 3-hour average inflow rate except to evacuate accumulated surcharge storage subsequent to the predicted time of peak inflow. This would ensure that the outflow from the reservoir is lower than the inflow.**
- 5) **Alabama Power would continue its current practice to notify the National Weather Service (NWS) when spillway gate operation is used in flood control operations and would continue to share data with the NWS' Southeast River Forecast Center (SERFC) and the Corps.**

Appendix A, article 404, identifies the staff-recommended license article for flood control operations. We recommend that any license issued for the Martin Dam Project include an article for flood control consistent with Alabama Power's proposed four changes listed above, with the two following exceptions proposed for the reasons discussed below:

- 1) Item No. 3 adds the text, "which would be beyond the control of Alabama Power." This proposed change does not define an operational measure to be implemented for flood control and thus it is not necessary. Therefore, to maintain clarity, we are not recommending this change.
- 2) Item No. 5 reduces coordination with the Corps when compared to the current Exhibit H conditions. Specifically, the current Exhibit H states,

"During flood periods, communications will be maintained with the Weather Bureau's River Forecast Center, Atlanta, Georgia, and the Corps of Engineers, and if greater flood control benefits can be attained through increased coordination of operations at the Tallapoosa and Coosa river dams, and increased coordination with the Corps of Engineers' downstream Alabama River dams than would be attained through use of the above flood control procedures, then these procedures will be modified as mutually agreed to verbally by the Corps of Engineers and Alabama Power Company."

Alabama Power provides no justification for the modification of the Exhibit H language, which could effectively reduce the level of coordination with the Corps. Therefore, to maintain the current level of coordination, we are not recommending this change.

## **Drought Management Plan Review**

As discussed in section 3.3.2, *Aquatic Resources*, in wet and normal years, inflows to the project generally are adequate to maintain normal reservoir levels and meet existing downstream flow needs, including maintaining downstream water quality, aquatic habitat, water supply, power generation, navigation, and recreation. However, during extreme drought years, as experienced in 2007 and to a lesser extent in other recent years, inflows to the project have been inadequate to maintain downstream flow needs, and at times, normal reservoir levels.

In comments on the draft EIS Alabama Power proposes to implement the Tallapoosa River portion of the Alabama-ACT Drought Operations Proposal (ADROP). Alabama Power included, in Attachment B of its August 13, 2013 comment letter, a copy of ADROP, Version 3.3.3, dated July 12, 2013. The FWS recommends implementing the Tallapoosa River portion of ADROP.

ADROP includes provisions to manage all Alabama Power's reservoirs within the Alabama, Coosa, and Tallapoosa River Basins during drought conditions. ADROP requires monitoring rainfall and stream flow within the ACT River Basin. When drought indicators reach specified levels, operations responses are triggered, resulting in pre-determined incremental reductions or increases in flow released from reservoirs in the Coosa, Tallapoosa, and Alabama River basins

The Corps is currently updating its reservoir regulation manuals to provide a comprehensive management plan for the Coosa, Tallapoosa, and Alabama River basins that would include drought management. On October 31, 2014, the Corps issued the Final Environmental Impact Statement for Updates to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin. The Corps also issued a draft Master Water Control Manual for the Alabama-Coosa-Tallapoosa River basin (draft ACT Water Control Manual). The Corp's final EIS and draft ACT Water Control Manual include implementing ADROP, which has flow criteria and operational responses for the Coosa, Tallapoosa, and Alabama Rivers.

The license for the Coosa Project requires Alabama Power implement the Coosa River portion of ADROP. ADROP covers three river basins. Implementing the Tallapoosa portion of ADROP would provide long-term benefits to water supply, fish and wildlife resources, and power generation by coordinating management of flows in the Coosa and Tallapoosa Basins during drought years. Since the Corps final ACT Water Control Manual has not yet been issued we recommend a provision requiring Alabama Power to review the Corps' regulation manuals, once finalized, for consistency with the Tallapoosa River portions of ADROP, and file a report of its findings along with any recommendations for modifications to the aforementioned portions of ADROP to be consistent with the finalized manuals.

## **Nuisance Aquatic Vegetation and Vector Control Management Program**

As part of its current Nuisance Aquatic Vegetation and Vector Control Management Program, Alabama Power performs lake-wide surveys to identify areas of aquatic plant infestation at least once per year. Throughout the year Alabama Power also reviews, on a case-by-case basis, requests to treat nuisance aquatic vegetation made by the public, state and federal agencies, and Alabama Power employees. Alabama Power treats nuisance aquatic vegetation that: (1) may provide mosquito breeding habitat; (2) could pose a threat to power generation facilities or water withdrawal structures; and (3) could restrict recreational use of the reservoir, and/or (4) pose a threat to the ecological balance of the reservoir.

Alabama Power proposes to continue implementing its Nuisance Aquatic Vegetation and Vector Control Management Program, which includes a plan to monitor aquatic vegetation for the purpose of reducing potential effects of increased nuisance aquatic vegetation on the ecological balance of the reservoir. The annual cost for implementing this plan is \$11,570. As discussed in section 3.3.3, *Terrestrial Resources*, neither the current Nuisance Aquatic Vegetation and Vector Control Management Program, nor Alabama Power's proposed revision, describe the survey and monitoring methods. These details should be developed and filed for Commission approval to ensure its effective implementation and the Commission's administration of any such license requirement. We estimate the additional cost of preparing the survey plan would be \$5,600, or about \$783/year. We find that the benefits of this measure would justify this cost and recommend the development of the enhanced program.

## **Recreation Plan**

Alabama Power proposes to implement its Recreation Plan filed on December 9, 2011. The plan includes the following: (1) a description of the recreation sites owned and operated by Alabama Power and other entities at the project; (2) continued O&M of 18 existing recreation sites, 12 of which are currently recognized project facilities and six that would become project facilities under the new license; (3) improvements to the existing boat ramp and construction of two bank fishing sites and a parking area at the Jaybird Landing; (4) expansion of the parking areas, as needed, at Smith Landing and Madwind Creek Ramp; (5) an evaluation for developing bank/pier fishing areas within the Martin Dam Project boundary; (6) a provision to update project recreation signage as specified in section 8.2 of the Commission's regulations; and (7) reservation of one site, the 36.4-acre Ponder Camp (Stillwaters Area Boat Ramp), for future recreation development as demand increases (for a total of 19 recreation sites). The plan also includes a provision for an annual meeting with Alabama DCNR and filing an annual addendum to the Recreation Plan to provide the means to inform stakeholders and the Commission about the schedule for implementing the Recreation Plan.

However, Alabama Power's proposed Recreation Plan describes non-project facilities (i.e., facilities that it would not operate and maintain), does not reflect all amenities at the existing project facilities, and includes extraneous material (e.g., pre-filing study plans). Accordingly, we recommend that a revised Recreation Plan be developed that includes Alabama Power's proposed measures and the following additional components: (1) a description of the amenities at only the project recreation sites, including a map or maps of the project recreation sites in relation to the project boundary; a provision to file a Recreation Monitoring Report concurrent with the filing of the FERC Form 80 that discusses recreational use and demand, associated project-related resource effects, and any additional measures or modifications to the project recreation sites that may be needed and a schedule for implementing such changes. These modifications would improve Commission oversight of the license requirements and ensure that future recreation needs are met at the project.

In section 4, *Developmental Analysis*, we estimate that the levelized annual cost for implementing Alabama Power's proposed recreation plan would be \$125,799. Revising the plan as described above would increase the annual cost by \$11,310. We find the benefits of this measure would justify the cost and therefore, would be in the public interest.

### **Public Education and Outreach Plan**

Alabama Power proposes to develop and implement a Public Education and Outreach Plan that provides: (1) a description of current public education efforts, such as, the *Shorelines* newsletter, and an updated website; (2) a brochure about BMPs that would be published in the *Shorelines* newsletter and submitted for publication in *Lake Magazine*; (3) the results of a striped bass hooking mortality study that would be published in the *Shorelines* newsletter and submitted for publication in *Lake Magazine*; (4) periodic articles about nuisance aquatic vegetation in the *Shorelines* newsletter and/or *Lake Magazine*; (5) an "Adopt an Island" program on project lands to address litter and the effects of domestic livestock on native terrestrial resources; (6) a brochure about the Longleaf Pine Legacy Program; and (7) periodic updates to the plan.

Development and implementation of a Public Education and Outreach Plan would document the means by which shoreline landowners and the public will be informed of Alabama Power's various initiatives, as identified above. Therefore, we recommend that Alabama Power develop and implement a Public Education and Outreach Plan, which we estimate would have a levelized annual cost of \$1,900. We find the benefits of this measure would justify the cost and therefore, would be in the public interest.

### **Shoreline Management Plan**

Alabama Power proposes to implement its final SMP to protect environmental resources along the project shoreline, and enhance public access to the project's lands and waters. As part of the SMP, the Shoreline Permitting Program addresses specific

uses and occupancy of the Lake Martin shoreline not tied to project purposes. This program takes into account the ability of Alabama Power to grant permission, without prior Commission approval, for the use and occupancy of project lands for such minor activities as landscape plantings.

Under the SMP, Alabama Power would encourage shoreline landowners to use native vegetation and bioengineering techniques and, where those techniques are not practical, riprap and gabions for shoreline stabilization along the Lake Martin shoreline, which would control or minimize soil erosion and protect aquatic and wildlife habitat.

Interior recommends that Alabama Power implement a final SMP with a provision to limit construction of seawalls to only instances where necessary to protect land and property. Interior also recommends that Alabama Power encourage shoreline developments to maintain the 30-foot-wide Control Strip within the project boundary. We recommend that the SMP contain a provision to limit construction of new seawalls because the use of alternative bank stabilization techniques would provide greater benefits to aquatic resources than the use of a seawall. As discussed in section 3.3.5, *Recreation Resources and Land Use*, Alabama Power's revised land use classification includes a provision for a 30-foot Control Strip that prohibits certain activities (e.g., habitable structures) to protect the environmental resources. We find that this classification comports with Interior's recommendation.

However, the existing Shoreline Classification maps do not take into account certain project boundary modifications proposed by Alabama Power, including changes to the land use classification system. Therefore, we recommend that the SMP be revised to include updated Shoreline Classification maps. Also, the SMP should include Geographic Information System (GIS) data regarding the Lake Martin area to allow the Commission to track shoreline resources and uses, and facilitate future reviews of the SMP.

In its filing of March 14, 2012, and as discussed in section 3.3.5, *Recreation and Land Use*, Alabama Power found several unpermitted structures (e.g., a recreational vehicle) on all of its project's lands, including the Martin Dam Project lands. In a letter dated August 17, 2012, the Commission required Alabama Power to address the unpermitted structures and file annual status reports on activities under its Shoreline Compliance Program for each of its project reservoirs, including the Martin Dam Project. Thus, to protect project lands and waters the revised SMP should identify any unpermitted structures at the project and how Alabama Power intends to resolve any such structures.

In section 4, *Developmental Analysis*, we estimate that the levelized annual cost for implementing Alabama Power's proposed SMP would be \$17,278. Revising the plan as described above would increase the annual cost by \$3,917. We find the benefits of this measure would justify the cost and therefore, would be in the public interest.

In comments on the draft EIS, Interior recommends that Alabama Power develop a restoration plan as part of the SMP to minimize habitat fragmentation and restore habitat and species (particularly aquatic species). We discuss Interior's recommendation in section 5.4, *Fish and Wildlife Agency Recommendations*.

### **Project Boundary Modifications**

Alabama Power proposes to remove 499.2 acres from the project boundary that consist of Lake View Park (classified Quasi-public), Pleasure Point Park and Marina (classified Commercial), and land classified as Natural/Undeveloped or Potential Residential. As previously discussed in section 3.3.5, *Recreation Resources and Land Use*, the affected acreage associated with Lake View Park and Pleasure Point Park are not needed for project purposes and could be removed from the project boundary.

However, 373.1 acres of the 499.2 acres of land to be removed are designated as Natural/Undeveloped. According to Alabama Power's Shoreline Management Plan, lands classified as Natural/Undeveloped are intended to buffer public recreation areas, prevent overcrowding of partially developed shoreline areas, protect environmentally sensitive areas, and maintain aesthetic qualities. The 373.1 acres are dispersed around Lake Martin such that they continue to provide these benefits. Because Alabama Power has not demonstrated why these lands are not necessary for these project purposes, we recommend that these lands remain within the project boundary.

Alabama Power proposes to re-classify 1,294.4 acres within the project boundary either as Natural/Undeveloped or as Recreation, which would be consistent with the use occurring at those sites. Lands that Alabama Power proposes to classify under the Recreation Land classification include: 1.9 acres for the boat launch and parking area at Bakers Bottom Landing; 19.9 acres for the boat launch and proposed improvements that include two bank fishing sites and a gravel parking area at Jaybird Landing; 8.7 acres for the boat launch, courtesy pier, and parking area at Pace Point Ramp; and 36.4 acres at Ponder Camp (Stillwater Area Boat Ramp) for future recreation development.

Alabama Power proposes to maintain 32.3 acres as Commercial Recreation, which is consistent with the use occurring at the sites. These lands include: Anchor Bay Marina (6.4 acres), Parker Creek Marina (9.7 acres), Pleasure Point Park and Marina (6.6 acres) and Real Island Marina and Campground (9.6 acres).

Alabama Power's proposal to modify the project boundary would more clearly delineate lands necessary for the O&M of the project and for other project purposes, such as recreation, shoreline control, or protection of environmental resources. Also, Alabama Power's proposal to classify certain lands would make those lands consistent with the use occurring at those sites. The current Exhibit G drawings do not reflect the changes to the project boundary. We recommend that Alabama Power file revised Exhibit G drawings to reflect the project boundary modifications.



## Historic Properties Management Plan

Alabama Power filed, and initially proposed to implement, a February 2012 draft HPMP to protect cultural resources within the project's APE.<sup>71</sup> The draft HPMP was developed after consultation with the CRWG, consisting of Alabama Power, Alabama SHPO, BLM, the Alabama-Quassarte Tribal Town, Kialegee Tribal Town of the Muscogee (Creek) Nation, Thlopthlocco Tribal Town, Muscogee (Creek) Nation of Oklahoma, Poarch Band of Creek Indians, the Alabama-Coushatta Tribe of Texas, and Commission staff. The draft HPMP describes standards to be applied during project activities that have the potential to affect historic properties.

Alabama Power defined the project APE in consultation with the CRWG. The APE for the project is defined as lands above 491 feet enclosed by the project boundary which encompasses a 41,150-acre reservoir (Lake Martin), a dam, a spillway, a powerhouse, a tailrace, two 450-foot-long transmission lines, project recreation sites, and appurtenant facilities. Because Alabama Power proposes to modify the current project boundary, the APE may need to be revised to reflect the project boundary change and potential project-related effects on cultural resources. The CRWG and we recommended including a provision in the HPMP to revise the APE to include these areas.

Alabama Power has not completed cultural resource surveys of selected sites within the project's APE. The CRWG recommended that the surveys be completed within five years of license issuance. Alabama Power agreed to complete the surveys within the shortened timeframe, instead of its proposal by the 20<sup>th</sup> year of the new license. Completion of these surveys would ensure that all cultural resources are identified and appropriate measures for unavoidable adverse effects on historic properties are determined and implemented (e.g., stabilization, data recovery).

In its draft HPMP Alabama Power proposes to complete the identification of historic properties within the project's APE. This measure would address the National Register status of the dam, and any other project features and equipment older than 50 years, including the fourth generating unit. Since the time the draft HPMP was developed, the Alabama SHPO determined that the Martin powerhouse, Martin dam, and the stilling basin are eligible for the National Register under Criteria A and Criteria C (letter from Elizabeth Ann Brown, Deputy State Historic Preservation Officer, Alabama Historical Commission, Montgomery, Alabama, to William Gardner, Alabama Power Company, Birmingham, Alabama, filed August 21, 2013). The Alabama SHPO also determined that the fourth generating unit is not eligible for listing in the National

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<sup>71</sup> Alabama Power's proposal changed on June 12, 2012, when Alabama Power signed the final PA as a concurring party, thereby agreeing to develop and implement a final HPMP within one year of license issuance.

Register and falls under the list of activities exempt from section 106 reviews (letter from Amanda McBride, Alabama Historical Commission, Montgomery, Alabama, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 21, 2013). The final HPMP should reflect these findings and include these two letters of documentation of consultation with the Alabama SHPO.

The final HPMP would define a process for evaluating and assessing the effects of future project-related actions on cultural resources and historic properties. The HPMP would provide for consultation with the Alabama SHPO, interested tribes, and BLM, if impacts on cultural resources as a result of project activity are unavoidable.

While Alabama Power comments that inundation can protect cultural sites from vandalism and recreational use, we find that project operations could result in impacts on cultural materials. These disturbances can be adverse because they can affect the integrity of sites that may otherwise meet the criteria for inclusion on the National Register. Therefore, the HPMP requires Alabama Power to identify and evaluate historic properties, as well as determine effects and identify ways to avoid, minimize, or mitigate adverse effects and implement appropriate treatment. This measure would ensure that historic properties are addressed in accordance with section 106 of the National Historic Preservation Act.

Other provisions required in an HPMP include documentation of the Martin Construction Camp/Project Village (148 acres), the continued use and maintenance of historic properties, public interpretation of historic and archeological properties at the project, and a review of the final HPMP during the term of the license. Overall, these measures would continue to protect historic properties and inform the public about cultural resources.

To meet the requirements of section 106 of the National Historic Preservation Act, the Commission executed a PA with the Alabama SHPO on June 12, 2012. Alabama Power, the Poarch Band of Creek Indians, and the Alabama-Coushatta Tribe of Texas concurred. The PA requires Alabama Power to develop and implement a HPMP within one year of license issuance. We estimate that the levelized annual cost for a HPMP would be \$21,665. We find the benefits of this measure would justify the cost and therefore, would be in the public interest.

### **5.2.3 Measures Not Recommended by Staff**

We find that some of the recommended measures would not contribute to the best comprehensive use of the Tallapoosa River, do not exhibit sufficient nexus to project environmental effects, or would not result in benefits to non-power resources that would be worth their cost. The following discussion explains why we did not recommend such measures.

## **American Eel Study**

The catadromous American eel is native to the Tallapoosa River system and has been documented downstream of Thurlow dam. Alabama Power proposes to implement an American eel investigation from the project tailrace to the mouth of the Tallapoosa River in consultation with FWS. Alabama Power's proposed eel study would provide information on current populations and identify potential restoration activities. We estimate that the levelized annual cost for this eel study would be \$7,840.

In the draft EIS, we proposed an alternative eel study focused on surveillance for the presence of eels at Martin Dam to help inform when passage might be needed at the dam. We estimated the levelized annual cost for this eel surveillance would be \$4,660.

In its comments on the draft EIS, Alabama Power estimated the levelized annual cost for our eel study to be \$180,000 and argued that it would produce little information of value because eels are blocked by two dams below Martin Dam and there is currently no proposal to pass eels upstream of these dams. Though we estimate the cost of surveillance trapping for eels as far less than the cost estimated by Alabama Power (partly because Alabama Power bases its estimate on a permanent structure and we do not) we agree that there is little value in monitoring for eels at this time. Further, FWS reserved its authority to prescribe eel passage, which would allow the Commission to address eel passage when the time is ripe.

In response to the draft EIS, Interior, Alabama DCNR, and Alabama Power continue to support the study of eel distribution in the Tallapoosa River below Thurlow Dam. They argue that this approach is holistic, will generate opportunities for restoration, and relates to Martin Dam through its flow releases. However, a general survey of eel distribution in the Tallapoosa River would not provide data that would support analysis of eel passage at Martin Dam or the effect of the operation of Martin Dam on fish passage in the Tallapoosa. Absent such a nexus, we do not recommend Alabama Power's proposed study as a requirement of a new license for Martin Dam. We also no longer recommend the surveillance trapping for eels at Martin Dam. Of course, Alabama Power is free to continue such efforts as an off-license measure.

## **Striped Bass Protection Measures**

In comments on the draft EIS Alabama DCNR requests Alabama Power implement measures to protect the striped bass fishery. Alabama DCNR mentions that measures such as reservoir aeration and adjusting intake levels have been successful in protecting striped bass in reservoirs operated by the Tennessee Valley Authority.

While there are indications of stress on striped bass at times, the population appears to be stable and the Lake Martin fishery is good. Alabama DCNR provides no recommendations specific to Lake Martin and does not explain how the specific circumstances of other lakes in the southeast that have aeration relate to the specific circumstances in Lake Martin. Alabama DCNR provides no cost estimates for such

measures and we cannot estimate the cost with the information provided. Therefore, we have no basis for recommending this measure.

### **Downstream Landowners' Recommendation for Flood Control**

The Downstream Landowners express concern regarding flood damage to their lands located downstream of the Martin Dam Project.<sup>72</sup> The Downstream Landowners request that Martin dam be operated with the unequivocal duty for downstream flood control to reduce flooding of their land. The Downstream Landowners identify two options that could provide flood control at Martin dam: (1) operate to pre-evacuate the pool using weather reports of impending heavy rainfall events; and (2) require flood control as a project purpose and operate with dedicated flood control storage on a year-round basis.

The Downstream Landowners assert that Alabama Power's studies have been inadequate in evaluating and addressing flood damage that may occur to downstream property. In order to address these concerns, we conducted an independent analysis and modeling to evaluate the Downstream Landowners' recommended operation measures. Staff's detailed analysis and modeling results are included in appendix C, *Analysis of Potential to Operate the Martin Dam Project for Downstream Flood Control*.

We do not consider pre-evacuation a viable procedure for flood control at this project. Weather reports are not precise enough in predicting either the location or amount of precipitation events, thus pre-evacuation could exacerbate downstream flooding.

Staff's modeling study shows that moderate floods could be minimally reduced, but not avoided. We evaluated the March 2003 flood and concluded it had a recurrence interval of between 10 and 25 years. In this case, providing either 3 or 5 feet of dedicated flood storage in Lake Martin resulted in minor reductions of peak outflow from Lake Martin. With no summer storage, the peak outflow would have been 124,000 cfs. With 3 and 5 feet of summer storage, the peak outflow decreased to 111,000 cfs and 94,000 cfs, respectively. For the March 2003 flood, a starting reservoir elevation of 482 feet, or about 9 feet of storage, would have been required to reduce peak outflow from Martin dam to 60,000 cfs, which is the flow Downstream Landowners state would avoid most downstream flooding. In this case, a summer

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<sup>72</sup> The Downstream Landowners' March 9, 2011, filing identifies their primary concerns, and analyses to support their recommendations. The March 9, 2010, filing states that it represents about three dozen landowners and farmers that utilize the lower Tallapoosa delta for agricultural activities. About 19 landowners participated in the relicensing process and filed multiple comments. Estimates of damages resulting from flooding were provided by 11 landowners.

drawdown of 9 feet would cause the surface elevation to fall below the drought curve and place the reservoir in a drought status.

Most damages associated with the March 2003 flood would not have been avoided with dedicated flood storage in Lake Martin. We estimate that with 3 and 5 feet of storage, the acres flooded in March 2003 would have been reduced from 19,500 acres, to 18,800 and 17,700 acres, respectively. With only a 10-percent reduction in flooded acres, most of the \$2.1 million in damages claimed by Downstream Landowners would have still occurred.

We evaluated the effect of dedicated flood storage on a less severe flood event, in this case a flood with a 5-year recurrence interval. Our analysis showed that, assuming no tributary inflow downstream of Martin dam, a 3-foot drawdown would have been adequate to avoid the 5-year flood. The potential effect of tributary inflow is important to our analysis because past floods have shown that, in cases of substantial rainfall occurring downstream of Martin dam, no changes in operation of Martin dam could be implemented to avoid downstream flooding.

No cost data were available to quantify the downstream damages associated with a 5-year flood event; however, it is reasonable to assume that damages would be far less than the \$2.1 million dollars reported by the Downstream Landowners for the May and July 2003 floods (two separate events). Staff's best estimate is to extrapolate from the \$2.1 million losses in 2003. The 5-year flood would inundate about 50 percent less acreage than the May 2003 flood, and thus cause half the damage, about \$1.1 million. Assuming such flood losses occur every 5 years, we estimated this is equivalent to a loss of \$210,000 per year. Absent actual loss data, this provides our best estimate for comparison purposes.

In determining whether to adopt a flood control measure as part of the staff alternative, we consider the potential effects of dedicated flood storage on all resources, which include generation, dependable capacity, lake-based recreation, the ability to maintain minimum flows and navigation flows, and the ability of Lake Martin to provide drought relief to the river basin. Staff's analysis shows that 3 feet of summer storage for flood control would reduce project generation by 10,192 MWh valued at approximately \$738,920 per year. In addition, there would be a reduction in dependable capacity.

With regard to effects on non-developmental resources, 3 feet of summer storage for flood control could adversely affect public, private, and commercial uses at Lake Martin. Alabama Power estimates 370,538 recreation user-days for the combined recreational use at Lake Martin and the tailwater area (as defined from Martin dam to 0.25 mile downstream of the dam) could be reduced by the lower summer lake levels. Alabama Power identified 6,901 privately owned parcels of property adjacent to, or near, Lake Martin, some of which have private boat docks, which could be affected by lower summer elevations. However, public recreation sites would have usable boat docks with up to a 5-foot drawdown, thus the effect on public access would be minimal.

With a 5-foot drawdown in the summer, we estimate the area of Lake Martin for boating would be reduced from 40,000 acres to 36,000 acres, which would expose 4,000 acres of shoreline. With a 3-foot drawdown in the summer, we estimate an additional 3,000 acres of shoreline would be exposed. Further, lower summer lake levels would likely affect aquatic vegetation and the associated wildlife.

Providing 3 feet of summer storage for flood control would reduce Alabama Power's ability to use Lake Martin to assist in meeting minimum flow requirements downstream of Thurlow dam. A 3-foot drawdown would be equivalent to providing 1,200 cfs of minimum flow releases, as measured downstream of Thurlow dam, for about 50 days. A 5-foot drawdown would be equivalent to providing a 1,200 cfs minimum flow for about 85 days.

Lower summer lake elevations would increase the likelihood of triggering drought operations. Modified operations in response to drought have occurred infrequently on Lake Martin. However, had Lake Martin been maintained at elevation 488.0 feet in Year 2000 (providing 3 feet of storage), with historical releases the reservoir would have dropped below the drought curve by July of that year, and would have triggered drought operations.

In summary, we do not find that pre-evacuation is viable. We also do not recommend operating the Martin Dam Project with dedicated flood storage. Although technically feasible, our modeling shows that such a measure would have little effect on larger, less frequent flood events, thus could not completely eliminate flooding along the Tallapoosa River. While providing dedicated storage for flood control could be implemented to avoid smaller, more frequent flood events, the cost of implementing the measure for small events, and the effects on other resources, would far exceed estimated flood damages to the Downstream Landowners' properties. Therefore, we conclude that the benefits of providing dedicated storage for flood control would not justify the costs to developmental and non-developmental resources.

### **Kowaliga (Highway 63) Launch Site**

In comments on the draft EIS, Alabama DCNR recommends Alabama Power upgrade the existing Kowaliga (Highway 63) Launch site or an alternative site at the lower section of Lake Martin. As discussed in section 3.3.5, *Recreation Resources and Land Use*, Alabama DCNR provides no basis, including current or projected recreational use, to support a need for any such improvements. The studies conducted during relicensing do not support the need for any upgrades beyond those proposed by Alabama Power. Further, the Kowaliga (Highway 63) Launch site is state-owned, which we assume the state will continue to own, operate, and maintain throughout a new license term. We, therefore, do not recommend that Alabama Power upgrade the Kowaliga (Highway 63) Launch, or an alternative site at the lower section of Lake Martin.

### **5.3 UNAVOIDABLE ADVERSE EFFECTS**

Continued operation of the Martin Dam Project would result in continued peaking operations and fluctuations in flow releases downstream of Martin dam. Fish entrainment and some mortality would continue at Martin dam, but the overall effects would continue to be minor based on the fisheries upstream and downstream of the dam.

Even if the 3-foot increase in the winter pool is implemented, regulation of the Martin Dam Project's reservoir levels would continue, resulting in seasonal drawdown affecting the shoreline landowners' ability to access their private boat docks at certain times of the year. Construction of, and improvements to, project recreation facilities would cause temporary, minor disturbance to geologic and soil resources. Implementing soil erosion control measures and revegetating disturbed areas, where appropriate, would minimize soil erosion and associated effects on aquatic and terrestrial resources.

Project operations would continue to affect some cultural resources sites, but Alabama Power's proposal to implement an HPMP, along with other staff-recommended measures, would protect cultural resources. In the event that a project-related activity could not be modified to avoid an adverse effect on a historic property within the project's APE, Alabama Power would consult with the Alabama SHPO, interested tribes, and BLM in order to develop mitigation measures.

### **5.4 FISH AND WILDLIFE AGENCY RECOMMENDATIONS**

Under the provisions of section 10(j) of the FPA, each hydroelectric license issued by the Commission shall include conditions based on recommendations provided by federal and state fish and wildlife agencies for the protection, mitigation, and enhancement of fish and wildlife resources affected by the project.

Section 10(j) of the FPA states that whenever the Commission believes that any fish and wildlife agency recommendation is inconsistent with the purposes and the requirements of the FPA or other applicable law, the Commission and the agency will attempt to resolve any such inconsistency, giving due weight to the recommendations, expertise, and statutory responsibilities of such agency. In response to our ready for environmental analysis notice, Interior submitted recommendations for the project in a letter filed April 6, 2012 (letter from J. Stanley, Regional Environmental Protection Assistant, Office of the Secretary, U.S. Department of the Interior, Atlanta, Georgia, to Kimberly Bose, Secretary, FERC, Washington, D.C., April 6, 2012). Interior's letter commenting on the draft EIS, filed on August 13, 2013, included a request to modify one of its recommendations (letter from Joyce Stanley, Regional Environmental Protection Specialist, The Department of the Interior, Atlanta, GA, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 13, 2013).

Table 5-2 lists Interior's recommendations filed subject to section 10(j), and whether the recommendations are adopted under the staff alternative. Environmental

recommendations that we consider outside the scope of section 10(j) have been considered under section 10(a) of the FPA and are addressed in the specific resource sections of this document and the previous section. No section 10(j) recommendations were filed by state agencies.

Of the three recommendations from Interior that we consider to be within the scope of section 10(j), we include two and we do not include one. We discuss the reasons for not including those recommendations in section 5.2, *Comprehensive Development and Recommended Alternative*. Table 5-4 indicates the basis for our preliminary determinations concerning measures that we consider inconsistent with section 10(j).

Table 5-2. Fish and wildlife agency recommendations for the Martin Dam Hydroelectric Project (Source: staff).

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
1. SMP: In order to protect fish spawning and rearing habitat, and maintain wildlife habitat diversity, no new seawalls should be constructed unless necessary to protect land and property.	Interior	Yes	\$0	Adopted



<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
2. SMP: In order to protect the shoreline from erosion and protect sensitive resources, encourage shoreline developments to maintain a 30-foot-wide control strip within project boundary, and increase the buffer width to at least 100 feet.	Interior	Yes	\$0	Adopted in part (see section 5.2.2). 30-foot-wide control strip recommended; increasing the buffer width to at least 100 feet would require acquisition of private property without specified benefit, not recommended
3. Modify the Shoreline Management Plan to encourage Alabama Power to work with Interior and Alabama DCNR to develop a restoration plan that would identify opportunities to restore shoreline habitats and species.	Interior <sup>b</sup>	No. Not a specific measure to protect, mitigate, or enhance fish and wildlife resources	\$0	Not adopted. Proposal too vague to evaluate. Sufficient protection provided through SMP.

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
4. Continue Alabama Power's support of aquatic restoration within the Mobile Basin and work with Interior and Alabama DCNR to identify suitable habitats (primarily tributaries) for species reintroductions within the Martin Dam Project boundary.	Interior	No. Funding is not a specific measure to protect, mitigate, or enhance fish and wildlife resources	\$0	Not adopted.
5. Consider utilizing the Tallapoosa River portion of the ADROP when assessing drought operations.	Interior	No. Not a specific measure to protect, mitigate, or enhance fish and wildlife resources	\$0	Adopted

<b>Recommendation</b>	<b>Agency</b>	<b>Within the scope of section 10(j)</b>	<b>Annualized cost</b>	<b>Adopted?</b>
6. Within the Core Management Area in the WMP, Alabama Power should manage towards a desired forest condition consistent with the “good quality foraging habitat” for the federally listed endangered red-cockaded woodpecker, a longleaf pine ecosystem.	Interior	Yes	\$0	Adopted

<sup>a</sup> See letter from Joyce Stanley, Regional Environmental Protection Specialist, The Department of the Interior, Atlanta, GA, to Kimberly Bose, Secretary, FERC, Washington, D.C., August 13, 2013.

On June 18, 2013, Commission staff offered to hold a 10(j) meeting to resolve the inconsistencies between the Interior’s recommendations and purposes and requirements of the FPA or other applicable laws. Staff made a preliminary finding that that providing a 100-foot buffer was inconsistent with sections 10(a) and 4(e) of the FPA because the cost of acquiring the necessary rights to protect such a large amount of land outweighed the benefits to fish and wildlife resources. In a telephone conversation on July 31, 2013, we asked Interior wished to meet on the matter (memo from Stephen Bowler, Environmental Biologist, to public files, FERC, Washington, D.C., August 7, 2013). Interior did not request a meeting.

In its August 13, 2013 letter, Interior modified its recommendation for a 100-foot buffer to request that as part of the Shoreline Management Plan Alabama Power work with Alabama DCNR to develop a restoration plan to restore habitat and species in the project boundary. Interior states that the development of the plan would be an ongoing process that would begin immediately after license issuance and continue through the term of the license. In support of the measure, Interior suggests that the restoration plan would minimize habitat fragmentation and species isolation caused by the creation of

the reservoir and conversion of shoreline habitats from their natural state to human influenced, residential states. Interior argues that habitat fragmentation and species isolation continue to be one of the biggest challenges to recovering imperiled species (particularly aquatic species) and this measure may preclude future listings.

Interior's modified recommendation is too vague to determine what measures might be implemented. Without this information we cannot determine what benefits would accrue from the measure or estimate its costs. Consequently, Interior's modified recommendation still does not resolve inconsistencies with section 4(e) and 10(a) of the Federal Power Act.

Further, we are recommending measures that would be sufficient to ensure the protection of fish and wildlife habitats. This includes reclassifying 1,294.4 acres within the project boundary as Natural/Undeveloped Lands and continuing to protect 373.1 acres of lands designated as Natural/Undeveloped by retaining these lands within the project boundary. Lands under this classification remain undeveloped for specific project purposes, while allowing public recreational use, such as hiking and wildlife observation. Finally, maintaining a 30-foot Control Strip around Lake Martin would help protect the lake by filtering runoff, stabilizing soil, and providing habitat for aquatic and terrestrial species.

## **5.5 CONSISTENCY WITH COMPREHENSIVE PLANS**

Section 10(a)(2) of the FPA, 16 U.S.C. §803(a)(2)(A), requires the Commission to consider the extent to which a project is consistent with federal or state comprehensive plans for improving, developing, or conserving a waterway or waterways affected by the project. We reviewed 11 comprehensive plans that are applicable to the Martin Dam Project, located in Alabama (table 5-3). No inconsistencies were found.

Table 5-3. Comprehensive plans considered for the Martin Dam Project (Source: staff).

Comprehensive Plan	Agency
Wildlife lands needed for Alabama, October 1990.	Alabama Department of Conservation and Natural Resources, Montgomery, Alabama
Alabama's comprehensive wildlife conservation strategy. Undated.	Alabama Department of Conservation and Natural Resources. Montgomery, Alabama
Alabama Statewide Comprehensive Outdoor Recreation Plan (SCORP): 2008-2012.	Alabama Department of Economic and Community Affairs. Montgomery, Alabama
The striped bass fishery of the Gulf of Mexico, United States: A regional management plan. March 2006.	Gulf States Marine Fisheries Commission. Ocean Springs, Mississippi
Recovery plan for the Mobile River Basin aquatic ecosystem. November 17, 2000.	U.S. Fish and Wildlife Service
Aquatic resource management plan for the Alabama River Basin. May 17, 2006.	U.S. Fish and Wildlife Service. Daphne, Alabama.
Gulf sturgeon ( <i>Acipenser oxyrhynchus desotoi</i> ) recovery/management plan. September 15, 1995.	National Marine Fisheries Service. Gulf Sturgeon Recovery/Management Task Team. Atlanta, Georgia
The Nationwide Rivers Inventory. 1993.	National Park Service. Department of the Interior, Washington, D.C.
North American waterfowl management plan. May 1986.	U.S. Fish and Wildlife Service. Canadian Wildlife Service.
Gulf Coast joint venture plan: A component of the North American waterfowl management plan. June 1990.	U.S. Fish and Wildlife Service.
Fisheries USA: the recreational fisheries policy of the U.S. Fish and Wildlife Service. Undated.	U.S. Fish and Wildlife Service. Washington, D.C.



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**APPENDIX A—Draft License Conditions Recommended by Staff**

**I. MANDATORY CONDITIONS**

On May 9, 2011, the Alabama Department of Environmental Management issued a water quality certification.

**II. ADDITIONAL LICENSE ARTICLES RECOMMENDED BY COMMISSION STAFF**

We recommend including the following license articles in any license issued for the project in addition to the mandatory conditions.

Draft Article 401. Commission Approval and Reporting.

(a) Requirement to File Reports.

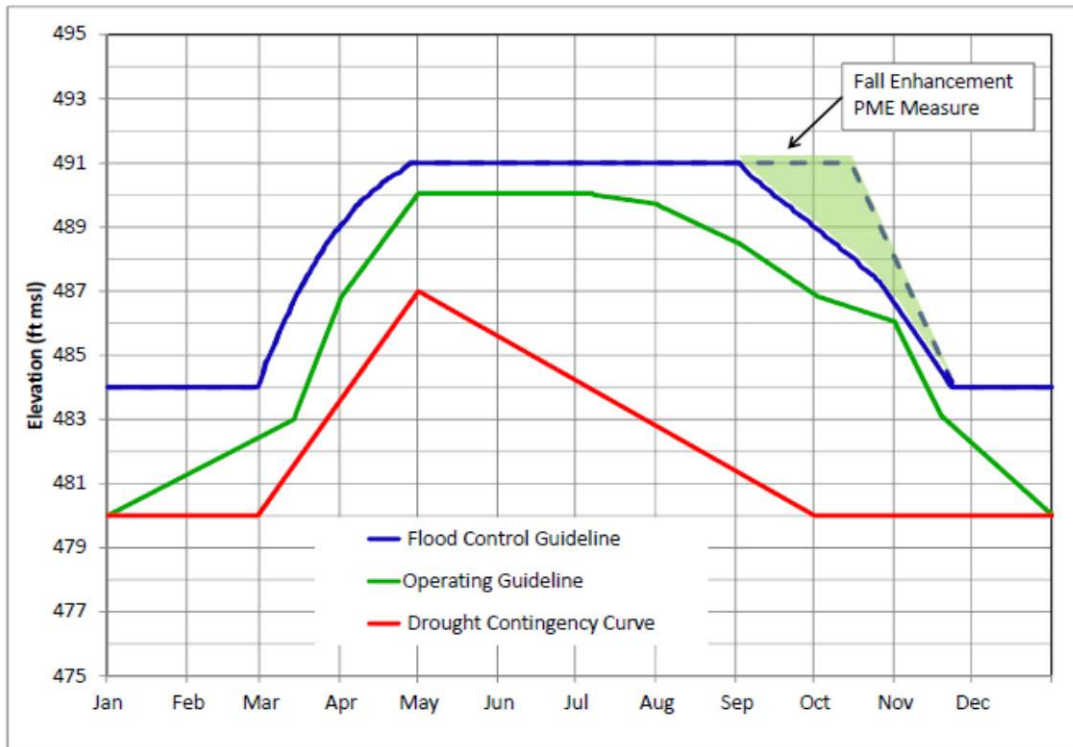
The licensee must file with the Commission the following reports or notifications as required by the Alabama Department of Environment Management’s (Alabama DEM) water quality certification.

<b>Alabama DEM Condition Number</b>	<b>Report Name</b>	<b>Commission Due Date</b>
5	Dissolved oxygen and water temperature monitoring report	Within 90 days following the end of the annual monitoring period

(b) Filing of Amendment Applications.

Alabama DEM’s Condition 6 of the water quality certification attached to this order contemplates unspecified long-term structural and/or operational changes for the purpose of ensuring compliance with state water quality criteria for dissolved oxygen. These changes must not be implemented without prior Commission authorization granted after the filing of an application to amend the license.

Draft Article 402. Lake Martin Water Level Management. The licensee must operate the Martin Dam Project in accordance with the guide curves and elevations shown in the figure below and described herein to protect the ecological and recreational values of Lake Martin and provide for flood control and downstream navigation:



Flood Control Curve. The flood control curve reflects the maximum elevation at which the lake may be maintained before implementing the flood control provisions in Article 404. On January 1 the curve is at elevation 484 feet mean sea level (msl) and remains at this elevation until February 28, when filling begins. The curve gradually rises until it reaches elevation 491 feet on April 28. The curve remains at 491 feet until September 2, then is gradually lowered to 484 feet by the third week in November, and remains at 484 feet until December 31, except when the conditional fall extension is implemented.

Conditional Fall Extension. If the conditions specified in Article 403 are met, the flood control curve remains at 491 feet through October 15; thereafter the flood control curve gradually declines until it reaches elevation 484 feet msl by the third week in November, and remains at 484 feet until December 31.



Operating Curve. The area between the flood control curve and operating curve represents the range in which the lake must be maintained under normal flow conditions. On January 1 the curve is at elevation 480 feet and gradually rises to elevation 483 feet by the middle of March. The curve then gradually rises to elevation 487 feet msl by April 3, 490 feet by May 1, and remains at 490 feet until July 7. On July 7 the curve begins declining to 489.7 feet by August 1, 486.9 feet by October 1, 486 feet by November 1, 483 feet by November 20, and 480 feet by December 31.

Drought Curve. Reservoir elevations below the drought curve indicate that Lake Martin is in drought condition and the drought management provisions of Article 405 must be implemented. On January 1, the curve is at elevation 480 feet and remains at this elevation until March 1. On this date the curve gradually rises to elevation 487 feet by May 1, then gradually lowers to elevation 480 feet by October 1. The curve remains at elevation 480 feet October 1 through December 31.

The licensee must notify the Commission when Lake Martin is at or below 488 feet for a 7-day period between June 1 and Labor Day, or 2 feet below the operating curve for a 7-day period between Labor Day and May 31.

To the extent possible the licensee must, maintain the lake level between the flood control and operating curves, and, between May 1 and August 31, no less than 0.5 foot below the flood control curve (i.e., 490.5 feet msl), except as provided in Articles 404 for flood control and 405 for drought management..

The lake level requirements may be temporarily modified if required by operating emergencies beyond the control of the licensee, and for short periods upon mutual agreement among the licensee, the U.S. Army Corps of Engineers, Alabama Department of Environmental Management, and Alabama Department of Conservation and Natural Resources. If the lake level is so modified, the licensee must notify the Commission as soon as possible, but not later than 10 days after each such incident, and must provide the reason for the change in lake levels.

Draft Article 403. Conditional Fall Extension. Upon issuance of the license, the licensee must implement the Conditional Fall Extension to enhance recreational use at Lake Martin. The flood control curve, identified in Article 402, must remain at elevation 491 feet mean sea level (msl) from September 1 through October 15 (i.e., the shaded zone in Figure 1, Article 402), provided that the following hydrologic and operational conditions are met:

1. Lake Martin is above its operating curve during September (487 to 488.5 feet msl);

2. the rolling 7-day average total basin inflow (i.e. the average of the total daily basin inflow for the previous 7 days recalculated on a daily basis for a given period of time) on the Tallapoosa River, calculated at Thurlow dam, is at or higher than the median flow (i.e. the median of the recorded daily flows over the period of record for the particular day of interest);
3. the rolling 7-day average total basin inflow on the Coosa River, calculated at Jordan dam, is at or higher than the median flow; and
4. the elevations at the Weiss, H. Neely Henry, and Logan Martin developments on the Coosa River and the Harris Project on the Tallapoosa River must all be within 1 foot of their respective rule curves.

Normal reservoir drawdown to the winter pool shall begin October 15 or as soon as the above conditions are no longer met, whichever occurs first.

The licensee must report to the Commission by December 15 of each year that the above conditions were not met. The report must include a description of the daily hydraulic and operation conditions that prevented implementing the fall extension. In addition, regardless of the outcome of the evaluation, the licensee must provide notice to Lake Martin Resource Association, Inc. and post, from July 15 through October 15, weekly reports on its website providing (1) the posting date; (2) the lake level on the posting date; and (3) from (a) July 15 through August 31, an estimate of the likelihood that the Conditional Fall Extension will be implemented that fall, (b) September 1 through October 15, a statement of whether or not the Conditional Fall Extension is being implemented, and (c) September 1 through September 30, an estimate of the likelihood that the Conditional Fall Extension will be implemented or will continue to be implemented through October 15.

Draft Article 404. Flood Control Operations. The licensee must operate the project such that Lake Martin does not exceed elevation 491 feet msl to assist in flood control. Flood control operation must be guided by the following:

(1) When Lake Martin is above the flood control curve and between elevations 484 and 486 feet msl, the turbines at Martin dam must be operated to provide an outflow from Thurlow dam of at least the equivalent of the hydraulic capacity of the turbines at Yates dam (about 12,400 cubic feet per second (cfs)).

(2) When Lake Martin is above the flood control curve and between elevations 486 and 489 feet msl:

- a) With increasing inflows, the turbines at Martin dam must be operated to provide an outflow from Thurlow dam of at least the equivalent of the hydraulic capacity of the turbines at Thurlow dam (about 13,200 cfs).
- b) With decreasing inflows, the turbines at Martin dam must be operated to provide for an outflow from Thurlow dam of at least the equivalent of the hydraulic capacity of the turbines at Yates dam (about 12,400 cfs).

(3) When Lake Martin is above the flood control curve and above elevation 489 feet msl, the turbines at Martin dam must be operated as it would in the increasing inflow scenario described in No. 2(a). In addition, if required to avoid rising above elevation 491 feet msl, the turbines must be operated to provide an outflow from Lake Martin at least equivalent to all turbine units operating at full gate (17,900 cfs), and spillway gates raised. An exception to this requirement would occur if the reservoir continues to rise after all gates are raised and inflow exceeds the gate capacity. Under these conditions, the licensee must operate the project to return Lake Martin to elevation 491 feet msl as soon as practicable.

(4) During periods when inflow exceeds the total hydraulic capacity of the turbines, the 3-hour average outflow rate from Lake Martin must not exceed the concurrent 3-hour average inflow rate, except to evacuate accumulated surcharge storage subsequent to the predicted time of peak inflow. This measure should ensure that the outflow from Lake Martin is lower than the inflow.

(5) The licensee must continue its current practice of notifying the National Weather Service (NWS) when spillway gate operation is used in flood control operations and must continue to share data with the NWS' Southeast River Forecast Center (SERFC), and the U.S. Army Corps of Engineers (Corps). In addition, the licensee must coordinate its planned operation of its spillway gates with the SERFC and the Corps to limit the effects of discharge from the Martin Dam Project to the extent practicable. If greater flood control benefits can be attained through increased coordination of operations at the Tallapoosa and Coosa River dams, and increased coordination with the Corps' downstream Alabama River dams than would be attained through use of the above flood control procedures, then these procedures may be modified as mutually agreed to verbally by the Corps and the licensee. The licensee must notify the Commission as soon as possible, but no later than 10 days after each temporary change to flood control measures which may arise as part of a verbal agreement between the licensee and Corps.

Article 405. Drought Management Plan. The licensee must implement the Tallapoosa River portion of Alabama Drought Response Operating Proposal (ADROP), Version 3.3.3, dated July 12, 2013, as on August 13, 2013. The licensee must notify the Commission as soon as possible, but no later than 10 days after modifying operations in response to drought conditions.

The licensee must review the Corps' regulation manuals, once finalized, for consistency with the Tallapoosa River portions of ADROP, and file a report of its findings along with any recommendations for modifications to the aforementioned portions of ADROP to be consistent with the finalized manuals.

Any future changes to the Drought Management Plan must be developed after consultation with the U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Alabama Office of Water Resources, Alabama Department of Environmental Management, Alabama Department of Conservation and Natural Resources, Georgia Department of Natural Resources Environmental Protection

Division, and Atlanta Regional Commission. The licensee must include with the plan documentation of consultation, copies of recommendations on the completed plans after both have been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plans. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plans with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the Drought Management plan. Upon Commission approval the licensee shall implement the drought Management Plan, including any changes required by the Commission.

Draft Article 406. *Water Quality Monitoring Plan.* Within 90 days of license issuance, the licensee must file for Commission approval a plan to monitor water quality in Lake Martin upstream of the dam and in the dam tail race. The tailrace monitoring requirements must be consistent with conditions two through six of the 401 water quality certification (Appendix B of this license). The plan must define the water quality parameters to be monitored, monitoring methods, and the schedules for data collection and reporting.

The plan must be developed after consultation with the U.S. Fish and Wildlife Service, Alabama Department of Environmental Management, and Alabama Department of Conservation and Natural Resources. The licensee must include with the plan documentation of consultation, copies of recommendations on the completed plans after both have been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plans. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plans with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plans. Upon Commission approval the licensee shall implement the plans, including any changes required by the Commission.

Draft Article 407. *Project Operation and Flow Monitoring Plan.* Within 120 days from the date of license issuance, the licensee must file with the Commission for approval, a plan to monitor compliance with: (1) Lake Martin water levels required in Article 402; (2) the Conditional Fall Extension required by Article 403; (3) operations for flood control required by Article 404; and (4) the Drought Management Plan required by Article 405.

The Project Operation and Flow Monitoring Plan must be developed after consultation with the Alabama Department of Conservation and Natural Resources, Alabama Department of Environmental Management, U.S. Fish and Wildlife Service, and the U.S. Army Corps of Engineers. The licensee must include with the plan an implementation schedule, documentation of consultation, copies of recommendations on

the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include licensee's project-specific reasons.

The Commission reserves the right to require changes to the plan. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Draft Article 408. *Reservation of Authority to Prescribe Fishways.* Authority is reserved to the Commission to require the licensee to construct, operate, and maintain, or to provide for the construction, operation, and maintenance of such fishways as may be prescribed by the Secretary of the Interior pursuant to section 18 of the Federal Power Act.

Draft Article 409. *Nuisance Aquatic Vegetation and Vector Control Program.* Within six months of license issuance, the licensee must file for Commission approval, a revised Nuisance Aquatic Vegetation and Vector Control Program. The revised program must specifically address project operating conditions required by this license and include, but not be limited to, the following: (1) methods, including the frequency, timing, and locations, of surveys to identify areas where nuisance aquatic vegetation could create a public health hazard, affect power generation facilities, restrict recreational use, or pose a threat to the ecological balance of the reservoir; (2) methods for monitoring increases in nuisance aquatic vegetation; (3) methods for controlling nuisance aquatic vegetation; and (4) a schedule for implementation of control measures and monitoring.

The revised Nuisance Aquatic Vegetation and Vector Control Program must be developed after consultation with the U.S. Fish and Wildlife Service, Alabama Department of Conservation and Natural Resources, and the U.S. Bureau of Land Management. The licensee must include with the plan documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Draft Article 410. *Wildlife Management Program.* The licensee's final Wildlife Management Program, filed on December 9, 2011, consisting of pages 1 through 23, is approved and must be implemented. The program must be implemented according to section 6.0, *Implementation Timeline*, of the *Wildlife Management Program*. Reporting

must be completed according to section 7.0, *Consultation and Reporting*, of the *Wildlife Management Program*.

Any revisions to the program must be developed after consultation with the U.S. Fish and Wildlife Service, Alabama Department of Conservation and Natural Resources, and the U.S. Bureau of Land Management. The licensee must include with the program documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the program. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the program with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the program. Upon Commission approval the licensee must implement the program, including any changes required by the Commission.

Draft Article 411. Recreation Plan. Within one year of license issuance, the licensee must file with the Commission for approval, a Revised Recreation Plan for the Martin Dam Hydroelectric Project. The conceptual and as-built drawings of the 19 project recreation sites contained in Appendix D, sheet D-1 through D19, of the Recreation Plan filed on December 9, 2011 are approved and must be included in the revised plan.

In addition, the Recreation Plan must include, at a minimum, the following:

(1) Provisions for the operation and maintenance (O&M) of the following 19 project recreation sites, described in the Recreation Plan filed on December 9, 2011: Anchor Bay Marina; Camp Alamisco; Camp ASCCA (Dadeville Campus); DARE Boat Landing; DARE Power Park; Kamp Kiwanis; Maxwell Gunter AFB Recreation Area; Parker Creek Marina; Pleasure Point Park and Marina; Real Island Marina and Campground; Scenic Overlook; Union Ramp; Bakers Bottom Landing; Jaybird Landing; Madwind Creek Ramp; Paces Point Ramp; Paces Trail; Smith Landing; and Ponder Camp (Stillwaters Area Boat Ramp). The O&M provisions must include, at a minimum: (a) signage at each project recreation site as specified in section 8.2 of the Commission's regulations, and updated for accuracy as needed; (b) "carry-in/carry-out" signage to inform the public to carry out their trash from the project recreation sites, and the identification and removal of existing trash receptacles and replacement of containers with appropriately-sized trash bags at the identified project recreation sites for use by the public to remove trash; and (c) a description of soil erosion and sediment control measures to be used where ground-disturbing activities are proposed.

(2) A description of the project recreation sites, the amenities at each site, and how the needs of the disabled were considered in the planning and design of the recreation facilities.

(3) A map or maps identifying the 19 project recreation sites from item No. (1) above in relation to the project boundary as licensed herein.

(4) Provisions for (a) improving the boat ramp, constructing two bank fishing sites, and constructing a gravel parking area at the Jaybird Landing; (b) expanding the parking areas, if needed, at Smith Landing and Madwind Creek Ramp; and (c) assessing the need for developing bank/pier fishing areas within the Martin Dam Project boundary.

(5) Concurrent with the periodic filing of the Licensed Hydropower Development Recreation Report (Form 80) with the Commission, the licensee must file a report that discusses: (a) the adequacy of the Recreation Plan to meet its stated goals and the need for any modification to the plan; and (b) any proposed measures or modifications to project recreation sites and a schedule for implementing such changes.

The revised Recreation Plan must be developed after consultation with the U.S. Fish and Wildlife Service, Alabama Department of Conservation and Natural Resources, the U.S. Bureau of Land Management, and Tallapoosa County, Alabama. The licensee must include with the plan an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing shall include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Draft Article 412. Public Education and Outreach Plan. Within one year of license issuance, the licensee must file with the Commission for approval, a Public Education and Outreach Plan to enhance the public experience at the Martin Dam Project. The plan must include, at a minimum: (1) a detailed description of the Public Education and Outreach Program; (2) a provision to develop a brochure about the longleaf pine forest and the licensee's efforts in the Longleaf Pine Legacy Program; (3) a description of the licensee's procedures for issuance of a permit and/or lease to occupy project lands and waters, including the application process as specified in Article 413; and (4) a provision to review and update of the plan every 6 years.

The Public Education and Outreach Plan must be developed after consultation with the Alabama Department of Conservation and Natural Resources, the U.S. Fish and

Wildlife Service, and the U.S. Bureau of Land Management. The licensee must include with the plan an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Upon Commission approval the licensee must implement the plan, including any changes required by the Commission.

Draft Article 413. Shoreline Management Plan. Within 1 year of license issuance, the licensee must file with the Commission for approval, a revised Shoreline Management Plan to protect the scenic quality of, and environmental resources at, the Martin Dam Project. The plan must include, at a minimum: (1) a description, including acreage and a map or maps of the following seven land use classifications: (i) Project Operations; (ii) Recreation; (iii) Quasi-public; (iv) Commercial Recreation; (v) Natural/Undeveloped; (vi) Martin Small Game Hunting Area; and (vii) 30-Foot Control Strip; (2) a provision for using a geographic information system to record areas designated as Sensitive Resources; (3) a description of allowable and prohibited uses for each of the above land use classification; (4) a description of best management practices, including bio-engineering techniques such as willow and wetland plantings to control erosion; (5) a description of the Dredging Permit Program; (6) a description of the Shoreline Compliance Program specific to the Martin Dam Project; (7) a provision to limit construction of new seawalls and criteria that must be applied in approving the installation of any new seawall; (8) a description of the encroachments at the Martin Dam Project, including the number of encroachments that have been addressed, the method of resolution, and the number and location of encroachments that remain unresolved; and (9) a provision to review and update the Shoreline Management Plan.

The revised Shoreline Management Plan must reflect the project boundary modifications and the reclassification of project lands from the Natural/Undeveloped Classification to the Recreation Classification for the following recreation sites as described in Section 4.1.1 of the licensee's Recreation Plan filed December 9, 2011: (1) Madwind Creek Ramp (5.8 acres); (2) Smith Landing (4.2 acres); (3) Union Ramp (7.0 acres); (4) Bakers Bottom Landing (1.9 acres); (5) Jaybird Landing (19.9 acres); (6) Paces Point Ramp (8.7 acres); (7) Paces Trail (24.1 acres); Pleasure Point Park and Marina (6.6 acres); and (8) Ponder Camp (Stillwaters Area Boat Ramp) (36.4 acres).

The filing must include two separate sets of Geographic Information System (GIS) data in a georeferenced electronic file format (such as ArcView shape files, GeoMedia files, MapInfo files, or a similar GIS format) with the Secretary of the Commission, ATTN: OEP/DHAC. The data must include (a) polygon files of the project reservoir



surface area including a separate polygon for the tailrace area, and (b) polyline file of the shoreline management classifications. The filing must be in CD or diskette format and must include polygon data that represents the surface area of the reservoir/tailrace, as shown on the project boundary exhibits, and polyline data that represents the linear extent of each shoreline classification segment as shown on maps in the shoreline management plan. A polygon GIS data file is required for the reservoir/ tailrace. The attribute table for the reservoir/ tailrace must include at least the reservoir name, water elevation, and elevation reference datum. A polyline GIS data file is required for the shoreline classifications associated with the reservoir. The attribute table for the reservoir must include at least the reservoir name and management classification description for each polyline, consistent with the shoreline management plan.

All GIS data must be positionally accurate to  $\pm 40$  feet in order to comply with National Map Accuracy Standards for maps at a 1:24,000 scale. The file name(s) must include: FERC Project Number, data description, date of this order, and file extension in the following format (P-xxxx, reservoir name polygon/or reservoir name shoreline polyline data, MM-DD-YYYY.SHP). The filing must be accompanied by a separate text file describing the spatial reference for the georeferenced data: map projection used (i.e., UTM, State Plane, Decimal Degrees, etc.), the map datum (i.e., North American 27, North American 83, etc.), and the units of measurement (i.e., feet, meters, miles, etc.). The text file name must include: FERC Project Number, data description, date of this order, and file extension in the following format (P-xxxx, project reservoir/or shoreline classification metadata, MM-DD-YYYY.TXT).

The Shoreline Management Plan must be developed after consultation with the Alabama Department of Conservation and Natural Resources, the U.S. Fish and Wildlife Service, and the U.S. Bureau of Land Management. The licensee must include with the plan an implementation schedule, documentation of consultation, copies of recommendations on the completed plan after it has been prepared and provided to the entities above, and specific descriptions of how the entities' comments are accommodated by the plan. The licensee must allow a minimum of 30 days for the entities to comment and to make recommendations before filing the plan with the Commission. If the licensee does not adopt a recommendation, the filing must include the licensee's reasons, based on project-specific reasons.

The Commission reserves the right to require changes to the plan. Upon Commission approval the licensee shall implement the plan, including any changes required by the Commission.

Draft Article 414. Programmatic Agreement. The licensee must implement the "Programmatic Agreement Between the Federal Energy Regulatory Commission and the Alabama State Historic Preservation Officer for Managing Historic Properties that May be Affected by Issuing a New License to Alabama Power Company for the Continued Operation of the Martin Dam Hydroelectric Project in Coosa, Elmore, and Tallapoosa Counties, Alabama (FERC No. 349-173)," executed on June 12, 2012, and including, but

not limited to, the Historic Properties Management Plan (HPMP) for the project. Pursuant to the requirements of this Programmatic Agreement, the licensee must file, for Commission approval, a HPMP within one year of issuance of this order. The Commission reserves the authority to require changes to the HPMP at any time during the term of the license. If the Programmatic Agreement is terminated prior to Commission approval of the HPMP, the licensee must obtain approval from the Commission and the Alabama State Historic Preservation Officer, before engaging in any ground-disturbing activities or taking any other action that may affect any historic properties within the project's area of potential effects.

Article 415. Use and Occupancy. (a) In accordance with the provisions of this article, the licensee shall have the authority to grant permission for certain types of use and occupancy of project lands and waters and to convey certain interests in project lands and waters for certain types of use and occupancy, without prior Commission approval. The licensee may exercise the authority only if the proposed use and occupancy is consistent with the purposes of protecting and enhancing the scenic, recreational, and other environmental values of the project. For those purposes, the licensee shall also have continuing responsibility to supervise and control the use and occupancies, for which it grants permission, and to monitor the use of, and ensure compliance with the covenants of the instrument of conveyance for, any interests that it has conveyed, under this article. If a permitted use and occupancy violates any condition of this article or any other condition imposed by the licensee for protection and enhancement of the project's scenic, recreational, or other environmental values, or if a covenant of a conveyance made under the authority of this article is violated, the licensee must take any lawful action necessary to correct the violation. For a permitted use or occupancy, that action includes, if necessary, canceling the permission to use and occupy the project lands and waters and requiring the removal of any non-complying structures and facilities.

(b) The type of use and occupancy of project lands and waters for which the licensee may grant permission without prior Commission approval are: (1) landscape plantings; (2) non-commercial piers, landings, boat docks, or similar structures and facilities that can accommodate no more than 10 water craft at a time and where said facility is intended to serve single-family type dwellings; (3) embankments, bulkheads, retaining walls, or similar structures for erosion control to protect the existing shoreline; and (4) food plots and other wildlife enhancement. To the extent feasible and desirable to protect and enhance the project's scenic, recreational, and other environmental values, the licensee must require multiple use and occupancy of facilities for access to project lands or waters. The licensee must also ensure, to the satisfaction of the Commission's authorized representative, that the use and occupancies for which it grants permission are maintained in good repair and comply with applicable state and local health and safety requirements. Before granting permission for construction of bulkheads or retaining walls, the licensee must: (1) inspect the site of the proposed construction, (2) consider whether the planting of vegetation or the use of riprap would be adequate to control

erosion at the site, and (3) determine that the proposed construction is needed and would not change the basic contour of the impoundment shoreline. To implement this paragraph (b), the licensee may, among other things, establish a program for issuing permits for the specified types of use and occupancy of project lands and waters, which may be subject to the payment of a reasonable fee to cover the licensee's costs of administering the permit program. The Commission reserves the right to require the licensee to file a description of its standards, guidelines, and procedures for implementing this paragraph (b) and to require modification of those standards, guidelines, or procedures.

(c) The licensee may convey easements or rights-of-way across, or leases of project lands for: (1) replacement, expansion, realignment, or maintenance of bridges or roads where all necessary state and federal approvals have been obtained; (2) storm drains and water mains; (3) sewers that do not discharge into project waters; (4) minor access roads; (5) telephone, gas, and electric utility distribution lines; (6) non-project overhead electric transmission lines that do not require erection of support structures within the project boundary; (7) submarine, overhead, or underground major telephone distribution cables or major electric distribution lines (69-kV or less); and (8) water intake or pumping facilities that do not extract more than one million gallons per day from a project impoundment. No later than January 31 of each year, the licensee must file three copies of a report briefly describing for each conveyance made under this paragraph (c) during the prior calendar year, the type of interest conveyed, the location of the lands subject to the conveyance, and the nature of the use for which the interest was conveyed.

(d) The licensee may convey fee title to, easements or rights-of-way across, or leases of project lands for: (1) construction of new bridges or roads for which all necessary state and federal approvals have been obtained; (2) sewer or effluent lines that discharge into project waters, for which all necessary federal and state water quality certification or permits have been obtained; (3) other pipelines that cross project lands or waters but do not discharge into project waters; (4) non-project overhead electric transmission lines that require erection of support structures within the project boundary, for which all necessary federal and state approvals have been obtained; (5) private or public marinas that can accommodate no more than 10 water craft at a time and are located at least one-half mile (measured over project waters) from any other private or public marina; (6) recreational development consistent with an approved report on recreational resources of an Exhibit E; and (7) other uses, if: (i) the amount of land conveyed for a particular use is five acres or less; (ii) all of the land conveyed is located at least 75 feet, measured horizontally, from project waters at normal surface elevation; and (iii) no more than 50 total acres of project lands for each project development are conveyed under this clause (d)(7) in any calendar year. At least 60 days before conveying any interest in project lands under this paragraph (d), the licensee must file a letter with the Commission, stating its intent to convey the interest and briefly describing the type of interest and location of the lands to be conveyed (a marked Exhibit G map

may be used), the nature of the proposed use, the identity of any federal or state agency official consulted, and any federal or state approvals required for the proposed use. Unless the Commission's authorized representative, within 45 days from the filing date, requires the licensee to file an application for prior approval, the licensee may convey the intended interest at the end of that period.

(e) The following additional conditions apply to any intended conveyance under paragraph (c) or (d) of this article:

(1) Before conveying the interest, the licensee must consult with federal and state fish and wildlife or recreation agencies, as appropriate, and the State Historic Preservation Officer.

(2) Before conveying the interest, the licensee must determine that the proposed use of the lands to be conveyed is not inconsistent with any approved report on recreational resources of an Exhibit E; or, if the project does not have an approved report on recreational resources, that the lands to be conveyed do not have recreational value.

(3) The instrument of conveyance must include the following covenants running with the land: (i) the use of the lands conveyed must not endanger health, create a nuisance, or otherwise be incompatible with overall project recreational use; (ii) the grantee must take all reasonable precautions to ensure that the construction, operation, and maintenance of structures or facilities on the conveyed lands will occur in a manner that will protect the scenic, recreational, and environmental values of the project; and (iii) the grantee must not unduly restrict public access to project waters.

(4) The Commission reserves the right to require the licensee to take reasonable remedial action to correct any violation of the terms and conditions of this article, for the protection and enhancement of the project's scenic, recreational, and other environmental values.

(f) The conveyance of an interest in project lands under this article does not in itself change the project boundaries. The project boundaries may be changed to exclude land conveyed under this article only upon approval of revised Exhibit G drawings (project boundary maps) reflecting exclusion of that land. Lands conveyed under this article will be excluded from the project only upon a determination that the lands are not necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control, including shoreline aesthetic values. Absent extraordinary circumstances, proposals to exclude lands conveyed under this article from the project must be consolidated for consideration when revised Exhibit G drawings would be filed for approval for other purposes.

(g) The authority granted to the licensee under this article must not apply to any part of the public lands and reservations of the United States included within the project boundary.

## APPENDIX B—401 Water Quality Certification Conditions

**Water Quality Certificate Conditions for the Martin Dam Hydroelectric Project No. 349 Issued By the Alabama Department of Environmental Management, May, 9, 2011.**

### Conditions of Certification:

#### LIMITATIONS

1. The operation of this project, including the operation of the turbines and existing turbine aeration systems, shall be managed such that dissolved oxygen (D.O.) criteria specified at ADEM Administrative Code Reg. 335-6-1 0-.09(2)4., 335-6-1 0-.09(3)4., and 335-6-10-.09(5)4, shall be maintained at all times at the monitoring point prescribed herein downstream of the project. Management steps required to maintain the D.O. concentration shall be implemented to assure that the 4.0 mg/l minimum D.O. criterion is maintained.

#### MONITORING AND REPORTING

2. The monitoring point for determining compliance with paragraph 1 above shall be located in an area immediately downstream of Martin Dam at the existing monitoring location indicated in Figure 1. The location is at approximately latitude 32.679350 N and longitude 85.911648 W.
3. The monitor in the Martin Dam tailrace will record D.O. concentrations and water temperature at 30-minute intervals during periods of hydroelectric generation following one continuous hour of generation beginning June 1 and extending through October 31. During flood events, the monitoring may be temporarily discontinued until tailrace elevations return to normal. The monitoring program will begin within 18 months of the effective date of a new license issued by the Federal Energy Regulatory Commission (FERC) for the Martin Project if the effective date is within the prescribed monitoring period. If the effective date of the license is not within the prescribed monitoring period, monitoring shall begin the following June 1. The monitoring program shall continue for a period of three years.
4. Alabama Power Company will provide adequate and frequent maintenance and calibration of the D.O. and temperature monitoring equipment to assure its proper operation. The D.O. monitoring equipment will be calibrated at an acceptable frequency using the manufacturer's recommendations, the modified Winkler Method, Method 360.2 of the Environmental Protection Agency's Method for

Chemical Analysis of Water and Wastes, latest edition, or other equivalent methods.

5. Dissolved oxygen and temperature monitoring reports shall be submitted with appropriate certifications to the ADEM within 90 days following the end of the annual monitoring period. Following the final year of monitoring, the complete set of data shall be submitted to ADEM for review and comment prior to submittal to the FERC. In addition to dissolved oxygen and temperature data, the monitoring reports shall specify whether turbines were in operation at the time of the dissolved oxygen and temperature measurements and the discharge rate of water flow passing through each turbine at the time of the measurements. Monitoring reports shall be submitted in an electronic form compatible with the Microsoft™ Excel and Word software.
6. An assessment of the effects of the operation of the Martin Project on the State of Alabama's water quality standards shall be conducted using the results of the monitoring as described in the previous paragraphs. If the monitoring results do not indicate compliance with the State of Alabama water quality standards (maintenance of a D.O. concentration of 4.0 mg/1 or greater), Alabama Power Company shall develop and implement measures to ensure compliance with the 4.0 mg/1 D.O. criterion through structural and/or operational modifications at the project as prescribed in paragraph I. The assessment shall be filed with ADEM within 6 months following the end of the three year monitoring period. As a part of the assessment Alabama Power Company shall furnish, at the Department's request, other data and information that may be available but not expressly required in this monitoring plan.
7. The Department also certifies that there are no applicable effluent limitations nor other limitations imposed under Sections 30 I (b) or 302 or other standards imposed under Sections 306 or 307 of the Clean Water Act. This certification does not, however, exempt Alabama Power Company from requirements imposed under the National Pollutant Discharge Elimination System for other discharges at these facilities regulated by the Department.

## APPENDIX C—Analysis of Potential to Operate the Martin Dam Project for Downstream Flood Control

### *Introduction*

The Downstream Landowners<sup>73</sup> assert that Alabama Power’s studies have been inadequate in evaluating and addressing flood damage that may occur to downstream property, lands, farms, timber, historical Indian artifacts, and wildlife. Specifically, they express concern regarding flood damage to their lands near or adjacent to the Tallapoosa River due to alleged mismanagement of releases from the Martin dam.

The Downstream Landowners request that Martin dam be operated with the unequivocal duty for downstream flood control, which would benefit downstream owners and farmers. Their comments in the public record focus on two floods in 2003 (both smaller than the 100-year flood). The Downstream Landowners claim that the 2003 floods (one from May 7-11, and the other from July 1-3) were allegedly the direct result of preventable flood events that were caused by Alabama Power’s “negligence” in operating Martin dam, and that the May 2003 and July 2003 flood events were common 4-year and 2-year flood events, respectively. The Downstream Landowners claim that a 3-day pre-evacuation plan could have eliminated the flooding downstream of Martin, Yates, and Thurlow dams in these events. In testimony made during the Judith P. Bryan et al. v. Alabama Power Company lawsuit hearing (2009 WL 153932 [Ala.]) (Court Case), the expert for the Downstream Landowners declined to state what lake level Alabama Power should have maintained at Lake Martin to prevent the flood; however, the expert opined that Alabama Power should have reserved between 2 and 3 feet of storage space during the summer months for flood control. Finally, the Downstream Landowners claim that the 2003 floods caused about \$2.1 million in damage.

The Downstream Landowners also mentioned other smaller floods in 2009 and 2010. A flood in late-March 2009 caused some damage, but farmers were able to re-plant because it was early in the season, while a flood in November/December 2009 flooded several hundred acres of mature cotton, causing a 50 to 60-percent loss for some farmers. A minor flood in late-March 2010 caused one farmer to replant about

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<sup>73</sup> Includes the following 19 landowners, farmers, and businesses: Euel A. Screws, Jr.; W. Thomas Dozier III; W. T. Dozier Farm, Inc.; Parmer G. Jenkins; R. Shepherd Morris, Sr.; Morris & Morris Farms, Inc.; Daniel G. Taylor; Mark B. Taylor; Carl E. Taylor; Milstead Farm Group, Inc.; Dale M. Taylor; Jimmy M. Dozier; Judy P. Bryan; Auttossee Plantation; L. A. Wisener; Howard T. Weir, III; Anne Weir; Charles E. Herron, Jr.; and Rock Springs Land & Timber, Inc.

100 acres of cotton. The Downstream Landowners provided no further detail on these 2009 and 2010 floods.

The Downstream Landowners identify two options which could provide flood control at Martin dam: (1) operate to pre-evacuate the pool in the face of weather reports of impending heavy rainfall events; and (2) require flood control as a project purpose and operate with dedicated flood control storage on a year-round basis. Staff conducted its own independent analysis to evaluate these two operation measures.

#### *Recurrence Interval of the May 2003 Flood Event*

The Downstream Landowners have characterized the May 2003 flood event as a “common” occurrence with a 4-year return interval. We reviewed the data provided by the Downstream Landowners for the May 2003 flood, and determined that the 4-year return interval flood flow calculated by the Downstream Landowners is based on the average rainfall occurring at 13 locations in the Tallapoosa basin during the period April 23 through May 31, 2003 rather than actual flow data over the same period. The frequency interval of rainfall events for each location varied widely, ranging from less than 1 year to as high as 20 years, and averaging **4 years**. An average “4-year rainfall event” is not the same as a “4-year flood event.” However, the landowners appear to use these terms interchangeably. When we analyzed the May 2003 data, we calculated that the May 2003 flood had a longer return interval of 10-25 years.<sup>74</sup> In other words, the May 2003 flood event is a much less common event than alleged by the Downstream Landowners. From these calculations, we conclude that rainfall in the basin is not the most appropriate measure to use in characterizing flooding, because rainfall does not necessarily have a high degree of correlation with flows in the receiving river. This is particularly true in this case where the Harris reservoir regulates flows in the basin.

#### *Staff Analysis, Pre-evacuate Lake Martin*

The Downstream Landowners recommend that the Martin Dam Project operate to pre-evacuate Lake Martin in the face of weather reports of impending heavy rainfall events. The Farmers state a 3-day pre-evacuation would have eliminated the flooding along the lower Tallapoosa River during the May and July 2003 floods.

In general, pre-evacuation procedures require an accurate prediction of the amount and distribution of rainfall, in combination with monitoring and analysis of the

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<sup>74</sup> Our estimate of flood frequency is based on the occurrence of flows measured upstream of the Martin Dam Project at the Horseshoe Bend flow gage.



flows in the project's water basin, to guide when a reservoir level should be lowered. Pre-evacuation measures are sometimes implemented in areas where inflows are highly predictable. Predictable inflows often occur in cases of snowmelt related floods in the spring, or when the project is located immediately downstream of another flood control reservoir. Pre-evacuation may also be used in cases where evacuated flows are unlikely to coincide with other flows in the project area. With inaccurate predictions of rainfall amount and distribution, and intervening tributary flows, pre-evacuation could actually exacerbate downstream flooding. This is the case for a project configuration such as the Martin Dam Project, in which downstream flooding is the result of releases from Martin dam in combination with inflows from tributaries along the Tallapoosa River downstream of Martin dam. Alabama Power has identified cases in which tributary inflow increased peak flows downstream of Martin dam by as much as 20 percent.

The downstream landowners provided an example of how pre-evacuation could be implemented to reduce downstream flooding. The example states, "And at any time their models indicate they will be spilling within the next 72 hours **and there is excess channel capacity downstream of the project**, they should commence that spill immediately....." This example demonstrates that excess channel capacity downstream of the project is a critical element of the pre-evacuation procedure.

The ability to quantify excess channel capacity is only as reliable as rainfall predictions and flow assessments in the region. Rainfall predictions in the vicinity of the Martin Dam Project have not been accurate. The March 9, 2011 filing by the Downstream Landowners included the March 2009 Alabama Supreme Court case, which stated, "The record shows that meteorologists had made errors in predicting the path of the storm such that heavy rains were not predicted for the Tallapoosa River Basin until June 30, 2003, the day before the heaviest rainfall of the storm on the morning of July 1, 2003." In this case pre-evacuation could have not been implemented without introducing the risk of larger floods.

In conclusion, we find that the reliability of forecasts of weather and rainfall in the Tallapoosa River watershed are inadequate to implement pre-evacuation on a regular basis.

#### *Staff Analysis, Dedicated Flood Control Storage at Lake Martin*

As part of the license application process, Alabama Power focused their modeling studies to assess the short-term and long-term effects that would result from a range of proposed reservoir level alternatives. Alabama Power's modeling focused on the winter time period, since that was the period they proposed changes to the flood guide curve. Alabama Power's general modeling method was to use the Alabama Power Project Routing Model (described below) to evaluate the reservoir levels and

outflows from Lake Martin, and the Corps software program HEC-RAS to evaluate effects (water levels and inundation) on downstream river reaches. Models were calibrated and, where necessary, verified using historical flow hydrograph and stage data, and flood effects were simulated using a 100-year design flood.

The Downstream Landowners requested that the Martin Dam Project operate with dedicated flood storage, but did not identify any specific level of storage for analysis. Staff conducted reservoir and riverine modeling to address the concerns of the Downstream Landowners. Our analysis focused on more frequently occurring flood events, and the spring/summer period, which is the period the farmers are most affected by flooding.

### *Modeling Parameters*

We focused our modeling on the May 2003 flood because it was a key recent flood discussed by the Downstream Landowners, and the focus of the Alabama Supreme Court Case. With the May 2003 flood, the majority of the heavy rainfall was located mostly upstream of Martin dam. Therefore, the operation of the Martin Dam Project could have an effect on downstream flooding along the lower Tallapoosa River and would demonstrate the maximum potential effect that Martin dam could have on downstream flooding, if it was to be used for flood control during the summer months.

The July 2003 flood<sup>75</sup> by comparison, was the result of heavy rainfall both upstream and downstream of Martin dam. During the July 2003 flood, there was a greater influence from tributary inflows downstream of Martin dam, compared to the May 2003 flood. Figure C-1, provides an example of the differences between the May and July 2003 stream flows on a tributary downstream of Martin dam, as recorded by USGS gage no. 02419000 Uphapee Creek near Tuskegee, Alabama.<sup>76</sup> This creek enters the Tallapoosa River a short distance downstream of Thurlow dam. The Uphapee Creek at this location has a drainage area of 333 square miles, and while stream flows recorded by this gage remained below 500 cfs during the May 2003 flood, it had a peak instantaneous value of 7,460 cfs on July 2, 2003 (USGS, 2012a). In comparison, the 100-year flood modeled by Alabama Power occurred in March of 1990, with a peak instantaneous value of 28,400 cfs on March 17, 1990.

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<sup>75</sup> We estimate that the July 2003 flood had a recurrence interval of about 5 years, while the Downstream Landowners stated that it was a 2-year flood.

<sup>76</sup> Figure C-1 also demonstrates the significance of tributary inflows to the Tallapoosa River downstream of Martin dam.

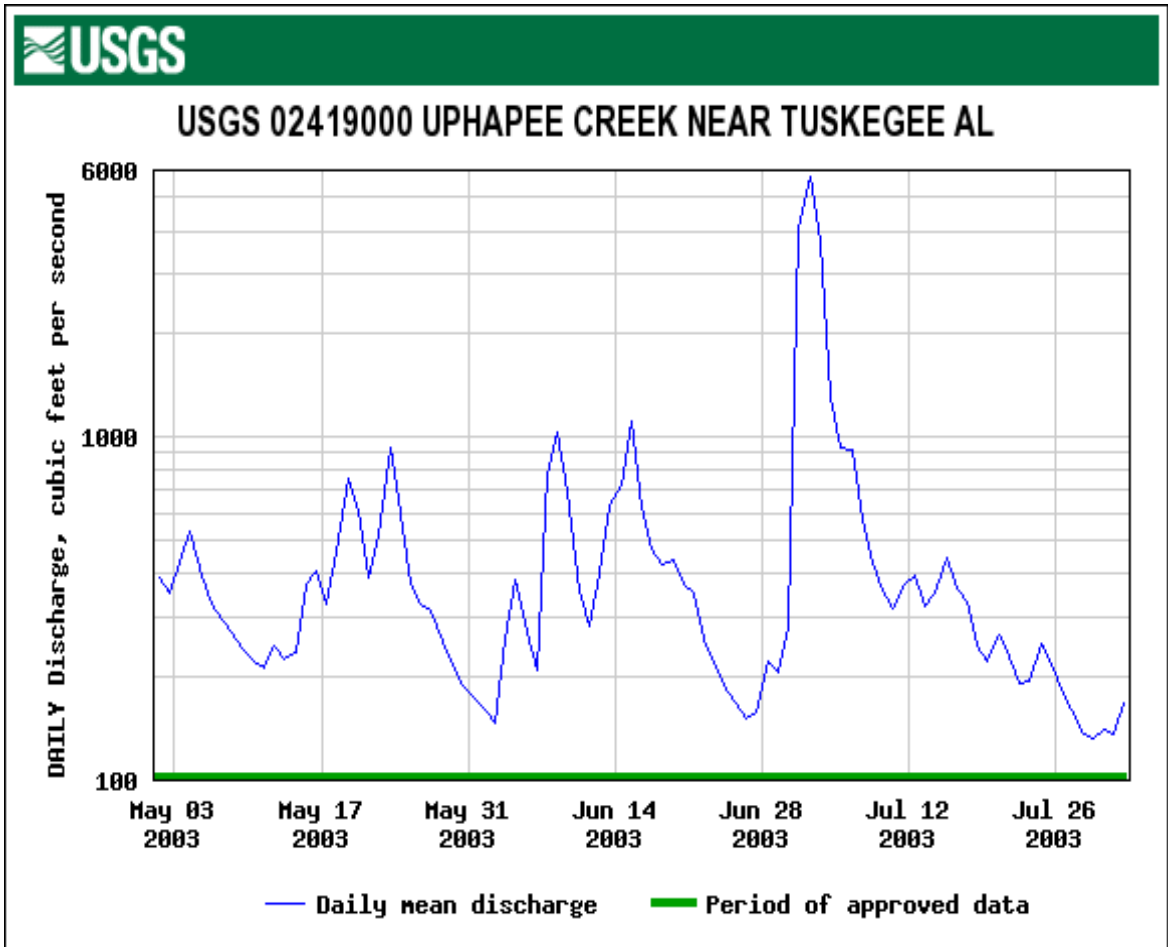


Figure C-1. Daily mean flows for Uphapee Creek, located downstream of Martin dam, for May 1, 2003 to August 1, 2003 (Source: USGS, 2012a). Uphapee Creek is representative of tributary inflows to the Tallapoosa River downstream of Martin dam.

Our modeling assessed the outflow from Lake Martin for the May 2003 flood while maintaining lower summer reservoir elevations of 488 and 486 feet msl (3 and 5 feet below the existing flood control guideline elevation 491 feet msl). We also estimated the reservoir elevation which would have been necessary to prevent the May 2003 flood. To assess a more frequently occurring flood event, we modeled an estimated

5-year flood event <sup>77</sup> with an initial reservoir level of 3 feet (elevation 488 feet msl) below the flood control guide.

As part of our modeling, we slightly adjusted the measured inflow to Lake Martin as measured immediately upstream of the reservoir at USGS Gage No. 02414715 Tallapoosa River at Horseshoe Bend, to provide a reasonable fit to the historic reservoir outflows and elevations for the May 2003 flood. At the start of the May 2003 flood, on May 7, Lake Martin had a reservoir elevation of 490.24. The peak outflow for the May 2003 flood was about 119,000 cfs. This hydrograph was then routed through Lake Martin using Alabama Power's spreadsheet reservoir model to obtain a discharge hydrograph with the starting lake levels at elevations 488 and 486 feet msl. The reservoir model followed current operational procedures of Alabama Power during flood conditions.

#### *Peak Flows*

Table C-1 and figures C-2 and C-3 show the results of our modeling. In the May 2003 flood the initial reservoir elevation of Lake Martin was 490.24 feet, resulting in an outflow from Martin dam which peaked at 119,000 cfs. The operation of Lake Martin, and reservoir storage created prior to the flood, reduced the peak outflow from 124,000 cfs to 119,000 cfs, a reduction of 5,000 cfs. With Lake Martin starting elevations of 488 and 486 feet, the peak outflow from Lake Martin would have been decreased to about 111,000 cfs and 94,000 cfs, respectively, compared to the actual outflow of 119,000 cfs. A starting elevation of 482 feet would have been required to reduce the peak outflow from Martin dam to 60,000 cfs, which is the flow Downstream Landowners states would avoid most downstream flooding.

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<sup>77</sup> We estimate that the May 2003 flood had a recurrence interval of between 10 and 25 years, contrary to the Downstream Landowners' assertion that it was a 4-year flood. Thus, to evaluate the more frequent flood events, we developed an inflow dataset representative of a 5-year flood.

Table C-1. Comparison of peak flows which would have occurred in May 2003 by implementing annual summer/fall drawdowns at Lake Martin.

Lake Martin Elevation (ft. msl)	Approximate drawdown May through October (ft.)	Peak flow from Martin dam (cfs)
491	0	124,000*
490.24	0.7	119,000
488	3	111,000
486	5	94,000
482	9	60,000

\* Staff recognizes that the modeled peak flow of 124,000 cfs is slightly less than the 128,000 cfs peak flow reported in Court Case. However we deem this an acceptable fit for modeled versus actual flow data.

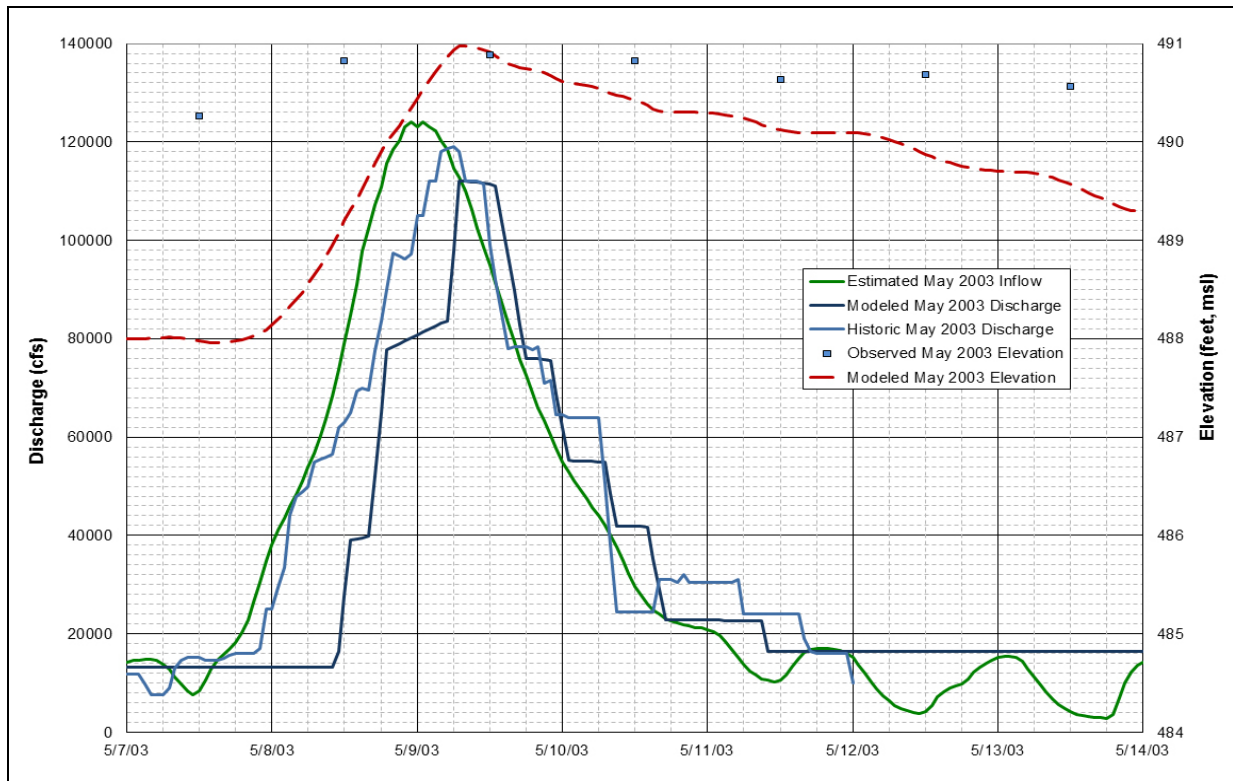


Figure C-2. May 2003 discharge from Martin dam with a reservoir elevation of 488 feet msl, with historical flow and reservoir level data (Source: staff).

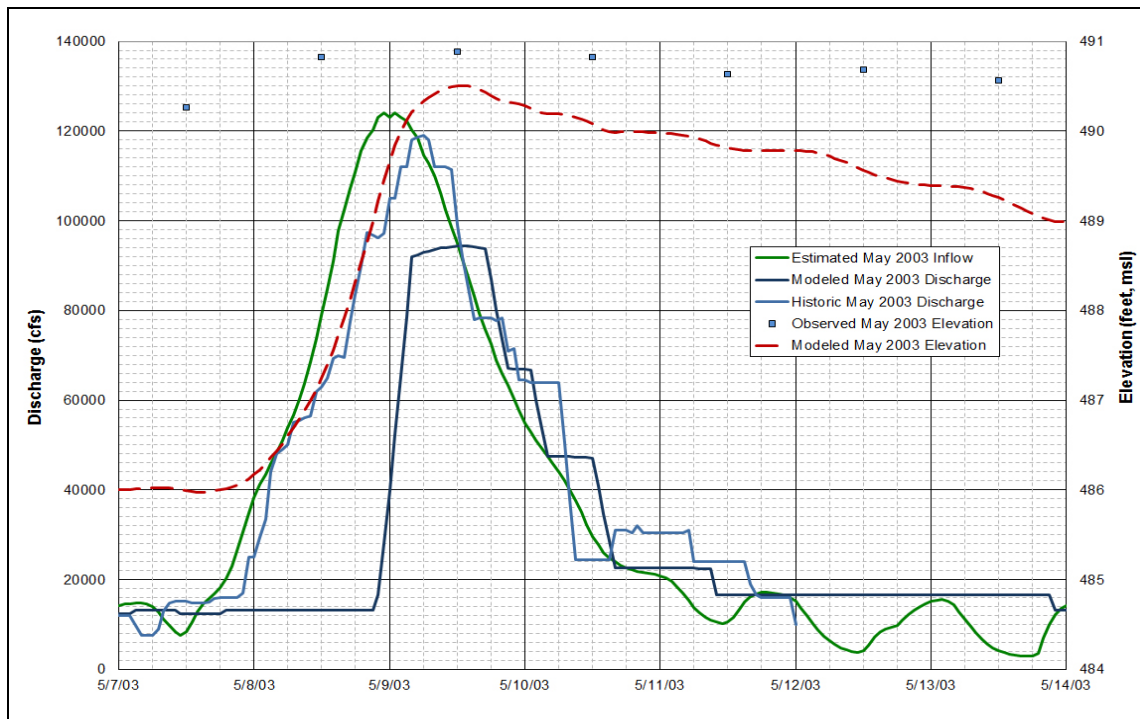


Figure C-3. May 2003 discharge from Martin dam with a reservoir elevation of 486 feet msl, with historical flow and reservoir level data (Source: staff).

### *5-Year Flood Event*

Downstream Landowners presented the May 2003 flood as an example of a frequently occurring flood (i.e., a 4-year flood event) which could have been significantly reduced or avoided had adequate storage been provided in Lake Martin. We estimated that the May 2003 flood had a recurrence interval of between 10 and 25 years. To evaluate more frequent flood events we estimated that the 5-year flood event would be about 67 percent of the observed May 2003 peak inflow at the Horseshoe Bend gage located above Lake Martin, on the basis of the computed 1-day average flow using data as shown in table C-2. This estimated 5-year inflow flood hydrograph was routed through Lake Martin using the Alabama Power spreadsheet reservoir model.

The results for a 5-year inflow flood are displayed in table C-3 and figure C-4. Our analysis shows that a peak inflow rate of 82,000 cfs would be decreased to an outflow of about 78,000 cfs at an initial reservoir elevation of 490.24 feet msl, but would be decreased to an outflow of about 43,000 cfs with an initial reservoir elevation of 488 feet msl. Thus, in this case, assuming no tributary inflows downstream of Martin dam, a 3-foot drawdown would have been adequate to avoid the 5-year flood event.

Table C-2. Calculated flood frequency flows (in cfs) for Martin dam and historical flood flows (in cfs) at Martin dam and the Tallassee gage (Source: Alabama Power, 2010f; Alabama Power, 2011a; USGS, 2012).

<b>Calculated Unimpaired Flows at Martin Dam</b>								
Average Flow	2-Year	5-Year	10-Year	50-Year	100-Year	500-year	April 1979	March 1990
1-day	48,000	72,000	87,000	118,000	130,000	156,000	114,551	125,019
3-days	NA	NA	66,400	91,400	102,000	125,000	92,446	103,610
5-days	NA	NA	51,800	71,700	80,100	99,600	68,262	78,483
<b>Historical Recorded Flows from Martin Dam</b>								
Average Flow		March 1990	May 2003	July 2003				
1-day		105,884	96,035	59,038				
3-days		75,665	66,522	47,945				
5-days		59,141	47,236	36,200				
<b>Historical Recorded Flows from the Tallassee Gage</b>								
Average Flow	April 1979	March 1990	May 2003	July 2003				
1-day	110,000	125,000	94,000	68,900				
3-days	76,433	85,667	62,967	51,133				
5-days	59,240	66,940	45,800	39,580				

Table C-3. Comparison of peak flows which would have occurred for a 5-year flood by implementing annual summer/fall drawdowns at Lake Martin.

Lake Martin Elevation (feet msl)	Approximate drawdown May through October (feet)	Peak flow from Martin dam (cfs)
491	0	82,000
490.24	0.7	78,000
488	3	43,000

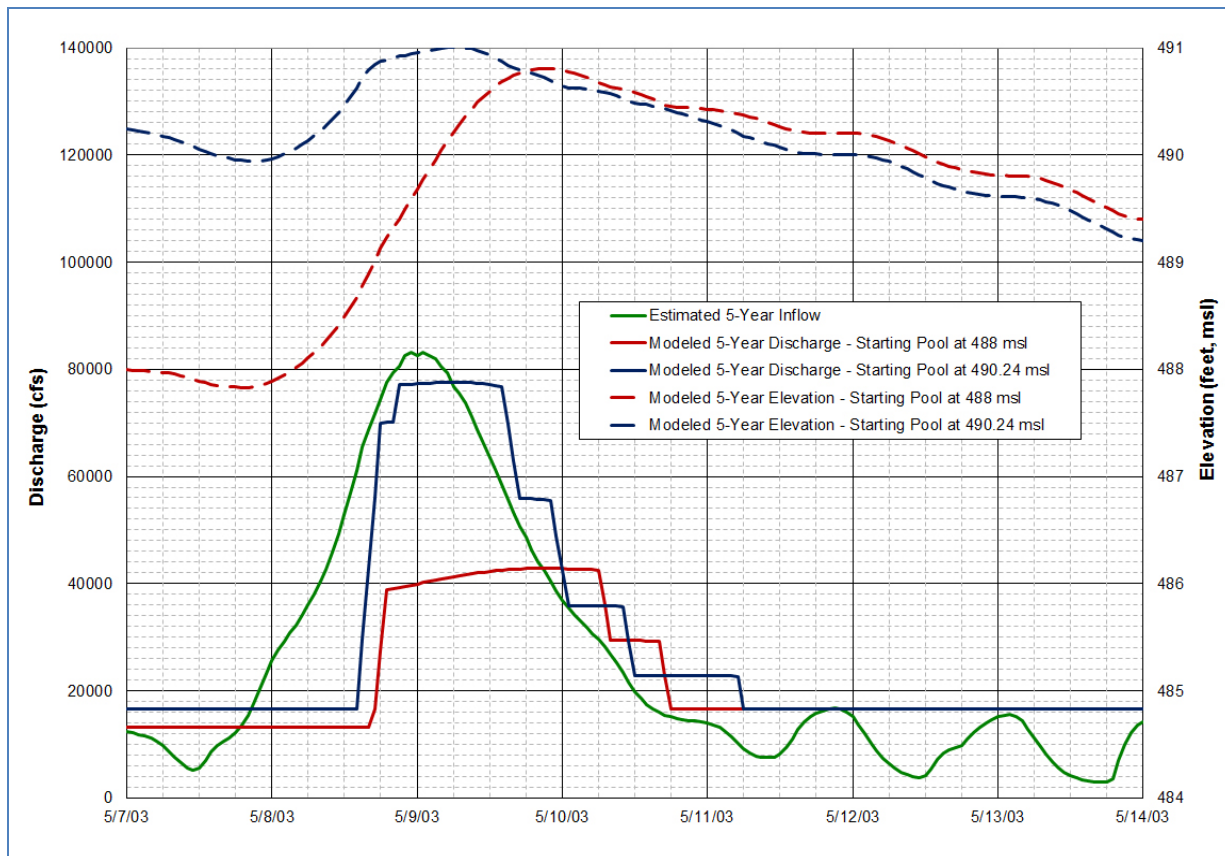


Figure C-4. Modeled 5-year flood discharge from Martin dam (Source: staff).

The discharge hydrographs from our modeled May 2003 flood and 5-year flood described above were then used as input to the upstream boundary of the Lower Tallapoosa HEC-RAS model developed by Alabama Power. The lateral hydrographs representing inflow from tributaries downstream of Lake Martin remained unchanged for our HEC-RAS modeling as compared to Alabama Power’s calibration run for the May 2003 storm. The resulting HEC-RAS profiles for the two modeled scenarios, compared to historic conditions are shown in figures C-5 and C-6. These figures show that peak flood levels along the lower Tallapoosa River would have been about 0.7 to 1.2 feet lower with an initial reservoir elevation of 488 feet msl at the beginning of the May 2003 flood. Similarly, flood levels along the lower Tallapoosa River would have averaged about 2 feet lower with an initial reservoir level of 486 feet msl. HEC-RAS modeling associated with the smaller 5-year flood event with starting reservoir elevation of 488 feet msl indicated that peak water levels in the lower Tallapoosa River would be 2 to 8 feet lower than what would occur with an initial reservoir elevation of 490.24 feet msl (figure C-7).



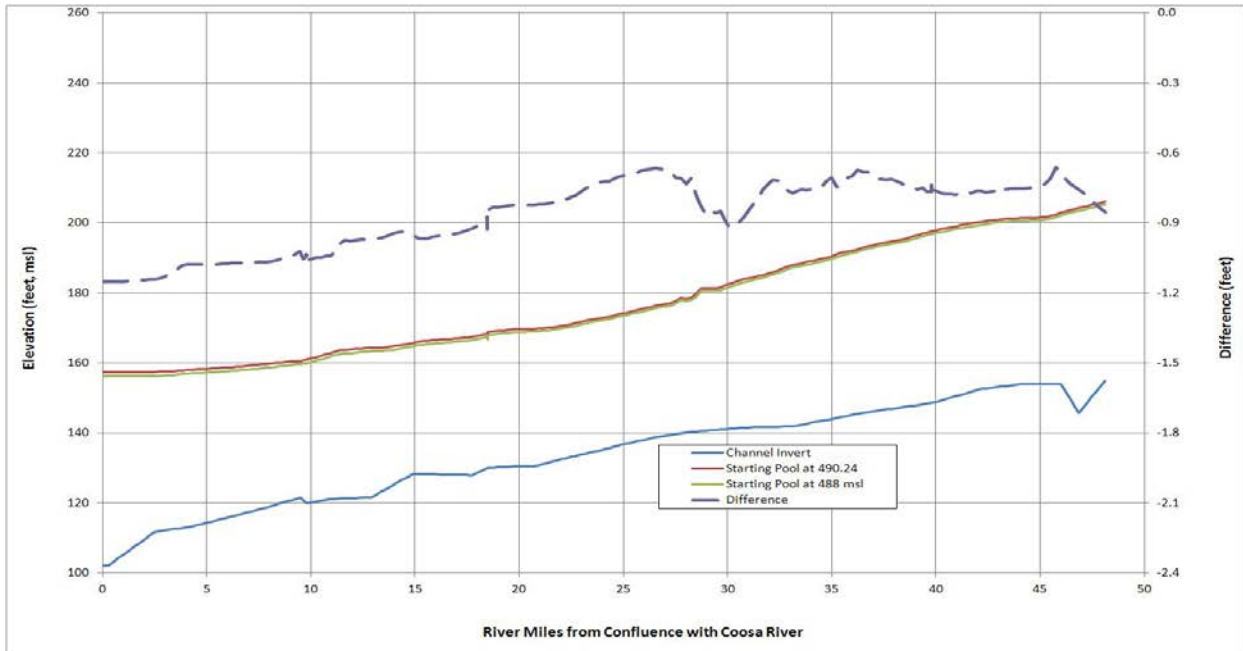


Figure C-5. May 2003 flood profile for the lower Tallapoosa River with a reservoir elevation of 488 feet msl, and difference from historical conditions (starting pool of 490.24 feet msl) (Source: staff).

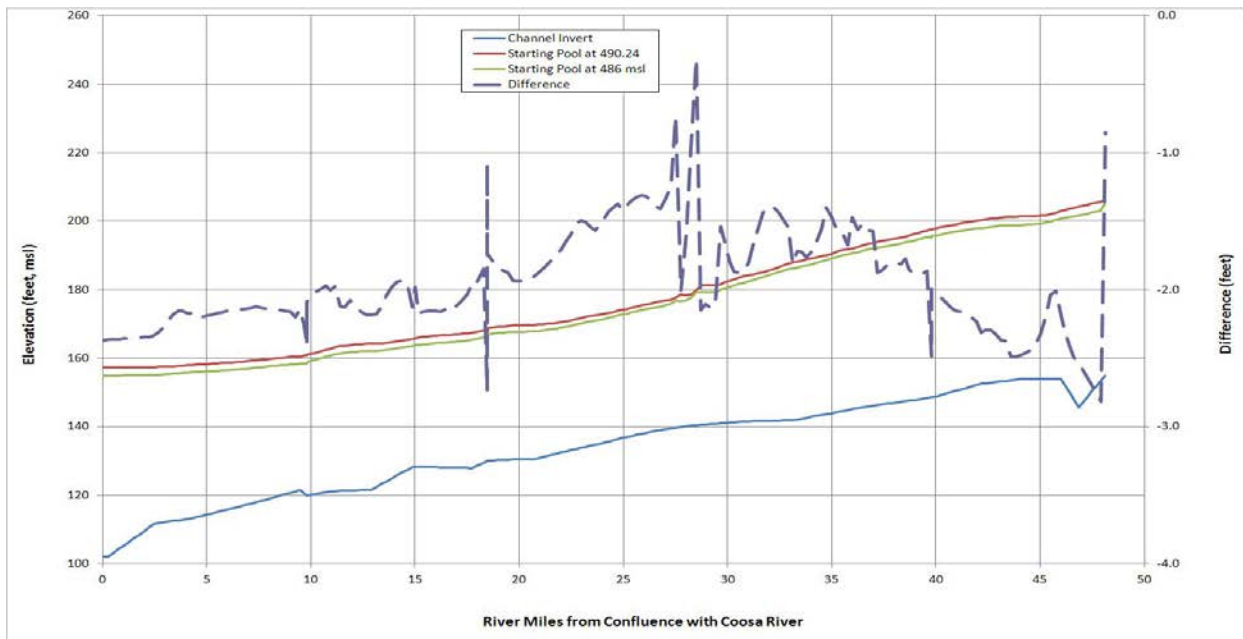


Figure C-6. May 2003 flood profile for the lower Tallapoosa River with a reservoir elevation of 486 feet msl, and difference from historical conditions (starting pool of 490.24 feet msl) (Source: staff).

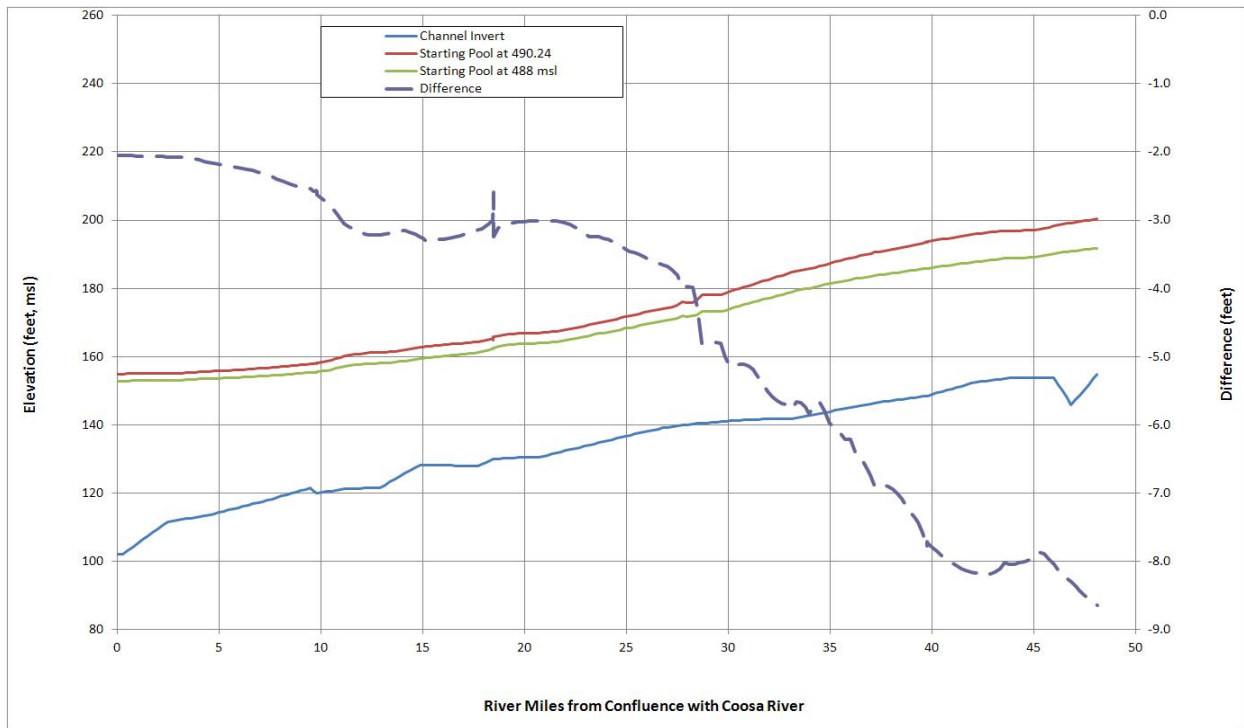


Figure C-7. Five-year flood profile for the lower Tallapoosa River with a reservoir elevation of 488 feet msl, and difference from historical conditions (starting pool of 490.24 feet msl) (Source: staff).

### *Acres Flooded*

We also analyzed the amount of land along the lower Tallapoosa River that would have been flooded in the May 2003 flood under the modeled lower reservoir levels. We used data from Alabama Power’s mapping as presented in Study Plan 12(a) Appendix D: Inundation Mapping & Assessment, which we summarize in table C-4.

Table C-4. Estimated downstream acres of land affected by flooding associated with alternative winter pool levels, at the 100-year flood level (Source: Alabama Power, 2010f).

<b>Model Scenario (elev. feet msl)</b>	<b>Inundated Area (acres)</b>	<b>Inundated Area (acres) by Land Use Category</b>			
		<b>Agricultural</b>	<b>Industrial</b>	<b>Commercial</b>	<b>Residential</b>
481 (existing)	19,924	17,733	448	385	23
482	20,256	18,063	449	385	23
483	20,568	18,354	459	393	25
484 (Alabama Power)	22,043	19,774	478	408	46
485 (Lake Martin RA)	22,500	20,097	491	496	79
486 (Lake Martin HOB)	23,277	20,752	581	513	94
489	24,353	21,499	607	560	1,230

Table C-5. Comparison of downstream inundation which would have occurred in May, 2003 by implementing annual summer/fall drawdowns at Lake Martin.

Lake Martin Elevation (ft. msl)	Approximate drawdown May through October (ft.)	No. acres inundated by flood (acres)
491	0	NA
490.24	0.7	19,500
488	3	18,880
486	5	17,770
482	9	NA

We calculated (Table C-5) that about 19,500 acres of mostly agricultural land were inundated during the May 2003 flood event. Under lower Lake Martin elevations of 488 and 486 feet msl, we estimate that the extent of inundated area in our modeled 2003 flood event would drop to 18,880 and 17,700 acres, respectively. Our modeled water levels for the May 2003 flood, with the three different initial Lake Martin water levels remained below the 100-year flood modeled by Alabama Power, which had an initial Lake Martin elevation of 481 feet msl, and was estimated to affect 18 structures (see table 3-10 in this draft EIS). Because our modeled May 2003 floods were lower than the modeled 100-year flood, fewer structures than 18 would be affected. We were

unable, however, to estimate the precise number of structures that could be affected by the smaller floods, with available information.

### *Generation*

We also analyzed the effects of lower Lake Martin water levels of 488 and 486 feet msl, from May 1 until September 1, on generation at the Martin Dam Project by analyzing four representative water years, 2003, 2004, 2005, and 2006 as summarized below in table C-6. As expected, generation was generally reduced due to the lower head. However, in some years (2003 in particular) a lower reservoir level would allow higher river flows to be retained in Lake Martin and then used later (for generation) as the reservoir level was drawn down to return to the modeled elevations of 488 or 486 feet msl. This compares to the current operations where the reservoir level is kept near elevation 490.5 feet msl, with limited ability to retain high-flow events. The ability to capture high-flow events would be more apparent at elevation 486 feet msl than at elevation 488 feet msl.

Our calculations showed that at a summer lake level of 488 feet msl, annual generation at the Martin Dam Project would decrease by an average of 8,800 MWh at a cost of \$630,000, for the four years modeled.<sup>78</sup> At a lower summer reservoir elevation of 486 feet msl, annual generation at the project would decrease an average of 8,100 MWh at a cost of about \$587,000, for the four years modeled.

The four years modeled include a range of low-to-high water years, thus the average for these years should be characteristic of the level of generation losses which could be expected if annual drawdowns were implemented. However, for the four years analyzed we note a wide range of generation losses, from \$150,000 in Water Year 2006 to \$1,421,363 for Water Year 2005. Generation losses could be further refined if a longer period of record were analyzed.

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<sup>78</sup> The value of power was calculated using the same assumptions identified in section 4.0, Developmental Analysis, of the draft EIS. The power value includes the energy rate of \$72.50/MWh and the dependable capacity rate of \$145.50/kilowatt-year.

Table C-6. Estimates for generation changes under lower spring and summer Lake Martin water levels (Source: staff).

<b>Water Year &amp; Period Modeled</b>	<b>Historical (MWh)</b>	<b>Modeled 3 ft. Lower Pool (MWh)</b>	<b>Difference</b>	<b>Modeled 5 ft. Lower Pool (MWh)</b>	<b>Difference</b>
<b>Water Year 2003</b>					
10/1/02 – 11/15/02	45,935	42,146	3,789 (loss)	44,396	1,539 (loss)
3/10/03-9/30/03	334,353	325,594	8,759 (loss)	332,071	2,282 (loss)
Net Total			12,548 (loss)		3,821 (loss)
Value			\$909,730 (loss)		\$277,020 (loss)
<b>Water Year 2004</b>					
3/10/04-9/30/04	107,451	106,559	892 (loss)	110,826	3,375 (gain)
Net Total			2,325 (loss)		3,652 (loss)
10/1/03 – 11/15/03	33,800	32,367	1,433 (loss)	26,773	7,027 (loss)
Value			\$168,562 (loss)		\$264,770 (loss)
<b>Water Year 2005</b>					
10/1/04 – 11/15/04	48,439	43,701	4,738 (loss)	38,459	9,980 (loss)
3/10/05-9/30/05	289,975	275,108	14,867 (loss)	277,096	12,879 (loss)
Net Total			19,605 (loss)		22,859 (loss)
Value			\$1,421,363 (loss)		\$1,657,280 (loss)
<b>Water Year 2006</b>					
10/1/05 – 11/15/05	27,197	30,368	3,171 (gain)	24,776	2,421 (loss)
3/10/06-9/30/06	102,485	98,592	3,893 (loss)	102,831	346 (gain)
Net Total			722 (loss)		2,075 (loss)
Value			\$52,345 (loss)		\$150,440 (loss)
<b>Average for</b>					

<b>Water Year &amp; Period Modeled</b>	<b>Historical (MWh)</b>	<b>Modeled 3 ft. Lower Pool (MWh)</b>	<b>Difference</b>	<b>Modeled 5 ft. Lower Pool (MWh)</b>	<b>Difference</b>
<b>Water Years 2003-2006</b>					
Average generation loss (MWh/year)			8,800		8,100
Value of energy (\$/year)			638,000		587,250

Notes: Water Year 2003 was a generally wet year, Water Year 2004 was a slightly dry year, Water Year 2005 was a slightly wet year, and Water Year 2006 was a near average year.

#### *Dependable Capacity*

Summer drawdowns could greatly reduce dependable capacity at the Martin Dam Project. Staff did not conduct a detailed analysis of dependable capacity losses because such an analysis would require information for a long-term period of record, which is not readily available. Alabama Power estimates the present dependable capacity for the project is 179,000 kW valued at \$26,044,500/year. In the staff analysis, annual generation from the project was estimated to be about 377,161 MWh valued at \$27,344,170; thus, dependable capacity provided about half the power benefit of \$53,388,670 for the project. As a rough estimate, average annual generation for the four years analyzed would be reduced by about 2.3 percent for a 3-foot drawdown. A similar reduction in dependable capacity would be about 4,176 kW valued at \$607,675/year. Annual losses in generation and dependable capacity would total \$1,245,675 for a 3-foot drawdown.

#### *Damages to Downstream Landowners*

Staff has no information on the damages associated with a 5-year flood event; however, it can be assumed to be far less than the number reported by the Downstream Landowners for 2003, which we estimated more likely represents the 10-25 year storm event. The Downstream Landowners stated the losses due to flooding in 2003 were about 2.1 million dollars. The Downstream Landowners estimate is based on a survey of landowners in which 11 landowners responded (table C-7).

It is important to note that the stated losses were for both the May and July 2003 floods; thus it is not possible to distinguish the percentage of losses attributed to the May 2003 flood which was analyzed by staff. In addition, the losses were a combination of crop losses (estimated at \$1,569,428) and other losses (river bank repairs estimated at \$545,091). Assuming a flood such as the one in May 2003 occurs about every 10 years, the \$2.1-million loss reported by the Downstream Landowners would be equivalent to a loss of about \$210,000 per year.

Table C-7. Downstream Landowner Losses in 2003, May and July Floods.

	<b>Crop Losses</b>	<b>Additional Production</b>	<b>Other (River Bank Repairs)</b>	<b>Total</b>
	92338	0	362600	454938
	37439	10768	0	48207
	336046	0	50500	386546
	50700	10400	30000	91100
	172482	2880	0	175362
	85020	0	0	85020
	362160	15793	79941	457894
	37076	3539	1350	41965
	17964	6728	20700	45392
	270457	0	0	270457
	107746	0	0	107746
<b>Total</b>	<b>\$1,569,428.00</b>	<b>\$50,108.00</b>	<b>\$545,091.00</b>	<b>\$2,164,627.00</b>

*Downstream Minimum Flows, Drought Operations*

Lower reservoir elevations in the summer can affect the ability of the project to provide minimum flows, especially during drought years. Currently, the Martin Dam Project operates to maintain a 1,200-cfs minimum flow as measured below Thurlow dam. In Lake Martin, every foot of storage represents about 40,000 acre-feet, or enough water to supply 1,200 cfs for about 17 days. Thus, a 3-foot drawdown would be equivalent to about 51 days of providing a 1,200-cfs minimum flow. A 5-foot drawdown would be equivalent to about 85 days of providing a 1,200-cfs minimum flow.

Lower reservoir elevations in the summer increase the likelihood of triggering drought operations. Staff notes that drought operations have occurred infrequently on Lake Martin; however, had the lake been maintained at elevation 488.0 feet in 2000 (i.e., providing 3 feet of storage), with historical releases the reservoir would have dropped enough to trigger drought operations by July of that year.





## APPENDIX D—Staff’s Response to Comments on the Martin Dam Project Draft EIS

The Commission staff issued its draft environmental impact statement (draft EIS) for the proposed relicensing of the Martin Dam Hydroelectric Project on June 6, 2013. Staff requested comments on the draft EIS be filed by August 13, 2013. The following entities and individuals filed comments on the draft EIS.<sup>79</sup>

Commenting Entity	Date Filed
Over 753 individuals with an interest in Lake Martin lake levels	7/5/2013 – 8/31/2013 <sup>80</sup>
State of Georgia, Georgia Department of Natural Resources Environmental Protection Division	8/13/2013
Atlanta Regional Commission	8/13/2013
Alabama Office of Water Resources	8/12/2013
Alabama Department of Conservation and Natural Resources	8/13/2013
Alabama Historical Commission	8/21/2013
Robert Bentley, Governor of the State of Alabama	8/14/2013
Senator Richard C. Shelby	8/29/2013
Congressman Mike Rogers, 3rd District, Alabama	8/12/2013
Euel Screws and Thomas Dozier	7/31/2013, 8/7/2013, 8/13/2013
Lake Martin HOBOS - Dave Heinzen	8/12/2013
Lake Martin HOBOS - Jesse Cunningham	8/13/2013

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<sup>79</sup> Comments also were made at the public meeting on the draft EIS on July 17, 2013. Those comments can be viewed in the transcript of the meeting (see Transcript of the 7/17/13 Public Meeting held in Alexander City, Alabama re the Martin Dam Hydroelectric Project under P-349, filed on July 17, 2013). All themes raised in the meeting are addressed in response to the written questions, many of which update or expand upon thoughts shared at the meeting.

<sup>80</sup> This count includes comments that were filed after the August 13, 2013 deadline (through the entire month August, 2013) in order to be as inclusive as possible. While about 36 comment filings were made after the deadline, the themes addressed below were all raised in the record prior to the deadline. Finally, we have responded to one additional comment that was filed on March 5, 2015. That comment (Comment 46 below) related to an Additional information Request we made on August 11, 2011 related to the Pleasure Point Park.

Lake Watch of Lake Martin - Kathryn Braund	8/14/2013
Lake Martin Resource Association - Steve Forehand	8/13/2013
Conservation Groups	8/13/2013
U.S. EPA, Region 4	8/20/2013
U.S. Department of Interior, Atlanta	8/13/2013
U.S. Army Corps of Engineers	8/12/2013
Mark Stirling, Auburn, AL	8/5/2013
William K. Haynes, Dadeville, AL	8/5/2013
Patrick R. England	3/6/2015

In this Appendix we summarize the substance of the comments received, provide responses to those comments, and explain how the text of the draft EIS was modified, as appropriate, to address the comments. Unless otherwise noted, changes addressing editorial comments or corrections were made to the final EIS, but are not described below. Comments are divided by resource areas.

#### DISSOLVED OXYGEN (DO) AND WATER QUALITY

1. **Comment: EPA Region 4** comments that DO monitoring should occur when generating and not generating and the results compared. EPA Region 4 comments that when not generating, the DO criterion is 5 mg/l. EPA Region 4 asks how far downstream the 4 mg/l standard applies below a hydropower facility before the ambient criterion of 5 mg/l becomes the threshold.

**Response:** Because both the Yates and Thurlow developments operate mainly as run-of-river developments and rely on the Martin Project’s storage to meet the minimum flow requirement for the Thurlow Project, Alabama Power must release water continually from Martin Dam, usually by generating. Therefore, there is little non-generation time to monitor or to which to apply a non-generation DO criterion. The 401 Water Quality Certificate requires monitoring compliance with the state water quality criteria “...immediately downstream of Martin dam at the existing monitoring station...”

2. **Comment: Alabama Power** comments that the \$1,123,960 per year cost for monitoring water quality in the tailrace and Lake Martin is incorrect. Alabama Power states the correct cost should be \$70,000 per year.

**Response:** On February 12, 2015 Alabama Power clarified the cost information it filed on December 9, 2011. All costs in the final EIS, including costs for monitoring water quality, have been revised and adjusted to 2015 dollars.

- 3. Comment: EPA Region 4** comments that three years of monitoring early in the license term is good, but monitoring is needed later in the license term, particularly in times of drought.

**Response:** This EIS discusses Alabama Power's tailrace temperature and DO data from 2002 through 2009. That water quality record includes a severe drought year, with an estimated average return frequency of greater than 50 years, in 2007. It also includes only two incidents of tailrace DO conditions falling below 4 mg/L while generating. Since 2009, Alabama Power has continued to monitor DO in the summer during generation as a requirement of the existing license. Combined with this existing data, o three more years of post-license monitoring, the data record should be adequate to evaluate the effectiveness of Alabama Powers' DO measures.

#### INCREASE IN WINTER POOL ELEVATION

- 4. Comment: Over 736 individuals, Alabama Governor Robert Bentley, Congressman Mike Rogers (3<sup>rd</sup> District, Alabama), the Lake Martin HOBO, LakeWatch of Lake Martin, and Lake Martin RA** provided comments supporting Alabama Power's proposed 3-foot increase in the winter pool elevation because they see the flooding risks as small and the recreational and economic benefit to be large. Alabama Power requests that we reconsider the 3-foot winter pool increase.

**Response:** In the draft EIS we did not recommend the winter pool increase because initial studies indicated some potential for downstream flooding. As discussed in section 5.2.2 *Measures Recommended by Staff*, Alabama Power conducted additional modelling to refine the initial analysis and further evaluate the potential for downstream flooding and the safety of the dam. Alabama Power's modeling results show that a 3-foot increase in the winter pool is unlikely to result in increased flood effects. In light of these results and the benefits to recreation and drought management, as well as minor benefits to paddlefish spawning, we now recommend the 3-foot increase in winter pool elevation.

- 5. Comment: The State of Georgia and Atlanta Regional Commission** comment that the Commission should not allow a 22.2% reduction in winter flood storage without adequate analysis. The **Corps** requests additional modeling of effects of raising the winter pool elevation on flows downstream of Montgomery, AL.

**Response:** Between November 8, 2013 and June 19, 2014, Alabama Power performed additional, refined analysis to evaluate the effect of the proposed change in operation on potential flooding. On July 14, 2014 Alabama Power filed the

resulting study report, and the supporting modeling documentation, with the Commission. Alabama Power's modeling results indicate that under this alternative additional flooding would be unlikely to occur.

6. **Comment: Frances Clement** interprets the Alabama Supreme Court Case, *Bryan v. Alabama Power Company* as finding that Alabama Power does not “have a heightened duty of flood control,” but only a responsibility to, “exercise reasonable care in operating or maintaining the dam.” She also observes that the changes in the conditional fall extension and the increased winter pool elevation proposed by Alabama Power would occur during the lower flow period of the year with smaller probabilities of large floods. Given these arguments, she argues that there is no reason that flood risk should prevent the implementation of Alabama Power's proposal.

**Response:** While it is not our role to interpret the rulings of the state courts, we do review the technical information available from *Bryan v. Alabama Power Company* in this EIS (see section 3.3.2.2, *Water Quantity* and Appendix C). We have also reviewed additional modeling carried out by Alabama Power, which reflects the lower risk of large storms and flooding during the period of the year in which the conditional fall extension and the increased winter pool elevation are proposed by Alabama Power. Alabama Power's modeling results indicate that under this alternative additional flooding would be unlikely to occur. Thus we now recommend Alabama Power's proposal.

7. **Comment:** Recognizing that we concluded in the draft EIS that we could not recommend the higher winter pool elevation and conditional fall extension because of potential downstream flooding effects described in the initial flood analysis, **Richard Marks** outlines a compromise operational regime including: (1) a delayed drawdown to 10/15 using proposed criteria with the 2-foot option for lake Harris as a criterion for the conditional fall extension; (2) maintaining at winter pool at a 10-foot drawdown only for 1 month (January); and (3) filling the reservoir from Feb 1 through April 15.

**Response:** As discussed above, based on the additional flooding analysis, we now recommend Alabama Power's proposal. Thus, we do not need to analyze the compromise alternative developed with the goal of partially implementing Alabama Power's proposal.

8. **Comment: LakeWatch of Lake Martin** comments that an increase winter pool elevation would help with ensuring proper summer pool elevation. **Will Legg** comments that a higher winter pool elevation reduces the risk from drought which could affect people's employment. **Jim Bain** comments that both raising the winter pool and extending the summer pool to October 15 would protect drinking water intakes.

**Response:** The EIS weighs these and other benefits against the risk of flooding. Based on the additional flooding analysis, we now recommend both the increase in winter pool elevation and the conditional fall extension of the summer pool. Staff also recommends implementing the Tallapoosa River Portion of ADROP, which takes into account protection of water intake elevations and summer pool elevations.

#### CONDITIONAL FALL EXTENSION

9. **Comment: Over 736 individuals, Alabama Governor Robert Bentley, Congressman Mike Rogers (3<sup>rd</sup> District, Alabama), the Lake Martin HOBO, LakeWatch of Lake Martin, and LMRA** provided comments supporting the conditional fall extension of the summer pool. They see the flooding risks as small and the recreational and economic benefit to be large. Several citizens commented that although the conditional fall extension would occur only in one in three years or less often, they were satisfied with the possibility of having the potential for a longer recreation season. Alabama Power requested that we reconsider the conditional fall extension.

**Response:** As discussed in section 5.2.2 *Measures Recommended by Staff*, we conclude that the benefits to recreation from the conditional fall extension will be experienced at least occasionally. Alabama Power proposes the measure and stakeholders support it. Adverse effects on aquatic resources, flooding, and public safety are unlikely. Given the benefits and the small risk of adverse impacts, we now recommend implementing this measure.

10. **Comment:** The **Lake Martin RA** comments that changing the Lake Harris elevation criterion 4 from within 1 foot of full pool to within 2 feet of full pool would increase the occurrence of the conditional fall extension.

**Response:** We discuss this proposal in the final EIS. We do not recommend this criterion be adopted because it is counter to ensuring that the conditional fall extension is implemented only in years of adequate flow to avoid exacerbating drought stress on the system.

## DOWNSTREAM CROP FLOODING

11. **Comment:** **Euel Screws** and **Thomas Dozier** raise the concern that the role of the U.S. Army Corps of Engineers is underrepresented in the draft EIS. They also point out that the draft EIS discusses managing flood events through mutual, verbal agreement with the Corps and question what happens if agreement is not reached. They also comment that Alabama Power is given discretion in managing floods. Finally, they comment that in the environmental analysis (pp 29-139) erosion was discussed, but not flood prevention.

**Response:** On October 31, 2014, the Corps' issued its Final EIS for Updates to the Master Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin, and draft Master Water Control Manual for the ACT basin. We have reviewed these documents and made several adjustments in this final EIS to ensure that the documents are consistent and compatible. The Corps' final EIS and Master Water Control Manual describe the roles of the Corps and Alabama Power in managing floods under the Master Water Control Manual adopted for the basin. The discussion includes mechanisms for seeking deviations from the requirements of the Master Water Control Manual, measures for back-up communications, and instructions on how to proceed if communications are lost because of disaster conditions. The details can be found in the Corps' FEIS and draft manual. Finally, the discretion in managing operations by Alabama Power that the commenters refer to, such a previous amendments to water level and release requirements and flow releases at Lake Martin, have been authorized by the Commission and the Corps after review by both agencies.

12. **Comment:** **Euel Screws** and **Thomas Dozier** comment that in the environmental analysis erosion was discussed, but not flood prevention.

**Response:** Flood prevention is not discussed in the same section as erosion, but is discussed in section 3.3.2.2, *Water Quantity*, and is the primary subject of Appendix C.

13. **Comment:** **Euel Screws** and **Thomas Dozier** describe the costs of flooding on the downstream farmers.

**Response:** The cost of flooding on downstream farmers is discussed in Appendix C and Section 5 of the final EIS.

14. **Comment:** **Jesse Cunningham** comments that Federal Crop Insurance is available to farmers below Martin Dam. He adds he thinks a low risk of additional flooding associated with the Alabama Power proposal makes it unlikely such insurance would be needed as a result of the proposal. He contrasts this information with his observation that the comment record shows that many people have an interest in seeing the conditional fall extension and the increase in the winter pool elevation adopted and takes the opinion that the proposal is in the overall community interests.

**Response:** As discussed above, Alabama Power's modeling results indicate that under this alternative additional downstream flooding would be unlikely to occur. Thus we now recommend Alabama Power's proposal. An analysis of the Crop Insurance Program is unnecessary, given this recommendation, and is beyond the scope of this final EIS.

#### DROUGHT

15. **Comment:** In the draft EIS we recommended that Alabama Power develop a drought management plan, and provide a combined flow of 4,640 cfs from the Coosa and Tallapoosa projects until such plan is developed and approved by the Commission. In comments on the draft EIS, **Alabama Power** disputes the basis for requiring the 4,650 cfs interim flow. In addition, for drought management, Alabama Power now proposes to implement the Tallapoosa River portion of ADROP. A copy of ADROP was provided as Attachment B of the company's, August 13, 2013, filing. Alabama Power also states that the Corps draft EIS for the update of the ACT Water Control Manuals, issued March 2013, incorporated ADROP in its Drought Contingency Plan, and the Commission adopted a similar requirement in the new license issued for the Coosa Project, Project No. 2146, issued on June 20, 2013.

**Response:** Staff now recommends implementing the Tallapoosa River portion of the ADROP. Since ADROP can be implemented upon issuance of the license, an interim 4,650 cfs flow is no longer needed. We note that the Corp's Control Manuals have not been finalized (Corps, 2014). Therefore, we recommend a provision requiring Alabama Power to review the Corps' regulation manuals, once finalized, for consistency with the Tallapoosa River portions of ADROP, and file a report of its findings along with any recommendations for modifications to the aforementioned portions of ADROP to be consistent with the finalized manuals.

16. **Comment:** In comments on the draft EIS, **Interior** requests adopting ADROP as a drought management plan for the project. The **State of Georgia** comments that Alabama Power stated that the ADROP was not its proposed drought plan and that there appeared to be inconsistencies between drought measures proposed by Alabama Power and ADROP. The **State of Alabama Office of Water Resources and Department of Conservation and Natural Resources** recommend the use of ADROP as the drought plan. The Alabama agencies describe ADROP as integral to Alabama's drought planning.

**Response:** We recommend implementation of the Tallapoosa River portion of ADROP. (Please see our response to Alabama Power immediately above.)

17. **Comment:** The **State of Georgia** and **Atlanta Regional Commission** comment that, in order to comply with NEPA, a drought plan must be described and analyzed before licensing rather than after. Also, the low flow analysis in the draft EIS is deficient because of a lack of modeling and a lack of description of our methodology. The **Conservation Groups** also state that drought analysis in the draft EIS is inadequate.

**Response:** This final EIS builds on drought analysis in the draft EIS in section 3.3.3.2. *Aquatic Resources*. It also incorporates information from the Corps' final EIS, issued on October 14, 2013. As discussed above, we now recommend the implementation of the Tallapoosa River portion of ADROP, as proposed by Alabama Power. The ADROP was developed with the involvement of Alabama Power, the Corps, and the State of Alabama using the Corps' HEC-Res Sim water quantity model covering the entire ACT Basin. The ADROP provides a mechanism for basin-wide cooperation to manage hydropower, water supply, environmental, navigation, and other drought-related issues.

18. **Comment:** The **State of Georgia** comments that the "no action" alternative in the draft EIS, which is supposed to describe the existing operation of the project, is inaccurate because Alabama Power did not provide an accurate description/analysis of its current operations. Georgia states that the Commission should require that Alabama Power provide models and operational descriptions that depict how Alabama Power actually operates the Martin Project, particularly under low flow conditions.

**Response:** A model that describes day to day operations is not necessary to define the baseline condition because daily records of flows and generation are more



accurate in describing how the project has operated in the past. Alabama Power summarized the existing flows and operation data in its application. Models are used to evaluate a range of alternatives, compared to a baseline condition. In this case Alabama Power generated a baseline condition that, while representative of current operations overall and adequate to support our analysis, is not expected to exactly match how the project is operated in any specific year.

19. **Comment:** The **State of Georgia** and **Atlanta Regional Commission** comment that the draft EIS confirms their concern that Alabama Power puts disproportionate pressure on the Coosa River over the Tallapoosa River to supply low flows to the Alabama River. Georgia suggests that the balance should be proportionate to watershed size. In contrast, **Will Legg** comments that the Tallapoosa is being used to supply a disproportionate amount of flow for its basin size and that the problem is compounded by Atlanta's withdrawals from the Coosa River system.

**Response:** As discussed above, Alabama Power now proposes, and we now recommend, implementing ADROP. The ADROP includes flow targets specific to the Tallapoosa River for each drought stage in the context of the rest of the Alabama-Coosa-Tallapoosa basin.

20. **Comment:** The **Corps** suggests that the final EIS and the license recognize that Lake Martin can be drawn down more than 11 feet. In contrast, the **Lake Martin HOBO** want the license to set a realistic limit to draw downs.

**Response:** Draft Article 402 defines the operational guide curves and associated conditions that we recommend. The basis for these curves and conditions is explained in the final EIS.

## INSTREAM FLOWS

21. **Comment:** **U.S. EPA Region 4** comments that the Martin dam relicensing provides an opportunity to incorporate state-of-the-art instream flow analysis to restore ecological conditions under which organisms have evolved and such an analysis should be carried out. The **Conservation Groups** request a standard instream flow study that compares the effects of releasing 1,200 cfs with other flows in meeting the needs of aquatic resources.

**Response:** The Martin Project is operated to meet the instream flow requirements established for the Thurlow Dam Project (FERC, 1994). Modification of the license

for the Thurlow Dam is not part of this license action; consequently, an instream flow analysis below Thurlow Dam does not need to be considered here.

22. **Comment:** The **Conservation Groups** comment that the final EIS should “consider alternatives, which specify a certain number of recreational releases across the spectrum of preferred flows to enhance boating opportunities and provide a more predictable schedule than afforded by current operations”

**Response:** In Section 3.3.5, *Recreation Resources and Land Use*, we presented and considered Alabama Power’s proposed operational changes in flows and public access to the Tallapoosa River downstream of Martin Dam, including the potential to alter the frequency and magnitude of floods downstream of the dam. The Conservation Groups did not provide any specific recreational flow releases, or a schedule for flow releases to consider in the EIS. No change to the text is required.

#### NAVIGATION FLOWS

23. **Comment:** **Alabama Power** states that the draft EIS incorrectly states that the 1972 Letter Agreement between the Corps and Alabama Power (Agreement) as “requiring” Alabama Power to meet a 4,640 cfs navigation flow with combined releases from the Coosa and Tallapoosa projects. Alabama Power considers the flow to be a “gentleman’s agreement” to be provided when the upstream storage dams are above the minimum rule curve elevations.

**Response:** An EIS is not intended to determine matters of law or contract. We have removed the term “requires” and replaced it with the term “specifies” to characterize the terms of the agreement as stated in the agreement. We now recommend adoption of the Tallapoosa portion of the ADROP. The ADROP addresses navigation flows directly and has been developed by Alabama Power and the Corps among others.

24. **Comment:** The **Lake Martin HOB0** comment that there is no commercial barge traffic on the Alabama River and that the Commission should look into whether flow releases for navigation are needed.

**Response:** Standard Article 12 will be included in any license issued for the Martin Project to preserve the Corps authority to determine flows needed for navigation. Regardless, the record indicates that navigation needs are still relevant in the basin. The tonnage of commodities shipped on the Alabama River varied greatly between

2002 and 2012 from a high of almost 142,000 tons in 2005 to low of 22 tons in 2011. The number of lockages and vessel passages, including recreational vessels, was steadier ranging from a high of 595 lockages involving 786 vessels in 2012 to a low of 155 lockages involving 199 vessels in 2010.<sup>81</sup>

## STRIPED BASS

25. **Comment:** **Alabama DCNR** disagrees with the interpretation that the conditional fall extension would have little effect on striped bass kills. **Alabama DCNR** points out that reducing the withdrawal of water from the upper hypolimnion to keep the lake level up for the conditional fall extension in wet years would increase striped bass habitat.

**Response:** We agree with Alabama DCNR and have modified our discussion to reflect this logic.

26. **Comment:** **Alabama DCNR** requests that Alabama Power implement active measures to improve DO concentrations in Lake Martin to protect and enhance a valuable striped bass fishery. Measures like forebay aeration have been used successfully by Tennessee Valley Authority and others.

**Response:** Alabama DCNR does not specifically describe what measures it recommends be deployed or why such measures are needed. Although there have been fish kills of striped bass in Lake Martin, the fishery appears to be reasonably healthy. Without clear definition of a problem in Lake Martin and the measures to be implemented, we have no basis on which to evaluate this proposal. We do not recommend detailed consideration of active measures to enhance striped bass habitat at this time.

## EELS

27. **Comment:** **Interior, Atlanta,** and **Alabama DCNR** ask that the Commission restore the eel passage study plan proposed by Alabama Power and agreed to by Interior and Alabama DCNR. They argue that the proposed passage study is more holistic and less costly than the eel surveillance program we proposed in the draft EIS. Further **FWS,** Alabama DCNR, and **Alabama Power** point out that the eel

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<sup>81</sup> Update of the Water Control Manual for the Alabama-Coosa-Tallapoosa River Basin in Georgia and Alabama.

trapping surveillance effort we proposed would be inefficient given that eels are not at Martin Dam today, there are two dams blocking eels from reaching Martin Dam, and there is no current proposal to provide eel passage at these dams.

**Response:** Because eel passage at Martin Dam is not likely in the foreseeable future, we no longer recommend any eel passage studies. Of course, Alabama Power would be free to participate in eel distribution surveys as an off-license requirement.

28. **Comment:** **Alabama Power** comments that staff's estimate of the cost in the draft EIS of the company's proposed eel study, at an annualized cost of \$269,750, was too high.

**Response:** On February 12, 2015 Alabama Power clarified cost information filed on December 9, 2011. All costs in the final EIS, including costs for the eel study, have been revised and adjusted to 2015 dollars.

#### LIPSTICK DARTER

29. **Comment:** **Alabama DCNR** and the **Conservation Groups** comment that that lipstick darter should be discussed in the final EIS.

**Response:** We have added information on the lipstick darter in the final EIS.

#### RARE, THREATENED, AND ENDANGERED SPECIES

30. **Comment:** The **Conservation Groups** comment that the draft EIS did not address endangered Alabama sturgeon or endangered gulf sturgeon which may occur in the project area. The Conservation Groups comment not enough time was spent searching for protected species, particularly sturgeon, to do a legitimate assessment.

**Response:** In the draft EIS, we found that continued operation of the Martin Dam Project would have no effect on these federally listed, aquatic species because the species and their designated critical habitats are not known to occur within the project area. Since we issued the draft EIS, FWS filed (on July 25, 2013) a letter concurring with this conclusion.

31. **Comment:** The **Conservation Groups** comment that the draft EIS does not address designated critical habitat for the threatened fine-line pocketbook.

**Response:** The two reaches mentioned as critical habitat, one on the Tallapoosa River above U.S. Highway 431 and one on Cane Creek, are located upstream of the R.L. Harris reservoir, which is 79 miles above the Martin project. The proposed action will have no effect on these locations.

## SHORELINE MANAGEMENT

32. **Comment: Alabama DCNR** comments that bank stabilization with seawalls degrades shoreline habitat and should not be permitted except under extreme circumstances. Alabama DCNR concurs with us that specific criteria should be met before a new seawall is permitted.

**Alabama Power** comments that its existing practices under the Standard Land Use Article and the Programmatic General Permit from the Corps provide sufficient limitations on the construction of new seawalls. Therefore, a staff-recommended measure to limit construction of a new seawall and apply criterion in approving the installation of any new seawall is not necessary.

**Response:** As we discuss in section 5.2, *Comprehensive Development and Recommended Alternative*, we recommend that the Shoreline Management Plan include a provision to limit construction of new seawalls because using alternative bank stabilization techniques would provide greater benefits to aquatic resources. Including such a stipulation in the Shoreline Management Plan would ensure that landowners are aware of these practices. No change to the text is required.

33. **Comment: Alabama Power** comments, as it did in its response to our Additional Information Request No. 22 filed December 9, 2011, that 373.1 acres classified as Natural/Undeveloped are no longer necessary for project purposes, and should be removed from the project boundary. Alabama Power states that removing the lands would “effectively distribute Natural/Undeveloped lands around Lake Martin so that there would not be too large a percentage of project Natural/Undeveloped lands concentrated in any particular area.”

**Response:** As we discuss in section 5.2, *Comprehensive Development and Recommended Alternative*, Alabama Power has not provided a compelling reason as to why the lands, composed of an estimated 12 separate parcels around Lake Martin, are no longer necessary for project purposes. As Alabama Power’s Shoreline Management Plan, dated June 2011, states in Section 4.3.3, “Private residential property occupies a considerable amount of shoreline, and residential activities have

a significant effect on the shoreline and as well as the reservoir itself.”

Natural/Undeveloped lands are intended to buffer public recreation areas, prevent overcrowding of partially developed shoreline areas, protect environmentally sensitive areas, and maintain aesthetic qualities. The 373.1 acres proposed for removal would continue to provide these benefits and thus serve project purposes. Therefore, we recommend that the 373.1 acres remain within the project boundary.

34. **Comment: Alabama Power** comments that the draft EIS incorrectly states that “the existing Shoreline Land Use Classification maps do not take into account certain project boundary modifications proposed by Alabama Power, including changes to the land use classification system.” The maps are correct and the final EIS should be corrected. Further, Alabama Power requests deletion of “Unclassified” as a Shoreline Land Use Classification.

**Response:** Our analysis was based on Alabama Power’s current Shoreline Land Use Classifications, which included “Unclassified” as a classification, but was not identified on Alabama Power’s Shoreline Land Use Classification maps. . Therefore, the current maps do not reflect the revised land use classifications. We revised section 3.3.5.2, *Environmental Effects, Shoreline Management Plan*, and draft Article 413 to incorporate this new information.

35. **Comment: The Alabama SHPO** requests to be removed as a consulting agency on the Shoreline Management Plan (draft Article 413).

**Response:** We removed the Alabama SHPO from the list of consulting agencies for the Shoreline Management Plan (draft Article 413).

## RECREATION

36. **Comment:** **Alabama Power** comments that the conclusions in the draft EIS “seem to discount, without explanation, and mischaracterize the results of two specific studies that demonstrate the recreational and economic benefits associated with the winter pool increase.” Alabama Power comments that the draft EIS should characterize “shoreline landowners” as both permanent residents and seasonal residents. In doing so, “shoreline landowners” compose more annual recreational use (62.7 percent) at Lake Martin than the 28.6 percent we analyzed in the draft EIS. Alabama Power states that a higher winter lake level will result in a 6 percent increase in recreational use from permanent residents, an 8 percent increase from seasonal residents, and a 6 percent increase from visitors, and therefore questions our conclusion that the expected increase in recreational use will be modest.

**Response:** In Section 3.3.5, *Recreation Resources and Land Use*, we present and consider the results of Alabama Power’s various studies and stakeholders’ comments. Particularly, Alabama Power’s study (Study Report 12g) did not characterize “shoreline landowners” as both permanent residents and seasonal residents. Rather, the study characterized total recreational use at Lake Martin for two separate and distinct recreational users groups: (1) visitors and seasonal landowners (71.4 percent); and (2) permanent residents (28.6 percent). We, therefore, incorporated the study data correctly into our analysis and still concluded the expected increase in recreational use and economic benefits as modest.

Alabama Power’s comments that a higher winter lake level would result in a 6 percent increase in recreational use from permanent residents refers to Table 17 of Study Report 12g, to Winter Pool Alternatives 1 or 2 (unclear to which alternative Alabama Power refers because 6 percent of permanent residents is representative for both alternatives); an 8 percent increase from seasonal residents refers to the Spring Shoulder Alternative B; and none of the alternatives identify a 6 percent increase in visitors. While no substantial changes to the text are required, we made minor changes to the text in order to reflect the change in recommendations made by Lake Martin RA and Lake Martin HOBO.

37. **Comment:** **Alabama Power** comments that the draft EIS mischaracterizes the increase in access to private boat docks and identifies Table 11 of Alabama Power’s Study Report 12g that, under current project operations, 76 percent of private docks are usable (able to moor a boat) at the end of October, which corresponds to a water level of 485 feet mean sea level. Alabama Power asserts that under the conditional fall extension up to 100 percent of private docks would be usable, which accounts

for up to 960 boat docks, a significant increase. Also, Alabama Power comments that the draft EIS mischaracterizes the expected increase in recreational use and associated economic effects resulting from the proposed conditional fall extension.

**Response:** In section 3.3.5, *Recreation Resources and Land Use*, we presented and considered the results of Alabama Power’s Study Report 12g and stakeholders’ comments. We considered and addressed the overall economic effects of the conditional fall extension on environmental resources, recreational use, and additional values to shoreline property. We recommend implementation of Alabama Power’s proposed conditional fall extension.

38. **Comment: Mark Stirling** comments that as the lake goes down, hazards pop up. The lake is safer to navigate at higher pool elevations. **Jim Bain** comments that the higher winter pool would make more boat ramps accessible and boating safer. **Dorothy Harper** comments that higher pool levels would allow her to keep her boat in the water and avoid a storage fee every year.

**Response:** Section 3.3.5, *Recreation Resources and Land Use*, assesses the effects of the proposed action and action alternatives on boat ramps and boating at the project. Our analysis acknowledges the benefits of a higher reservoir level by improving navigation as a result of decreasing the chance of collision with submerged objects (e.g., rocks and tree stumps).

39. **Comment: Wheeler Smith** comments that higher winter pool may not bring many more people. Usage is light after Labor Day, though the lake level is still up.

**Response:** Section 3.3.5, *Recreation Resources and Land Use*, recognizes a decrease in recreational use at Lake Martin after Labor Day.

40. **Comment: Alabama DCNR**, recommends an upgrade of the Kowaliga (Highway 63) Launch or an alternative site at the lower section of Lake Martin.

**Response:** As we explain in section 5.2, *Comprehensive Development and Recommended Alternatives*, Alabama DCNR provides no basis for their recommendation, including current or projected recreational use, to support such a need. The studies conducted during relicensing do not support the need for any site access improvements beyond that proposed by Alabama Power. Further, the Kowaliga (Highway 63) Launch site is state-owned, which we assume the state will continue to own, operate, and maintain throughout a new license term. We,



therefore, do not recommend that Alabama Power be required to upgrade the Kowaliga (Highway 63) Launch or an alternative site at the lower section of Lake Martin.

41. **Comment: Alabama Power** states that there are 14 existing recreation sites, not 12 existing project recreation sites as identified in the draft EIS. Alabama Power states that it proposes to maintain 12 of the 14 existing sites, of which General Public Use Area #2 would be reclassified to Natural/Undeveloped and Lake View Park would be removed from the project boundary.

**Response:** While General Public Use Area #2 and Lake View Park are located within the Martin Dam Project boundary, neither recreation site is a *project* (emphasis added) recreation site under the current license. In response to our Additional Information Request No. 28, filed on December 9, 2011, Alabama Power states that it proposes to continue to own, operate, and maintain 12 existing project recreation sites. No change to the text is required.

42. **Comment: Alabama Power** comments that the draft EIS incorrectly states that the Recreation Plan does not contain enough details and the final EIS should provide an accurate summary of the Recreation Plan.

**Response:** As we explain in section 5.2, *Comprehensive Development and Recommended Alternative*, Alabama Power's Recreation Plan includes, among other items: non-project recreation facilities, such as Emerald Shores Homeowner's Association's Boat Ramp; site descriptions in section 3.1 that do not reflect the updated maps in Appendix D as Sheets D-1 through D-19; and consultation only with Alabama DCNR. No change to the text is required.

43. **Comment: Patrick R. England** asks about the status of Alabama Power's response to our, April 11, 2011, additional information request regarding the purpose of removing 25.8 acres of land associated with Pleasure Point Park and Marina from the Martin Dam Project boundary. Mr. England states that he and other residents (leaseholders) at Pleasure Point Park and Marina have been asked by Alabama Power to vacate and remove their private facilities from the area due to septic violations and the cost to remediate. Mr. England requests the Commission's assistance in this matter.

**Response:** Alabama Power responded to our additional information request on December 9, 2011. Alabama Power explained that it proposed to remove 25.8 acres of project land associated with Pleasure Point Park and Marina from the project boundary because the land serves no project purpose, and proposes to retain the remaining 6.6 acres for public recreation. The 25.8 acres are leased for private residences, while the remaining 6.6 acres offer an existing marina, parking, six

cabins, docks, and a boat ramp, and would be classified as Commercial Recreation, under Alabama Power's Shoreline Management Plan. As explained in this EIS, the Commission only includes within the project boundary those lands necessary for project purposes, such as operation and maintenance, flowage, recreation, public access, protection of environmental resources, and shoreline control (including protection of shoreline aesthetic values). As the Commission has explained, residential, commercial, and other structures should be included within the project boundary only to the extent that underlying lands are needed for project purposes. In this instance, the 25.8 acres of land recommended for removal from the project boundary are not needed for any of the project purposes described above. Finally, the Commission has no control over the terms of Alabama Power's lease of non-project lands and is unable to assist leaseholders on the matter of Alabama Power's request that they vacate and remove their facilities.

## CULTURAL AND HISTORIC RESOURCES

44. **Comment:** In response to our request for clarification on the National Register of Historic Places (National Register) evaluation of 22 previously identified sites and Martin Dam, the **Alabama SHPO** explains that it has provided that information to Alabama Power and includes this information in its comments.

**Response:** We revised section 3.3.6, *Cultural Resources*, to incorporate the new information.

45. **Comment:** In response to our request concerning the National Register-eligibility of the Martin Dam and any other project feature more than 50 years old, including the fourth generating unit, the **Alabama SHPO** determined that the Martin Dam powerhouse, dam, and stilling basin are eligible for listing on the National Register. The fourth generating unit is not eligible for listing and should be included under activities exempt from section 106 review.

**Response:** We revised section 3.3.6, *Cultural Resources*, to incorporate the Alabama SHPO's determinations regarding the project features.

46. **Comment:** The **Alabama SHPO** concurs with staff-recommended measures for Alabama Power to (1) complete cultural resources surveys within 5 years of issuance date of the license and (2) evaluate currently inundated sites within the project's area of potential effects for listing in the National Register if and when the site or sites become exposed, assess the effects of inundation on all eligible sites, and implement appropriate treatment measures.

**Response:** Stipulation I.C. of the executed Programmatic Agreement requires the measures.

## CUMULATIVE EFFECTS

47. **Comment:** Regarding geographic scope for cumulative effects, the **Conservation Groups** comment that: (1) cumulative effects beyond the action area, called for in our description of the scope, are absent from analysis in the draft EIS and need to be added in the final EIS and (2) that we should broaden the scope of our cumulative effects analysis to include Mobile Bay and the Alabama, Coosa, and Tallapoosa Rivers and riparian lands. **EPA Region 4** comments that we should use a basin approach.

**Response:** Regarding high flows, the EIS considers the cumulative effects of project operations on high and low flows, floodplain areas, DO, and paddlefish down to the Alabama River. Regarding low flows, we are recommending the adoption of the Tallapoosa portion of the ADROP, which relies on the Corps' ACT-Basin-wide water balance model. It provides a cooperative, interagency approach to address multiple resource issues, including hydropower, water supply, environmental, and navigation concerns in a cumulative context. We did not identify reasonably foreseeable activities that would cumulatively affect Mobile Bay in new ways. We are not aware of reasonably foreseeable effects of future activities in the uplands of the basins that would require analysis.

48. **Comment:** The **Conservation Groups** comment that (1) we should broaden the scope of the cumulative effects analysis to include other actions including the Corps proposed basin plan and ADROP and that (2) cumulative effects analysis needs to be woven throughout the document and cover a wider range of topics, including protected species. The **State of Georgia** and the **Atlanta Regional Commission** comment that the cumulative effect of the overall operation by Alabama Power of the Tallapoosa and Coosa systems is not captured in the draft EIS and should include Georgia's request for water from the Corp's Allatoona Reservoir and ADROP.

**Response:** We considered those resources that are potentially affected through the influence of project operations on flow habitat, particularly the spawning conditions for paddlefish. NEPA guidance directs us to focus on cumulative effects in distinct, cumulative effects sections. We have done so in regard to flood conditions in the Alabama River. As discussed above, we are now recommending the ADROP which takes an ACT-Basin-wide, comprehensive approach to low flow issues, and which incorporates Georgia's water supply needs.

## PROCESS

49. **Comment:** The **State of Georgia** states the Re-licensing Application for the Martin Project should be coordinated with the Corps' development of Water Control Manuals for the ACT River Basin and should be dependent upon those manuals. The State of Georgia comments that the Commission should allow the Corps to finish its final EIS for the basin before finishing the Martin final EIS to avoid inconsistencies, particularly regarding the drought plans and the modeling. The **Atlanta Regional Commission** comments that the Commission should defer to the Corps rule curves. **Euel Screws** and **Thomas Dozier** comment that flood control authority should be granted to the Corps. The **Lake Martin HOBO** comment that the Commission should get more involved in the Corps basin plan process in order to keep water in Alabama. **EPA Region 4** comments that we should collaborate more closely with the Corps.

**Response:** The Corps has finalized its EIS for its Water Control Manuals. Staff has reviewed the Corps' final EIS and its draft manuals and incorporate several elements of the Corps' planning document to coordinate our efforts. As discussed above, we recommend a provision requiring Alabama Power to review the Corps' regulation manuals, once finalized, for consistency with the Tallapoosa River portions of ADROP, and file a report of its findings along with any recommendations for modifications to the aforementioned portions of ADROP to be consistent with the finalized manuals.

50. **Comment:** The **Corps** requests the opportunity to review the flood analysis for the new operating scenario.

**Response:** Our information requests to Alabama Power regarding flood modeling methods, results, and analysis and the company's responses have been posted in the Commission's public record and are available for the Corps' review.

51. **Comment:** Requesting consideration under section 10(j) of the Federal Power Act, **Interior** asks that we modify draft article 414 to include a provision that would encourage Alabama Power to work with the Alabama DCNR and Interior to develop a restoration plan to identify opportunities for habitat and species restoration.

**Response:** Interior's modified recommendation lacks specificity to evaluate the measure and determine benefits and cost of implementing the measure. The protection of land under the Natural/Undeveloped Land Classification and the 30-foot Control Strip Land Classification around Lake Martin would protect habitat and species under any new license.

52. **Comment:** **Richard Meinert** requests a structural inspection of Martin dam.

**Response:** Dam safety is a priority of the Commission's hydropower program. Commission staff engineers complete a dam safety and operations inspection annually for Martin Dam. Martin Dam was last inspected by Commission staff on December 16, 2014. In addition, Martin Dam is subject to Part 12, Subpart D of the Commission's Regulations, which requires a detailed project inspection and preparation of a report by an independent, experienced engineering consultant once every five years. The latest Part 12 inspection was completed on December 16, 2014. Commission staff engineers work with Alabama Power staff continually to review maintenance work and improvement actions at the project facilities, and ensure that license requirements are met.

53. **Comment:** The **EPA Region 4** requests that the Commission require Alabama Power to coordinate with EPA in the development of a drought plan.

**Response:** We are no longer recommending that Alabama Power develop an independent drought management plan. We now recommend implementing the ADROP which has been developed collaboratively by Alabama Power, the Corps, and the Alabama Office of Water. The ADROP has been subject to NEPA review in the Corps' process. We have recommended adding EPA to the consultation list for changes to the ADROP.

The ADROP agencies attempted to take into account the needs of the State of Georgia. The use of the Tallapoosa portion of the ADROP was recommended by Interior. According to Alabama Power ADROP changes to the ADROP will involve consultation with "relevant" federal agencies.

54. **Comment:** **EPA Region 4** suggests that the Commission include sections on environmental justice as described in Executive Order 12898, Federal Actions to Address Environmental Justice.

**Response:** The Scoping Document issued on August 5, 2008, requested information on socioeconomic issues, fishing, recreation, and land use. We received input on all of these topics and included those analyses in the appropriate places in the EIS. We analyzed issues related to potentially competing interests and we discussed fish consumption advisories which can affect those who participate in subsistence fishing. We did not, however, receive any comment or make any observation indicating an issue of environmental justice. Therefore, we did not include distinct environmental justice sections in this EIS. No change to the text is required.

55. **Comment:** EPA states that the final EIS should identify the local demographics of children under the age of 18, including children that may use or be affected by the resource as described in Executive Order No. 13045 on Children’s Health and Safety.

**Response:** We revised section 3.3.5, *Recreation Resources and Land Use*, to incorporate the local demographics of children under the age of 18. As we discuss in section 3.3.2, *Aquatic Resources*, there are currently no fish consumption advisories for Lake Martin or the area immediately downstream of the dam (Yates reservoir). The draft and final EIS recognize Thurlow reservoir and the lower Tallapoosa River that have fish consumption advisories for women of child-bearing age and for small children. No change to the text is required.

56. **Comment:** The EPA, American Rivers Alliance, and American Rivers contend that the cumulative impacts analysis was inadequate in light of the Resources and Ecosystems Sustainability, Tourist Opportunity and Revived Economics of the Gulf States Act (RESTORE Act).

**Response:** The RESTORE Act established a Gulf Coast Restoration Trust Fund, outlined trust fund allocation provisions, and established a Gulf Coast Ecosystem Restoration Council.<sup>82</sup> In our analysis, we found not proposed changes that would have a significant impact on the Gulf of Mexico. We analyzed water quantity and specific biological and recreation issues to the confluence of the Tallapoosa and Coosa Rivers and we analyzed water quality to the Martin Dam tailrace. Section 3.2 of the final EIS addresses cumulative impacts of the project and section 5.5 considers the project’s conformity with 12 different comprehensive plans. In our analysis, we found no proposal related to relicensing that would have a significant impact on the Gulf of Mexico or the Gulf Coast.

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<sup>82</sup> Resources and Ecosystems Sustainability, Tourist Opportunities, and Revived Economies of the Gulf Coast States Act of 2012, Pub. L. No. 112-141, §1601, 126 Stat 405, 588 (2012).