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November 17, 2008

VIA ELECTRONIC FILING

Ms. Kimberly D. Bose
Secretary
Federal Energy Regulatory Commission
888 First Street, N. E.
Washington, D.C. 20426

RE: Response to FERC's October 3, 2008 Study Requests, Comments on Preliminary Study Plan, and Requests for Additional Information for the Martin Dam Project (FERC No. 349)

Dear Secretary Bose,

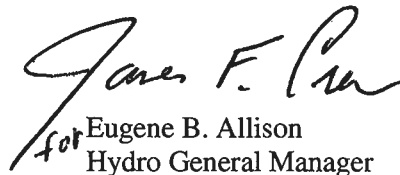
On October 3, 2008, the Federal Energy Regulatory Commission (FERC) issued a letter to Alabama Power Company containing comments on Alabama Power's preliminary study plans and a request for additional information on the Martin Dam Project (FERC No. 349). Specifically, FERC attached its proposed modifications to the study plans in a list entitled Schedule A, and provided its request for certain additional information in a document entitled Schedule B. Alabama Power hereby provides its attached response to both Schedules A and B. It should be noted that the responses to the items in Schedule A have also been incorporated in Alabama Power's proposed study plans for the Martin Project, filed on November 17, 2008, under separate cover.

FERC states in its October 3, 2008, letter that "based on our review of the data presented in your PAD and our observations during the project scoping meetings and site visit, we have identified additional information that we will need to address project impacts as part of our environmental analysis of the Martin Dam project." Alabama Power intends to completely address FERC's information requests in the Preliminary Licensing Proposal and Final License Application and provide FERC with the information it needs to process the license application and conduct their environmental analysis, pursuant to the National Environmental Policy Act.

Alabama Power believes that many of the information requests can only be addressed through the Integrated Licensing Process and in the 21 proposed study plans to be conducted in 2009-2010. The Study Reports, Preliminary Licensing Proposal, and Final License Application will serve to present the findings, discuss alternatives, and present potential protection, mitigation and enhancement measures in response to many of FERC's questions. Where possible, Alabama Power has responded to FERC's questions with specific information that does not require implementation of one or more of the 21 studies.

If you have any questions regarding this response, please contact Mr. Jim Crew at 205-257-4265.

Yours very truly,


for Eugene B. Allison
Hydro General Manager
Alabama Power Company

Attachment: Response to FERC's Schedules A and B
Cc (w/attachment): Mr. Lee Emery, FERC
Martin Project Stakeholder Distribution List

Alabama Power Company's Response to Schedule A – Comments on Preliminary Study Plan, Project No. 349-150

1) Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study Plan

FERC Comment: *In your revised Study Plan 15, criterion 6.0, you describe the methodology that is proposed for the Cultural Resources Programmatic Agreement and Historic Properties Management Plan study plan. Prior to conducting steps 1-7, please define the area of potential effects (APE) for the project. The APE should be defined in consultation with the Alabama State Historic Preservation Officer and the federally-recognized tribes who have an active interest in the project. At a minimum, the defined APE should contain the lands described in criterion 5.0, STUDY AREA AND STUDY SITES. Also, since the Martin Dam Project, which was constructed in 1926, represents an important engineering development for Alabama at that time, there is a strong likelihood that the project would be eligible for listing in the National Register of Historic Places (National Register). Therefore, criterion 6.0 should contain methodology to determine the project's National Register eligibility.*

Alabama Power Response: Alabama Power has added the tasks of defining the APE and evaluating the project structures for eligibility on the National Register to the November 17, 2008 Cultural Resources Programmatic Agreement and Historic Properties Management Plan Study Plan.

2) Lake Martin Assessment of Fish Density and Species Composition Associated with Various Shoreline Types

FERC Comment: *In Appendix R, Study Plan 2, you propose to study the effectiveness of structures and materials used in shoreline alterations in providing shoreline refuge and habitat for aquatic species. Your reference to aquatic species includes fish and macroinvertebrates, but excludes other aquatic or semi-aquatic species potentially using the shoreline habitat. The scope of your study should be expanded to include aquatic and semi-aquatic organisms, including amphibians, reptiles, and mammals. Also, please provide maps of the areas studied, in both hardcopy and electronic shapefiles in a format compatible with ArcGIS.*

Alabama Power Comment: Study Plan 2- Assessment of Fish Density and Assessment of Species Composition Associated with Various Shoreline Types, is designed to address aquatic species; however, Alabama Power has added the FERC requested species to the methodology section of Study Plan 7 – Wildlife Management Plan, where this issue was first raised by the Alabama Department of Conservation and Natural Resources. The map of the areas that will be studied, which is currently proposed to include Blue Creek because it represents the most diverse of the shoreline types and an abundance of fish and

macroinvertebrates, will be presented in the Study Report and discussed in the Preliminary License Proposal, per FERC's request.

3) Rare, Threatened, and Endangered (RTE) Species Surveys

FERC Comment: *In Appendix R, Study Plan 5, you propose to conduct a study to determine the location, abundance, and potential impact of the project on RTE species occurring in the project boundary. In addition, you provide a list of RTE species that includes two botanical species occurring within the Tallapoosa Basin. You also provide preliminary studies completed for RTE species occurring within the project boundary. However, you do not provide information regarding preliminary or planned studies for RTE botanical species. Therefore, please modify your current study on RTE species surveys to include botanical RTE species within the project boundary. Your data collection should also include areas under the primary transmission lines associated with the project. Please provide maps of the areas studied in both hardcopy and electronic shapefiles in a format compatible with ArcGIS.*

Alabama Power Response:

Alabama Power has modified Study Plan 5 – Rare, Threatened and Endangered Species Survey to include terrestrial species and will provide maps as part of the Study Report and include maps/figures in the Preliminary License Proposal, per FERC's request.

**Alabama Power Company's Response to Schedule B – Additional Information, Project
No. 349-150**

1. FERC Comment: *In section 5.7.1.3, page 5-73, of the PAD, you state that the Alabama Power Company (Alabama Power) owns 13 of the 57 recreation sites located around Lake Martin. However, you did not specify which 13 recreation sites Alabama Power owns, who operates and maintains these sites, or which sites were inside the project boundary.*

Therefore, please provide the following:

- a. A comprehensive list of who owns, operates, and maintains each of the 57 recreation sites at the Martin Dam Project; and*
- b. A description of the location of all Alabama Power-owned recreation sites in relation to the existing project boundary. Also, please identify, if applicable, whether a recreation site is partially inside and partially outside the existing project boundary, and please tell us which features at the site are inside the project boundary and which project features are outside the project boundary.*

You should show the locations of the recreation sites and the project boundary on a map of the project.

Alabama Power Response: The PAD identifies all sites as either public, private, or commercial. The Recreation Use Report, in Appendix A of the PAD, provides a map of all sites but does not include the project boundary. The report further identifies some of the ownership of sites (private, local, Alabama Power, County, or State) and management of site (private, local, Alabama Power, County, or State), but FERC is correct that this information is not complete.

Alabama Power intends to complete this information as part of Study Plan 14 – Recreation Plan and include the information in the Recreation Plan and file this information in the Final License Application.

2. FERC Comment: *Project Operations and Current License - We request clarification on the transmission lines for your proposed project. The current project consists of generating units 1, 2, and 3, each connected to a bank of three 12/115-kilovolt (kV), 14,000 kilovoltampere (kVa) step-up transformers, and unit 4 is connected to a bank of three 12/115-kV, 23,333 kva step-up transformers. The transformers connect to a switching station located at the west end of the dam. The generating plant is connected to the integrated transmission system through nine 115-kv transmission lines which terminate at the switching station. The project also includes two 450-foot-long, 115-kV transmission lines which terminate at the Martin Dam switchyard. Appendix G of the PAD includes a single line diagram which shows that Martin Dam is connected to five transmission lines that are identified as Sylacouga, Crooked Creek A, Crooked Creek B, North Auburn A, and North Auburn B. The PAD does not provide, however, adequate information for us to evaluate whether these five transmission lines should be included as part of the Martin Project. Please*

provide a detailed description of all the transmission facilities identified above. You should include a diagram of these transmission facilities which clearly identifies the origination and termination points, as well as the length and rating of each line. You should also include in your discussion the criteria you used to determine that the Sylacouga, Crooked Creek A, Crooked Creek B, North Auburn A, and North Auburn B transmission lines should not be included as part of your project.

Alabama Power Response: As a result of discussions in 2007 with FERC staff regarding transmission lines on the Coosa and Warrior River Projects, it was our understanding that if it was determined there was tap load on a transmission line leaving the project, then it should not be included in the project license. All of the transmission lines leaving the Martin Project have tap loads, and therefore should not be included within the project.

3. FERC Comment: *The PAD is required, by the Commission's regulations at §5.6(2)(v)(A), to include a complete description of the current license requirements, including any amendments to the license made during the license term. Appendix H of the PAD includes a copy of the current license for the Martin Dam Project. However the license appears to be missing several license articles, or has not been updated to include all amendments to the license since it was issued on May 11, 1978. For example license articles beyond Article No. 52 are missing, and Article 56, which refers to a revised water quality monitoring plan, is also missing. Therefore, please provide for the record, a complete license for the Martin Dam Project that meets the requirements of the Commission's regulations stated above.*

Alabama Power Response: The complete license for the Martin Dam was included as part of PAD filed on June 5, 2008. The missing articles that FERC refers to are no longer applicable; however, the FERC license was never amended to reflect the change in the order of the license article numbers. Therefore, the license that FERC has as part of the June 5, 2008 filing is the most up-to-date license, including amendments and article deletions.

4. FERC Comment: *In section 5.3.2, page 5-49, of the PAD, you discuss potential cumulative effects of current project operations of the Martin Dam Project. You indicate that project operations greatly influence downstream flows in the Tallapoosa River, and state that water level fluctuations in the river may affect aquatic habitats in the downstream Tallapoosa River. In order for us to understand the full extent of project effects, please identify where the downstream effects of project operations terminate in the Tallapoosa River (distance from Martin Dam). You should identify the amount of water fluctuations (in feet) at that downstream site, the daily frequency or occurrence of the fluctuation, and any known or potential effects on (a) fish, (b) aquatic resources, (c) wetlands, (d) riparian and littoral habitats and their associated wildlife and botanical species (including invasive species), and/or (e) streambank erosion and sedimentation in this downstream area of the river, or other areas downstream from the project, if any.*

Alabama Power Response: The Martin Project tailrace is coincident with the lake formed by the downstream Yates Dam. Releases from Martin become reregulated to some extent by the releases from Yates. The two dams (Martin and Yates) are located relatively close, only 7.9 river miles apart. Partly due to this close proximity and the relative difference in reservoir storage amounts, the dams normally operate in tandem. Inflow conditions at each reservoir along with system generation needs can produce fluctuations in Yates that vary on average from zero to about 2 feet. Alabama Power has developed seven study plans to look at the effects of the change in operations at Martin on the resources identified above by FERC and those effects on the above listed resources for both the baseline condition and any proposed operational changes will be presented in the Preliminary Licensing Proposal and Final License Application.

5. FERC Comment: *On September 29, 2008 you filed draft study plans [Study Plan 12(a) through 12(g)] for the Martin Dam Project that show where you propose to model several changes to the rule curve, as well as evaluate the effects of these changes on various resources. Presenting the results of the report in a single table, using a matrix format, would facilitate our review of the final report. Please include in the table each of the modeled rule curve changes and the associated effects on each of the resources evaluated.*

Alabama Power Response: Alabama Power agrees with FERC that a table, matrix format, would be a valuable and appropriate tool for presenting review of the modeling and its effects on various project resources. Alabama Power commits to including such matrix in the modeling report and in the Preliminary Licensing Proposal.

6. FERC Comment: *The Lake Martin Project storage reservoir is estimated to provide around 49 percent of the total storage in the Alabama-Coosa-Tallapoosa (ACT) River Basin. Aside from briefly mentioning, in section 4.4 (Current and Proposed Project Operations), on page 4-7, of the PAD, the association between the development of a drought contingency flow release for the Martin Dam Project and a flow modeling effort that was part of ACT, there is little discussion in the PAD clearly delineating how the proposed operation of the Martin Dam Project would affect minimum flows required in the downstream Alabama River. In addition, in Appendix R, the MIG2—Water Quality and Quantity Draft Study Plans, you state that Alabama Power will develop a white paper for the project that details its (a) water withdrawal policy, (b) the current known water withdrawals from the Martin Dam Project, (c) ecological and navigational flow requirements in the Tallapoosa River Basin, and (d) drought contingency operations at the Martin Dam Project.*

To assist staff in assessing the project's effects on flows in the Tallapoosa and Alabama rivers, as well as potential effects on other uses in the basin, please describe in detail how the current operation of the project interacts with downstream navigation in the Tallapoosa and Alabama rivers. Also, please provide more specific detail about what constitutes "ecological flow requirements," which is described as a component of the forthcoming "white paper." In addition, you should describe how the proposed operation of the Martin Dam Project would affect items (a) to (d) that you plan to address in the "white paper."

Alabama Power Response: The Martin Project is one of seven storage reservoirs in the Alabama River Basin. In addition to Martin, the list includes Allatoona, Carters, Weiss, Neely Henry, Logan Martin and Harris. The Corps of Engineers and Alabama Power work closely during times of low reservoir inflows to coordinate releases from these storage projects in the interest of navigation on the Alabama River. Specifically, under normal low flow conditions, Alabama Power makes releases of daily inflows coupled with storage releases from its projects on the Coosa River (Weiss, Neely Henry, Logan Martin) and the Tallapoosa River (Harris, Martin) in an effort to support a running 7-day total volume of 32,480 cfs-days. This volume of water is measured by the sum of releases from each of the most downstream dams (Bouldin, Jordan and Thurlow). All releases from Martin flow through the Thurlow Dam. Furthermore, a 3-day running average is set at 8,000 cfs-days to help minimize prolonged periods of lower releases to the downstream navigation segment. A rarely used provision that provides benefits to navigation during periods of temporary high flows describes a step-down process for the 7-day total release whenever it has been above 50,000 cfs-days for 21 days or more. This states that releases should be reduced no faster than 1,700 cfs-days per day until reaching the 32,480 value. Since Martin is one of the storage projects operated by Alabama Power in the Alabama River Basin, it contributes to the releases that support the navigation flow augmentation plan.

The “ecological flow” that FERC references is the Thurlow Project 1,200 cfs minimum flow that is part of the Yates/Thurlow license. Alabama Power will include the minimum flow from Thurlow in any study report developed during relicensing. In addition, Alabama Power intends to include items (a) through (d) once Alabama Power has determined the operational changes that will be proposed in the Preliminary Licensing Proposal and Final License Application.

7. FERC Comment: *In section 5.11 of the PAD, you provide brief descriptions of various ongoing management programs for the Martin Dam Project. The voluntary fish habitat enhancement program, mosquito control program, and aquatic plant management program were three of the programs described. However, the information provided is not sufficient for us to adequately evaluate the effects associated with these programs, or how these programs would be affected by continued project operations. Therefore, please provide the following information:*

- a. a detailed explanation of Alabama Power’s participation in the ongoing fish habitat, mosquito, and aquatic plant management programs;*
- b. (i) the entities, aside from Alabama Power, involved in the three ongoing management programs identified above, (ii) the annual cost of the programs, if any, (iii) whether you propose to continue these programs, and who may be involved, and (iv) a description of the success to date since the inception of these programs; and*
- c. the treatment methods used to control mosquitoes in the project area, the amount of acreage treated by year, and the frequency of treatment.*

Alabama Power Response: It is Alabama Power’s intent to provide detailed effects of existing and proposed fish habitat, mosquito, and aquatic plan management programs in the

preliminary Licensing Proposal. Although Alabama Power cannot predict what changes may be included in these programs at this time, but it can provide summary information herein.

- a. a detailed explanation of Alabama Power's participation in the ongoing fish habitat, mosquito, and aquatic plant management programs;*
- b. (i) the entities, aside from Alabama Power, involved in the three ongoing management programs identified above,*

Fish Habitat Program

The "fish habitat program" is a voluntary program which has enhanced fish habitat by sinking and anchoring Christmas Trees annually in Lake Martin. The fish habitat program is hosted annually by Alabama Power and its employees and assisted at varying levels by the Alabama Department of Conservation and Natural Resources and local fishing clubs and stakeholders.

The program has changed over the last several years with the drastic reduction in availability of discarded Christmas trees. Therefore, in 2005 Alabama Power initiated a maintenance mode for the entire program by only adding trees to previously established areas. Trees placed in Lake Martin during the past 4 years are 100 in 2005; 0 in 2006; 0 in 2007; and 155 in 2008.

Mosquito and Aquatic Plant Management Programs

Alabama Power is the sole participant in both of these programs. Each of these programs is funded by Alabama Power and performed by employees from the Alabama Power Laboratory. A detailed description of the study is provided below.

Vector Control on Lake Martin 2003-2007

Mosquito control on Lake Martin is conducted in accordance with the control measures used on all twelve Alabama Power Company reservoirs. These best practice measures were developed by the U.S. Public Health Service and Tennessee Valley Authority. These measures were recognized and adopted by the World Health Organization, Center for Disease Control, and the American Mosquito Association. These methods include monitoring techniques, source reduction, larviciding, adulticiding, and education.

Adult resting stations near potential breeding sites are monitored and used as an index of permanent pool production. Larvae of permanent pool, floodwater, and container breeding mosquitoes are collected and identified for the purpose of monitoring or complaint resolution. Other methods that have been employed over the years include the use of light traps and biting collections.

Aedes albopictus, a container breeding mosquito, has accounted for over ninety percent of mosquito complaints on Lake Martin in recent years. These mosquitoes breed in artificial sites such as tires, bird baths, folds of tarps, gutters, boats, and other receptacles. Since this species breeds outside of the reservoir, control measures within Alabama Power project boundaries have no impact on their populations. Alabama Power staff biologists advise lake

residents on how to identify and eliminate this and other important species of mosquitoes originating on their property.

Where the elimination of breeding sites is not feasible, pre-emergent larvicides are used to prevent the emergence of adult mosquitoes. This is a site specific control method, designed to protect non-target species. These larvicides are applied by hand, all-terrain vehicles, and airboat. These activities are conducted by Alabama Power staff biologists certified as commercial applicators by the State of Alabama, Department of Agriculture and Industries. Larvicides currently used are: **Aquabac** – granular formulation of *Bacillus thuringiensis* var. *israelensis*. **Bactimos** – granular and briquette formulation of *Bacillus thuringiensis* var. *israelensis*. **Altosid** - granular and briquette formulation of methoprene. **Agnique MF** – a monomolecular liquid film used to control larvae, pupae, and emerging adult mosquitoes.

Larvicides used in Alabama Power Company’s reservoirs are non- persistent in the environment and will not affect fish, water-fowl, mammals or beneficial predatory insects.

Aquatic Plant Management Program

Alabama Power’s Aquatic Plant Management Program is applicable to all of Alabama Power’s reservoirs. Aquatic vegetation is managed in compliance with local, state and federal laws and regulations to optimize all the uses of these reservoirs. Aquatic Plant Control will be considered if the vegetation:

- 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 (such as may be the case of an aquatic plant which is known to create problems in the above categories).

Aquatic vegetation will be left in its natural state in areas which do not meet the above criteria (as deemed appropriate by Alabama Power biologists and staff) to enhance fishery habitat and reservoir aesthetics. The extent of assistance to homeowners or corrective action initiated will be determined by actual need and whether the control falls within the above categories.

The table below lists the total acres of nuisance aquatic vegetation treated by Alabama Power from 2003 - 2007 on the Martin Project. Types of nuisance aquatic vegetation treated include emergent and floating.

Year	Acres Treated
2007	0 acres
2006	3 acres – emergent
2005	1.25 acres – emergent
2004	0.5 acres - floating
2003	0 acres

Alabama Power’s aquatic plant control program is directed toward, but not limited to, species listed in the “Alabama Non-indigenous Aquatic Plant Control Act”. The table below presents the aquatic species that are prohibited from being introduced or placed or caused to be introduced or placed into public waters of the state of Alabama.

Common Name	Scientific Name
African elodea	<i>Lagarosiphon spp</i>
Alligator weed	<i>Alternanthera philoxeroides</i>
Brazilian elodea	<i>Egeria densa</i>
Curlyleaf pondweed	<i>Potamogeton crispus</i>
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>
Floating waterhyacinth	<i>Eichhornia crassipes</i>
Giant salvinia	<i>Salvinia molesta</i>
Hydrilla	<i>Hydrilla verticillata</i>
Hygrophila	<i>Hygrophila polysperma</i>
Limnophila	<i>Limnophila sessiliflora</i>
Parrot-feather	<i>Myriophyllum aquaticum</i>
Purple loosestrife	<i>Lythrum salicaria</i>
Rooted waterhyacinth	<i>Eichhornia azurea</i>
Spinyleaf naiad	<i>Najas minor</i>
Water-aloë	<i>Stratiotes aloides</i>
Water-lettuce	<i>Pistia stratiotes</i>
Water-chestnut	<i>Trapa natans</i>
Water spinach	<i>Ipomea aquatica</i>

Alabama Power’s aquatic plant control program is based on a maintenance control philosophy. Control measures are initiated before noxious weeds reach a problematic stage because once weeds reach this stage, it is difficult to return to the original maintenance level. This philosophy helps to minimize chemical applications and promote plant diversity.

All aquatic plant control measures are directed by Alabama Power staff biologists certified as commercial aquatic applicators by the State of Alabama, Department of Agriculture and Industries. Only EPA approved aquatic herbicides are used in the aquatic plant management program.

b. (ii) the annual cost of the programs, if any,

Alabama Power performs these programs on all of its reservoirs within the state. The following is spent annually for each program for the Martin Project.

- Fish Habitat -Christmas Tree Program. The cost estimate for installing 100 trees is approximately \$1,500. Therefore the project costs for Martin Lake have ranged between \$0 to \$2,500 annually – based on the number of trees placed in the Lake.
- Mosquito Vector Control Program for Lake Martin is typically less than \$10,000 annually. Although no larvicides or adulticides were applied for mosquitoes in 2006 or 2007, there are six (6) monitoring stations on Lake Martin that are checked by Alabama Power staff biologists twice each month
- Aquatic Plant Management Program costs for Lake Martin are typically less than \$3,000 (\$2,500 for manpower & \$500 for chemicals) annually due to the low number of applications needed.

b. (iii) whether you propose to continue these programs, and who may be involved,

Alabama Power plans to continue the Mosquito Vector Control Program and the Aquatic Plant Management Program as part of the Shoreline Management Program for the Martin Project. Continuation of the voluntary Fish Habitat Program is dependent on public involvement.

b. (iv) and a description of the success to date since the inception of these programs;

The programs have been deemed successful for Lake Martin based on the few number of acres of problematic aquatic vegetation treated each year since 2003 and the few number of local requests for mosquito control (2006 = 5 requests; 2007 = 6 requests). The low call volume during the past two years is somewhat attributed to drought conditions experienced.

c. and the treatment methods used to control mosquitoes in the project area, the amount of acreage treated by year, and the frequency of treatment.

As stated in the Program description above, Alabama Power does not perform broadcast spraying but treats complaints on a case by case basis. There are six (6) mosquito monitoring stations around Lake Martin. Currently there are no pre-treatment sites on Lake Martin, and it has not been necessary to treat for adult mosquitoes. This low mosquito production can be attributed to drought conditions experienced in 2006 and 2007.

8. FERC Comment: *In Appendix N of the PAD, you provide a copy of the Exotic Species & Aquatic Plant Management Program Issue Report for the Coosa (P-2146) and Warrior (P-2165) projects. This report, which you indicate will be used as the basis to develop a similar program at Lake Martin, includes a discussion of your aquatic plant and mosquito control*

programs at the aforementioned projects. This report, while providing some good information on the number of acres of nuisance plants treated by year, types of vegetation treated, and a listing of nonindigenous aquatic plants targeted for treatment at the Coosa Project, does not present specific information pertaining to your Martin Dam Project.

Therefore, please provide information on:

- (a) the species of invasive aquatic plants occurring at Lake Martin,
- (b) the acreage treated annually,
- (c) the location of treated areas and any known, existing invasive plant beds (*should be included on the map requested as part of question 12 below*),
- (d) and the methods used to control or remove invasive aquatic plants (*including identifying any chemical treatments used and the frequency of application*).

Alabama Power Response: Invasive plant species (aquatic and littoral zone) that are currently present on Lake Martin and receive some level of control are shown in the table below.

Common Name	Scientific Name	
giant cutgrass	<i>Zizaniopsis miliacea</i>	<i>Indigenous</i>
torpedo grass	<i>Panicum repens</i>	<i>Non-indigenous</i>
spinyleaf/brittle naiad	<i>Najas minor</i>	<i>Non-indigenous</i>

The table below lists the total acres of nuisance aquatic vegetation treated by Alabama Power from 2003 - 2007 on the Martin Project. Types of nuisance aquatic vegetation treated include emergent and floating.

Year	Acres Treated
2007	0 acres
2006	3 acres – emergent
2005	1.25 acres – emergent
2004	.5 acres - floating
2003	0 acres

Alabama does not currently have maps available with the exact locations of treated aquatic vegetations, but a general description of the locations by year is as follows:

Year of Treatment	Species Treated	Location Description
2006	giant cutgrass	3 acres of exposed river bank/sand bars downstream of Irwin Shoals.
2005	torpedo grass	Lake Martin near Anchor Bay Marina
2004	water hyacinth	.5 acres treated on Lake Martin – location not recorded.

Alabama Power uses herbicides/formulations and application techniques depending on the target vegetation and locations that need treatment. In 2006, three (3) acres of giant cutgrass were treated by airboat with a one-time foliar application of a glyphosate formulation approved by the EPA for aquatic use. This treatment was consistent with standard treatment methods for emergent species of aquatic vegetation.

9. FERC Comment: *In addition, you mention in Appendix R, Study Plan 3 (Erosion and Sedimentation), that an Aquatic Vegetation Control Group periodically inspects Lake Martin for nuisance aquatic vegetation and treats infected areas accordingly. Please identify the members of the Aquatic Vegetation Control Group, the frequency of meetings, and provide a description of the group's decision-making process to take action on nuisance aquatic vegetation*

The Vector and Aquatic Plant Management Program is managed by Alabama Power staff that are trained and experienced in the control of nuisance aquatic vegetation. The staff reviews requests from the public, state and federal agencies, and other Alabama Power employees to treat nuisance aquatic vegetation on all of the Alabama Power reservoirs on a case by case basis. In addition, the staff periodically (at least annually) performs lake-wide surveys to identify areas of aquatic plant infestation. The review process for application of treatment is as follows:

Aquatic Plant Control will be considered if the vegetation:

- 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 (such as may be the case of an aquatic plant which is known to create problems in the above categories).

Aquatic vegetation will be left in its natural state in areas which do not meet the above criteria (as deemed appropriate by Alabama Power biologists and staff) to enhance fishery habitat and reservoir aesthetics. The extent of assistance to homeowners or corrective action initiated will be determined by actual need and whether the control falls within the above categories.

10. FERC Comment: *In the PAD, you provide a list of noxious weeds and invasive plants potentially occurring within the project vicinity. The list, which was developed from a study conducted by Whetstone in 2006, lists seven primary species. Please provide the complete Whetstone report so we can see a complete list of all species collected during the study, including any maps that are part of the report. Also, during the site visit, Commission staff and Alabama Department of Conservation and Natural Resources personnel noticed a plant species that is not represented on the list. Therefore, please provide an updated list of noxious weeds and invasive plants occurring within the project boundary, and the abundance of each species listed. Please provide maps of the areas where the invasive plant species are*

located. The maps should be in both hardcopy and electronic shapefiles in a format compatible with ArcGIS.

Alabama Power Response: The requested Whetstone report is included attached as Appendix A.

It is not known what specific species of vegetation were observed by FERC personnel during the site visit. If FERC will provide additional information such as a description of vegetation or pictures of the vegetation, the area of Lake Martin where the vegetation was observed, and the ADCNR personnel that observed the species, Alabama Power will make an effort to determine the species of vegetation observed.

Alabama Power does not currently have any maps of the distribution of noxious aquatic vegetation on Lake Martin. Maps locating this information will likely be a product of proposed Study Plan (b) – Effects of a Rule Curve Change on Sedimentation and Rates and Nuisance Aquatic Vegetation. Alabama Power has planned to provide additional lists of noxious aquatic weeds and distribution maps of those species as part of the Study Plan 12 (b) to be performed during 2009. Alabama Power is currently performing its annual lake-wide survey and will make that information available as part of the Study Plan reports.

11. FERC Comment: *In section 5.3, page 5-46, of the PAD, you describe information related to the collection of benthic macroinvertebrates. You indicate that benthic macroinvertebrates were collected from four sites in the upstream portion of Lake Martin between May and October 1994. However, you do not provide any location information. Therefore, please show, on a map, the four sampling locations on Lake Martin where the data for benthic macroinvertebrates was collected.*

You also provide an assessment of project effects on benthic macroinvertebrates in the PAD. We understand this assessment does not constitute your final analysis of project effects on benthic macroinvertebrates. Nonetheless, our experience has been that, in determining the effects hydropower projects have on benthic macroinvertebrates, some states (e.g., Georgia), use an EPT (Ephemeroptera, Plecoptera, and Trichoptera) Index system to evaluate taxa richness, as well as to make a community assessment of the current populations (e.g., Biotic Integrity ratings of fair, good, excellent) (See Georgia Department of Natural Resources. 2002. Draft Standard Operating Procedures: Freshwater Macroinvertebrate Biological Assessment. Georgia Department of Natural Resources, Water Protection Branch, Atlanta, Georgia). We recommend that you use this, or a similar type of system, in your analysis of project effects on benthic macroinvertebrates. Such a system would be helpful in our review of your final assessments, as it provides quantitative rather than qualitative data.

Alabama Power Response: The macroinvertebrate collections referenced in the PAD were from the Bayne et.al. 1995 study. We have included a map of the collection areas from that report and included the report in Appendix B of this letter.

The EPT system referred to by FERC is applicable to stream ecosystems and not necessarily to reservoirs. To date, no state or federal agencies involved in the Martin relicensing have requested additional macroinvertebrate data for Lake Martin. Alabama Power has not proposed a study specific to macroinvertebrate collections.

12. FERC Comment: *In Appendix P of the PAD, you describe the issues raised during the issue identification workshop. You indicate that one of the issues raised relates to effects of project operation on the commercial fishery in Lake Martin. However, the PAD provides little information regarding the lake's commercial fishery. Therefore, please describe the commercial fishery occurring in the lake, and identify (a) species harvested and annual commercial value for each species harvested, and (b) types of gear used to harvest the fish. We will need this information to help identify and evaluate any potential effects associated with continued project operation on the commercial fishery in the lake.*

Alabama Power Response: The Alabama Department of Conservation and Natural Resources (ADCNR) has indicated there is no regulated commercial fishing operations on Lake Martin (see comments from Nick Nichols at the September 11, 2008 Scoping Meeting). However, some individual fisherman may use slat baskets to harvest catfish, but this is not a regulated fishery by the ADCNR.

13. FERC Comment: *Terrestrial Resources - In Appendix Q, page 5, and Appendix R, page 2 (Study Plan 5—Rare, Threatened, and Endangered Species Surveys), of the PAD, you mention that dam removal projects may be pursued as part of any potential restoration efforts for aquatic species, including RTE species. We suspect you would be looking at some old, low-head dams on tributaries entering Lake Martin or at sites adjacent to the project boundary. However, you do not adequately describe these potential restoration efforts for RTE species in the PAD. Therefore, please provide more details on potential on-site and off-site restoration and enhancement areas for RTE species. Your descriptions should include (a) specific locations and habitat types of each potential site, (b) land ownership of the site, (c) estimated cost of the site if not within the project boundary, (d) estimated cost of dam removal, if applicable, and (e) target RTE species for which the area would be restored. Please provide maps of the areas, in both hardcopy and electronic shapefiles in a format compatible with ArcGIS.*

The Commission typically prefers on-site enhancement measures to off-site measures. Your discussion and explanation of this issue in your study plans should show a clear and direct nexus of project effects on these RTE species that would justify any future enhancement efforts for these RTE species.

Alabama Power Response: Alabama Power removed reference to dam removal in Study Plan 5 as a potential restoration opportunity as a result of recent discussions with state and federal resource agencies. There is some concern now in the scientific community over removing low head dams. Alabama Power believes it to be premature to discuss protection and mitigation measures without the benefit of completing the study, interpreting the study

results and conducting the appropriate consultation with stakeholders. During implementation of Study Plans 5 and 12 (e), Alabama Power proposes to collect information to address FERC's questions and will include that information in the study reports as well as the Preliminary Licensing Proposal.

14. FERC Comment: *In the PAD, you do not provide information regarding plant communities occurring under the primary transmission lines within the project boundary and the methods, if any, of maintaining these transmission line rights-of-way. Therefore, please provide specific descriptions of the plant communities and associated wildlife species occurring under the transmission lines, and describe your methods for maintaining the transmission line rights-of-way. We need this information to evaluate potential effects of continued operation and maintenance of transmissions lines on botanical and wildlife species occurring in, and near, the transmission line rights-of-way. Also, please provide maps of the habitats located in the transmission line routes, in both hardcopy and electronic shapefiles in a format compatible with ArcGIS.*

Alabama Power Response: Alabama Power intends to collect this information during the relicensing process and present findings in the Study Report and Preliminary Licensing Proposal. With regard to transmission lines, Alabama Power reiterates its position that only transmission lines within project boundary would be included in this analysis.

15. FERC Comment: *In Draft Study Plan 7, Lake Martin Wildlife Management Program, you indicate that implementing the wildlife management program would provide information on forest types within the project boundary. Alabama Power owns about 8,800 acres of land within the project boundary. In the PAD, you broadly describe the forest communities occurring in the project area, but provide little detail. Therefore, please provide specific forest stand data showing (a) cover type, (b) composition, (c) age, and (d) structure for forest stands located within the project boundary. In addition, please describe current and future forest and wildlife management objectives for forests within the project boundary. You should provide maps of the forested areas within the project boundary, in both hardcopy and electronic shapefiles in a format compatible with ArcGIS. We need this information about forests located within the project boundary to evaluate any potential project effects on terrestrial resources.*

Alabama Power Response: Alabama Power proposes to address FERC's questions on wildlife management and forest/timber management on Alabama Power lands within the project boundary as part of Study Plan 7 – Wildlife Management Program. Alabama Power has edited Study Plan 7 to address FERC's comments and will provide the information and maps in the Study Report and as part of the Preliminary Licensing Proposal.

Attachments: Appendix A - Whetstone Report
Appendix B - Map of Macroinvertebrate Collection Areas

Appendix A

The Appalachian System extends from central Alabama northward to Newfoundland. The system comprises several physiographic provinces including the Martimes, New England, Adirondack Mountains, Piedmont Plateau, Blue Ridge, Valley and Ridge, and Appalachian Plateau. This particular region of Alabama lies within the Piedmont Plateau province. Piedmont Plateau is mostly a rolling plateau that is tilted eastward from 450m to approximately 150m at the Fall Line (Brouillet and Whetstone¹). Expanses of granite flatrocks, bluffs, benches, and smaller outcrops are exposed within this area (Image 1). This section of the Piedmont is the near the Fall Line. Most hills surrounding the lake slope sharply to the water line (Image 2). Thus, extensive floodplains and bottomland hardwoods are not present.

Potential natural vegetation for this area is considered to be oak – hickory – pine association by Barbour and Christensen². This association is a component of the extensive eastern deciduous forest province which is dominated by a number of mesophytic species including *Fagus grandifolia* (Beech), *Quercus* spp. (Oak species), *Carya* spp. (Hickory species), *Liriodendron tulipifera* (Yellow-poplar), *Tilia americana* (Basswood), *Fraxinus americana* (White ash), *Fraxinus pensylvanica* (Green ash), *Acer rubrum* (Red maple), among others. The title of the association refers to commonly encountered contemporary components of the community, *i.e.*, oaks (*Quercus*), hickories (*Carya*), and pines (*Pinus*). The addition of pine to the title is somewhat problematic since original vegetation likely had pines much more restricted in importance. Most likely, oaks and hickory forest dominated this area in pre-settlement times. This association and the province as well, have been subjected to increasing human impact since mankind first appeared on the scene. The clearing for agriculture, burning for habitat, subsequent abandonment of cleared spaces, and other activities have produced a patchwork of mostly second-growth forest, mid-successional stages, and a panoply of early successional assemblages. While the study is not definitive, Figure 1 presents community structure based upon an eight thousand acre stand survey so demonstrates the patchwork nature of natural vegetation, silviculture, and urban areas.

Locally, canopy in older second-growth is dominated by dry-mesic to mesic, upland oaks (*Quercus* species), hickories (*Carya* species), and pines (*Pinus* species). Oaks commonly abundant in this area include *Quercus alba* (White oak), *Q. velutina* (Black oak), *Quercus falcata* (Southern red oak), *Q. montana* (Rock chestnut oak), *Q. stellata* (Post oak), *Q. coccinea* (Scarlet oak), *Q. marilandica* (Blackjack oak), and *Q. phellos* (Willow oak). Hickories tend to be less in importance, though frequently found species include *Carya pallida* (Sand hickory), and *C. tomentosa* (Mockernut hickory). Common pines in the area are *Pinus taeda* (Loblolly pine), *P. virginiana* (Scrub pine), *P. echinata* (Shortleaf pine), and *P. palustris* (Longleaf pine). Other canopy and subcanopy species that are locally important are *Liquidambar styraciflua* (Sweetgum), *Prunus serotina* (Black cherry), *Nyssa sylvatica* (Blackgum), *Diospyros virginiana* (Persimmon), *Oxydendrum arboreum* (Sourwood), *Robinia pseudoacacia* (Black locust), *Ostrya virginiana* (Hophornbeam), *Carpinus virginiana* (Hornbeam), *Celtis occidentalis* (Hackberry), *C. laevigata* (Hackberry), *Magnolia tripetala* (Cucumber magnolia), *Sassafras albidum* (Sassafras), *Crataegus* spp. (Hawthorn species), *Malus* spp.

¹ Luc Brouillet, and R. David Whetstone. 1993. Climate and physiography. *In* Flora of North America Editorial Committee. 1993+. Flora of North America... Oxford.

² Michael G. Barbour, and Norman L. Christensen. 1993. Vegetation. *In* Flora of North America Editorial Committee. 1993+. Flora of North America... Oxford.

(Crabapple species), *Cornus florida* (Flowering dogwood), *Rhus* species (Sumac species), *Ilex decidua* (Possumhaw), *Acer negundo* (Box-elder), *A. leucoderme* (Chalk maple), *Aesculus pavia* (Red buckeye), *Aralia spinosa* (Devil's-walkingstick), and *Chionanthus virginicus* (Grandsir's-gray-beard). Among the primary components of the shrub/small tree stratum are *Vaccinium pallidum* (Low-bush blueberry), *V. arboreum* (Tree sparkleberry), *V. stamineum* (Deer berry), *Kalmia latifolia* (Mountain-laurel), *Hypericum hypericoides* (St. John's wort), *Myrica cerifera* (Wax-myrtle), *Calycanthus floridus* (Sweet shrub), *Hydrangea quercifolia* (Oakleaf hydrangea), *Hamamelis virginiana* (Witch-hazel), and *Rubus* spp. (Blackberry species). Lianas in these sites are variable though *Toxicodendron radicans* (Poison-ivy), *Smilax* (Cat-briar), *Parthenocissus quinquefolia* (Virginia creeper), *Vitis rotundifolia* (Muscadine), *V. vulpine* (Fox grape), *Gelsemium sempervirens* (Yellow jessamine), *Bignonia capreolata* (Cross-vine), and *Campsis radicans* (Cow-itch-vine) are common. Riparian zone and lowland vegetation include representatives of the upland forests as well as more wet-mesic to hydric taxa. Trees that are locally abundant in these habitats are *Sambucus canadensis* (Elderberry), *Catalpa bignonioides* (Catalpa), *Salix nigra* (Black willow), *Alnus serrulata* (Alde), *Betula nigra* (River birch), *Platanus occidentalis* (Sycamore), and *Ilex verticillata*. Common shrubs include *Itea virginica* (Sweetspire), *Cephalanthus occidentalis* (Button-bush), *Amorpha fruticosa* (Lead plant), *Cornus* spp. (Swamp dogwood species), *Halesia tetraptera* (Silverbell), and *Vaccinium elliotii* (Blueberry). Frequently encountered lianas along the riparian zones and other lowlands are *Ampelopsis arborea* (Pepper-vine), *Brunnichia ovata* (American buckwheat vine), *Berchemia scandens* (Rattan-vine), and *Cocculus carolinianus* (Moonseed) among other taxa. Herbs common to the area are extensive. Along ridges and upper slopes, *Pteridium aquilinum* (Bracken fern), *Polystichum acrostichoides* (Christmas fern), *Pleopeltis polypodioides* (Resurrection fern), *Stipa avenacea* (Needle grass), *Chasmanthium laxum* (Spike grass), *C. sessilifolium* (Spike grass), *Solidago odora* (Fragrant goldenrod), *S. altissima* (Goldenrod), *S. arguta* (Goldenrod), *Trillium cuneatum* (Sweet Betsy), *Aster* spp. (Aster species), are abundant among a host of other taxa that also may have locally extensive populations. Some of the more prevalent species along the lower slopes (Image 4) are cited in Table 1. A "sightings" list of species available for this study is attributable to the USDA (Table 2).

Table 1. Prevalent species list along Lake Martin.

Family	Scientific Name	Vernacular Name
Acanthaceae	<i>Justicia americana</i>	Water willow
Aceraceae	<i>Acer rubrum</i>	Red maple
Anacardiaceae	<i>Rhus copallina</i>	Winged sumac
Anacardiaceae	<i>Rhus glabra</i>	Smooth sumac
Araliaceae	<i>Aralia spinosa</i>	Devil's-walking-stick
Aspidiaceae	<i>Polystichum acrostichoides</i>	Christmas fern
Asteraceae	<i>Chrysopsis grammifolia</i>	Golden aster
Asteraceae	<i>Eupatorium maculatum</i>	Joe-Pye-weed
Asteraceae	<i>Silphium</i> sp.	Rosinweed
Asteraceae	<i>Vernonia</i> sp.	Ironweed
Betulaceae	<i>Alnus serrulata</i>	Tag alder
Betulaceae	<i>Betula nigra</i>	River birch
Bignoniaceae	<i>Bignonia capreolata</i>	Cross-vine
Bromeliaceae	<i>Tillandsia usneoides</i>	Spanish moss

Family	Scientific Name	Vernacular Name
Caprifoliaceae	<i>Lonicera japonica</i>	Japanese honeysuckle
Caprifoliaceae	<i>Sambucus canadensis</i>	Elderberry
Clusiaceae	<i>Hypericum hypericoides</i>	St. John's-wort
Convolvulaceae	<i>Cuscuta compacta</i>	Compact dodder
Convolvulaceae	<i>Ipomea pandurata</i>	Man-root
Cornaceae	<i>Cornus florida</i>	Flowering dogwood
Cyperaceae	<i>Scirpus cyperinus</i>	Wool-grass
Ebenaceae	<i>Diospyros virginiana</i>	Persimmon
Ericaceae	<i>Kalmia latifolia</i>	Mountain laurel
Ericaceae	<i>Oxydendrum arboreum</i>	Sourwood
Ericaceae	<i>Rhododendron viscosum</i>	Swamp azalea
Ericaceae	<i>Vaccinium arboreum</i>	Sparkleberry
Ericaceae	<i>Vaccinium elliotii</i>	Elliott's blueberry
Fabaceae	<i>Albizia julibrissin</i>	Silk tree
Fabaceae	<i>Amorpha fruticosa</i>	Amorpha
Fabaceae	<i>Apios americana</i>	Groundnut
Fabaceae	<i>Lespedeza cuneata</i>	Sericea
Fabaceae	<i>Pueraria lobata</i>	Kudzu
Fabaceae	<i>Robinia pseudocacia</i>	Black locust
Fabaceae	<i>Tephrosia virginiana</i>	Goat's rue
Fagaceae	<i>Quercus alba</i>	White oak
Fagaceae	<i>Quercus montana</i>	Rock chestnut oak
Fagaceae	<i>Quercus nigra</i>	Water oak
Fagaceae	<i>Quercus phellos</i>	Willow oak
Fagaceae	<i>Quercus velutina</i>	Black oak
Hamamelidaceae	<i>Liquidambar styraciflua</i>	Sweet-gum
Hydrangeaceae	<i>Hydrangea quercifolia</i>	Oak-leaf hydrangea
Juglandaceae	<i>Carya pallida</i>	Sand hickory
Juglandaceae	<i>Carya tomentosa</i>	Mockernut hickory
Juncaceae	<i>Juncus effusus</i>	Soft rush
Magnoliaceae	<i>Liriodendron tulipifera</i>	Tulip poplar
Magnoliaceae	<i>Magnolia macrophylla</i>	Bigleaf magnolia
Malvaceae	<i>Hibiscus militaris</i>	Marsh mallow
Nyssaceae	<i>Nyssa sylvatica</i>	Black gum
Oleaceae	<i>Ligustrum sinense</i>	Chinese privet
Osmundaceae	<i>Osmunda cinnamomea</i>	Cinnamon fern
Pinaceae	<i>Pinus echinata</i>	Shortleaf pine
Pinaceae	<i>Pinus palustris</i>	Longleaf pine
Pinaceae	<i>Pinus taeda</i>	Loblolly pine
Pinaceae	<i>Pinus virginiana</i>	Scrub pine
Platanaceae	<i>Platanus occidentalis</i>	Sycamore
Poaceae	<i>Arundinaria gigantea</i>	Switch cane
Poaceae	<i>Chasmanthium latifolium</i>	Indian woodoats
Poaceae	<i>Panicum repens</i>	Torpedo grass
Poaceae	<i>Phyllostachys aurea</i>	Golden bamboo
Poaceae	<i>Schizachyrium scoparium</i>	Little bluestem
Poaceae	<i>Zizaniopsis miliacea</i>	Giant cutgrass
Polygonaceae	<i>Brunnichia ovata</i>	American buckwheat vine
Ranunculaceae	<i>Clematis virginiana</i>	Virgin's bower

Family	Scientific Name	Vernacular Name
Rubiaceae	<i>Cephalanthus occidentalis</i>	Buttonbush
Salicaceae	<i>Salix nigra</i>	Black willow
Saxifragaceae	<i>Itea virginica</i>	Sweet-spire
Scrophulariaceae	<i>Catalpa bignonioides</i>	Indian cigar tree
Tiliaceae	<i>Tilia americana</i>	Basswood
Vitaceae	<i>Ampelopsis arborea</i>	Peppervine
Vitaceae	<i>Parthenocissus quinquefolia</i>	Virginia creeper
Vitaceae	<i>Vitis rotundifolia</i>	Muscadine

Table 2. List of riparian zone plants from the Martin Dam Project vicinity (Source: USDA, 2006).

Family	Scientific Name	Vernacular Name
Acanthaceae	<i>Justicia</i> sp.	Water willow
Aceraceae	<i>Acer rubrum</i>	Red maple
Aceraceae	<i>Acer saccharum</i>	Sugar maple
Anacardiaceae	<i>Toxicodendron radicans</i>	Poison ivy
Betulaceae	<i>Betula nigra</i>	River birch
Betulaceae	<i>Alnus serrulata</i>	Hazel alder
Bignoniaceae	<i>Catalpa bignonioides</i>	Southern catalpa
Bignoniaceae	<i>Campsis radicans</i>	Trumpet creeper
Blechnaceae	<i>Woodwardia areolata</i>	Netted chain fern
Caprifoliaceae	<i>Sambucus</i> sp.	Elderberry
Clusiaceae	<i>Hypericum</i> sp.	St. Johnswort
Cornaceae	<i>Cornus foemina</i>	Stiff dogwood
Cornaceae	<i>Nyssa sylvatica</i>	Blackgum
Cupressaceae	<i>Taxodium distichum</i>	Bald cypress
Cyrtillaceae	<i>Cyrtilla racemiflora</i>	Swamp titi
Dryopteridaceae	<i>Onoclea sensibilis</i>	Sensitive fern
Ebenaceae	<i>Diospyros virginiana</i>	Common persimmon
Ericaceae	<i>Vaccinium elliotii</i>	Elliot's blueberry
Ericaceae	<i>Rhododendron viscosum</i>	Swamp azalea
Ericaceae	<i>Oxydendrum arboreum</i>	Sourwood
Ericaceae	<i>Lyonia lucida</i>	Fetterbush
Fabaceae	<i>Mimosa microphylla</i>	Littleleaf sensitive-briar
Fabaceae	<i>Amorpha</i> sp.	False indigo
Fabaceae	<i>Lespedeza cuneata</i>	Sericea lespedeza
Fabaceae	<i>Gleditsia triacanthos</i>	Honeylocust
Fabaceae	<i>Cercis canadensis</i>	Redbud
Fabaceae	<i>Pueraria</i> sp.	Kudzu
Fagaceae	<i>Quercus nigra</i>	Water oak
Fagaceae	<i>Quercus alba</i>	White oak
Fagaceae	<i>Quercus stellata</i>	Post oak
Fagaceae	<i>Fagus grandifolia</i>	American beech
Fagaceae	<i>Quercus rubra</i>	Northern red oak
Fagaceae	<i>Quercus velutina</i>	Black oak
Fagaceae	<i>Quercus falcata</i>	Southern red oak
Fagaceae	<i>Quercus prinus</i>	Chestnut oak
Graminoid	<i>Andropogon virginicus</i>	Broomsedge bluestem

Grossulariaceae	<i>Itea virginica</i>	Virginia sweetspire
Hamamelidaceae	<i>Liquidambar styraciflua</i>	Sweetgum
Hamamelidaceae	<i>Hamamelis virginiana</i>	American witchhazel
Hydrangeaceae	<i>Hydrangea quercifolia</i>	Oakleaf hydrangea
Juglandaceae	<i>Carya aquatica</i>	Water hickory
Juncaceae	<i>Juncus effusus</i>	Common rush
Liliaceae	<i>Crinum sp.</i>	Swamp Lily
Magnoliaceae	<i>Liriodendron tulipifera</i>	Tuliptree
Malvaceae	<i>Hibiscus sp.</i>	Hibiscus
Meliaceae	<i>Melia azedarach</i>	Chinaberrytree
Oleaceae	<i>Ligustrum sinense</i>	Chinese privet
Onagraceae	<i>Ludwigia repens</i>	Red ludwigia
Pinaceae	<i>Pinus echinata</i>	Short leaf pine
Pinaceae	<i>Pinus taeda</i>	Loblolly pine
Pinaceae	<i>Pinus paulustris</i>	Long leaf pine
Plantanaceae	<i>Plantanus occidentalis</i>	American sycamore
Poaceae	<i>Zizaniopsis miliacea</i>	Giant cutgrass
Poaceae	<i>Panicum repens</i>	Torpedo grass
Poaceae	<i>Arundinaria gigantea</i>	Giant cane
Polygonaceae	<i>Brunnichia ovata</i>	American buckwheat vine
Pontederiaceae	<i>Pontederia cordata</i>	Pickeralweed
Rosaceae	<i>Crataegus sp.</i>	Hawthorn
Rubiaceae	<i>Cephalanthus occidentalis</i>	Buttonbush
Salicaceae	<i>Salix nigra</i>	Black willow
Vitaceae	<i>Vitis sp.</i>	Grape
Vitaceae	<i>Ampelopsis arborea</i>	Peppervine

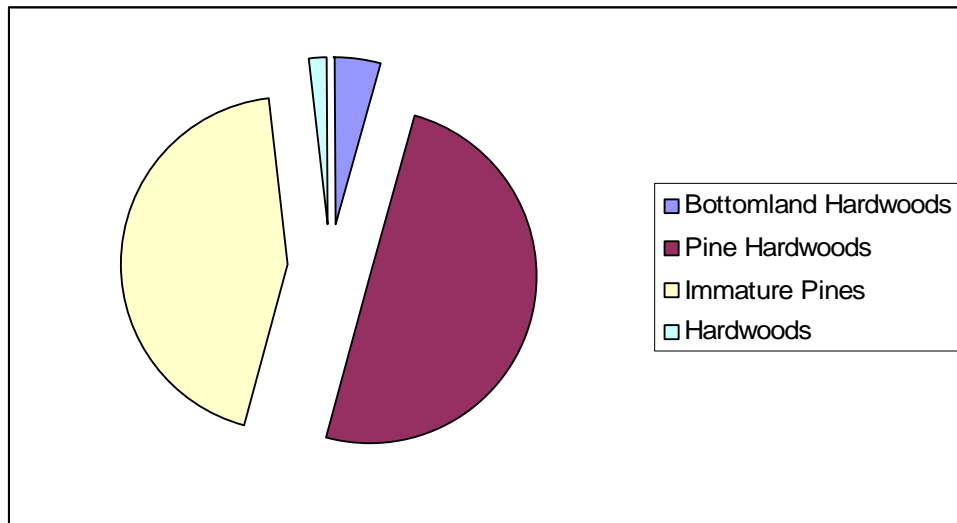


Figure 1. Plant community occurrences (from APCo stand data).

Threatened and Endangered Plant Species

A list of Threatened and Endangered Species cited as occurring in Coosa, Elmore, and Tallapoosa counties, Alabama, was obtained from the U.S. Fish and Wildlife Service. From a review of the literature, one threatened species, one endangered species, and one candidate species were found to be of potential occurrence in Coosa, Elmore, and Tallapoosa counties (Table 3). Possible habitat may occur within the tributaries of Lake Martin, but no species were located nor are any known. Another species that has not been located in any of the three counties, but has a potential occurring along Lake Marting is *Amphianthus pussilus* (Little amphianthus). All plant species are discussed below.

Table 3. Threatened and Endangered Species for Coosa, Elmore, and Tallapoosa counties, Alabama (U.S. Fish and Wildlife Service 2006).

Scientific Name	Vernacular Name	Status
<i>Sagittaria secundifolia</i>	Kral's water-plantain	Threatened, Coosa County
<i>Sarracenia rubra ssp. alabamensis</i>	Alabama canebrake pitcher-plant	Endangered, Elmore County
<i>Arabis georgiana</i>	Georgia rockcress	Candidate, Elmore County

Sagittaria secundifolia (Kral's water-plantain)

Sagittaria secundifolia (Alismataceae) is a perennial herb that is either submerged, on wet sands, or in standing water. This species grows on rocky creek beds and nearby



slopes in either sun or shade. *Sagittaria secundifolia* has many growth forms. Specimens found in crevices become linear with leaves much reduced. Specimens growing in unconsolidated substrates form tussocks with much longer leaves. The species has been observed growing in rocky shoals so this potential habitat is not available on-site. Potential habitat is available in runs and riffles of tributaries above the pool level of the project area. The

aquatic and wetland plant flowers from May to August and fruits from July to September.

Sarracenia rubra ssp. *alabamensis* (Alabama canebrake pitcher-plant)

The Alabama canebrake pitcher-plant is in the Sarraceniaceae, thus a carnivorous species. This perennating structure is a rhizome that produces hollow or flattened leaves. This pitcher plant produces significantly different pitchers in the earlier portion of the growing season than during summer months. The spring pitchers are smaller and arcuate, while the summer leaves are erect, larger, covered with a fine pubescence, and light green in color. Flowers are dark red to maroon presented on pedicels that may reach 60cm in length. This pitcher-plant is an inhabitant of wetlands, thus is found in sandy and gravelly seeps, highly organic soils, and in swamps. The habitat is usually highly acidic and devoid in nitrogen so the carnivory provides a ready source of nitrogen (via the animal protein). The species thrives in areas where it is exposed to sunlight, though can persist for long periods in shaded environments. Flowering is from late April to early June.



Arabis georgiana (Georgia rockcress)

Georgia rockcress (Brassicaceae) is a perennial herb. This plant is approximately 90 cm in height. Basal leaves are oblanceolate, has dentate margins, and has the apices rounded. Basal leaves usually persist throughout the year. Aerial leaves are alternate, tend to clasp the stem, and are lanceolate to narrowly elliptic. The adaxial leaf surfaces are glabrous to pubescent. Racemes are terminal. Petals are white. Siliques are erect. Seeds are in single rows on each side of the replum, and they are flattened, oblong, and narrowly winged. The habitat for this species is primarily rocky (limestone, shale, granite-gneiss) bluffs and slopes. Georgia rockcress March to April. Fruits may be found from from May to early July.



Amphianthus pusillus (Little amphianthus)

Amphianthus pusillus is a small, greenish-purple aquatic annual that may reach 7cm in height. Basal leaves are submerged. Delicate branches arise from the submerged stem. They are tipped with a pair of broad, rounded, green, purple-edged, floating leaves. The leaves are bracteal and subtend a single white flower. This flower is chasmogamous. A cleistogamous (non-opening) flower is attached to the submerged portion of the stem. The life cycle of this species is only three to four weeks and is restricted to the wetter portions of spring. The habitat is shallow basins on granitic flat-rocks, an environment that in



summer is very dry, thus season weather profoundly affects the appearance of this species. This herb flowers from March to April. Fruits occur from from April to May.

Invasive Species

Invasive species typically produce large numbers of seeds, assisting their spread. Invasives, sometimes called weeds are typically plants growing where humans do not want them to grow. Species considered invasive mostly comprise alien or non-native species; however, under disturbed conditions, native taxa may become weedy and may not be the most desirable species. For example, *Acer negundo* (Box-elder) is a common component of lowland communities with a broad mixture of species composition. When bottomlands are cleared, *Acer negundo* may have a good source of local propagules and form a near mono-specific canopy that does not resemble common native communities. Invasives are mostly species associated with early stages of ecologic succession so includes mostly taxa that invade disturbed habitats, tolerate full sunshine, reproduce quickly, and produce large numbers of propagules (e.g., spores, fruits, seeds). Propagules spread into more mature plant communities, including waterways, via gravity, wind, water, people, vehicles, machinery, birds and other animals. Weeds rapidly invade disturbed sites. Human activities and domesticated animals, such as rabbits, cattle, horses, goats and pigs, create good conditions for weed growth. They contribute to soil disturbance, loss of plant cover, soil compaction, or changed burning patterns. Perhaps the more serious of the weeds are those that tolerate both full sunshine and shaded conditions. These species are capable of invading disturbed communities as well as communities that are second growth or climax forests. Invasive species threaten the survival of many native plants and animals because they:

- ◆ usually grow faster than native plants and successfully compete for the available nutrients, water, space, and sunlight;
- ◆ often survive better than native plants as they may not be affected by the pests or diseases that would normally control them in their natural habitats;
- ◆ reduce natural diversity by smothering native plants or preventing them from growing back after clearing, fire, or other disturbance; and
- ◆ replace the native plants that animals use for shelter, food, and nesting.

Further, many invasives form disclimax communities overwhelmed by a single species that may offer a single type of cover, as well as a single type and temporal food source thereby adversely impacting the diversity of animal life that occurs within the vicinity.

Some estimate that from 9 – 20% of the floristic composition of the region comprises non-native species. Many of these species have the propensity to become invasive species; however, those of most in the project area include *Albizia julibrissin* (Silk tree), *Ligustrum sinense* (Chinese privet), *Lonicera japonica* (Japanese honeysuckle), *Panicum repens* (Torpedo grass), *Phyllostachys aurea* (Golden bamboo), *Pueraria lobata* (Kudzu), and *Zizaniopsis miliacea* (Giant cut grass or millet).

Albizzia julibrissin (Silk tree)

Silk tree or mimosa is a small tree that is 10 to 50 feet in height, often having multiple trunks. The bark is smooth to pebbly, and light-brown. Leaves are alternate, deciduous,



and bipinnately compound which resemble fern fronds. Silk tree has very showy, pink flowers that are fragrant. Fruits are flattened legumes that remain throughout winter. Silk is invasive in an array of disturbed habitats including old fields, stream banks, roadsides, flower gardens, rail yards, abandoned homesites, and rights-of-way. Mostly, the plant occurs in full sunlight but is widely dispersed in shaded areas. Once established in a site, silk tree is difficult to control due to the aggressive suckering

and a soil bank with long-lived seeds. Silk tree is native to Asia and was first introduced into the U.S. in 1745 as an ornamental.

Ligustrum sinense (Chinese privet)

Chinese privet is a shrub to a small tree that commonly attains 20+ feet. Bark is small and usually greenish. Leaves are opposite, deciduous, and simple with ovate blades.



Flowers are in panicles, are white to yellowish, and very fragrant. Fruits are purplish drupes at maturity. This shrub can be found throughout the south and forms dense thickets along roadsides, fence rows, fields, rights-of-way, and in bottomland forests. Chinese privet produces large numbers of fruits and regenerates by suckering. Thus, this plant is capable of quickly forming dense stands which crowd out native plants and trees. Stands are so dense that maneuvering through areas may become nearly impossible. The shading and

competition can be so vigorous that frequently the herb layer is multi-storied communities are eliminated. Chinese privet is native to China and was introduced in the U.S. as an ornamental shrub in 1852.

Lonicera japonica (Japanese honeysuckle)

Japanese honeysuckle is a trailing or twining liana that can grow up to 30 feet in length. The bark is greenish-brown on twigs while older growth has scaly bark. The leaves are opposite, semi-evergreen to deciduous, simple with ovate blades. Flowers are mostly in axillary clusters, flowers vary from yellow to white, are showy, and fragrant with copious amounts of nectar. Fruits are black, globose, berries. Japanese honeysuckle primarily occurs in disturbed habitats such as fence rows along fence rows, old home sites, along rail roads, roadsides, abandoned fields, and in forests. Honeysuckle invades mature plant communities after disturbances such as windstorms, logging, or floods. Japanese honeysuckle grows and spreads rapidly from fruit dispersal as well as aggressive, brittle stems that readily form adventitious roots.



The species flowers most abundantly in full sunshine; however, individuals persist for long periods in shaded conditions. When disturbances occur, these persistent individuals quickly spread within the herb layer as well as by climbing into the shrubs and trees. Japanese honeysuckle is native to eastern Asia and was introduced into cultivation in 1862 as an ornamental ground cover.

Panicum repens (Torpedo grass)

Torpedo grass is perennial herb that forms extensive colonies. Stems are long rhizomes located both on the surface and below ground. The vernacular name refers to the



rhizomes having characteristic torpedo like apexes. Leaves are flat and elongate. The inflorescence comprises a panicle of spikelets. Lemmas are smooth. Torpedo grass occurs in ditches, along marshy shores and canals, and other poorly drained habitats. At one time, this panic grass was used for cattle forage in the 1920's for its resistant to grazing and trampling. This species grows into water up to 6 feet deep forming a thick dense floating mat. Torpedo grass begins to grow in February. The grass is not cold tolerant, thus is killed back to the ground by frost. Once established, torpedo

grass is difficult to eradicate due to the impressive rhizomatous growth. Torpedo grass was first collected in the United States near Mobile, Alabama in 1876.

Phyllostachys aurea (Golden bamboo)

Golden bamboo is a bamboo that primarily spreads by rhizomes. Stems are green, “woody”, and characterized by nodes with hollow internodes. Shoots develop in the



spring. Non-flowering individuals may be separated from our local native bamboo by possessing a number of internodes in the first few inches above the ground. The stems grow from side shoots at alternate nodes of the rhizome. Flowering is infrequent. Mostly the species occupies old home sites; however, the species was widely planted for fishing canes in the area. Also, many stands appear to occupy waste places where yard waste was likely thrown

away. This aggressive species forms dense, nearly impenetrable stands from underground rhizomes. The species was introduced to the United States in 1882.

Pueraria lobata (Kudzu)

Kudzu is a perennial, woody, high-climbing liana that has been known to grow 50 feet in a growing season. Young stems are bristly-hairy. Leaves are alternate, deciduous, and trifoliolately compound. The flowers are borne in panicles, pea-like and purple, with a



distinctive and pronounced grape-like odor. Clusters of 20 to 30 hairy, legumes are produced that contain tiny kidney-bean-shaped seeds. Ornamental use is suggested by the large number of abandoned home sites that are overgrown with this aggressive species. The USDA and other agencies used the species for erosion control. Few species can tolerate the competition by kudzu. The species forms a dense blanket of leaves and stems that limits light that penetrates below. Limited spread by seeds means most infestations result from persistence rather

than new introductions. Kudzu was originally introduced into the United States as an ornamental vine in 1876.

***Zizaniopsis miliacea* (Giant cut grass or millet)**

Giant cutgrass is a terrestrial or an emergent grass that grows to about 9 feet. This



grass is a coarse perennial with scaly rhizomes, commonly forming extensive dense colonies. Leaf blades are flat with sharply toothed margins, hence the name “cut grass”.

Spikelets are panicle; erect, fruiting spikelets are with ribbed, scabrous lemmas. The grass usually grows in fresh or brackish shallow water of ponds, sloughs, ditches, etc. Reproduction occurs from rhizomes, grains, and from aerial stems that fall over and root at the nodes. Colonies are often dense and nearly impenetrable thus limit other native species. Thus, this native species is frequently controlled to provide additional habitat or to foster

recreational and navigational activities. This species is native to the southeastern United States. See also Image 5.



Image 1. Granitic bench above pool level (Irwin Shoals).



Image 2. View of shoreline upstream from US-280 crossing. Note mixture of hardwoods and pine communities and well-drained slopes.



Image 3. View of canopy of *Pinus palustris* (Longleaf pine). Nesting site of Bald eagles.



Image 4. Partially submerged floodplain near the vicinity of the confluence of Hillabee Creek with the Coosa River. Riparian vegetation that is clearly in zones provides unique habitat around Lake Martin for wildlife.



Image 5. View of treated stand of *Zizaniopsis miliacea* (Giant cut-grass) in slough. This species aggressively colonizes sand bars thus excludes a number of other native species offering additional habitat features important to local wildlife.

Appendix B

