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1 November 2010

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
888 First Street, NE
Washington, DC 20426

Subject: Comments of World Wildlife Fund on Martin Hydroelectric Project (FERC Project No. 349) Study Reports

Dear Secretary Bose:

The World Wildlife Fund (WWF) appreciates this opportunity to provide comments on the Study Summary, distributed to all stakeholders on October 1, 2010, for Alabama Power Company's (APC) Hydroelectric Project (FERC Project No. 349-150). We will provide more extensive input as study reports are finalized, sent to stakeholders and filed with the Federal Energy Regulatory Commission (Commission).

WWF has been an active stakeholder in the Martin Hydroelectric Relicensing process. We have participated in stakeholder meetings (May 24-25, 2007, September 26-27, 2007, April 1-2, 2008, March 30-31, 2010 and May 19, 2010), the Martin Rule Curve Meeting (March 6, 2008), draft study plan meeting (January 7, 2009), relicensing modeling workshops (February 10, 2009 and September 29, 2009), the informal study plan update meetings (October 21, 2009 and September 14, 2010), the formal initial study report meeting (December 3, 2009), the Water Quality Expert Panel (July 27, 2010) and the Martin Relicensing Multi-Criteria Decision Analysis Tool meetings (October 13, 2010 and October 26, 2010). WWF also participated in the Martin Hydroelectric Project tour and scoping meeting (September 10-12, 2008) where we provided public comments on our interests and potential points of intersection with the operation and maintenance of the Martin Hydroelectric Project. We have also filed with the Commission and/or APC written comments throughout the relicensing process, including APC's PAD Questionnaire and letters in 2007 (October 15 and December 14), 2008 (October 12), 2009 (February 17, April 2 and November 6) and 2010 (February 17, April 16, May 28, September 3 and October 22).

WWF is an international 501 (c) (3) nonprofit conservation organization dedicated to protecting the world's wildlife and wildlands. WWF maintains its primary office in Washington, DC, and has a regional office in Nashville, Tennessee. The mission of the Nashville office is to ensure the protection, preservation and enhancement of aquatic life in the rivers and streams of the southeastern United States, specifically the Cumberland,

Mobile, and Tennessee River Basins. WWF has over 1.2 million members in the United States and over 8,000 members in Alabama. We are interested in determining and quantifying the Martin Hydroelectric Project's impacts on fish, wildlife, and plants, and their habitats (including water quality). Our goal is to develop and implement measures to protect, enhance, and mitigate the impacts of Martin on these natural resources.

WWF appreciates the continued efforts by the many parties working on this process and look forward to continued dialogue with APC staff, other stakeholders, and the Commission in this relicensing process.

Sincerely,

Judy Takats
Senior Program Officer

cc: Jim Crew, Alabama Power Company

Study 1: Migratory Fish - Tallapoosa Basin Literature Review

The Commission approved Study Plan 1 in April 2009 (see Commission filing eLibrary no. 20090417-3036 and APC filing eLibrary no. 20081117-5039). However, inadequate information has been provided by APC to finalize this report. Specifically, in *Section 6 Proposed Methodology* item 6 states that APC will:

- *Include information on abandoned tributary dams that may be candidate for removal.*

  APC committed to collecting and presenting the names and locations of abandoned or "no longer used" diversions or other fish passage obstructions that could be candidate locations for fish passage improvement in the Tallapoosa River sub-basin in the vicinity of the Martin Hydropower Project. However, the "Final" Study Report (dated May 2010) does not contain this information nor has this information been presented to stakeholders in another form.

  Recommendation: APC should present this information in the Final report.

Also in Section 6, item 7 states that APC will:

- *Discuss how releases from Martin may potentially affect migratory fish below the Thurlow development.*

  APC committed to evaluate how flow releases at Martin Dam affect fish migrations in the Tallapoosa River downstream of Thurlow Dam. Base flows (those that occur at the Thurlow minimum flow of 1,200 cfs) may interfere with upstream or downstream fish movements by making shoals or riffle areas difficult for fish to pass. Widely fluctuating flows, specifically those that occur frequently during weekdays as a result of peaking operations at Martin, may trigger migrations of certain fish species during a time period that is maladaptive to the life history of the species (for example, but not limited to, Alabama Shad (*Alosa alabamae*), Alabama Sturgeon (*Scaphirhynchus suttkusi*), Southeastern Blue Sucker (*Cycleptus meridionalis*) and other large river fish species that use the Alabama and Tallapoosa Rivers).

  Recommendation: APC's analysis should include the potential impact of base flows and widely fluctuating flows to migrations and migratory cues of the fishes listed in Table 2-1 of the Study Plan (Table 3-1 of the current Study Plan Report). Presentation of this analysis could be satisfied by adding a column in Table 4-1 of the Study Plan Report that estimates the effect of fluctuating flows during the time of species migration and spawning on each species.

Study 3: Evaluation of Minimum Flows Downstream of Martin Dam

Though the study report is still in draft form (dated September 2010), WWF has some questions about the analyses presented to evaluate the suitability of flows in the Tallapoosa River downstream of Martin Dam (particularly between Thurlow Dam and river mile 12.9).

With respect to paddlefish, APC uses *mean daily flows* in access of 6,000 cfs during the months of March to April as an indication of suitable migratory cue and available spawning habitat (see Table 6-1 of the study report). Drawing conclusions from this statistic alone is dangerously flawed for two reasons:

1. Fish do not experience mean daily flow, rather, they experience flow on an an instantaneous basis. A mean daily flow of 6,000 cfs could be produced in a number of ways including:

    - a consistent flow of 6,000 cfs for 24 hours,
    - 6 hours of 5,500 cfs, followed by 12 hours of 6,000 cfs, followed by 6 hours of 6,500 cfs, or
    - 11 hours of 1200 cfs followed by 13 hours of 10,000 cfs.

    The first two examples are flow patterns that are likely just fine for spawning paddlefish (if, in fact, 6,000 cfs is a suitable flow threshold for paddlefish migration [see point 2 below]). However, during March and April, APC frequently operates the Martin Project in a peaking fashion; meaning that the last example is a reasonable representation of flow conditions on an hourly basis that occur in the Tallapoosa River downstream of Thurlow Dam during this time period during many years.

    The concern with the potential for widely fluctuating, hourly flows on assessing paddlefish migration, spawning, and incubation suitability is inherent in the life history characteristics of paddlefish. Regardless of the migration trigger, that flow event should be a broad, consistent flow event, not a single short duration pulse (or a series of short duration, high flow pulses). Such a broad event would draw the largest number of mature, adult paddlefish into the Tallapoosa or up the Tallapoosa to contribute to effective spawning. This long-duration high flow event would allow the greatest dispersal of adult paddlefish throughout the Tallapoosa, increasing the likelihood that a large number of fertilized eggs will settle on substrates that will stay submerged and offer useable habitat conditions for larval and juvenile paddlefish.

    During spawning, paddlefish eggs are broadcast in fast water where they drift and sink to the bottom of the river. Some of these eggs will settle in deep water while others will settle in relatively shallow areas (less than 3-feet deep). The eggs are adhesive, so once they have settled on a rock, a bedrock ledge, or a log, there the egg will rest until it hatches or is dislodged. In an environment that fluctuates in depth several feet on a near daily basis, all of the eggs that happen to settle within the fluctuation zone, whatever the fluctuation zone may be, will be exposed to air and perish. Daily fluctuations of several feet assure the elimination of some proportion, likely substantial, of the paddlefish spawn. Under typical March and April water temperatures in the Tallapoosa River, it seems that paddlefish eggs will

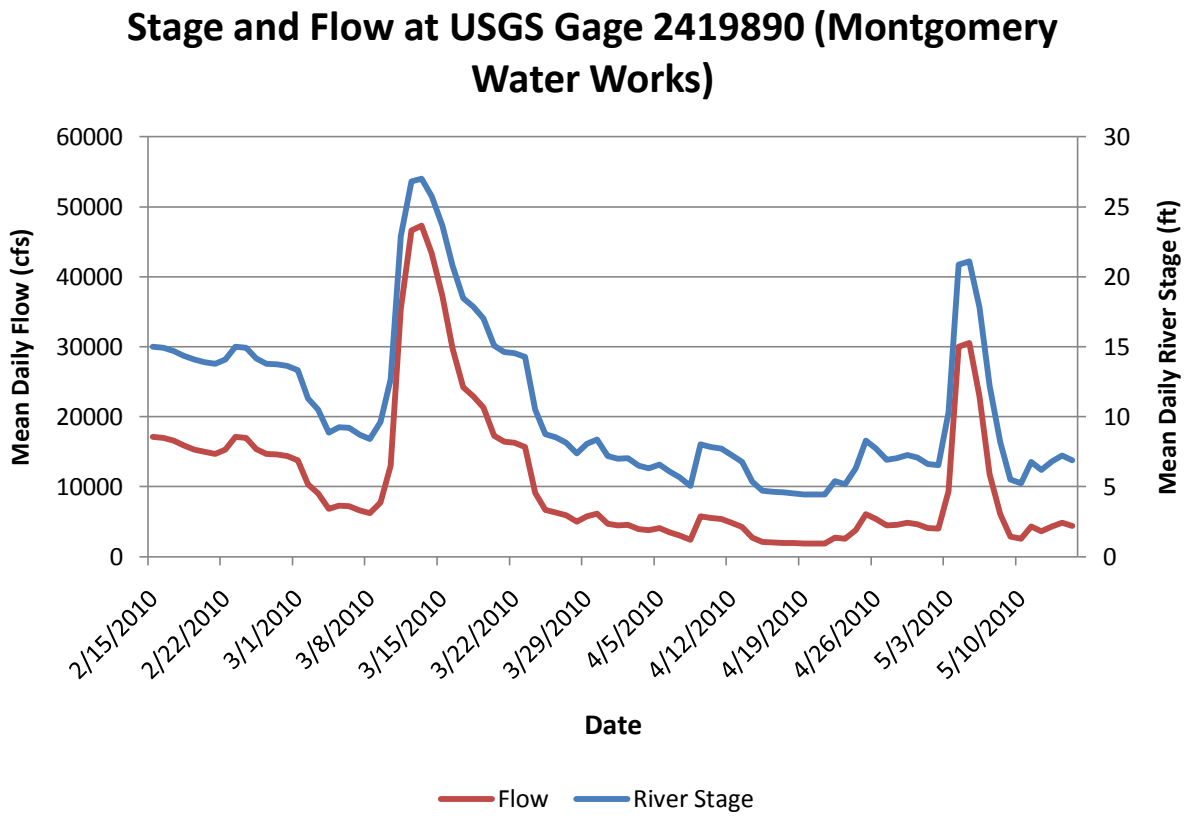
hatch about 14 days after they are spawned. Clearly, an egg that successfully reaches hatching stage must stay submerged for at least this long.

Recommendation: The best scenario for maximizing suitable paddlefish migration, spawning, and egg incubation would seem to start with a substantial increase in flow that raises river stage 7 to 11 feet lasting several days. Following this large flow increase, flows could slowly decline over a roughly 12 to 14 day period. This broad event would allow spawning fish to enter, disperse freely, and spawn. It would also allow the vast majority of eggs to stay submerged until hatching and give larval paddlefish the opportunity to feed and become swimmers capable of finding suitable rearing conditions.

2. Based on peer-reviewed literature it appears that a substantial rise in river stage (9 to 12 feet), and not a specific flow threshold, is a trigger for paddlefish to begin spawning migrations. WWF supplied one such study (see Appendix A of WWF's 22 October 2010 letter eLibrary no. 20101022-5124). Thus, sometime during the period of paddlefish spawning (which has been accurately described by APC as March to April), the Tallapoosa River should experience an increase in river stage of somewhere around 9 feet above the base flow heading into the early to mid-March period. Historically, this change in river stage would have been caused by a substantial spring rain event. This 9-foot river stage increase can be correlated to a variety of base flow conditions. For example, if the base flow of the Tallapoosa River at Montgomery Water Works is 6,200 cfs (a flow level that seems like a potential base flow in early March at this gaging station based on examination of the record), an increase in river stage of 9 ft would be achieved from a flow of 22,000 cfs (see Figure 1, early March 2010). Examining the river stage information for the Montgomery Water Works gaging stations shows that this is a river stage increase of 9.01 feet (increasing from a stage of 8.40 ft to 17.41 ft). Alternatively, if the base flow of the Tallapoosa River at Montgomery Water Works is 3,000 cfs (another potential base flow level during the spawning period at this gaging station), a 9-ft increase in river stage would be achieved with a flow of 16,400 cfs (see Figure 1 in late April/early May). These Tallapoosa River flows equate to river stage changes from 5.67 ft to 12.40 ft, an increase of 8.96 ft. The key points here are that the "stable" flow conditions in the lower Tallapoosa River immediately prior to triggering paddlefish spawning dictate the target flow condition. This target flow must be sufficient to approximate a 9 to 12-foot increase in river stage.

Recommendation: APC should assess the impacts of the proposed alternatives on river flows sufficient to trigger paddlefish spawning migrations (increase in river stage by 9 to 12 feet in the lower reaches of the Tallapoosa River).

Figure 1: Tallapoosa Mean Daily River Stage and Mean Daily Flow at USGS Gaging Station 2419890, Montgomery Water Works February 2010 – May 2010.*



*Note: This gage is located at river mile 12.9 of the Tallapoosa River, near the City of Montgomery, AL.

We concur with APC's approach to the relationship between alternative operations at Martin Dam and flow sufficiency for aquatic species that use the lower Tallapoosa River, in general. Further, conditions that are sufficient for Paddlefish are likely in the range of sufficient for other freshwater and diadromous (species using both freshwater and marine habitats through the course of their life histories) fishes that use or historically used the Tallapoosa River to spawn in the late February to mid-May timeframe. However, APC has constrained this analysis to a species that spawns during the early spring period. Such analysis provides little to no information relative to those fish species that spawn in the Tallapoosa River in late spring and early summer, including species such as Silver Chub, Shoal Chub, Channel Catfish, Flathead Catfish, Largemouth Bass, Spotted Bass, Redspotted Sunfish, Southern Walleye, Freckled Darter, and Muscadine Bridled Darter. Moreover, not all of the fishes that rely on the lower reaches of the Tallapoosa River can successfully withstand occasionally successful spawning conditions. Short-lived species (minnows and darters), in particular, require at least fair spawning conditions on a yearly basis to persist at reasonable levels. This lack of broad analysis on a number of species is missing in the Study Report potentially limits the utility of the results of Study Plan 3 on the range of fish species that use or potentially use the lower Tallapoosa River for spawning and juvenile rearing habitat.

Recommendation: As we have frequently commented, the results of this study would be far more robust if the analyses included more species than paddlefish alone. In fact, such an analysis, we contend, is necessary under the National Environmental Policy Act.

Study 4 – Fish Entrainment & Turbine Mortality

APC makes an important assumption in the process of adjusting the relatively high levels of entrainment from field-based hydroacoustic studies during the winter time period to lower estimates. That assumption is that high flows coinciding with days of particularly cold water temperatures in the Tallapoosa during the days of hydroacoustic sampling in February of 2010 pushed more fish into the forebay and into the turbine intakes than would have occurred under more normal flow conditions.

Recommendation: We recommend APC provide evidence to support the assumption noted above. We are particularly interested in validating the link between cold-stressed shad, higher flows, and increased entrainment. If there is not any evidence to support this assumption, please state that in the study report. If APC plans to gather another year of data to test the assumption, that should be stated in the report. If APC chooses to gather peer-reviewed data to support the assumption, several citations showing that high flows resulted in higher than ordinary entrainment, particularly for reservoirs with large shad (*Dorosoma* spp.) populations and during the winter season, would be necessary.

Moreover, APC adjusts entrainment estimates (which affect turbine mortality estimates) without presenting analysis of the frequency of occurrence of these conditions at the Martin project. Instead, APC presents the cold February temperatures and the simultaneous high flows as unusual and "adjusts" these estimates to more "ordinary" flow conditions. WWF would like to have a more complete understanding entrainment during this time period. By adjusting entrainment estimates to an "ordinary" condition discounts the potential impacts of the occasional extreme condition, a series of conditions that obviously occur (as they did during the field verification for this study).

Recommendation: APC should present flow and water temperature patterns in the Martin forebay to establish how frequently Martin forebay temperatures drop below 8°C. APC should also provide information to describe how frequently flows in the Martin forebay are in the "ordinary", "below ordinary", and "above ordinary" range. Ideally, these analyses would be presented concurrently and in such a manner that the reader will understand how often particularly cold water temperatures coincide with the range of flow conditions. APC should then describe how all the various combinations of temperature and flow conditions would affect entrainment during the winter time period.

In the Study Plan report "Appendix B Species Composition and Length Frequency Data", data for the longnose gar is inconsistent (see Page 149 of the PDF *Updated Study Report for the Martin Hydroelectric Project (FERC No. 349-150),* eLibrary no. 20100901-5230). On page B-1, the data table shows that longnose gar were only captured in June, but the Winter Size Table (see page B-2) shows that a gar was captured during winter. This discrepancy shows the potential for inconsistent data presentation that may affect subsequent analyses.

Recommendation: WWF recommends cross-checking the data and verifying and discrepancies with the author(s) of the source reports.

Study 5 – Rare, Threatened, and Endangered Species Survey

The Tallapoosa River is a substantial tributary to the globally significant Mobile River Basin, a center of freshwater biodiversity. This aquatic diversity is not limited to fishes, but also includes mussels, snails, crayfish, other aquatic invertebrates, and terrapins. Some of these fauna are rare, only found across a limited distribution and/or found only in the Tallapoosa River Sub-Basin. Some are protected by the Endangered Species Act while others are recognized by the Alabama Department of Conservation and Natural Resources. These latter species are included in *Conserving Alabama's wildlife: a comprehensive strategy,* Alabama's Wildlife Action Plan, a document that the Commission recognizes as a Comprehensive Plan (see http://www.ferc.gov/industries/hydropower/gen-info/licensing/complan.pdf)[1]. Despite the fact that these species are afforded some status under *Alabama's Wildlife Action Plan*, APC did not sample for crayfish, or alligator snapping turtle. Overall, the methods used to sample for fauna were geared for mollusks, snails, fishes, terrestrial plants, and birds. As such, it is not surprising that alligator snapping turtles, Tallapoosa crayfish, slackwater crayfish, or Chattahoochee crayfish were note reported in samples, despite information available that demonstrates the likely occurrence of at least some of the crayfish species in the project vicinity (Moore Martin 2010).

Recommendation: APC should clearly state whether they have any information regarding these species and their presence in the potentially affected stream reaches. If APC does not have any information, that should be stated clearly in the report. If there is information on any of these species with respect to their use of project affected areas, including the Tallapoosa River and streamside habitats, their habitat requirements, and how the Martin Project operational alternatives does or does not impact the species or habitats.

Recommendation: Table 3 should be updated to reflect the dates of sample during 2009 or 2010 for the final report.

On page 8 of the draft study, APC describes the little amphianthus and Georgia rockcress sub-sampling protocol used by Whetstone Consulting.

[1] Though noted as being undated, the plan was actually published in 2005 (see Literature Cited section).

Recommendation: WWF would like to see the percentage of the lands within the study area deemed suitable for little amphianthus (based on soils, associated vegetation, topography, and other characteristics) that were included in the sub-sample. We would like to see the same percentage for Georgia rockcress in the vicinity of Martin reservoir. Given that these are protected species and, therefore, likely to be rare or otherwise difficult to find in surveys, the level of effort expressed as a percentage of the likely habitat surveyed is useful for interpreting APC's conclusion that there are no threatened or endangered plants in the Project area.

Study 12 (b) – Effects of a Rule Curve Change on Sedimentation Rates and Nuisance Aquatic Vegetation

In the Study Report (dated July 2010) it seems like at least spinyleaf naiad (*Najas minor*) is capable of establishing and thriving in areas that are deeper than the other plants included in this analysis.

Recommendation: WWF suggests that APC revise their criteria for prospective nuisance aquatic plant based on specific plant characteristics (e.g. ability to establish in areas) and recalculate the acreages presented in the results section of the report, if they are impacted by this new depth criteria.

Section 3 attempts to estimate the area that could be impacted at each site by each one foot change in rule curve. Moreover, APC goes to the trouble of ascribing priorities to various acreages at each winter pool target alternative. However, discussion of the ramifications of increased aquatic nuisance species populations / expanded areas of aquatic nuisance species / larger expanses of shallow depths is not provided. This leaves the reader unsure of how to interpret the overall risk of each alternative compared to current conditions – the bottom-line of each analysis conducted by APC in this proceeding.

Recommendation: In this section, APC should draw some general conclusions from the acreage estimates. These conclusions should describe how the acreages, weighted by priority, will affect homeowners around the lake, reservoir recreationists (water skiers, pleasure boaters, swimmers, anglers), and other interested stakeholders that might be impacted by increased levels of nuisance aquatic plants and aquatic plant management activities (or the consequences of not managing nuisance aquatic plants). For example, APC could include an assessment of how these risks may translate into increased costs to dredge embayments, facilitating typical boat traffic (if this is likely to be necessary).

Bedload in the Tallapoosa mainstem upstream of Martin reservoir, and in tributaries entering Martin reservoir have a direct impact on how much a site is likely to be affected by sedimentation. While APC has no control over these activities (outside of development / road construction / forestry activities on APC lands), these factors relate directly to sedimentation in Martin reservoir. Therefore, they are an important consideration for the results of Study 12(b).

> **Recommendation: To effectively estimate how sedimentation is likely to impact various areas within the Martin impounded area, the likelihood of future home site development or new or increased forestry activity within contributing watersheds should be included in some quantitative manner (or qualitatively if it cannot be effectively estimated). Both home or commercial site development and increased forestry / forest road construction are likely to route fine sediments into Martin reservoir and might modify the rankings APC has proposed.**

Study 12 (d) – Effects of a Rule Curve Change on Lake and Downstream Erosion

APC has provided information on erosion sites along the Tallapoosa River between Thurlow Dam and the USGS Milstead gaging station. The Milstead gaging station is located, approximately, at river mile 40. The study plan for this study was amended based on an order from FERC during the study plan approval process, to include erosion sites downstream to river mile 12.9. WWF believes that APC has only partially fulfilled the commitment articulated in their study plan.

> **Recommendation: APC should survey the Tallapoosa River between the Milstead gage (the approximate downstream extent of the Thurlow monitoring sites) and river mile 12.9 to meet the commitment expressed in the study plan. APC should evaluate any erosion sites that are found during the survey to estimate how erosion might change, and to what degree, under the alternative operations.**

Study 12(e) – Effects of Rule Curve Change at Federally Endangered & Threatened Species

The Tallapoosa River is a substantial tributary to the globally significant Mobile River Basin, a center of freshwater biodiversity. This aquatic diversity is not limited to fishes, but also includes mussels, snails, crayfish, other aquatic invertebrates, and terrapins. Some of these fauna are rare, only found across a limited distribution and/or found only in the Tallapoosa River Sub-Basin. Some are protected by the Endangered Species Act while others are recognized by the Alabama Department of Conservation and Natural Resources. These latter species are included in *Conserving Alabama's wildlife: a comprehensive strategy,* Alabama's Wildlife Action Plan, a document that the Commission recognizes as a Comprehensive Plan (see http://www.ferc.gov/industries/hydropower/gen-

info/licensing/complan.pdf)[2]. Despite the fact that these species are afforded some status under *Alabama's Wildlife Action Plan*, APC did not sample for crayfish, Alabama red-bellied turtle, or alligator snapping turtle. Overall, the methods used to sample for fauna were geared for mollusks, snails, fishes, terrestrial plants, and birds. As such, it is not surprising that alligator snapping turtles, Alabama red-bellied turtles, Tallapoosa crayfish, slackwater crayfish, or Chattahoochee crayfish were note reported in samples, despite information available that demonstrates the likely occurrence of at least some of the crayfish species in the project vicinity (Moore Martin 2010).

Recommendation: APC should clearly state whether they have any information regarding these species and their presence in the potentially affected reaches of the Tallapoosa River downstream of Martin dam (to river mile 12.9). If APC does not have any information, that should be stated clearly in the report. If there is information on any of these species with respect to their use of project affected areas (including streamside habitats and species habitat requirements), APC should further describe how the Martin Project operational alternatives do or do not impact the species or habitats.

The Tallapoosa River downstream of Thurlow Dam is subject to substantial ramping several to every day of most weeks. These ramping events (commonly in the 2 to 5 foot range and occasionally as much as 8 feet at the Milstead Gaging Station [USGS Gage 02419500]) are the result of water management activities undertaken at Martin. These events may change to some degree under proposed alternative water management at the Martin Project.

Georgia Rockcress is a plant species that is known to occur on disturbed soils along creeks, streams, and rivers in eastern Alabama. There are a number of active erosion sites along the Tallapoosa River downstream of the Martin Project within the geographic scope of this study. These actively eroding streambanks may be the result of natural events and they may be associated with land use or other factors. Regardless of their origin, these eroding areas may provide suitable habitat characteristics for Georga rockcress.

Alabama Power should survey sites along the Tallapoosa River from Martin Dam downstream to River mile 12.9 for this federally listed species. The frequent, short-term inundation of these streamside areas may impact existing Georgia rockcress populations by preventing population expansion or population establishment. Either of these potential impacts could be important to recovery of this species. While it is entirely possible that Georgia rockcress do not occur along the Tallapoosa River downstream of Thurlow Dam, the absence of any survey data preclude making any conclusion about the impact, or non-impact, of Martin operations on this protected species.

Recommendation: APC should survey near active erosion sites along the Tallapoosa River downstream to river mile 12.9 to sufficiently demonstrate presence or likely absence of Georgia rockcress. If populations are found, APC should estimate whether or not Martin Project operations are limiting populations in any way. To the extent that alternative operations may change flow fluctuations or persistent

[2] Though noted as being undated, the plan was actually published in 2005 (see Literature Cited section).

flow levels in the Tallapoosa River downstream of Martin dam, APC should describe the potential impact to established Georgia rockcress populations.

Literature Cited

Boshung, H. T., and J. Mayden. 2004. *Fishes of Alabama.* Washington, DC: Smithsonian Books.

Moore Martin, M. A. 2010. Shoal occupancy estimate for 3 lotic crayfish species in the Tallapoosa River basin, Alabama. Master's thesis. Auburn University. 62 pages.

Wildlife and Freshwater Fisheries Division, Alabama Department of Conservation and Natural Resources. 2005. Conserving Alabama's wildlife: a comprehensive strategy. Alabama Department of Conservation and Natural Resources, Montgomery, Alabama. 322 pp.