



ALABAMA POWER COMPANY

BIRMINGHAM, ALABAMA

MARTIN HYDROELECTRIC PROJECT

FERC NO. 349

STUDY PLAN 3 – EVALUATION OF MINIMUM FLOWS DOWNSTREAM OF MARTIN DAM

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Prepared by:



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**STUDY PLAN 3 – EVALUATION OF MINIMUM FLOWS
DOWNSTREAM OF MARTIN DAM**

1.0 GOALS AND OBJECTIVES OF STUDY

Operation of hydroelectric projects in a peaking mode could result in impacts downstream of the project in the tailrace area. The Alabama Department of Conservation and Natural Resources (ADCNR) and U.S. Fish and Wildlife Service (USFWS) would like to characterize the tailrace at Martin and understand the relationship of project operation and the potential impacts of hydro peaking on the aquatic fauna and aquatic habitat in the tailrace area downstream of the Martin Project and downstream in the Tallapoosa River below the Thurlow Dam. In addition, the agencies are interested in system wide flow management of Tallapoosa River. In particular, the ADCNR would like to explore possibilities for flexibility in the Martin Dam operations that could enhance downstream areas – Martin tailrace, Yates reservoir, Thurlow reservoir, and the Tallapoosa River downstream of Thurlow Dam not to exceed the mouth of the Tallapoosa (RM 0).

2.0 RELEVANT RESOURCE MANAGEMENT GOALS

The ADCNR manages recreational fisheries downstream of the Martin Project. ADCNR and USFWS would like to understand any flexibilities Alabama Power has in normal project operations that may enhance downstream fisheries and/or aquatic habitat.

3.0 BACKGROUND AND EXISTING INFORMATION

There is limited data available for the Martin tailrace in terms of water quality, fisheries, rare, threatened, or endangered (RTE) species, and habitat parameters. Tailrace information for fish populations may be available through the ADCNR Reservoir Management Reports. Other recent information is presented in the Preliminary Application Document for the Martin Hydroelectric Project (Alabama Power, 2008). Water quality, fisheries, and RTE information for the Tallapoosa River downstream of Thurlow Dam is available from a series of studies that the Alabama Power Company (Alabama Power) has performed over the past 16 years.

4.0 PROJECT NEXUS

Operation of the Martin project affects the tailrace aquatic habitat downstream of the Martin Dam and to some extent, areas downstream of Thurlow Dam. This study will help determine the magnitude of effects (related to hydro peaking) on the Martin Project tailrace area and identify project flexibility for enhancing downstream aquatic habitat conditions in the Tallapoosa River.

5.0 STUDY AREA AND STUDY SITES

Alabama Power has identified Martin Project operation-related effects downstream to the USGS river gauge at Montgomery Water Works located on the Tallapoosa River at RM 12.9. The proposed geographic scope for this study would include the Tallapoosa River from the Project to the Montgomery Water Works river gauge. Alabama Power has selected the Montgomery Water Works location for three primary reasons. Having a geographic scope that includes 30+ miles below the Project will account for the principal effects of Martin's operations downstream. Also, the Montgomery Water works location has 18+ years of gage data that would be available for use in depicting elevations and Martin Project related effects on that gage. Finally, keeping the geographic scope limited to the Montgomery Water Works, compared to expanding the scope to the confluence of the Coosa and Tallapoosa Rivers, would minimize the hydrologic complexity of the Coosa and Alabama Rivers operations and intervening flows. Keeping the geographic scope to the Montgomery Water Works would focus on the effects of the Martin Project operations, including low, normal and high flow operations.

6.0 PROPOSED METHODOLOGY

The methodology for this study includes three parts:

- 1) review of project operations;
- 2) review existing environmental data for the Tallapoosa downstream of Thurlow Dam; and
- 3) perform limited field surveys in the Martin Dam tailrace as needed to evaluate habitat potential for unionids (mussels and snails).

Review of Project Operations and Existing Data

MIG 1 members will review seasonality of historic flows and peaking operations. This analysis will also include review of potential drought operation scenarios and the existing environmental data collected downstream of Thurlow Dam as part of the license compliance requirements. After review of this data, any field survey information needed (data type and location) will be identified and collected.

Field Sampling, Data Analysis and Reporting

The level of field sampling needed will be determined based on the results of the review of project operations. Surveys may include:

- Limited reconnaissance surveys to define the Martin tailrace and establish sampling areas.
- Sampling locations will be documented on maps (electronic and hard copy format).
- Habitat survey to determine available macroinvertebrate and fish habitat.
- Fish Sampling to gather fish community data at specific sampling sites. Fish sampling would be qualitative and quantitative in nature and used to characterize

the species present in each sampling reach. Because habitat types are quite deep (*i.e.*, lack of wadeable areas), sampling would primarily consist of boat electrofishing.

- Mussel, Snail, and Crayfish Sampling to gather occurrence and distribution data may need to be collected.
- Water Quality data will be reviewed - both historical (as reported in the Martin Water Quality Data Report) and present day data - including temperature and dissolved oxygen.

The collected data will be assimilated into a report for review by the agencies. This report will be used for discussing the need for any recommended changes in project operation to be considered in Alabama Power's license application. The report will include:

- Results of any sampling conducted in the Martin tailrace.
- Potential impacts of any Drought Management Plan agreed to by Alabama Power for future operation.
- Identification of opportunities to enhance the Martin Tailrace for fish and macroinvertebrates through alteration of flow patterns.
- Evaluation of the ability to deliver variable flows from Martin on an annual basis to mimic a more "natural riverine system" in the Tallapoosa River downstream of Thurlow Dam in relation to the geographic scope identified in Section 5.0.

7.0 CONSISTENCY WITH GENERALLY ACCEPTED SCIENTIFIC PRACTICE

This study employs generally accepted practices for evaluating aquatic habitats at hydroelectric projects. The study methodology is consistent with generally accepted aquatic habitat sampling principles and practices.

8.0 PRODUCTS

Data and analyses from this study will be shared periodically with the agencies and the MIG 1 during the study phase. A draft report including maps will be distributed to the MIG 1 for review and comment within 6 months of completion of the analysis. A final report will be provided as part of the draft license application that will include raw data in tabular form, analysis performed, and results and discussion.

9.0 SCHEDULE

This schedule corresponds to Alabama Power’s Process Plan and Schedule filed with FERC on February 16, 2009. Actual consultation meeting dates will be determined with MIG 1 members upon FERC approval of the study plan.

Project Operation Review	April - June 2008
Alabama Power files Final Study Plan	March 2009
FERC Approval	April 2009
MIG 1 Consultation	May 2009 – December 2010
Field Surveys (as needed)	May to October 2009 (Fish, Water Quality, Mussel, snail, crayfish)
Initial Study Report.....	November 2009
Initial Study Report Meeting	December 2009
Draft Report	January 2010
Discussion of Data	March 2010
Final Report	May 2010
FERC Updated Study Report.....	September 2010
Updated Study Report Meeting	September 2010

10.0 LEVEL OF EFFORT AND COST

Alabama Power estimates the cost of consulting on study plan development, conducting the study and associated generation losses, developing a study report, and discussing the results with all stakeholders is approximately \$150,000.

11.0 REFERENCES

Alabama Power Company. 2008. Preliminary Application Document for the Martin Hydroelectric Project FERC No. 349-134.