

Draft

**Appendix B**  
**Project Management Plan**

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Draft

# **PROJECT MANAGEMENT PLAN**

## **FLAT CREEK SECTION 206 ECOSYSTEM RESTORATION PROJECT**

### **FLAT CREEK WATERSHED, HALL COUNTY, GEORGIA**




**DECEMBER 2010**

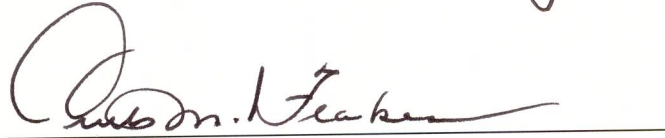


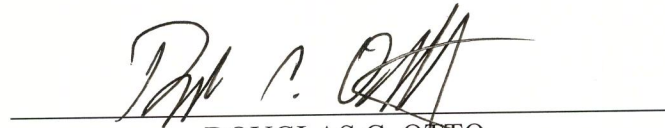
**US Army Corps  
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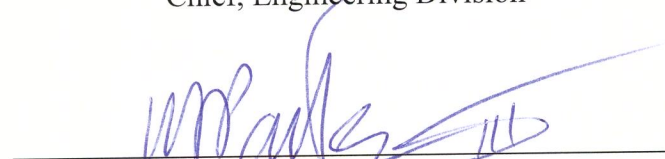
**STATEMENT OF CERTIFICATION  
PROJECT MANAGEMENT PLAN  
FOR  
FEASIBILITY PHASE STUDY  
Aquatic Ecosystem Restoration Project  
Flat Creek Watershed, Hall County, Georgia**

This is to certify that the undersigned concur in the scope, structure, and cost estimate for the subject study based on FY 2011 salary levels.

  
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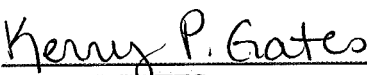
  
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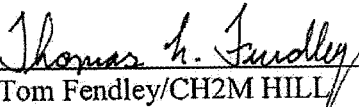
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**PROJECT MANAGEMENT PLAN**  
**FOR**  
**FEASIBILITY PHASE STUDY**  
**Aquatic Ecosystem Restoration Project**  
**Flat Creek Watershed, Hall County, Georgia**

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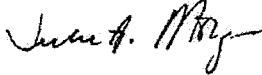
This is to certify that the undersigned have participated in the development of, reviewed, and concur in the scope, structure, and cost estimate for the subject study based on FY 2011 salary levels.

  
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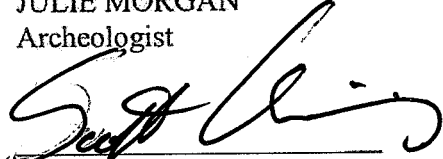
  
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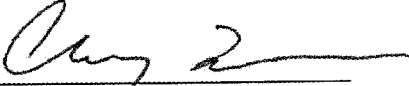
  
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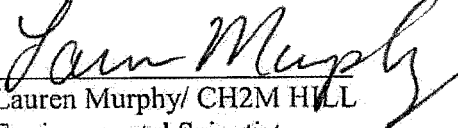
  
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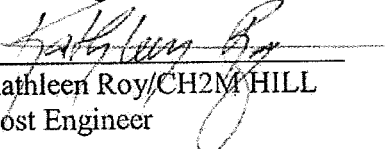
  
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**FLAT CREEK  
ECOSYSTEM RESTORATION PROJECT**

**PROJECT MANAGEMENT PLAN**

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**FLAT CREEK  
ECOSYSTEM RESTORATION PROJECT**

**PROJECT MANAGEMENT PLAN**

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**PROJECT MANAGEMENT PLAN**  
**FLAT CREEK SECTION 206**  
**ECOSYSTEM RESTORATION PROJECT**  
**FLAT CREEK WATERSHED, HALL COUNTY, GEORGIA**

**INTRODUCTION**

This study plan is a narrative description that defines the products and services to be provided in developing the engineering and design activities and responsibilities required for monitoring and managing the efforts involved in restoring Flat Creek and habitat communities. The Project Management Plan (PMP) describes the scope, schedule, budget and overall management of the project through the feasibility phase.

**PURPOSE**

The purpose of the PMP is to serve as a living document that can be revised as work progresses. The goal of the project management is to complete the project on time and within budget through a logical sequence. The PMP is intended to facilitate that process.

**PROJECT AUTHORITY**

The Congress of the United States has delegated Continuing Authority through Section 206 of the Water Resources Development Act of 1996 (WRDA 96), as amended, to the Secretary of the Army to restore degraded aquatic ecosystems.

**CONGRESSIONAL INTEREST**

Georgia Congressional District 9, Tom Graves (R), Senators Johnny Isakson and Saxby Chambliss.

**NON-FEDERAL SPONSOR**

The Non-Federal Sponsor is City of Gainesville, Georgia and Hall County, Georgia.

**PRIOR STUDIES & PREVIOUS REPORTS**

2002 - Preliminary Restoration Plan  
Total Maximum Daily Load Development  
2000 – Community Watershed Assessment & Management Plan  
2006 – City of Gainesville Watershed Protection Plan  
2008 – Flat Creek Watershed Improvement Plan

**PROJECT LOCATION AND DESCRIPTION**

The feasibility study area includes the Flat Creek Watershed, which is within the Chattahoochee River Basin in Hall County, Georgia, upstream of Lake Sidney Lanier. The Chattahoochee River Basin is part of the larger Apalachicola-Chattahoochee-Flint (ACF) River Basin, which

flows south to the Gulf of Mexico and also drains parts of Alabama and Florida (Figure 1-1). Flat Creek is an eastern tributary to Lake Lanier, the largest lake (38,500 acres) entirely within Georgia.

The Flat Creek Watershed lies entirely within Hall County, which is part of the upper Piedmont physiographic province. The watershed encompasses 7,337 total acres (698 acres of which are inundated by Lake Lanier) and 31 stream miles (six miles of main stem, 25 miles of tributaries). Roughly 38 percent of the watershed is within the City of Gainesville and less than one percent is in the City of Oakwood. This correlates to incorporated areas of the watershed totaling 2,617 acres, of which 2,553 are in Gainesville and 64 in Oakwood (Figure 1-2). For the purposes of this study, the watershed was divided into three study areas: Upper Flat Creek (headwaters), Lower Flat Creek, and the Flat Creek Embayment (includes Lake Lanier backwaters). The three areas are roughly equal in size but have notable land use differences. Figure 1-2 shows the study areas.

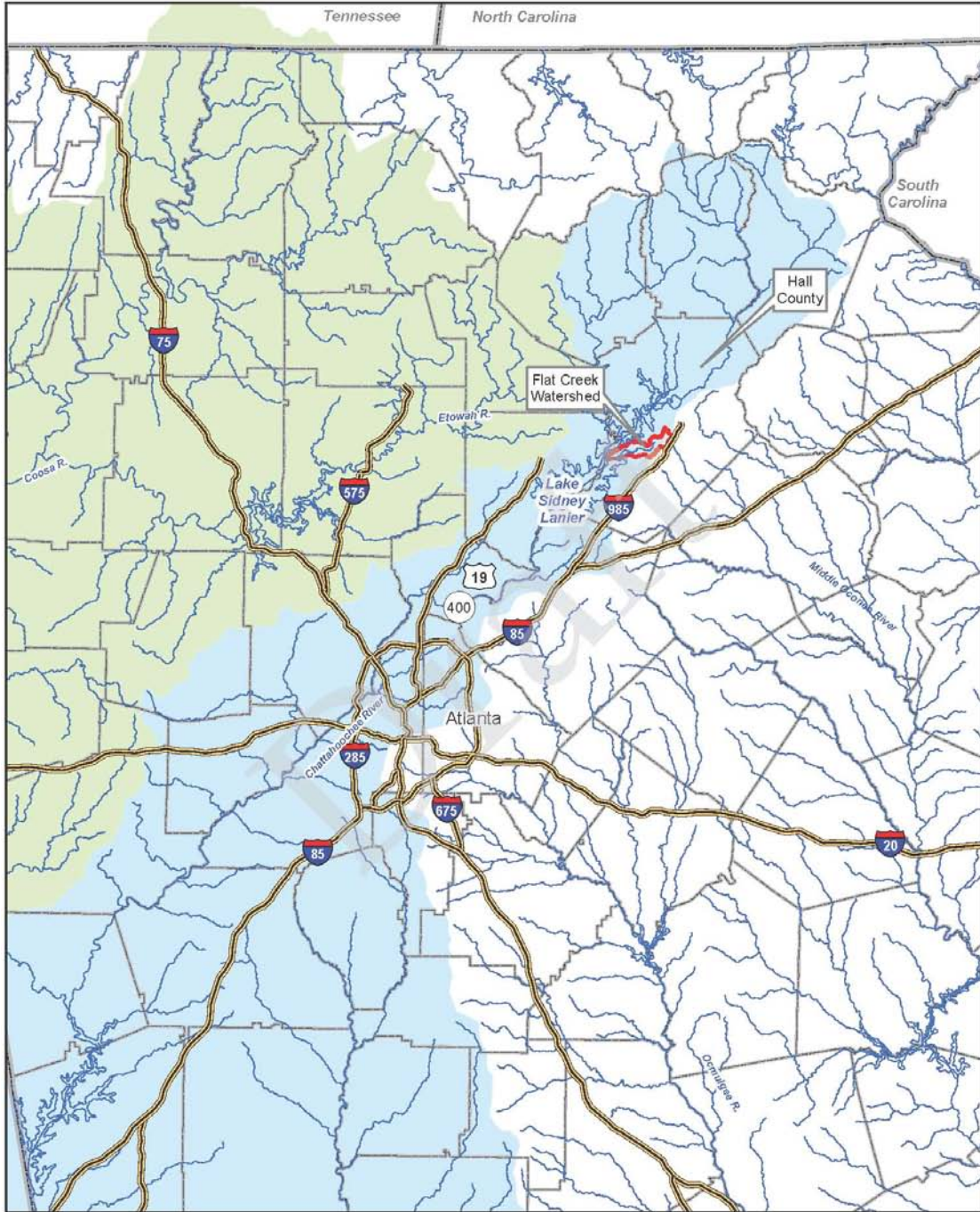
## **PROBLEMS**

Overall problems identified in Flat Creek were based on degraded habitat conditions that have compromised the diversity and robustness of biological communities. Instream and riparian habitats have been adversely affected by changes to the natural stream hydrology that have led to scarcity of riffle/pool habitat, limited availability of woody debris and shade, and increased instream sedimentation and substrate embeddedness. The following five problems have been identified to support ecosystem restoration planning efforts for the Flat Creek Watershed:

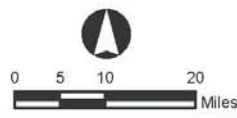
1. Impairment due to decline in native, intolerant fish and macroinvertebrate species.
2. Hydrologic channel impacts, including a limited connection to the floodplain and more intense peak instream flow velocities, which result in decreased habitat use for native, sensitive fish and macroinvertebrate species.
3. Scarcity of riffle/pool habitats critical for maintaining species diversity and taxa richness in aquatic ecosystems.
4. Decline in woody debris inputs to streams, stream shade, refuge habitats, and streambank stability due to disrupted riparian buffers.
5. High degree of instream sedimentation and substrate embeddedness, which is reducing the availability and quality of instream habitat.

## **OPPORTUNITIES**

1. Restore native, intolerant aquatic species, and increase species richness/evenness in the watershed.
2. Restore natural flow regimes to a practicable extent and reconnect the stream to the floodplain to dissipate peak flow velocities, which increases the quality of instream and riparian habitats.
3. Restore and protect native, sensitive fish and macroinvertebrate species by increasing the frequency and quality of riffle/pool habitats in the watershed.
4. Increase instream food availability, refuge, and stream shading by adding woody, native vegetation in currently disturbed riparian areas.
5. Reduce sedimentation and prevent further habitat embeddedness by improving bank stability and enhancing vegetated riparian buffers.



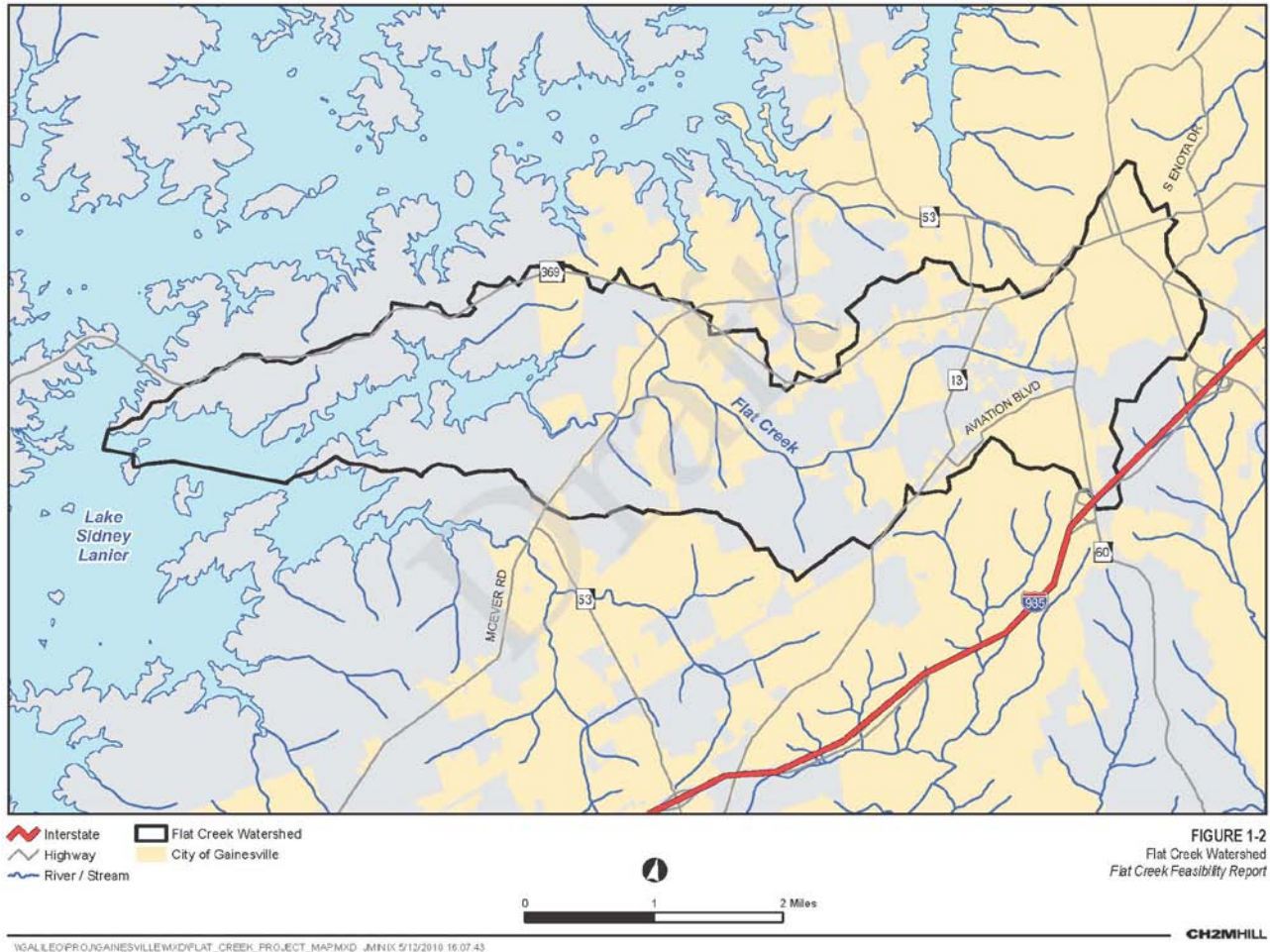
-  Major Road
-  River / Stream
-  Flat Creek Watershed
-  County Boundary
-  State Boundary
-  ACT River Basin
-  ACF River Basin



**FIGURE 1-1**  
Location Map  
*Flat Creek Watershed Feasibility Report*

**CH2MHILL**

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## OBJECTIVES

The object of ecosystem restoration is “to restore degraded ecosystem structure, function, and dynamic processes to a less degraded, more natural condition” (USACE, 2000).

1. Increase species richness and evenness of native fish and benthic macroinvertebrates in the watershed by five percent over the next five years.
2. Reduce peak flows by at least 50 percent during the one-year storm and five percent during the five-year storm, by implementing flow attenuation measures, such as the creation of riparian wetlands in the floodplain or retrofits to existing detention ponds.
3. Create sustainable riffle/pool habitats in stream reaches by constructing instream habitat features. Use rock/grade control to provide an adequate frequency of riffles and diverse velocity/depth regimes. Increase species richness and evenness of native fish and benthic macroinvertebrates in the watershed by five percent over the next five years.
4. Plant native, woody vegetation along disrupted riparian corridors, at a density to achieve 60 percent cover of woody species after five years. Reduce bank erosion at the National Environmental Restoration (NER) Plan locations by one physical habitat condition category after 5 years.

5. Implement stream channel restoration measures, including both stream stabilization and grade control, in highly degraded areas of the watershed. Reduce bank erosion at the NER Plan locations by one physical habitat condition category after five years.

## **TASKS AND DISCIPLINES**

### **PLAN FORMULATION AND EVALUATION**

The feasibility phase study will follow the six step planning process specified in ER 1105-2-100. Steps in the plan formulation process will include:

- The specific problems and opportunities that will be addressed in the study will be identified, and the causes of the problems will be discussed and documented. Planning goals will be set, objectives will be established, and constraints will be identified.
- Existing and future without project conditions will be identified, analyzed and forecast. The existing condition of resources, problems and opportunities critical to plan formulation, impact assessment, and evaluation will be characterized and documented.
- The Project Delivery Team (PDT) will formulate alternative plans that address the planning objectives. An initial set of alternatives will be developed and will be evaluated in order to identify the NER Plan, and the optimum tradeoff plan.
- Alternative plans will be evaluated for effectiveness, efficiency, completeness and acceptability. The impacts of alternative plans will be evaluated using the system of accounts framework (EQ, RED, OSE) specified in the Principles and Guidelines and ER 1105-2-100.
- Alternative plans will be compared. A cost effective, incremental cost analysis will be conducted to identify the NER Plan (plan with greatest net ecosystem restoration benefits). An optimum tradeoff plan will be developed to identify the plan having the greatest net sum of economic and restoration benefits. The public involvement program will be used to obtain public input to the alternative evaluation process.
- A plan will be selected for recommendation and a justification for plan selection will be prepared.

**Project Management** - Consists of oversight responsibility of all project activities. Functions include developing budgetary data, allocation of project funds, monitoring overall expenditures and obligations, review work progress in relation to costs, and updating the project management plan. The Project Manager (PM) in accordance with Engineering Regulation (ER) 5-7-1 will manage contingencies. The PM has approval authority over certain limited cost /contingency changes as outlined in the ER. Larger cost/contingency changes must be elevated for approval as outlined in the ER. The PM is responsible for identifying any changes due to inflation in the estimate obtained through the annual budget cycle.

**Program Management** - Consists of preparing budget documents, managing input into the budgetary process, providing notifications of work allowances, and processing requests for additional funds or for revocation of funds.

## **ENGINEERING TASKS**

**Engineering Appendix.** An engineering appendix will be prepared describing the process and results relevant to the Flat Creek Ecosystem Restoration Report dated September 2008. The Engineering Appendix to the Feasibility Report shall include the engineering and design effort during project formulation. The length and complexity of the Engineering Appendix shall be appropriate with the size and complexity of the project being formulated. The engineering appendix to the feasibility report shall include applicable items found in ER 1110-2-1150, Appendix C. Comparative studies, field investigations, design, and screening level cost estimates shall be in sufficient detail to substantiate the recommended plan and the baseline estimate.

### **Hazardous, Toxic, and Radioactive Materials/Wastes (HTRW) Environmental Assessment:**

A Phase I Environmental Assessment shall be conducted at the subject site in accordance with the provisions of ASTM E 1527-05, "Standard Practice for Environmental Site Assessment: Phase I Environmental Site Assessment Process". The report shall utilize the "Recommended Table of Contents and Report Format" found in Appendix X4 of the standard.

**Cost Estimating:** A detailed labor, equipment and material cost estimate consistent with the level of design will be prepared. The tentatively selected plan should have a Micro-Computer Aided Cost Estimating System (MCACES) II level of estimate. The estimate shall reflect fair and reasonable costs that would be expected for a prudent, experienced construction contractor to incur to accomplish the work. MCACES Second Generation (MII), Version 3.0 (or most recent version) will be used to prepare the estimate. An MCACES template will be furnished by the Government for overall structure and organization of the estimate.

The estimate shall include a statement as to the price level (month/year) of the estimate; escalation (to anticipated construction date) shall not be applied to the estimate. The estimate shall include project summary notes (i.e. in the project properties) to describe the scope of work, construction methods and sequence and any other pertinent information that is important to know that is not fully documented in the notations associated with specific line items and features. Costs in the estimate shall be based on: quantity take offs, backup data, drawings, sketches, quotes, etc. All supporting documentation shall be clearly labeled to correlate to specific line items in the estimate. The supporting documents shall be organized and included in a narrative report with the estimate. The following library files for the calculation of the MCACES estimate should be used:

- Unit Price Book: English Cost Book v3.0 (or most recent version).
- Crew: NA
- Labor: Nation Labor 2006 (or most recent version) (modified within the estimate to reflect Davis Bacon Wage Rates)
- Equipment: MII Equipment Region 5 2005 (or most recent version)

### *Quantities for all Work and Materials*

Quantities for all work and materials to be incorporated into the detailed estimate shall be calculated and submitted as part of the estimate, with assumptions clearly stated. Only items not subject to variation shall be paid for as lump-sum items. Lump-sum items shall have detailed

description of the lump-sum work and a description of any subsidiary work required for such payment. Items subject to variation shall be unit priced and measured.

Quantities shall also include approximations for waste/loss, swell, shrinkage etc. and be grouped into appropriate components of work. Material prices shall reflect actual costs (including freight, handling, storage, etc.) to the construction contractor during the period of construction. Supplier quotes shall be obtained for all major material components. Noted in the MCACES estimate the source for all quantities used and either include quantity calculations within the MCACES estimate or provide supporting documentation of quantity take off clearly labeled so that the quantity-take offs can be matched to a specific line item in the MCACES estimate.

#### *Construction Plant and Equipment*

All costs shall include appropriate charges for equipment, including mobilization and demobilization. Established hourly rates as determined by the appropriate provisions of EP 1110-1-8 (Vol. V), Construction Equipment Ownership and Operating Expense Schedule, shall be used to determine all equipment costs.

#### *Labor*

All costs for work shall include charges for bare, direct, and indirect labor. Davis Bacon Wage Rates appropriate for the project location shall be used. These costs shall be based on anticipated hourly wage rates and include appropriate taxes, insurance, and fringe benefits. All overtime charges necessary to accomplish work consistent with the construction scenario(s) used as a basis to develop the estimate will be estimated and included. Crew makeup, productivities, and other assumptions made with regard to labor costs, shall be clearly presented and documented to support the detailed cost estimate.

#### *Contingency*

Assignment of contingency factors shall be made at the most detailed level possible. Careful consideration shall be given to the determination of contingency assignments along with the insertion of notes within the estimate to support the contingency factors used.

#### *Assumptions*

All assumptions shall be documented in the MCACES estimate. Notes shall be inserted at the appropriate feature or detail in which the assumption applies.

#### *Cost Estimate Narrative Document*

The narrative shall include a discussion of the construction task's scope of work, including discussion of construction methods, staging area requirements, work sequences for each of the structural features estimated, and perceived risks associated with construction. Also discussed will be the price levels used for the estimate, material prices, quantity calculations and development, contingency assignments and justification for such, the basis of assumptions used to develop the detailed estimate, material availability, and all other important information so that a full understanding of the parameters that went into the development of the estimate are communicated. In addition, all supporting documentation (i.e. quantity takeoffs, backup data, drawings and sketches, quotes etc.) shall be included.

## **ENVIRONMENTAL TASKS**

**Environmental Assessment (EA).** A document will be prepared, as required by the National Environmental Policy Act (NEPA) that evaluates the impacts of the project alternatives on the human environment. An EA and Finding of No Significant Impact (FONSI) will be prepared, if appropriate. If significant impacts are identified, then an Environmental Impact Statement (EIS) will be prepared. All appropriate NEPA requirements will be met including Public Notices, 404(b) (1), Legal Notices and coordination with other state and federal agencies and the general public.

To comply with NEPA an inventory and description of environmental conditions will be prepared. The environmental portions of the aquatic ecosystem restoration study will survey existing environmental information as well as collecting field data, sampling and monitoring to establish baseline environmental conditions. This information will consist of searching available historic data as well as other state and federal databases, private environmental groups and will include the following:

The Fish and Wildlife Service will be consulted pursuant for the Environmental Site Assessment on the existence of any threatened and endangered species as well as sensitive species and critical habitat will be documented for the study area. Furthermore, a Fish and Wildlife Coordination Act will be conducted.

Fisheries and wildlife resources will be identified and documented for the study area by searching existing historical information and by searching available USFWS databases and other appropriate regional and local agencies.

Plant and timber resources will be identified and documented for the study area by searching existing U.S. Department of Agriculture survey information and through consultation with the U.S. Forest Service as well as other regional and local agencies.

Water quality conditions will be assessed to be used as the baseline for existing, future without project and future with project conditions.

Air quality will be determined within the study area as defined by the Environmental Protection Agency's Final Clean Air Act General Conformity Rule (1993).

Identification and evaluation of potentially affected Cultural Resources, assessment of effect, and consultation with the State Historic Preservation Officer (SHPO) will be documented for the study area.

Information assessing and comparing environmental and human health risks borne by populations identified by race, national origin, or income according to the Environmental Justice in minority populations and low-income populations will be documented and displayed for the study area.

**Hazardous, Toxic, and Radioactive Materials/Wastes (HTRW):** The appropriate HTRW field analysis will be performed during the study phase.

Wetland surveys will be performed to identify and evaluate the potential effects of the proposed project.

Attend and hold meetings to coordinate with the non-Federal sponsor, contractor, general public and state and federal agencies.

Field data collection and sampling will include fish, Indices of Biotic Integrity (IBI), macroinvertebrate biological assessments and habitat assessments that will be performed and used as the baseline for existing, future without project and future with project conditions.

**Cultural Resources Plan.** The Corp's archeologist will evaluate and determine the existence of or potential for impacts to cultural resources. This would also include any impacts to structures listed on the List of National Historical Places. This would be determined initially by a site files search and coordination with the State Historic Preservation Office and associated Native American tribes. In the event potential cultural resources are located on a site files search there would be an additional effort for surveying the site, depending on its size, location and potential.

**Environmental Appendix.** The Environmental Appendix shall include all data, photographs, etc. collected and the results of each subtask.

**Ecosystem Response Model (ERM).** In order to define the baseline stream conditions, develop restoration features, and develop incremental environmental outputs for the project alternatives, the ERM developed by the North Georgia Water Resource Agencies (NGWRA) team for use on metro-Atlanta region aquatic ecosystem restoration projects shall be utilized. The ERM will be used to model the I+J alternatives selected for the tentatively selected plan and explain the results using graphs, charts, etc. The following sub-tasks describe the modeling process. These tasks have already been completed and are results are located in the draft report dated September 2008.

**Field Reconnaissance Trip.** Prior to any data collection within the study area, field reconnaissance trips will be conducted. These trips will be held for the purposes of selecting and delineating the biological data sample sites. The biological data sampling sites will be selected via the stratified random sampling protocol described in the model description. The sample sites will be randomly selected based on drainage area. The first sample site will be randomly located within the one square mile drainage area of the headwaters of the stream. Additional sample sites will be randomly located downstream within the reach of stream associated with an approximate doubling of drainage area. Selection of the sampling sites will also comply with the guidelines set forth in the protocols for the fish and macroinvertebrate assessments. Once the Government has approved the sampling site locations, data collection may begin.

**Fish Indices of Biotic Integrity (IBI).** An IBI of the fish community will be conducted at each of the sample sites identified during the field reconnaissance trip. Collection methods and data analysis for the fish IBI will be conducted in accordance with Georgia Department of Natural Resources (GADNR) Standard Operating Procedures for Conducting Biomonitoring on Fish Communities in Wadeable Streams in Georgia. A copy of the Standard Operating Procedures (SOP) can be found at the following World Wide Web link - <http://georgiawildlife.dnr.state.ga.us/content/displaycontent.asp?txtDocument=436>. The fish data collection shall occur within the specified seasonal period (generally April to mid-October).

**Conduct Freshwater Macroinvertebrate Biological Assessment.** A freshwater macroinvertebrate biological assessment will also be conducted at each of the sample sites identified during the field reconnaissance trip. Collection methods and data analysis for the macroinvertebrate biological assessment will be conducted in accordance with Georgia

Environmental Protection Division's (GAEPD) Macroinvertebrate Biological Assessment of Wadeable Streams in Georgia Standard Operating Procedures. A copy of the SOP can be found at the following World Wide Web link – [http://www.gaepd.org/Documents/WPB\\_Macroinvertebrate\\_SOP.html](http://www.gaepd.org/Documents/WPB_Macroinvertebrate_SOP.html). In addition to the water quality data collection prescribed by the macroinvertebrate SOP, two other water quality data collections should be done to include biological oxygen demand (BOD) and chemical oxygen demand (COD). The water quality data collection will be consistent with the United States Environmental Protection Agency (USEPA)'s standard operating procedures. Quality Assurance/Quality Control (QA/QC): QA/QC will be utilized according to USEPA approved guidance and methodology, including chain-of-custody protocol. For QA/QC purposes, duplicate sampling will be conducted at one of the sampling sites and all sampling instrumentation will be calibrated according to the manufacturer and USEPA protocol. The macroinvertebrate data collection shall occur within the specified seasonal period (mid-September to February). As noted in the protocols, sampling of fish and macroinvertebrate communities in the same reach should not be done concurrently. "The process of sampling one of the communities will invariably disturb the other. If fish are sampled first then two weeks should be allowed for stabilization of the macroinvertebrate communities. If macroinvertebrates are sampled first there would be substantially less wait time for the fish communities to stabilize due to the higher mobility of fish" (GAEPD 2007). The raw data collected during the sampling effort can be applied to the ecoregion metric spreadsheets available at the above website to determine the individual site scores.

**Habitat Assessment.** A visual habitat assessment will be conducted at each of the sample sites identified during the field reconnaissance trip. A habitat assessment is conducted at each site during both the fish IBI and macroinvertebrate biological assessment data collections. Both the fish IBI and the macroinvertebrate biological assessment utilize the visual habitat assessment tool developed by GAEPD. The instructions for conducting the habitat assessment are included in both SOPs. The habitat assessments will be conducted in accordance with the SOPs. Final habitat assessment scores for each site will be calculated by averaging the independent scores collected during the sampling periods. By averaging the scores provided by different surveyors at different times, the subjectivity of the visual habitat assessment technique should be reduced.

**Baseline Condition Analysis.** Baseline condition shall be quantified (i.e., total stream health score) by applying the results of sub-tasks (c-e) to the ERM spreadsheet tool. The physical habitat (including flow regime) and water quality characteristics likely contributing to the fish IBI, macroinvertebrate biological assessment, and habitat assessment scores calculated at each site shall be evaluated. This evaluation will set the foundation for interpreting the Hydrology and Hydraulics (H&H) model outputs as they relate to the "Future Without" and "Future With" project analyses.

**"Future Without" Analysis.** The "Future Without" project condition (i.e., total stream health score) will be quantified. The "Future Without" project fish IBI, macroinvertebrate biological assessment, and habitat assessment scores for each site are calculated by predicting how the baseline condition scores for each site are likely to change based on the "Future Without" project H&H model results, including sediment analysis. The predictions represent "Best Professional Judgment" and should be based on the various habitat and life history requirements of the species described in the individual metrics for the fish IBI and macroinvertebrate biological assessment. The "Future Without" habitat predictions will likely provide the basis for this

interpretation and should represent the conditions most likely to occur based on the H&H model results, including sediment transport. All individual metric score calculations shall be thoroughly documented and conclusions shall be peer reviewed and/or developed by the appropriate resource agency contacts and the PDT. The “Future Without” project condition (i.e., total stream health score) is calculated by applying the predicted scores to the ERM spreadsheet tool

**“Future With” Analysis.** The “Future With” project condition (i.e., total stream health score) will be quantified. This process is identical to the “Future Without” project analysis, but incorporates the results of the various alternative “Future With” project hydraulic and hydrologic (H&H) model results. The predictions represent “Best Professional Judgment” and should be based on the various habitat and life history requirements of the species described in the individual metrics for the fish IBI and macroinvertebrate biological assessment. The “Future With” habitat predictions will provide the basis for this interpretation and should represent the conditions most likely to occur based on the H&H model results. The “Future With” project condition (i.e. total stream health score) is calculated by applying the predicted scores to the ERM spreadsheet tool.

**Monitoring Plan.** A monitoring plan is to be developed and included in the feasibility report.

**Pre-construction Monitoring.** Biological monitoring in accordance with ERM protocols shall be conducted at each of the pre-defined monitoring stations for this project prior to construction.

**Post-construction Monitoring.** Monitoring will be conducted within the first and third years after construction at same pre-defined stations by the United States Army Corps of Engineers USACE, in accordance with ERM protocols. Post-construction monitoring is not to exceed three years.

## **ECONOMIC TASKS**

**Economic Appendix.** An Economic Appendix will be provided as an appendix to the Feasibility Report. The IWR Plan model results were included in the September 2008 partial draft report, but shall be clearly displayed in an economic appendix. Pertinent results shall also be provided directly in the main report in accordance with format provided. The economic appendix shall clearly layout the screening process, reasoning and justification, and the tentatively selected plan as supported by IWR plan results. Discussion of alternatives being efficient, effective, complete, and acceptable is important to alternative comparison and ultimately plan selection.

**Preliminary Screening:** Check the simultaneous or combined effectiveness of small scale measures before eliminating them from consideration. If the cost of smaller scale measures is minimal, it may be cost-effective to implement these measures even though they do not have as large of an effect as some of the more costly measures. All measures that pass or are screened should include a description and explanation that point to the planning objectives they do or do not achieve.

**IWR Plan:** IWR Plan runs that incorporate the ERM modeling results. The results shall be included in the Ecosystem Restoration Report.

The appendix shall expand upon what the IWR Plan software is and explain how the IWR Plan Run results for this study were concluded. Excel spreadsheets, graphs, charts, etc. needed to clearly state how the tentatively selected plan, are to be included in the appendix. The explanation is to include the nine steps below:

1. Display outputs and costs - displays the environmental outputs and cost estimates of the increments of management measures.
2. Identify combinable management measures - reviews the management measures used to separate those that can be implemented together from those that can't be implemented together.
3. Calculate outputs and costs of combinations - lists all combinations of the combinable management measures' increments, and calculates each combination's output and cost.
4. Eliminate economically inefficient solutions - identifies and eliminates inefficient solutions: If you can produce a given level of output in more than one way, only the least expensive choice makes economic sense for that level of output.
5. Eliminate economically ineffective solutions - identifies and eliminates ineffective solutions: If you can produce a greater level of output for the same or less cost, then only the greater output choice makes economical sense.
6. Calculate average costs - calculates the average cost of the cost effective solutions and identifies the solution with the lowest average cost.
7. Recalculate average costs for additional output - repeatedly asks the question: Of the remaining levels of output, which solution has the lowest average cost for additional output?
8. Calculate incremental costs - calculates incremental costs for the remaining levels of output.
9. Compare successive outputs and incremental costs - progressively compares successive levels of output and their incremental costs to provide decision makers with information that is useful in addressing the question: Is the environmental output worth its cost?

## **REAL ESTATE STUDIES**

**Real Estate Planning:** During the feasibility phase study, Real Estate Division (RE-P) will review selected alternatives to determine real estate requirements and appropriate real property interests. RE personnel will prepare all real estate reports and cost estimates for the feasibility report. A Real Estate Plan (REP) will be prepared as an appendix to the Feasibility Report that outlines the minimum real estate requirements for the proposed project, in accordance with ER 405-1-12, Chapter 12. May 98. The REP contains a description of the area; the acreage and proposed estates, including non-standard estates, and reasons therefore; a discussion of any land owned by the Federal Government, the non-Federal sponsor or any public entity; an estimate of the Public Law 91-646 relocations; the Baseline Cost Estimate for Real Estate; a discussion of the non-Federal sponsor's ability to acquire Lands, Easements, Rights-of-Way, Relocations and Disposal area (LERRD); a discussion of mineral activity, if any, and the attitude of the landowner; a detailed schedule of land acquisition; a preliminary assessment of the facilities/utilities to be relocated; and any other relevant real estate information appropriate for

the project. The appropriate interest to be acquired in properties identified in the proposed alternatives will be defined. RE will identify benefits available to displaced residents under Public Law 91-646. If necessary, the acreage needs for land mitigation (survey, description and appraisal) for affected wetlands will be established as required.

**Preliminary Real Estate Acquisition Maps:** RE will prepare an initial set of maps and drawings that delineate the real estate acquisition lines based on technical design drawings developed by the Engineering Division (EN) during feasibility phase. Maps and drawings will reflect the minimum real estate required for project purposes.

**Physical Takings Analysis:** If necessary, a written legal opinion will be prepared as to whether flooding will be induced by the construction, operation or maintenance of the proposed project. If induced flooding is expected, a determination will be made as to whether it will rise to the level of a taking of an interest in real property for which just compensation must be paid to the owner of the real property. The opinion will describe the analysis of relevant information regarding the depth, frequency, duration, velocity and extent of induced flooding, as well as relevant State and Federal law, and will present a conclusion on the physical taking issue.

**Preliminary Attorney's Opinion of Compensability:** If necessary, a preliminary legal opinion will be prepared on whether provision of a substitute facility is required under the Fifth Amendment as compensation for a facility/utility being acquired for the project. The opinion makes findings on whether the owner has a compensable interest, whether the owner has the legal duty to continue to maintain and operate the facility/utility, and whether Federal law requires the provision of a substitute facility/utility rather than a mere payment of the market value for the property acquired. The preliminary legal opinion differs from the final legal opinion only in its acceptance as fact of the owner's statement of interest in the subject property, without a search of property records.

**Gross Appraisal:** A staff appraiser from USACE-RE-P will prepare a gross appraisal of appropriate real estate interests. The appraisal which will include a total estimated value for fee and easement estates, including improvements, minerals, and severance damages. It will also include any additional details or refinement beyond the Initial Real Estate Reconnaissance of the location and description of the area; the special features (i.e., timber, minerals, water rights, etc.); environmental concerns including potential HTRW or lack thereof; existing encumbrances; the highest and best use(s) involved; and the assumptions and limiting conditions. The gross appraisal will be of sufficient detail to provide an accurate cost estimate, which will be sufficient for authorization considering the cost growth limits of Section 902 of Public Law 99-662.

**Rights-of-Entry:** USACE-RE and/or the non-Federal sponsor will obtain any rights-of-entry needed for surveys or other preliminary work. At this time, the total numbers of right-of-entries needed for this project are not known. If any are required, an average cost of \$200.00 per tract is anticipated.

**Relocations of Facilities and Utilities:** RE personnel will determine if alternatives for the project require the relocation of any existing facilities or utilities. A staff appraiser will

determine the fair market value of any additional lands needed for the relocations. USACE Office of Counsel (OC) and RE Division will coordinate with the non-Federal sponsor to fulfill all legal obligations.

**Relocation Assistance and Advisory Services:** Section 205 of Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (Public Law 91-646), as amended, requires establishment of a relocation assistance advisory program for persons displaced as a result of Federal or Federally-assisted programs or projects. Programs or projects undertaken by USACE shall be planned in a manner that (1) recognizes, at any early stage in the planning of such programs or projects and before the commencement of any actions which will cause displacements of individuals, families, businesses, and farm operations, and (2) provides for the resolution of such problems in order to minimize adverse impacts on displaced persons and to expedite program or project advancement and completion.

**Participate in Meetings and Public Workshops:** RE personnel will attend (as needed) progress review meetings and all other pertinent public/private meetings. RE Division will provide all necessary real estate data for workshops, feasibility, and internal review. Preliminary Draft REP: A preliminary draft REP will be prepared after the aforementioned real estate planning activities have been completed to an acceptable level. The REP will be fully coordinated and accomplished with the PDT. Supervisory and OC review will be accomplished and the preliminary draft report will be revised to incorporate appropriate comments. The preliminary draft real estate report will be incorporated as an appendix into the preliminary draft feasibility report and distributed for the final technical review. Responses to technical review comments will be prepared and any necessary changes will be incorporated into the draft real estate report.

**Draft Real Estate Plan:** The draft REP will be prepared after the final technical review has been completed. The report will discuss and display all data, findings, procedures and assumptions used in the analysis. Changes to comply with appropriate comments from the final technical review will be incorporated into the draft real estate plan. Supervisory review will be accomplished and the draft real estate report will be revised to incorporate appropriate comments. The draft REP will be incorporated into the draft feasibility report.

**Final Real Estate Plan:** The final REP will be prepared and will be incorporated as an appendix into the final feasibility report. The report will discuss and display all data, findings, procedures and assumptions used in the analysis. Supervisory and OC review will be accomplished and the final report will be revised to incorporate appropriate comments.

**Other Real Estate Analyses/Documents:** No other Real Estate analyses/documents are anticipated.

<b>PROJECT DELIVERY TEAM</b>			
Discipline	Name of POC	Office/Agency	Phone number
Program Manager	Bob Allen	CESAM-PM-CP	251-690-2731
Project Manager	Dean Trawick	CESAM-PM-CM	251-690-3254
Plan Formulator	Kerry Gates	CESAM-PD-FP	251-694-3809
Environmental	Velma Diaz	CESAM-PD-EI	251-690-2025
Economics	Jeff Morris	CESAM-PD-FE	912-652-5008
Economics	Meredith Hazard	CESAM-PD-FE	251-690-2608
Cultural Resources	Julie Morgan	CESAS-PD-EM	888-893-0678 ext.378
Real Estate	Russell Blount	CESAM-RE-P	251-694-3675
Hydraulics/Modeling	Scott Chodkiewicz	CESAM-EN-HH	251-690-2739
Geotechnical	Mike McKown	CESAM-EN-GG	251-690-2681
Cost	Gary Payton	CESAM-EN-E	251-694-3890

<b>REVIEW SCHEDULE</b>		
Milestone	Review	Schedule Dates
AFB Materials	ATR	October 2010*
AFB	AFB by SAD	November 2010
Draft Report and Draft EA	ATR	November 2010*
Final Report and Final EA	ATR	December 2010*

\*Note: ATR on CAP are anticipated to be a continuum of the same review with backchecks at each of these milestones resulting in one ATR certification to be included in the Final Report and EA delivery to SAD for project approval.

<b>FEASIBILITY PHASE COST ESTIMATE</b>	
Description	Cost
Hydrology and Hydraulics Studies/Report	\$50,000
Geotechnical Studies/Report	\$12,000
HTRW Studies	\$15,000
Cost Engineering	\$20,000
Engineering Management (PAE)	\$5,000
Reproduction & CADD	\$5,000
Economic and Socioeconomic Studies	\$5,000
Real Estate Analysis/Report	\$30,000

Environmental Studies/Report	\$30,000
Biological Assessment	\$10,000
Section 404(b) 1 Evaluation	\$7,000
Fish and Wildlife Coordination Act Report	\$15,000
Cultural Resources Studies/Report	\$20,000
Public Involvement Program	\$10,000
Plan Formulation and Evaluation	\$40,000
Report Preparation	\$30,000
Agency Technical Review	\$20,000
Project Management and Budget Documents	\$10,000
DQC	\$16,000
Total	\$350,000

#### **FEASIBILITY COST SHARING AGREEMENT**

Agreement between the Federal Government and the non-Federal sponsor to complete the Feasibility Study. The non-Federal sponsor invested considerable effort into this study during a period when the USACE was unable to obtain funding. No credit is expected from the non-Federal sponsor for work conducted during this period though their effort significantly reduced remaining study cost.

#### **REVISIONS**

The PMP is a living document and will be revised as necessary to keep it current and to document progress from initiation of design through project implementation and turnover of the completed project to the non-Federal sponsor.