

Catawba-Wateree Hydro Project (FERC No. 2232)
Study Plan

Study Plan Name: Great Falls Bypass Botanical Study

Study Plan Designation: Terrestrial 03

Study Short Description: Inventory terrestrial and aquatic vegetation within the Project boundary and areas within the zone of Project influence in association with the Great Falls Bypass

Applicable Hydro Projects/Developments: Bypass reach and areas within the Project boundary as associated with the Great Falls-Dearborn Development.

Prerequisite Study Designation: None

I. Study Objective

The objectives of this botanical study are to: 1). Classify and characterize the existing vegetative composition and structure of the Bypass area; 2). Assess the effects of Project-related hydropower operations areas on the vegetative communities within the Bypass area; and 3). Provide information to assist in developing any potential protection, mitigation, and enhancement (PM&E) measures.

This study will also provide information needed to support several other relicensing studies including:

- A Project-wide vegetation cover map
- RTE Habitat Survey (Terrestrial 04)
- Great Falls Bypass Wildlife Survey (Terrestrial 06)

II. Basis

This botanical study will provide information on the vegetative composition and structure, and the distribution and relative condition of the existing vegetative communities associated with the Great Falls Bypass as required by 18 CFR 4.51 (f). This information will provide the basis for evaluating any potential Project effects on these resources which will be summarized in Exhibit E of the License application. These items are required under NEPA and are required for license review under the Federal Power Act.

III. Geographic and Temporal Scope

This study will focus on the Great Falls Bypass area located between Fishing Creek dam and the Rocky Creek reservoir and the area immediately adjacent. Field components of this study will be conducted within the 2004 growing season between mid-April through mid-October.

IV. Summary of Existing Data

Few studies have been conducted that provide information on the ecological communities associated with the bypass. The only recent information for this area is associated with a 2001 survey conducted by L.L. Gaddy (Gaddy 2001) entitled *A Brief Overview of the Flora and Fauna of the Catawba Shoals near the Town of Great Falls, South Carolina*. Other information sources such as FEMA floodplain maps, National Wetland Inventory maps (NWI), county soil surveys, and any existing Duke Power aerial

Catawba-Wateree Hydro Project (FERC No. 2232)

Study Plan

photography will be used to characterize this areas. Duke Power currently has Year 2000 true color, digitally orthorectified photography at a 1:10,000 scale for most of the Catawba Project. A Duke Power Co. Feb/Mar 2004 overflight will provide additional aerial images that will be utilized when available.

V. Methodology

The following methods will be followed to classify and characterize the botanical resources associated with the Great Falls Bypass. All reasonable attempts will be made to sample all habitat types. However if field conditions exist that are detrimental to the safety or well-being of the researchers, such sites will not be sampled and the final report will contain the explanation.

- Through the use of the Gaddy (2001) report and other information such as the FEMA floodplain maps, USGS 7.5 minute quadrangles, NWI maps, soil surveys and aerial photography, the vegetative communities within the Bypass area will be mapped and characterized. This information and the Project boundary information will be transferred and digitized into the Geographic Information System (GIS) and preliminary community maps will be prepared.
- Using the information described above, field assessments will be conducted to determine the species composition, structure, and distribution of Bypass vegetative communities. The types of data that will be collected includes percent cover and dominant species within the herbaceous (aquatic and terrestrial), shrub and tree layers along with estimates of leaf litter and downed woody debris. The distribution and juxtaposition of vegetative communities will also be assessed.

Field assessments will involve vegetation transects established in habitat types associated with the Bypass area. The stratified random transects and associated multiple sample plots will be determined by the Project scientist. The transects will be located in an effort to gather the most information possible and to provide a comparison of covertypes, elevations, and their relationships to factors such as inundation magnitude, duration and frequency. With selected transects, special emphasis will be placed on any areas known to include RTE plant species.

The vegetation transects will be located perpendicular to the bypass and shoreline and will start at the lowest elevation within the bypass and extend upslope into the adjacent riparian or upland zones to either the Project boundary or the upper limit of the zone of lateral influence.

Multiple sample plots will be established along the transects to collect quantitative information to characterize the Bypass vegetation. The distance between the plots and the number of sample lots will be determined by the homogeneity of the area and the relative width of the Project boundary or lateral zone of Project influence. Two types of sample plots will be used:

- 1). To collect information on tree and shrub species, canopy and sub-strata cover, and tree size (dbh), a 10-meter radius circular plot will be established along the transect. The information collected, through use of a standard field form, will include percent cover by strata, dominant species, height of canopy and/or strata, elevation above shoreline, distance from edge of bank, amount of seedling reproduction/recruitment, amount of downed woody debris, and amount of leaf litter; and
- 2). Nested plots of four-meter radius will be used for shrubs and a one-meter radius plot will be used to sample the herbaceous vegetation.

Other general information that will be gathered along the transects will include wildlife observations and sign (along with a list of representative and indicator species and the specific habitats), general health of community, evidence of erosion, and site quality conditions. The

Catawba-Wateree Hydro Project (FERC No. 2232)

Study Plan

position of these transects and transect elevation will be determined through use of surveying level and stadia rod and/or GPS. Vegetation communities will be classified through use of the South Carolina natural community classifications (Nelson 1986) and the NatureServe community classifications (NatureServe 2001), and mapped via the GIS.

- A determination of any inundation phenology (season inundated), duration (percentage of time inundated), magnitude (extent or depth in which inundated), and frequency (number of inundation times per unit time) will also be conducted in this task with the objective of determining and predicting water surface elevations for the current discharges in association with the vegetation community requirements
- Any rare, threatened, or endangered (RTE) botanical species documented in the Bypass area will be processed like all other records and these data will be made available immediately to appropriate organizations (Duke Power, SCDNR, USFWS)
- Incidental data on other taxonomic groups (e.g., herptiles, mussels, birds, mammals) will be given to Gene Vaughan (Duke Power Co.) for incorporation into other Catawba-Wateree relicensing studies. In addition, representative samples of crayfish and snails encountered during botanical sampling will be collected, preserved, labeled, and given to Gene Vaughan (Duke Power) for use in invertebrate reports.

Determination of Project Effects

The objective of this task is to assess and summarize the effects of the current and any reasonable future water regimes resulting from Project operations on the vegetative communities within the Bypass area. The current condition of habitats within the Bypass area will be assessed through their vegetative structure, species composition, evidence of disturbance, distribution within the Bypass, presence of representative plant and wildlife species, and the presence of non-native or invasive plant species. These factors will be related to the existing water regime to assess potential Project effects. This assessment will incorporate a spatial analysis using GIS overlay maps of vegetation cover-types, inundation characteristics, contours, and other relevant information.

A Draft and Final technical report will be prepared for this Project that includes the following elements:

- a) Project Introduction and Background
- b) Study areas;
- c) Methodology;
- d) Discussion and Analysis
- e) Results (includes impact discussion)
- f) Location maps, GIS analysis and photos;
- g) Any agency correspondence and or consultation;
- h) Literature citations

VI. Schedules and Required Conditions

The schedule, timeline and required conditions for this project area as follows:

- | | |
|--|-------------------------------------|
| ▪ Task 1 Classify and Characterize Bypass Vegetation | Growing Season 2004 |
| ▪ Task 2 Determination of Project Effects | Fall 2004 |
| ▪ Task 3 Prepare Technical Report | Fall/Winter 2004 and
Winter 2005 |

**Catawba-Wateree Hydro Project (FERC No. 2232)
Study Plan**

VII. Use of Study Results

This study and associated results will provide both quantitative and qualitative information that will be important in characterizing existing conditions, as well as providing any information on potential Project impacts as they related to preparation of the License Application and specifically Exhibit E. The technical report will provide sufficient information for development and incorporation into any associated NEPA documentation. The botanical information associated with the technical report can also be used as a basis for any future PM&E discussions.

VIII. Study Participants

	<u>Name</u>	<u>Organization</u>	<u>Phone #</u>	<u>E-Mail</u>
Applicant Lead	Gene Vaughan	Duke Power	704 875 5240	gevaugha@duke-energy.com
Agency Leads	Mark Cantrell Ron Ahle	USFWS-NC SCDNR	828 258 3939 803 734 2728	Mark_a_cantrell@fws.gov RonA@scdnr.state.sc.us
Supporting Consultants	L.L. Gaddy Scott T. Fletcher	Terra Incognita Devine Tarbell & Associates	803 765 9976 704 342 7380 2808	lgaddy@bellsouth.com Scott.Fletcher@DevineTarbell.com
Other Participants				

IX. List of Attachments

None

X. List of References

Cooperrider, A.Y., R.J. Boyd, H.R. Stuart (eds.). 1986. Inventory and Monitoring of Wildlife Habitat. U.S. Dept. Inter., Bur. Land Manage. Denver, CO. 858 pp.

Gaddy, L.L. 2001. A Brief Overview of the Flora and Fauna of the Catawba Shoals near the Town of Great Falls, South Carolina. Prepared for Duke Power.

Martin, W.H., S.G. Boyce, and A.C. Echternacht (eds.). 1993. Biodiversity of the Southeastern United States: Lowland Terrestrial Communities. John Wiley and Sons. New York, New York. 502 pp.

NatureServe. 2001. International classification of ecological communities: terrestrial vegetation. Natural Heritage Central Databases. NatureServe, Arlington, Virginia.

Nelson, J.B. 1986. Natural Communities of South Carolina. SC Wildlife and Marine Resources Depart. February. 55 pp.

Catawba-Wateree Hydro Project (FERC No. 2232)
Study Plan

Platts, W.S., W. F. Megahan, and G.W. Minshall. 1983. Methods for evaluating stream, riparian, and biotic conditions. USDA- Intermountain For. and Range Exp. Station. General Technical Report INT-138. Ogden UT. pp. 70.

SC Department of Parks, Recreation, and Tourism. 1994. Animals and plants of South Carolina's Catawba River corridor. Columbia, SC. 30 pp.