# THE WEST GEORGIA REGIONAL RESERVOIR WETLANDS IMPACT ASSESSMENT AND MITIGATION

J. Patrick Barber and David E. Hawkins

*AUTHOR:* Dames and Moore, 455 E. Paces Ferry Road, Suite 200, Atlanta, Georgia 30363.
*REFERENCE: Proceedings of the 1991 Georgia Water Resources Conference,* held March 19 and 20, 1991, at The University of Georgia, Kathryn J. Hatcher, Editor, Institute of Natural Resources, The University of Georgia, Athens, Georgia.

## INTRODUCTION

The Georgia Department of Natural Resources contracted with Dames & Moore in October of 1989 to provide site selection, environmental assessment and Section 404 permit application services in support of a planned water supply reservoir to serve parts of a five-county west Georgia area consisting of Haralson, Douglas, Carroll, Polk and Paulding Counties. A major issue in the selection and approval of a site for water supply reservoir development was the extent of potential wetlands impacts.

The wetlands study was conducted in two phases. In Phase I, candidate reservoir sites and areas were evaluated for water supply yield, environmental impact potential, and cost of development (including mitigation). At this stage, wetlands were identified from available National Wetlands Inventory (NWI) maps, county soils survey maps and aerial photography. Brief field reconnaissance visits were used to verify or modify these data, using as guidance the 1989 "Federal Manual for Identifying and Delineating Jurisdictional Wetlands" (Federal Manual). Several sites were identified as having fatal flaws and these were eliminated from further consideration. For example, sites with more than 500 acres of wetlands were eliminated in this manner since viable sites with substantially fewer wetlands were available.

Phase II studies consisted of a more detailed assessment of environmental effects, including substantial field investigation of biological, wetland and archaeological resources, for two basic dam locations and a range of potential normal and flood pool elevations along the Tallapoosa River and tributaries. One basic reservoir configuration (Site 1) was a subset of a larger configuration (Site 0).

## FIELD SURVEYS

The first priority in assessing impacts to the wetlands was to conduct detailed site surveys over a 4,200 acre area and delineate wetland (jurisdictional) boundaries on 1" = 400' blueline aerial photographs in the field. These delineations were conducted in accordance with the Federal Manual, utilizing the three parameters of hydrology, soils, and vegetation. Upon returning from the field, the wetlands were digitized on a CAD system and then mapped in their location within the reservoir boundary. Following the production of the map, a field verification visit was scheduled with the COE, EPA and USFWS personnel to confirm the methods used and the boundary of the wetlands. The area of wetlands which could be potentially impacted by the largest (Site 0) reservoir configuration (for normal pool at 1010 feet above mean sea level) was 205 acres of forested, 100 acres of scrub/shrub, 0 acres of emergent, 82 acres of altered, and eight acres of stream bank wetlands.

## WETLAND VALUE ANALYSIS

The wetlands were classified into three of the four categories (forested, scrub/shrub, and emergent wetlands) according to the NWI classification scheme developed by the USFWS and described in the 1979 publication, Classification of Wetlands and Deepwater Habitats of the United States by Cowardin, et al. However, the altered wetlands category includes wetlands that have been subjected to alteration or destruction by agricultural practices so that they may or may not still fully function as wetlands.

The next step in evaluating the impacts to wetlands was to consider the value of the wetlands in performing certain inherent functions in the environment. The Wetlands Evaluation Technique (WET) analyzes the value or quality of wetlands in performing these functions in terms of social significance, effectiveness, and opportunity. Social significance addresses the value of a wetland to society due to its special designations, potential economic value, and strategic location. Effectiveness addresses the capability of a wetland to perform beneficial functions due to its physical, chemical, and biological characteristics. The opportunity ratings address the opportunity for a wetland to perform a function to its highest level of capability (Adamus, 1987).

Each of these categories were evaluated and ranked in terms of low, moderate, and high values for the following wetland functions:

- Ground water recharge,
- Ground water discharge,
- Floodflow alteration,

- Sediment stabilization,
- Sediment/toxicant retention,
- Nutrient removal/transformation,
- Production export,
- Wildlife diversity/abundance,
- Aquatic diversity/abundance,
- Uniqueness/heritage, and
- Recreation

WET will compare functional values of existing and planned wetlands, using value estimates to represent past, present, or future conditions. Under these conditions, it is possible to "roll-the-clock forward" to the post-mitigation period if accurate site specific baseline information has been collected, or can reasonable be inferred from the immediate environment. Assumptions concerning past physical, chemical, and biological conditions must be accurate in order for the derived probability ratings to represent accurate conditions.

The function and value evaluations of WET for each of the vegetational types at the West Georgia Regional Reservoir Site 0 indicate higher values for the forested and scrub/shrub wetlands than for the altered wetlands. (See Tables). The contrast between these wetland types can be directly related to the lack of diversity of vegetational strata in the altered wetlands and the likelihood that these areas will be further disturbed or destroyed for agricultural purposes.

## MITIGATION PLAN

The final step in Phase II was to develop a Conceptual Mitigation Plan that would rectify or replace the loss of wetland habitat in such a way that there will be effectively no net loss of wetland habitat and wetland functional value. To achieve the replacement of lost wetland habitat, the mitigation plan proposes to create large stretches of continuous or contiguous wetlands along the Tallapoosa River and its tributaries upstream of the reservoir. Design of the wetlands mitigation plan in this manner will restore a large amount of area that was formerly wetlands and is now in agricultural use to high quality, functioning wetlands. These wetlands will be dependent on stream flow rather than reservoir flooding and therefore will be independent of reservoir pool level management. Additionally, restoration of these areas to wetlands will help protect the reservoir watershed by stabilizing and removing sediments from the water upstream. These areas will also provide wildlife corridors along the river and tributaries.

The information gathered from the WET analysis was utilized to measure the extent to which a created wetland can mitigate the impacts of a given project (i.e., wetland classification type, water regime, topography, habitat types, vegetation, and other site-related factors). The analysis of a future wetland system by the WET is based on the assumption that the wetlands to be inundated by the reservoir will be successfully duplicated to equal or better functional characteristics. This can be accomplished if the mitigated wetlands are assessed at or near a climax successional stage similar to a forested wetland, which is the goal of the mitigation plan and which can be accomplished with state protection of these lands. Thus, the WET comparison is made between the ultimate, fully functional mitigated wetland system and the present wetland system.

The social significance, effectiveness, and opportunity WET evaluations for function and value are very similar between the mitigated wetlands and the existing forested and scrub/shrub wetlands. These similarities between the evaluation results are due to an assumption that the existing wetlands function within a larger contiguous wetland system rather than within a series of independent systems scattered throughout the reservoir. The actual functional value of the mitigation wetlands should be higher due the large size and contiguous nature of the wetlands.

The primary objective of the Conceptual Mitigation Plan is to target suitable properties so that the restoration process can be implemented relatively quickly and cost effectively with a high degree of success. Restoration will primarily be concentrated along the smaller rivers and creeks that feed the Tallapoosa River because these areas are more protected from public access and the topography and soils are well suited for restoration. Furthermore, this plan does not rely on creation of wetlands along the edge of the reservoir which may be dependent on pool water level; any wetlands that do form in this manner will supplement to the total amount of wetlands.

Prior to implementing the full mitigation plan, a series of test plots will be established in several representative restoration areas to insure that this plan will work. Test plot establishment will include both planting areas with wetland vegetation and allowing revegetation to occur naturally. Test plot water retention methods will also be used to enhance the local hydrologic regime. (The test plots will be established prior to the start of any work on the reservoir to demonstrate adequate progress of the restoration process.) Specific test plot areas will be established prior to full-scale wetlands restoration.

## LITERATURE CITED

Adamus, Paul R., and ARC, Inc. and Ellis S. Clairain, Jr., R. Daniel Smith, Richard E. Young. 1987. Wetland Evaluation Technique (WET), Vol.II: methodology. Department of the Army, Vicksburg, MS.

Cowardin, Lewis M., and Virginia Carter, Francis C. Golet, Edward T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. United States, Fish and Wildlife Service. Washington D.C. 103 pp. FWS/OBS - 79/31.

Fish and Wildlife Service, and Department of the Army, Environmental Protection Agency, Soil Conservation Service. 1989. Federal Manual for Identifying and Delineating Jurisdictional Wetlands. U.S. Government Printing Office. Washington D.C.

TABLE 1. WET Analysis of Existing Wetlands at Site 0, Based on: (a) Social Significance Evaluation, (b) Effectiveness Evaluation and (c) Opportunity Evaluation.

| | Forested Wetlands | Scrub/Shrub Wetlands | Altered Wetlands |
|---|---|---|---|
| Ground Water Recharge | M U * | M U * | M U * |
| Ground Water Discharge | M L * | M L * | M L * |
| Floodflow Alteration | M H M | M H M | M L[1] H |
| Sediment Stabilization | M H * | M H * | M L * |
| Sediment/Toxicant Retention | M H H | M H H | M M[1] H |
| Nutrient Removal/Transformation | M H H | M H H | M H H |
| Production Export | * M * | * M * | * M * |
| Wildlife Diversity/Abundance | H * * | H * * | M * * |
| Wildlife D/A Breeding | * H * | * M[1] * | * L * |
| Wildlife D/A Migration | * H * | * H * | * H * |
| Wildlife D/A Wintering | * H * | * H * | * H * |
| Aquatic Diversity/Abundance | H L * | H L * | M L * |
| Uniqueness/Heritage | H * * | H * * | H * * |
| Recreation | L * * | L * * | L * * |

Note:

"H" = High, "M" = Moderate, "L" = Low, "U" = Uncertain, and "*"'s identify conditions where functions and values are not evaluated.

[1] Revised Effectiveness Evaluation based on site specific conditions.