

## Restoration of Lost Lake, Recovery of an Impacted Carolina Bay (U)

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The very nature of Carolina bays makes them frequent victims of disturbance. As isolated inter stream wetlands without associated stream inflows or outflows they are easy candidates for filling or ditching and draining for agricultural use. These shallow perched water table wetlands are relatively common on the Atlantic coastal plain from coastal Virginia to Eastern Georgia; unimpacted bays are not common. Carolina bays are characterized by sandy margins, fluctuating water levels, and an elliptical shape. Size and hydrology can vary widely, from large bays that may contain water all year to small bays that generally dry completely every year. Hydrology of an individual bay tends to lead to unique combinations of water chemistry, soil development, and plant and animal communities. Even though Carolina bays have been extensively studied (see Schalles et al, 1989), restoration of these wetlands was not known until relatively recently.

Lost Lake is one of approximately 200 Carolina bays found on the Savannah River Site ( ), a Department of Energy (DOE) facility near Aiken, South Carolina. Prior to establishment of the SRS in 1950, Lost Lake was ditched and drained for agricultural production. After 1950, the ditch, no longer maintained, filled naturally and Lost Lake again began to function as a wet ( ). Until 1984 Lost Lake was contaminated by heavy metals and solvents overflowing from a near by settling basin. Up to 12 inches of surface soil and all vegetation was removed from the bay as part of a RCRA removal action. A plan for restoration was initiated in 1989 and implemented in 1990 and 1991. ( restoration was a cooperative effort initiated by DOE Savannah River and included representatives from Westinghouse Savannah River Company, Soil Conservation Service, USDA Forest Service, and the University of Georgia Savannah River Ecology Laboratory (DOE, ( )). Extensive planning led to defined objectives, strategies, treatments, and monitoring programs allowing successful restoration of Lost Lake.

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More than a dozen individuals from the five participating organizations provided the guidance for the Lost Lake restoration. The primary goal of the project was to restore the wetland ecosystem after a hazardous waste clean up operation. An additional goal was to study the progress of the project and the success of the restoration activity. Several strategy considerations were necessary in the restoration plan. The removal of existing organic soils had to have compensation, a treatment scheme for planting and the extent of manipulation of the substrate had to be considered, monitoring decisions had to be made, and the decision whether or not to actively control the hydrology of the restored system.

The bay was divided into eight "pie slices" and four treatments of substrate were replicated. Woody tree and shrub species were planted in the upland areas, and extensive emergent and submerged plants were put in the eight experimental areas. Topsoil was brought in to help ameliorate the lack of organic materials and gypsum was added to adjust pH. The decision was made to allow the water levels to fluctuate naturally. Current monitoring programs are limited to those examining plant community development and reptile and amphibian colonization

DOE (United States Department of Energy, Savannah River Field Office). Lost Lake/M-Basin Restoration Reference Guide. DOE-SR Environmental and Laboratory Programs Division, Aiken, SC. 1992.

Schalles, J. F., R. R. Sharitz, J. W. Gibbons, G. J. Leverage, J. N. Knox. Carolina Bays of the Savannah River Plant. Savannah River Ecology Laboratory. SRO-NERP-18. 1989.

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