

Hydrology Section — Land, Water and Conservation Division

South Carolina Department of Natural Resources

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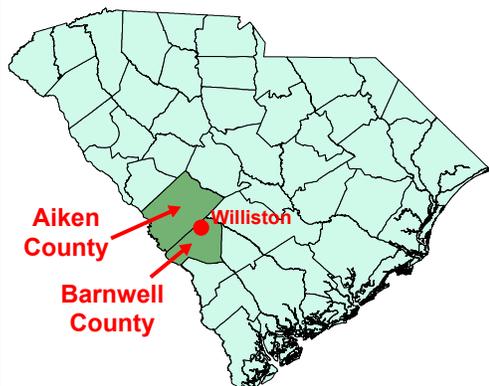


DNR

PROJECT: Ditch Pond Bay Hydrologic Study

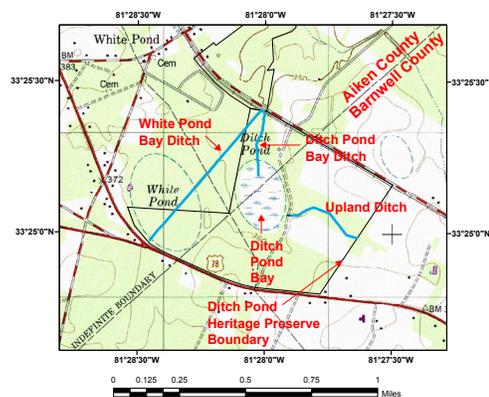
OBJECTIVE: Characterize the hydrology of a Carolina Bay and assess the need for its restoration

Carolina bays are shallow wetland depressions characterized by an elliptical shape oriented in a northwest-southeast direction. These depressions are unique geometric features of the Atlantic Coastal Plain, occurring from New Jersey to northern Florida but heavily concentrated in North and South Carolina. Carolina bays vary in size from thousands of acres to less than 1 acre, and their hydrologic regimes can range from permanently flooded to frequently dry. As wetland systems, Carolina bays may have one or more associated wetland functions such as water storage, wildlife habitat, biodiversity conservation, or nutrient cycling. Approximately 97 percent of Carolina bays in South Carolina have been disturbed, often by conversion to agriculture or silviculture, where bays are often ditched and drained. The alteration of bay hydrology in these systems has degraded habitat for many plant and animal species.



The DNR's Heritage Trust Program has highlighted the need to preserve and/or restore these unique ecosystems and has identified a Carolina bay at Ditch Pond Heritage Preserve as a site suitable for preservation and possible restoration. Ditch Pond Bay is a 25-acre Carolina bay on the border of Aiken and Barnwell Counties near Williston, S.C., and is a prominent feature of the Ditch Pond Heritage Preserve, which was acquired for preservation in December 2002. Water levels in the bay may be below normal because of several ditches located in and around the bay.

A study of the bay was initiated in 2006 to determine the water budget of the bay, the impacts of the ditches, and the feasibility of restoration. A monitoring-well network was installed across the site to assess potential groundwater recharge or discharge to the bay and to assess drainage impacts from the ditches. Surface-water levels in the bay are monitored by a staff gage and an automatic data recorder. Rainfall is measured by an onsite automatic rain gage, and evapotranspiration is estimated using temperature and evaporation pan data from a nearby, long-term weather station. Data collection has been ongoing since the spring of 2006.



Preliminary results suggest that groundwater inflow and outflow is a significant component of the bay's water budget and that the ditch network has had a minimal effect on surface-water levels in the bay. The study period, however, has been dominated by dry conditions and additional data collected over extended wet conditions are needed to fully assess the potential impacts of the ditches on the bay over a wide range of climate conditions.



Staff gage used to measure water depth in Ditch Pond.

Selected reports:

SCDNR Water Resources Report 44: *Ditch Pond Carolina Bay restoration project, Aiken and Barnwell Counties, South Carolina – Phase II* (2007) Harder, S.V., Gellici, J.A., and Wachob, A.: http://www.dnr.sc.gov/water/hydro/HydroPubs/Abs_dnr_R44.htm

SCDNR Open-File Report 11: *Ditch Pond Carolina bay restoration project: Phase I Progress Report* (2006) Harder, S.V., Gellici, J.A., and Wachob, A.

South Carolina Wildlife and Marine Resources Department Nongame and Heritage Trust Publication No. 1: *Distribution and status of Carolina bays in South Carolina* (1991) Bennett, S.H. and Nelson, J.B.

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