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Conservation Effects Assessment Project
Key Findings of CEAP–Wetlands Component

Wetland Conservation Practices in the Southeast U.S. Piedmont–Atlantic Coastal Plain Region

Incentives-Based, Voluntary Conservation Programs are Restoring Diverse Wetland Habitats and Functional Types in the Southeast U.S. The Southeast Piedmont–Coastal Plain region is predominantly forested, with roughly 20% of land used in agriculture including row-cropping and grazing. The region also has abundant wetlands, which provide valuable ecosystem services such as pollutant reduction, flooding abatement, and wildlife habitat. Nearly 50% of regional wetlands were lost or degraded historically when land was converted to agriculture or silviculture. Under conservation programs such as the Wetlands Reserve Program (WRP, now part of the Agricultural Conservation Easement Program), implementing wetland restoration and related conservation practices can increase the provision of wetland ecosystem services within agricultural landscapes. Wetland functions can differ among wetland hydrogeomorphic (HGM) types, which are classified according to geomorphic setting, water source, and hydrodynamics. The HGM system provides a tool for assessing the services gained from restoration, creation, and enhancement projects. This report describes the wetland types and restoration practices used in WRP projects across the Southeast, to understand the functional outcomes for regional ecosystem services.

Wetlands Conservation and WRP in the Southeast

- Agricultural land use is most prevalent in the Rolling Coastal Plain and Piedmont. Relative abundance of wetlands increases along the topographic gradient from the Piedmont to the Coastal Flats.
- Common HGM types in the Southeast include depressions, wet flats, riverine wetlands (riparian and floodplain), and estuarine wetlands. Restoring these varied wetland types requires flexible techniques.
- Typical WRP projects restore hydrology and establish easements that may include managed upland habitat surrounding the wetlands. Over 90% of regional WRP sites are enrolled voluntarily in perpetual or 30-year conservation easements.
- Representative wetland restoration projects in three states (Fig. 1) evaluated how restoration practices were adapted to wetland types. Rapid field assessments were also conducted on a subset of projects.

Figure 1. Sub-regions of the Southeast for CEAP-Wetlands assessments. This study evaluated a total of 109 WRP sites across South Carolina, Georgia, and Mississippi.

Southeastern WRP Wetlands Are Diverse

- WRP wetlands at 109 sites were well-distributed among four HGM types: depressions (27%), wet flats (18%), headwater riparian wetlands (21%), and mainstem river floodplains (34%). While many sites were actively used for agriculture prior to restoration, others had some naturalized vegetative cover at the time of enrollment.
- Most wetlands had lost hydrology function through ditching and drainage. Prior-cropped floodplains had been drained and were also protected with levees. A unique project type was represented by forested floodplains with past clear-cut harvesting, where hydrology function was degraded by logging roads and debris which blocked natural water flows.
- Restorable wetland area estimates averaged from 60–70 acres (depressions, riparian sites) to 300–600 acres (large flats, floodplains). On non-floodplain easements, the amount of included upland habitat ranged from near 0% to 69% of easement area. Large floodplain tracts generally had a complex mosaic of upland and wetland areas.
- Because the “wetland restoration” practice is broadly defined, implementing the practice in these diverse wetland types requires a flexible suite of specific restorative and site-management practices.

Restoration Practices Varied with Wetland HGM Type

- The primary restorative practices used (Table 1) were ditch-blocking for unmanaged hydrology (flats) or dikes and water-control structures for retaining and managing water levels (depression, riparian, and prior-cropped floodplain). The main practices used on timber-harvested floodplains were breaching roads and installing rock-ford crossings to restore natural water flows.
- Restored wetlands were generally allowed to re-vegetate naturally. Supplemental planting of wetland and bottomland trees was frequent on prior-cropped sites (35–82% of projects), but was not widely used on prior-vegetated sites.
- Supporting practices for wildlife habitat management (wetland and upland) included moist-soil hydrologic management, planting food plots, and prescribed burning.

Table 1. Percentage of projects using specific hydrology-restoration practices, by wetland HGM type. Values in boldface indicate significantly higher use for a given wetland type.

Restoration Practice	Depression	Wet Flat	Headwater Riparian	Floodplain (prior-cropped)	Floodplain (timber-harvested)
ditch plug or tile break	24	**60**	*	*	*
dike and water-control structure	**52**	40	**78**	**82**	38
barrier breach, rock-ford crossing	*	*	26	18	**54**
macrotopography excavation†	24	**45**	*	27	19

† secondary practice to create variable water depths; * = infrequent (<10% of projects).

Practices Interact with Wetland Type to Influence Functional Benefits

- Depending on the specific practices used, the functional outcome of restoration may be to recover original hydrodynamics or to modify hydrodynamics differently from the original HGM type. Approximately 81–90% of depressions, flats, and timber-harvested floodplains were restored to original hydrodynamic function by using compatible practices.
- Conversely, 82–83% of riparian sites and prior-cropped floodplains were modified to increase water retention, rather than to promote natural flow-through hydrology. The water-retention practices were designed to enhance wildlife habitat services, but may potentially reduce the levels of riverine-wetland services such as nutrient filtering.
- Field surveys of 53 project wetlands found that 85–87% had indicators of functional hydrology and vegetation dominated by diverse wetland plant species. Presence of wetland-dependent fauna was observed frequently. About 11–15% of project wetlands were drier than planned despite the use of water-retention practices; these sites may have naturally short hydroperiods and thus were less suitable for such practices.

Improving Ecosystem Services Delivery in Regions of Diverse Wetlands

The Southeast is a predominantly forested region, thus WRP projects are fewer and more dispersed than in agriculturally-dominant regions such as the Central Plains. Most Southeastern wetland projects are successfully providing environmental benefits at local scales. Large forested-floodplain projects may also offer synergistic benefits at watershed and landscape scales, by providing flood abatement and nutrient-filtering services both locally and downstream.

All wetlands do not provide all services equally, leading to some trade-offs in the benefits derived from wetland restoration. The WRP has a primary emphasis on wildlife habitat and biodiversity, but the associated practices may sometimes be incompatible with certain wetland types. An HGM framework is useful for identifying these trade-offs, so that restorations can be optimized for multiple services. More consistent use of upland-buffer habitat within WRP easements could also protect the functions of sensitive wetland types (particularly depressions) within the agricultural landscape.