WILDLIFE HABITAT: AN ALTERNATIVE USE FOR DEGRADED AGRICULTURAL WETLANDS

Kristin Ling Smith[1], Robert N. Smith[2] and Buster Haddock[3]

AUTHORS: [1]Water Quality Specialist, USDA-NRCS, 30 West Broad Street, Camilla, GA 31730; [2]Forest and Wildlife Biologist, RNS Resource Management Services, Route 2 Box 245, Arlington, GA 31713; and [3]H&H Farms, P.O. Box 100, Damascus, GA 31741.
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Abstract. Numerous degraded wetlands are present under center-pivot agricultural irrigation systems in southwestern Georgia. These areas hinder agricultural operations, are not as productive as surrounding upland areas, and provide only a fraction of their original wetland functions and values. At H&H Farms in Early County, a prior-converted wetland has been developed into a series of moist soil units. This has resulted in improved agricultural efficiency, better wildlife habitat, restoration of some wetland hydrology and vegetation, and a potential income source for the landowners.

INTRODUCTION

Numerous degraded wetlands are present under center-pivot irrigation systems in the agricultural fields of southwestern Georgia. These areas hinder agricultural operations, are not as productive as the surrounding upland areas, and provide only a fraction of their original wetland functions and values. When the larger wetlands under center-pivot irrigation systems are moist during the growing season, it is difficult for agricultural equipment to cross these areas, much less to produce a crop; irrigation systems may also get stuck as they cross these wetlands resulting in the system either breaking or going into automatic shut-down as it gets out of line. The economic returns from these areas are often lower, even though they may require more time, equipment, lime, and fertilizer inputs than adjacent upland areas. Compared to unfarmed wetlands, their hydrologic and biologic functions and values are greatly impaired.

If some wetland functions and values can be restored to these areas while improving the farm's economic baseline and making agricultural operations more efficient, then it is a win-win situation for the farmer and the environment. A series of dikes with flashboard riser water control structures in them may be used in some cases (Frederickson and Taylor, 1982; Payne 1992; Puckett *et al*, 1994). These dikes may be used by agricultural equipment and the wheels on the towers of center-pivot irrigation systems. While dikes with drainage systems in them can be used, water control structures add the capability to manage water levels.

Constructing dikes to allow irrigation systems to function more efficiently is common sense and makes economic sense also. While restoring wetland functions and values or other ecosystem components may not motivate landowners to install water control structures, they may be motivated by opportunities to observe or hunt wetland birds or the chance to market the opportunities to others while the resulting hydrological and habitat benefits accrue to many different species.

By approaching this water problem in ways that match landowners' wants, needs, and desires, USDA representatives, extension agents, consultants, and others to whom farmers turn for advice are more likely to see farmers actually implement sound conservation practices.

BACKGROUND

A large agricultural field on H&H Farms in Early County contained a former depressional wetland with Grady soils (Grady pond). This area was technically a prior-converted (PC) wetland as it had been ditched, planted and maintained since the 1960's. Even with the drainage, some areas were too wet to consistently farm, and the irrigation system would often shut down as a tower got stuck crossing the ditch. Stuck towers result in automatic shutdown as parts of the system continue to walk and get out of line, missed irrigation opportunity,

and the need to get equipment and manpower into the field to free the irrigation system.

A ditch runs from near the center of the field and the well and irrigation pump through the historic Grady wetland into an existing wetland outside the field.

There have been several species of waterfowl observed in the prior-converted wetlands in this field and even more in ponds and wetlands in the immediate area. Wood ducks, mallards, blue-winged teal, hooded mergansers, buffleheads, and snow geese have all been seen in this field from 1997 to 2001. During the winter of 1999-2000, over 500 wood ducks were observed in and around less than 1/10 acre of water in an adjacent field, and an estimated 10,000 wood ducks were roosting and feeding in a nearby 600 acre depressional wetland. Apparently because of the lack of water from a dry fall and early winter, many of the migratory ducks that historically use this area were using areas along the Flint and Chattahoochee rivers and in the panhandle and peninsula of Florida in the winter of 2000-2001 resulting in few ducks in the area early in the season.

METHODS

During a dry period in September, 1999, moist soil units were built by constructing a series of dikes with flashboard risers across the prior converted area (Figure 1), supplying a raised route for the center-pivot irrigation towers to safely cross the area and a means for controlling water levels. The first step in construction was to surround the area with a firebreak and burn off the existing grass and brush. The area was then harrowed. The irrigation system was walked across the area to leave tracks where the towers crossed.

Using a transit, it was determined that using only the dikes needed by the towers would allow the majority of the prior converted wetland area to be flooded with 6 to 30 inches of water. Had the slopes been steeper as they are in some areas, it might have been necessary to construct other dikes between the tower dikes in order to flood the entire area with shallow water.

Curved dikes were constructed by following the tower tire tracks with a terrace plow. The terrace plow worked these areas until they were 30 inches above the surrounding area, which was the maximum height possible because of equipment limitations. After the dikes were remeasured with a transit and marked to their respective heights, the dikes were further built up and widened using a John Deere 450 bulldozer and a John Deere 410 backhoe that were available on the farm. The dikes were then smoothed off, remeasured, and adjusted as necessary. The backhoe was then used to install the flashboard risers.

Soil tests were taken and the area was limed and fertilized based on the results of that analysis. Wheat was planted in late October to help stabilize the area and with the hope of attracting some of the snow and Canada geese that are observed in the area. After the wheat was up, some of the area was shallowly flooded, which resulted in usage of the area by several shorebird and wading bird species, as well a pair of hooded mergansers.

In late spring (after most shorebird migration), the moist soil units were drained. In June, the areas were again harrowed and fertilized. The lower areas were planted with rice. The upper areas were planted to a mixture of rice, Japanese millet, grain sorghum, corn,

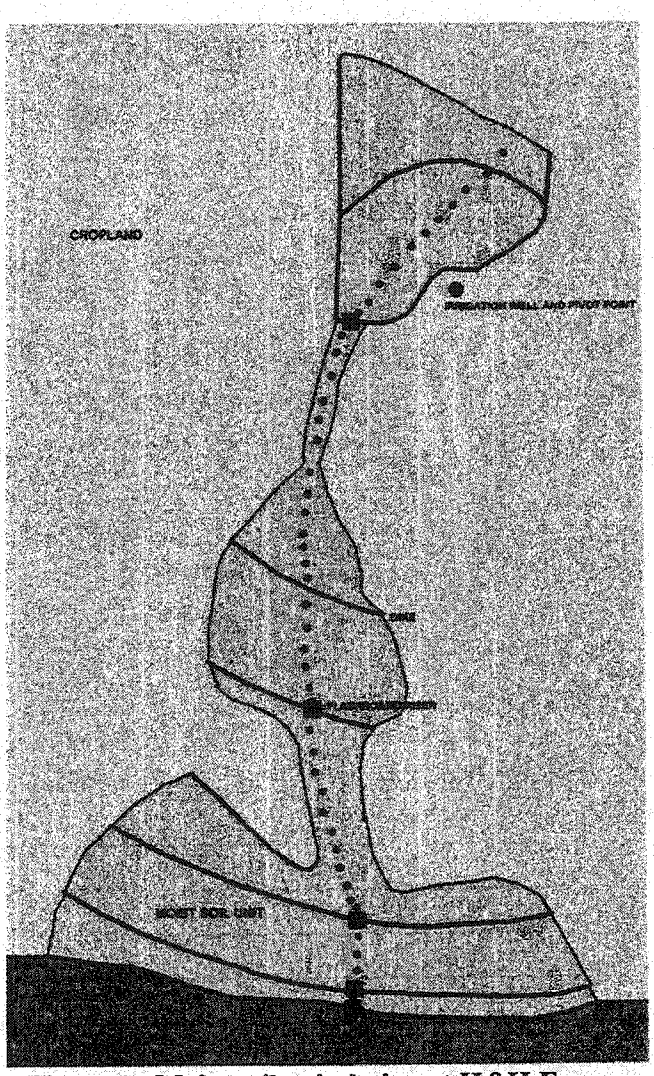

Figure 1. Moist soil unit design at H&H Farms.

sunflowers, proso millet and sesame (Frederickson and Taylor, 1982; Payne 1992; Puckett *et al*, 1994). In late July, a few boards were put in the water control structures, and the irrigation pump and well were used to put a few inches of water under the rice to help control competition. In mid-October, there was still a lack of rainfall to fill the moist soil units, so the irrigation pump and several feet of hard pipe were used to reach the ditch and fill the moist soil units, beginning with the lower unit and working the water up to the upper unit. Initially filled in a few days, filling could have been done over a period of weeks or months to increase the period of resource availability.

CONCLUSIONS

Up to 300 wood ducks with additional teal, buffleheads, and mergansers have been observed in the moist soil units in February, 2001. Two other migratory game birds that are using the moist soil unit in some numbers are greater snipe and American woodcock. Besides the waterfowl and other game birds, many species of wading birds and shorebirds, at least five species of sparrows, red-winged blackbirds, killdeer, northern harriers, and a number of other wetland and seed-eating birds have been documented using the area (R. Smith, unpublished data). Sandhill cranes have also been documented in the field along the edges of the moist soil units. Over time, the use of the moist soil units by many species of birds should increase as the quality of the area improves, birds collectively begin to use it as a feeding area, and general weather patterns are more favorable.

Through the use of dike construction and water control, the prior converted wetland area has been turned from a liability into an asset that benefits both the environment and the landowner. The irrigation system can now cross the ditch without getting stuck. The vegetation can be managed with prescribed fire, flooding, soil disturbance, and planting so that it not only does not interfere with the irrigation system, but also benefits many species of game and non-game wildlife. Over time, it is hoped that at least a portion of the wetland may be managed with native vegetation such as smartweed and red root that are used by many ducks in this area. By flooding the area during the non-growing season, the natural hydrology is much more closely mimicked than when the area was simply drained at all times. Habitat for waterfowl, shorebirds, wading birds, and other birds and wildlife associated with marshy habitats and depressional wetlands has been increased and improved in the area.

The landowners now have waterfowl, snipe, and woodcock hunting and birdwatching for personal enjoyment or as a potential income source. In 1999-2000, approximately 1,710 man-days of waterfowl hunting were supported by commercial hunting operations in southwest Georgia (Thompson and Smith, in press). Using the national average of $422 per trip (USDI, 1997), estimated local expenditures by waterfowl hunters of almost three-quarters of a million dollars can be calculated.

DISCUSSION

There are several reasons why this project was successful. The most important was probably that it met the landowners' objectives to use their natural and economic resources wisely with long-term stewardship playing an important role. Prior planning before implementing this project was also important. One key criteria that allowed this project to move forward was the designation of this area as a prior-converted wetland which allowed modifications to the area that would not have been permitted without mitigation under the Farm Bill and Clean Water Act regulations that govern agricultural activities in wetlands. Another significant factor was the ability to control the water. The series of dikes with flashboard risers allows water to be held. A lower area below the dikes allows water to be drawn from the area when necessary also. Because the area is fairly flat, comparatively few dikes were necessary to flood the area with shallow water, reducing the cost of construction and maintenance. Having a water source like the irrigation well and pump above the moist soil units allows the area to be flooded even if there is little or no rainfall. The ability to plant and otherwise manage vegetation that benefits waterfowl and other wildlife in the area is also a benefit.

RECOMMENDATIONS

While moist soil units do not fit every situation, there are a number of degraded wetlands in southwestern Georgia that could have some of their historic functions and values restored while making the agronomic operations more efficient and improving wildlife habitat.

When it is legally, biologically, hydrologically, economically, and socially possible to use dikes and water control structures to make these changes, it is an option worth considering.

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