WATERBIRD USE OF COASTAL IMPOUNDMENTS AND MANAGEMENT IMPLICATIONS IN EAST-CENTRAL FLORIDA

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Abstract: Monthly surveys were conducted on Kennedy Space Center for one year to determine densities of waterbirds within impounded salt marshes that were predominantly open water with little emergent vegetation. The objective was to assess the importance of these impoundments to waterbirds, particularly wading birds, which are species of special conservation concern. Water-level management for mosquito control and waterfowl provided habitat for an abundance of ducks, shorebirds, coots, and wading birds. Average densities throughout the year for these groups were 5.26, 4.12, 2.80, and 2.20 birds/ha, respectively. The majority of waterfowl were present during the winter. Shorebirds were most common during spring migration. Wading bird densities increased with declining water level. Due to the extensive alteration and development of coastal wetlands in central Florida, properly managed impoundments may provide important feeding areas for maintaining certain waterbird populations.

Key Words: Anseriformes, Charadriiformes, Ciconiiformes, Florida, habitat use, impoundments, mosquito control, shorebirds, wading birds, waterfowl, wetlands.

INTRODUCTION

The creation of open water impoundments has proven to be an economic, simple, non-toxic approach to mosquito control (Provost 1967, 1969). Along the east-central Florida coast, these impoundments were originally high salt marshes that were diked to flood the exposed mud on which salt-marsh mosquitoes (i.e., Aedes taeniorhyncus) oviposit (Provost 1967). Unbroken expanses of high salt marsh or scrub mangrove were reported to have low bird densities; impoundments are used by numerous waterbirds, particularly waders (Ciconiiformes) and waterfowl (Trost 1968, Provost 1969). Most wildlife studies concerning impoundment management have focused on waterfowl and their food items, but a need exists to document the importance of impoundments to other birds (Rundle and Fredrickson 1981, Epstein and Joyner 1986).
Florida wetlands are vital habitat for migrating waterfowl using the Atlantic Flyway, and Merritt Island National Wildlife Refuge (MINWR) on the John F. Kennedy Space Center (KSC, Figure 1) supports a large wintering population. Since much of the nearby waterbird habitat has been converted to agriculture, silviculture, pasture, or housing, and is not being managed for wildlife (Lowe et al. 1984), impoundments at MINWR and along the Indian River lagoon are probably important for maintaining the existing regional wading bird populations (H.W. Kale, II, pers. comm.).

Some effects of impounding marshes have been negative, particularly for the dusky seaside sparrow, clapper rail, and certain fish-eating waterbirds (Trost 1968). Since marsh impoundment has been implicated in the decline of fisheries in nearby estuaries, managers have been pressured to reduce or eliminate such negative influences (Montague et al. 1985).

The objective of this study was to quantify waterbird use of open water impoundments on MINWR near operational areas of KSC. Wading birds were emphasized because they are abundant on MINWR and are species of special conservation concern in Florida (Wood 1987).

**STUDY AREA**

The impoundments studied (T-29A, T-27D, T-33A, T-33B; Leenhouts 1983) were created in the early 1960s and are comprised principally of open water with little emergent vegetation. Areas of open water for each impoundment were 37.2 ha, 259.9 ha, 43.3 ha, and 46.6 ha, respectively. Surrounding the open water areas are dikes, or the original uplands or marshes. The landscape is characterized by slight topographic relief in a series of ridges and troughs where uplands occupy the ridges, open water areas occupy the troughs, and marshes are intermediate. Because of natural features and dikes, the impoundments are comprised of areas where surface waters are connected during high water but are often isolated during low water. The coastal zone of central Florida is the southern transition between grassy marshes to the north and mangrove swamps to the south, due to climatic differences and the intolerance of mangroves to freezes (Trost 1968, Bidlingmayer 1982). Salt marshes on MINWR are comprised of saltwort, glasswort, graminoids such as sand cordgrass, salt grass, or needle rush, with patches of mangroves, especially black mangrove and white mangrove, and occasionally *Spartina alterniflora* (Provost 1967). Before impoundment, these marshes were nontidal and usually dry except for creeks and pools (Trost 1968). The prolonged flooding associated with impoundment resulted in the loss of salt marsh vegetation, which was replaced by open water. Salinity level in the impoundments is dependent on rainfall and water level and can range from near fresh water to 35 ppt (Snelson 1976).