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RELATIVE DISTRIBUTION AND ABUNDANCE OF WINTERING RAPTORS IN AGRICULTURAL AND WETLAND LANDSCAPES OF SOUTH FLORIDA

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South Florida provides important winter habitat for a variety of migratory and resident raptor species (Bohall and Collopy 1984). In this area, habitat loss has occurred as natural habitat has been modified for either agriculture or urban use. Two predominant features of the current vegetated landscape are Everglades wetland communities and agricultural areas (Pearlstone et al. 2001), including sugarcane-dominated (*Saccharum* sp.) fields south and east of Lake Okeechobee in the Everglades Agricultural Area (EAA). Although the two habitats are open and contain superficially similar components such as upland, wetland, temporary and permanent water, and sparsely-distributed trees, structure and composition varies greatly between natural and agricultural habitat.

Roadside surveys are convenient for obtaining information on distribution, population trends, and abundance of raptors (Fuller and Mosher 1981). Such surveys have been used extensively to determine relative abundance (e.g., Woffinden and Murphy 1977, Leptich 1994, Eakle et al. 1996, Meunier et al. 2000), population trends (e.g., Layne 1980), habitat associations (e.g., Preston 1990, Sorley and Anderson 1994, Garner and Bednarz 2000, Thiollay and Rahman 2002), perch use (e.g., Bohall and Collopy 1984, Smallwood et al. 1996, Meunier et al. 2000, Leyhe and Ritchison 2004), activity patterns (e.g., Meunier et al. 2000), and species richness and diversity (e.g., Leptich 1994, Sorley and Anderson 1994). However, a number of factors may cause variation in raptor counts including differences in detectability across cover types, distance of observation (Millsap and LeFranc 1988) and time of day (Bunn et al. 1995).

Migratory and wintering hawks begin arriving in south Florida in October and are present throughout the winter. They can be easily observed along roadsides and flying over the landscape. The purpose of our study was to

compare relative distribution and abundance of common wintering raptors in agricultural and wetland landscapes. Our null hypotheses were that there was no difference in raptor abundance and diversity between the two habitats and that perch types were chosen randomly.

METHODS

Study Area. Historically, south Florida was dominated by the greater Everglades ecosystem. From Lake Okeechobee southward, water flowed across a wide landscape of marshes, sloughs, tree islands, and mangrove swamps into Florida Bay (Porter and Porter 2002). Before the turn of the century, drainage of the northern part of the Everglades commenced with production of a system of canals and dikes in the vicinity of and around Lake Okeechobee. The EAA came into being in the early 1950s (Light and Dineen 1994). The major road through these two habitat types is U.S. Route 27, a four-lane, divided highway passing through two counties, Palm Beach County to the north and Broward County to the south. The county line follows a demarcation between agriculture and Everglades vegetation. Vegetation along the roadside consists of mowed strips, powerlines, trees and shrubs of mostly exotic species, and canals. Beyond the canals, the landscape is dominated either by huge expanses of agricultural fields or of natural marsh and tree islands; both habitats are open with few scattered trees.

The EAA dominates western Palm Beach County and is comprised mostly of sugarcane fields with a small percentage of other crops including rice, sod, and various vegetables (Izuno et al. 1991). The agricultural fields are intermixed with a grid system of unpaved roads, permanent canals, and shallow ditches that provide varying degrees of irrigation and drainage for the fields. This system of fields and canals produces a patchwork of agricultural crops with field and canal-edge cover consisting of herbaceous and shrubby vegetation, usually exotic species, and sparse trees.

A single large canal on the east side of the road in Palm Beach County was fringed by tall brush and short trees, some of which were dead and used as nighttime roosts by various species of egrets (*Egretta* spp., *Bubulcus ibis*, *Butorides virescens*) and Anhingas (*Anhinga anhinga*). Few live trees were present in the area, but in some places there was significant tall brushy growth. There was a mean of 12.5 powerline poles per km on the west side of the road. Roadsides were mowed to a distance of 25 m and trees were found in less than 1% of roadside edge cover type.

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