

**PATTERNS OF SALT MARSH AND FARMLAND USE BY
WADING BIRDS IN SOUTHERN RHODE ISLAND**

BY

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ABSTRACT

Six species of wading birds nest in Narragansett Bay and all are listed as species of conservation concern in the State of Rhode Island. Efforts have been made to protect nesting sites in Rhode Island, but little is known about the foraging habitat used by these birds during the breeding and post-breeding seasons. All species regularly feed in salt marshes. Thus, if carefully designed, salt marsh restoration efforts may have positive impacts on local wading bird populations. I conducted visual surveys at 13 salt marshes in southern Rhode Island approximately 2 times per week during both the breeding (6 May – 29 June) and the post-breeding (4 August – 20 September) seasons in 2001 and 2002. Study sites varied in both size and distance from active colonies. Great (*Ardea alba*) and Snowy Egrets (*Egretta thula*) were the most widespread and consistently observed species during both seasons. More wading birds were observed per survey during the post-breeding season ($\bar{x} = 125.24$, $SD = 56.47$, $N = 21$ surveys) than the breeding season ($\bar{x} = 50.39$, $SD = 27.22$, $N = 28$ surveys), but the ranking of site importance was similar between seasons. The majority of birds observed during both seasons were foraging (breeding: 82%; post-breeding: 64%). The number of wading birds using each site was significantly related to site size during both seasons. More birds were detected in larger sites, but even very small sites (< 2 ha) were used. No relationship between the number of birds using each site and the distance to the nearest colony was evident in either season.

At the patch scale, linear models predicting site mean were constructed from measures of habitat availability at each site, and were evaluated using an information-theoretic approach. Salt marsh area was the best parameter in both seasons at

predicting the mean number of foraging herons using each site. Density varied little among sites, suggesting that foraging habitat may be saturated. Tidal stage showed no relationship to site use at the patch scale. At the microhabitat scale, I evaluated habitat preferences by calculating standardized resource selection ratios for foraging herons at each site. Foraging herons strongly preferred salt marsh pool habitat, regardless of tidal stage. Some shift in habitat selection by tide stage was evident, but preferences varied widely among sites. Within each site, Great and Snowy Egrets showed similar habitat preferences. Mosquito control ditches were rarely used, and foraging birds were never detected in common reed (*Phragmites australis*). Carefully designed salt marsh restoration projects may benefit the local heron population, especially since it appears that foraging habitat is limiting. To insure use by foraging herons, salt marsh restoration designs should include adequate pool habitat and accessible open water, while reducing *Phragmites* and inaccessibly deep ditches and channels.

Glossy Ibis (*Plegadis falcinellus*) rely on active agricultural lands for foraging, especially during the breeding season, when salt tolerance may limit nestling growth. I surveyed 11 farms in Newport County, Rhode Island, all within 8 km of the primary nesting colony, approximately two times per week during the breeding season (15 May and 23 July) in 2002. The majority of ibis observed using farms were foraging. Farms with high densities of cows (> 10 cows per ha) and streams were especially important, but foraging ibis used many different habitat types, including cultivated grass, wet areas, uncut meadows, and recently mowed grasslands. This study clearly shows that active agricultural lands are beneficial to Glossy Ibis in Rhode Island, and efforts to preserve active farms will also help to sustain ibis populations.