AVIAN COMMUNITY-HABITAT RELATIONSHIPS IN RED MAPLE SWAMPS AND ADJACENT UPLAND FORESTS IN SOUTHERN RHODE ISLAND

BY

BOB DEEGAN

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF

MASTER OF SCIENCE

IN

NATURAL RESOURCES SCIENCE

UNIVERSITY OF RHODE ISLAND

1995

ABSTRACT

The relationship between the avian community and its habitat was investigated along a soil-moisture gradient in three mature red maple swamps and adjacent upland forests in Washington County, Rhode Island. Habitat measurements and bird surveys were conducted in 12 60-m diameter plots distributed evenly among three transects and four habitat zones (A, B, C, D) at each site. Dendrograms generated from cluster analyses showed a distinct break between upland (A, B) and wetland (C, D) habitats at each site. However, differences among zones for specific habitat variables were inconsistent among the sites. Of the 54 significant differences over the three sites, 51 were upland-wetland differences. Thus, habitat analyses suggested a two-zone, rather than a four-zone, gradient at the study sites.

Avian community composition at all three sites indicated that the birds in these habitats, with few exceptions, were facultative.

Data were analyzed for both singing birds and total birds observed. Species richness, relative abundance, and heterogeneity were compared among habitat zones and between upland and wetland habitats at each site. Species richness was significantly greater in the upland than in the wetland at Burlingame and Great Swamp. Except for one case at Arrow Swamp, there were no significant differences among zones or between upland and wetland habitats for either relative

abundance or heterogeneity. Similarity indices calculated for total birds generally were higher for comparisons between upland (A and B) zones or between wetland (C and D) zones than for comparisons between upland and wetland zones at each site, although this pattern was less obvious at Burlingame. Similarity indices for singing birds showed no consistent patterns at any of the sites.

Two new methods for comparing the composition of bird communities were introduced: the wetland frequency category (WFC) method and the wetland preference index (WPI) method. Application of WFC and WPI methods was more effective in identifying subtle changes in the bird community along the upland-wetland gradient than were zonal comparisons focusing on species richness, relative abundance, and heterogeneity.

Single-site analyses revealed that the cover of evergreen shrubs 0.25-1.00 m tall and the cover of low herbs <25 cm tall were the only habitat variables significantly correlated with any of the avian community characteristics at all three sites. Pooled-site analyses showed that low herb cover was most strongly correlated with avian community characteristics.

Management schemes designed to protect birds in red maple swamps should focus on the habitat requirements of the Northern Waterthrush and Canada Warbler, the only wetland-dependent species observed in this study.