

AVIAN POPULATION DENSITIES AND SPECIES DIVERSITY ON RECLAIMED STRIP-MINED LAND IN EAST-CENTRAL TEXAS

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The objective of this study was to determine the effects of coal strip-mining and subsequent reclamation on population densities and species diversity of a native avian community in the east-central Texas post oak savannah region. I marked three transects in May-June 1976 and measured vegetational parameters (percent canopy cover, percent litter cover, average canopy height, average maximum canopy height and species composition) in June 1977, using a 20 x 50 cm quadrant and canopy-coverage methodology. One transect sampled three successive years (1974-1976) of reclaimed land, with one third of the transect sampling each year; a second transect sampled newly reclaimed land. Both reclaimed areas were essentially monospecific grasslands with low to moderate forb invasion. An unmined control site represented improved pasture/post oak savannah typical of the area. Aerial photographs were used to determine arboreal canopy cover. The control site showed considerably greater vegetation diversity than the reclaimed sites.

A modification of a strip transect method was used to census avian communities, and two indices (h' and S) were employed to chronicle changes in avian community diversity. Results of univariate and multivariate analysis of variance and pair-wise contrasting procedures indicated that 22 of the 42 species considered were adversely affected by mining and reclamation. This was generally attributable to the loss of foraging, nesting and observation substrates from reclaimed areas. Fourteen species, generally grassland types adapted to a vegetationally two-dimensional habitat, were favorably affected. Six species showed no ill or favorable effects attributable to mining and reclamation. Mining and reclamation adversely affected 12 avian associations by destroying necessary foraging and/or nesting habitat. Four associations were favorably affected through addition of foraging and/or nesting habitat. Two associations showed both favorable and adverse affects.

The highest and lowest total densities were always associated with reclaimed areas. Portions of reclaim often appeared barren of birds while other portions supported large numbers. Species richness was generally low on reclaimed sites, with a few select species contributing large densities. The control showed densities mid-way between the reclaim extremes. Permanent resident species remained on the control tract throughout the year; on reclaimed sites, they appeared to emigrate during the winter. The control area also showed the

highest number of species considered and, generally, the greatest species richness.

I concluded that mining and reclamation procedures considerably altered the native avian community and that the overall effects were harmful to a majority of species and group associations.

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