

## FOREST-POWERLINE EDGES, CLEARCUTTING, AND BIRD COMMUNITIES

by William E. Davis, Jr.

Powerline corridors through forests produce substantial edge—the interface between forest and clearing—and often enhanced habitat for nesting birds. This “edge effect” —with higher concentrations of bird species and individuals in forests immediately adjacent to clearings—is well known (e.g., Small and Hunter 1989, Lay 1938). Further, forest edges, and particularly clearcut areas, often have a different mix of species from forest interior (e.g., Strelke and Dickson 1980), since they produce a different mix of vegetation types and structure. This report presents the results of a five-year census of a powerline corridor and adjacent forest, compares the “edge” and “corridor” species composition with the results of other studies, and assesses the effects, if any, of clearcutting the corridor.

In March, 1986, a powerline corridor was clearcut and the cuttings removed, leaving some stumps three to four inches in diameter, from trees which had been approximately 10-15 feet high. The vegetation had been cut off 3-4 inches above the ground. The census was conducted in a 4000 foot segment of this 300-foot-wide powerline corridor between Willow and East streets in Foxboro, Massachusetts. By 1987, the cut area had recovered to produce a dense shrub layer, about three feet high, and a qualitative census of the plant community indicated that the vegetation consisted mostly of alder, gray birch, maples, hickory, aspen, and choke cherry, interspersed with patches of ferns (bracken), wild blackberry, sumac, goldenrod, green briar, and lowbush blueberry. By 1988, there were emergent trees 6-8 feet tall. By 1989, sassafras was 6-12 feet, maple up to 10 feet, oak 6-8 feet, with some shrubs 5-6 feet tall. The area was clearcut again in 1990, but to only about two feet from the ground, and 3-4 foot high patches of shrubs were apparently not cut. The edge on both sides of the powerline corridor is composed primarily of oak-maple second-growth forest, with most trees 30-40 feet high.

The area was censused four times in 1986, twice in 1987, and three times in 1988, 1989, and 1990, in early mornings by walking a path which runs down the center of the powerline cut. All birds seen in the powerline cut and in the trees along the edge, and birds heard in the 50 feet of forest on both sides of the corridor, were recorded on a map. All species recorded during at least two years of the study are presented in table 1. Sightings of the same species in the same location on two or more census runs were considered indicative of a territorial pair; the numbers of pairs are presented in Table 1. Birds heard in the 50 feet of forest adjoining either side of the powerline corridor were not mapped as breeding pairs.

**Table 1: Presence or absence of all species recorded during at least two years of the census period.** Sighting = x; breeding pairs indicated by numbers.

| Species                        | 1986 | 1987 | 1988 | 1989 | 1990 |
|--------------------------------|------|------|------|------|------|
| Red-tailed Hawk                | x    |      | x    |      | x    |
| Mourning Dove                  | x    | x    | x    |      | x    |
| Downy Woodpecker               | x    | x    |      | x    |      |
| Northern Flicker               | x    |      | x    | x    |      |
| Eastern Wood-Pewee             | x    |      | x    | x    |      |
| Great Crested Flycatcher       |      | x    |      | x    | x    |
| Eastern Kingbird               | x    | 1    | 2    | 2    | 2    |
| Blue Jay                       | x    | x    | x    | x    | x    |
| Black-capped Chickadee         | x    | x    | x    | x    | x    |
| Tufted Titmouse                | x    |      | x    | x    | x    |
| House Wren                     | x    |      |      | x    |      |
| American Robin                 | x    | x    | x    | x    | x    |
| Gray Catbird                   | x    | x    | 1    | 2    | 1    |
| Northern Mockingbird           | x    |      | x    |      |      |
| Brown Thrasher                 | 1    | x    | x    | 1    | x    |
| Blue-winged Warbler            |      |      | 1    | 1    |      |
| Prairie Warbler                | 1    | 2    | 3    | 3    | 3    |
| Black-and-white Warbler        | x    | x    | x    | x    | x    |
| Common Yellowthroat            | 2    | 3    | 3    | 3    | 3    |
| Scarlet Tanager                | x    |      | x    |      |      |
| Indigo Bunting                 |      | 1    | x    | 1    |      |
| Rufous-sided Towhee            | 2    | 2    | x    | 2    | 2    |
| Field Sparrow                  | 3    | 3    | 2    | 3    | 3    |
| Song Sparrow                   | x    |      |      |      | 1    |
| Common Grackle                 |      |      |      | x    | x    |
| Brown-headed Cowbird           | x    | x    | x    | x    | x    |
| Northern Oriole                | 2    | 2    | 2    | 1    | 1    |
| American Goldfinch             |      |      |      | x    | x    |
| House Sparrow                  | x    |      |      | x    |      |
| Total species                  | 24   | 17   | 22   | 24   | 20   |
| Total pairs (where determined) | 11   | 14   | 14   | 19   | 16   |

These census results were consistent with those of Strelke and Dickson (1980) in a Texas study, which found that Indigo Buntings and Prairie Warblers were associated with clearcuts, and Great Crested Flycatchers and Eastern Wood-Pewees were primarily edge species. They also found the Black-and-white warbler more commonly on woodland edge than in the interior but ranked it as a "woods" species. Anderson et al. (1977) found Prairie Warblers, Indigo Buntings, and Field Sparrows were particularly common species on their study corridors. Field Sparrows and Prairie Warblers did well on the Foxboro study plot, but Indigo Buntings appeared to be more marginal (Table 1). Kroodsma (1982), in a Tennessee study of edge effect of a powerline corridor, also ranked Prairie Warbler, Indigo Bunting, and Field Sparrow as corridor species. Johnston (1947) listed as forest-edge birds, among others, Field Sparrow, Mourning Dove, Goldfinch, Blue Jay, American Robin, Indigo Bunting, Common Yellowthroat, House Wren, and Eastern Wood-Pewee, all species found along our powerline. Shugart and James (1973) found Blue-winged Warbler to be primarily an edge species. Conner et al. (1983) suggested that clearcutting provides excellent habitat for birds specializing in early successional habitat, such as Prairie Warblers and Indigo Buntings. The Foxboro powerline corridor appears to support a typical mix of edge and shrub species.

The presence of Brown-headed Cowbirds each year (Table 1) underscores one of the drawbacks of forest edge for breeding birds. Cowbirds are nest parasites that frequent the forest edge and have been implicated in recent population declines of several species (Kricher 1990). Hence, there is a trade-off for in advantages (edge effect) and disadvantages for birds which frequent the edge and shrub habitat of powerline corridors.

An examination of Table 1 suggests that clearcutting on short rotation has not been detrimental to most of the edge and shrub community bird species. There were no obvious trends in the pattern of distribution over the five years for Northern Orioles, Black-and-white or Prairie warblers, Common Yellowthroats, Field Sparrows, or Rufous-sided Towhees. However, Eastern Kingbirds did not nest along the powerline during the year of the first clearcut, but did in subsequent years, and Blue-winged Warblers and Indigo Buntings, historically present as breeding species along the powerline, were both absent in the years when clearcutting occurred. The sample sizes in these cases are much too small to make definitive statements, but the data are suggestive.

The current powerline management program may even enhance breeding habitat for some species, such as Field Sparrows, by producing an enduring shrub habitat (arrested succession), not subject to normal succession to forest (Kricher 1988).

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