

The Morton Arboretum bluebird trail, which consisted of 73 boxes by year three of the study, is located in open, savanna-type woodlands. Large oaks (*Quercus sp.*) are the dominant trees, and the groundcover is composed of Eurasian grasses that are mowed one to three times per year. At McKee Marsh, 9 km northwest of the Arboretum, the 41-box trail is in open grassland (*Bromus sp.* predominate) that borders a 32 ha man-made marsh. In contrast to the Arboretum site, none of the boxes at McKee Marsh are under a wooded canopy; most border floodplain woodlands or wooded fence rows and some are very much in the open (e.g. in meadows on exposed hilltops).

Fermilab, a high-energy physics research laboratory, the grounds of which are designated a National Environmental Research Park, is approximately 6 km southwest of McKee Marsh. Most of the 18 bluebird boxes on the site border a 10-year old reconstructed prairie. Indian grass (*Sorghastrum nutans*) and big bluestem (*Andropogon gerardi*) are the dominant grasses. Part of the prairie is usually burned each year in early spring or late fall. Scattered oak trees and an old apple (*Malus sp.*) orchard provide canopy cover for a few of the boxes. Five of the 18 boxes are located along the edge of an old pasture.

All three study sites had bluebird trails established four to eight years prior to

the present study. The boxes at all sites were monitored only irregularly however, and only at the Arboretum site did a few pairs of bluebirds consistently fledge young.

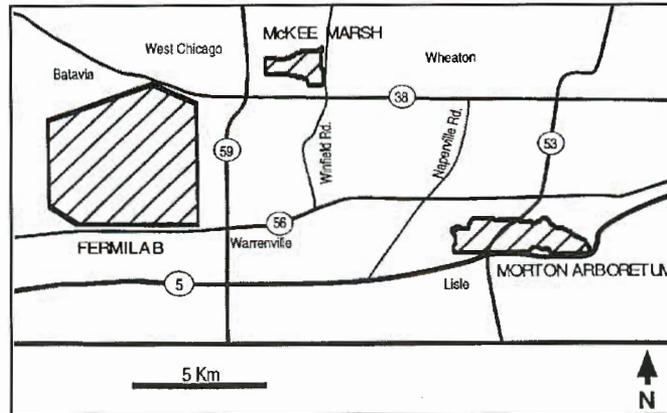


Figure 1. Location of three DuPage County, Illinois Eastern Bluebird study sites.



Mary Hennen, left, and volunteer Joan Harmet measuring bluebird nest box characteristics at Morton Arboretum. Photo by Victoria J. Byre.

Methods

Peterson-style (Henderson 1984) nest boxes, separated by a distance of at least 50 m and usually greater than

90 m (except for a few placed within 3–6 m of another box to reduce Tree Swallow [*Tachycineta bicolor*] competition), were used at all three study sites. Thirty-one boxes were added to the Arboretum site at the beginning of the second year of the study, and three more were added at the start of the third year. The number of boxes at the other two sites was kept virtually constant during all

three years of the study. Most boxes were mounted on either smooth metal poles or steel fence posts (T-posts). A few boxes at the Fermi site were attached to trees. By the end of the second year of the study, approximately 90% of the 130 nest boxes were protected with at least one type of predator guard; usually either a heavy coating of grease on the pole or a wire "cat 'n coon guard" (Noel 1991) or both.

Throughout the nesting period (April to mid-August) from 1989 through 1991, all boxes were monitored a minimum of one to two times per week. During the 1988 nesting season, prior to the formal initiation of this study, 30 of the boxes at the Arboretum site were monitored at least weekly. Species use was determined by presence of adults or characteristics of nests or eggs. A nest was defined as a box containing at least