dent and migratory bird species utilizing bluff forests, we are also generating predictive habitat models that will enable us to identify suitable habitat for each species in order to make more informed land use decisions.

Northern Parula was one of the more common species detected at Bohm Woods and the SIUE Nature Preserve. Photo by Mark Bowman.

Materials and Methods

We selected 130 randomized plots in Bluebell (n = 34), Bohm (n = 30); and Sweet William (n = 66) for our study. At each plot, we collected a suite of vegetation variables, including: Distance to edge, Successional age of the forest (based on analysis of historic aerial photos; Fritzgerald and Minchin, in prep), total richness (native and exotic), total shrub density (native and exotic), total tree dominance, total groundlayer cover, total tree density, 90th percentile DBH, snag class, coarse woody debris class, and canopy height. In addition, we used the statistical techniques known as non-metric multidimensional scaling (NMDS) and Lance-Williams flexible beta clustering, to summarize the major dimensions of variation in forest species composition and to classify the three forest patches into four forest types: Group 1: Sugar maple - White ash - Red oak – Basswood forest; Group 2: White Ash - White Oak – Hickory forest; Group 3: Box elder - Hackberry – Elm forest; Group 4: Black locust - Hackberry – Elm (Looft et al. in prep).

We conducted fixed-distance point-count surveys (25 m radius) from May-July, 2008 and from May-August 2010 at each of the 130 plots (see Richter et al. 2010). Surveys were conducted daily from 0600-1000 hours except when raining, foggy, or excessively windy. Each survey included a 1 minute warm-up period, followed by a 5 minute sampling period. Before the warm-up period a laser rangefinder was used to mark distance. All birds seen or heard during the sampling period were recorded (Bibby et al. 2000). During the sampling period a digital voice recorder (Olympus DS-40) was used to record songs and calls for subsequent identification in the lab. Plots were visited multiple times during the spring and summer.

Survey data were used to estimate population densities for individual species and for comparisons of species richness and diversity among forest patches. In addition, we conducted an indicator species analysis (Dufrene and Legendre 1997) in order to identify bird species that best differentiated the forest patches. The combined survey and vegetation data are currently being used to build predictive habitat models using logistic regression.

Results and Discussion

We recently published results from the 2008 season (Richter et al. 2010) and are currently combining this dataset with additional data from our 2010 survey. To date, we have encountered a combined total of 92 species during point count surveys within the three forest patches over the two field seasons (Table 1).

Research findings thus far underscore the importance of the E2B corridor and the avian community which it supports. For example, the Sweet William Woods, which is part of the corridor, exhibited the highest number of species (n = 63). In addition, species diversity, which incorporates both species richness and evenness, was highest for the two forests (Bohm and Sweet William Woods) within the corridor (Richter et al., 2010).

Species found to be indicators for Bohm Woods included a number of forest interior species, such as the Wood Thrush. Other indicators included three woodpeckers (Downy, Hairy, and Northern Flicker), two additional thrushes (Swainson's and American Robin), two warblers (Yellow and Black-throated Green), two apodiforms (Ruby-throated Hummingbird and Chimney Swift), one sparrow (White-throated), and one flycatcher (Acadian). Bohm Woods was especially attractive to Acadian Flycatchers. Three species were indicators for Sweet William Woods including the Carolina Chickadee, Carolina Wren, and Kentucky Warbler. In contrast, Bluebell Woods, which is largely comprised of young forest, was characterized by a larger number of relatively common species including Northern Cardinal, American Goldfinch, Tufted Titmouse, Eastern Towhee, Common Grackle, Black-capped Chickadee and Blue-gray Gnatcatcher.

We have created habitat models for 82 bird species with 54 exhibiting significant associations with one or more habitat variables (French et al. in prep). Figure 2 shows an example of a habitat model for the Wood Thrush in Bohm Woods, demonstrating the utility of this approach. In this instance, the Wood Thrush, was found to exhibit a positive association with distance to edge. The model predicts the highest probability (~60%) of encountering a Wood Thrush in the forest interior