

agement history. The plots were designated as either: "degraded", "early management", "mature management", "high quality" or "unknown". No restoration is planned for the duration of the study in the woodland plots that are considered degraded, which are heavily invaded with the invasive shrubs. The plots placed in the early management category have

Red-headed Woodpecker was detected only once during a survey conducted at Chicago area forest preserves in 2010.

Photo taken at Heron County Park, Vermilion County, 24 October 2010 by Bob Schifo.

the BBIRD protocol (Martin et al. 1997). Variables that were measured included: canopy height, percent canopy cover, litter depth, and the number of logs, snags, and trees. The largest diameter-at-breast height was also recorded. Ground cover was quantified using the Braun-Blanquet scale (Mueller-Dombois and Ellenberg 1974). In addition, invasive shrubs



been undergoing restoration for the past 0-7.5 years, and the plots placed in the mature management category have been undergoing restoration for at least the past 7.5 years. The high quality plots were not invaded, and the management history was not known for the unknown plots.

One 10-minute unlimited radius point count was conducted at the center of each plot following standard protocols (Bibby et al. 2000). Each site was surveyed three times during the breeding season from the middle of May through the middle of July during the summer of 2010 by two trained observers. In order to minimize observer bias, individuals rotated which points they surveyed throughout the summer. Surveys were conducted on clear mornings between sunrise and 10 am CST when songbirds were most active. Waterfowl, flocks of birds flying overhead, and birds in adjacent habitats were not counted in the surveys (Ralph et al. 1993).

Surveys of vegetation structure and composition were adapted from

were identified and the number of stems were counted in order to calculate shrub densities. Lastly, shrub cover was estimated visually.

Overall, 57 bird species were detected during the point counts in 2010 (Table 1). American Robins (*Turdus migratorius*) were found at every site and were the most abundant bird, followed by Blue Jay (*Cyanocitta cristata*), Eastern Wood-Pewee (*Contopus virens*), and Northern Cardinal (*Cardinalis cardinalis*). It should also be noted that a Cerulean Warbler (*Dendroica cerulean*) was recorded during a survey and a Black-billed Cuckoo (*Coccyzus erythrophthalmus*) was detected at a site. Both of these bird species are currently listed as threatened in Illinois (Illinois Endangered Species Protection Board 2010). Mean abundance was highest in the reference and early management plots and lowest in the degraded, mature and unknown plots (Table 2), but there was little variation within these two groupings. Avian diversity and species richness were highest in the early

management plots and lowest in the reference plots (Table 2).

Both invasive stem density and buckthorn tree density were highest in the degraded plots, and lowest in the reference plots (Table 3). Generally, the amount of invasive vegetation within and between management categories varied considerably among counties. Land managers conducting the restorations seemed to follow different management plans. Therefore, placing plots into different restoration categories based on their management histories might not be the best approach for analyzing these data. The mature management category for example includes plots that have been under restoration for at least 7.5 years, so the plots could have received varying amounts and types of management for the past 7.5 years. While some sites may have received management 7.5 years ago, some could have been restored one year ago. Even though the categories may reveal some interesting trends, a gradient approach is likely a better-suited approach for this study.

Year 2

The bird surveys will be repeated and additional vegetation measurements will be taken during the 2011 field season. ArcGIS 10 will be used to calculate the total continuous forested area for each plot, and the distance from each bird survey location to the nearest forest edge. In the future, landscape composition surrounding each plot will also be quantified using digital orthophotos and GIS. Buffer analysis will be used to quantify landscape variables such as land cover and building density in order to describe general patterns of land use and settlement around the plots.

In order to assess avian community-level relationships across restoration categories, nonmetric multidimensional scaling (NMDS) will be used (Okansen 2007). In addition, Generalized Linear Models (GLM) will also be used to examine the