

## Appendix 4

### ***Identification of Geographically-explicit Focus Areas For Priority Bird Species Suites***

Biologists, land managers and other technical staff from the region's conservation agencies and organizations were invited to a series of three workshops held in different regions of the BCR to facilitate the process of identifying focus areas. The first workshop was held the first week in February 2002 in Tullahoma, TN and targeted the Tennessee-Alabama portion of the Interior Low Plateaus; the second was held in Eureka Springs, AR the last week of February 2002 and focused upon the Ozarks; the third was held during the last week of May 2002 in Henderson, KY and targeted the Kentucky, Illinois and Indiana portions of the Interior Low Plateaus.

Each of the workshops began with a day-long series of presentations designed to familiarize participants with the various bird initiatives, key conservation programs, conservation issues, and the ecological requirements of the BCR's priority species associated with four basic habitat types: wetland, grassland, grass-shrub, and woodland-forest. The following day, participants met in breakouts by habitat type to identify focus areas for the various habitat types and species groups. Hard copy maps of landcover and laptop computers loaded with geographic information system software were available to each breakout. Geospatial data used in delineating bird conservation areas was compiled from a variety of sources.

Each of those layers and its reason for inclusion are as follows:

1. National Land Cover Data: Derived from the early to mid-1990s Landsat Thematic Mapper satellite data, the National Land Cover Data (NLCD) is a 21-class land cover classification scheme applied consistently over the United States. The spatial resolution of the data is 30 meters and mapped in the Albers Conic Equal Area projection, NAD 83. For more information, see:

<http://landcover.usgs.gov/natl/landcover.html>. Land cover derived from satellite imagery was used to assess basic land use patterns across the planning unit.

2. Roads, state lines, county lines: TIGER/Line® files (Topologically Integrated Geographic Encoding and Referencing system) from the U.S. Census Bureau contain data that were updated for the 2000 census. For more information, see: <http://www.census.gov/geo/www/tiger/index.html>. These were primarily used by the groups as a means of orientation.
3. Surface Water Features: The National Hydrography Dataset (NHD) is based upon USGS Digital Line Graph (DLG) hydrography data integrated with reach-related information from the EPA Reach File Version 3 (RF3). The NHD contains information about surface water features. For more information, see: <http://nhd.usgs.gov/>. The locations of rivers and streams were used as a means of orientation but also were used in the delineation of wetland focus areas.
4. Grass- and forest-dominated landscapes: Results of Donovan et al. 1995, and Robinson et al. 1995 suggest that reproductive success of forest birds breeding in landscapes with less than 70 percent forest cover within a 10 kilometer radius of the breeding sites often is too low to sustain local populations due to high levels of nest predation and brood parasitism. Because reproductive success in large forested landscapes tends to be greater than needed to sustain local populations, these landscapes are thought to be the “sources” of birds that breed in forest fragments in other parts of the Midwest region where reproductive success often is extremely low (Donovan et al. 1995). Maintaining forest cover above the 70 percent threshold is therefore critical not only to breeding forest birds in the Central Hardwoods BCR, it may also be pivotal in maintaining forest bird communities and sustaining their ecological services in adjacent BCRs. Research also suggests that the amount of grass cover in landscapes surrounding grassland sites also can affect densities and reproductive success of local grassland-breeding bird populations (Winter and Faaborg 1999; Winter et

al. 2000, J. Herkert, unpublished data) although the relationships appear to be more variable than those of forest breeding birds with forest cover. However, as a precaution, Central Hardwoods BCR planners delineated conservation focus areas for open-grassland breeding birds in the Central Hardwoods in landscapes with greater than 30 percent or greater grass cover in a 3 kilometer radius. Maps of areas meeting these thresholds were generated by the Missouri Resource Assessment Partnership using a neighborhood function in ESRI ArcInfo software to sum the amount of target land cover. Neighborhood functions produce an output in which the value at each location is dependent on the input value at a location and the values of the cells in a specified neighborhood.

5. Public lands: Locations of public lands were initially obtained from the World Wildlife Fund's database of protected areas (PAD) for the United States and Canada. These data were then supplemented with additional information from individual state and federal agencies. Most of the public land in the Central Hardwoods BCR is administered by BCR partner agencies with a desire to improve the condition of those lands for birds. The ability to overlay the locations of those lands on land cover and maps of grassland and forest-dominated landscapes (features associated with higher densities and enhanced reproductive success of birds in those species suites) was essential to providing those partner agencies with information regarding which species suites were most in need of conservation actions at each site.
6. Ecological subregions: Although much of the BCR's prairies, wetlands and pine woodlands have been converted to other community types and land uses, rather large expanses of barrens, glades, savannas, oak woodlands and forests still exist, although often in degraded conditions. In order to identify the areas where those ecosystems occurred historically and were most likely to benefit from restoration efforts, maps of ecological subregions identified by the U. S. Forest Service's National Hierarchy of Ecological Units were employed. Section and subsection coverages of the hierarchy were available for the entire BCR and

were classified primarily on the basis of lithology, topography and geomorphology, regional soils, and regional potential vegetation. Landtype associations (LTAs), or ecological landscapes, are a finer scale of ecological delineation that further reflect local variation in topography, parent material, soil type, and vegetation communities. These were developed through the Missouri Ecological Classification System Project (Nigh and Schroeder, 2002) and available for the Ozarks only. Landtype associations were grouped for us by Nigh into three categories that combined prairie and shrub prairie; glade-savanna and prairie-savanna complexes; and forests and woodlands. Each grouping was targeted for grassland, grass-shrubland, and forest-woodland priority bird species suites, respectively.

7. The Nature Conservancy's (TNC) Ecoregional Planning Portfolio Sites: The Nature Conservancy had completed draft ecoregional planning portfolios for both the Ozarks and Interior Low Plateaus regions of the BCR. The portfolio sites typically identify large landscapes containing terrestrial and aquatic ecosystems with rare species and natural communities in need of conservation attention.

Maps of landscapes that met the thresholds for forest and grass cover were the first layer planners considered during the process of identifying bird conservation focus areas within the Central Hardwoods BCR for the forest and grassland-grass-shrub species suites, respectively. Discouraging loss and fragmentation of existing habitat in those areas will be important in maintaining adequate levels of nesting success for breeding birds. In the Ozarks, however, many areas that historically were glade-savanna or prairie-savanna complexes are now overgrown with densely stocked trees (Nigh and Schroeder 2002). Maps of landtype associations were used to delineate which areas now classified as forest should be considered for restoration of those habitat types.

Public lands were then overlain upon the percent cover maps. Public lands falling within forested areas were encircled by a 10 km buffer, and those within grassland areas

encircled with a 3 km buffer to identify the matrix around the public lands that needed to be considered with regards to maintaining reproductive success of forest or grassland birds breeding on those sites.

The Nature Conservancy's portfolio sites were considered next. Biologists involved with the BCR planning effort feel that improving habitat for birds should be done in association with the restoration of the BCR's native ecosystems where possible so that other biodiversity components associated with those systems will benefit as well. TNC portfolio sites often overlaid public lands, but the planners felt that places where the TNC sites intersected largely forest or grass-dominated landscapes without public lands should be considered for future acquisitions and easement projects or become a focus for private lands incentive programs.

Map layers used to identify wetland focus areas included large water bodies identified by the National Hydrography Data Set and lands classified as emergent or woody wetlands from the National Land Cover Dataset. Participants' knowledge of local conditions and wetland habitats also were incorporated.

#### **LITERATURE CITED:**

Donovan, T. M., Thompson, F. R. III, Faaborg, J. and J. R. Probst. 1995. Reproductive success of migratory birds in habitat sources and sinks. *Conservation Biology* 9:1380-1395.

Nigh, T. A. and W. S. Schroeder. 2002. *Atlas of Missouri Ecoregions*. Missouri Department of Conservation, Jefferson City, Mo. 208pp.

Robinson, S. R., Thompson, F. R. III, Donovan, T. M., Whitehead, D. R. And J. Faaborg. 1995. Regional forest fragmentation and the success of migratory birds. *Science* 267:1987-1990.

Winter, M. and J. Faaborg. 1999. Patterns of area sensitivity in grassland-nesting birds. *Conservation Biology* 13:1424-1436.

Winter, M., D. H. Johnson and J. Faaborg. 2000. Evidence for edge effects on multiple levels in tallgrass prairie. *Condor* 102:256-266.