

The Population Decline of the Red-headed Woodpecker in Wisconsin and Illinois

by William P. Mueller

Although it is found throughout much of eastern North America, the Red-headed Woodpecker (*Melanerpes erythrocephalus*) is declining in many areas of its geographic range (Muehter 1998, Smith et al. 2000). Over the North American range of this species, an average annual decline of 1.88% was noted for the period of 1966-1993 on the Breeding Bird Survey (Peterjohn, Sauer, and Link 1994). In Wisconsin, during the period of 1966-91, a decline of an average of 4% per year has been recorded (Robbins et al 1996). The decline recorded in Illinois during the same time period is somewhat less pronounced than that noted for Wisconsin, but BBS data show a "trend estimate" of -2.8 (in percent per year, based on route-regression analyses) (Link and Sauer 1994, Sauer et al. 2001).

Habitat and Vegetation Changes

The Red-headed Woodpecker is primarily a species of open woodlands and oak savanna. In Wisconsin and Illinois, oak savanna was a prominent plant community in pre-settlement times. In Wisconsin for example, 5.5 million acres or about 16% of the state's land area was in oak savanna. More than 99% of this plant community in Wisconsin has been altered or lost (Cochrane and Iltis 2000). Ecological succession, fire suppression, and the encroachment of exotic shrubs (Wisconsin DNR 2001) such as buckthorn (*Rhamnus, sp.*), and honeysuckles (*Lonicera, sp.*) have altered savanna areas. As reforestation, fire suppression, and increases in invasive shrubs have altered areas of the eastern United States, open woodlands and savanna have become closed-canopy forests, and these habitats are unsuitable for the Red-headed Woodpecker (Smith et al. 2000).

BBS Data and Utilization of Geographic Information System

The objective of my graduate research (Mueller 2002) at the University of Wisconsin-Milwaukee has been to examine possible causes for the population decline currently being noted. Is there a correlation between habitat loss and the decline of the Red-headed Woodpecker? To test this hypothesis, I measured changes in potential Red-headed Woodpecker habitat area along eight Breeding Bird Survey routes in Wisconsin using a Geographic Information System (GIS). Using aerial photographs of the areas through which

breeding bird survey routes pass, I measured the area of habitat patches from the 1970s and the 1990s. The difference between these measurements was calculated to determine habitat area change over a 20-to-25-year period. Statistical analysis using a Spearman rank correlation test demonstrated a correlation between habitat loss and population change in the Red-headed Woodpecker (Mueller 2002).



Red-headed Woodpecker numbers are declining in Illinois. Photo by Peter Weber.

Land Use Changes Affecting the Red-headed Woodpecker

Housing development in suburban and "exurban" areas, and logging of deciduous trees for lumber and firewood may be factors in the decline of the Red-headed Woodpecker. New agricultural practices that remove hedgerows and trees at the edges of plowed fields, and conversion of woodlands to row crops may also be limiting or altering habitat for the Red-headed Woodpecker (Ehrlich et al. 1992, Muehter 1998, Smith et al. 2000). Logging may limit food supplies or remove trees used as nest cavity sites (Smith et al. 2000). Both habitat loss and alteration/conversion are thus implicated in population decline of the Red-headed Woodpecker.

Interference Competition with European Starling

Competition with the European Starling (*Sturnus vulgaris*) for nest sites (Ehrlich et al. 1992, Keller and Castrale 1998, Robbins et al. 1986, Smith et al. 2000) has been suggested as an additional cause of the decline of the Red-headed Woodpecker. A clear relationship between these phenomena is difficult to prove. While Ingold (1989, 1994) found cavity takeover by starlings had little effect on woodpecker nesting success in Mississippi, the deleterious effect of delayed nesting in the woodpecker may be exacerbated at higher latitudes, where nestlings