

## Shrubland Birds in Massachusetts - David I. King

Shrubland birds are species that are restricted to habitats with little or no tree canopy and a well developed shrub cover. Their association with shrubs makes them relatively distinct from grassland specialists. There are about 41 species of shrub birds in the northeast. Warblers and sparrows are the best represented taxa. Many of these species are extreme habitat specialists restricted to specific habitat characteristics present only 10-15 years post disturbance (Schlossberg and King 2009).

Shrubland birds are of high conservation interest. Seven of 10 federally endangered songbirds in the contiguous US are scrub-shrub birds. Closer to home, the National Breeding Bird Survey indicates that 75% of the species have declined significantly since the BBS was initiated in 1966. Particularly grave examples include the Brown Thrasher and Eastern Towhee, both of which have declined >90%, and two other shrubland bird species, the Golden-winged Warbler and Yellow-breasted Chat, have disappeared from Massachusetts altogether.

These declines are strongly associated with declines in habitat availability. For example, the percentage of forested habitat in Massachusetts that is suitable for shrubland birds has declined >90% since 1950 to only 3-6% of forested land in the state (train et al. 2001). Although the amount of habitat for shrubland bird habitat has increased in Maine over this period, many of the shrubland bird species of regional concern, such as Golden-winged Warblers, Yellow-breasted Chats, Brown Thrashers, Prairie Warblers, Eastern Towhees etc., are not present in industrial forest lands in Maine.

As the result of their regional population declines, most state and federal land management agencies are engaged in activities to create and maintain early-successional habitat as part of their statutory obligations. These practices typically involve either maintaining old field and/or even-aged silviculture such as shelterwood treatments or clearcutting. These agencies are also required to consider the impact of these practices on other forest values.

Detailed guidelines exist for protecting environmental values, however opposition to the creation or management is still often pronounced. There are a number of standard arguments opponents use to support their opposition to active management for shrubland species, which include variants of the following: 1. Shrubland birds were not historically present in the northeast and are an artifact of recent human activity; 2. Shrubland birds are "weedy species" and thus suitable habitat conditions are created by routine human activities. In the following pages, I would like to provide an alternative perspective on these issues.

Our native bird fauna has been evolving for tens of thousands of years, and over this period, the northeast has been subject to extensive disturbance in the form of glaciations and browsing by Pleistocene mega-fauna (Askins 2000). Isolation of ancestral populations by glaciers is thought to have been a major influence in the evolution of the northeastern bird fauna, thus, the assertion that disturbance was absent from the northeast based on accounts of pre-Columbian forests by early

explorers does not reflect the same time-scale as the biological processes that created the bird fauna of the northeast. Further evidence for the pre-historical presence of extensive disturbance in the northeast includes the presence of grassland and shrubland bird remains in middens left by early Native Americans centuries before colonization (Askins 2000).

These early disturbance processes gave way in historic times to a variety of natural and anthropogenic disturbances. Coastal areas were subject to frequent hurricanes and fire resulting from natural ignition sources as well as the wildlife management activities by Native Americans (DeGraaf and Miller 1996, Askins 2000). These large-scale and frequent disturbances were largely confined to coastal areas, leading some to question the validity of shrubland management in interior areas, however John Litvaitis points out that coastal areas in New England are too urbanized to support sufficient shrubland habitat (Litvaitis 2003). In addition, some shrubland birds are less abundant and suffer higher nest parasitism rates by brown-headed cowbirds in urbanized landscapes (Burhans and Thompson 2006, King and Schlossberg, *In Prep*).

The influence of other agents of habitat disturbance has also declined from historic levels. The younger forests that characterize the region are less susceptible to windthrow, and although beaver provide habitat for shrubland birds (Chandler et al. 2009a), and populations are increasing in many areas, sites historically flooded by beaver have been developed by humans, and thus large areas that would have been subject to flooding in historical times are no longer available.

Currently between 3-6% of Massachusetts consists of shrubland habitat, and 70% of this consists of habitat created by logging. Thus, the cessation of logging would result in the rapid loss of more than 2/3 of habitat for shrubland birds. Other types of shrubland habitat include scrub-shrub wetlands, pitch pine-scrub oak barrens, powerline corridors and wildlife openings. Openings created by forestry are occupied by a slightly different suite of bird species than wildlife openings (King et al. 2009a), which in turn differ from wetlands and pitch pine-scrub oak barrens. Powerline corridors provide habitat for shrubland birds, however, the only account for about 0.61% of shrubland habitat in Massachusetts (B. Compton, Personal communication). Also, only corridors in which shrubland habitat is allowed to develop, and which are >50 m in width provide good quality habitat for shrubland birds (King et al. 2009b).

Forest management is an efficient way to create shrubland habitat, because the cost is offset by the value of the timber, however openings need to be at least as large as the territory size of the target species, which in the case of northeastern shrubland birds, is about 3 acres (Chandler et al. 2009b). Also, canopy conditions need to be fairly open. Although we are still working on identifying the exact habitat thresholds for shrubland birds, King and DeGraaf (2000) found that 56% canopy closure was enough to exclude some species of shrubland birds from shelterwood sites in New Hampshire.

Shrubland birds require disturbance to persist, and humans routinely create disturbance as the result of industrial, agricultural and commercial activities. Thus, one could conclude that this chronic and increasing level of disturbance could be sufficient to maintain scrub-shrub birds. Data on songbirds in Missouri suggests that this is not necessarily the case. Researchers there found some shrubland birds, including species of the high conservation concern such as the Blue-winged Warbler and Yellow-breasted Chat, were present in field forest ecotones, which might have led the researchers to conclude these species were flexible in their habitat use, however further examination showed these species were unable to reproduce successfully in edges (Woodward et al. 2001). Thus, the sporadic occurrence of shrubland birds on roadsides or edges probably does not represent a viable population that can sustain itself. Additional evidence for this comes from the Breeding Bird Survey, which is conducted on roadsides, and which shows that shrubland birds in these roadside habitats are declining precipitously.

The more we learn about shrubland birds, the more it becomes apparent that they are habitat specialists. In fact, it turns out that many of the basic principles of conservation biology that were originally described for mature forest birds apply to shrubland birds. For example, most shrubland birds avoid edges (Schlossberg and King 2008), are absent or scarce in smaller habitat patches (Schlossberg and King 2007), and experience lower nesting success near edges (King et al. 2001, King and Byers 2003, King et al. 2009b).

Reports of area sensitivity and edge effects for shrubland birds means that managers need to make sure that habitat patches are large enough to accommodate shrubland birds and minimize edge effects. Currently, we do not know what the exact size thresholds are, but clearly patches need to be at least as large as the territory size of the target organisms, which as we mentioned above, is about 3 acres in the case of northeastern shrubland birds (Chandler et al. 2009b), although work by Rodewald and Vitz (2005) shows that the density of shrubland birds continues to increase beyond 20 acres. Since nest success is generally greater away from edges, we would predict that nest success would be greater in larger clearcuts, because a larger proportion of the habitat is farther away from edges (Thompson 1993, King et al. 1998). Nest success in clearcuts in New Hampshire was slightly higher than smaller openings, however we found no relationship between nest success and area in wildlife openings (Chandler et al., *In Prep*). Larger openings create less edge per area, and thus less edge effects, than the equivalent area of small openings (King et al. 1998).

Because creation of shrubland habitat results in a nearly complete turnover of the bird fauna, a balance of age classes must be maintained. It is possible to maintain both mature forest and shrubland birds in the same landscape, however. Welsh and Healy (1993) showed that forested landscapes in New Hampshire with 18% of their area in regenerating clearcuts had more species than landscapes without clearcuts, and all of the species present in the unmanaged landscapes were present in the managed landscape. Also, regenerating clearcuts are used extensively by mature forest birds for during the vulnerable postfledging period (Vega et al. 1998, Marshall et al. 2003), probably because regenerating clearcuts have greater fruit

and insect resources, or offer better protection from predators. Postfledging habitat can be as important for population viability as nesting habitat (King et al. 2006).

Finally, the creation and maintenance of shrubland habitat benefits threatened species other than birds, including the New England Cottontail (*Sylvilagus transitionalis*), as well as native bees (Milam et al. *In Prep*).

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