**Red-shouldered Hawk** (*Buteo lineatus*)

*Status: State Threatened*

The strikingly-patterned, forest-loving Red-shouldered Hawk is an uncommon raptor in Michigan. Like most forest-breeding raptors, it goes relatively unnoticed during the nesting period unless its nest is threatened. Its breeding range extends from central Minnesota, northern Michigan, southern Ontario, southwestern Quebec and New Brunswick south to the Florida Keys, eastern Texas and possibly northeastern Mexico, and west to the eastern edge of the Great Plains. A disjunct population breeds in California. Of the five recognized subspecies, the nominate race, *Buteo lineatus lineatus* occurs in the Midwest and Northeast where it prefers moist deciduous woodlands and hunts frequently near water (Dykstra et al. 2008).

**Distribution**

A century ago, Barrows (1912) indicated that the most abundant *Buteo* species in Michigan was not our now-familiar Red-tailed Hawk but rather the Red-shouldered Hawk. This was still true in the early 1940s at which time Wood (1951) referred to this species as a “common summer resident in the southern third of Michigan”, where today it is uncommon to rare. Zimmerman and Van Tyne (1959) describe its status as “uncommon migrant and summer resident, rare in the northern half of the state.” For Isabella County, Cuthbert (1962) lists one pair observed in 1949 and a nest in 1954. For the Saginaw Bay, area Kenaga (1983) reports seven nests during 1956-67 and one in 1974, all at Midland. It was not known to breed in northern Michigan prior to the 1960s. For the vicinity of the University of Michigan Biological Station, in operation in Cheboygan County since 1909, Nelson (1956) described the status of this hawk as a “rare transient” and the first nest was found only in 1965 (Pettingill 1974). No nests were reported in the UP until the late 1970s (Postupalsky 1980).

In Michigan, the center of Red-shouldered Hawk nesting is now in the NLP where it was recorded in 32.7% of all townships during MBBA I and in 32.5% during MBBA II, however the number of townships with confirmed nesting dropped from 95 to 68. During MBBA I the highest concentrations occurred in Manistee, Cheboygan, Emmet and Alpena counties, reflecting areas where field studies were then underway, rather than actual breeding distribution. The proportion of townships in the SLP remained unchanged (12.4% and 12.3%) for MBBA I and MBBA II. A substantial increase in the UP occurred since
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MBBA I (from 5.9% to 13.7% of all townships), which is also reflected in an increase in the number of townships with confirmed nesting from 7 to 41. This is the most significant change in the status of this species since MBBA I.

In Wisconsin and Ontario, the greatest concentration of Red-shouldered Hawks occurred between 43.5° N and 46° N, similar to Michigan’s NLP (Jacobs 2006, Badzinski 2007). In Ohio and Indiana, the breeding records are high in the northern and southern portions of the state and nearly absent from the central parts of the state where agriculture is the prevalent land use. In Illinois, most breeding records are in the southern third of the state, probably due to widespread agricultural land across central and northern Illinois and paucity of sizeable woodlots (Peterjohn and Rice 1991, Webster 1998, Milosevich 2004).

**Breeding Biology**

Some Red-shouldered Hawks are permanent residents in the SLP and establish territories in March and slightly later in the NLP and UP (Dykstra et al. 2008). Nest sites are located in mesic deciduous or mixed woodlands, often near water, with most of the nests built in deciduous trees (Palmer 1988). The nests are typically placed in the main fork of the tree, are 45-60 cm wide with a cup diameter of ~20 cm (Bent 1937), made of fresh and dried sticks, leaves, and bark, and are often lined with green conifer or deciduous sprigs (Dykstra et al. 2009). Established pairs often return to the same nest year after year and refurbish it (Bent 1937). Nests in the NLP have been found most frequently in American beech trees (Cooper et al. 1999). Weber et al. (2007) found significantly lower reproductive success in pairs nesting in American beech trees (n=21) than in other tree species (n=11) in surveys of 32 nests in the NLP, and concluded that although favored, the American beech tree may not be the most ideal nest tree for Red-shouldered Hawks.

Typically three to four eggs are laid beginning on average around 5 April in Michigan’s SLP (Craighead and Craighead 1956, Bent 1937) and somewhat later farther north. Incubation of ~33 days duration begins before the clutch is complete, resulting in asynchronous hatching that leads to uneven food distribution and aggression between nestlings (Palmer 1988, Townsend 2006). Fledging occurs at around six weeks of age (Bent 1937).

Although adults are vocal and aggressive during territory establishment and nest-building, they become more secretive after eggs are laid. They respond vocally, rarely aggressively to humans near the nest; typically they silently steal away and scream at the intruder from a distance (Postupalsky, unpubl. notes).

During the breeding season, Red-shouldered Hawks feed primarily on eastern chipmunks and meadow voles, but also include in their diet *Peromyscus* mice, frogs, toads, crayfish, small birds, snakes, and invertebrates (Craighead and Craighead 1956). Several authors have suggested that the early breeding coincides with the emergence of eastern chipmunks from hibernation (Jacobs and Jacobs 2002). Owing to these hawks’ preference of forests with small wetlands, reptiles and amphibians can be important parts of their diets, which places them at a higher trophic level and thus vulnerable to the effects of bioaccumulation by persistent pesticides.

**Abundance and Population Trends**

During the second half of the 20th Century, the Red-shouldered Hawk extended its breeding range northward, concurrent with a southward range expansion of the Northern Goshawk, occurring as forests were regenerating and maturing. Owing to the lack of nest records for northern Michigan dating prior to mid-century, it is unclear whether these changes constitute re-occupations of previously lost range (due to timber removal), or original range extensions.
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For the Red-shouldered Hawk it more likely is an original northward range expansion, similar to that reported for several other avian species by de Vos (1964).

Neither more intensified agricultural practices, nor pesticide effects alone fully explain the observed changes in the breeding distribution of this hawk. In Superior Township, Washtenaw County, the species was already declining during the 1940s (at a time when DDT use was only starting) and was being replaced by the Red-tailed Hawk (Craighead and Craighead 1956). In the mid-1960s only 1-2 Red-shouldered Hawk pairs remained; the species was gone by 1973 and was not found in subsequent surveys (Postupalsky, unpubl. data). Agriculture was the dominant land use in the SLP already prior to mid-century, and extensive forest loss occurred in the late 1800s. The size of most woodlots in the township remained unchanged from those shown on the maps in the cited Craighead study, and many still contained permanent and temporary ponds, yet they were occupied by nesting Red-tailed Hawks which had increased to 12 pairs in 1966 and 20 pairs by 1990 (Postupalsky, unpubl. data). More intensified agricultural practices, such as draining of marshes and increased use of chemicals, may have contributed to the decline of Red-shouldered Hawks by reducing their amphibian and insect prey. Several studies report eggshell thinning in Red-shouldered Hawks, an effect of DDE (a metabolite of DDT), albeit not as severe as found in other raptorial and fish-eating birds (Anderson and Hickey 1972, Wiley 1975, Campbell 1976). The Red-tailed Hawk, by virtue of its feeding mainly on herbivorous rodents and lagomorphs, occupies a lower trophic level and consequently was relatively unaffected by DDT and other organochlorine pesticides. The combination of several factors – intensified agricultural practices, pesticides, and build-up of Red-tailed Hawk numbers – appears to account for the decline of the Red-shouldered Hawk in the SLP.

Kielb et al. (1992) stated that both Cooper’s and Broad-winged Hawks were moving into forests previously occupied by Red-shouldered Hawks. This is likely due to the Red-shouldered Hawk’s preference of mature hardwood and mixed forests and the Cooper’s and Broad-winged Hawk’s acceptance of younger forest stands.

The Red-shouldered Hawk’s reliance upon mature hardwood forests makes it vulnerable to timber harvest. Forest fragmentation is also a threat because it favors Red-tailed Hawks and Great Horned Owls, both of which are competitors and the latter is also a predator of nestling and adult hawks (Bryant 1986; Postupalsky, unpubl. observations). Although small openings may be beneficial for some Red-shouldered Hawk prey species (meadow voles, *Peromyscus* mice), large openings or fragmentation favors an influx of Red-tailed Hawks and Great Horned Owls.

Present population trends from MBBA I to MBBA II in Michigan suggest that the population is stable in the LP and growing in the UP.

**Conservation Needs**

The Red-shouldered Hawk is listed as threatened in the state of Michigan by the DNR. It is ranked by Michigan Natural Features Inventory as “uncertain, ranging from vulnerable to apparently secure” (MNFI 2007).

The increase in UP observations of Red-shouldered Hawks between MBBA I and MBBA II and the apparent stability in the LP suggests that this species is faring well in Michigan as forests mature and larger areas of forest are maintained. However, targeted Red-shouldered Hawk surveys conducted to support...
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The development of state forest management guidelines during MBBA II likely also contributed to larger numbers of observations relative to MBBA I (D. Cuthrell, pers. comm.). Because each nesting pair requires a minimum of 8 ha (20 acres) of mature forest (Jacobs and Jacobs 2002), protecting a viable population of Red-shouldered Hawks requires large areas of contiguous forest. The DNR in cooperation with other groups has developed draft management guidelines for Red-shouldered Hawks addressing mainly nest site protection; these guidelines can be revised as more insights into the species’ habitat requirements are gained to allow a consistently implemented extension of the guidelines on a landscape scale (Weber et al. 2007). Long term comprehensive nesting surveys should be sustained to determine population trends, at the very least in “core areas” identified by previous studies. Michigan’s larger tracts of forests, such as the Manistee National Forest and the Pigeon River Country State Forest, provide valuable reserves for the future of this species (Cooper et al. 1999).

**Literature Cited**


Dykstra, C.R., J.L. Hays, and M.M. Simon. 2009. Selection of fresh vegetation for nest...
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