Conservation Status Report

Red-shouldered Hawk

Scientific Name: *Buteo lineatus*

French Name: *Buse á Èpaulettes*

Spanish Name: *Gavilán Ranero, Gavilán Alí-rojo, Aguililla Pechirrojo*

Body length: 38-47 cm

Wingspan: 94-107 cm

Mass: 460-930 g

Breeding Range (words in italics are defined in the glossary):

In eastern Canada from southern New Brunswick west to western Ontario and south to the U.S. border. In the eastern U.S., throughout the Atlantic coastal states to the eastern edge of the Great Plains, south to Florida and west along Gulf of Mexico to central Texas and eastern Mexico. In western U.S., breeds primarily west of the Sierra Nevada and Cascade Mountains from southern Washington to Baja California. A small number of individuals breed in the Owens Valley of California, east of the Sierra Nevada. The species has been gradually expanding its breeding range north of California along the west coasts of Oregon and Washington for the past 20–30 years, and the first breeding record west of the Sierra-Cascade ranges was recorded in southern Nevada in 2001.

Winter Range:	In eastern North America, from southern Wisconsin, Oklahoma, southern Ohio, and southern New England south to the Gulf of Mexico. In Mexico, south to Jalisco, state of México, and Veracruz. In western North America, generally remains on breeding range but avoids high elevations; however, average counts of ~360 birds at Golden Gate Raptor Observatory's migration monitoring site in the Marin Headlands of central California suggest at least significant regional movements. Individuals banded as nestlings in southern California often spend their first winter in the Great Basin desert of Nevada or Baja del Sur.
Type of Migrant:	Partial
Nest Type:	Well-formed, large stick nest in a fork of the main trunk of a dominant tree or where a primary branch meets the trunk.
Food Habits:	Preys primarily on small mammals, birds, amphibians, reptiles and invertebrates.
Primary Flight Mode:	Frequent flapping interspersed with gliding in a manner that resembles that of an *Accipiter*. Also soars on and then glides between thermals.

ECOLOGY

This small *Buteo* is generally associated with mature mixed deciduous forests, though it can be found in a wide array of forest types. Individuals of the western population are strongly associated with riparian oak forests, although they also occur in small suburban groves with access to woodlots. Notable field marks include reddish shoulders, boldly barred flight feathers that present a checkered appearance, and black tail with distinct white bars. From below, crescent-shaped, translucent "windows" can be seen near the wingtips. Like other *Buteos,* Red-shouldered Hawks often soar on out-

stretched wings; however, they also flap their wings frequently in a shallow pattern reminiscent of a large *Accipiter*.

Although it is quite vocal early in the breeding season, it is secretive later in the breeding cycle, and populations are not well-monitored on the breeding grounds by any surveys. The species nests primarily in deciduous and mixed deciduous-conifer forests. In California, nests are often located in stands of oak or mixed oak-sycamore with dense canopies and open, park-like understories. The nest is typically located in a fork of the main trunk of a tree or on a horizontal limb near the main trunk, generally below the forest canopy. Individuals in the western population often locate nests on top of clumps of mistletoe. Red-shouldered Hawk nests are usually 45-60 cm in diameter, composed of fresh twigs and dead sticks, and lined with shreds of bark, mosses, lichens and fresh conifer sprigs. Fresh green foliage is added as the nesting season progresses. In the northeast, Red-shouldered Hawks appear more sensitive to human disturbance and forest fragmentation than in southern states.

Red-shouldered Hawks hunt primarily from perches near the forest canopy, but they also sometimes course low over the ground and surprise prey at close range. Known prey includes a wide array of birds (primarily juveniles), mammals, amphibians, and insects. Most diet studies indicate that small mammals (mice, chipmunks) reptiles, and amphibians are the primary categories of prey (Portnoy and Dodge 1979, Janik and Mosher 1982, Bednarz and Dinsmore 1985). Regionally, invertebrates such as crayfish and grasshoppers can form a significant portion of the Red-shouldered Hawk's diet.

The Red-shouldered Hawk is a *partial migrant*. In most years, most individuals from the northern half of the eastern breeding range migrate south up to 1,500 km in the fall. Southern populations do not appear to be migratory.

POPULATION STATUS

The Red-shouldered Hawk was once a common breeding bird in forests of eastern North America, but some studies indicate that populations have declined as the land coverage of large, contiguous forests has diminished (Bednarz and Dinsmore 1981, Bryant 1986, Martin 2004). Nearly all (99%) Red-shouldered Hawks occur within North America, with an estimated 822,000 nesting individuals continent-wide (Appendix B, Table 1). Data from *raptor migration counts* and *Breeding Bird Surveys (BBSs)*, indicate that populations of Red-shouldered Hawks have (1) remained relatively stable in northeastern North America since 1974; (2) increased in western North America since the early 1980s; and (3) increased at around the Gulf of Mexico.

Trends in Eastern North America

Historic analyses. Bednarz et al. (1990) reported a non-significant decline in counts of Red-shouldered Hawks at Hawk Mountain Sanctuary from 1934 to 1986 and a non-significant increase from 1971 to 1986 (Bednarz et al. 1990), but no estimates were made of the rates of change. In a study of six raptor migration cou*nts* in eastern North America, Titus and Fuller (1990) reported a non-significant regional increasing trend of 0.9% per year from 1972 to 1987. Hussell and Brown (1992) reported a non-significant decline (-1.2% per year) in spring counts at Grimsby, Ontario from 1975 to 1990. At Cedar Grove, Wisconsin, Mueller et al. (2001) reported a *statistically significant* increase

in counts of Red-shouldered Hawks from 1936 to 1961, but no significant trend from 1936 to 1999.

Recent analyses. Raptor migration counts and BBSs indicate that populations of Red-shouldered Hawks have generally remained stable in northeastern North America since 1974. From 1974 to 2004, *statistically significant* increases in migration counts were recorded at Lighthouse Point, Connecticut (3.3% per year, $P \leq 0.01$) and Montclair Hawkwatch, New Jersey (1.3% per year, $P \leq 0.05$). Population trends in the remaining *raptor migration counts* in this region were not significantly different from zero (non-significant trends and confidence intervals overlapping zero). Non-significant declines were recorded at Cape May Point, New Jersey (-0.3% per year), Hawk Mountain Sanctuary, Pennsylvania (-0.6% per year), and Holiday Beach, Ontario (-1.3% per year). A non-significant increase was recorded at Waggoner's Gap, Pennsylvania (0.2% per year).

From 1994 to 2004, a statistically significant increase was recorded at Montclair Hawkwatch (1.3% per year, $P \leq 0.05$). Non-significant increases were recorded at Lighthouse Point (3.5% per year) and Waggoner's Gap (0.6% per year). Non-significant declines were recorded at Cape May Point (-0.3% per year), Hawk Mountain Sanctuary (-0.7% per year), and Holiday Beach (-1.8% per year) (Fig. 1). Continued population change at the 1994-2004 rates would lead to a 50% increase of Red-shouldered Hawk source populations in approximately 20 years at Lighthouse Point, 53 years at Montclair, and 116 years at Waggoner's Gap, and 50% declines in 231 years at Cape May, 99 years at Hawk Mountain, 39 years at Holiday Beach, and 99 years at Hawk Ridge. The Red-

shouldered Hawk did not occur as a migrant at l'Observatoire d'oiseaux de Tadoussac, Quebec.

From 1976 to 2003, BBSs suggest a non-significant decline of 6.0 % per year in Red-shouldered Hawk populations in northeastern North America (Connecticut, Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, New Brunswick, Nova Scotia, Ontario, and Quebec east of 79° W), which includes the areas from which the seven raptor migration counts receive migrants,.

CBC data for the period 1974 to 2004 indicate statistically significant increases in counts of Red-shouldered Hawks of 2.7% per year ($P \leq 0.01$) in the northeastern (Massachusetts, Maine, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, Vermont, New Brunswick, Nova Scotia, Ontario, and Quebec), and 2.9% per year ($P \leq 0.01$) in the southeastern United States (Delaware, Florida, Georgia, Kentucky, Maryland, North Carolina, South Carolina, Tennessee, Virginia, West Virginia).

Trends in Western North America

Historic analyses. None.

Recent analyses. Small numbers of migrating, or at least wandering/dispersing, Red-shouldered Hawks have been recorded in at Bonney Butte, Oregon, Boise Ridge, Idaho, the Goshute Mountains, Nevada, Lipan Point, Arizona, and at a former spring monitoring site at Jordanelle Reservoir in northern Utah (HawkWatch International and Idaho Bird Observatory unpublished data), but nowhere in sufficient numbers to warrant trend analyses. The only migration watchsite in western North America that records significant numbers of this species is Golden Gate Raptor Observatory's site in the Marin Headlands of central California.

BBSs indicate *statistically significant* increases of 8.2% per year ($P \leq 0.01$) from 1983 to 2005, and 6.8% per year ($P \leq 0.01$) from 1995 to 2005 in California (Sauer et al. 2004).

CBC data (National Audubon Society 2002) for California indicate that winter Red-shouldered Hawk populations increased significantly (2.3% per year, $P \leq 0.01$) from 1983 to 2005, and 1995 to 2005 (2.4% per year, $P \leq 0.01$).

Trends Around the Gulf of Mexico

Recent analyses. A statistically significant increase in raptor migration counts was recorded in the last decade at Veracruz, Mexico (1995-2005, 10.9% per year, $P \leq 0.01$), a non-significant increase occurred at Smith Point, Texas (1997-2005, 1.4% per year), and a non-significant decline occurred at Corpus Christi, Texas (1997-2005, -8.5% per year) (Fig. 1). Southern populations of this species are not highly migratory, so these trends may indicate either changes in the degree of local movement or changes in more northerly populations, which migrate up to 1500 km. Confidence intervals associated with the trend estimates also are wide, and the significant trend estimate should therefore be considered to indicate the direction of change, but have low precision in terms of magnitude.

BBSs for 1995–2005 indicated that breeding populations increased in both Texas (5.1% per year, $P = 0.07$) and Florida (4.2% per year, $P \leqq 0.05$), which suggests that counts at the migration watchsites covered here were more influenced by local populations than by northern migrants.

HISTORIC CONSERVATION CONCERN

Red-shouldered Hawks were shot at well-known migration spots, including Hawk Mountain Sanctuary and Cape May Point, in the early 20th century. Like many other raptor species, Red-shouldered Hawks suffered from eggshell thinning due to the misuse of pesticides during the *DDT era* of 1945-1972. This thinning appeared to be less severe than in other raptor species, and the impact on populations of the Red-shouldered Hawk is unknown (Henny et al. 1973, Wiley 1975).

CURRENT STATUS AND CONCERNS

Global and United States populations are considered secure while Canadian birds are ranked apparently secure (Appendix B, Table 1).

In the breeding range monitored by *raptor migration counts* in northeastern North America, the Red-shouldered Hawk is considered apparently secure in six of the states and provinces, vulnerable in four, imperiled in one, and critically imperiled in two (New Brunswick, New Jersey). In California, the species is not currently ranked or its status is under review (NatureServe 2006), but populations appear to be stable or increasing (P.H. Bloom, pers. comm.). Kirk and Hyslop (1998) rated the Red-shouldered Hawk as probably stable in Canada.

Increased rates of forest fragmentation and loss, particularly in northeastern North America may threaten some populations. Raptor migration counts suggest that populations of the Red-shouldered Hawk are stable or decreasing slightly in the Great Lakes and Appalachian regions and increasing in northeast coastal locations. Coupled with indications of decreasing populations in northeastern North America on the breeding grounds (BBS) and increasing numbers on wintering grounds (CBC), these trends suggest that populations of the Red-shouldered Hawk are currently stable or decreasing in much

of northeastern North America, with probable increases in populations near the Atlantic coast. However, increasing trends in CBC*s* may indicate that the species is becoming less migratory, complicating the interpretation of raptor migration counts. There is also high variability in counts of this species on migration at most watchsites (annual CVs 28-133%), and this variation reduces the power of raptor migration counts to detect small population changes and increases the width of confidence intervals around estimates of trend.

Monitoring of the Red-shouldered Hawk at raptor migration counts is particularly important despite their high variability, because BBSs have very low precision for this species. Efforts should be made to improve detection rates for this species at watchsites conducting raptor migration counts and to add more sites to analyses. In particular, spring counts near the Great Lakes may provide useful information on Canadian populations. Furthermore, telemetry studies of migration behavior may shed light on the meaning of disagreement among raptor migration counts, BBSs, and CBCs.

SUMMARY

Raptor migration counts produced few significant trend estimates for this species. Although this may indicate that the monitored populations are stable, we believe that the high inter-annual variability counts and corresponding low precision of estimates may conceal trends. Considerable regional structure is apparent in the migration trends, and this probably is the result of the species' tendency to be a short-distance migrant and its lower affinity to *leading lines* than many other raptors. Efforts should be made to improve detection rates for this species at watchsites conducting raptor migration counts and to add more sites to analyses. Precision of estimates from BBS is also low, limiting

the value of those estimates. Red-shouldered Hawks are conspicuous early in the breeding season, and a targeted breeding season survey should be developed to augment migration monitoring for this species.

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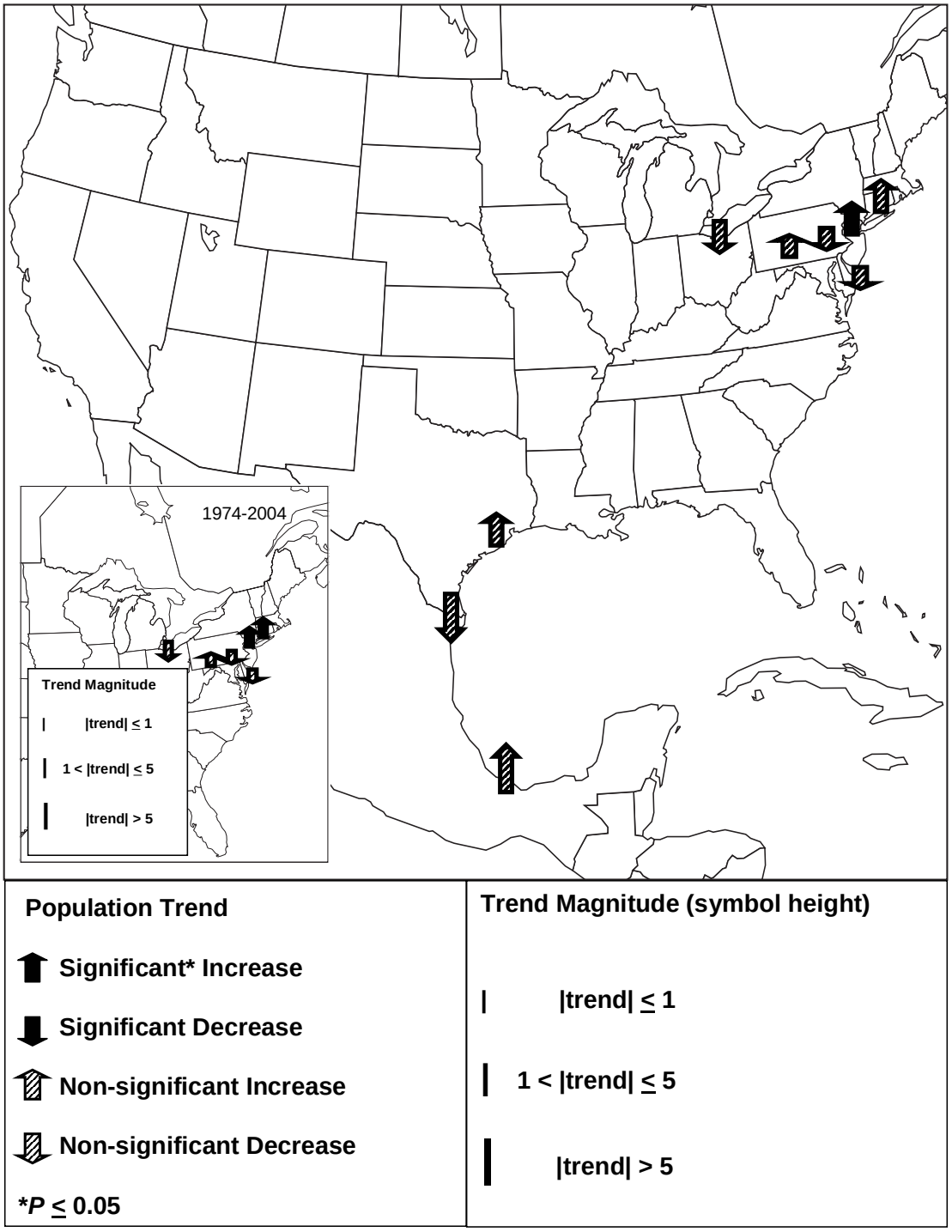

[a] 1997-2005 [b] 1998-2005 [c] 1999-2005

Figure 1. Population trends for Red-shouldered Hawks at 6 eastern and midwestern (1994-2004) and 3 Gulf of Mexico raptor migration counts in North America, and long-term trends (1974-2004) for 6 eastern counts (inset). Trend magnitudes are expressed in percent change per year.