

# Conservation Status Report

## Broad-winged Hawk

Scientific Name:	<i>Buteo platypterus</i>
French Name:	<i>Petite Buse</i>
Spanish Name:	<i>Busardo aliancho, Gavilán aludo</i>
Body length:	34-44 cm
Wingspan:	81-100 cm
Mass:	265-560 g

(Females are typically 3-6 % larger and up to 22% heavier than males)

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

In Canada, breeds in central Alberta, Manitoba and Saskatchewan, East to Maritime Provinces, South to southeastern Alberta, southcentral Saskatchewan and U.S. border. Some breeding records in British Columbia . In U.S., breeds from northeastern North Dakota and southeastern Iowa East to Atlantic coast of Maine, and South to coastal Texas and Florida. Endemic subspecies resident in Cuba, Puerto Rico, Antigua, Dominica, Martinique, St. Lucia, St. Vincent, Grenada, and Tobago.

*Winter Range:* Winters primarily in Central and South America, with small numbers, primarily juveniles, wintering in coastal Florida and Texas. In Mexico, winters along the Pacific slope from Colima to Oaxaca. In southern Mexico and Central America, along both slopes from Chiapas, Guatemala, and Belize south. In South

America, south as far as northern and eastern Peru, Bolivia, Colombia, Venezuela, and southern Brazil.

Type of Migrant: Complete

Nest Type: Small, relatively crude stick nest in a fork of the main trunk of deciduous or coniferous trees.

Food Habits: Preys primarily on small mammals, birds, amphibians, reptiles and invertebrates.

Primary Flight Mode: Soaring on thermals with occasional flapping. Glides between thermals.

## **ECOLOGY**

The Broad-winged Hawk is one of the smallest species of *Buteo* in North America, and is the only *complete migrant* among *Buteos* in northeastern North America. Notable field marks include its namesake, broad wings, and conspicuous, broad white tail bands on a dark tail. Females are typically 3-6% larger and up to 22% heavier than males. Although broadwings occasionally flap during migratory flights, they are most often seen soaring on thermal updrafts.

Although a common breeding bird throughout deciduous forests of eastern North America, the Broad-winged Hawk is a secretive nester, and is not commonly seen during breeding. In contrast, broadwings often form large, conspicuous flocks on migration. These large flocks or “kettles” sometimes contain tens of thousands of birds, particularly at concentration points from south Texas through Central America.

The species nests primarily in deciduous and mixed deciduous–conifer forests in the temperate zone of North America. Nests usually are located in larger forested areas,

often close to small forest openings and water sources. The nest is typically located in a fork of the main trunk of a tree or on a horizontal limb, generally in the lower third of the forest canopy. Broad-winged Hawk nests are usually 30–50 cm in diameter, composed of fresh twigs and dead sticks, and lined with bark chips. Fresh green foliage sprigs are added to the nest rim shortly after the initiation of nest construction.

Broad-winged Hawks hunt from perches near forest openings, edges, and bodies of water. Known prey include a wide array of birds (primarily juveniles), mammals, amphibians, and insects, usually 10–30 g in mass. Most diet studies indicate that small mammals and amphibians are the primary categories of prey (Fitch 1974, Matray 1974, Crocoll 1984). On wintering grounds, broadwings consume large insects, reptiles, frogs, crabs, and small mammals.

The Broad-winged Hawk is a *complete migrant*. All continental populations are migratory, although those breeding in the West Indies are presumably non-migratory. Primarily a soaring migrant, the species is dependent on updrafts generated by thermals and mountain ridges. Largely because of their dependence on thermal updrafts, Broad-winged Hawks are one of the earliest migrants among North American raptors. This reliance on thermals also leads to a very concentrated migration, with 95% of individuals passing migration watchsites like Hawk Mountain Sanctuary during a two-week period. The combination of concentrated migration timing and the need to find thermal updrafts causes the formation of large flocks where favorable conditions exist.

## **POPULATION STATUS**

An estimated 96% of the global population occurs in North America with Veracruz migration counts (>2.3 million birds) providing the best estimate of total North

American populations (Appendix B, Table 1). Data from *raptor migration counts* and *Breeding Bird Surveys (BBSs)* indicates that populations of Broad-winged Hawks have (1) generally declined in northeastern North America since 1974; (2) increased in western North America since the early 1980s; and (3) remained stable or increased continent-wide since 1995, as measured by raptor migration counts near the Gulf of Mexico.

#### Trends in Eastern North America

**Historic analyses.** Bednarz et al. (1990) reported a non-significant increase in counts of Broad-winged Hawks at Hawk Mountain Sanctuary from 1934 to 1942 and a non-significant decline for the period 1971 to 1986, but no estimates were made of the rates of change. In a study of six raptor migration counts in eastern North America, Titus and Fuller (1990) reported a non-significant regional declining trend of 2.7% per year from 1972 to 1987. Hussell and Brown (1992) reported that counts of Broad-winged Hawks at Hawk Ridge Bird Observatory declined non-significantly from 1974 to 1989 (-3.0% per year), and those at Grimsby, Ontario (a spring count) declined significantly (-5.3% per year,  $P \leq 0.05$ ) from 1975 to 1990. At Cedar Grove, Wisconsin, Mueller et al. (2001) reported that counts of broad-wings were stable from 1936 to 1999, and underwent a non-significant decline from 1989 to 1999. Miller et al. (2002) reported decreasing trends in counts of Broad-winged Hawks at Hawk Mountain Sanctuary and Montclair Hawkwatch from 1979 to 1998.

**Recent analyses.** Data from raptor migration counts and *Breeding Bird Surveys (BBSs)* indicate that populations of Broad-winged Hawks have generally declined in northeastern North America since 1974. From 1974 to 2004, statistically significant declines in migration counts were recorded at Hawk Mountain Sanctuary, Pennsylvania

(-3.1% per year,  $P \leq 0.01$ ) and Holiday Beach, Ontario (-5.2% per year,  $P \leq 0.01$ ). Non-significant declines were recorded at Lighthouse Point, Connecticut (-0.4% per year), Cape May Point, New Jersey (-1.4% per year; 1976-2004), Montclair Hawkwatch, New Jersey (-1.8% per year), and Waggoner's Gap, Pennsylvania (-1.8% per year). A non-significant increase was recorded at Hawk Ridge Bird Observatory, Minnesota (1.1% per year).

From 1994 to 2004, statistically significant declines in counts of Broad-winged Hawks were recorded at Montclair Hawkwatch (-9.5 % per year,  $P \leq 0.05$ ), Hawk Mountain Sanctuary (-3.4 % per year,  $P \leq 0.01$ ), and Holiday Beach (-1.1 % per year,  $P \leq 0.05$ ) and a statistically significant increase was recorded at Waggoner's Gap (7.8% per year,  $P \leq 0.05$ ). Non-significant declines were recorded at Lighthouse Point (-3.6% per year) and Cape May Point (-1.4 % per year), and a non-significant increase was recorded at Hawk Ridge Bird Observatory (1.1 % per year) (Fig. 1). Continued population change at the 1994–2004 rates will lead to a 50% increase of Broad-winged Hawk source populations in approximately 13 years at Waggoner's Gap and in 63 years at Hawk Ridge, and 50% declines in 28 years at Lighthouse Point, 50 years at Cape May, 8 years at Montclair, 20 years at Hawk Mountain, and 63 years at Holiday Beach.

The entire North American population of Broad-winged Hawks (with the exception of a few birds that winter in Florida, coastal Texas, and the Mississippi River delta) migrates to Central and South America each winter; hence, no reliable CBC data are available for this species.

BBSs recorded a non-significant increase of 2.0% per year in northeastern North America from 1976-2003; however, this trend is nearly statistically significant ( $P = 0.06$ ),

and therefore provides strong evidence of an increase in hawks observed on *BBS* counts. Low detection rates on *BBS* routes make use of *BBS* for monitoring Broad-winged Hawk populations questionable.

#### Trends in Western North America

**Historic analyses.** Smith et al. (2001) reported annual increases of 3–16% in the Goshute Mountains, Nevada (autumn 1983–1999); Manzano Mountains, New Mexico (autumn 1985–1999); Sandia Mountains, New Mexico (spring 1985–2000); Bridger Mountains, Montana (autumn 1991–1999); and at Lipan Point., Arizona (1991–1999). Other indicators of possible increasing patterns were also recorded for the Wellsville Mountains, Utah (autumn, late 1970s and 1987–1999), Bonney Butte, Oregon (1995–1999), and Chelan Ridge, Washington (1997 to 1999).

Re-analyzing many of the same datasets with more years of data, Hoffman and Smith (2003) reported statistically significant increases in migrating Broad-winged Hawks from 1983 to 2001 at the Goshute Mountains, from 1985 to 2001 at the Sandia Mountains, New Mexico (spring site), and from 1992 to 2001 at the Bridger Mountains, Montana and Lipan Point, Arizona. No significant trends were recorded at the Wellsville Mountains, Utah (1987 to 2001) or Manzano Mountains, New Mexico (1983–2001). Smith et al. (2001) and Hoffman and Smith (2003) suggested that increasing trends in the West were indicative of a westward shift in the breeding distribution of the Broad-winged Hawk.

**Recent analyses.** Data from raptor migration counts and *BBS*s indicate that populations of the Broad-winged Hawk have increased in portions of western North America since the mid-1980s. Low sample sizes at most western raptor migration counts

can potentially bias the RPI migration indexes, which are derived from multiple regression, and we therefore do not report trends at watchsites receiving <20 migrants per year. A statistically significant long-term increase was recorded from 1983 to 2005 at the Goshute Mountains, Nevada (6.5% per year,  $P \leq 0.01$ ), which is the only western location at which we could estimate trends from migration counts. From 1995 to 2005, a non-significant increase was recorded at the Goshute Mountains (1.1% per year) (Fig. 1).

BBSs show a non-significant, long-term decline of 4.5% per year from 1983 to 2004, and a recent decline of 9.2% per year in the BBS western region (Arizona, California, Idaho, Nevada, Oregon, Utah, Washington, western Montana, western Wyoming, western Colorado, western New Mexico, British Columbia; Sauer et al. 2004); however, BBS detection rates for this species are low, and western trends are estimated from too few routes to be considered accurate, and therefore should be interpreted with caution.

#### Trends Around the Gulf of Mexico

**Recent analyses.** From 1995-2005, non-significant increases occurred in raptor migration counts over the last decade at the Florida Keys (1999-2005; 6.1% per year), Smith Point, Texas (1997-2005; 8.2% per year), and Veracruz Mexico (3.1% per year), whereas a non-significant 2.4% per year decline (1997-2005) was recorded at Corpus Christi, Texas. Given that the population source areas for the Texas and Veracruz sites are approximately the same, and that virtually all North American Broad-winged Hawks winter in Central and South America, the inconsistent pattern at Corpus Christi, which is situated between the other two sites, appears anomalous. This anomaly may be an artifact of the wide confidence intervals associated with these trend estimates, or it may

reflect the unpredictable influence of major weather events, such as hurricanes, on the flight corridors used by Broad-winged Hawks from year to year. Major weather events can dramatically influence the corridor(s) used by migrants when passing through broad coastal plains where they rely on highly variable thermal updrafts for lift. Because Broad-winged Hawk passage is highly concentrated, flight line variation due to wind or weather conditions that moves migrants out of observable range can have a particularly noticeable effect on annual site-specific counts of this species.

### **HISTORIC CURRENT CONSERVATION CONCERN**

Broad-winged Hawks were shot at well-known migration spots, including at Hawk Mountain Sanctuary and Cape May Point, in the early 20<sup>th</sup> century. Band-return data indicated that such direct persecution continued to affect the species on its wintering grounds into the 1980s (Robbins 1986). Although many other raptor species declined during the *DDT era* of 1945-1972, there is little evidence that broadwings were significantly impacted by pesticides.

### **CURRENT STATUS AND CONCERNS**

Collisions with vehicles are a primary source of mortality of birds wintering in the Florida Keys (Tabb 1973). Increased rates of forest fragmentation and loss, particularly in the boreal zone and the Caribbean may threaten some populations. Forest loss on the migration route and in wintering areas also may pose a threat to these forest birds. Migrants also are vulnerable to direct exploitation on migration through Central and South American regions.

Declines in migration counts of broadwings in northeastern North America may be due to changes in the structure and distribution of boreal forests in Canada due to

logging activities, but a westward range expansion also appears to be underway, and declines in eastern counts may reflect changes in migration geography associated with changes in the distribution of breeding habitat. Broad-winged Hawks seek thermal updrafts on migration, and landscape changes that alter patterns of thermal production, such as suburban sprawl in the Northeast, may be altering migratory pathways.

Global, United States, and Canadian populations are ranked as secure (Appendix B, Table 1). In the breeding range monitored by raptor migration counts in northeastern North America, the Broad-winged Hawk is considered secure in 10 of the states and provinces, apparently secure in two, vulnerable in one, and critically imperiled in one (Prince Edward Island) (NatureServe 2006; Appendix B, Table 2). In the breeding range monitored by raptor migration counts in western North America, the Broad-winged Hawk is considered vulnerable in two of the states and provinces, and is not ranked in the remaining states and provinces (NatureServe 2006; Appendix B, Table 2). Kirk and Hyslop (1998) rated the species as declining or stable in Canada, with declines possible as a result of timber harvest practices.

Monitoring of the Broad-winged Hawk at raptor migration counts is particularly important because it is not well-monitored by BBSs on the breeding grounds, and is not present in most of North America during CBCs. Additional raptor migration counts may further clarify patterns of population change for this long-distance migrant.

## **SUMMARY**

Based on the nearly complete count of the continental population at Veracruz, the Broad-winged Hawk appears to be stable or increasing in North America. The ubiquity of decreasing long-term trend estimates in northeastern North America east of the central

Great Lakes, however, suggests either (1) regional declines are underway in the east, perhaps as a consequence of logging in the Boreal forest, (2) populations are stable in eastern Canada, but changes in migration geography are causing declines in established counts in eastern North America, or (3) a combination of these factors is occurring. These possibilities, together with evidence of range expansion into western North America, suggest that further breeding-season research is needed to accurately monitor this species.

#### **ADDITIONAL READING:**

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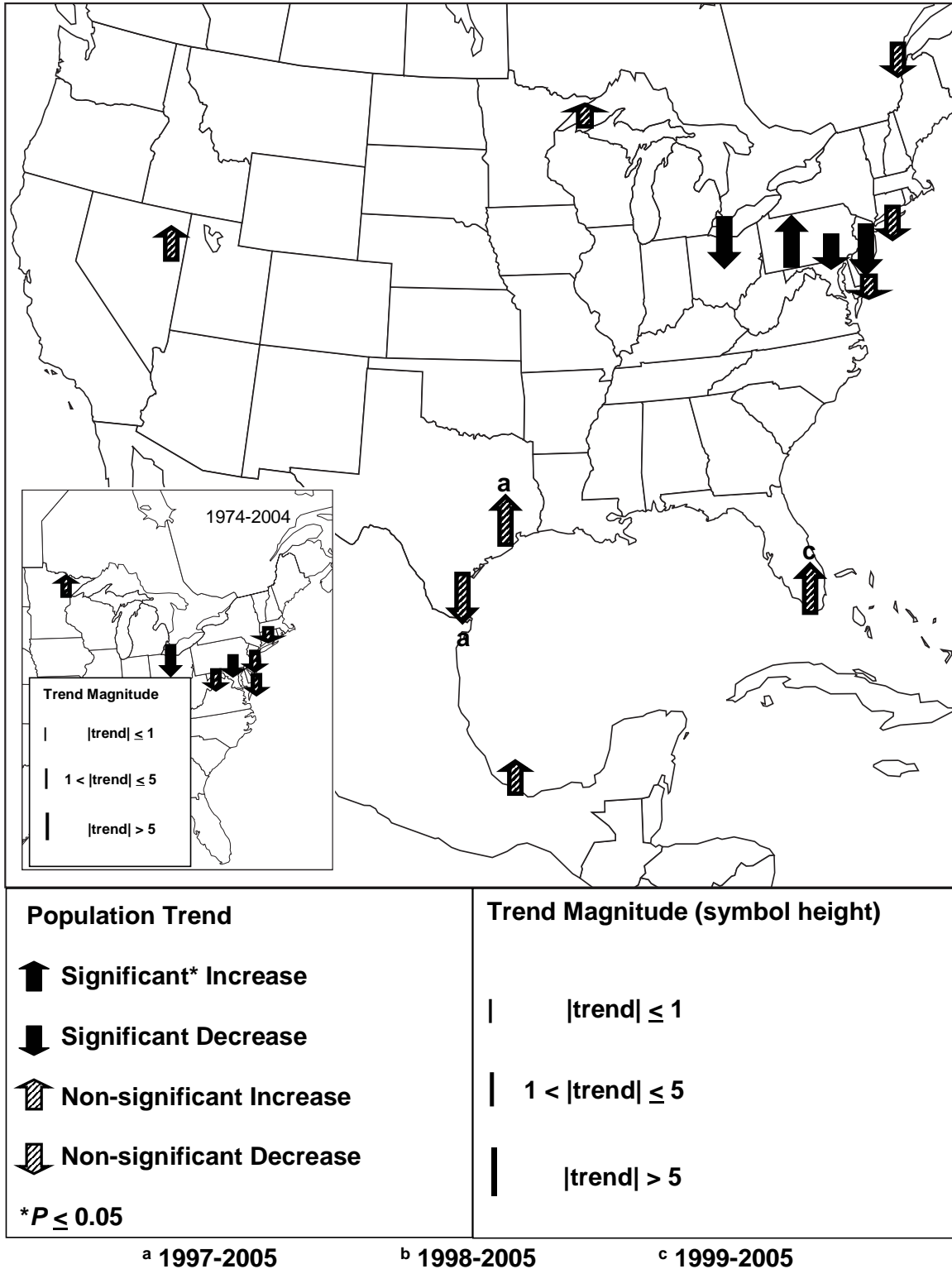


Figure 1. Population trends for Broad-winged Hawks at 8 eastern and midwestern (1994-2004), 1 western (1995-2005), and 4 Gulf of Mexico 1995-2005) raptor migration counts in North and Central America, and long-term (1974-2004) trends at 7 eastern sites (inset). Trend magnitudes are expressed in percent change per year.