

Conservation Status Report

Osprey

Scientific Name: *Pandion haliaetus*

French Name: *Balbuzard pêcheur*

Spanish Name: *Gavilán pescador*

Body length: 51-66 cm

Wingspan: 150-180 cm

Mass: 1,400-2,000g

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

North to tree line throughout Alaska and Canada, south along Pacific coast to northern California, Idaho, Montana, northwestern Nevada, Oregon, Washington, and Wyoming. In eastern United States south to lower peninsula of Michigan, northern Minnesota, central Wisconsin, northern New York, New Hampshire, and Maine, also along Atlantic and Gulf coasts. Discontinuous distribution along inland rivers, lakes, and reservoirs in southeastern and southwestern U.S. In Mexico, along coasts of central and southern Baja California, coasts of Sonora and Sinaloa, east coast of Yucatán Peninsula, and south into Belize. Also resident in Cuba and southern Bahamas.

Winter Range: Most of the North American population winters in Central and South America, but small numbers also winter along Pacific coast from southern Oregon to southern California, along Gulf coast of

Texas, Louisiana, and Florida, and along the Atlantic coast as far north as central North Carolina. Sometimes observed at scattered locations throughout U.S. and into southern British Columbia, Alberta, Ontario, Quebec, Nova Scotia, and Newfoundland.

Type of Migrant: Complete. Often long-distance and transequatorial.

Nest Type: Large stick nest near water in a tree or other large platform

Food Habits: Eats primarily fish. Other items, including birds, mammals, mollusks, and snakes have been reported, but are uncommon.

Primary Flight Mode: Slow, deep, stiff-winged flapping flight interspersed with soaring on crooked, "M"-shaped wings. Crosses water regularly.

ECOLOGY

Despite its close association with water, the Osprey is a cosmopolitan raptor, breeding or wintering on all continents except Antarctica. In North America, it nests in coastal areas and around lakes, rivers, marshes, and reservoirs, generally within a few kilometers of water. The largest concentrations of breeding pairs occur around marine bodies of water.

Ospreys are large birds of prey, approximately the same size as the larger species of *buteos*. The species is easily identifiable in flight, due to its long, gull-like wings typically held in an "M"-shaped profile. At a distance, it is sometimes mistaken for a Bald Eagle because its head is mostly white, and only upon closer inspection does a distinctive dark eye stripe become apparent. They are the only *diurnal* raptors in North America that prey almost exclusively on fish, and are sufficiently unique to be the sole species in the family *Pandioninae* and the genus *Pandion*.

Nests of this species are large (0.7 - 2m diameter), built of large-diameter sticks in sites near water, with good visibility and limited access for predators. On islands free of predators and trees, Ospreys sometimes build their nests on the ground. Typical nest sites included open-crowned or dead trees, cliffs, rocky outcrops, utility poles, channel markers, and human-made nest platforms. Ospreys show high site fidelity and do not establish new nesting areas easily.

The Osprey is a *complete migrant*. Its diet of live fish makes migration away from many high-latitude areas necessary as cold water causes fish to move to deeper water and many bodies of water freeze in winter. Most North American populations make long migratory movements into Central and South America in winter, but those in Florida, Mexico, and the Caribbean remain on their breeding range year-round. Ospreys from eastern North America generally migrate farther south (South America) than those from western North America, which winter in Mexico or Central America.

POPULATION STATUS

Numbers in the U.S. were estimated at 8,000 breeding pairs in 1983 (Henny 1983), and 16,000-19,000 pairs in 2001 (BONA account). Estimated number of breeding pairs in Canada in the early 1990s was 10,000-12,000 (Kirk et al. 1995). Populations of the Osprey are considered healthy in North America due to its wide geographic range, protected status, and recent positive population trends in most areas (Natureserve 2006). The current population is estimated at 211,600 birds in North America, comprising 46% of the global population (Appendix B, Table 1). Data from *raptor migration counts* and annual *Breeding Bird Surveys (BBSs)* indicate that populations of the Osprey have (1) increased in eastern North America since 1974 and apparently stabilized in the last 10

years; (2) increased or remained stable in western North America since the early 1980s; and (3) increased more strongly in eastern and midwestern North America than in the Great Lakes or western North America, based on count trends in the Gulf of Mexico.

Eastern North America

Historic analyses. Bednarz et al. (1990) reported a non-significant increase in counts of Ospreys at Hawk Mountain Sanctuary from 1934 to 1942. A *statistically significant* decline in counts of eagles was recorded from 1946 to 1972, and a statistically significant, post-*DDT-era* increase was reported for the period 1973 to 1986 (Bednarz et al. 1990), 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 *statistically significant* regional increase of 8.9% per year from 1972 to 1987. Hussell and Brown (1992) reported a statistically significant increase of 5.8% per year in counts of Ospreys at Hawk Ridge Bird Observatory from 1974 to 1989, while those at Grimsby, Ontario (a spring count) increased 6.2% per year from 1975 to 1990. At Cedar Grove, Wisconsin, Mueller et al. (2001) reported a statistically significant increase in counts of Ospreys from 1936 to 1999, and a non-significant decline from 1989 to 1999.

Recent analyses. Raptor migration counts and BBSs indicate that populations of the Osprey have increased steadily in northeastern North America since 1974. From 1974 to 2004, *statistically significant* increases in migration counts were recorded at Lighthouse Point, Connecticut (5.1% per year, $P \leq 0.01$), Cape May Bird Observatory, New Jersey (1976-2004, 2.4% per year, $P \leq 0.01$), Montclair Hawkwatch, New Jersey (2.4% per year, $P \leq 0.01$), Hawk Mountain Sanctuary, Pennsylvania (1.5% per year, $P \leq 0.01$), and Hawk Ridge Bird Observatory, Minnesota (4.3% per year, $P \leq 0.01$). Non-

significant increases were recorded at Waggoner's Gap, Pennsylvania (2.0% per year), and Holiday Beach, Ontario (0.8% per year) during this period.

In the last decade, migration counts in eastern North America did not increase significantly, and many began to decline. From 1994 to 2004, non-significant increases in Osprey numbers were recorded at Montclair Hawkwatch (2.7% per year), Hawk Mountain Sanctuary (1.0% per year), and Waggoner's Gap (4.1 % per year). l'Observatoire d'Oiseaux de Tadoussac, Quebec (-1.8 % per year), Lighthouse Point (-6.0% per year), Cape May Point (-3.1% per year), Holiday Beach (-1.7 % per year), and Hawk Ridge Bird Observatory (-0.1% per year) recorded non-significant declines during this period (Fig. 1). Thus, the species increased throughout the region over the last 30 years, primarily due to increases in the 1970s and 1980s but has largely stabilized in the last decade.

BBSs indicate significant increases in Osprey 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 eight raptor migration counts receive migrants. *BBS* estimates include statistically significant increases in the Osprey population of 4.6 % per year ($P \leq 0.01$) for 1976-2003 in northeastern North America (Sauer et al. 2004), and 20.5 % per year ($P \leq 0.05$) in the Mississippi flyway. Precision of the Mississippi flyway estimate is low, however, due to a small number of routes included in the analysis. Osprey populations are not well sampled by BBSs, so these trend estimates are probably less reliable than those from raptor migration counts.

Western North America

Historic analyses. Hoffman and Smith (2003) reported statistically significant increases in migrating osprey from 1983 to 2001 at the Goshute Mountains ($P \leq 0.01$), from 1987 to 2001 at the Wellsville Mountains ($P \leq 0.05$), from 1983 to 2001 at the Manzano Mountains ($P \leq 0.01$), from 1991 to 2001 at Lipan Point, Arizona ($P \leq 0.05$), and from 1985-2001 at the Sandia Mountains, New Mexico (spring counts, $P \leq 0.01$). No significant trend was recorded at the Bridger Mountains (1992-2001; Hoffman and Smith 2003).

Recent analyses. Data from raptor migration counts and BBSs suggest that populations of the Osprey have increased or remained stable in parts of the western United States since the mid-1980s. Statistically significant long-term increases in raptor migration counts were recorded at the Goshute Mountains, Nevada (4.4% per year, $P \leq 0.01$) from 1983 to 2005 and the Manzano Mountains, New Mexico from 1985-2005 (3.8 % per year, $P \leq 0.01$). At the Wellsville Mountains, Utah, a non-significant increase was recorded (0.7% per year) from 1987 to 2004.

From 1995 to 2005, statistically significant declines were recorded at the Bridger Mountains, Montana (-12.6% per year, $P \leq 0.05$), the Wellsville Mountains (1995-2004; -7.1% per year, $P \leq 0.05$), and Lipan Point, Arizona (-5.0% per year, $P \leq 0.01$). Non-significant declines were recorded at the Goshute Mountains (-1.0% per year), Chelan Ridge, Washington (1998-2005; -6.0% per year), Bonney Butte, Oregon (2.2% per year), and Yaki Point, Arizona (1998-2005; -3.7% per year). No net change in counts was observed at the Manzano Mountains (0.0% per year) (Fig. 1).

Restricting trend estimation to the drought period (i.e., post 1997) indicated negative rates of change for most sites, though significant only for the Wellsvilles (-10%

per year) and Lipan Point (-9.0% per year). Exceptions included Bonney Butte and Boise Ridge. Whether based on full 12-year datasets or limited to the post-1997 drought period, overall positive trajectories and rates of change were indicated for both of these sites. A 4.4% per year rate of increase was statistically significant for Boise Ridge, whereas a 2.2% rate of increase was non-significant at Bonney Butte. Reasons for the different Bonney Butte and Boise Ridge count trends compared to other sites remain uncertain, but may reflect the influence of a hypothesized drought-related westward shift in migration routes.

BBSs show a statistically significant, long-term increase of 6.3% per year ($P \leq 0.01$) from 1983 to 2004, and a recent (1995-2005) increase of 6.0% per year ($P \leq 0.01$) 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).

Overall these data suggest an expansion of western Osprey populations between the early 1980s and mid-1990s, most likely reflecting a combination of an emerging recovery from the deleterious effects of DDT and increasing exploitation by the species of artificial reservoirs and nesting structures (Smith and Hoffman 2003). The positive effects of moist El Nino periods in the early-to-mid 1980s and early-to-mid-1990s on foraging habitat may have aided this expansion (although heavy rainfall can reduce Osprey breeding success in more mesic areas). It appears that the onset in 1998 of severe, widespread, and prolonged drought throughout much of the interior West, which dried up some water courses completely and caused large fish kills may have altered the migration geography of Ospreys away from the intermountain region.

Gulf of Mexico

Recent analyses. From 1995 to 2005, raptor migration counts recorded statistically significant increases in Ospreys in the Florida Keys, Florida (1999-2005, 9.0% per year, $P \leq 0.05$) and at Smith Point, Texas (1997-2005, 4.7% per year, $P \leq 0.05$). A marginally significant ($0.05 \leq P \leq 0.10$) increase occurred at Corpus Christi, Texas (1997-2005, 7.1% per year, $P = 0.08$) and a non-significant increase was recorded at Veracruz, Mexico (1995-2005, 2.8% per year) (Fig. 1). Migrants recorded in the Florida Keys and possibly Smith Point are primarily of eastern and midwestern origin, whereas those counted at Corpus Christi and Veracruz originate primarily in the Great Lakes and western North America (Martell et al. 2001). Thus, differences in the magnitude and significance of trends between these groups of watchsites suggest that Ospreys have increased more strongly in the east than in the west over the last decade. Confidence intervals around the trends in this region are relatively wide, owing to the relatively short time series available for analysis, and this limits our ability to distinguish between stable and increasing trends until further data accumulate.

HISTORIC CONSERVATION CONCERN

Osprey populations in some regions of North America were negatively affected by organochlorine pesticides, primarily *DDT*, which was widely used from the mid 1950s until 1972, when widespread use was banned in the United States (Spitzer et al. 1978). Coastal populations in northeastern North America were the most severely affected by organochlorine misuse. Osprey populations also were historically affected by shooting, though to a lesser extent than many other raptors. Poole and Agler (1987) reported that

U.S. banding data from 1972 to 1984 showed 30% of recovered banded Ospreys were shot, mostly on wintering grounds in Central and South America.

CURRENT STATUS AND CONCERNS

Shooting still occurs at low levels in North America, with apparently higher rates of shooting-caused mortality in South America. Ospreys are generally tolerant of human activity, and land development per se does not appear to affect them negatively.

However, limitation of suitable nest sites can limit populations unless mitigated by the construction of artificial nest platforms (e.g., Watts et al. 2004). Abundance of fish may also present a limiting factor in some years in some regions.

In the breeding range monitored by raptor migration counts in northeastern North America, the Osprey is considered secure in three of the states and provinces, apparently secure in five, vulnerable in four, and imperiled in four (NatureServe 2006). In the breeding range monitored by raptor migration counts in western North America, the Osprey is considered secure in three of the states and provinces, apparently secure in four, vulnerable in two, imperiled in four, and critically imperiled in one (Nevada). In the Northwest Territories of Canada, it is not ranked or currently under review (NatureServe 2006). Kirk and Hyslop (1998) rated the Osprey as increasing or stable in most of Canada.

SUMMARY

Data derived from migration monitoring and BBSs indicate that Osprey populations in eastern and western North America increased over the last 20-30 years, but that these gains have slowed or been reversed in the most recent decade in both regions. Overall numbers are believed to be close to pre-DDT-era levels (A. Poole, pers. comm.),

and the recent changes probably indicate stabilization of populations after a period of rapid increase. Recent trends at raptor migration counts along the Gulf of Mexico suggest that more southerly populations of this species are currently increasing in the eastern regions monitored by the Florida Keys and Smith Point watchsites and stable or slightly increasing in the Great Lakes and western regions from which Corpus Christi and Veracruz draw migrants. Longer time series of counts are needed to resolve trends at gulf coast migration watchsites.

ADDITIONAL READING:

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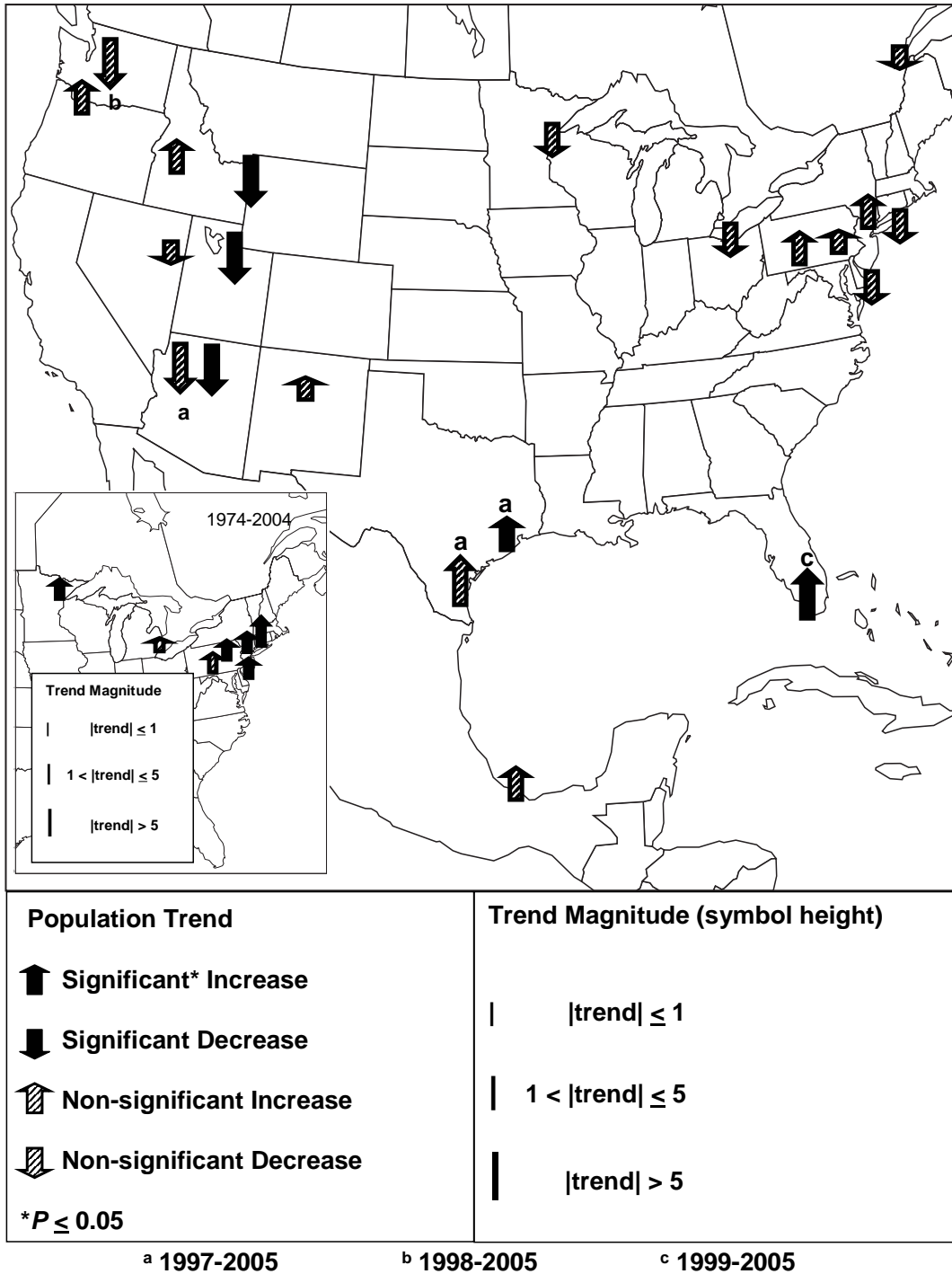


Figure 1. Population trends for Ospreys at 8 eastern and midwestern (1994-2004) and 8 western (1995-2005) raptor migration counts in North America, and long-term trends (1974-2004) for 7 eastern counts (inset). Trend magnitudes are expressed in percent change per year.