

INDICATOR: FALL RAPTOR MIGRATION AT HOLIDAY BEACH CONSERVATION AREA, AMHERSTBURG, ONTARIO

Background

Fall migrating birds have used the north shore of Lake Erie since the last ice sheet retreated over ten thousand years ago. Since the 1950s casual observers have recorded large numbers of hawks at Holiday Beach Conservation Area (HBCA) east of Amherstburg, Ontario, and nearby sites. More systematic observations began in the 1970s, when evidence indicated that hawks and other birds were experiencing dramatic population declines. Over two million raptors have been counted at this site during the past 35 years.

Since 1974, from September through November, qualified volunteer observers and members of Holiday Beach Migration Observatory (HBMO) have worked enthusiastically (averaging 600 hours in a season) toward a goal of identifying and recording all migrant raptors passing the count site. The information collected is analyzed locally in cooperation with Hawk Migration Association of North America (HMANA) (Chartier and Stimac 2002). HMANA was organized to help standardize count procedures and identification, and to educate the public. Currently, HMANA is assessing the well-being of raptor populations with data collected at several well-established raptor sites, including HBCA. These sites will be included in their Raptor Population Index project.

Since birds of prey are indicators of ecosystem health due to their terminal position in the food web, any decline in their numbers may indicate unfavorable environmental conditions. Because raptors are top carnivores in short food webs, they are usually the first wild species to show ill effects of bioaccumulated contaminants in the watersheds. Historically, these contaminants included heavy metals and chlorine-based pesticides (DDT, aldrin, dieldrin, and heptachlor). In several species of raptors these accumulated materials have contributed to reproductive failure, eggshell thinning, bill malformations, nesting failure, and death.

Raptors depend on updrafts of warm air, primarily over land, for gliding and soaring. As the raptors move south from their eastern Canadian breeding areas, the north shores of Lakes Erie and Ontario become migration barriers. The birds are forced to follow the Lake Erie shoreline westward and are funneled into a narrow migration avenue with Lakes St. Clair and Huron bordering to the north. After passing HBMO and crossing the Detroit River, many birds are recounted by observers (Southeastern Michigan Raptor Research, SMRR) located at Lake Erie Metropark and the Pointe Mouillee State Game Area Headquarters (Figure 1). However, while many birds are recounted at SMRR, there are significant numbers that were not first seen at HBMO. Therefore, SMRR is certainly not a complete reflection of the migration of the same birds at HBMO, but similar trends between the two sites can be found.

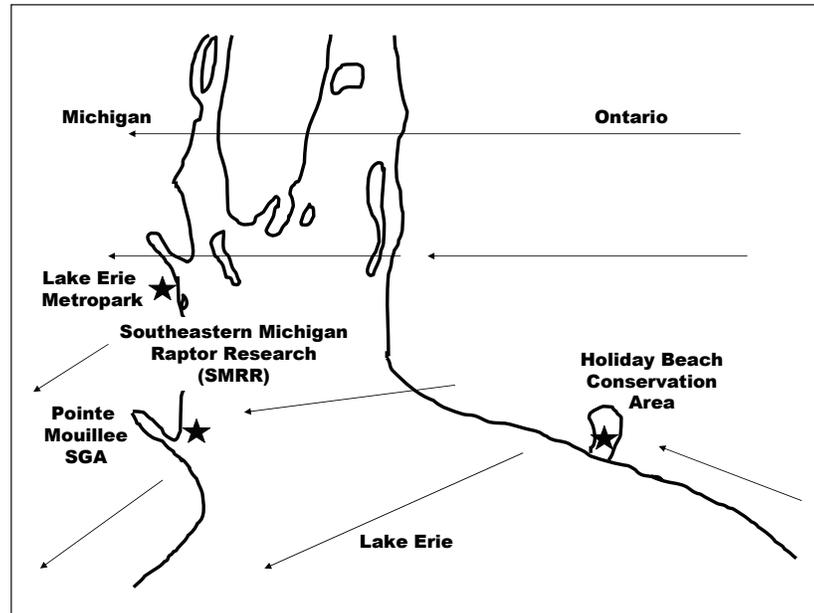


Figure 1. Count site locations at Holiday Beach Migration Observatory (HBMO) and Southeastern Michigan Raptor Research (SMRR). The arrows indicate the general flyway and their precise route is variable.

Status and Trends

Each fall at HBCA, observers tally between 600,000 and 750,000 migrant birds, from ducks to warblers, with an average of 75,000 of these being hawks. Because of these large numbers of fall migrants using this region for their trek southward, HBCA has received the status of an Important Bird Area (IBA). Hawks in the area generally start flying after sunrise and continue throughout the day. The most significant factor influencing whether a bird is counted or not is wind direction. North component winds (NNW, NW, N, NE, NNE) force the birds to follow more closely to the north shore of the lake, and therefore, within range of being counted. South component winds tend to move the birds more north of the count site out of range of viewing and therefore are not counted. Consequently, there may be large variations in total numbers within a species from year to year, however, over a long period these differences are minimal. Analysis of population trends must take into account this wind-influencing factor.

Figure 2 illustrates an upward trend of red-shouldered hawks from the mid-1970s through the early 1990s, followed by a decline through 2004. The low numbers observed in recent years are due to the decreased percentage of immature birds. The cause or causes of this very poor recruitment is unknown and likely requires research on their nesting grounds.

Figure 3 shows a dramatic increase in turkey vulture numbers. A similar increase was also observed at the U.S. sites operated by SMRR. In recent years, this species has continuously had record numbers each season. In 2004, the turkey vulture count was 86% higher than the 1974 count at HBCA and in 2005 a record number of 41,500 vultures were sighted (not indicated on graph). All but one hawk watch site within the Central Continental Flyway have recorded increases in turkey vulture sightings (Berardi 2004).

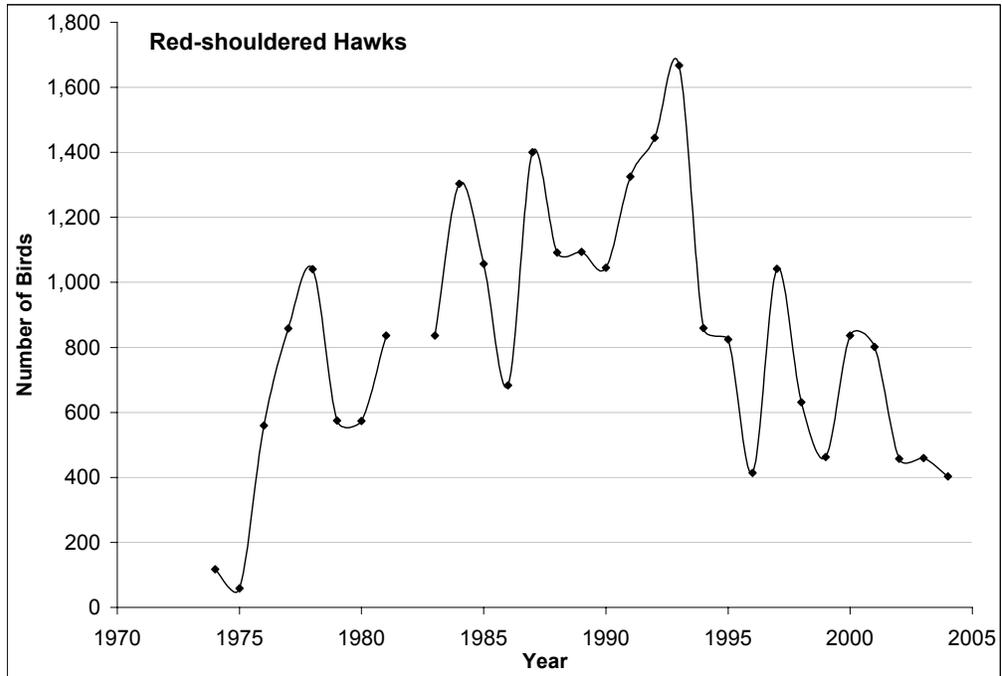


Figure 2. Red-shouldered hawk trend data from Holiday Beach, 1974-2004 (no data available for 1982).

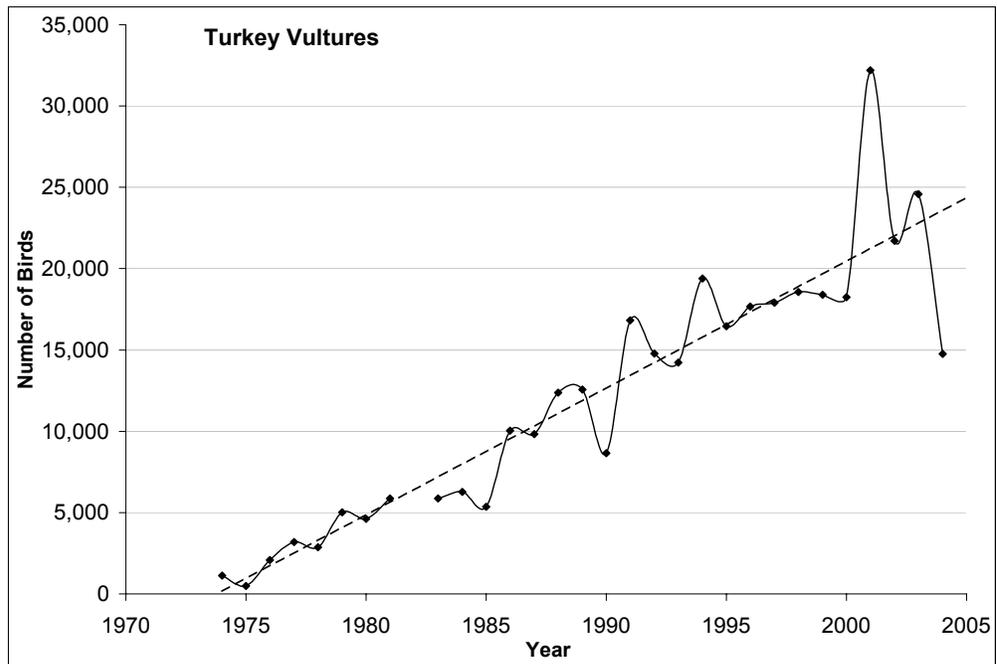


Figure 3. Turkey vulture trend data from Holiday Beach, 1974-2004 (no data available for 1982).

Figure 4 illustrates increases in numbers of peregrine falcons, ospreys, and bald eagles during the 30-year period, 1974-2004 (HBMO). Hawk watches throughout the Central Continental Flyway have also noted a similar increase (Berardi 2004). Ospreys and peregrine falcons were below their 10-year averages in 2004 (unlike SMRR's 2004 tally) by 27% and 30%, respectively. That same year, the bald eagle totals were approximately equal to their 10-year average.

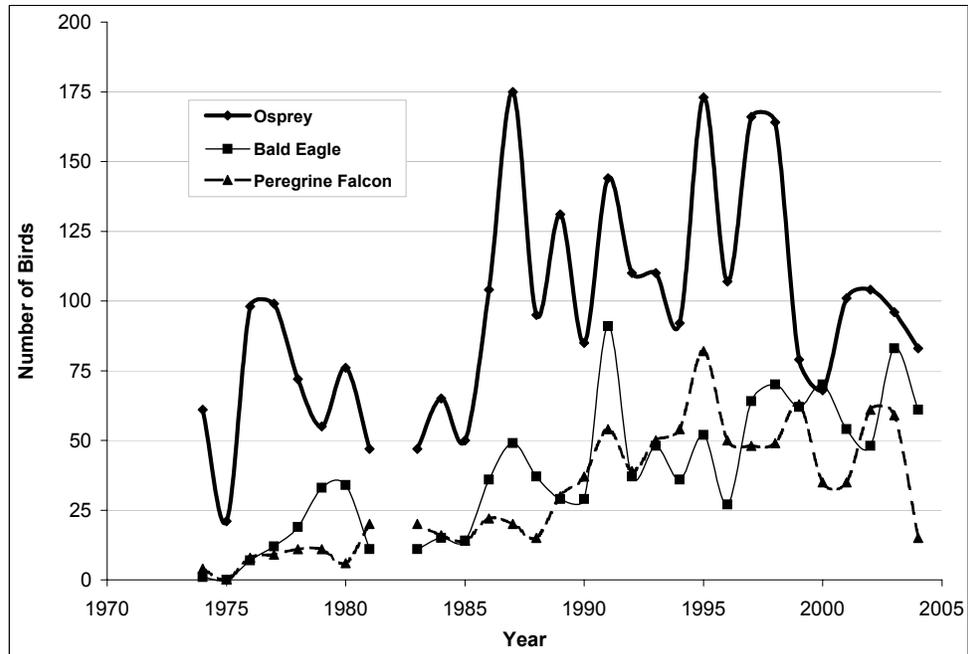


Figure 4. Osprey, bald eagle, and peregrine falcon trend data from Holiday Beach, 1974-2004 (no data available for 1982).

The sharp-shinned hawk is the most consistently observed raptor during the 92 days of the fall count season (Figure 5). Excluding days with severe weather (very high winds, thunderstorms, or driving rain), sharp-shinned hawks are recorded on 98% of the remaining count days. Figure 6 demonstrates that the yearly totals for this species are dramatically decreasing with 2004 being a record low count year. Even though wind direction does influence count totals, there is a real declining trend in sharp-shinned hawk numbers. This trend is recorded at many of the eastern count sites. Two factors



Figure 5. Sharp-shinned hawk (*Accipiter striatus*) (Photo credit: John Longhenry).

are thought to contribute to this decline. One is the possible reduction in prey species in their breeding range, since fall numbers reflect nesting success. The second factor may be that pesticide usage on their wintering areas in Central America is altering their reproductive success.

Management Next Steps

Reaching a goal of sustainable raptor populations will require increasing the carrying capacity in North America by improving the amount of foraging and nesting habitat through conservation and restoration. Because of the migratory nature of these birds, the populations will benefit most through an international conservation vision that includes both the breeding and wintering areas. Red-shouldered hawk management may require conservation and restoration of their preferred breeding habitats of damp woods, river bottomlands, and swamps with tall trees where birds can nest 6-20 meters (approximately 20-60 ft) above ground. Perches with a wide field of view could be constructed to assist the birds to hunt prey such as rodents, birds, frogs, and snakes (Fergus 2004).

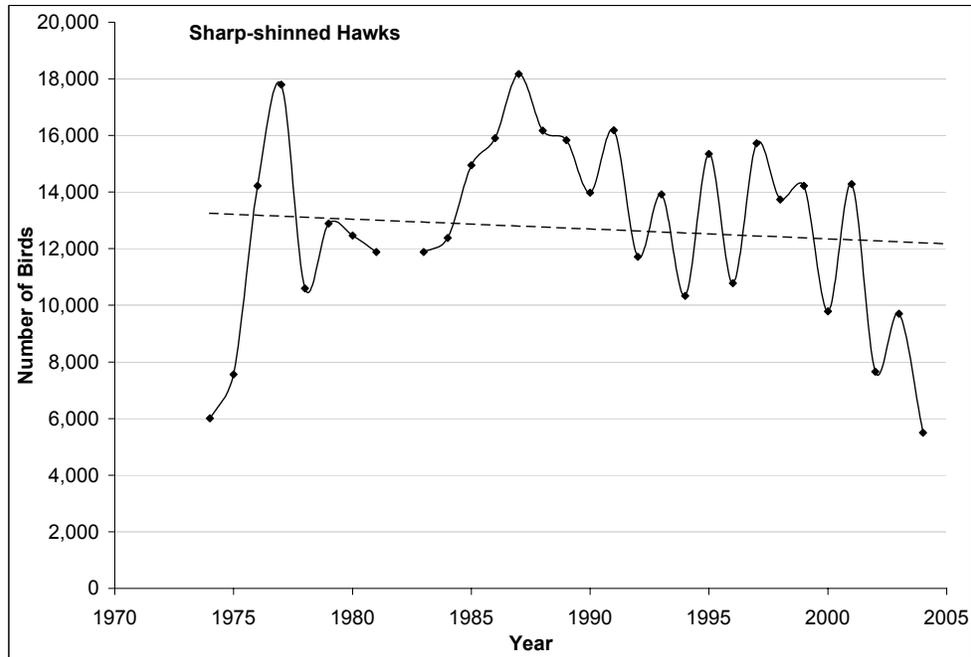


Figure 6. Sharp-shinned hawk trend data from Holiday Beach, 1974-2004 (no data available for 1982).

Research/Monitoring Needs

Monitoring consistently during fall migration should continue. Procedures and guidelines should be reviewed and updated each year. Improvements to the existing program should include more funding for paid staff (counters and banders), more educational opportunities for volunteers to maintain high standards of data collection, and more public outreach. Additional research efforts during the breeding season in north and northeastern Ontario could explain trends in population fluctuations (in particular, the red-shouldered hawk adult/immature ratios). Using radio-tagged birds would broaden our knowledge of the migration habits of each species. Increasing the number of raptor count sites would also help paint a broader picture of the scope of raptor migration and ultimately give us a more realistic view of their numbers.

Well-funded studies of the blood chemistry of migrating sharp-shinned hawks during their fall and spring passage need to be conducted to determine what foreign chemicals might be influencing reproductive success. Obtaining samples at both times of the year could show differences in the period of accumulation of any foreign material.

References

- Berardi, V. 2004. Fall 2003 Central continental flyway report. *HMANA Hawk Migration Studies* Vol. 29: No. 1.
- Chartier, A., and David Stimac. 2002. *Hawks of Holiday Beach: A Guide to Their Identification, Occurrence, and Habits at Holiday Beach Conservation Area, Ontario, Canada*. Second edition. Holiday Beach Migration Observatory.
- Fergus, C. 2004. Pennsylvania Game Commission. *Wildlife Notes*. <http://www.pgc.state.pa.us/pgc/cwp/view.asp?a=458&q=150468> (January 2006).

Links for More Information

Holiday Beach Migration Observatory (HBMO): <http://www.hbmo.org>

Southeastern Michigan Raptor Research (SMRR): <http://www.smrr.net/>

Hawk Migration Association of North America (HMANA): www.hmana.org

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