FALL RAPTOR MIGRATION TREND S AT THE DETROIT RIVER HAWK WATCH

Dave Oleyar, Senior Scientist, HawkWatch International, doleyar@hawkwatch.org

John Hartig, Visiting Scholar, Great Lakes Institute for Environmental Research, University of Windsor, jhhartig@uwindsor.ca

Background

Birds of prey can be indicators of ecosystem health because of their terminal position in the food web. Since a number of contaminants biomagnify through food webs, avian predators are usually the first wild species to show ill effects, such as failure to reproduce, egg shell thinning and nesting failure, or death through poisoning. Heavy metals and chlorine-based pesticides such as DDT, aldrin, dieldrin, and heptachlor have been implicated in causing such wildlife impacts. Trends in raptor numbers over time can indicate build up or removal of such toxins, the condition of the landscapes they live in, or other impacts that require further investigation.

The geography of the eastern Great Lakes, combined with the migratory preferences of North American birds of prey, provide unique opportunities to monitor status and trends of raptor populations at the mouth of the Detroit River. The Detroit River is at the intersection of the Atlantic and Mississippi Flyways making it a unique area to survey migrating birds, especially raptors. As raptors move south from their eastern Canadian breeding grounds, they are blocked by the north shore of Lakes Erie and Ontario. Thermals (i.e., rising columns of warm air) do not form over water so the birds are forced in one of two directions: east around Lake Ontario or west around Lake Erie. Those that move west follow the north shore of Lake Erie, until they reach the mouth of the Detroit River. Turning back is not an option so the birds fly over a four-mile span of water to southeast Michigan, specifically near Lake Erie Metropark and Pointe Mouillee State Game Area. They lose altitude as they cross, making it easier for them to be observed. Volunteer monitoring programs such as the Detroit River Hawk Watch (DRHW) have proven invaluable in monitoring fall raptor migrations. Migration monitoring at the DRHW occurs each fall from September through November for the last 28 years and 23 raptor species have been observed (16 regularly occurring species).

History of Detroit River Hawk Watch

DRHW gets its origin from the Lake Erie Metropark Hawk Watch in Gibraltar, Michigan that was founded in 1983. Counters discovered that the boat launch at Lake Erie Metropark and nearby Pointe Mouillee State Game Area Headquarters were viable sites for counting hawks crossing Lake Erie. In 1998 the Lake Erie Metropark Hawk Watch gained nonprofit status and became the Southeast Michigan Raptor Research. During these early years, DTE Energy generously provided support for a full-time hawk counter. In 2007, additional funding from the Detroit River International Wildlife Refuge helped compile the data and upload them to hawkcount,org, a database maintained by the Hawk

Migration Association of North America (HMANA). In 2008, U.S. Fish and Wildlife Service took over responsibility for the hawk watch as part of the Detroit River International Wildlife Refuge, with support from its Friends Organization called the International Wildlife Refuge Alliance. That same year the hawk watch's name was officially changed to DRHW. Federal funds and funds raised through the International Wildlife Refuge Alliance were made available to compile and analyze data collected since 1991 (Panko and Battaly, 2011). The Detroit River Hawk Watch Advisory Committee was formed in 2010 to help develop a site protocol with U.S. Fish and Wildlife Service, and provide recommendations for managing data, analyses, partnerships, and cooperative projects. In 2010, DRHW developed a new website (see http://detroitriverhawkwatch.org/).

Status and Trends

The Raptor Population Index (RPI) is a partnership between four leading hawk watch and migration research organizations: the Hawk Migration Association of North America (HMANA), Hawk Mountain Sanctuary (HMS), HawkWatch International (HWI), and Bird Studies Canada (BSC).

Accurate knowledge of population status and change is fundamental for bird conservation. Lack of reliable information on populations of many raptors forms a conspicuous gap in North American bird monitoring. The vision of the RPI partners is to contribute to effective conservation of migratory raptors through continent-wide long-term monitoring of raptor migration, scientifically sound assessments of population status, and public outreach and education. RPI analyzes count data from monitoring sites across the country in a standardized way and identifies recent (10-year), 20-year, and long-term (life of site) trends in migrants counted. See http://rpi-project.org/2016/ for results of the most recent analysis for all sites, and for detailed methodology.

The data below come from the 2016 RPI analysis for the DRHW. Results are for 10 years (2006-2016, 'recent') and the life of the site (1991-2016, 'long-term').

Species with increasing counts:
Counts of the following species are increasing over the long-term at the DRHW based on RPI results: Bald Eagle, Merlin, and Turkey Vulture. Results show no species with increasing counts over the last 10 years.

Species with decreasing counts:
Long-term declines in counts of migrants are strongly supported for Rough-legged Hawk and somewhat supported for American Kestrel, Northern Goshawk, and Osprey at the DRHW.

More concerning are declining counts for eight of the 14 species that we estimated trends for at the DRHW over the last 10 years, including American Kestrel, Golden Eagle, Cooper's Hawk, Osprey, Peregrine Falcon, Sharp-shinned Hawk, Red-shouldered Hawk, and Red-tailed Hawk.

Figure 1. Trends in major raptor species as measured by Detroit River Hawk Watch. Heading for each plot includes: estimated trend slope of line (negative values indicating declines and positive value indicating increases); 95% credible intervals for the trend estimate; and posterior probability (i.e., probability an event will happen after all evidence or background information has been taken into account) of that trend (weight of support for the trend—a value greater than or equal to 0.95 indicated a strongly supported trend, greater than equal to 0.9 a supported trend, less than 0.9 indicates the trend is not well supported (no trend)), 1991-2016 (http://rpi-project.org/2016/).

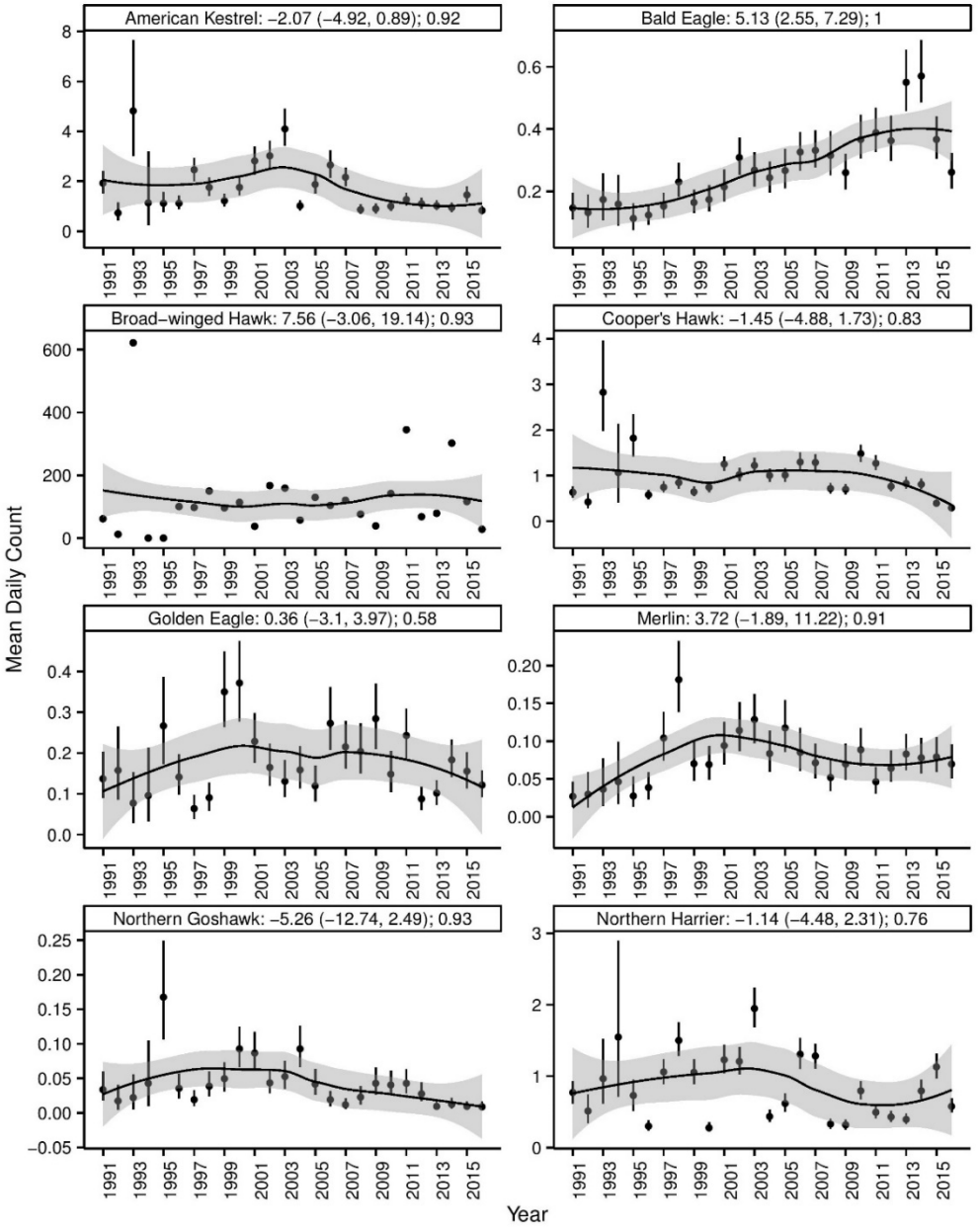
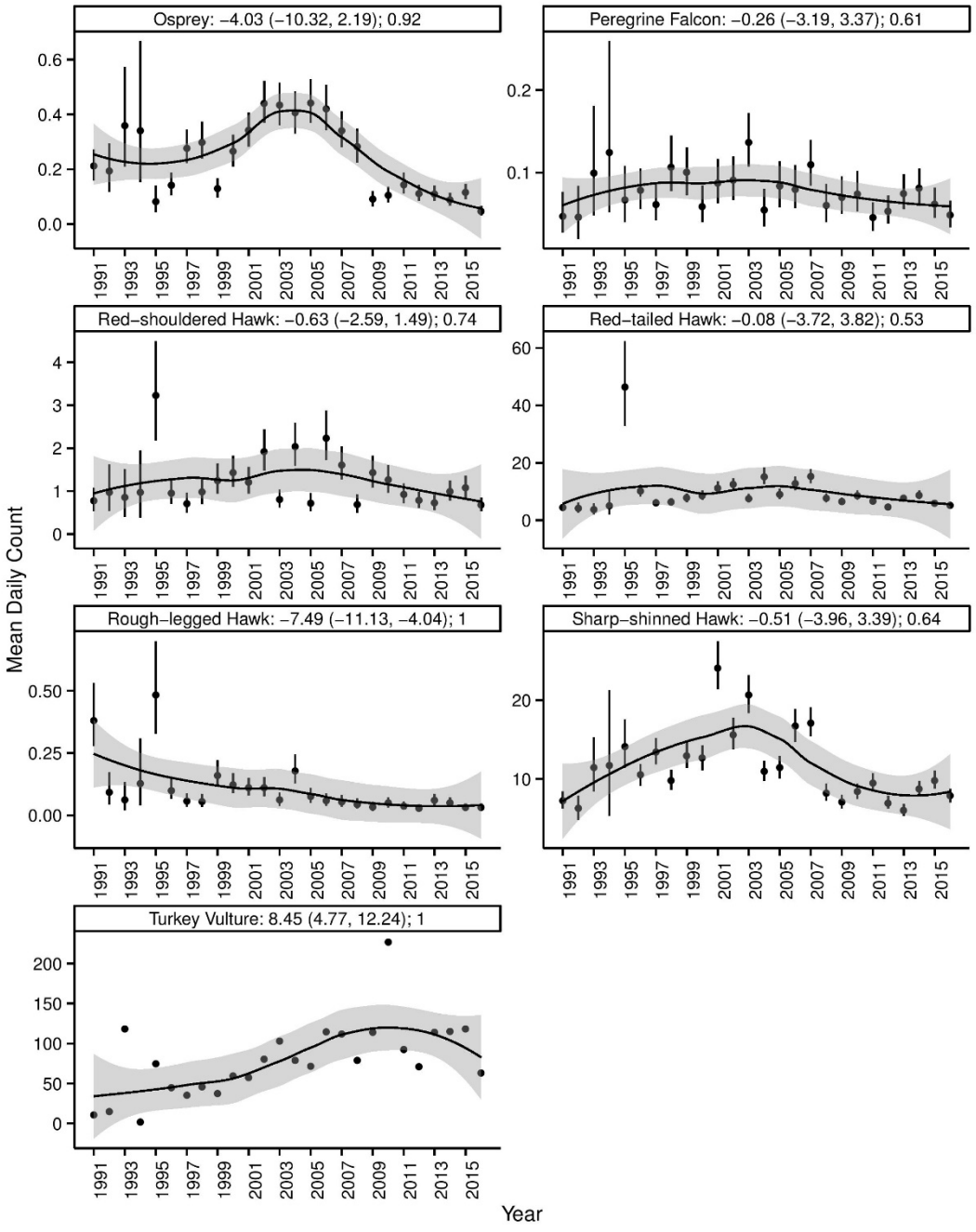

American Kestrel: −2.07 (−4.92, 0.89); 0.92
Bald Eagle: 5.13 (2.55, 7.29); 1
Broad−winged Hawk: 7.56 (−3.06, 19.14); 0.93
Cooper's Hawk: −1.45 (−4.88, 1.73); 0.83
Golden Eagle: 0.36 (−3.1, 3.97); 0.58
Merlin: 3.72 (−1.89, 11.22); 0.91
Northern Goshawk: −5.26 (−12.74, 2.49); 0.93
Northern Harrier: −1.14 (−4.48, 2.31); 0.76
Mean Daily Count
Year

Figure 1. Continued.



Reaching long-term goals of sustainable raptor populations will require increasing the amount of foraging and nesting habitats conserved and restored for a number of species. For example, management of Red-shouldered Hawks requires conservation and restoration of habitats such as damp woods, river bottomlands, and swamps with tall trees where they can nest 6-18 m above the ground. Efforts to decrease threats to raptor species (and other wildlife), including habitat loss and alteration, contaminants, electrocution, vehicle and structure collisions, and direct persecution, will contribute towards these goals.

While long-term monitoring such at that at the DRHW will not identify the drivers of declines and increases, they are essential to understanding the effectiveness of management efforts and policies designed to benefit raptors and other wildlife. Without the continuity of such efforts, any changes to trends will go unnoticed—both conservation successes and new or continued declines. Continued priority must be placed on recruitment of volunteers, as well as consistent funding for paid staff (counters and banders) and greater public outreach. Findings from this monitoring effort should steer focused research elsewhere to understand if recent declines indicate actual population decline, a shift in migration paths, or a shift in the proportion of populations that migrate.

References

Panko, D. and G. Battaly. 2010. Detroit River International Wildlife Refuge-raptor monitoring: Compilation and analysis of Hawk Watch data, Lake Erie Metropark and Pointe Mouillee, 1991-2008. Report to Detroit River International Wildlife Refuge, Grosse Ile, Michigan, USA.

Links for more information

Detroit River Hawk Watch: detroitriverhawkwatch.org
The Raptor Population Index: http://rpi-project.org/2016/