Detroit River Hawk Watch

2024 Season Summary

Rough-legged Hawk. Courtesy of J. Jourdan.

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Abstract

The 2024 count was the 42nd consecutive season of monitoring diurnal raptor migration at the mouth of the Detroit River and the 27th year of consistent coverage at Lake Erie Metropark. There were 602.7 hours of data collection with counts conducted over 90 days between September 1st and November 30th. This season, 79,317 total raptors of 16 species were counted. Outreach and community engagement continued to be successful, particularly through the Detroit River Hawk Watch Facebook, HawkFest, refuge programming, and sharing informational pamphlets at the count site.

Background

Accurate information about raptor population status and its change is fundamental for avian conservation. Since 1934, hawk watches have been established across the Americas to count diurnal raptors as they migrate in the spring and fall. Raptors often breed in remote northern areas and winter in Central and South America, so migration counts are the best way to monitor their populations[1]. Over 200 hawk watches are currently operating, most of which are run by highly skilled and dedicated volunteer groups. To facilitate communication between hawk watches and create a standardized count protocol, the Raptor Population Index (RPI) was created in 2004. The RPI takes the work of the volunteer counters and provides continental-scale statistical assessments of raptor population trends[2].

Most count sites occur along leading lines (mountain ridges) and diversion lines (coastlines), which are landscape features that tend to concentrate migrating raptors[3]. The western shore of Lake Huron and the northern shores of Lake Erie and Ontario act as a geographic funnel, creating a notable corridor for the passage of migratory birds. The pinch-point of this funnel, and thus the prime location for witnessing migration, is by the Detroit River[4].

The Lake Erie Metropark (LEMP) Hawk Watch was established in 1983 under the leadership of Tim Smart. Smart counted for several seasons at Holiday Beach Hawk Watch in Malden Center, Ontario, Canada. He knew that birds moving past Holiday Beach had to cross into Michigan near the Detroit region. Smart scouted the area, trying to find the most consistent concentration of raptors. He discovered that the LEMP Boat Launch and Pointe Mouillee State Game Area Headquarters parking lot were the best locations. Smart and a handful of dedicated volunteers began counting at these sites. In 1998, LEMP Hawk Watch became Southeastern Michigan Raptor Research (SMRR) and was granted nonprofit status. In 2008, SMRR turned over the count to the U.S. Fish and Wildlife Service (USFWS) at the Detroit River International Wildlife Refuge and its friends' group, the International Wildlife Refuge Alliance (IWRA). A standardized monitoring protocol was developed under the USFWS. The new protocol included dropping Pointe Mouille as a count site and LEMP becoming the sole location for the Hawk Watch[5].

DRHW is now a partnership among the USFWS, IWRA, Huron Clinton Metroparks, and the DRHW Advisory Committee. USFWS provides a program coordinator, IWRA funds the professional counter and two apprentices, Huron Clinton Metroparks hosts the count at LEMP, and the DRHW Advisory Committee allows community scientists with decades of hawk watch experience to advise program decisions. The 2024 count was the 42nd consecutive season of monitoring diurnal raptor migration at the mouth of the Detroit River and the 27th year of consistent coverage at Lake Erie Metropark.

Methods

Observation protocol was conducted in accordance with The Detroit River Hawk Watch Monitoring Protocol[6] except in the case of hourly weather recording. Hourly measurements were recorded directly from the Grosse Ile Weather Station (KONZ) at Weather Underground rather than with a handheld Kestrel device[7].

An hourly count of migrating diurnal raptors was conducted from 0900 – 1600 hours each day (weather permitting) between 01 September and 30 November 2024. The count was conducted at the LEMP boat ramp (N 42.0792, W 83.1937). Counters use binoculars up to the limit of 10x magnification to spot migrating raptors. The counters waited until migrants passed the northwestern/southeastern boundary (seawall) of the site before tallying them to mitigate double-counting and mistaking a non-migrant. During periods of large migration volume—typical of Broad-winged Hawks and Turkey Vultures—counters tallied birds exiting or entering kettles in a stream. Hourly weather and species totals were recorded on physical datasheets as well as entered directly into the Hawk Count website. A daily narrative was also submitted to Hawk Count upon the conclusion of the day's count.

We calculated the percent deviation of 2024 species counts in relation to LEMP's Long-Term Averages (LTA) since 1998 as well as 10-Year Averages (TYA). We also performed a linear regression analysis to examine the relationship between year and species counts. Scatter plots with trend lines from the regressions can be found in Appendix B. The t-values and p-values associated with the regressions can be found in the Species Account section for each species. The RPI provides an analysis that considers multiple sites, as well as the effect of date, weather, and observation hours on species, counts for a more accurate understanding of population trends[8]. The current RPI analyses (2009-2019) can be found at www.rpi-project.org.

Monthly Narratives

September

Image courtesy of E. Van Kirk.

September usually is an important contributor to the season totals due to the large number of Broad-winged Hawks that typically migrate over our site. The Broad-winged Hawk migration peaks in mid-September around weeks two and three of the watch. These birds are known to travel together in large groups known as kettles. They stream out of these large kettles and regroup as they head toward South America.

We sat diligently by the boat launch, waiting day after day for the Broad-winged Hawks to arrive. To our great dismay, they never showed in the tens of thousands typical at DRHW. Their absence was felt by our neighbor, Holiday Beach Hawk Watch, as well. The usual large kettles did not appear at any other northern hawk watches. We know the hawks did in fact make the journey because they were counted in typical numbers at southern sites such as Corpus Christi[9] and Veracruz[10]. The kettles could have passed to the north, crossed Lake Erie using the islands as stepping stones, or flown above us at altitudes that exceeded our vision.

Weather is only one of many variables that may alter the count from year to year, but it almost certainly had a hand in the exceptionally low Broad-wing numbers at DRHW this year. With less than 7,000 counted, 2024 is the lowest in the 27 years of consistent coverage at LEMP. The total Broad-winged Hawk count was just 11% of our LTA.

Summer lingered long into September and October. Many days saw clear blue skies, temperatures hovering near 70 F (21 C) and winds primarily from the south. Precipitation was also largely absent from the forecast. A high-pressure system had landed on top of us and refused to move on. Although this sounds excellent for most humans, it is not conducive to bird movement. An ideal day for migrating Broad-wings often includes cool northern winds and a rising barometer. But alas, with no variability in the weather, we were not graced by an ideal day this year.

Although we missed our Broad-wings, we persisted and appreciated the 11 other species seen this month. The ever-reliable Sharp-shinned Hawk made their usual mark. With over 2,000 seen, they were solidly in the range of normal. Turkey Vulture kettles in the hundreds showed up to start week three. They ended the month with just shy of 1,000 individuals counted. The latter half of September was also popular with the Northern Harrier, American Kestrel, Cooper's Hawk, and Osprey. Several dozen Bald Eagles and Red-tailed Hawks were also noted, along with Merlins and Peregrine Falcons in the single digits.

October

Image courtesy of J. Patterson.

October is a favorite month for many hawk watchers. Diversity becomes a keyword, as many different species take to the flyways. Trees take on more vibrant colors before shedding their leaves, and the dew point is sometimes reached— revealing spider webs and other details that normally remain unseen. The shortening days and cooler temperatures tell the birds that harsher weather is on the way and that the time to move south has arrived once more.

We struggled to shake the hold of summer, even into October. At the end of Hawk Watch week five, autumn seemed to be finally upon us. Although the temperature got back to 80 F (27 C) on the 21st, it went down to 33 F (.5 C) degrees on the 27th and spiked at 80 degrees again on the 29th. Counters jumped between their summer and winter closets as quickly as an angry Merlin jumped between targets.

In true October fashion, we saw representatives from 15 of our 16 total species for the year. The Broad-winged flights are generally considered to provide the most impressive sights at DRHW, however, the Turkey Vultures, who also travel in large congregations, outnumbered them handily this year. Turkey Vultures teetered across our sky by the thousands. Their perfectly symmetric bell curve peaked on October 15 with almost 8,500 individuals. The lovely Sharp-shinned Hawk broke 1,000 this month and Red-tailed Hawks were close with just under 900. The last three dozen dawdling Broad-wings dried up a few days into the month. American Kestrels dwindled into week seven. Red-shouldered Hawks, Harriers, and Bald Eagles were consistent throughout the month, but none of them broke 200 individuals.

Swainson's Hawk, an abundant western species, is one of the holy-grail rarities at DRHW. We were lucky to catch just one at the end of week seven. The arctic-breeders, Golden Eagle and Rough-legged Hawk, are common in low numbers at DRHW. They both showed up in relative abundance during the latter half of October. The 44 Golden Eagles counted marks the highest October since 2015. 14 light-morph Rough-legged were counted; besides last year, there haven't been over 10 Rough-legs in October since 2013.

November

Image courtesy of J. Jourdan.

November is the month that previews winter in small doses. Weather systems arrive that can deposit snow, instead of rain, and chilling winds can challenge the best technical clothing available. Although certain days can be rewarding with large numbers of eagles and buteos traveling through, there are a lot of days with little traffic as the season winds down.

Weeks nine and ten of the count were quite productive for our migrants. Turkey Vultures completed their final push by the 9th. Although the ~3,000 individuals are only 5% of their season total, watching the bomber-style flight will always provide entertainment. Red-tails came through, sometimes in the hundreds each day. The most impressive sight came when they kettled together, imitating the vultures with which they shared the sky; up to 10 were seen circling together. Red-shouldered Hawks were the only other species to comfortably break 100 in November. This smaller cousin of the Red-tail could be shy and cryptic until they banked, revealing the brilliant crescent on their wingtips. The ever-present Sharp-shin had a good flight, one of the few species to be seen reliably in most conditions. Bald Eagles, Cooper's Hawks, Harriers, as well as all three falcon species made an appearance.

We were treated to a handful of Rough-legs scattered throughout the month. Golden Eagles got over 60% of their season total in the first two weeks of November; we were even blessed with 21 in a single day. The American Goshawk, our 16th and final species for DRHW Fall 2024, was seen just three times. Goshawks hold the same status as Swainson's at our site: a coveted rarity that only makes occasional appearances.

Autumn gave way to winter rather abruptly in week 11. We received a few dustings of snow, and the roaring winds had the "feels like" temperatures in the low 30s F; it was more than enough to chill our counters to the bone. The bitter cold of the final weeks was made even more bitter by the waning daily counts; we averaged only 14 birds per day. Nevertheless, with persistence, the 2024 count season came to a solid end with 79,317 raptors counted. A respectable number even without the Broad-wings, defending our name as one of the most prolific northern count sites.

Species Accounts

Total

There were 79,317 raptors counted between September 1st and November 30th this year[11]. The 2024 count is 35% less than the Ten-Year Average (TYA) and 38% less than the Long-Term Average (LTA) (Appendix A).

Turkey Vulture

There were 65,220 Turkey Vultures counted between September 4th and November 28th this year[11]. The 2024 count is 3% greater than the TYA and 22% greater than the LTA (Appendix A). There is a significant positive trend in the number of Turkey Vulture counted at DRHW from 1998-2024 (t=3.77, P=0.001; Appendix B).

Image courtesy of W. Peregord, 2024.

Osprey

There were 18 Osprey counted between September 11th and October 11th this year[11]. The 2024 count is 53% less than the TYA and 83% less than the LTA (Appendix A). There is a significant negative trend in the number of Osprey counted at DRHW from 1988-2024 (t=-5.825, P<0.001; Appendix B).

Image courtesy of M. Hainen, 2024.

Bald Eagle

There were 230 Bald Eagles counted between September 5th and November 30th this year[11]. The 2024 count is 71% greater than the TYA and 44% greater than the LTA (Appendix A). There is a positive, but not significant, trend in the number of Bald Eagles counted at DRHW from 1998-2024 (t=0.870, P=0.393; Appendix B).

Image courtesy of W. Peregord, 2024.

Northern Harrier

There were 348 Northern Harriers counted between September 1st and November 28th this year[11]. The 2024 count is 17% less than the TYA and 22% less than the LTA (Appendix A). There is a negative, but not significant, trend in the number of Norther Harriers counted at DRHW from 1998-2024 (t=-1.695, P=0.103; Appendix B).

Image courtesy of M. Hainen, 2024.

Sharp-shinned Hawk

There were 3,496 Sharp-shinned Hawks counted between September 1st and November 28th this year[11]. The 2024 count is 35% less than the TYA and 42% less than the LTA (Appendix A). There is a significant negative trend in the number of Sharp-shinned Hawks counted at DRHW from 1998-2024 (t=-2.288, P=0.031; Appendix B).

Image courtesy of M. Hainen, 2024.

Cooper's Hawk

There were 119 Cooper's Hawks counted between September 3rd and November 27th this year[11]. The 2024 count is 5% less than the TYA and 69% less than the LTA (Appendix A). There is a significant negative trend in the number of Cooper's Hawks counted at DRHW from 1998-2024 (t=-4.369, P<0.001; Appendix B).

Image courtesy of A. Sturgess, 2024.

American Goshawk

There were 3 American Goshawks counted between November 4th and November 27th this year[11]. The 2024 count is the same as the TYA and 81% less than the LTA (Appendix A). There is a significant negative trend in the number of American Goshawk counted at DRHW from 1998-2024 (t=-5.441, P<0.001; Appendix B).

Image courtesy of A. Sturgess, 2014.

Red-shouldered Hawk

There were 336 Red-shouldered Hawks counted between October 4th and November 28th this year[11]. The 2024 count is 42% less than the TYA and 46% less than the LTA (Appendix A). There is a negative, but not significant, trend in the number of Red-shouldered Hawk counted at DRHW from 1998-2024 (t=-1.546, P=0.135; Appendix B).

Image courtesy of M. Hainen, 2024.

Broad-winged Hawk

There were 6,785 Broad-winged Hawks counted between September 2nd and November 24th this year[11]. The 2024 count is 86% less than the TYA and 89% less than the LTA (Appendix A). There is a negative, but not significant, trend in the number of Broad-winged Hawks counted at DRHW from 1998-2024 (t=-0.271, P=0.788; Appendix B).

Image courtesy of M. Hainen, 2024.

Swainson's Hawk

There was 1 Swainson's Hawk counted on October 7th this year[11]. The 2024 count is the same as the TYA and 70% less than the LTA (Appendix A).

Image courtesy of J. Jourdan, 2007.

Red-tailed Hawk

There were 2,028 Red-tailed Hawks counted between September 1st and November 29th this year[11]. The 2024 count is 46% less than the TYA and 54% less than the LTA (Appendix A). There is a negative, but not significant, trend in the number of Red-tailed Hawks counted at DRHW from 1998-2024 (t=-2.352, P=0.0268; Appendix B).

Image courtesy of M. Hainen, 2024.

Rough-legged Hawk

There were 21 Rough-legged Hawks counted between October 17th and November 28th this year[11]. The 2024 count is 11% more than the TYA and 34% less than the LTA (Appendix A). There is a significant negative trend in the number of Rough-legged Hawks counted at DRHW from 1998-2024 (t=-3.522, P=0.002; Appendix B).

Image courtesy of W. Peregord, 2024.

Golden Eagle

There were 120 Golden Eagles counted between October 14th and November 26th this year[11]. The 2024 count is 57% more than the TYA and 28% more than the LTA (Appendix A). There is a negative, but not significant, trend in the number of Golden Eagles counted at DRHW from 1998-2024 (t=-1.264, P=0.218; Appendix B).

Image courtesy of A. Sturgess, 2024.

American Kestrel

There were 410 American Kestrels counted between September 1st and November 7th this year[11]. The 2024 count is 52% less than the TYA and 55% less than the LTA (Appendix A). There is a negative, not significant, trend in the number of American Kestrels counted at DRHW from 1998-2024 (t=-1.481, P=0.151; Appendix B).

Image courtesy of M. Hainen, 2024.

Merlin

There were 27 Merlins counted between September 3rd and November 27th this year[11]. The 2024 count is 53% less than the TYA and 46% less than the LTA (Appendix A). There is a positive, but not significant, trend in the number of Merlins counted at DRHW from 1988-2024 (t=0.227, P=0.823; Appendix B).

Image courtesy of M. Patrikeev, 2024.

Peregrine Falcon

There were 34 Peregrine Falcons counted between September 5th and November 30th this year[11]. The 2024 count is 45% less than the TYA and 31% less than the LTA (Appendix A). There is a positive, but not significant, trend in the number of Peregrines counted at DRHW from 1998-2024 (t=1.629, P=0.116; Appendix B).

Image courtesy of A. Sturgess, 2024.

Unidentified Accipiters, Buteos, Falcons, Eagles, and Raptors

For a variety of reasons, even the most skilled raptor counters will not be able to confidently identify all migrants they observe. Unidentifiable raptors must be reported as unknown, rather than guessing[6,12]. There were 121 migrants not identified to species this year: 19 unidentified accipiters, 50 unidentified buteos, 15 unidentified falcons, 7 unidentified eagles, and 30 unidentified raptors[11]. Raptors not identified to species make up 0.15% of the DRHW 2024 count. Unidentified migrants at HMA sites ranges around 1-2% of season totals[12].

Species Accounts Discussion

Almost all the species counts were below the TYA and LTA (Appendix A). This is likely due to the unfavorable weather that we had from mid-September to early-October. The best fall migration conditions typically occur after the passage of a low-pressure system (cold front) and on days with northerly winds. Unfortunately, we experienced high-pressure systems (warm fronts) that did not pass for several weeks. There are weaker and fewer thermals in the middle of warm fronts. Additionally, in those weeks, we experience very low winds, often also from disadvantageous directions. With unfavorable weather, it was not unexpected that raptors altered their migration route/behavior this season.

This fall is just a snapshot of the overall trends in count data at DRHW. Our analysis is a linear regression of the number of birds counted. The RPI provides trend graphs for DRHW that consider many variables for a better understanding of populations[8,13]. Our regression showed that nine of the fifteen species regularly observed do not have significant changes in their counts from 1998-2024. Turkey Vulture counts have been increasing significantly; while Osprey, Cooper's Hawk, Rough-legged Hawk, and American Goshawk counts have been decreasing significantly. The RPI lists Turkey Vulture as a raptor species on the rise; their range is expanding northwards, likely due to their affinity for human-modified landscapes[13,14]. The RPI suggests that Osprey populations may be declining in the Northeast; however, with waterways not freezing during recent milder winters, Osprey may not need to migrate as far ("short-stopping"), or at all[13,15]. The RPI notes that Rough-legged Hawks are likely losing habitat due to development and changes in the climate; however, their primary food source, lemmings, follow an irruptive cycle, which may result in an irruptive migratory pattern in the raptors[13,15]. The RPI has found American Goshawk to be a species of high research and conservation priority, due to its consistent declines across hawkwatches and Christmas Bird Counts since 2009. Habitat loss is considered the primary threat to American Goshawk; loss of prey species and the spread of West Nile Virus may also contribute[13,15]. Although DRHW has counted fewer Cooper's Hawks in recent years, their population trends are variable across the continent and do not display a notable overall decline[13].

Outreach and Community Engagement

DRHW participates in outreach and community engagement in a variety of forms throughout the season to increase interest not only in the hawk watch but in raptor conservation as well. We provide those who visit the count site with pamphlets that detail information on raptor migration, species migration timelines, and give in-depth hawk identification information. We teach visitors important landmarks so that they can also see the raptors when counters call out their locations.

Several interpretive refuge programs were conducted during the count season. The goal was to increase awareness of DRHW, raptors, and raptor conservation. Let's Talk Hawks, Turkey Vulture Venture, Eagle Eyes to the Skies, and a drop-in craft program called Hawk Marionettes were this year's offerings.

Josh Haas orienting visitors to the count site during HawkFest weekend. Image courtesy of E. Van Kirk, 2024.

HawkFest 2024 was held on September 21st and 22nd at Lake Erie Metropark. The event was free to all visitors upon entering the park. The main event was held at the Marshlands Museum. Barb and Joe Rogers from the Wildlife Recovery Association presented interpretive talks with non-releasable educational birds. Josh Haas from Hawk Migration Association hosted talks for Michigan birding groups, such as Oakland Bird Alliance Young Birder's Club, and Washtenaw County Bird and Nature Alliance. Dave Hogan was banding raptors, and several were released with help from the public. Over 600 people visited the refuge tent at the museum to learn about raptor identification and our programs. Additionally, we welcomed 178 people at the count site and answered many questions about the raptors and migration. Next year, HawkFest will take place September 20th and 21st.

Listservs:

birders@great-lakes.net

birdnews@ontbirds.ca

birdhawk@hmana.org

Daily counts and narratives are submitted to three large listservs as well as a private mailing list.

In the last year, the Detroit River Hawk Watch Facebook Group has added 168 new members for a total of 2,646! Thank you for following and supporting us.

Season Staff

A new contract counter and two apprentices were hired for the 2024 season. The contract counter dedicated their time to locating and identifying migrating raptors. The apprentices developed raptor identification and data management skills, learning from the professional counter and volunteers. The apprentices also played a key role in visitor engagement and education at the count site. Erika Van Kirk assumed the responsibility of the USFWS Coordinator. Erika counted at DRHW as an apprentice in 2021 and 2022. Many thanks go out to the previous Coordinator, Refuge Biologist, Jessie Fletcher for her years of hard work and dedication to DRHW. Notably, Jessie spearheaded the apprenticeship program in 2021 and, due to her efforts, it is still going strong.

Jessie Fletcher (left) and Erika Van Kirk (right) at HawkFest 2023.

Michael Patrikeev – Contract Counter

Michael is a graduate of St. Petersburg State University (Russia). He studied diurnal birds of prey for his M.S. and various projects on raptor nesting ecology and habitat management. Michael headed the wildlife inventory section at the Ecological Centre of Azerbaijan and published The Birds of Azerbaijan in 2004. After arriving in Canada in 1992, he worked for the Canadian Wildlife Service, Ontario Ministry of Natural Resources, Parks Canada, The Nature Conservancy, and Texas Parks and Wildlife. Michael is now semi-retired and has counted at Whitefish Point and South Carolina Coastal Raptor Migration Survey.

Jo Patterson - Apprentice

Jo graduated from Grand Valley State University this summer. She studied Wildlife Biology, Natural Resource Management, and Geographic Information Systems. She has worked wildlife field seasons at Sleeping Bear Dunes National Lakeshore, Pierce Cedar Creek Institute, and the Corps of Engineers Garrison Project.

Ben Sehl - Apprentice

Ben graduated from Purdue University, where he studied Ecology, Evolution, and Environmental Biology. Since then, he has been working in education and interpretation. He has worked at Indiana Dunes National Park, Sequoia National Park, and in the Santa Cruz Mountains.

Non-Raptor Notes

In addition to counting raptors, DRHW staff and volunteers count migrating monarch butterflies, Blue Jays, and American Crows. In December 2020, the USFWS determined the monarch butterfly to be a candidate for listing under the Endangered Species Act but was precluded by higher-priority listing actions. The USFWS reviews the monarch's status each year until time and resources allow a listing proposal to be developed[16]. Blue Jays and American Crows migrate in large flocks, allowing them to be easily located and identified.

Monarchs

1,713 migrating monarch butterflies were counted during the 2024 season. The highest daily count of monarchs this season was 296 on 21 September. The bulk of the monarch migration occurred between 10 September and 04 October (Figure 1).

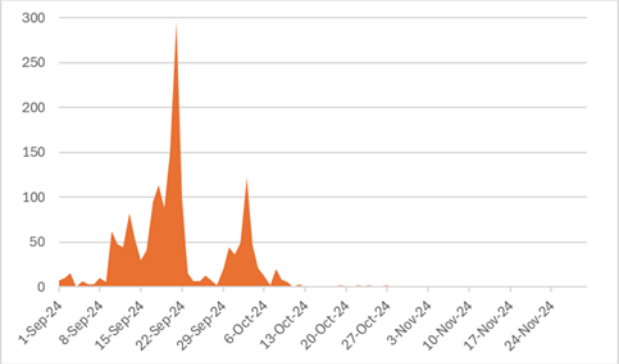

Figure 1. Daily monarch counts in 2024.

Blue Jays

88,844 migrating Blue Jays were counted during the 2024 season. The highest daily count of Blue Jays this season was 12,013 on 03 October. The bulk of the Blue Jay migration occurred between 16 September and 12 October (Figure 2).

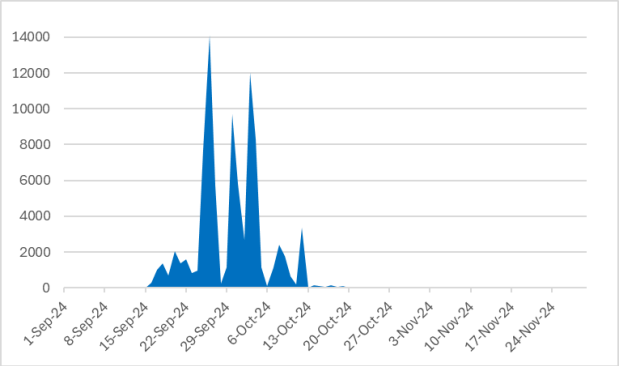

Figure 2. Daily Blue Jay counts in 2024.

American Crows

30,102 migrating American Crows were counted during the 2024 season. The highest daily count of American Crows this season was 10,542 on 02 November. The bulk of the American Crow migration occurred between 14 October and 15 November (Figure 3).

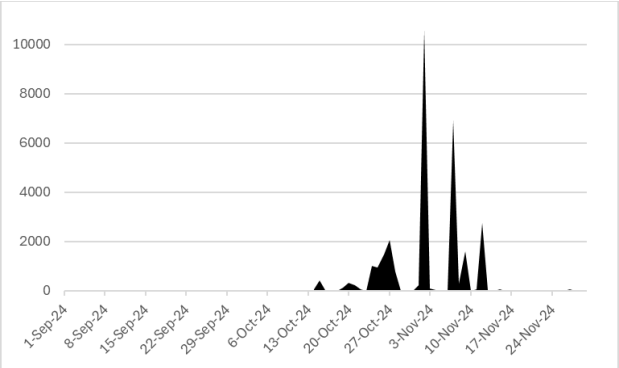

Figure 3. Daily American Crow counts in 2024.

Photographs

Blue Jay with peanuts. Courtesy of M. Hainen

Muskrat. Courtesy of A. Strugess

Female Belted Kingfisher. Courtesy of W. Peregord

Juvenile Herring Gull with yellow perch. Courtesy of W. Peregord

Northern water snake. Courtesy of B. Sehl

Monarch butterfly. Courtesy of W. Peregord

Cape May Warbler. Courtesy of M. Hainen

Bonepart's Gull. Courtesy of M. Hainen

Acknowledgments

Detroit River Hawk Watch is a collective effort supported by members of the United States Fish and Wildlife Service and a dedicated core of volunteers. The success of the Detroit River Hawk Watch itself would not be possible without the volunteers who log hundreds of hours counting hawks in all-weather situations. Thanks go out to Don Sherwood, Bill Peregord, Michelle Peregord, Andrew Sturgess, Rosemary Brady, Mark Hainen, Frank Kitakis, Johannes Postma, Jerry Jourdan, Shelly Andrews, Wave Reaume, Dan Atherton, and Sam Heilman; as well as USFWS Coordinator Erika Van Kirk, Professional Counter Michael Patrikeev, and Apprentices Jo Patterson and Ben Sehl.

Detroit River Hawk Watch is also grateful to all visitors (some regular) who came out on many occasions to assist with sightings and provide a break during particularly slow days. Special acknowledgment is made to Andrew Sturgess, Bill Peregord, Don Sherwood, Jerry Jourdan, Mark Hainen, and Michelle Peregord, all of whom provided wonderful photos and videos for the DRHW Facebook Page. Daily narratives, insights, and predictions provided by Michael Patrikeev, Andrew Sturgess, Jo Patterson, Ben Sehl, and Erika Van Kirk were posted to both HawkCount and the Detroit River Hawk Watch Facebook Page where they received many compliments. Of course, the success of the count would not be possible without financial and site support from the United States Fish and Wildlife Service, the International Wildlife Refuge Alliance, Huron-Clinton Metropolitan Authority at the Lake Erie Metropark, Hawk Migration Association, and DTE Energy. Volunteers are always welcome and are invited to come out to the boat launch at Lake Erie Metropark to join in our efforts. Keep looking up!

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Appendix A: Detroit River Hawk Watch species totals between 1998 - 2024. Totals for previous years, as well as the Long-term Average (LTA) and 10-year average between 2014 – 2023 (TYA) are given. 2024 deviations from the LTA and TYA are also shown in light blue (+ deviation) and light red (- deviation). Values greater than +/- 15% are notable and are shown in dark blue (+) and dark red (-). While continuous coverage at LEMP began in 1998, standardized counting protocols were not implemented until 2011.

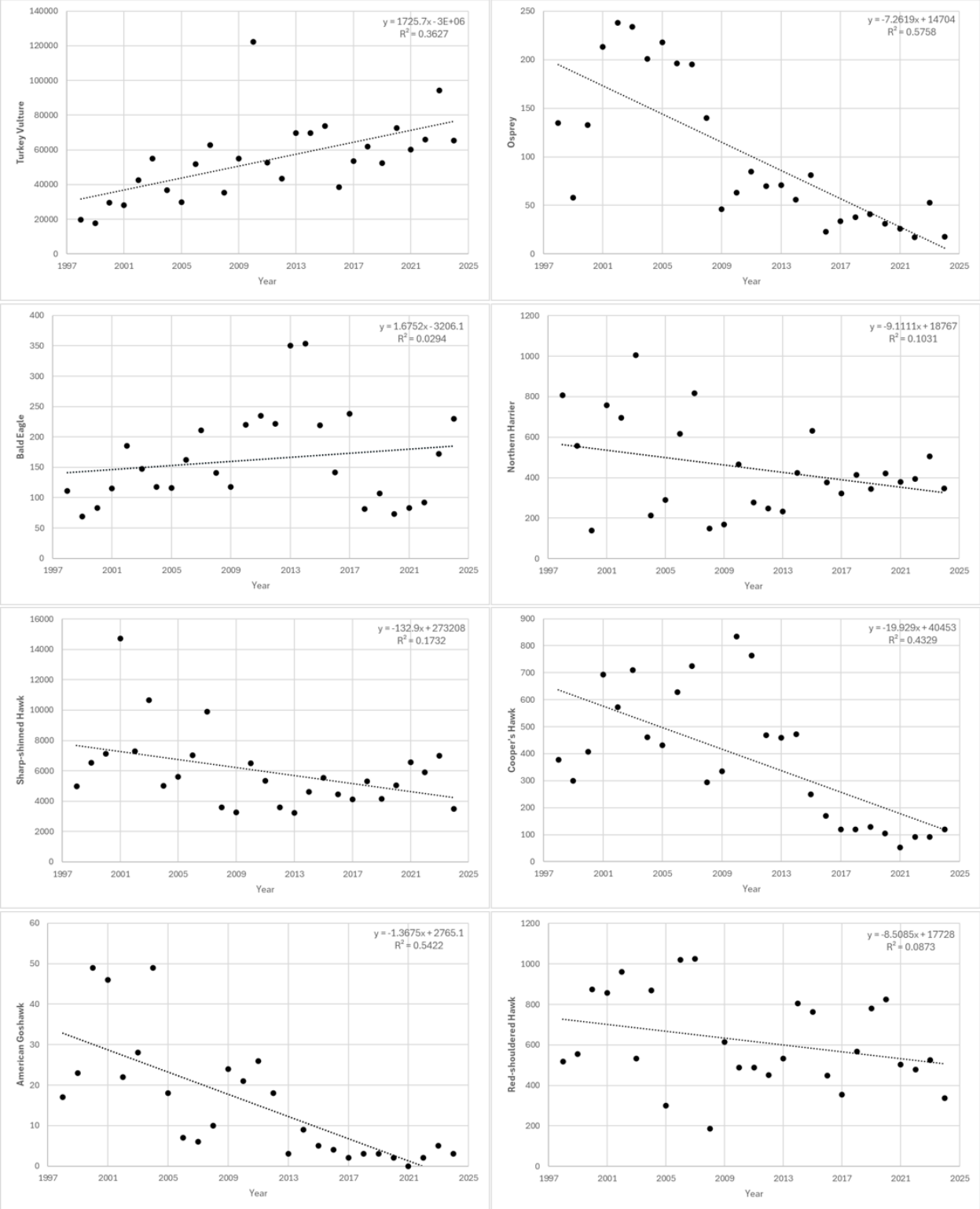
Year	Hours	TV*	OS	BE	NH	SS	CH	AG	RS	BW	SW	RT	RL	GE	AK	ML	PG	UNK	Total
1998	451	19743	135	111	807	4968	378	17	517	63689	5	3782	17	33	1046	**95**	52	86	95481
1999	481	17559	58	69	556	6534	299	23	556	45711	8	3504	76	**208**	664	30	49	47	75951
2000	510	29421	133	83	138	7132	408	**49**	875	57585	5	5754	55	188	790	34	24	37	102711
2001	526	28237	213	115	757	**14715**	693	46	858	19386	3	8153	55	120	1026	50	48	45	74520
2002	562	42644	**238**	185	696	7307	572	22	962	91499	3	6565	63	79	**2277**	64	52	15	153243
2003	545	54975	234	147	**1005**	10643	709	28	533	84085	**12**	5789	31	60	2128	72	**82**	0	160533
2004	479	36893	201	118	214	5027	461	49	869	27381	0	6155	**101**	79	470	38	20	0	78076
2005	456	29699	218	116	291	5623	432	18	299	56229	8	2619	30	45	1018	55	37	0	96737
2006	476	51722	196	162	616	7013	628	7	1019	50718	8	6025	27	124	1314	40	38	0	119657
2007	599	62882	195	211	818	9909	724	6	**1026**	69574	2	**9406**	29	124	1275	41	67	8	156297
2008	465	35173	140	141	149	3593	294	10	185	36216	0	2507	18	89	404	19	23	0	78961
2009	519	54989	46	118	169	3259	335	24	615	20016	4	2474	13	117	441	39	35	14	82708
2010	565	**122325**	63	220	465	6504	**834**	21	488	79572	5	3207	29	76	675	52	40	18	214594
2011	592	52745	85	235	278	5331	763	26	487	**195858**	5	4100	19	167	664	21	21	169	260974
2012	619	43285	70	222	248	3590	468	18	450	40923	4	2986	14	51	531	38	30	**182**	93110
2013	643	69723	71	350	234	3230	460	3	532	49629	5	3473	43	69	681	53	46	112	128714
2014	628	69768	56	**354**	423	4627	**472**	**9**	804	184860	**4**	4616	34	129	563	46	51	**115**	**266931**
2015	**648**	73601	**81**	219	**632**	5540	250	5	763	72461	1	4830	23	100	816	48	37	102	159509
2016	636	38528	23	142	377	4456	169	4	448	17529	0	2917	19	77	551	41	28	89	65398
2017	637	53393	34	238	323	4116	120	2	354	10392	2	2483	**35**	96	538	59	67	11	72263
2018	542	61967	38	81	413	5324	120	3	568	47246	3	3041	22	49	1104	56	74	14	120123
2019	575	52438	41	107	344	4167	128	3	779	64440	0	**4983**	14	62	718	37	53	3	128317
2020	568	72585	31	73	421	5050	105	2	**825**	16971	0	4241	27	55	641	67	**102**	4	101200
2021	532	60098	26	83	379	6571	52	0	502	21987	0	3643	4	65	1068	67	70	1	94616
2022	574	65788	17	92	393	5897	91	2	479	67349	0	4299	4	44	981	**79**	62	0	145577
2023	571	**94131**	53	172	506	**7008**	91	5	525	**107751**	1	3618	22	**138**	**1294**	60	65	4	215444
2024	**602**	**65220**	**18**	**230**	**348**	**3496**	**119**	**3**	**336**	**6785**	**1**	**2028**	**21**	**120**	**410**	**27**	**34**	**121**	**79317**
LT Average	554	53627	104	160	448	6044	387	15	628	61502	3	4430	32	94	911	50	49	41	128525
LT s	62	23083	76	78	229	2536	239	15	226	45582	3	1776	22	46	468	18	20	55	57033
LT Min	451	17559	17	69	138	3230	52	0	185	10392	0	2474	4	33	404	19	20	0	65398
LT Max	648	122325	238	354	1005	14715	834	49	1026	195858	12	9406	101	208	2277	95	102	182	266931
2024 Mean % Dev. From LTA	9	22	-83	44	-22	-42	-69	-81	-46	-89	-70	-54	-34	28	-55	-46	-31	192	-38
10-Yr Average	587	63614	38	134	421	5348	125	3	583	47347	1	3784	19	76	857	57	62	25	122494
10-Yr s	43	15772	19	62	95	1024	57	2	166	33152	1	870	10	30	268	13	22	40	46899
10-Yr Min	532	38528	17	73	323	4116	52	0	354	10392	0	2483	4	44	538	37	28	0	65398
10-Yr Max	648	94131	81	238	632	7008	250	5	825	107751	3	4983	35	138	1294	79	102	102	215444
2023 Mean % Dev.from 10-Yr Average	3	3	-53	71	-17	-35	-5	0	-42	-86	0	-46	11	57	-52	-53	-45	378	-35

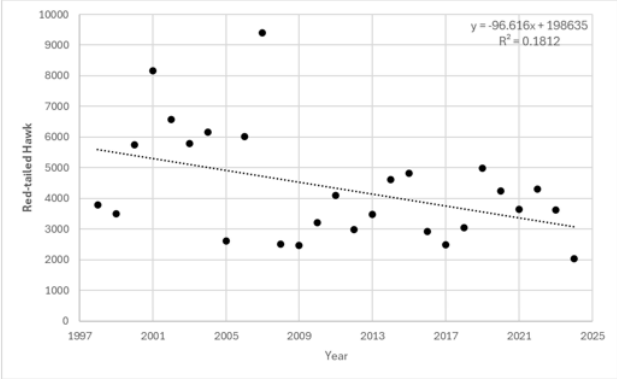
* - A single black vulture (Coragyps atratus) was observed migrating on 25 September 2015.

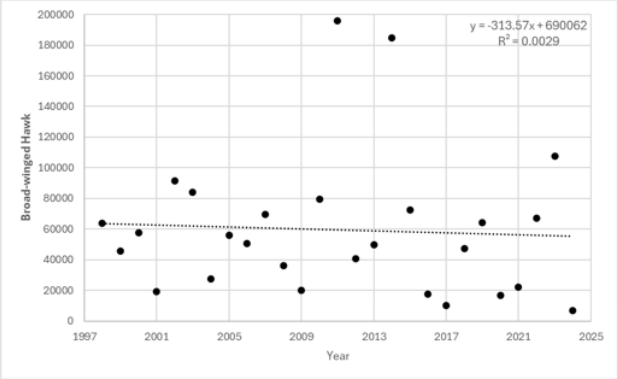
- 10-Yr Maximum

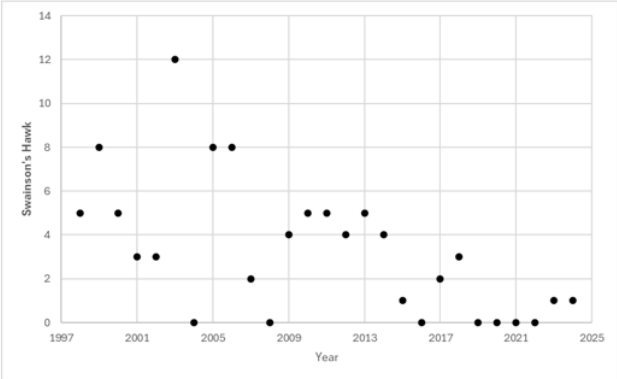
- Long Term Maximum

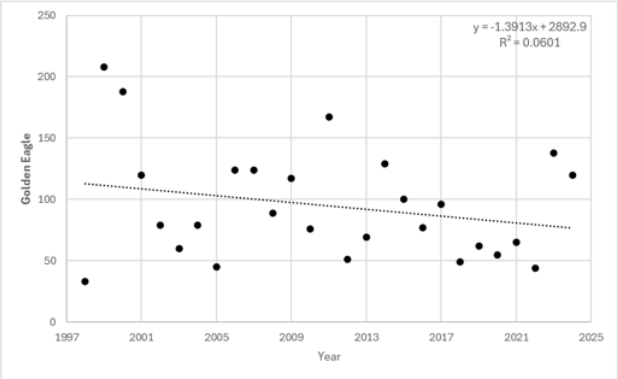
Appendix B: Scatterplots with linear trendlines of annual counts by species.

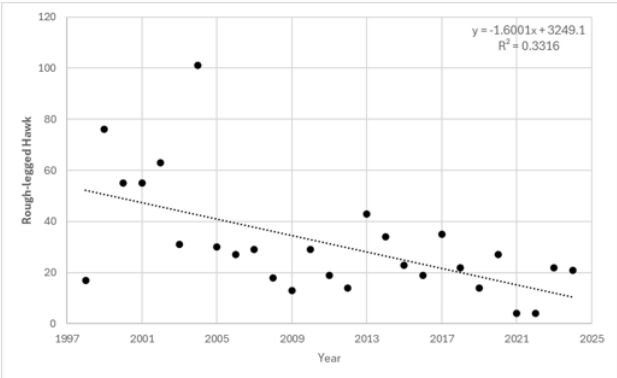


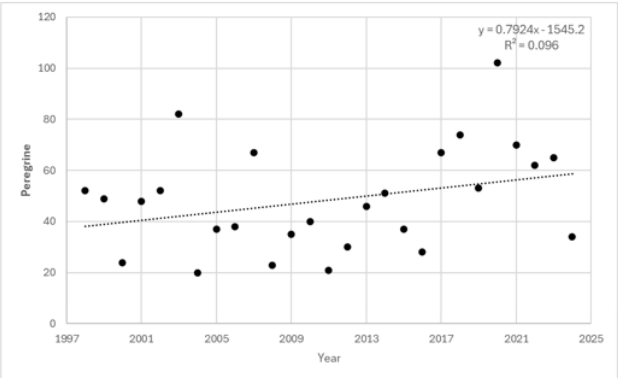

y = -96.616x + 198635
R² = 0.1812
Red-tailed Hawk
Year

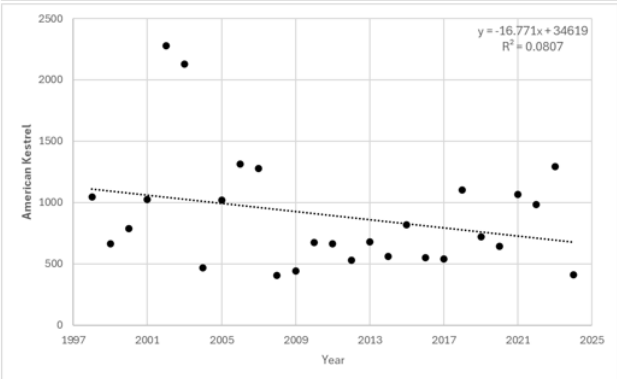

y = -313.57x + 690062
R² = 0.0029
Broad-winged Hawk
Year

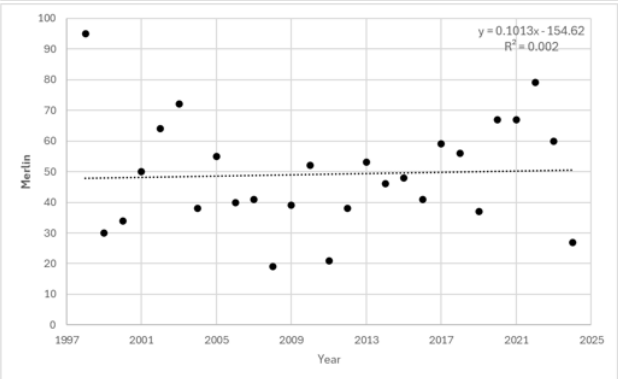

Swainson's Hawk
Year


y = -1.3913x + 2892.9
R² = 0.0601
Golden Eagle
Year


y = -1.6001x + 3249.1
R² = 0.3316
Rough-legged Hawk
Year


y = 0.7924x - 1545.2
R² = 0.096
Peregrine
Year


y = -16.771x + 34619
R² = 0.0807
American Kestrel
Year


y = 0.1013x - 154.62
R² = 0.002
Merlin
Year