Pack Monadnock Raptor Observatory
Final Report | Fall 2025

Common Raven and Bald Eagle © Chuck Carlson

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HARRIS CENTER FOR CONSERVATION EDUCATION

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Introduction

Pack Monadnock Raptor Observatory's 21st consecutive season was another great season of counting raptors and educating the public on the summit of Pack Monadnock. Run by the Harris Center for Conservation Education in partnership with NH Parks and the Department of Natural and Cultural Resources, this project collects important long-term data on raptor species. Numerous observers, visitors and volunteers came to count the season's 8,581 raptors that passed by the Observatory on their migration routes. Whether it was catching a glimpse of a brilliant white leucistic Red-tailed Hawk, watching a Northern Harrier playfully pursue a Peregrine Falcon, or admiring a Golden Eagle as it soared low through the valley, the fall was filled with special moments observing these incredible birds.

Why Pack Monadnock?

Pack Monadnock is ideally situated for the study of raptor migration. In order to efficiently complete migrations of hundreds or thousands of miles to their wintering grounds, raptors follow mountain ridges to find thermals and updrafts. Caused by the sun warming up the ground or rocky areas on mountaintops, thermals are rising columns of air that allow birds to effortlessly gain altitude before gliding for long distances. Updrafts form on windy days when air is forced upwards after hitting the side of the ridge, which again helps raptors travel without having to spend as much time flapping. With favorable winds, generally from a northerly or westerly direction, raptors can travel up to a few hundred miles in a single day. To conserve energy on their flight, migrants like to follow continuous leading lines such as north-south running mountain ridges, river valleys, and coastlines. This combination of geography and weather patterns brings raptors by Pack Monadnock, a more northern and eastern mountain in the Appalachian Mountain range of North America. Pack Monadnock has long been known as an excellent vantage point for observing raptor migration because of its high elevation, location along the north-south running Wapack ridgeline, and prominent views to the north and west. With a seasonally operated auto road, it is also easily accessible by both counters and visitors.

Site Description

The Pack Monadnock Raptor Observatory (PMRO) is located near the summit of Pack Monadnock (2,290 feet) within Miller State Park in Peterborough, New Hampshire. Stationed in south-central New Hampshire along the scenic and rugged 22-mile-long Wapack Range, the Observatory platform offers spectacular views to the north and west, including Mount Washington, the White Mountains, Crotched Mountain, Mount Kearsarge, Mount Cardigan, North Pack Monadnock, Mount Monadnock, and several summits in Vermont. Able to accommodate large crowds during peak season, the observation platform is accessed via a short, hard-packed trail from the parking lot atop the scenic summit. This parking lot can be reached from the 1.5-mile paved auto road that connects to the park's entrance at the base of the mountain from NH 101. The observation platform can also be reached from several hiking trails along the mountain for those seeking a less paved route. Bad weather notwithstanding, the auto road is generally open to vehicles through Veterans Day (conditions permitting), while the trails remain open to hikers year-round.

History and Mission

Like many of New Hampshire's mountains, Pack Monadnock has a long and storied history of human use, including hawkwatching. The Hawk Migration Association (HMA) has data going back to the mid 1970s, mostly collected in the month of September on days that looked promising for a Broad-winged Hawk flight. In 2005, PMRO was officially founded by New Hampshire Audubon under the leadership of Iain MacLeod, with initial funding from the Samuel P. Hunt Foundation, the Monadnock Community Foundation, and the Putnam Foundation. This allowed for the hire of a seasonal biologist/interpreter to staff the hawk watch full-time through the fall migration season. PMRO has been staffed by an official counter every year since, thanks to continued fundraising and support. In 2018, the Harris Center for Conservation Education came on board to partner with NH Audubon to jointly run PMRO. The hawk watch was fully handed over to the Harris Center for Conservation Education in 2022. Pack Monadnock Raptor Observatory has become a fixture of the local community and is widely renowned as one of the premier hawkwatching locations in New England.

The Observatory is one of at least 87 hawk watches located in a region designated by HMA as the 'Eastern Flyway,' which runs the length of the east coast of North America from New Brunswick, Canada, all the way south to Alabama. Hawk watches along this flyway and throughout the Americas report data to the online database, http://hawkcount.org, maintained by PMRO's partner organization, HMA. Further, the Observatory, owing to its longevity and standardized methodology, is now part of a select analysis through the Raptor Population Index (RPI), a project of HMA and other partners. The set of raptor migration monitoring sites chosen for the RPI analysis is the 'gold standard' for hawk watches, as each contributes key data that conservation biologists use to make determinations about global populations of raptors and conservation strategies for them. In this way, PMRO plays a key regional role in this periodic analysis, the most recent of which was completed in 2023. For more information, see http://rpi-project.org/index.php.

Opening Day at Pack Monadnock. © Phil Brown

Education and Outreach

Environmental education is a key element of the hawk watch. The Harris Center is dedicated to promoting understanding and respect for our natural environment through education of all ages, direct protection and exemplary stewardship of the region's natural resources, conservation research, and programs that encourage active participation in the great outdoors. PMRO's work aligns beautifully with this mission. The splendor of a New England autumn and the accessibility of the mountain draws visitors from across the country and around the world. Local schools bring classes to the Observatory to learn about and witness hawk migration. Every year, PMRO provides thousands of people with the opportunity to learn more about the natural world around them, and some of these visitors become dedicated volunteers at Pack or their own local hawk watch.

This year, a record-high total of 6,449 visitors interacted with counters and informative signage posted around the platform. School groups, birding clubs, and other organizations planned trips to witness the magic of migration and learn about why it matters. Over 300 students visited the hawk watch as a part of their schooling, some already having worked with the Harris Center on a "raptor unit" in the classroom. The Observatory welcomes many more school groups to visit us in future years. To arrange a visit, contact Miller State Park at (603) 924-3672.

A busy September weekend at Pack. © Harris Center

Visiting School Groups

- Wells Memorial School - Harrisville, NH
- Wilkins Elementary School - Amherst, NH
- Mountain View Middle School - Goffstown, NH
- Mountain Shadows School - Dublin, NH
- High Mowing School - Wilton, NH
- Peterborough Elementary School - Peterborough, NH
- The Well School - Peterborough, NH
- Jaffrey Grade School - Jaffrey, NH
- Antioch University - Keene, NH

Visiting Organizations

- Seacoast Chapter of NH Audubon
- Monadnock Bird and Nature Club
- South Shore Bird Club
- Bowman Place

Events

Raptor Release September 20

Raptor Release Day came on a clear, sunny day with a temperature of almost sixty degrees and a gentle breeze from the northwest. This year, three Broad-winged Hawks from Wings of the Dawn Wildlife Rehabilitation Center were released back into the wild from the Observatory platform to the delight of both the children and adults in the audience. The Broad-winged Hawks, an adult and two juveniles, had all tested positive for rodenticide exposure, which is a major threat to raptor populations. This popular event not only offers a chance to experience raptors up close but also sheds light on the challenges that these birds face during their daily lives and the actions we can take to help protect them.

Kate McKay releases a rehabilitated Broad-winged Hawk on raptor release day. ©Susan Kline

Big Sit! October 11

The weather also cooperated nicely for the Big Sit in October. The complete bird list for the day reached 33 species (slightly more than the past few years), with highlights including a pair of Common Loons, a flyby Red-bellied Woodpecker, and flocks of Pine Siskins. In addition to the diverse mix of non-raptor species, it was also an excellent day for raptor migration with over 100 individuals counted, representing 11 species, including a late immature Broad-winged Hawk and several kettles of Turkey Vultures.

Big Soup! November 8

It was difficult to vote on the five soups entered in this year's friendly contest because they were all delicious. The winning soup, made by former counter Katrina Fenton, was called "Golden Dahlicious." During the soup competition, we were treated to the sight of a Golden Eagle flying by in front of the hawk watch, fairly distant but still closer than most of the Golden Eagles this year. For many observers present, it was the only Golden Eagle they got to see this season. A total of 100 visitors came by the hawk watch throughout the day, several pausing to taste our soups and vote for their favorites.

Methods

For 21 years, data collection has remained largely standardized and unchanged, the exceptions being the lengthening of the official season, the last of which occurred eleven years ago. This season marked the eleventh year that data collection has extended beyond November 15th. A written protocol was recently introduced, and qualified counters have always enforced standardized protocol to ensure consistent quality data collection. Standardization eliminates unnecessary variables that could impart negative and unforeseen influences on subsequent analyses. For the 2025 season, an official counter was present daily at the count site for the entire survey period from September 1 through November 20. Exceptions were made on rainy days and days with less than 2 km visibility (the distance to North Pack Monadnock from the Observatory) when the count would be postponed or canceled until conditions improved.

The season's official hours were 8 a.m. EST to 4 p.m. EST from September 1 through November 1, then from 9 a.m. EST to 3 p.m. EST from November 2 through November 20. The switch from Daylight Savings Time to Eastern Standard Time marked the change in hours. On days when the weather forecasts were favorable for good flights, the counter made the effort to extend the effort beyond the regular hours. This involved getting to the hawk watch early or using the "15-minute rule" to stay late on days when the flight continued past the official count hours. With this rule, if a raptor were seen within a 15-minute block, the counter would stay for another quarter hour until a quarter-hour went by without a migrant.

Once again, hawk watch volunteer extraordinaire Glen Chretien spent some time at the Observatory during the month of August this year, putting in an additional 23.75 hours between August 18 and August 31 and recording 39 migrants of six different species.

While some migrating raptors are undoubtedly first detected with the unaided eye, optics are integral to the project. Without them, a much smaller portion of migrants would be successfully spotted and correctly identified. Along with standard 8x-10x binoculars, spotting scopes (20x-60x) are employed to scan distant horizons and detect raptors that otherwise could be dismissed as specks of dirt on binocular lenses. Quality optics are often necessary to ensure accurate IDs on distant, challenging species but are also useful for semi-distant or distant rare birds that need 100% confidence by the lead counter.

In order to be added to the official count, a raptor must be deemed actively migrating. The distinction between migrating and non-migrating raptors is determined by various factors, including known

migration periods for a given species at this site, knowledge of the local individuals based on early season viewing, and the behavior of the individual bird or kettle being monitored. However, this distinction can be tricky, particularly for such species where local, non-migratory individuals are regularly seen throughout parts of the season. Troublesome species include Turkey Vulture, Bald Eagle, Cooper's Hawk, Red-tailed Hawk, Merlin, and in some years, American Goshawk, Red-shouldered Hawk, and Sharp-shinned Hawk.

Beyond numbers and species, hourly data are (to a varying degree) collected on the height of flight, flight direction, and distance for migrants. Weather data are collected at the top of each hour. These data include cloud cover, wind speed and direction, visibility, and the temperature in degrees Celsius. This information, along with a daily summary and next-day forecast, is submitted to HawkCount (https://www.hawkcount.org), the online hawk watch database for the Hawk Migration Association. Copies of this daily report are submitted to the NH.Birds listserv.

In addition to migrating raptors, daily checklists (including numbers) are typically kept for other species of birds. This information, along with raptor numbers (migrants and non-migrants), is then submitted to eBird (https://ebird.org), an online database of bird observations that provides scientists, researchers, and amateur naturalists with real-time data about bird distribution and abundance. All checklists are submitted to the 'Miller SP–Pack Monadnock' hotspot (https://ebird.org/hotspot/L450946).

The 2025 Season

A total of 8,581 migrating raptors, composed of 15 different species, was tallied over the course of 605.5 observation hours. It was a relatively low year for Broad-winged Hawks, which brought the total raptor count down, but the tally of 5,821 Broad-winged Hawks was still an increase from last year's record-low count of 3,042. This year, about 68% of the migrants counted were Broad-winged Hawks. One species set a record-high count this season, the Black Vulture, which has only recently begun to make appearances over the past few years. And Northern Harriers almost passed their season-high count, with a final tally that was only a few birds away from the all-time record.

September

Total September Migrants: 7,280

A drought across New England resulted in a sunny, dry September that had only two days when it was rainy enough for the count to be canceled for the day. The best day of the entire season came on September 14th, when a total of 3,376 migrants were recorded. The majority of them were Broad-winged Hawks but there were also good numbers of Sharp-shinned Hawks, American Kestrels, and Ospreys mixed in. Sharp-shinned Hawks, American Kestrels, and Cooper's Hawks had especially good flights in September, with each species posting second-highest single-day counts during the middle of the month.

October

Total October Migrants: 980

Warm weather continued well into October, a month historically marked with numerous cold and foggy days. As is usual for October, the month held a nice diversity of raptor species, including all fifteen species seen this season. This month brought the first Golden Eagles and American Goshawks, two uncommon migrants that always cause considerable excitement. Additionally, a leucistic, mostly white Red-tailed Hawk that spent two days drifting about above the Observatory was a pleasant surprise.

November

Total November Migrants: 282

Despite occasional snow squalls and strong wind gusts, November remained relatively mild overall. These weather conditions might have contributed to lower flights of Red-tailed Hawks and Red-shouldered Hawks, raptors that will sometimes choose to delay migration if weather is favorable and food is still plentiful. November brought many exciting non-raptor sightings including Pack's third-ever Townsend's Solitaire, flocks of Evening Grosbeaks, and one Pine Grosbeak.

An adult Red-tailed Hawk kiting over Pack. © Chuck Carlson

Species Accounts

Black Vulture (*Coragyps atratus*)

Season Total: 6
High count: 2 (August 31, October 5)
21-year Mean: <1
21-year Median: <1
Number counted between November 16 and 20: 0
RPI (2006-2023): N/A

A species that has been expanding its range into the northeast in recent years, Black Vultures were first recorded from PMRO in 2021 and have been seen from the Observatory almost every year since. This year's total of six set a new season high for the species. Two of them were sighted in late August and four more were seen during October. There were also two seen during the month of September, but they were not counted as migrating since they were flying northward.

Turkey Vulture (*Cathartes aura*)

Season Total: 222
High Count: 87 (October 11)
21-year Mean: 198
21-year Median: 145
Number counted between November 16 and 20: 0
RPI (2006-2023): +11.53% per year

Turkey Vulture numbers were close to average this year. The largest Turkey Vulture kettles came during October on days when there were light winds with a westerly component. Although the number of Turkey Vultures seen at PMRO each year can vary widely, this species seems to be experiencing a steady upward population trend throughout the years.

Osprey (*Pandion haliaetus*)

Season Total: 167
High Count: 24 (September 14)
21-year Mean: 213
21-year Median: 201
Number counted between November 16 and 20: 0
RPI (2006-2023): -4.89% per year

Once again, Ospreys ended the year with a tally slightly below average. In recent years, it has become more common for the Bald Eagle count to surpass the Osprey count at PMRO and other nearby hawk watches including Putney Mountain. This trend happened again for Pack this year but only by a few

birds. Overall, the data shows a long-term decline in migration for Ospreys at the Observatory. It is interesting to note that fewer Ospreys were seen migrating in October this year than in prior years.

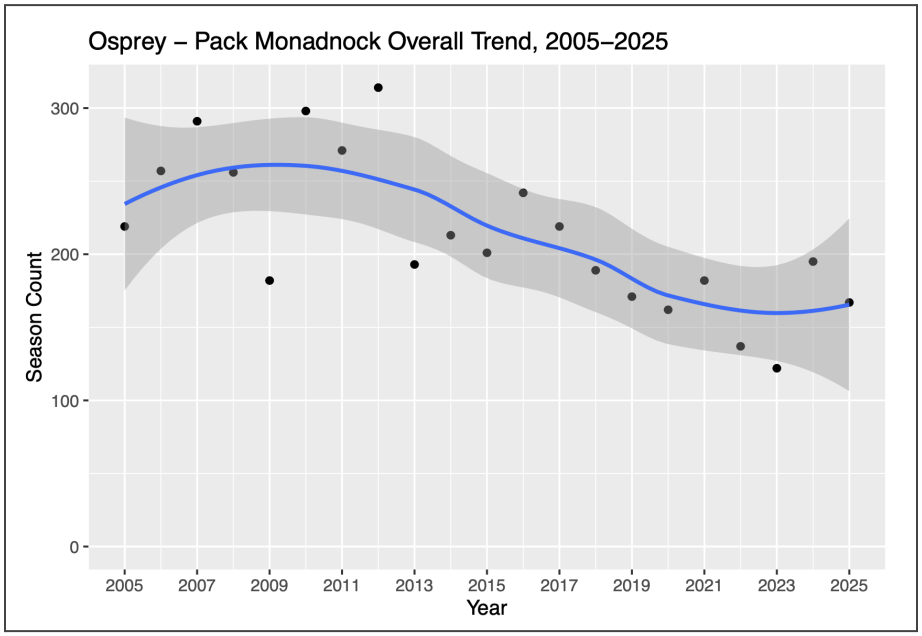


Figure 1. *PMRO Overall Osprey Trend from 2005 to 2025*

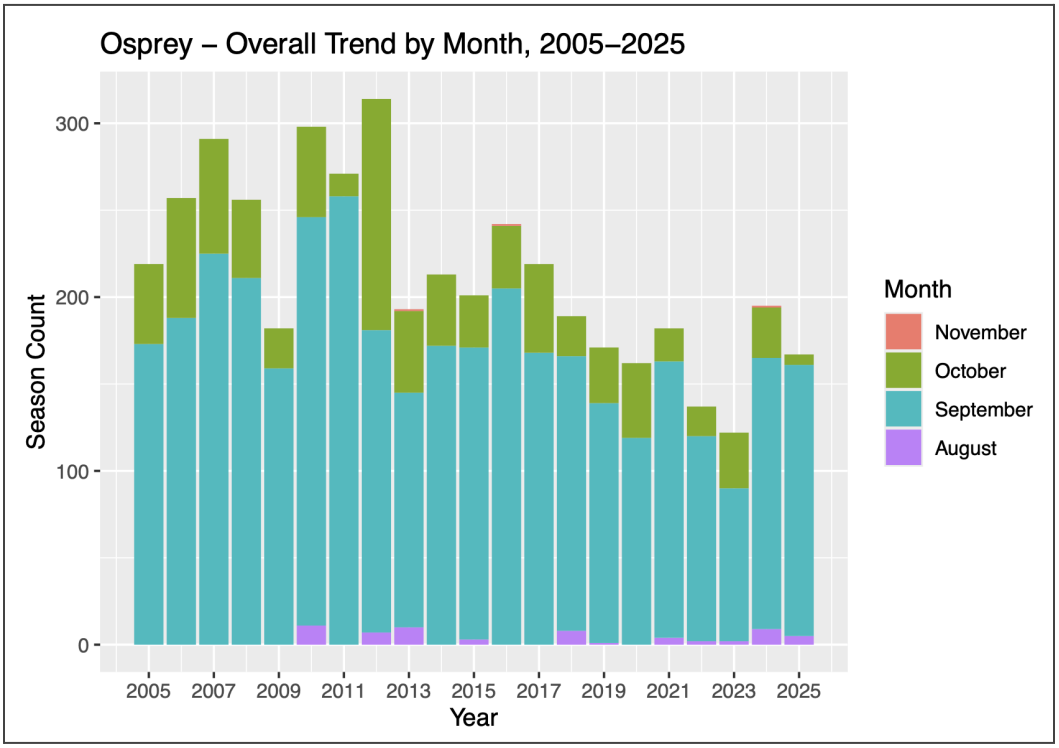


Figure 2. *PMRO Osprey Trend by Month from 2005 to 2025*

Bald Eagle (*Haliaetus leucocephalus*)

Season Total: 170
High Count: 18 (September 14)
21-year Mean: 127
21-year Median: 132
Number counted between November 16 and 20: 7
RPI (2006-2023): +9.77% per year

The Bald Eagle count was slightly above average and very close to last year's count of 173. This year follows the trend observed at PMRO over the past three years where Bald Eagles have not made a new season high after several years of steady increase, suggesting that Bald Eagle numbers may have started to level off. According to NH Audubon, Bald Eagles reached a record high number of territorial pairs within the state this year. Despite the increase in territorial pairs, breeding success was on the lower side, likely caused by poor weather during early spring when the young are most vulnerable. Once again, PMRO counters were conservative when recording Bald Eagle numbers to avoid adding non-migratory individuals to the count. Local birds were ruled out based on flight direction, behavior, and timing.

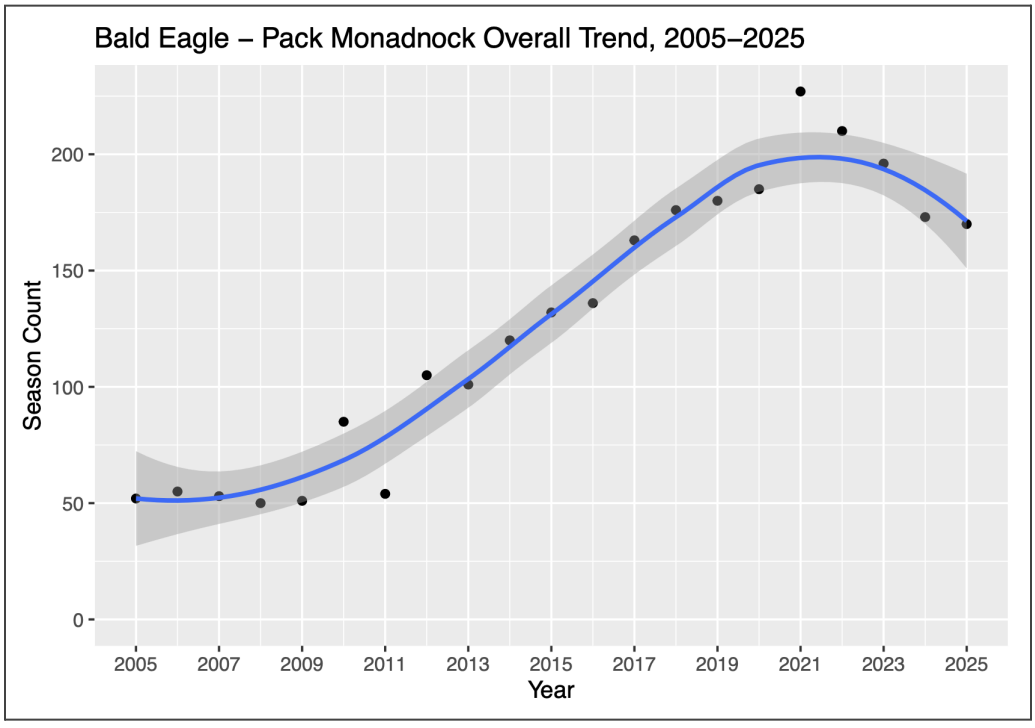


Figure 3. *PMRO Overall Bald Eagle Trend from 2005 to 2025*

Northern Harrier (*Circus hudsonius*)

Season Total: 122
High Count: 12 (October 5)
21-year Mean: 89
21-year Median: 88
Number counted between November 16 and 20: 1
RPI (2006-2023): -1.72% per year

It was another above-average season for Northern Harriers, with this year's total coming in very close to last year's count of 124. This meant that Northern Harriers once again almost passed their season-high record of 125 but didn't quite make it in the end. Although more data are needed to know for sure, these numbers may indicate a positive population trend for this state-endangered species. The 2025 season is the sixth consecutive year that Pack has made an effort to age and sex migrating harriers. This year, 81% of the birds were aged with 75.8% of those aged being juveniles. These are average numbers in terms of total percentage aged and majority of all aged birds being juveniles.

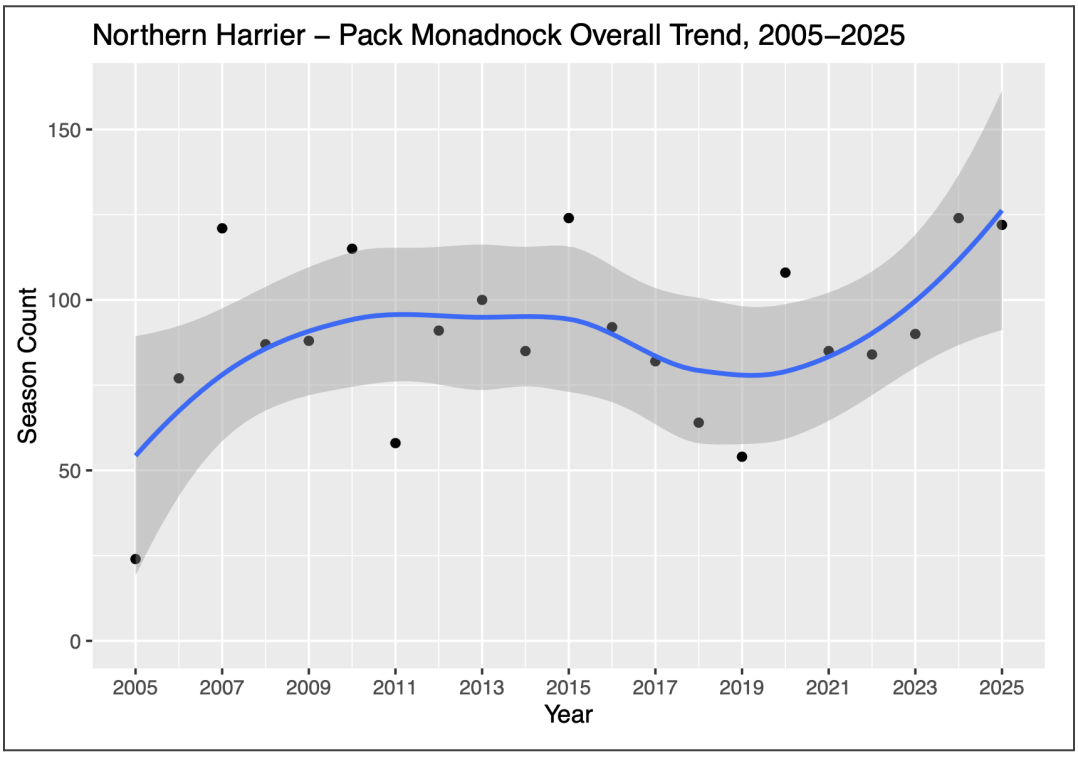


Figure 4. *PMRO Overall Northern Harrier Trend from 2005 to 2025*

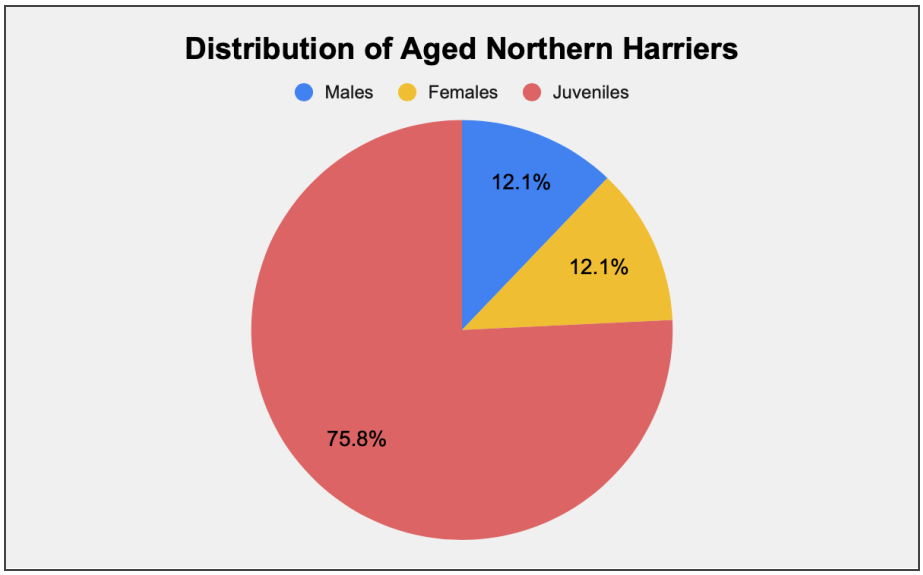


Figure 5. *Age and Sex Distribution of Aged Northern Harriers at PMRO in 2025*

Sharp-shinned Hawk (*Accipiter striatus*)

Season Total: 1142
High Count: 130 (September 19)
21-year Mean: 1,137
21-year Median: 1,189
Number counted between November 16 and 20: 5
RPI (2006-2023): -1.98% per year

The total for Sharp-shinned Hawks this year came in right around average. On September 19th, we counted 130 of these migrants, breaking our second-highest single day record. Although Sharp-shinned Hawks will move in many types of weather conditions, many of the Sharp-shinned Hawks recorded this year were seen on days with a strong northwest wind. Even though these little accipiters were a common sight at Pack this year, their overall regional trend shows one in decline.

A sharp-shinned Hawk on a blue sky day. © Chuck Carlson

Cooper's Hawk (*Astur cooperii*)

Season Total: 191
High Count: 17 (September 11)
21-year Mean: 150
21-year Median: 157
Number counted between November 16 and 20: 0
RPI (2006-2023): -1.94% per year

The count for Cooper's Hawks was slightly above average and marked the highest season count since 2006. On September 11th, we had an impressive 17 Cooper's Hawks go by, tying our second-highest single day count. The Cooper's Hawk is a species that has adapted well to suburban environments. In recent years, the number of Cooper's Hawks sighted at Pack has increased slightly, suggesting they have been doing well in the region.

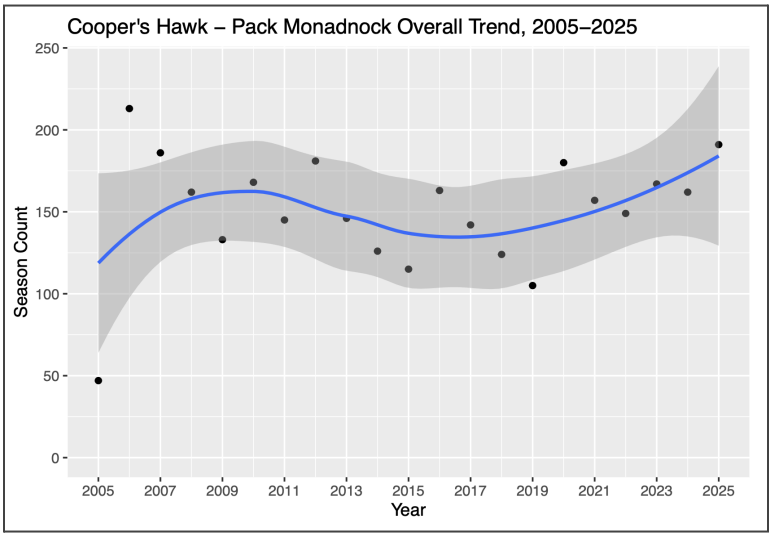


Figure 6. *PMRO Overall Cooper's Hawk Trend from 2005 to 2025*

American Goshawk (*Astur atricapillus*)

Season Total: 13
High Count: 4 (October 24)
21-year Mean: 28
21-year Median: 22
Number counted between November 16 and 20: 0
RPI (2006-2023): -10.7% per year

The first of this year's migrant American Goshawks wasn't seen until the second half of October, which is the latest first occurrence in the Observatory's history. The best day for goshawks was October 24th when four individuals flew low under an overcast sky within the same hour. At the end of the season, Goshawks had a final tally that fell below average. The American Goshawk Bioregional Monitoring Project, a regional effort that the Harris Center was involved in this year, also had low detection rates during surveys of previous breeding territories within New Hampshire.

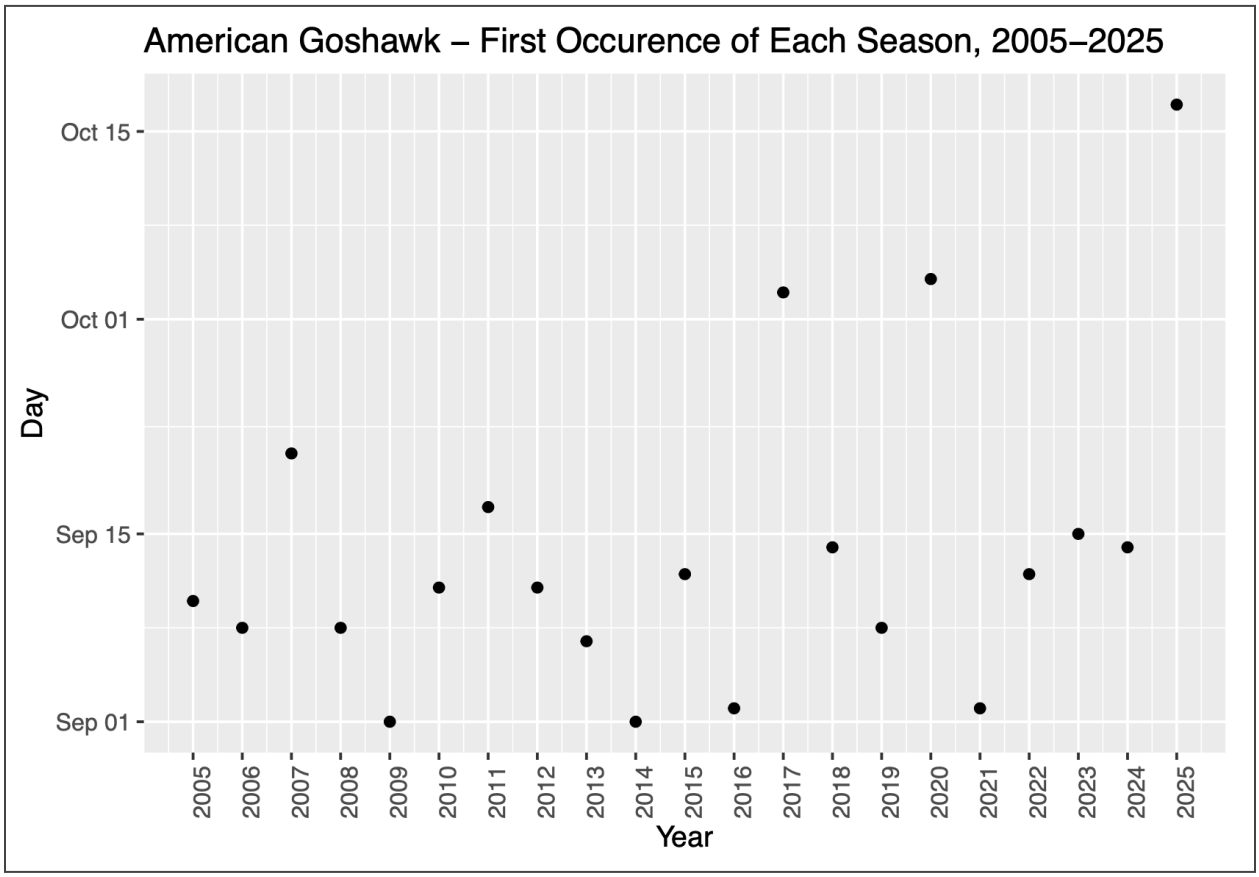


Figure 7. *American Goshawk Season First Occurrences from 2005 to 2025*

An immature American Goshawk. © Chuck Carlson

Red-shouldered Hawk (*Buteo lineatus*)

Season Total: 104
High Count: 11 (October 25)
21-year Mean: 140
21-year Median: 126
Number counted between November 16 and 20: 7
RPI (2006-2023): +5.88% per year

With a count that is the lowest since 2011, Red-shouldered Hawks came in significantly below average. Although the past several years have shown a steady increase in Red-shouldered Hawk numbers, last year's total was also on the low side. It will be interesting to see if this downward trend continues in future years. One theory suggests that the decrease in migrants may be due to warmer weather conditions during late fall. As with other late-season migrants, Red-shouldered Hawks will sometimes choose to stay further north if enough food is still available.

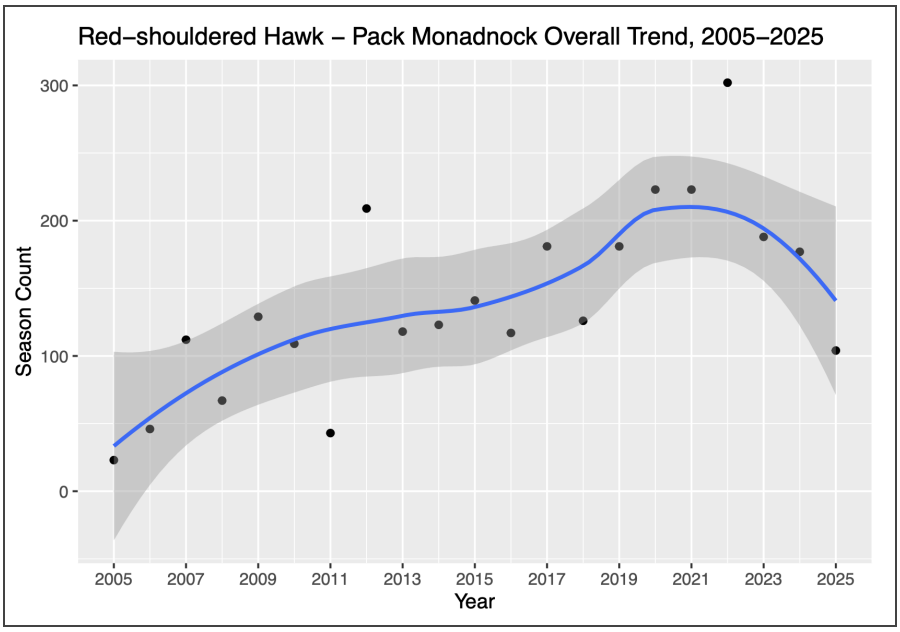


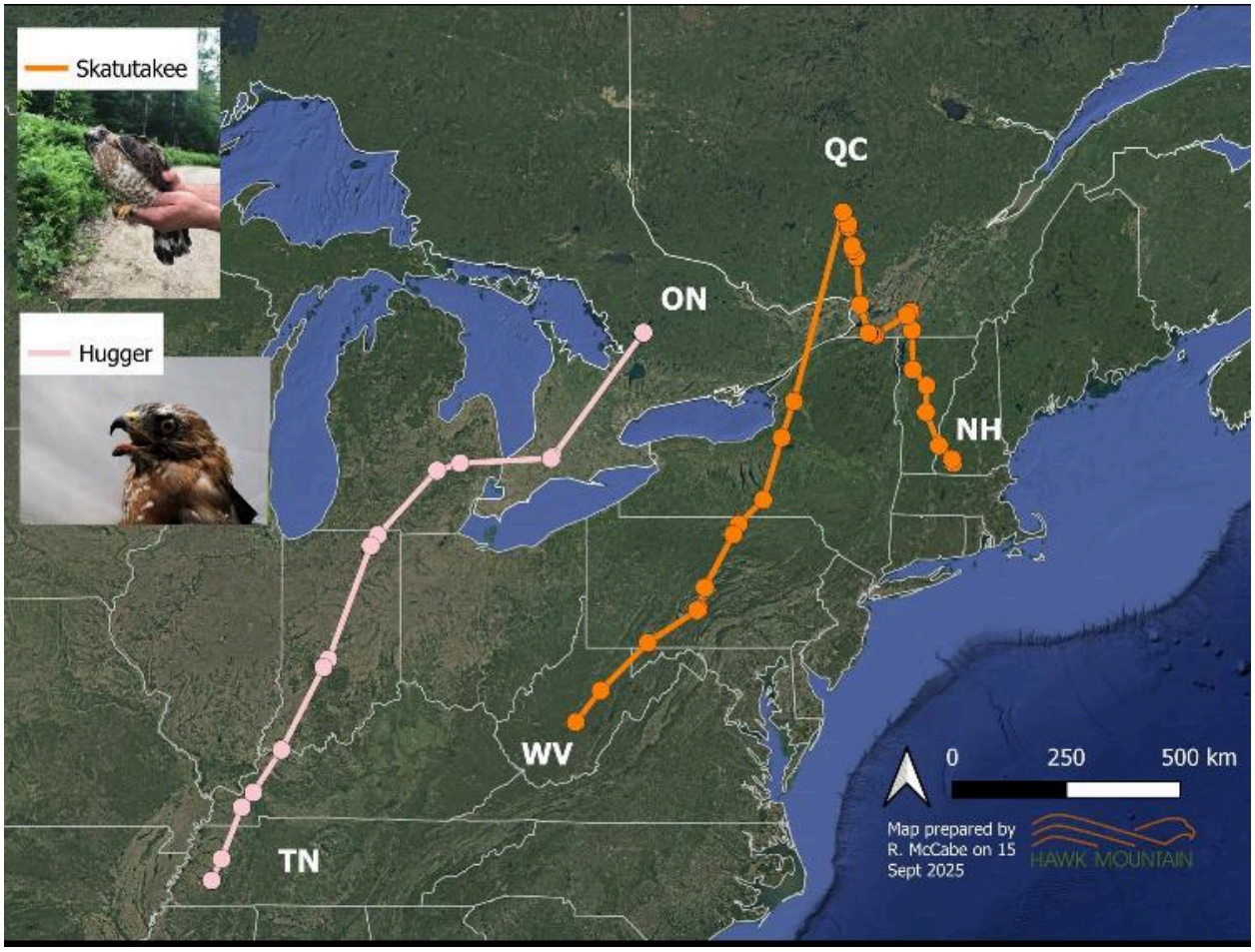
Figure 8. *PMRO Overall Red-shouldered Hawk Trend from 2005 to 2025*

Broad-winged Hawk (*Buteo platypterus*)

Season Total: 5821
High Count: 3,160 (September 14)
21-year Mean: 8,184
21-year Median: 7,840
Number counted between November 16 and 20: 0
RPI (2006-2023): +1.94% per year

This season ended with a below-average count for Broad-winged Hawks, and there was only one day with over 1,000 birds. That day was September 14th, when more than half of the season's total Broad-winged Hawks were observed. Although that day came on the earlier side of historic peak Broad-winged Hawk migration and held the highest daily tally of this species in a few years, it was only followed by days of lighter migration. Rather than suggesting a population decline, it seems more likely that a change in weather and wind patterns took the Broad-winged Hawk flight to other ridgelines.

A kettle of Broad-winged Hawks. September 14th saw over 3,000 migrating by. © Chuck Carlson



"*Where are they all going*?" We're finally beginning to answer that question, at least for Broad-winged Hawks tagged by the Harris Center and its Hawk Mountain collaborator. "Skatutakee" (orange) was tagged in nearby Dublin, NH and ventured north before heading to South America this autumn.

Migration Map courtesy of Hawk Mountain

Red-tailed Hawk (*Buteo jamaicensis*)

Season Total: 264
High Count: 39 (November 14)
21-year Mean: 313
21-year Median: 294
Number counted between November 16 and 20: 53
RPI (2006-2023): -4.54% per year

The Red-tailed Hawk count was slightly below average. As has been the trend for the past decade, the highest numbers of Red-tailed Hawks were recorded in November rather than October, which adds support to the idea that Red-tailed Hawks appear to be waiting later into November to migrate. As with other opportunistic species such as Red-shouldered Hawks and Bald Eagles, some Red-tailed Hawks will

not migrate without the presence of cold temperatures causing a decrease in food availability. This year, most Red-tailed Hawks chose to migrate on windy days with a strong northern or western component.

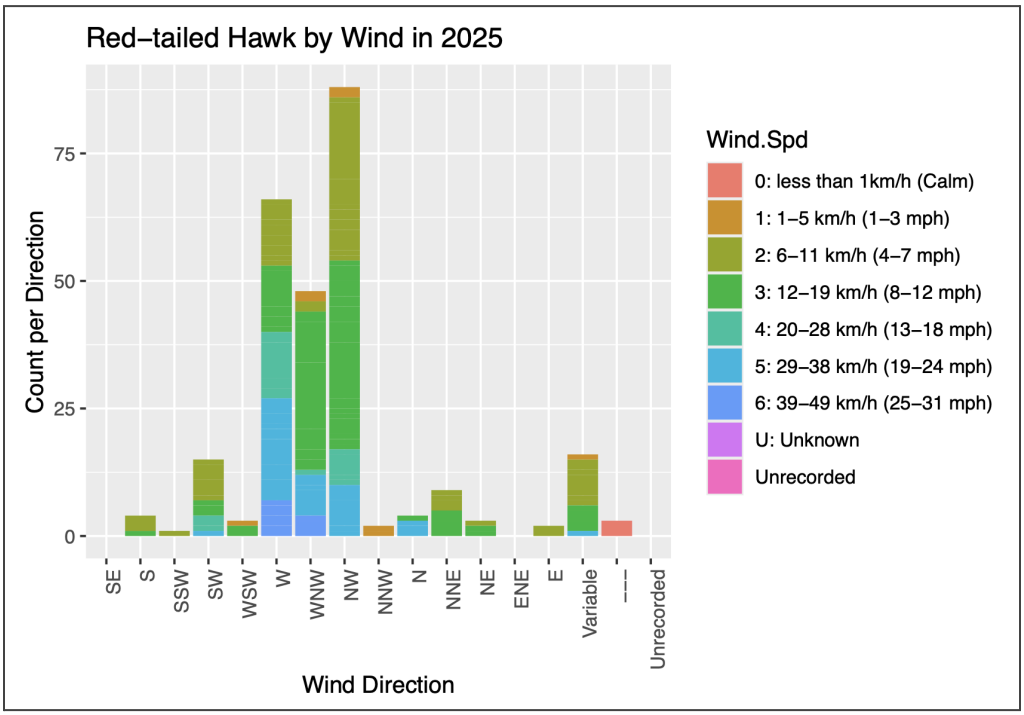


Figure 9. *Red-tailed Hawk Season Count by Wind Speed*

Golden Eagle (*Aquila chrysaetos*)

Season Total: 5
High Count: 2 (October 16, November 1)
21-year Mean: 8
21-year Median: 7
Number counted between November 16 and 20: 0
RPI (2006-2023): N/A

Golden Eagle numbers were below average, and Putney Mountain also had a below-average count of these prized migrants. Few and far between after last year's second-highest season count of 15, only three days this season were graced with the sighting of a Golden Eagle. Two of those days held two of the season's five Golden Eagles. Looking back at Pack's history, it seems that a low has often occurred after a high for Golden Eagle numbers. Overall, there has been an upward trend for the past four years, so perhaps this could just be another one of those low years mixed in.

Golden Eagles were scarce this season, but this immature bird passed close on November 8th, allowing great looks by many. © Chuck Carlson

American Kestrel (*Falco sparverius*)

Season Total: 196
High Count: 42 (September 14)
21-year Mean: 165
21-year Median: 170
Number counted between November 16 and 20: 0
RPI (2006-2023): -0.81% per year

An above-average year for these colorful falcons, kestrels also got their second-highest day count of 42 on September 14th (2003 holds the record day count of 50). While kestrels have had some recent low counts, this season was promising for these charismatic raptors. Now in its third year, the Harris Center's kestrel nest box project is one of several local conservation efforts aimed at expanding research opportunities and appropriate breeding habitat for this declining species.

Merlin (*Falco columbarius*)

Season Total: 80
High Count: 5 (September 15, September 26, October 8)
21-year Mean: 91
21-year Median: 90
Number counted between November 16 and 20: 0
RPI (2006-2023): +1.92% per year

The Merlin count was slightly below average. In fact, the 2025 season marks the first year since 2020 that under 100 Merlins have been recorded at PMRO. As with some of our other raptor species, other flight lines might have simply held better migration conditions this season for Merlins.

Peregrine Falcon (*Falco peregrinus*)

Season Total: 30
High Count: 4 (September 30, October 5)
21-year Mean: 42
21-year Median: 44
Number counted between November 16 and 20: 0
RPI (2006-2023): +2.36% per year

This year, NH Audubon's Peregrine Falcon Project recorded a record-high 30% increase in the number of territorial pairs of Peregrine Falcons. Although that is a good sign for local Peregrine populations, the increase did not contribute much to Pack's season tally, which fell slightly below average. It is suspected that Pack tends to get Peregrines that are migrating from further north or west. Most of the Peregrines this year came through during September and October, typically on days with northwest or west winds, but one was also seen during the middle of November.

Non-Raptor Species

A total of 100 bird species were documented at the Observatory this season (see Appendix, Table 2). Highlights include a Townsend's Solitaire seen on November 18th, furnishing the third-ever record of this western species at the Observatory with the previous observations being from October 2017 and November 2023. Following the sighting of the Townsend's Solitaire, another gray songbird, the Northern Shrike, was seen on the last two days of the season. Northern Shrikes were last reported from Pack in November 2021. Not as uncommon for Pack but still notable was the sighting of 97 Brant coming by in three separate flocks on November 1st. Finally, it was an excellent finch year with flocks of Red Crossbills, White-winged Crossbills, Pine Siskins, and Evening Grosbeaks occasionally being seen from the Observatory, along with a single Pine Grosbeak that showed up in November and perched briefly on top of a spruce tree in front of the hawk watch.

A Townsend's Solitaire graced the hawk watch briefly in early November. © Nora Hanke

Some regular migrants that counters tally include:

- Canada Geese (1,899)
- Common Loon (14)
- Ruby-throated Hummingbirds (72)
- Tree Swallow (5)
- Barn Swallow (7)
- Chimney Swift (25)
- Blue Jays (182)
- American Crows (268); high daily count (156)

For a brief summary of migratory insect sightings, it was a fairly good year for Monarch butterflies, with the season count of 512 being higher than recent years. Their biggest day was the same as it was for the raptors; on September 14th, over 100 Monarchs were tallied flying by, with the last time we passed 100 Monarchs in a single day being two years ago. The season total for dragonflies was around 50 with several migratory species seen in September and early October including Common Green Darner, Black Saddlebags, and Wandering Glider.

Acknowledgements

First, thank you to all the individuals and organizations involved with this project's success, especially the continuing partnership of the Harris Center for Conservation Education, Miller State Park, and the NH Division of Natural and Cultural Resources. Thanks to our many supporters, those steadfast donors who have contributed season to season, and those who donated onsite this year, and to all those who contributed their funds, time, and leveraged support in other ways.

Furthermore, many thanks to site coordinator Phil Brown for serving as the driving force for the Observatory's continued success. Thank you to Julie Brown and Tom Delaney for counting with Phil on Tuesdays. Thank you to Norma Reppucci, Park Manager at Miller State Park, for her heartfelt support of Pack Monadnock Raptor Observatory. Things wouldn't have run as smoothly at the Observatory without the procedures the State Park and its supportive staff were following.

Another special thanks to Nate Marchessault, for being the official counter on Mondays, as well as Katrina Fenton and Levi Buford, who were able to help out occasionally throughout the season. We are grateful that we still have experienced past counters willing to come up for a few days every year and help with the data collection.

Finally, a huge strength contributing to PMRO's continuing success comes from the resounding number of dedicated volunteers and observers who come out and help spot and identify the birds, as well as help educate the many visitors. It has been such a pleasure getting to know so many of you over the last few months and spending time together hawkwatching. I'm extremely grateful for the welcoming community at Pack and the Harris Center, and the work we do would not be possible without the help of our volunteers and observers. I'm going to miss driving up the mountain in the morning, searching for the first raptor of the day, feeding the songbirds, and watching the hawk watch bunnies, but most of all, I'm going to miss you guys. We would like to extend a heartfelt thank you to all those below for your diligence and good company this season:

Andrea Badger, Keith Badger, Pam Bondi, Julie Brown, Phil Brown, Laurel Brown, Alden Brown, Levi Burford, Meade Cadot, Chuck Carlson, Kris Carlson, Alan Chretien, Glen Chretien, Lori-Ann Chretien, Ginny Chrisenton, Tom Chrisenton, Dot Currier, Helen Dalbeck, Janet Delaney, Tom Delaney, Joseph DelConte, Katrina Fenton, Robin Feustel, Miki Foley, Nathan French, Nikko Gagnon, Mike Gebo, Austin Gelinas, Ben Griffith, Melanie Haber, Nora Hanke, Mitch Heydt, Bob Holt, Malcolm Holt, Bill Howe, Barry Johnson, Cameron Johnson, Jeff Kirk, Steven Lamonde, Chris Liazos, Nate Marchessault, Amy Maurer, Jim McCoy, Kate McKay, Lucy McKay, Tom Momeyer, Andre Moraes, Nancy Moreau, David Nakasone, Judd Nathan, Cynthia Nichols, Brian Rusnica, Annamarie Saenger, Cliff Seifer, Hillary Siener, Lillian Stokes, James Teitgen, Mark Timmerman, Tony Troppito, Henry Walters, John Welch, David Wiedner, Marcia Wilson, Mark Wilson, Rob Woodward, Van Zimmer, with many more.

Official counter Kate McKay honing in on a distant raptor. © Phil Brown.

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Appendix

Table 1. *All Seasonal Data from Pack Monadnock Raptor Observatory*

Season	Obs.Hrs	BV	TV	OS	BE	NH	SS	CH	AG	RS	BW	RT	RL
2005	330.25	0	29	219	52	24	520	47	11	23	3978	122	0
2006	408.25	0	99	257	55	77	1253	213	68	46	7595	407	0
2007	430	0	121	291	53	121	1288	186	49	112	7776	263	0
2008	435.75	0	47	256	50	87	1189	162	28	67	6835	254	0
2009	420.75	0	80	182	51	88	1196	133	25	129	4322	421	0
2010	627.75	0	145	298	85	115	1248	168	66	109	7606	410	0
2011	368	0	127	271	54	58	1124	145	21	43	11831	202	0
2012	600.75	0	164	314	105	91	1388	181	63	209	8848	522	1
2013	575	0	142	193	101	100	1254	146	25	118	8221	378	1
2014	497	0	99	213	120	85	1094	126	22	123	11043	348	1
2015	586.92	0	137	201	132	125	1443	115	48	141	16593	546	1
2016	527	0	322	242	136	92	1126	163	48	117	10530	294	1
2017	515.25	0	324	219	163	82	1179	142	16	181	8744	341	2
2018	463.25	0	98	189	176	64	668	124	11	126	6756	246	2
2019	557.17	0	268	171	180	54	1027	105	9	181	7840	223	0
2020	557.67	0	172	162	185	108	1325	180	12	223	8815	293	0
2021	548.42	2	641	182	227	85	1291	157	13	223	6055	329	1
2022	553.42	1	493	137	210	84	886	149	22	301	9369	300	0
2023	567.75	3	286	122	196	90	1198	167	6	188	10256	212	1
2024	608.92	0	158	195	173	124	1058	162	22	177	3042	209	2
2025	605.5	6	222	167	170	122	1142	191	13	104	5821	264	0
Average	513.6	0.6	198.8	213.4	127.3	89.3	1138	150.6	28.5	140	8184.6	313.5	0.6
Total	10784	12	4174	4481	2674	1876	23897	3162	598	2941	171876	6584	13

Season	GE	AK	ML	PG	UA	UB	UF	UE	UR	SE	SO	SW	TOTAL
2005	5	78	40	11	4	7	5	4	42	0	0	0	5221
2006	11	201	48	29	7	4	2	1	62	0	0	0	10435
2007	5	143	90	44	9	2	3	0	68	0	0	0	10624
2008	3	183	59	17	5	8	2	2	20	0	0	0	9274
2009	6	135	56	30	8	14	8	2	77	0	0	0	6963
2010	10	221	147	53	17	10	5	3	70	0	0	0	10786
2011	9	170	68	40	14	6	4	0	69	0	0	0	14256
2012	7	194	108	54	7	4	2	2	59	0	0	1	12324
2013	11	166	89	48	10	2	1	3	20	1	0	0	11030
2014	7	112	80	39	5	6	6	2	34	0	0	0	13565
2015	13	118	120	54	3	5	5	2	42	0	0	1	19845
2016	5	167	96	49	6	4	3	2	63	0	0	0	13466
2017	7	166	106	64	6	6	4	1	51	0	0	0	11804
2018	22	172	58	31	16	18	10	1	63	0	0	0	8851
2019	4	185	64	64	15	14	4	0	95	0	0	0	10503
2020	5	257	143	30	11	25	2	2	82	0	0	0	12032
2021	11	165	100	57	7	5	2	4	48	0	0	0	9605
2022	11	175	130	44	2	12	1	0	43	0	0	0	12370
2023	10	92	108	61	8	12	4	4	34	0	0	0	13058
2024	15	180	138	39	10	17	3	0	44	1	1	0	5770
2025	5	196	80	30	5	4	4	2	33	0	0	0	8581
Average	8.7	165.5	91.8	42.3	8.3	8.8	3.8	1.8	53.3	0.1	0.0	0.1	10969.7
Total	182	3476	1928	888	175	185	80	37	1119	2	1	2	230363

BV = Black Vulture, TV = Turkey Vulture, OS = Osprey, BE = Bald Eagle, NH = Northern Harrier, SS = Sharp-shinned Hawk, CH = Cooper's Hawk, AG = American Goshawk, RS = Red-shouldered Hawk, BW = Broad-winged Hawk, RT =

Red-tailed Hawk, RL = Rough-legged Hawk, GE = Golden Eagle, AK = American Kestrel, ML = Merlin, PF = Peregrine Falcon, UA = Unidentified Accipiter, UB = Unidentified Buteo, UF = Unidentified Falcon, UE = Unidentified Eagle, UR = Unidentified Raptor, SE = Short-eared Owl, SO = Snowy Owl, SW = Swainson's Hawk

Table 2. ***All Avian Observations from Pack Monadnock Raptor Observatory***

	Full Name	First Seen	Last Seen	High Count	High Count Date	Total Obs
1	Brant - Branta bernicla	2025-11-01	2025-11-01	97	2025-11-01	97
2	Canada Goose - Branta canadensis	2025-09-19	2025-11-19	314	2025-11-15	1899
3	Common Merganser - Mergus merganser	2025-11-14	2025-11-17	19	2025-11-17	24
4	duck sp. - Anatidae (duck sp.)	2025-10-24	2025-11-20	16	2025-11-20	17
5	Mourning Dove - Zenaida macroura	2025-08-08	2025-11-20	5	2025-11-20	25
6	Common Nighthawk - Chordeiles minor	2025-09-15	2025-09-15	1	2025-09-15	1
7	Chimney Swift - Chaetura pelagica	2025-08-26	2025-09-14	8	2025-09-03	25
8	Ruby-throated Hummingbird - Archilochus colubris	2025-08-18	2025-09-19	7	2025-09-08	72
9	Ring-billed Gull - Larus delawarensis	2025-09-20	2025-11-01	8	2025-10-26	13
10	American Herring Gull - Larus smithsonianus	2025-09-01	2025-10-04	3	2025-09-21	6
11	gull sp. - Larinae sp.	2025-11-08	2025-11-15	8	2025-11-15	11
12	Common Loon - Gavia immer	2025-09-08	2025-11-12	3	2025-10-26	14
13	Double-crested Cormorant - Nannopterum auritum	2025-08-18	2025-10-19	37	2025-10-19	113
14	Great Blue Heron - Ardea herodias	2025-09-12	2025-11-15	1	2025-11-15	2
15	Black Vulture - Coragyps atratus	2025-08-31	2025-10-23	2	2025-10-05	8
16	Turkey Vulture - Cathartes aura	2025-08-08	2025-11-08	88	2025-10-11	496
17	Osprey - Pandion haliaetus	2025-08-26	2025-10-11	24	2025-09-14	167
18	Golden Eagle - Aquila chrysaetos	2025-10-16	2025-11-08	2	2025-11-01	5
19	Sharp-shinned Hawk - Accipiter striatus	2025-08-26	2025-11-20	130	2025-09-19	1144
20	Cooper's Hawk - Astur cooperii	2025-08-30	2025-11-14	17	2025-09-11	220
21	American Goshawk - Astur atricapillus	2025-08-31	2025-11-13	4	2025-10-24	15

22	Accipitrine hawk sp. (former Accipiter sp.) - Aerospiza/Tachyspiza/Accipiter/Astur sp.	2025-09-19	2025-10-27	2	2025-09-30	5
23	Northern Harrier - Circus hudsonius	2025-09-01	2025-11-19	12	2025-10-05	122
24	Bald Eagle - Haliaeetus leucocephalus	2025-08-08	2025-11-20	19	2025-09-14	261
25	Broad-winged Hawk - Buteo platypterus	2025-08-08	2025-10-11	3160	2025-09-14	5843
26	Red-shouldered Hawk - Buteo lineatus	2025-08-31	2025-11-20	11	2025-10-25	135
27	Red-tailed Hawk - Buteo jamaicensis	2025-08-18	2025-11-20	41	2025-11-14	481
28	Buteo sp. - Buteo sp.	2025-09-01	2025-11-06	2	2025-11-06	4
29	hawk sp. - Accipitridae sp. (hawk sp.)	2025-09-14	2025-10-23	5	2025-09-19	20
30	eagle sp. - Accipitridae sp. (eagle sp.)	2025-10-28	2025-11-04	1	2025-11-04	2
31	Barred Owl - Strix varia	2025-09-01	2025-11-19	2	2025-09-09	12
32	Yellow-bellied Sapsucker - Sphyrapicus varius	2025-10-05	2025-10-05	1	2025-10-05	1
33	Red-bellied Woodpecker - Melanerpes carolinus	2025-10-11	2025-10-11	1	2025-10-11	1
34	Downy Woodpecker - Dryobates pubescens	2025-10-05	2025-11-15	1	2025-11-15	12
35	Hairy Woodpecker - Leuconotopicus villosus	2025-09-04	2025-11-20	1	2025-11-20	9
36	Downy/Hairy Woodpecker - Dryobates pubescens/Leuconotopicus villosus	2025-09-29	2025-09-29	1	2025-09-29	1
37	Pileated Woodpecker - Dryocopus pileatus	2025-09-21	2025-11-11	1	2025-11-11	9
38	Northern Flicker - Colaptes auratus	2025-09-09	2025-10-15	3	2025-09-20	17
39	woodpecker sp. - Picidae sp.	2025-09-22	2025-09-22	1	2025-09-22	1
40	American Kestrel - Falco sparverius	2025-09-01	2025-10-24	42	2025-09-14	196
41	Merlin - Falco columbarius	2025-08-30	2025-11-08	5	2025-10-10	82
42	Peregrine Falcon - Falco peregrinus	2025-09-14	2025-11-12	4	2025-10-05	32
43	falcon sp. - Falco sp.	2025-09-26	2025-11-01	1	2025-11-01	4
44	diurnal raptor sp. - Accipitriformes/Falconiformes sp.	2025-09-15	2025-11-15	3	2025-10-11	12
45	Willow Flycatcher - Empidonax traillii	2025-08-31	2025-08-31	1	2025-08-31	1
46	Least Flycatcher - Empidonax minimus	2025-08-27	2025-08-27	1	2025-08-27	1

47	Empidonax sp. - Empidonax sp.	2025-09-09	2025-09-09	1	2025-09-09	1
48	Eastern Phoebe - Sayornis phoebe	2025-09-01	2025-09-28	1	2025-09-28	7
49	Blue-headed Vireo - Vireo solitarius	2025-09-16	2025-10-05	2	2025-09-28	7
50	Red-eyed Vireo - Vireo olivaceus	2025-09-01	2025-09-23	1	2025-09-23	7
51	Northern Shrike - Lanius borealis	2025-11-19	2025-11-20	1	2025-11-20	2
52	Blue Jay - Cyanocitta cristata	2025-09-01	2025-11-20	46	2025-09-30	412
53	American Crow - Corvus brachyrhynchos	2025-09-04	2025-11-20	156	2025-10-28	315
54	Common Raven - Corvus corax	2025-08-08	2025-11-20	41	2025-09-12	904
55	Black-capped Chickadee - Poecile atricapillus	2025-08-08	2025-11-20	6	2025-11-11	226
56	Tufted Titmouse - Baeolophus bicolor	2025-09-27	2025-11-12	5	2025-10-23	41
57	Horned Lark - Eremophila alpestris	2025-10-28	2025-10-28	1	2025-10-28	1
58	Tree Swallow - Tachycineta bicolor	2025-08-31	2025-09-14	2	2025-09-03	5
59	Barn Swallow - Hirundo rustica	2025-09-02	2025-09-07	4	2025-09-02	7
60	Cliff Swallow - Petrochelidon pyrrhonota	2025-08-26	2025-08-26	1	2025-08-26	1
61	swallow sp. - Hirundinidae sp.	2025-09-04	2025-09-04	1	2025-09-04	1
62	Ruby-crowned Kinglet - Corthylio calendula	2025-09-16	2025-10-18	3	2025-10-05	18
63	Golden-crowned Kinglet - Regulus satrapa	2025-08-31	2025-11-20	6	2025-09-16	105
64	White-breasted Nuthatch - Sitta carolinensis	2025-09-28	2025-10-22	1	2025-10-22	4
65	Red-breasted Nuthatch - Sitta canadensis	2025-08-18	2025-11-20	8	2025-09-08	266
66	Brown Creeper - Certhia americana	2025-09-12	2025-11-18	2	2025-10-11	19
67	Blue-gray Gnatcatcher - Polioptila caerulea	2025-09-05	2025-09-05	1	2025-09-05	1
68	Winter Wren - Troglodytes hiemalis	2025-09-04	2025-09-23	1	2025-09-23	6
69	Carolina Wren - Thryothorus ludovicianus	2025-09-23	2025-09-23	1	2025-09-23	1
70	Eastern Bluebird - Sialia sialis	2025-10-23	2025-10-28	1	2025-10-28	2
71	Townsend's Solitaire - Myadestes townsendi	2025-11-18	2025-11-18	1	2025-11-18	1
72	Swainson's Thrush - Catharus ustulatus	2025-10-08	2025-10-08	1	2025-10-08	1

73	Hermit Thrush - Catharus guttatus	2025-09-30	2025-10-23	1	2025-10-23	6
74	Catharus sp. - Catharus sp.	2025-09-22	2025-09-22	1	2025-09-22	1
75	American Robin - Turdus migratorius	2025-08-18	2025-11-15	12	2025-11-12	97
76	Cedar Waxwing - Bombycilla cedrorum	2025-08-08	2025-10-02	24	2025-09-21	96
77	American Pipit - Anthus rubescens	2025-09-04	2025-09-04	1	2025-09-04	1
78	Evening Grosbeak - Hesperiphona vespertina	2025-11-01	2025-11-19	14	2025-11-11	50
79	Pine Grosbeak - Pinicola enucleator	2025-11-13	2025-11-20	1	2025-11-20	3
80	Purple Finch - Haemorhous purpureus	2025-09-02	2025-11-18	25	2025-10-29	232
81	Redpoll - Acanthis flammea	2025-11-08	2025-11-08	4	2025-11-08	4
82	Red Crossbill - Loxia curvirostra	2025-08-27	2025-11-20	5	2025-11-20	32
83	White-winged Crossbill - Loxia leucoptera	2025-10-18	2025-11-18	12	2025-10-29	24
84	Pine Siskin - Spinus pinus	2025-10-08	2025-11-20	50	2025-11-20	190
85	American Goldfinch - Spinus tristis	2025-08-31	2025-11-20	5	2025-09-11	25
86	finch sp. - Fringillidae sp.	2025-11-08	2025-11-08	45	2025-11-08	45
87	Snow Bunting - Plectrophenax nivalis	2025-10-28	2025-11-18	6	2025-11-09	27
88	Fox Sparrow - Passerella iliaca	2025-11-08	2025-11-15	1	2025-11-15	6
89	Dark-eyed Junco - Junco hyemalis	2025-08-08	2025-11-20	200	2025-11-12	1182
90	White-crowned Sparrow - Zonotrichia leucophrys	2025-09-13	2025-09-16	1	2025-09-16	4
91	White-throated Sparrow - Zonotrichia albicollis	2025-09-16	2025-11-20	15	2025-10-14	369
92	Savannah Sparrow - Passerculus sandwichensis	2025-11-01	2025-11-01	1	2025-11-01	1
93	Song Sparrow - Melospiza melodia	2025-09-23	2025-09-23	1	2025-09-23	1
94	Swamp Sparrow - Melospiza georgiana	2025-10-14	2025-10-14	1	2025-10-14	1
95	Eastern Towhee - Pipilo erythrophthalmus	2025-08-30	2025-10-07	2	2025-09-30	41
96	new world sparrow sp. - Passerellidae sp.	2025-11-10	2025-11-10	1	2025-11-10	1
97	blackbird sp. - Icteridae sp.	2025-10-28	2025-10-28	3	2025-10-28	3
98	Black-and-white Warbler - Mniotilta varia	2025-09-03	2025-09-03	1	2025-09-03	1

99	Tennessee Warbler - Leiothlypis peregrina	2025-09-04	2025-09-23	4	2025-09-08	8
100	Nashville Warbler - Leiothlypis ruficapilla	2025-09-01	2025-09-26	3	2025-09-04	11
101	Common Yellowthroat - Geothlypis trichas	2025-09-23	2025-09-23	1	2025-09-23	1
102	American Redstart - Setophaga ruticilla	2025-09-03	2025-09-08	1	2025-09-08	2
103	Northern Parula - Setophaga americana	2025-09-12	2025-09-12	1	2025-09-12	1
104	Magnolia Warbler - Setophaga magnolia	2025-09-08	2025-09-08	1	2025-09-08	1
105	Blackburnian Warbler - Setophaga fusca	2025-09-01	2025-09-05	2	2025-09-02	4
106	Northern Yellow Warbler - Setophaga aestiva	2025-09-23	2025-09-23	1	2025-09-23	1
107	Blackpoll Warbler - Setophaga striata	2025-09-08	2025-10-11	3	2025-09-08	14
108	Black-throated Blue Warbler - Setophaga caerulescens	2025-09-03	2025-09-07	2	2025-09-07	6
109	Palm Warbler - Setophaga palmarum	2025-09-23	2025-09-23	2	2025-09-23	2
110	Pine Warbler - Setophaga pinus	2025-09-26	2025-09-28	1	2025-09-28	2
111	Yellow-rumped Warbler - Setophaga coronata	2025-08-27	2025-10-27	10	2025-10-02	175
112	Black-throated Green Warbler - Setophaga virens	2025-09-01	2025-09-30	2	2025-09-19	10
113	new world warbler sp. - Parulidae sp.	2025-09-04	2025-10-06	6	2025-09-04	20
114	Northern Cardinal - Cardinalis cardinalis	2025-08-08	2025-11-08	1	2025-11-08	2