



Monitoring of Owls and Nightjars, MOON, in Illinois: 2015-2016 Report



Photo by James Ellis - INHS

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2015 and 2016 Summary

We are closing in on the 10th year of the MOON program. While we are seeing some consistency with routes, there are still many gaps we have among monitored routes. With the addition of Chuck-will's-widow to the Illinois Threatened Species List continued monitoring is especially important. In addition Eastern Whip-poor-will could potentially be listed in the future. While the listing of these birds is not something we want to see, it does potentially provide a way to advocate for research funds to study individual species and use best management practices to attempt to increase their abundance and occupancy. The greater consistency we have among routes, the more powerful our data will be. The data collected through MOON is expected to be used to look at trends in nightjar and owl populations, and furthermore seek best management practices for these birds. This past year all of the MOON data was uploaded into the Midwest Avian Data Center (MWADC) (<http://data.prbo.org/partners/mwadc/>). Because of the new location of these data MWADC citizen science users will be able to access the data for analysis in the future.

Background

Bird monitoring has played a crucial role in estimating population trends, distribution, and abundance for many species, which in turn has been integrated into management and conservation decisions regarding many high profile species. These changes in management, and efforts to conserve, have restored and stabilized many of the once extirpated or nearly extirpated species. However, while current monitoring programs, such as Breeding Bird Survey (BBS), Spring Bird Count (SBC), and Christmas Bird Count (CBC) have done an excellent job of estimating population trends for most species they do not have the power to estimate population trends for nocturnal species. Because of this void, many organizations throughout Canada and the United States have implemented, or are beginning to implement, monitoring programs for nocturnal species. Over the past few years The Midwest Coordinated Bird Monitoring Partnership has helped to facilitate the coordination of this Midwest nocturnal monitoring group so that we can work together to make the most beneficial bird conservation decisions (http://midwestbirdmonitoring.ning.com/group/midwest_nightbirds). Forming efficient and statistically powerful monitoring programs for nocturnal species will allow us to detect small population changes over a shorter period of time.

Owl and Nightjar Status in Illinois

In Illinois we have five confirmed breeding species of owl; Barn Owl, Barred Owl, Eastern Screech-Owl, Great Horned Owl, and Short-eared Owl and three confirmed breeding species of nightjar; Chuck-will's-widow, Common Nighthawk, and Eastern Whip-poor-will. Within these two groups the Barn Owl has been moved from the endangered to the threatened list while the Short-eared Owl is still currently listed as endangered. Recently the Chuck-will's-widow was listed as Threatened. The Eastern Screech-Owl is found in low numbers on BBS routes (BBS data), the Great Horned Owl is widespread and the Barred Owl, which historically was listed as rare, is now found throughout the state. As far as nightjars go, in 1934 Ford et al. were quoted as saying this of the Whip-poor-will in *Birds of the Chicago Region* – "A fairly common summer resident. Although not so numerous as formerly, they still occur throughout the area". Unfortunately, the same statement could not be said today. The Eastern Whip-poor-will is considered to be rare and declining by the U.S. Fish and Wildlife Service. In Canada it has declined so much it is now considered Threatened. While Common Nighthawks are considered to be evenly distributed throughout the state, monitoring their population trend is difficult. The Chuck-will's-widow has been historically found in the southern portion of the state. Loss of habitat, lack of forest management, cattle grazing, and food availability are all factors that could be contributing to possible declines of some of these species.

Because much of Illinois has become agriculturally dominated habitat selection is limited for owls and nightjars. Additionally, changes in agricultural and mowing practices have caused a decrease in available food sources for owls and nightjars. Also, while Illinois has retained much of its forested landscape throughout the last hundred years many forests are not managed and succession has become a problem, especially for nightjars, which prefer an open understory (Walk et al. 2010, Hunt 2010, and Cink 2002). In addition, worldwide there has been a rapid loss of large trees with cavities and failure to allow new ones to establish. Obstacles contributing to these declines in cavities include invasive plants, logging, lack of fire regimes, and livestock grazing (Lindenmayer et al. 2012). In 2008 a study found that the high number of habitat openings created by some forest regeneration practices provided whip-poor-wills with foraging opportunities that were not present in systems not managed intensely (Wilson and Watts 2008). Furthermore a study conducted from 2008-2010 in New Hampshire found that Eastern Whip-poor-will will rapidly colonize a site that is managed (Hunt 2010). Because we cannot anecdotally say specific owls and nightjars are declining, due to these changes, we needed to create a powerful monitoring program to determine the population trends of these birds. Therefore, in the spring of 2008 Monitoring of Owls and Nightjars, MOON, in Illinois was initiated (<http://www.inhs.illinois.edu/research/moon/>). MOON is a volunteer based statewide program. Volunteers monitor routes located along suitable habitat for owls and nightjars. The majority of routes are 9 miles long with 10 stops per route.

Protocol

Based on previous research (Northeast Coordinated Bird Monitoring Partnership, Wisconsin Bird Conservation Initiative, Bird Studies Canada, and the U.S. Nightjar Survey Network) we know that there are certain criteria that are important when monitoring for owls and nightjars (Hunt 2007, Gallo 2007, Wilson and Watts 2006). Because of these criteria, we closely followed the standard protocols of those currently undergoing Owl and Nightjar research with some minor adjustments to fit interest we have here in Illinois:

- 1) Each survey is conducted at least 30 minutes following sunset (when the moon is above the horizon) and end no later than 15 minutes prior to sunrise.
- 2) 2015 monitoring dates were May 26 – June 9 and June 25 – July 8; 2016 monitoring dates were May 14 – May 29 and June 13 – June 27.
- 3) If time allows, surveys should be completed when the moon is above the horizon and not obstructed by clouds.

Counting Owls and Nightjars:

If detected, each individual owl or nightjar is recorded once during each 1 minute block of a 6 minute passive listening period. Monitors with acoustic equipment play an Eastern Screech-Owl playback and in some areas of the state a Barn Owl playback is incorporated as well. Playbacks are used following the 6 minute passive listening period. After each playback monitors listen for an additional two - 1 minute blocks. Monitors should listen with the same consistency at each stop for birds from a stationary position outside of their vehicle. Volunteers should use their best judgment when determining if a bird is moving while listening at a stop.

Data is recorded at the time birds are detected, rather than waiting for the end of the 6, 8, or 10 minute listening period, to avoid data omission errors.

Other Species – Monitors are encouraged to record any species they hear calling while monitoring. In the future we hope that these data may become applicable to understanding more about other species that call at night.

Data forms:

Data forms include the route name and number, observer name, date, start time, and end time, estimated temperature, playback use, as well as detection data at each stop. In conjunction with other surveys already in progress, data is collected on wind speed, sky condition, and noise at each stop. When entering data Alpha codes were used for species names (BDOW=Barred Owl, EASO=Eastern Screech-Owl, BANO=Barn Owl, GHOW=Great Horned Owl, EWPW= Eastern Whip-poor-will, CWWI=Chuck-will's-widow, CONI=Common Nighthawk, and AMWO=American Woodcock). In addition, route location data is also collected from volunteers, as well as habitat data at each stop.

Route Selection:

Each route consists of 10 stopping points where monitors stop, get out of their vehicle, and listen for nightjars and owls for a period of 6 minutes or 8/10 if using playback. Each stopping point is at least one mile apart. The starting point of a route is recorded as stop #1 and so on until stop #10 is reached. At this time a nine mile route will have been completed. Note: at times, rather than shortening space between stops to avoid double counting, distance was added. Also, given the topography of the state and the layout of many roads we realized that not all routes would be straight nine mile routes. While some of the MOON routes were put together by volunteers in the past, in 2010 we randomly selected new routes using GIS forest coverage layers. Because of the topology of Illinois (agriculturally dominated) using a forest coverage GIS layer appeared to be the best way to ensure that nightjar/owl habitat was being monitored. Routes created prior to 2010 are still monitored. Monitors, as always, are asked to scout their route to make sure problems such as noise, traffic, unavailable roads, and safety would not be limiting.

Results and Discussion

Routes

In 2015 21 routes were monitored and, subsequently, in 2016 23 routes were monitored (Figure 1). Figure 2 is a map depicting routes that are already monitored and routes that we would like to have monitored in 2017 and beyond. Not all routes are monitored every year, of the 66 routes that have been monitored in the past, only 22 of those routes have been monitored ≥ 5 times (Figure 3). Nearly half of the total number of routes surveyed ($n=31$) have only been surveyed ≤ 2 times. Having routes monitored with higher consistency continues to be a challenge we need to work on. Because we only have a 15 day window to complete these surveys, and they are nocturnal, maintaining a strong volunteer base is a challenge. That being said, we have had great volunteers, and continue to have great volunteers, and we are slowly starting to strengthen the dataset into a more useful tool. Of the 21 routes monitored in 2015 19 detected ≥ 1 individual and of the 23 routes monitored in 2016 21 detected ≥ 1 individual (Table 1).

Nightjars

Monitors detected a total of 123 nightjars in 2015 and 98 in 2016 (Table 2). The average number of Eastern Whip-poor-will/route was 1.6 in 2015 and 2016. The average number of whip-poor-will/route over the past 9 years is 1.4. The majority of these detections are from a small subset of routes. Of the 21 routes monitored in

2015 6 had Eastern Whip-poor-will detections. In 2016 Eastern Whip-poor-will were detected on 10 of the 23 routes monitored. Likewise, in 2015 Chuck-will's-widow were detected along 3 of the 21 routes and in 2016 Chuck-will's-widow were detected on 2 of the 23 routes. One of the routes that has regular detections of Chuck-will's-widow is in and around Forbes State Park. The Illinois Department of Natural Resources has used prescribed fire as a management tool at Forbes for many years with a rotating burn schedule, which has provided preferred habitat for nightjars. Fire recycles nutrients in the soil, thus catering to native plants, which bring in native insects especially moths and butterflies (Brose et al. 2013 and Wilson and Watts 2008). Because nightjars are insectivorous this regime is beneficial to them.

Owls

In 2015 a total of 81 owls were detected and, subsequently, in 2016 154 owls were detected along routes. The breakdown in 2015 is as follows: 2 Barn Owl, 54 Barred Owl, 4 Eastern Screech-Owl, 20 Great Horned Owl, and 1 Long-eared Owl. The Long-eared Owl and 2 Barn Owl were detected in Jo Daviess County. The Long-eared Owl is a new species to the MOON count. The 2016 breakdown is as follows: 1 Barn Owl, 111 Barred Owl, 7 Eastern Screech-Owl, 35 Great Horned Owl and 1 Northern Saw-whet Owl. The Northern Saw-whet Owl has been detected only 3 times over the course of the past 9 years. These too were found in Jo Daviess County. Northern Illinois is on the southern tip of both the Long-eared Owl and Northern Saw-whet Owl breeding range, so detections are rare.

Future of MOON

We will continue the MOON program and try and gain consistency among our routes to strengthen the dataset, so that it can be used to document trends. Having monitors monitor routes that have been run in the past will take priority, however if volunteer numbers allow we will continue to grow the routes covered. In 2017 we will be using the same protocol. Because playback calls increase the detectability of the Eastern Screech-Owl we would like to encourage volunteers to use it (see protocol) if they have the resources.

Acknowledgements

I would like to thank all of the volunteers that use their personal time to help continue to make MOON a success. Without all of you MOON would not be possible. Additionally, I would like to thank our partners; Midwest Coordinated Bird Monitoring Partnership, Northeast Coordinated Bird Monitoring Partnership, Wisconsin Bird Conservation Initiative, U.S. Nightjar Survey, and Bird Studies Canada. Together we can make changes. Also, a thank-you to all the natural areas that have allowed us admittance for monitoring; Crab Orchard National Wildlife Refuge, Lost Mound Field Station, Ferne Clyffe State Park, Sam Dalton Lake Conservation Area, Stephen A. Forbes State Park, Iroquois County Conservation Area, and Chain O' Lakes State Park. Finally, we would like to thank the IDNR, USFWS, TNC, and INHS for lending your support.

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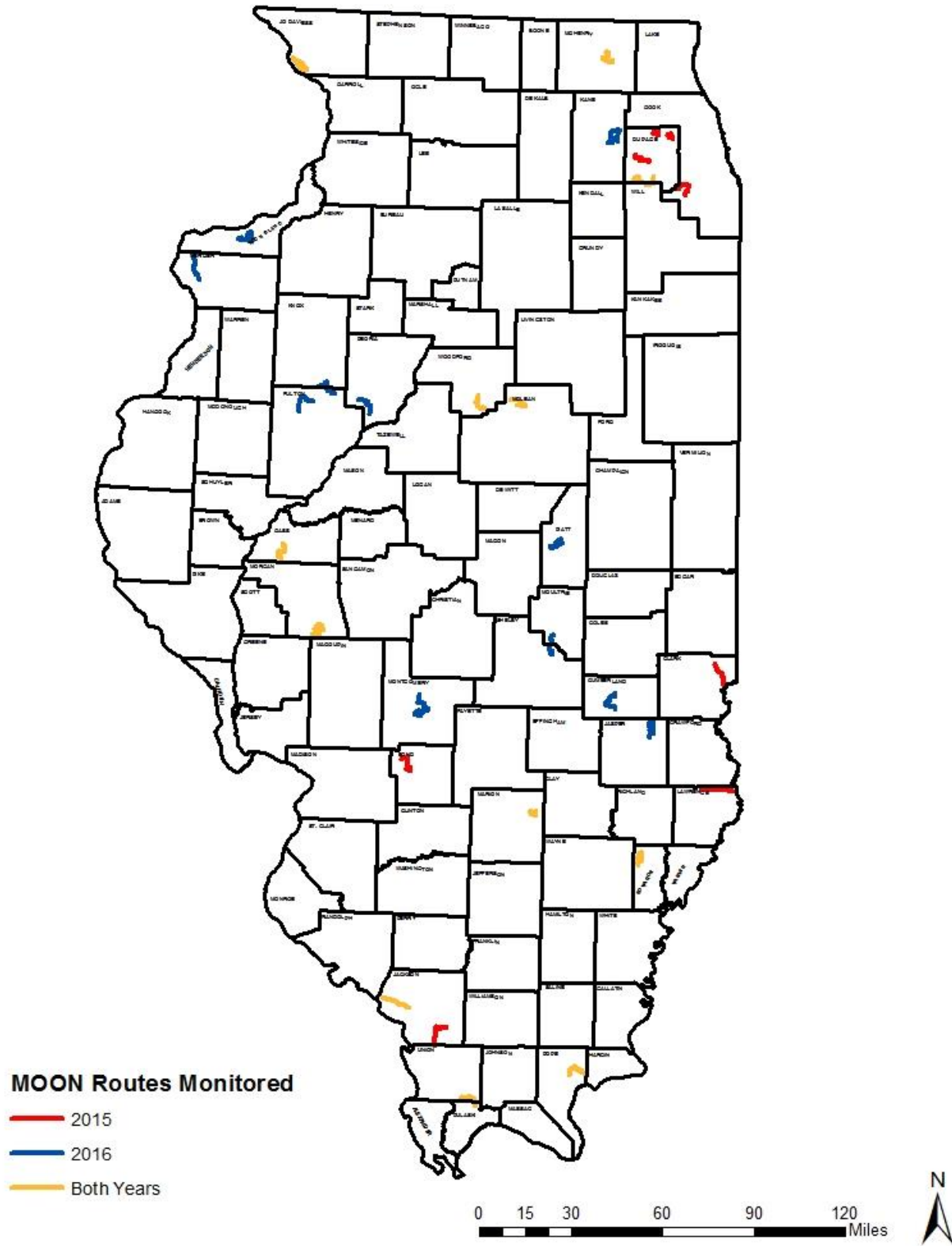


Figure 1. MOON routes monitored in 2015 and 2016.

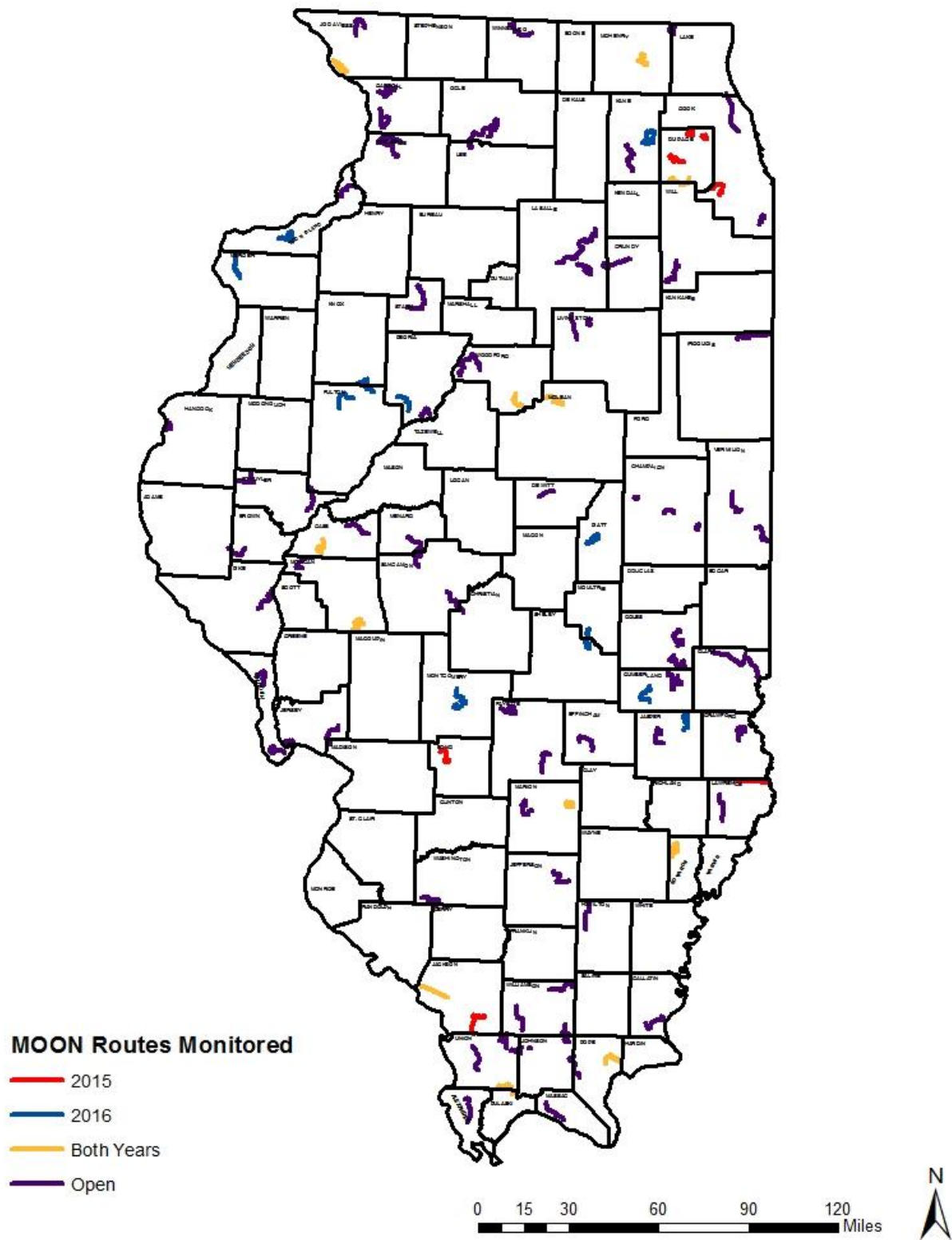


Figure 2. MOON routes available for 2017.

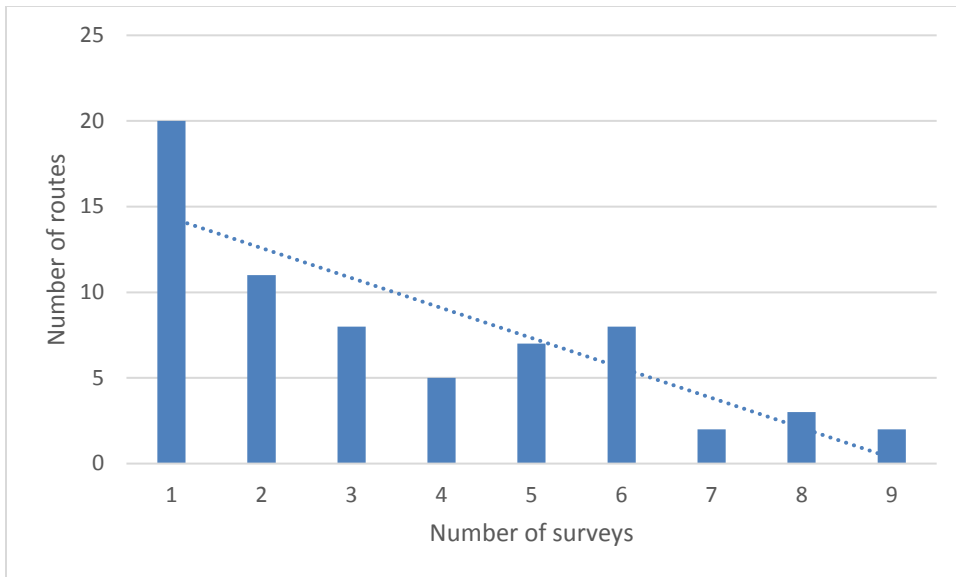


Figure 3. There have been 66 routes monitored since the beginning of MOON in 2008, this figure shows the breakdown of the number of times each route has been monitored during that time.

Table 1. 2015 and 2016 species detected by route and month. (AMWO – American Woodcock, BANO – Barn Owl, BDOW – Barred Owl, CONI – Common Nighthawk, CWWI – Chuck-will’s-widow, EASO – Eastern Screech-Owl, EWPW – Eastern Whip-poor-will, GHOW – Great Horned Owl, LEOW – Long-eared Owl, and NSWOW – Northern Saw-whet Owl).

| Route/Species | 2015 | | 2015 Total | 2016 | | 2016 Total |
|-----------------------|------|------|------------|------|------|------------|
| | May | June | | May | June | |
| Bond3565 | | 1 | 1 | | | |
| BDOW | | 1 | 1 | | | |
| Cass1235 | | 25 | 25 | | 9 | 9 |
| BDOW | | 7 | 7 | | | |
| EASO | | 1 | 1 | | | |
| EWPW | | 17 | 17 | | 9 | 9 |
| Clark1622 | | 8 | 8 | | | |
| BDOW | | 6 | 6 | | | |
| EWPW | | 2 | 2 | | | |
| Cook1515 | | 1 | 1 | | | |
| GHOW | | 1 | 1 | | | |
| Cumberland1212 | | | | 4 | 1 | 5 |
| BDOW | | | | 4 | 1 | 5 |
| DuPage1021 | | 5 | 5 | | 5 | 5 |
| AMWO | | 4 | 4 | | 3 | 3 |
| GHOW | | 1 | 1 | | 2 | 2 |
| DuPage1212 | | 0 | 0 | | | |
| DuPage3542 | | 4 | 4 | | | |
| AMWO | | 3 | 3 | | | |

| | | | | | | |
|-----------------------|---|----|----|----|----|----|
| GHOW | | 1 | 1 | | | |
| Edwards0476 | | 4 | 4 | 4 | | 4 |
| BDOW | | 2 | 2 | 3 | | 3 |
| GHOW | | 2 | 2 | 1 | | 1 |
| Fulton7635 | | | | 8 | 5 | 13 |
| BDOW | | | | 6 | 4 | 10 |
| EWPW | | | | 2 | 1 | 3 |
| Jackson5725 | | 6 | 6 | | | |
| BDOW | | 4 | 4 | | | |
| GHOW | | 2 | 2 | | | |
| Jackson6296 | | 4 | 4 | | 3 | 3 |
| BANO | | | | | 1 | 1 |
| EASO | | 2 | 2 | | 2 | 2 |
| GHOW | | 2 | 2 | | | |
| Jasper2685 | 2 | | 2 | | | |
| EWPW | 2 | | 2 | | | |
| JoDavies3053 | | 61 | 61 | 23 | 17 | 40 |
| BANO | | 2 | 2 | | | |
| BDOW | | 4 | 4 | 3 | 4 | 7 |
| CONI | | 12 | 12 | 2 | 3 | 5 |
| CWWI | | 1 | 1 | | | |
| EWPW | | 41 | 41 | 12 | 9 | 21 |
| GHOW | | | | 5 | 1 | 6 |
| LEOW | | 1 | 1 | | | |
| NSWO | | | | 1 | | 1 |
| Kane17345 | | | | | 1 | 1 |
| CONI | | | | | 1 | 1 |
| Knox3954 | | | | 6 | | 6 |
| BDOW | | | | 5 | | 5 |
| GHOW | | | | 1 | | 1 |
| Marion6245 | | 12 | 12 | 13 | 4 | 17 |
| BDOW | | 3 | 3 | 3 | 1 | 4 |
| CONI | | | | 2 | | 2 |
| CWWI | | 9 | 9 | 7 | 3 | 10 |
| EWPW | | | | 1 | | 1 |
| McHenry0165 | 4 | | 4 | | | |
| EWPW | 4 | | 4 | | | |
| McLean7432 | | 8 | 8 | 10 | 6 | 16 |
| BDOW | | 1 | 1 | 3 | | 3 |
| EASO | | 1 | 1 | | 1 | 1 |
| GHOW | | 6 | 6 | 7 | 5 | 12 |
| Mercer2506 | | | | 10 | | 10 |
| BDOW | | | | 6 | | 6 |
| CONI | | | | 2 | | 2 |
| GHOW | | | | 2 | | 2 |
| Montgomery5473 | | | | | 8 | 8 |
| BDOW | | | | | 4 | 4 |

| | | | | | | |
|-------------------------|-----------|------------|------------|------------|-----------|------------|
| EWPW | | | | 2 | | 2 |
| GHOW | | | | 2 | | 2 |
| Montgomery5473_2 | | | | 10 | | 10 |
| BDOW | | | | 7 | | 7 |
| EWPW | | | | 2 | | 2 |
| GHOW | | | | 1 | | 1 |
| Morgan7212 | 5 | | 5 | 14 | 7 | 21 |
| BDOW | 1 | | 1 | 2 | 3 | 5 |
| EASO | | | | 2 | | 2 |
| EWPW | 3 | | 3 | 10 | 2 | 12 |
| GHOW | 1 | | 1 | | 2 | 2 |
| PeoriaWest5883 | | | | 5 | 3 | 8 |
| BDOW | | | | 3 | 2 | 5 |
| EASO | | | | 1 | | 1 |
| EWPW | | | | 1 | | 1 |
| GHOW | | | | | 1 | 1 |
| Piatt7824 | | | | 14 | | 14 |
| BDOW | | | | 14 | | 14 |
| Pope2079 | 20 | 18 | 38 | 20 | 14 | 34 |
| BDOW | 3 | 7 | 10 | 6 | 4 | 10 |
| CWWI | | | | | 1 | 1 |
| EWPW | 17 | 10 | 27 | 14 | 9 | 23 |
| GHOW | | 1 | 1 | | | |
| RockIsland5678 | | | | 5 | | 5 |
| BDOW | | | | 3 | | 3 |
| CONI | | | | 1 | | 1 |
| EWPW | | | | 1 | | 1 |
| Shelby2525 | | | | 6 | 2 | 8 |
| BDOW | | | | 5 | 1 | 6 |
| EASO | | | | | 1 | 1 |
| EWPW | | | | 1 | | 1 |
| Williamson5750 | | 15 | 15 | | | |
| AMWO | | 2 | 2 | | | |
| BDOW | | 7 | 7 | | | |
| CWWI | | 2 | 2 | | | |
| EWPW | | 3 | 3 | | | |
| GHOW | | 1 | 1 | | | |
| Woodford2828 | 10 | | 10 | 11 | 8 | 19 |
| BDOW | 8 | | 8 | 9 | 5 | 14 |
| GHOW | 2 | | 2 | 2 | 3 | 5 |
| Grand Total | 49 | 164 | 213 | 163 | 93 | 256 |

Table 2. Avian species detected by month during nine consecutive years (AMWO – American Woodcock, BANO – Barn Owl, BDOW – Barred Owl, CONI – Common Nighthawk, CWWI – Chuck-will’s-widow, EASO – Eastern Screech-Owl, EWPW – Eastern Whip-poor-will, GHOW – Great Horned Owl, LEOW – Long-eared Owl, and NSWO – Northern Saw-whet Owl).

| Year/Month | AMWO | BANO | BDOW | CONI | CWWI | EASO | EWPW | GHOW | LEOW | NSWO | Grand Total |
|--------------------|-----------|----------|-------------|------------|------------|------------|------------|------------|----------|----------|-------------|
| 2008 | 3 | | 144 | 18 | | 13 | 84 | 35 | | | 297 |
| May | | | 58 | 4 | | 6 | 40 | 17 | | | 125 |
| June | 1 | | 46 | 5 | | 2 | 39 | 10 | | | 103 |
| July | 2 | | 40 | 9 | | 5 | 5 | 8 | | | 69 |
| 2009 | 31 | | 192 | 19 | 26 | 47 | 135 | 62 | | 2 | 514 |
| April | 15 | | 63 | 2 | | 13 | | 34 | | 1 | 128 |
| May | 16 | | 94 | 4 | 13 | 18 | 54 | 10 | | 1 | 210 |
| June | | | 29 | 9 | 13 | 14 | 64 | 17 | | | 146 |
| July | | | 6 | 4 | | 2 | 17 | 1 | | | 30 |
| 2010 | 22 | | 232 | 19 | 6 | 52 | 156 | 37 | | | 524 |
| April | 20 | | 93 | | | 23 | 54 | 21 | | | 211 |
| May | 2 | | 120 | 12 | 4 | 26 | 90 | 16 | | | 270 |
| June | | | 19 | 7 | 2 | 3 | 12 | | | | 43 |
| 2011 | 4 | | 114 | 9 | | 17 | 77 | 22 | | | 243 |
| April | 4 | | 36 | | | 4 | 17 | 12 | | | 73 |
| May | 0 | | 44 | 6 | | 4 | 30 | 6 | | | 90 |
| June | | | 32 | 3 | | 1 | 23 | 4 | | | 63 |
| July | | | 2 | | | 8 | 7 | | | | 17 |
| 2012 | | | 140 | 10 | 7 | 16 | 112 | 30 | | | 315 |
| April | | | 69 | | | 6 | 20 | 14 | | | 109 |
| May | | | 21 | | 1 | | 35 | 3 | | | 60 |
| June | | | 50 | 10 | 6 | 10 | 57 | 13 | | | 146 |
| 2013 | 9 | | 159 | 4 | 25 | 10 | 82 | 33 | | | 322 |
| April | 4 | | 78 | | 5 | 3 | 24 | 16 | | | 130 |
| May | 3 | | 71 | 2 | 20 | 7 | 58 | 16 | | | 177 |
| June | 2 | | 10 | 2 | | | | 1 | | | 15 |
| 2014 | 14 | | 110 | 8 | 13 | 14 | 84 | 12 | | | 255 |
| May | 10 | | 62 | 2 | 3 | 8 | 24 | 7 | | | 116 |
| June | 4 | | 48 | 6 | 10 | 6 | 60 | 5 | | | 139 |
| 2015 | 9 | 2 | 54 | 12 | 12 | 4 | 99 | 20 | 1 | | 213 |
| May | | | 13 | | | 1 | 26 | 9 | | | 49 |
| June | 1 | 2 | 21 | 6 | 12 | 1 | 29 | 5 | 1 | | 78 |
| July | 8 | | 20 | 6 | | 2 | 44 | 6 | | | 86 |
| 2016 | 3 | 1 | 111 | 11 | 11 | 7 | 76 | 35 | | 1 | 256 |
| May | | | 82 | 7 | 7 | 3 | 44 | 19 | | 1 | 163 |
| June | 3 | 1 | 29 | 4 | 4 | 4 | 32 | 16 | | | 93 |
| Grand Total | 95 | 3 | 1256 | 110 | 100 | 180 | 905 | 286 | 1 | 3 | 2939 |