



PA Farmland Raptor Project

2021 Newsletter

T L SEPKOVIC
PHOTOGRAPHY



Twenty twenty-one proved a productive year for the PA Farmland Raptor Project with 14,773 farmland raptors sightings tallied. Thanks to a grant from the Kittatinny Coalition, the strength of the database could be tested to assess its potential to identify important habitat for farmland raptors at a county level. This grant also allowed us to expand the reach of the project and place kestrel boxes in each of the counties adjacent to the ridge increasing available nesting opportunities for our smallest grassland raptor and engaging new interest groups and landowners along the way. As always, this effort is not possible without the contributions of our community scientists reporting their data to the Project or eBird; we always enjoy hearing more about what you are seeing in your local grasslands and look forward to incorporating your data in the coming year!

~Bracken Brown Farmland Raptor Project Coordinator, Hawk Mountain



How You Can Help

- **Become a Donor or Sponsor:** Funds from donors and sponsors are used to build nestboxes, attend public events, print brochures and posters, and expand our network. These are expenses we must cover each year, and your donations are crucial to our efforts.

- **To make a donation:** Use our secure web form, and note in comments for Farmland Raptor Project: www.hawkmountain.org/giv/donate-now

OR: Contact Bracken Brown at brackenbrown@hawkmountain.org or 570-943-3411 x103.

- **Report Sightings:** Use the Online Sighting Form at www.hawkmountain.org/farmlandraptorsightings

- **Build and Erect Nestboxes:** For barn owls and American kestrels, see plans on our web site.

- **Join Us at Public Events:** Email farmlandraptors@gmail.com to volunteer.

- **Maintain large grasslands on your property:** Nesting sites for short-eared owls and northern harriers

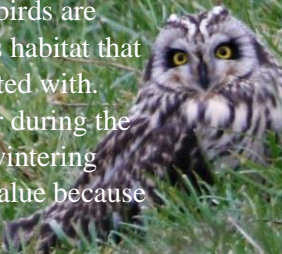
2021 SIGHTINGS

Twenty twenty-one was an average year for our reporting base. Of note both our grassland owl species had higher than average reports from previous years. Many of our sightings occurred during the migratory periods when birds are likely to be observed moving across habitat that they would not normally be associated with. Because of this, sightings that occur during the breeding period, May-August and wintering seasons Dec-March, are of higher value because

they indicate habitat that is supporting a population of grassland specialists.

Table 1: FRP 2021 Raptor Sighting Sources

	Farmland Raptor	eBird
American Kestrel	345	10,490
Northern Harrier	62	3,331
Barn Owl	0	83
Short-eared Owl	19	443



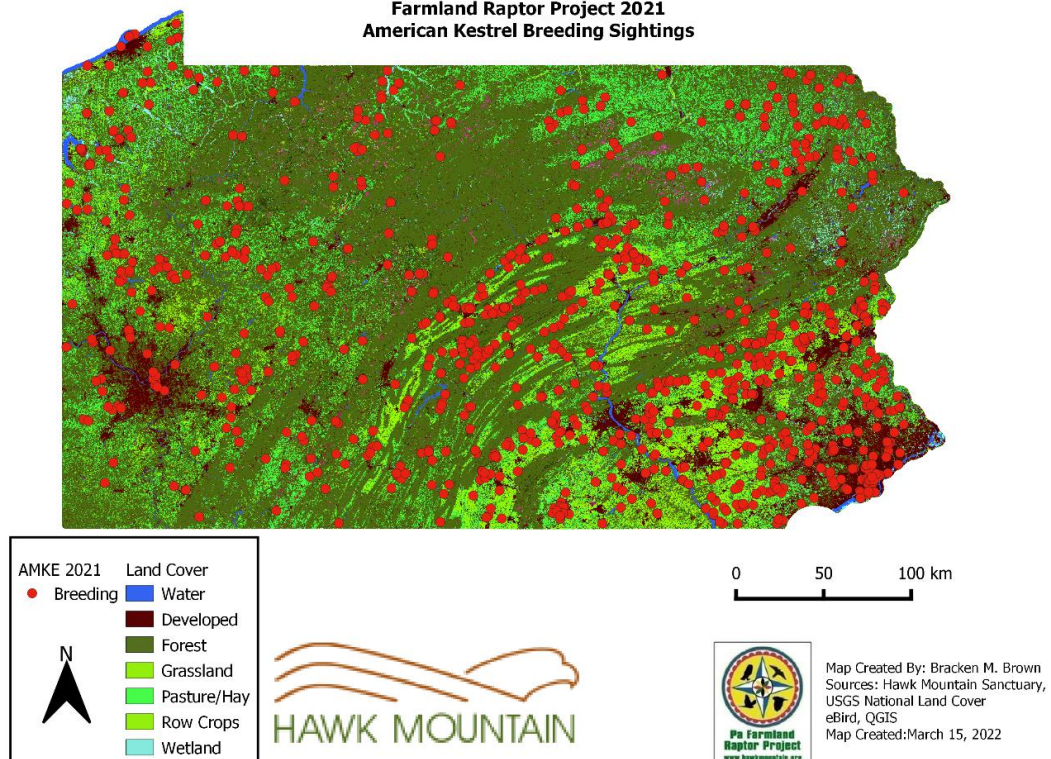


American kestrel pair by Bill Moses

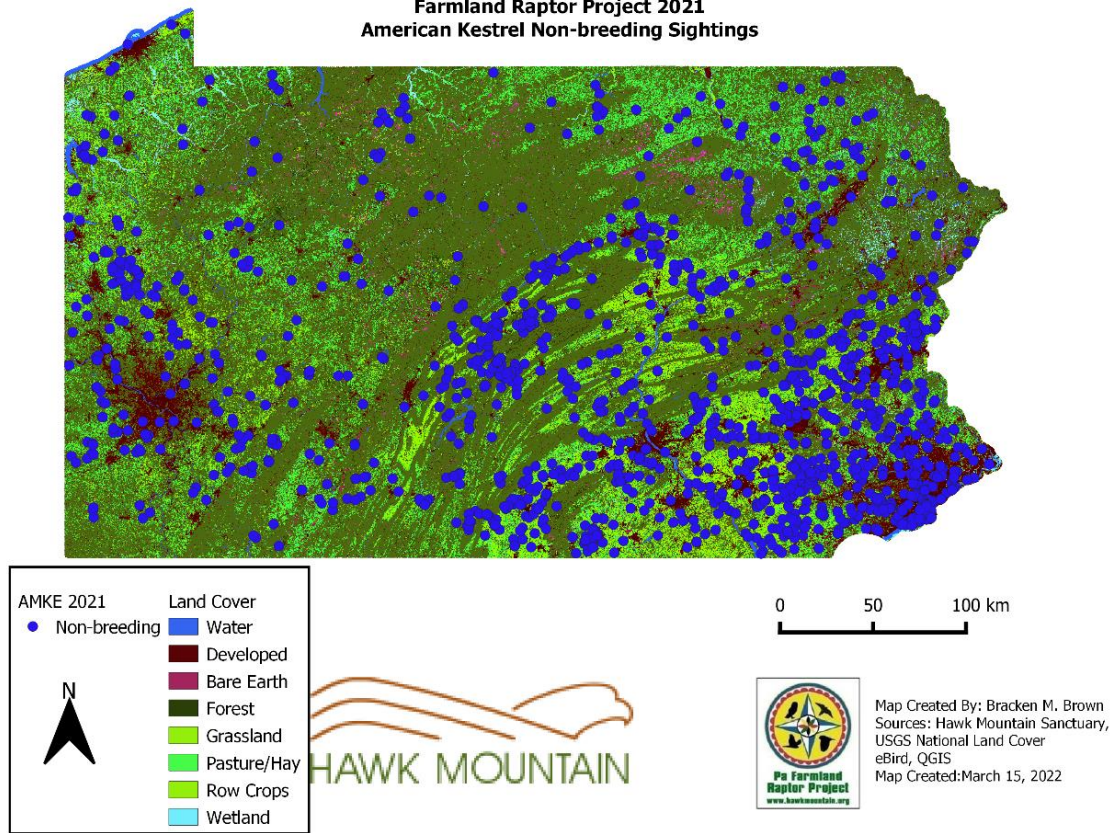
American Kestrel: *Falco sparverius*

It was an average year for total number of American kestrel sightings reported. Of these sightings 48% fell during the migratory period, 32% were overwintering birds, and breeding activity accounted for only 20% of the reports. Many of the sites had kestrels reported throughout the year, showing the importance of PA for both nesting and wintering kestrel. These birds could represent the non-migratory portion of the population, or such sightings could reflect particularly good habitat at a site used by winter visitors and nesters. More research on banded birds could illuminate this question.

**Farmland Raptor Project 2021
American Kestrel Breeding Sightings**



**Farmland Raptor Project 2021
American Kestrel Non-breeding Sightings**



Female American Kestrel exploring a snag, by Bill Moses



Photo of young northern harrier by Bill Moses

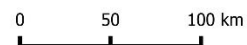
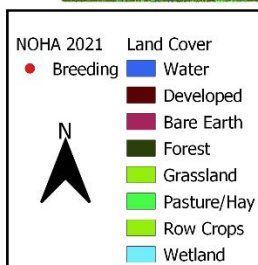
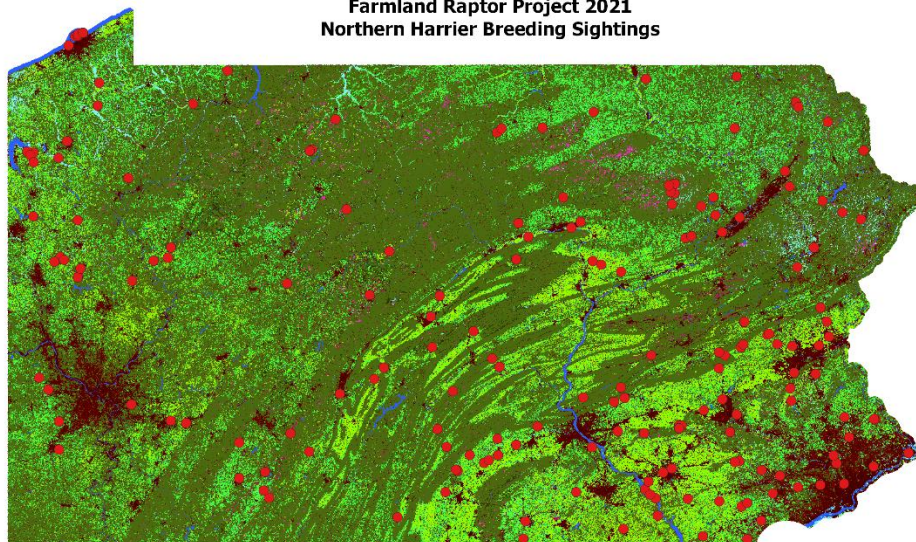
Northern Harrier: *Circus hudsonius*

Observers in 2021 reported 3,393 northern harrier sightings statewide. Representing 12% of the reports, there were 403 sightings of northern harriers during the breeding season. This raises the hope that there are more harriers than expected attempting to nest in the Commonwealth. Harriers rely on large, undisturbed tracts of grassland to raise offspring and, as such, their summer habitats are much more restricted than for wintering birds. Farmland Raptors would appreciate leads on any suspected northern harrier nests; see below in ***Find That Breeding Grassland Raptor*** on page 13. Sixty-two percent of the reports occurred during the migratory windows, with only 24% of these sites registering northern harrier during the wintering period, highlighting the importance of winter reports to help identify key habitat in the state.



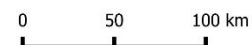
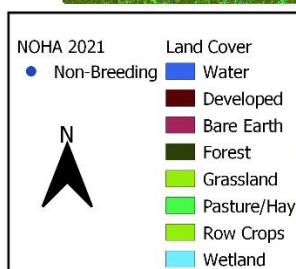
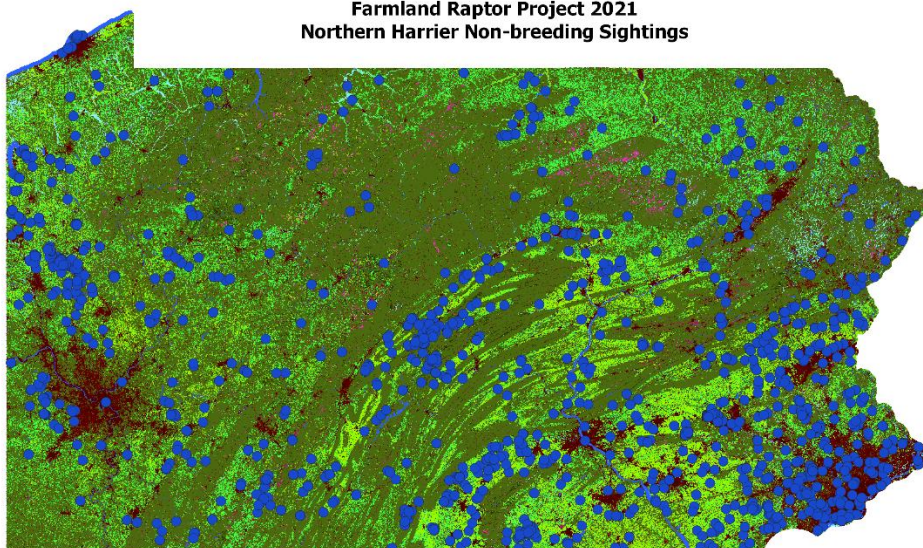
Northern harrier male by David Brandes

**Farmland Raptor Project 2021
Northern Harrier Breeding Sightings**



Map Created By: Bracken M. Brown
Sources: Hawk Mountain Sanctuary,
USGS National Land Cover
eBird, QGIS
Map Created: March 15, 2022

**Farmland Raptor Project 2021
Northern Harrier Non-breeding Sightings**



Map Created By: Bracken M. Brown
Sources: Hawk Mountain Sanctuary,
USGS National Land Cover
eBird, QGIS
Map Created: March 15, 2022

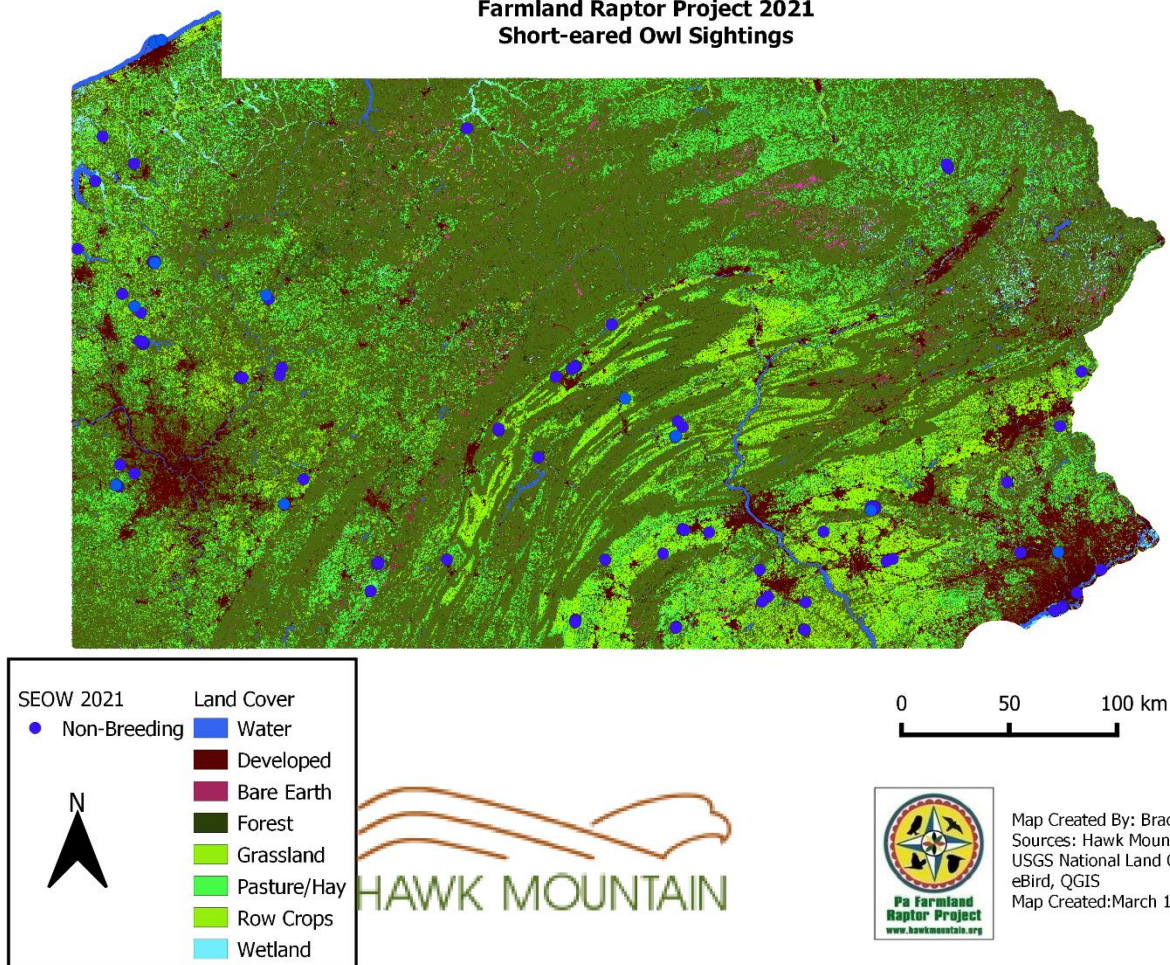


Short-eared owl with rodent by Bill Moses

Short-eared Owl: *Asio flammeus*

Short-eared owls remained elusive in 2021, with wintering or migratory individuals spread across the state, and only 18 sites that hosted multiple owls for more than a week. The most reliable sites all included maintained warm-season grasslands near agricultural practices-- the best example being the Gettysburg Battlefield National Park and Middle Creek Wildlife Management Area, whose grasslands continued to attract a wintering population. Short-eared owls are an infrequent nester within PA due to their need for extensive grasslands to successfully breed. If you observe individuals in the nesting season, please consult the guidelines in [Find that Breeding Grassland Raptor](#) on page 13. Sightings will be kept confidential by the Farmland Raptor team.

Farmland Raptor Project 2021
Short-eared Owl Sightings



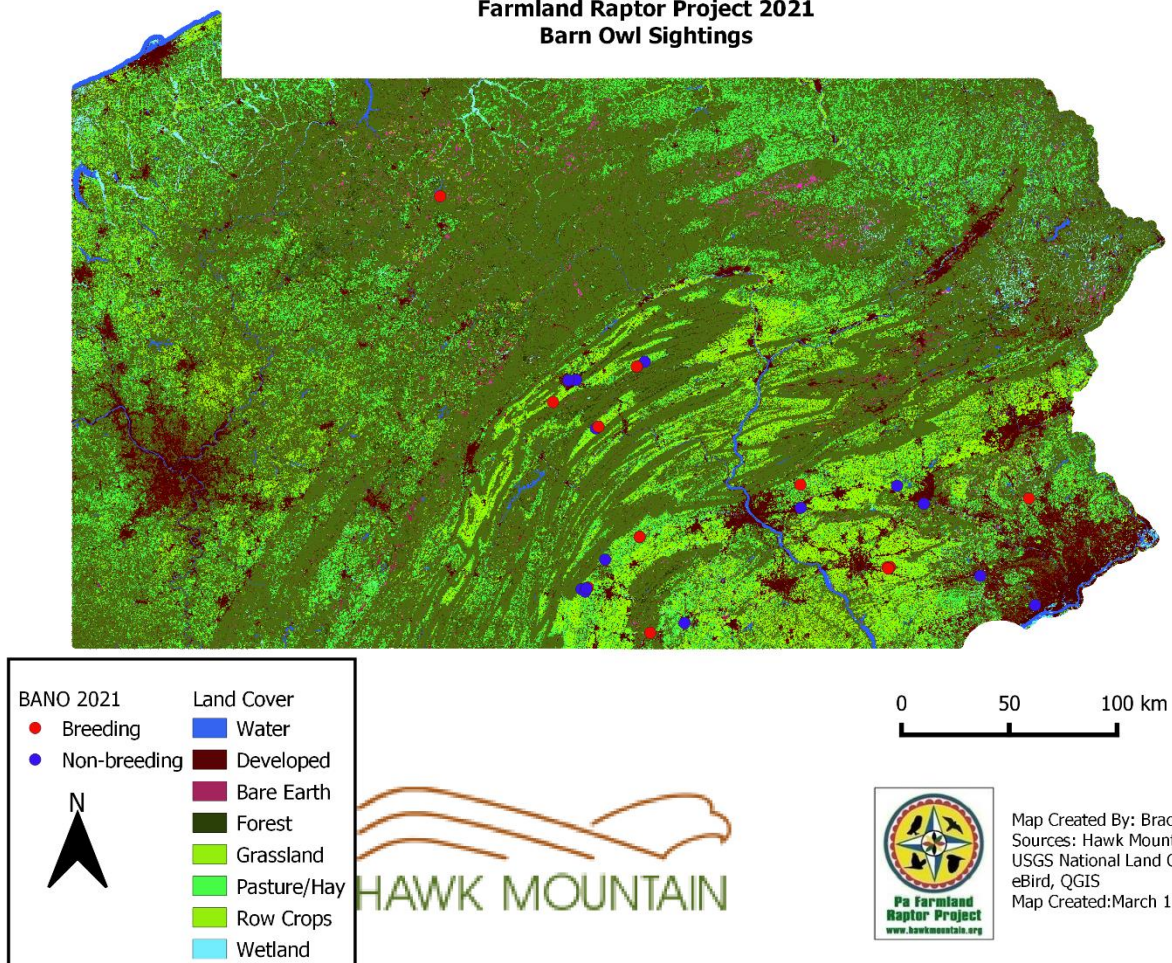


Hawk Mountain Sanctuary's farmland raptor barn owl ambassador by Aaron Prince.

Barn Owl: *Tyto alba*

Despite the barn owl's propensity to roost and nest in manmade structures the barn owl remained one of the least encountered grassland species of the Project. The 83 reports in 2021 primarily came from the south-central region of the state, where large agricultural landscapes provide excellent habitat. Sightings were mixed between breeding and non-breeding, demonstrating a year-round association with preferred habitats in Pennsylvania.

**Farmland Raptor Project 2021
Barn Owl Sightings**



Hawk Mountain Kestrel Nestboxes

By: Dr. Rebecca McCabe Research Biologist

This field season was one for the books! In 2021, Hawk Mountain's kestrel research expanded thanks to major funding from the Pennsylvania Game Commission, Wild Resource Conservation Fund (DCNR), Giorgi Family Foundation, Robert F. Schumann Foundation, and Christina Clayton and Stanley Kolber. Staff, graduate students, trainees, and collaborators in Pennsylvania and New Jersey measured the growth rates of 250+ chicks, collected over 300 blood samples to test for contaminant load, conducted habitat surveys at 180 nestboxes, and deployed 70 VHF radio tags to track survival post-fledging.

From the 50 occupied nestboxes in 2021, 108 young successfully fledged. Although the number of pairs was higher than last year (43 pairs in 2020), our failure rate was about the same (40% in 2020). However, average clutch size increased from 3.7 in 2020 to 4.4 in 2021. The average lay date this season was April 28, a few days earlier than the 10-year average (i.e., May 1). Of the 130 nestboxes monitored in the region, occupancy rate was about 40%.

Table 1. Average numbers of pairs, occupancy, clutch size, and proportion of failures by American kestrels in Hawk Mountain Sanctuary nestboxes

Year	Number of pairs	Occupancy	Clutch size	Nest failure
1992-2001	90	46%	4.6	29%
2002-2011	54	40%	4.5	25%
2012-2021	41	45%	4.5	27%

Table 2. Average laying dates for American kestrels using Hawk Mountain Sanctuary nestboxes (sample size represents numbers of pairs for which laying date is known)

Year	Sample size	Average laying date
1992-2001	648	1 May
2002-2011	347	2 May
2012-2021	263	1 May
2021	28	28 April



Nestboxes for Farmland Raptors



Barn owl and American kestrel are two farmland raptor species with close associations to humans. Being cavity nesters, these species will seek out holes in trees or move into a quiet barn, shed, or outbuilding. This means nestboxes can be put out to recruit these beneficial raptors to a property that has ideal habitat, where they will quickly get to work dining on farmland pests.

Selecting the location:

Boxes should be placed in quieter sites on the property facing open habitat, where hunting will occur.

- Large isolated trees in the middle of or facing fields
- Barns or outbuildings with large open view for hunting
- Tall poles surrounded by open habitat
- Open areas where small mammals are common, that have few natural cavities
- Avoid placing a box where pesticides are used as they poison a raptor feeding on impacted prey

For more information, or to report your sightings, please visit the project pages at:

www.hawkmountain.org/farmlandraptors

Barn Owl photographed by TL Sepkovic





Expanding the Kestrel Project

By PhD Candidate Mercy Melo

Beyond monitoring the continent's first nestbox program for American kestrels, Hawk Mountain Sanctuary is now leading a collaborative project to gain a deeper understanding of the regional American kestrel population decline. Partnering with colleagues across North America, our project is investigating the effects of habitat quality, environmental contaminants, and decreased prey abundance on both the individual and population levels. By employing new field technologies and cutting-edge laboratory analyses, our goal is to use this multifaceted approach to think about the decline through different perspectives and discover what can be done to reverse the trend of this once-abundant raptor.

With one year of data collection completed, this project is now expanding to look at these drivers of decline over a larger geographic area with even more sites. Going into the summer of 2022, we are now leading a group of 15 collaborative sites throughout the northeastern United States, Idaho, and Florida. By looking at how habitat quality, prey abundance, and contaminant load differ among these sites,

we can detect population-level trends that will help us to develop informed conservation strategies.

Habitat Quality

American kestrels thrive in open habitats with a few perching spots such as agricultural fields with nearby forested land. With both types of land converting into residential properties the ongoing shift in this habitat may be playing a significant role in kestrel population declines. By looking at factors such as perch availability and vegetation height, we can learn about what types of habitat characteristics are important to kestrels for hunting successfully, feeding chicks, and evading predators. Last year we conducted habitat quality surveys looking at these characteristics at 90 different nestbox sites throughout Pennsylvania. This data is compared to nestbox occupancy and reproductive success to see how habitat quality may be impacting kestrel chick production in the Commonwealth and beyond.

Environmental Contaminants

The American kestrel diet, which mostly consists of small mammals, insects, and songbird species, makes them a powerful addition to any farm, but it also leaves them vulnerable to a new source of challenges, agricultural pesticides. Pesticides in use today, including neonicotinoids, have been shown to alter reproductive and foraging behaviors of many different grassland bird species, and kestrels are no exception. To explore the effects of contaminant load in kestrels, we measured contaminant load in both adults and chicks to see how different amounts of contaminants may impact survival and chick development. For this year, we are continuing to collect samples to test for contaminants in Pennsylvania but have also expanded to multiple other sites as far west as Idaho and as far south as Florida to detect larger-scale trends.

Decreased Prey Abundance

Agricultural pesticides may also impact kestrel populations as they decrease abundance of their prey species. When

insecticides and rodenticides are employed to control those populations, kestrels face a stark decrease in available prey options. Many songbird species have also faced population declines in recent years, further limiting prey availability for kestrels. With less prey available, adult survival and ability to feed chicks is suspected to be affected. To learn more about how prey abundance varies across different habitats and impacts kestrels, we quantified prey populations around nestboxes and correlated that data with our habitat quality surveys and measurements of chick development and success of the nest.

Conclusion

American kestrels face many challenges that may ultimately be leading to their population decline. By investigating the effects of these different challenges, Hawk Mountain hopes to gain insight into future conservation management strategies for kestrels and other raptor species that are undoubtedly facing similar challenges.



Male American kestrel by Bill Moses



What Can You Do To Help?

While kestrels face challenges, we can help them by making simple changes in our own backyards.

- Plant natives to increase biodiversity
- Preserve large grassy open areas
- Keep dead trees for nest cavities
- Put up a kestrel nest box
- Avoid using herbicides & pesticides
- Snap traps instead of rodent poison

To help specifically with this project, you can keep an eye out for color bands on kestrel legs and report your sightings to Hawk Mountain Sanctuary. Over the past two years, we have deployed color bands with two-digit codes and transmitters on kestrel chicks and adults throughout Pennsylvania. For this upcoming season, we are planning to deploy even more color bands in Pennsylvania, New Jersey, New York, Virginia, and Delaware. To help with this effort, citizen scientists across the northeastern United States can report sightings of kestrels with color bands or transmitters to our project at hawk.mountain.kestrel@gmail.com. With reports like these, we can track where our kestrels are moving and how long they are surviving even after they leave the study site.

Feel free to email us with any questions regarding this project or kestrel conservation in general. By working together with other nestbox programs and citizen scientists, Hawk Mountain's research team is looking forward to learning more about how we can help this beautiful raptor species return to its abundant status.

Support Ground-nesting Raptors



Pennsylvania boasts two ground nesting raptor species the northern harrier and short-eared owl. They are found widely throughout the state associated with open grassland habitats, often preferring a mosaic of grasslands, agricultural fields interspersed with wetlands. Breeding records of both species in Pennsylvania are dropping due primarily to conversion of appropriate habitat to development, high-intensity agricultural practices, or forest regeneration.

In order to nest, these species need:

- Tracts of open land over 100 acres
- Low impact agricultural activity if in ag fields
- Sections of dense grass over 20 inches to hide their nest
- Healthy vole populations to feed their chicks

What can you do to help?

- Maintain and protect patches of native grassland
- Do not mow near the nest until after the young fledge
- Avoid overgrazing to maintain mixed grass heights
- Report sightings of territorial birds observed in PA May-August

For more information, or to report your sightings, please visit the project pages at:

www.hawkmountain.org/farmlandraptors

Short-eared Owl and Northern Harrier photographs by TL Sepkovic

Find That Breeding Grassland Raptor

The PA Farmland Raptor Project is still gathering sightings of our four grassland specialists during the breeding seasons. The project is particularly interested in any reports of nesting northern harrier and short-eared owl as they are listed as threatened and endangered, respectively. Because as ground nesters, these two species establish territories over large tracts of grassland habitat that allow them to hide their nest from prying eyes of potential predators. Unfortunately, Pennsylvania grasslands of appropriate size are typically hay fields destined to be mowed prior to the chicks being old enough to fly. If you identify a potential territory, it is possible to check on the field ownership and determine the mowing risk. Often property holders, if made aware, are happy to work around the birds giving them a buffer of unmown grass until their chicks fledge in July. In the past few years, the only short-eared owl nests in the state have been on reclaimed mine lands converted into warm season grasslands.

If you suspect nesting activity, it is important not to unintentionally harass these sensitive species which would impact nest success. It is best if you use a spotting scope from a place where your presence is not altering the bird's behavior. An approximate nest location can be mapped by observing the bird's behavior. Note any location in the field where the birds prefer to land and look for courtship flights as they often perform them over the nest area. If you suspect nesting, you should confidentially report the territory to us and request further monitoring recommendations by contacting the Project or reaching out to the regional PA Game Commission biologist. The dates for the known nesting season in Pennsylvania for ground nesters are identified in the table below.

Common Name	Scientific Name	State Listed	Safe Dates	Nesting Season
Northern Harrier	<i>Circus hudsonius</i>	THREATENED	June 1 - July 31	April 15 - August 31
Short-eared Owl	<i>Asio flammeus</i>	ENDANGERED	April 20 - August 15	April 15 - July 31

If you do encounter breeding northern harriers or short-eared owls, please forward information to Bracken Brown at Hawk Mountain Sanctuary All reports are kept confidential and only shared to PGC regional biologist.



Thank you for reading our 2021 newsletter. This is one of Hawk Mountain's initiatives to promote and facilitate farmland raptor conservation. It is only possible to achieve this effort through support of landowners and members of the public reporting their sightings and implementing land practices to benefit these iconic raptors that rely on our grass and farmlands to survive. If you have any questions about how to get involved or want to share your farmland raptor data, please don't hesitate to get in touch via one of the methods listed below. Here is to a great 2022 nesting season for farmland raptors and those who monitor them! A particular thank you goes out to the photographers willing to share their phenomenal pieces for the newsletter. This year photos came from Traci Sepkovic, David Brandes, Aaron Prince, and Bill Moses

Contact us or for more information!

Contact:

Bracken M. Brown, Biologist-Naturalist

brackenbrown@hawkmountain.org

farmlandraptors@gmail.com

570-943-3411 ext. 103

410 Summer Valley Road,

Orwigsburg, PA 17961

or find out more at our website:

<https://www.hawkmountain.org/conservation-science/active-research/raptor-conservation-studies/farmland-raptors>

To report your farmland raptor sightings:

<https://www.hawkmountain.org/conservation-science/active-research/raptor-conservation-studies/farmland-raptors>