



Prepared by Rachel Yurchisin and Jordan Brown

# Delaware Kestrel Partnership 2025 Report

## OVERVIEW

In 2013, American Kestrels (*Falco sparverius*) were listed in Delaware as a state endangered species and later, in 2015, as a Tier 1 Species of Greatest Conservation Need (SGCN) in the Delaware Wildlife Action Plan<sup>1</sup>. The Delaware Kestrel Partnership (DKP) was created in 2016 to address these state population declines. The partnership, lead by the Delaware Department of Natural Resources and Environmental Control (DNREC) Division of Fish and Wildlife (FW) aims to monitor American Kestrel populations in the state and create additional nesting opportunities by installing nest boxes in suitable habitats. All nest boxes are monitored, primarily by volunteers, to assess nesting activity, productivity, and success of breeding populations of this state-endangered bird throughout Delaware. Additionally, individual birds are evaluated by the DNREC FW to determine body condition, exposure to environmental contaminants, and dispersal patterns. This year, 21 kestrels were fitted with radio tags, compatible with the Motus Wildlife Tracking System's network of receivers. More information regarding this project can be found on page 2.

<sup>1</sup>To read more about Delaware's State Wildlife Action Plan, please visit our website: <https://dnrec.alpha.delaware.gov/fish-wildlife/conservation/wildlife-action-plan/>

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Days old kestrel chicks from a nest box in Sussex County

Photo courtesy of Joel Martin



## MOTUS INFORMATION

### General Summary

The Motus Wildlife Tracking System is an international collaborative research network that uses cooperative automated radio telemetry to track small flying organisms (birds, bats, and insects). The system enables a community of researchers, educators, organizations, and citizens to undertake impactful, cost-effective, research, and education on the ecology and conservation of migratory animals.

Data collected by Motus is revolutionizing the understanding of migratory animals and is being used in conservation planning for species and sites, status assessments and recovery plans for species at risk, environmental assessment, and mitigation planning for development projects, and contributing to numerous continental conservation efforts. For more info, please visit <https://motus.org/>.



Motus tower install

*Photo courtesy of Rachel Yurchisin*



Female kestrel fitted with a Motus tag

*Photo courtesy of Jordan Brown*

### DKP Involvement

There is a lack of information on the movements, survivability, and year-round habitat use of Delaware American Kestrels. Therefore, in 2023, DNREC FW successfully acquired the funds, equipment, and necessary permitting to allow FW biologists to install Motus towers and begin outfitting kestrels with radio tags. These tags will provide the data necessary to understand more about these small falcons and how to best conserve this species. Thus far, in both 2024 and 2025, DNREC FW staff have been able to deploy 38 Motus tags. Kestrels tagged include nesting adults and chicks from Delaware nest boxes, as well as individuals trapped during migration or over the winter.

The tags used are hybrid—meaning they are both battery and solar-powered. The battery can last up to three days without solar charge, which is beneficial when the adults are incubating in nest boxes or other cavities and spend less time out in the open. Existing data from other projects using these tags show the lifespan of the tags to last at least three years, which will provide much more data than is typically seen with leg bands only.



## MOTUS INFORMATION (CONTINUED)

### Year One Results

Motus tagged American Kestrels from our project have been detected by 49 receivers in 12 states from New Hampshire to Georgia. 25 other species of birds have been detected by our towers, including Red Knots traveling from as far away as French Guiana in South America, or Nunavut, Canada. There are currently 15 Motus towers in Delaware, three of which were installed last year thanks to our grant funding.

### Looking Forward

With a tight grid of receivers, it should almost be impossible for a tagged animal to move through without being detected. In order to fill gaps of coverage in Delaware, four more Motus towers are being installed, one of which is a restoration of the existing but inactive, Mispillion Harbor tower, which will be integral in detecting migrating shorebirds. The other locations will provide more inland coverage to target American Kestrels in open habitats.



Motus tower install at  
DNS Abbott's Mill

*Photo courtesy of Errol Ebanks*

### An Incredible Journey

If you walked an average of 12 hours a day, it would take over 20 days to travel the 800 miles that this female American Kestrel flew in half the time! Beginning her journey north during spring migration on March 16, she was detected at the intersection of the North Carolina, Georgia, and South Carolina borders. In two days, she flew 430 miles (as the kestrel flies) to Virginia Beach. At 5:30 pm on March 19 she flew through the Chincoteague area to then be detected five hours later near Idylwild. The next day, she was in Cedar Swamp Wildlife Area for lunch and Westchester, PA for dinner. She then decided it was too far north and came back to Redden State Forest in the middle of the state where she was not detected for nine days. She was picked back up on March 31st when she made a 100 mile journey, pinging towers on the way from Little Creek Wildlife Area to Longwood Gardens and back to Bucktoe Preserve. She remained in the area for the first few days of April then most likely moved on to an area where there currently is not Motus coverage.



Nesting adult female from 2024  
who made this journey

*Photo courtesy of Erica Miller*

Watching this journey step by step truly shows the power of Motus. Learning the preferred migration paths of these birds can lead towards further conservation and protection of this Species of Greatest Conservation Need.



## 2025 SEASON SUMMARY

### Monitoring

During the 2025 season, the DKP monitored a total of 88 nest boxes across the state. The DKP currently has 58 nest boxes in New Castle County, nine in Kent County, and 21 in Sussex County. At least one American Kestrel was seen within the area of 24 (approximately 28%) nest boxes this season, while American Kestrel *pairs* were seen within the area of 14 (approximately 16%) nest boxes this season. A total of nine nest boxes (approximately 10%) were determined to be active with all nine boxes having eggs laid within them. In total, at least 42\* eggs were laid (six boxes with five eggs, two boxes with four\* and one box with three).



Two chicks observed at a fledge check.

Photo courtesy of Rachel Yurchisin

Seven of the active boxes successfully hatched American kestrel chicks, totaling 30 chicks. Two nest boxes had full clutches that were abandoned, while one (successful) box had one unhatched egg. This year, our monitors and staff were able to confirm successful fledging of at least 23 individual chicks, including two foster chicks that were rehabilitated at Tri-State Bird Rescue. Fledging can be difficult to determine, especially in large, open settings where birds can easily blend into their surroundings or where birds are forced to travel further away from their nest box to the nearest perch, and are not easy to locate.

\*This year, a nest box that we deemed inactive at the end of May ended up surprising us! When staff returned to the area for roadside trapping in early August, a male and female were noted bringing food to the nest box. Upon checking, there were four, fledging-aged kestrels inside of the box. It is unknown how many total eggs were originally laid so we are only counting the number of chicks inside of the nest box.

### 2024 vs 2025 Season Overview

	2024	2025
Active nests	7	9
Failed nests	2	2
Chicks	21	30
Unhatched eggs	19	6
Chicks banded	11	33*

\*Three foster chicks that were rehabilitated from Tri-State Bird Rescue were banded and added to broods of similar ages

### Banding, Measuring, and Sampling

When a nest box was reported active, DKP researchers took the opportunity to safely capture the adult birds at the nest box to gather additional data about the kestrel pair (and ultimately Delaware’s overall kestrel population). During the 2025 season, a total of nine adult kestrels (three males, six females) were successfully captured at (or nearby) nest boxes.

Of the nine adults, three (one male, two females) were re-captured birds that had been previously banded. The first bird, color band “069” was the nesting female at an active Winterthur nest box this year. This bird was originally banded at a Delaware Nature Society (DNS) nest box as an adult in 2023, and nested at Brandywine Creek State Park in 2024. The second female, originally banded as

a chick in 2023, was already equipped with a Motus tag that we deployed during her nesting period at Auburn Heights State Park in 2024. This year, she nested in a box at Mt. Cuba Center. Finally, the male was originally



## 2025 SEASON SUMMARY (CONTINUED)

### Banding, Measuring, and Sampling (Continued)

banded as a chick in Marshallton, Pennsylvania. This season marking his first season as a breeding adult.

Additionally, we had three bands get reported back to us this year from outside observers. One encounter, reported as a deceased bird, was from Morgantown, PA during the 2024 nesting season. The male bird, "025", was originally banded as a chick at Winterthur in 2022. In May, adult females, color bands "038" and "078", were resighted incubating in nest boxes in Bucks County, PA and East Amwell Township, NJ, respectively. "038" was banded as a chick in 2022 and "078" in 2023, both from the same nest box!

In addition to the eight adults banded at nest boxes, three adults (a pair captured together on the same day, and one additional female nearby a nest box) were caught via **Bal-chatri traps** along roadsides throughout Delaware. These trapping efforts will continue throughout the year and will allow the Delaware Kestrel Partnership to gather information about kestrels outside of the nest box program, including migrating and overwintering birds. Each adult was weighed, measured, and fit with a metal USGS band. As in previous years, a blood sample was also drawn from each bird to be tested for malaria via a partnership with the University of Delaware.

In 2024, the nesting period for our Delaware kestrels was later than our historical average resulting in higher temperatures within the nest boxes, and seemingly inducing early fledging. In order to avoid missing out on this data, DNREC FW staff implemented a visit

**Bal-chatri traps** are a popular trap used to capture birds of prey. They use bait animals (in this case, a hamster) to lure the bird to the trap. The bird is removed immediately by a trained professional, processed, and banded. No hamsters, or birds, are harmed during this process.



Adult female trapped roadside via Bal-chatri trap and Fred, the hamster.

*Photo Courtesy of Jordan Brown*



Female chick from Winterthur equipped with a Motus tag.

*Photo Courtesy of Larry Drexler*

at the 14 day old mark to band chicks, and another around 21 days to deploy Motus tags. DNREC FW staff also placed temperature gauges inside active nest boxes to gain insight concerning the conditions the chicks are experiencing. Our highest recorded temperature was over 100 degrees! Overall, the nest boxes seemed to average six degrees higher than the outside temperatures.

During the appropriate visits, chicks were safely removed from the nest to be weighed, measured and given a uniquely numbered metal USGS band. About half of the chicks also received a Motus tag. The same blood samples that were drawn from the adults were also drawn from each chick when possible. In total, DKP biologists banded 33 chicks: 15 males and 18 females, with seven males and seven females Motus- tagged.



## Volunteer Effort

The DKP's consistent and widespread monitoring is made possible through the hard work of dedicated volunteers! This season, volunteers contributed at least 316 hours visiting nest boxes, collecting data, reporting their findings, and engaging with the program. Of the 35 total volunteers, 29 were returning and 6 were new. Volunteers come to us after hearing about DKP from a friend, our webpage, the Brandywine Zoo, or even Reddit!

We would like to acknowledge and thank our volunteers for giving their time this season to assist in monitoring and banding efforts. The accomplishments of the 2025 season could not have been done without them.

We want to thank those volunteers who joined trapping and banding sessions to learn more about and support the DKP's efforts. As a bonus, we are lucky enough to have some extremely skilled photographers who have shared their photos with the DKP (some included in this report!) These images represent the hard work that each volunteer contributes to. All images shared are greatly appreciated.



Volunteer, Jen Llewelyn, observed DKP staff fitting a Motus tag on an adult kestrel.

*Photo courtesy of Rachel Yurchisin*



Volunteer, Dr. Miller, and her vet student taking measurements on a female kestrel fledgling

*Photo courtesy of Carly Costello*

## Volunteer Highlight

This year, during the 2024 DNREC FW Recognition event, Dr. Erica Miller of the Pennsylvania Wildlife Futures Program received the Division's Volunteer of the Year award. Not only did she assist with nest box monitoring, but also provided guidance and expertise during the banding visits, as well as consulted on nestling health when applicable. Students from the University of Pennsylvania's School of Veterinary Medicine additionally assisted with banding efforts and blood draws under the guidance of Dr. Miller and Jordan Brown. We thank Erica all for the time, effort, and guidance she provided to DKP and all of her contributions to the wildlife field!



## LANDOWNERS

The hosts of our nest boxes are just as important as our monitors! From private landowners, public owned properties, to land conservation organizations; from backyards and horse pastures, to multi-acre grasslands and agricultural fields, all are important potential kestrel habitat. We greatly appreciate the use of their land to assist in the protection of this sensitive species; check out their webpages linked on their logos below! The DKP is continually interested in identifying new sites to install nest boxes, feel free to reach out if your property is a potential match for our program. In particular, there is a need to increase the number of boxes in Kent and Sussex Counties to gather data which more accurately represents the kestrel population throughout the entire state.

After each season, the DKP continues to coordinate with landowners to alter, relocate, or remove nest boxes based on information collected throughout the current and previous breeding seasons. We continue to fine-tune where our nest boxes should be located within a landscape. In many instances, nest boxes have to be established for multiple years prior to being used by kestrels! We are happy to report that 7 additional nest boxes were installed in before the 2024 breeding season, three in Kent County, three in Sussex County, and one in New Castle County.



## 2026 PREPARATION



Carly, volunteer Abby, and Rachel after installing a nest box

Photo courtesy of Wayne Bench

Nest boxes will remain open year-round which will allow for American Kestrels to investigate potential nesting sites and over-wintering kestrels to roost in these boxes during the off-season. As previously mentioned, if a box was not active in the 2025 season and the nest box is in good kestrel habitat, there is still a possibility of kestrel nesting in future years.

Looking ahead to 2026, the DKP will continue to install Motus towers throughout the state to better understand the kestrels movements and habitat use year-round. All tagged birds will also help answer questions about migration and dispersal, as well as overall survival of the adults and chicks. These answers will provide valuable data to the Division as the DKP continues to research and attempt to reverse the decline of this species in the First State.



## A NOTE FROM JORDAN



Jordan with a kestrel chick

*Photo courtesy of Steve Minner, volunteer*

2025 was a big year! This was my tenth season working with American Kestrels in Delaware. From the days of empty kestrel boxes to a record-breaking nesting season and radio-tagged birds, this program has come a long way and it is so exciting to be a part of it. The success of the Delaware Kestrel Partnership would not be possible without our generous landowner partners and our dedicated volunteers! I want to thank each of our landowners and our 35 volunteers for their interest in this program, hard work to keep the program going, and also their patience as we have built the program up. A special shout-out to our 2024 Volunteer of the Year, Dr. Erica Miller, who has been with us since the inception of this program. Our

staff, our landowners, and our volunteers have greatly benefitted from Dr. Miller's knowledge and contributions to this program.

As we look forward to 2026, I am personally excited for the data that we will gain from our radio-tracked birds so that we can further investigate the movements of both the adult and young kestrels as they disperse and migrate, as well as creating new relationships and collaborating on research in the area!

## MORE INFORMATION

To find more information about this project, please visit: [American Kestrel Monitoring and Management - DNREC Alpha \(delaware.gov\)](#).

## CONTACT US

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*Images provided by DFW Staff unless stated otherwise*