Iowa's Motus Wildlife Tracking Network

2024 Annual Report

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Abstract

The Iowa DNR, with support from U.S. Fish and Wildlife Service grant funding, initiated a network of automated radio telemetry receiver stations as part of the Motus Wildlife Tracking System (motus.org) in summer 2021. Between August 2021 and September 2022, eight Motus stations were installed at DNR buildings across the state. Three additional stations were funded by partners and placed on County Conservation Board properties in fall 2022. In 2023, Iowa DNR and partners installed eight more stations, and in 2024 added another 13 stations, bringing the total to 32 stations across the state. These stations are part of a hemisphere-wide coordinated wildlife telemetry system focused on understanding long-distance movements of small migratory wildlife species like birds, bats, and insects. Any wildlife tagged on the Motus system have the potential to be detected by the Iowa DNR's receiver stations if they come within range. In 2024, Iowa Motus stations recorded 291 detections of 151 individuals from 24 bird species. Since the beginning of the project in 2021, Iowa Motus stations have recorded a total of 607 detections of 340 individuals from 39 bird species. While many of these individuals were captured and tagged by licensed researchers outside of Iowa, the Iowa DNR collaborated with regional partners to tag 27 Wood Thrush in Iowa during summer 2024.

Introduction

What is Motus?

The Motus Wildlife Tracking System is a collaborative global network of automated radio telemetry receivers and tagging projects. Motus was initiated in Ontario by Birds Canada in 2012 and has expanded globally since (Figure 1). Motus uses radio telemetry, which has three main components; transmitters, antennas, and receivers. The transmitters send out radio signals every few seconds and are placed on wildlife. Antennas are used to listen for the radio signals of nearby wildlife tagged with transmitters. Receivers interpret the radio signals heard by the antennas. Traditional wildlife telemetry requires every tagged individual to transmit a unique radio frequency, and for the receiver to be re-tuned to the frequency of each tagged individual a researcher is trying to find. The Motus system uses the same general components of radio telemetry, but the transmitters are digitally coded tags that allow for unique identification of thousands of individuals on a single radio frequency and the receivers are automated and set to listen only for Motus radio frequencies (Taylor et al. 2017).

Figure 1 Motus Wildlife Telemetry System receivers (yellow dots) across the globe as of December 2024.

In the Western Hemisphere, Motus tags and receiver stations (**Figure 2**) operate on two frequencies, 166.38 and 434 MHz. Scientists register tags and stations in a centralized database operated by Birds Canada, allowing researchers across the globe to collaboratively learn about the movements of small wildlife like never before. A tagged animal can

be detected by any Motus receiver station in the Hemisphere, allowing researchers to build point-by-point maps of large migrations for animals like birds, bats, and insects. Although GPS tracking technologies exist and are capable of recording highly-accurate locations of wildlife in real time, these technologies are too heavy to be carried by small wildlife like birds, bats, and insects. The Motus system, which uses tags as small as 0.2 grams, is particularly suited for learning about long-distance movements of small wildlife by leveraging the power of global collaboration.

Figure 2 Examples of Motus receiver stations

Full Annual Cycle Conservation

Over 400 species of birds can be seen in Iowa, the majority of which are considered migratory, meaning their range shifts during different parts of the year. Of those, a large proportion are long-distance migrants, traveling thousands of miles each year between breeding and nonbreeding areas. For example, the Baltimore Oriole, a common forest bird in Iowa during the summer, may travel as far as northern South America for winter (Figure 3). Using a full annual cycle conservation approach recognizes that these migratory species face different population pressures, habitat needs, and threats in different parts of their range throughout the year, and aims to support them at all stages of their annual cycle.

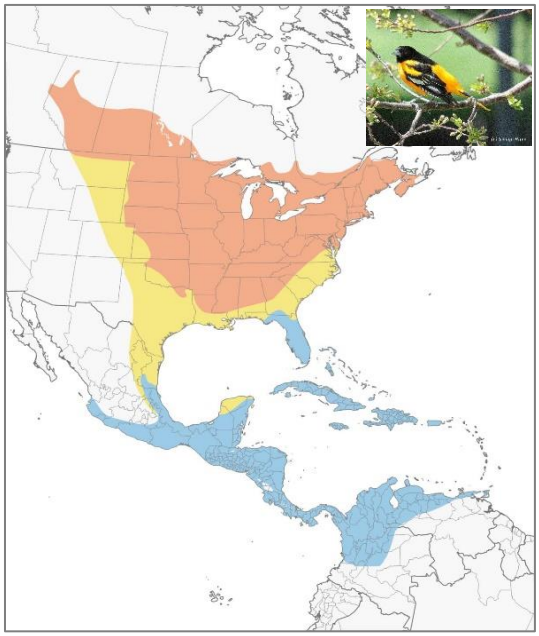


Figure 3 The annual range of the Baltimore Oriole. (Inset photo credit: Doug Harr). Map credit: Cornell Lab of Ornithology, Allaboutbirds.org.

Scientists have documented a loss of 2.9 billion North American birds since 1970, with migratory birds declining by 28% over that time (Rosenberg et al. 2019). Habitat loss, outdoor domestic cats, collisions with windows, and other threats are largely driving these declines. However, each species has its own unique population trend which coincides with the species-specific range, habitat and resource needs, and the unique threats each species faces. The migration period, while birds are highly mobile at a hemispheric scale, is the most difficult part of the annual cycle for biologists to

understand. There are many questions surrounding the threats birds face during migration, their habitat needs, migratory connectivity, and what conservation actions can most help bird populations. Motus is one important tool that can help conservationists answer some of these important questions about migration and implement full annual cycle conservation to help stop and reverse the decline of North American bird populations.

Why Motus in Iowa?

Iowa is an important migratory corridor for North American birds. Its location in the heart of the Mississippi Flyway and between two major rivers contributes to its high use by birds during migration. In fact, Iowa sees some of the highest volumes of migratory birds of any state during fall migration (Figure 4). An estimated 868 million birds crossed through Iowa during the fall of 2021, and in some years that number reaches 1 billion (BirdCast - Cornell Lab or Ornithology).

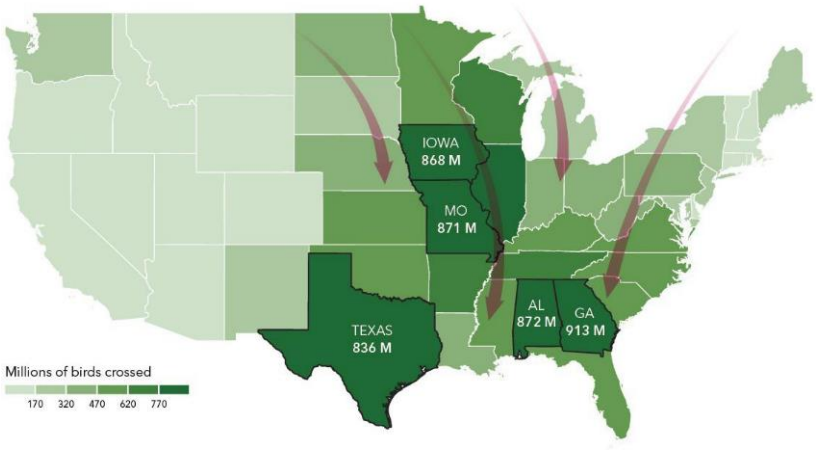


Figure 4 Cumulative estimates of the number of migratory birds passing through each state during fall migration 2021 based on radar data. The states with the highest volume of migratory birds are shown in dark green with Iowa seeing the 4rd highest volume of birds. Credit: Allaboutbird.org, BirdCast.

By strategically placing Motus receiver stations across Iowa, we have the potential to contribute valuable migratory data for a large variety of species, including over 100 migratory bird and 6 bat species of greatest conservation concern. The data gathered by these Motus stations can help researchers understand aspects of the routes, timing, speed, and habitat use of migratory species which can be used to inform conservation action.

Motus Station Placement in Iowa

Strategic Station Placement

The vision for Motus station placement in Iowa is to create an east-west fence through the center of the state and to border the Mississippi and Missouri Rivers with stations (Figure 5). This would maximize our detection of north-south migrating wildlife and our understanding of wildlife use of the corridors of habitat along the major rivers. This scenario would require 42 stations, however, implementation will need to be flexible to account for elevation, property ownership, and other practical constraints of placement. This vision will be used by the Iowa DNR as a starting point for prioritizing station placement across the state in order to contribute data at a regional scale. That being said, Motus stations placed anywhere in the state are valuable, and there is no reason to discourage placement of stations wherever funding and technical logistics allow. Iowa's station placement vision also aligns with the broader vision for Midwestern States as created by the Midwest Migration Network.

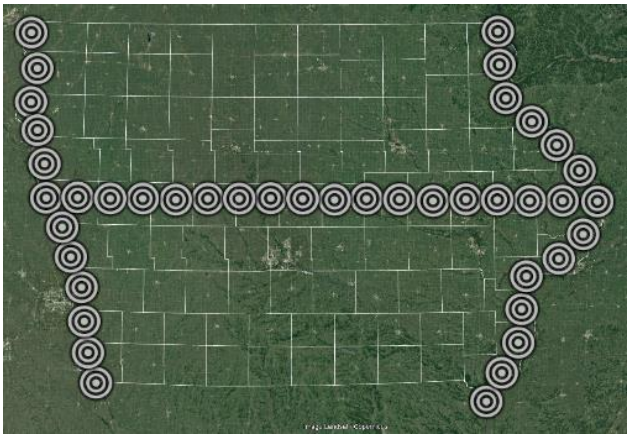


Figure 5 The vision for Motus station placement in Iowa.

Station Placement Progress

The initiation of the Motus network in Iowa was made possible by a U.S. Fish and Wildlife Service (USFWS) Competitive State Wildlife Grant (Missouri Division of Conservation 2020) which funded 59 stations in eight Midwestern states (IA, IN, IL, OH, MI, MN, MO, WI) and three countries (Mexico, Costa Rica, and Colombia). This grant funded the equipment for seven of the Iowa DNR's stations and partially funded an eighth station. The first five of these DNR stations were placed between August and December of 2021, with two additional stations placed in spring of 2022, and one station placed in fall of 2022 (Figure 6).

Partner organizations started funding and placing stations in the fall of 2022 and have continued since. Partner stations were made possible through funding and support from Pottawattamie County Conservation, Bremer County Conservation, Hardin County Conservation, the Prairie Rapids Audubon Society, the Gilchrist Foundation, Des Moines Audubon, Iowa Audubon, Iowa Ornithologists' Union, Dubuque County Conservation, Friends of Mines of Spain, Dubuque County Conservation Society, Dubuque Audubon, Lyon County Conservation, Wapello County Conservation, Madison County Conservation, Black Hawk County Conservation, The Friends of Hartman Reserve, Neal Smith National Wildlife Refuge, USFWS Migratory Birds -Midwest Region, Blank Park Zoo, the Loess Hills Preservation Society, Winterset Kiwanis Club, Friends of Ada Hayden Heritage Park, the City of Ames, Story County Conservation, Colo-NESCO Elementary School, Polk County Conservation, Linn County Conservation, Harrison County Conservation, Crawford County Conservation, and a number of donations from individuals, including in memory of John Utter and Nancy Slife. In July of 2023, the Iowa DNR received two generous donations from Musco Sports Lighting and Diane Crookham-Johnson, which will allow us to install an additional 20 stations across the state over the next five years.

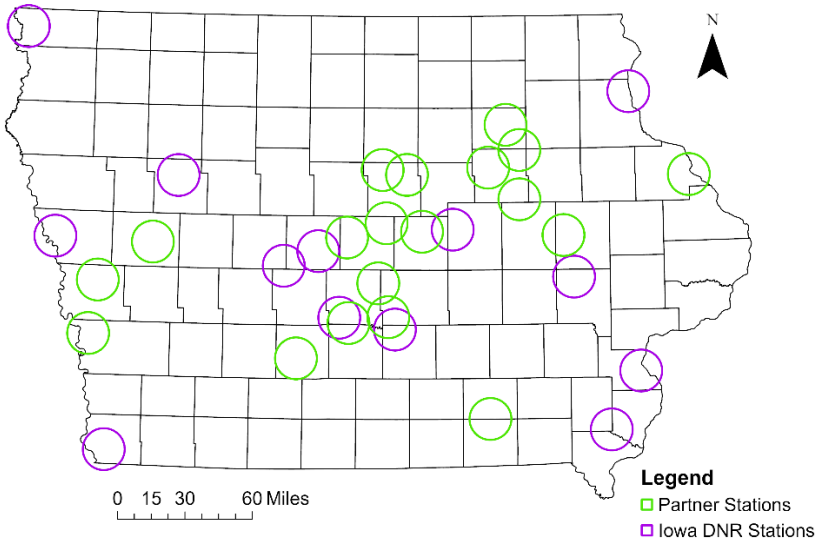


Figure 6 Motus stations in Iowa as of December 2024. DNR stations are in purple, partner stations are in green. Circles represent a 15-km radius around each station, the approximate detection range of most antennas.

Station placement thus far has generally followed the vision of an east-west fence through the center of the state and north-south fences along the rivers, but additional stations have been added based on local support. Stations in Iowa are dual-listening, meaning they operate on both the 166.38 and 434 MHz Motus frequencies, allowing them to detect any wildlife tagged on the Motus system in the Western Hemisphere. Antennas at each station are directional and generally oriented east and west in order to maximize detection of north-south moving wildlife (Figure 7). The 166 MHz antennas have a maximum detection range of 15 km (9.3 miles) and the 434 MHz antennas have a maximum detection distance of 10 km (6.2 miles).

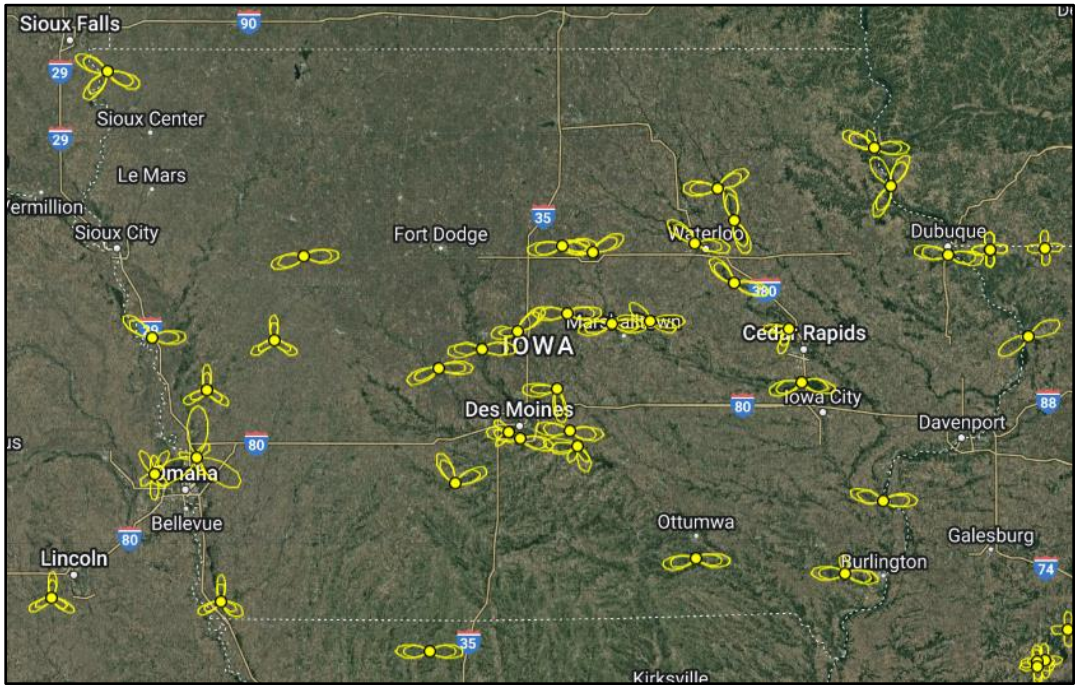


Figure 7 The approximate antenna range at each Motus station in or bordering Iowa is shown in yellow (December 2024).

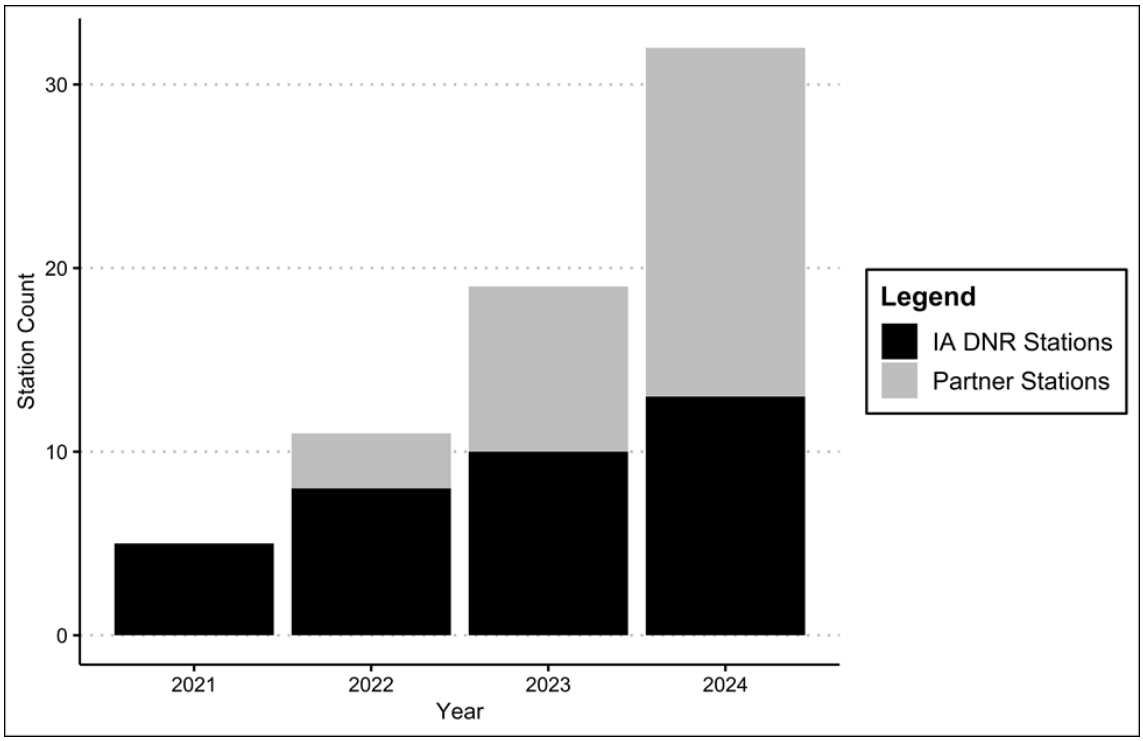


Figure 8 The number of Motus stations operational in Iowa in each year from 2021-2024. Black represents DNR stations, and gray represents partner stations.

Motus Tagging in Iowa

Wood Thrush

In 2024, the Iowa DNR collaborated with the U.S. Fish and Wildlife Service and many other states and international partners on an effort to deploy Motus tags on Wood Thrush across their eastern North America breeding range and their nonbreeding range in Central America. Wood Thrush are a Species of Greatest Conservation Need in 25 states, including Iowa, and are considered a common forest bird in steep decline. By tagging Wood Thrush across their range and detecting them on the network of Motus stations throughout the year, we are able to learn about their migratory routes and timing, migratory connectivity, and annual survival. Project partners tagged nearly 600 Wood Thrush in 2024 across 25 states and provinces and several Central American countries.

During the summer of 2024, Iowa DNR staff tagged 27 Wood Thrush at nine sites across the state near existing Motus stations. Wood Thrush were captured and tagged under Federal Bird Banding permits using targeted mist netting and audio lures (Figure 9). Tags were attached to the Wood Thrush with a leg-loop harness and were 3% or less of the bird's body weight so they do not impact the birds daily activity or flight. The battery lifespan of each tag is at least 400 days, allowing us to track the Wood Thrush during their fall and spring migration routes throughout a full annual cycle.

Figure 9 Left: A Wood Thrush fitted with a Motus tag. Right: A Wood Thrush caught safely in a mist net.

Iowa Wood Thrush started their fall migrations between September 20th and October 11th 2024. Many of the Wood Thrush were detected at Motus stations south of Iowa including in Missouri, Illinois, Kansas, Louisiana, and Texas (Figure). Six birds were detected outside the United States in Mexico, Guatemala, and Belize (Figure 10). Particularly interesting were two Wood Thrush that traveled through Belize and were detected at the same Motus receiver as many other tagged Wood Thrush (https://motus.org/data/receiverDeployment?id=10712). Wood Thrush from all across the breeding range were detected at this station including birds tagged in Missouri, Mississippi, Ohio, New Hampshire, Pennsylvania, West Virginia, Kentucky, Vermont, New Jersey, Delaware, Georgia, Maine, and the Canadian Province of Ontario. This high detection rate indicates that this particular area of Belize is an important migratory corridor for the species at large, and that habitat conservation efforts in this region are necessary and valuable to Wood Thrush no matter where they breed.

In 2025, the Iowa DNR plans to continue partnering with the Wood Thrush tagging effort and is also collaborating with researchers at Iowa State University to tag more Wood Thrush in Iowa. These tagging efforts will continue to improve our understanding of Wood Thrush across their full annual cycle and help us to improve conservation efforts for this declining bird species.

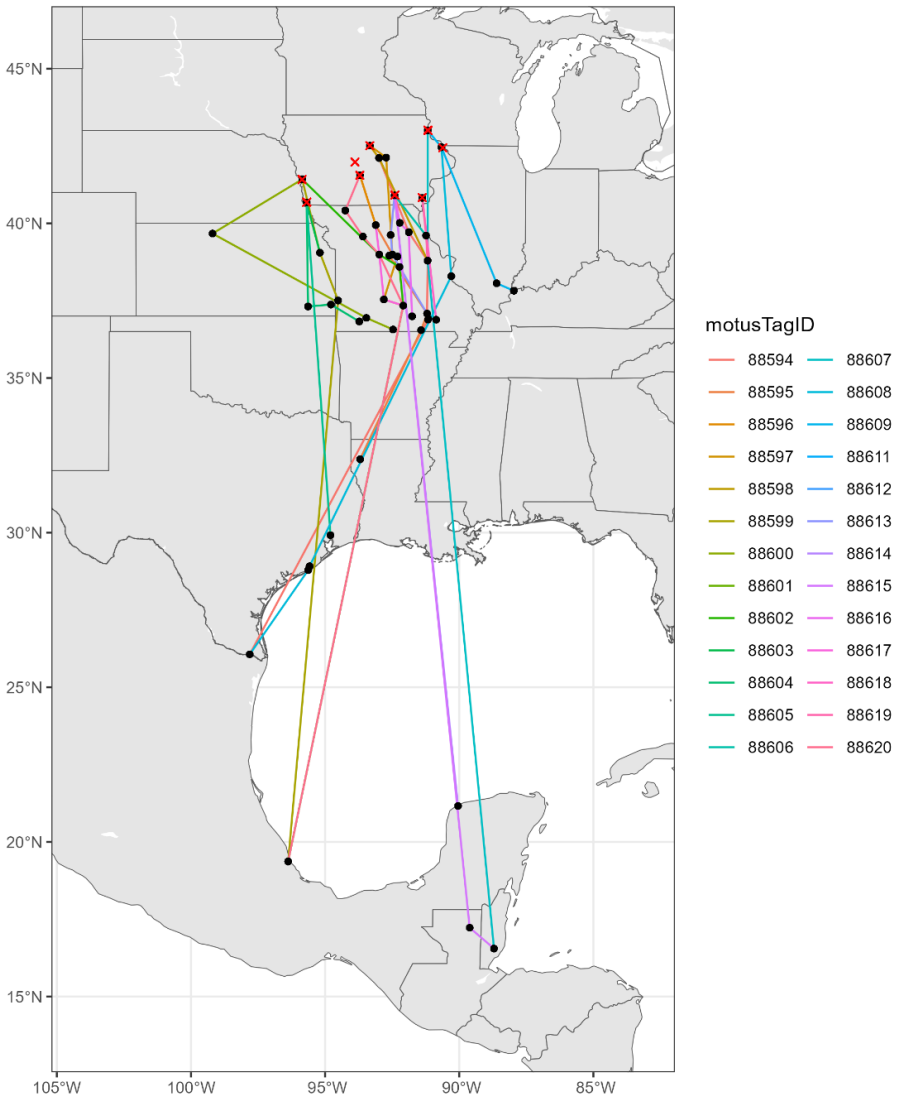


Figure 10 Map showing fall migration routes of all Wood Thrush tagged in Iowa during 2024 that were detected by at least one Motus receiver. Tagging locations are represented by the red x's, Motus receivers where Wood Thrush were detected are represented by the black circles, and individual migration pathways are uniquely color-coded.

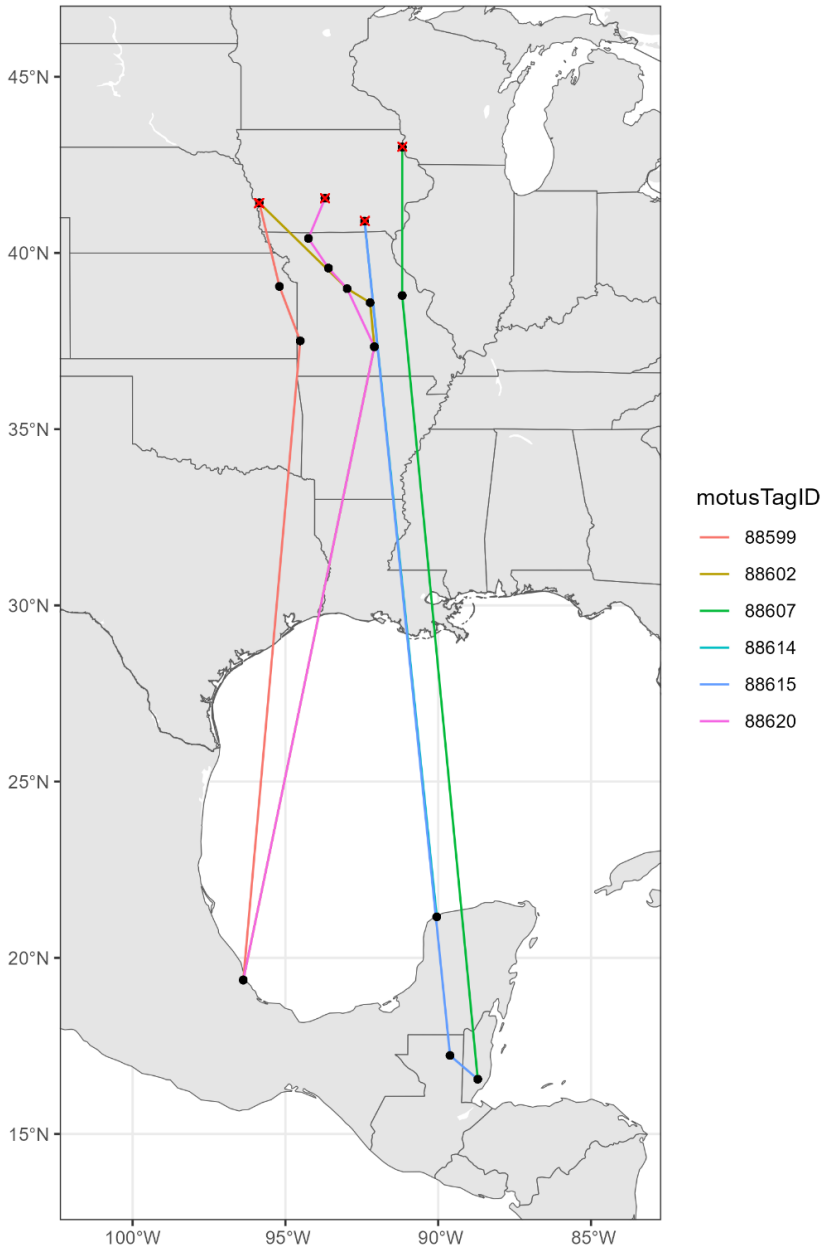


Figure 11 Map showing fall migration routes of Wood Thrush tagged in Iowa during 2024 that were detected at Motus receivers outside the United States. Tagging locations are represented by the red x's, Motus receivers where Wood Thrush were detected are represented by the black circles, and individual migration pathways are uniquely color-coded.

Iowa Motus Detections

Motus Detection Summary 2021-2024

Motus stations in Iowa have been operational for as little as 1 and as many as 39 months. All but the newest stations, which were installed after the peak of fall migration in 2024, have detected birds. From 2021-2024, Iowa Motus stations had a total of 607 detections of 340 individuals from 39 bird species.

Table 1 Total number of detections and detection rate (detections per month) for IA DNR stations since station start.

Station Name	Start Date	Total Detections	Detection Rate
Boone WRS	09-2021	51	1.27
Blackhawk Unit	04-2022	38	1.15
Union Grove State Park	09-2022	33	1.22
Pikes Peak	10-2021	18	0.47
Geode State Park	04-2022	32	1
Hawkeye WMA	10-2021	60	1.54
MO River Unit	09-2021	24	0.62
Odessa Wildlife Unit	10-2021	26	0.67
Waubonsie State Park	08-2023	13	0.81
Lake Pahoja - IA Ornithologists' Union/IA Audubon	10-2023	6	0.4
Iowa DNR Headquarters	05-2024	8	1.14
Red Rock Wildlife Unit	11-2024	2	1
Greene County - Rippey	11-2024	0	0

Table 2 Total number of detections and detection rate (detections per month) for partner stations since station start.

Station Name	Start Date	Total Detections	Detection Rate
Hitchcock Nature Center	09-2022	40	1.43
Bremer County Conservation	11-2022	39	1.5
Calkins Nature Area- Hardin County Conservation	10-2022	15	0.56
Mines of Spain - Dubuque County Conservation	06-2023	27	1.42
Hartman Reserve -Black Hawk County Conservation	07-2023	14	0.78
Blank Park Zoo -Des Moines Audubon	07-2023	28	1.65
Pioneer Ridge- Wapello County Conservation	09-2023	26	1.73
Pammel State Park - Madison County Conservation	12-2023	5	0.42
Neal Smith NWR	11-2023	6	0.46
Albion-Marshall County Conservation	01-2024	11	0.92
Willow Lake Nature Center	05-2024	9	1.12
Ada Hayden Heritage Park	03-2024	5	0.5
Colo-Nesco/Story County Conservation	06-2024	4	0.67
Nancy Slife Memorial Station at HCCB HQ	06-2024	1	0.14
Wickiup Hill Learning Center	09-2024	2	0.5
McFarlane Park -Black Hawk County Conservation	09-2024	4	1.33
Yellow Smoke	08-2024	3	0.6
Polk County Conservation - Chichaqua	11-2024	2	1
Siggelkow Park -Black Hawk County Conservation	09-2024	0	0

2024 Motus Detection Summary

In 2024, Iowa stations had 291 detections of 151 individuals from 24 bird species, with some individuals detected at more than one station and/or during both spring and fall migration. 43 individuals were detected in spring and 116 individuals were detected in fall, with several detected during both periods. Species detected in 2024 include: Greater Yellowlegs (*Tringa melanoleuca*), Lesser Yellowlegs (*Tringa flavipes*), Least Sandpiper (*Calidris minutilla*), Sora (*Porzana carolina*), Solitary Sandpiper (*Tringa solitaria*), Franklin's Gull (*Leucophaeus pipixcan*), Ring-Billed Gull (*Larus delawarensis*), Black Tern (*Chlidonias niger*), Canada Goose (*Branta canadensis*), American Kestrel (*Falco sparverius*), Northern Saw-whet Owl (*Aegolius acadicus*), Common Nighthawk (*Chordeiles minor*), Cliff Swallow (*Petrochelidon pyrrhonota*), Purple Martin (*Progne subis*), Black-billed Cuckoo (*Coccyzus erythropthalmus*), Baltimore Oriole (*Icterus galbula*), Wood Thrush (*Hylocichla mustelina*), Swainson's Thrush (*Catharus ustulatus*), Veery (*Catharus fuscescens*), Mourning Warbler (*Geothlypis Philadelphia*), American Redstart (*Setophaga ruticilla*), Harris's Sparrow (*Zonotrichia querula*), Grasshopper Sparrow (*Ammodramus savannarum*), White-throated Sparrow (*Zonotrichia albicollis*); Table 3. Iowa Stations detected tagged birds from 27 different projects in 2024. Detected birds were tagged in the United States (IL, MN, MS, DE, NE, SC, TX, OK, ND, IA, MI, MT, WI), Canada (BC, SK, NS, NL), Colombia, Costa Rica, Mexico (Dgo), and Jamaica (Figure 12).

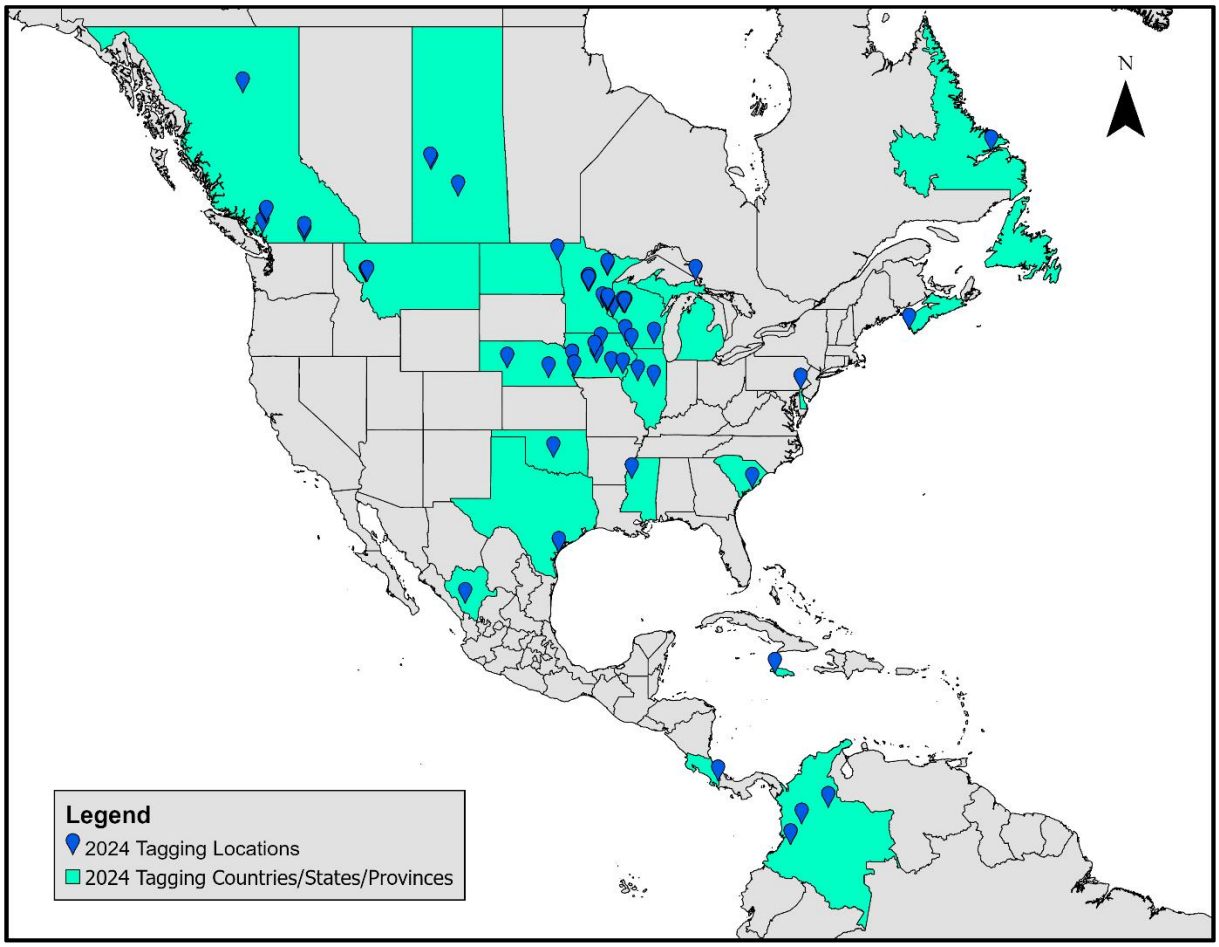
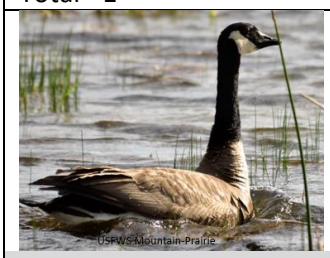


Figure 12 The origin of birds detected at Iowa Motus stations in 2024. The states (U.S. and Mexico), provinces (Canada), and Countries (Caribbean and Central and South America) where birds detected in Iowa were tagged are highlighted in green. Exact tagging locations are shown as blue pins.

Table 3 Summary of species detected by Iowa Motus stations in 2024.

			
Greater Yellowlegs	Sora	Lesser Yellowlegs	Least Sandpiper
Individuals Detected: Spring - 1 Fall - 1 Total - 2	Individuals Detected: Spring - 2 Fall - 0 Total - 2	Individuals Detected: Spring - 0 Fall - 2 Total - 2	Individuals Detected: Spring - 1 Fall - 1 Total - 2
			
Solitary Sandpiper	Franklin's Gull	Ring-Billed Gull	Black Tern
Individuals Detected: Spring - 1 Fall - 0 Total - 1	Individuals Detected: Spring - 0 Fall - 21 Total - 21	Individuals Detected: Spring - 0 Fall - 2 Total - 2	Individuals Detected: Spring - 3 Fall - 7 Total - 10
			
Canada Goose	American Kestrel	Northern Saw-whet Owl	Common Nighthawk
Individuals Detected: Spring - 0 Fall - 1 Total - 1	Individuals Detected: Spring - 5 Fall - 1 Total - 5	Individuals Detected: Spring - 1 Fall - 2 Total - 2	Individuals Detected: Spring - 2 Fall - 2 Total - 4
			
Cliff Swallow	Purple Martin	Black-billed Cuckoo	Baltimore Oriole
Individuals Detected: Spring - 0 Fall - 1 Total - 1	Individuals Detected: Spring - 1 Fall - 0 Total - 1	Individuals Detected: Spring - 0 Fall - 1 Total - 1	Individuals Detected: Spring - 1 Fall - 0 Total - 1

			
Veery Individuals Detected: Spring - 0 Fall - 6 Total - 6	Wood Thrush Individuals Detected: Spring - 13 Fall - 42 Total - 49	Mourning Warbler Individuals Detected: Spring - 3 Fall - 1 Total - 4	Swainson's Thrush Individuals Detected: Spring - 4 Fall - 26 Total - 30
			
American Redstart Individuals Detected: Spring - 1 Fall - 0 Total - 1	Harris's Sparrow Individuals Detected: Spring - 2 Fall - 0 Total - 2	Grasshopper Sparrow Individuals Detected: Spring - 1 Fall - 0 Total - 1	White-throated Sparrow Individuals Detected: Spring - 1 Fall - 0 Total - 1
TOTAL			
Individuals Detected: Spring - 43 Fall - 116 Total - 151			

Iowa DNR Station Summaries

Station: Blackhawk Unit

Sac County
Start Date: April 2022
2024 detection rate: 1.92 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=8513

2024 Blackhawk Unit Detections

Species	Individuals Detected	Total Detections
American kestrel	4	4
Black tern	5	5
Common nighthawk	1	1
Franklin's gull	6	6
Harris s sparrow	2	2
Lesser yellowlegs	1	1
Ring-billed gull	1	1
Swainson's thrush	2	2
Veery	1	1

Station: Boone WRS

Boone County
Start Date: August 2021
2024 detection rate: 1.17 detections/month

Links to station: https://motus.org/data/receiverDeploymentDetections?id=8131
https://motus.org/data/receiverDeploymentDetections?id=8295
https://motus.org/data/receiverDeploymentDetections?id=10917

2024 Boone WRS Species Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Black tern	3	3
Common nighthawk	1	1
Franklin's gull	1	1
Grasshopper sparrow	1	1
Lesser yellowlegs	1	1
Mourning warbler	1	1
Solitary sandpiper	1	1
Swainson's thrush	1	1
Veery	1	1
Wood thrush	2	2

Station: Geode State Park

Henry County
Start Date: April 2022
2024 detection rate: 1.17 detection/month

Links to station: https://motus.org/data/receiverDeploymentDetections?id=8585
https://motus.org/data/receiverDeploymentDetections?id=11058

2024 Geode State Park Detections

Species	Individuals Detected	Total Detections
Franklin's gull	2	2
Greater yellowlegs	1	1
Mourning warbler	1	1
Swainson's thrush	4	4
Wood thrush	6	6

Station: Greene County -Rippey

Greene County
Start Date: November 2024
2024 detection rate: 0.0 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11371

2024 Greene County -Reppey Detections

Species	Individuals Detected	Total Detections
NA	NA	NA

Station: Hawkeye WMA

Johnson County
Start Date: November 2021
2024 detection rate: 1.33 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=8309

2024 Hawkeye WMA Detections

Species	Individuals Detected	Total Detections
Franklin's gull	2	4
Northern saw-whet owl	1	1
Ring-billed gull	1	1
Swainson's thrush	7	7
Wood thrush	5	6

Station: Iowa DNR Headquarters

Polk County
Start Date: May 2024
2024 detection rate: 1.14 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10928

2024 Iowa DNR Headquarters Detections

Species	Individuals Detected	Total Detections
Canada goose	1	1
Swainson's thrush	1	1
Wood thrush	6	6

Station: Lake Pahoja -IA Ornithologists' Union/IA Audubon

Lyon County
Start Date: November 2021
2024 detection rate: 0.33 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10258

2024 Lake Pahoja - IA Ornithologists' Union/IA Audubon Species Detections

Species	Individuals Detected	Total Detections
Black tern	1	1
Franklin's gull	2	2
Lesser yellowlegs	1	1

Station: MO River Unit

Monona County
Start Date: November 2021
2024 detection rate: 0.75 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=8336

2024 MO River Unit Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Black tern	2	2
Cliff swallow	1	1
Franklin's gull	2	2
Lesser yellowlegs	1	1
Swainson's thrush	1	1
Veery	1	1

Station: Odessa Wildlife Unit

Louisa County
Start Date: December 2021
2024 detection rate: 0.75 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=8336

2024 Odessa Wildlife Unit Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	1
Swainson's thrush	3	3
Wood thrush	5	5

Station: Pikes Peak

Clayton County
Start Date: October 2021
2024 detection rate: 0.67 detections/month

Links to station: https://motus.org/data/receiverDeploymentDetections?id=8266
https://motus.org/data/receiverDeploymentDetections?id=11057

2024 Pikes Peak Detections

Species	Individuals Detected	Total Detections
Least sandpiper	1	1
Northern saw-whet owl	1	1
Wood thrush	6	6

Station: Red Rock Wildlife Unit

Marion County
Start Date: November 2024
2024 detection rate: 1.0 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11385

2024 Red Rock Wildlife Unit Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	1
Ring-billed gull	1	5

Station: Union Grove State Park

Marshall County
Start Date: September 2022
2024 detection rate: 0.83 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=9059

2024 Union Grove State Park Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Franklin's gull	2	3
Mourning warbler	1	1
Ring-billed gull	1	1
Swainson's thrush	2	2
Wood thrush	3	3

Station: Waubonsie State Park

Fremont County
Start Date: August 2023
2024 detection rate: 0.83 detections/month

Link to Station: https://motus.org/data/receiverDeploymentDetections?id=10125

2024 Waubonsie State Park Detections

Species	Individuals Detected	Total Detections
Black tern	1	1
Franklin's gull	4	4
Harris s sparrow	1	1
Veery	1	1
Wood thrush	3	3

Partner Station Summaries

Station: Ada Hayden Heritage Park

Story County
Start Date: March 2024
2024 detection rate: 0.5 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10606

2024 Ada Hayden Heritage Park Detections

Species	Individuals Detected	Total Detections
Franklin's gull	5	5

Station: Albion-Marshall County Conservation

Marshall County
Start Date: January 2024
2024 detection rate: 0.92 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10487

2024 Albion-Marshall County Conservation Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Baltimore oriole	1	1
Common nighthawk	1	1
Franklin's gull	2	3
Ring-billed gull	1	1
Sora	1	1
Swainson's thrush	1	1
Veery	1	1
Wood thrush	2	2

Station: Blank Park Zoo – Des Moines Audubon

Polk County
Start Date: July 2023
2024 detection rate: 1.17 detections/month

Link to Station: https://motus.org/data/receiverDeploymentDetections?id=10144

2024 Blank Park Zoo - Des Moines Audubon Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Black-billed cuckoo	1	1
Common nighthawk	1	1
Franklin's gull	6	12
Lesser yellowlegs	1	1
Ring-billed gull	1	1
Swainson's thrush	1	1
Wood thrush	2	2

Station: Bremer County Conservation

Bremer County
Start Date: November 2022
2024 detection rate: 0.83 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=9466

2023 Bremer County Conservation Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Franklin's gull	1	1
Swainson's thrush	5	5
Wood thrush	3	3

Station: Calkins Nature Area - Hardin County Conservation

Hardin County
Start Date: October 2022
2024 detection rate: 0.42 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=9090

2024 Calkins Nature Area Species Detections

Species	Individuals Detected	Total Detections
Black-billed cuckoo	1	1
Franklin's gull	1	2
Wood thrush	3	3

Station: Colo-Nesco/Story County Conservation

Story County
Start Date: June 2024
2024 detection rate: 0.67 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11012

2024 Colo-Nesco/Story County Conservation Detections

Species	Individuals Detected	Total Detections
Franklin's gull	4	6

Station: Hartman Reserve -Black Hawk County Conservation

Black Hawk County
Start Date: July 2023
2024 detection rate: 0.58 detections/month

Links to station: https://motus.org/data/receiverDeploymentDetections?id=9971
https://motus.org/data/receiverDeploymentDetections?id=11281

2024 Hartman Reserve- Black Hawk County Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
American redstart	1	1
Franklin's gull	1	2
Swainson's thrush	2	2
Wood thrush	2	2

Station: Hitchcock Nature Center

Pottawattamie County Conservation
Start Date: September 2022
2024 detection rate: 1.25 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=9005

2024 Hitchcock Nature Center Detections

Species	Individuals Detected	Total Detections
Black tern	1	1
Franklin's gull	5	6
Lesser yellowlegs	1	1
Swainson's thrush	3	3
Veery	1	2
White-throated sparrow	1	1
Wood thrush	3	3

Station: McFarlane Park – Black Hawk County Conservation

Black Hawk County
Start Date: September 2024
2024 detection rate: 1.33 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11279

2024 McFarlane Park -Black Hawk County Conservation Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	1
Mourning warbler	1	1
Swainson's thrush	1	1
Wood thrush	1	1

Station: Mines of Spain – Dubuque County Conservation

Dubuque County
Start Date: June 2023
2024 detection rate: 1.42 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=9822

2024 Mines of Spain -Dubuque county Conservation Detections

Species	Individuals Detected	Total Detections
Common nighthawk	1	1
Northern saw-whet owl	2	2
Sora	1	1
Swainson's thrush	3	3
Wood thrush	10	10

Station: Nancy Slife Memorial Station at HCCB HQ

Hardin County
Start Date: June 2024
2024 detection rate: 0.14 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11019

2024 Nancy Slife Memorial Station at HCCB HQ Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	2

Station: Neal Smith NWR

Jasper County
Start Date: November 2023
2024 detection rate: 0.5 detections/month

Link to station: https://motus.org/data/receiverDeployment?id=10388

2024 Neal Smith NWR Detections

Species	Individuals Detected	Total Detections
Black tern	1	1
Franklin's gull	1	4
Least sandpiper	1	1
Purple martin	1	1
Veery	1	1
Wood thrush	1	1

Station: Pammel State Park -Madison County Conservation

Madison County
Start Date: December 2023
2024 detection rate: 0.42 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10469

2024 Pammel State Park - Madison County Conservation Detections

Species	Individuals Detected	Total Detections
American kestrel	3	3
Franklin's gull	2	2

Station: Pioneer Ridge -Wapello County Conservation

Wapello County
Start Date: September 2023
2024 detection rate: 1.5 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10239

2024 Pioneer Ridge - Wapello County Conservation Detections

Species	Individuals Detected	Total Detections
American kestrel	1	1
Common nighthawk	1	1
Franklin's gull	3	3
Mourning warbler	1	1
Swainson's thrush	6	6
Wood thrush	6	6

Station: Polk County Conservation – Chichaqua

Polk County
Start Date: November 2024
2024 detection rate: 1.0 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11376

2024 Polk County Conservation - Chichaqua Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	1
Ring-billed gull	1	2

Station: Siggelkow Park – Black Hawk County Conservation

Black Hawk County
Start Date: September 2024
2024 detection rate: 0.0 detections/month

Link to station: https://motus.org/data/receiverDeployment?id=11280

2024 Siggelkow Park - Black Hawk County Conservation Detections

Species	Individuals Detected	Total Detections
NA	NA	NA

Station: Wickiup Hill Learning Center

Linn County
Start Date: September 2024
2024 detection rate: 0.5 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11228

2024 Wickiup Hill Learning Center Detections

Species	Individuals Detected	Total Detections
Franklin's gull	1	1
Wood thrush	1	1

Station: Willow Lake Nature Center

Harrison County
Start Date: May 2024
2024 detection rate: 1.12 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=10818

2024 Willow Lake Nature Center Detections

Species	Individuals Detected	Total Detections
Black tern	1	1
Franklin's gull	5	5
Lesser yellowlegs	1	1
Swainson's thrush	1	1
Veery	1	1

Station: Yellow Smoke

Crawford County
Start Date: August 2024
2024 detection rate: 0.6 detections/month

Link to station: https://motus.org/data/receiverDeploymentDetections?id=11151

2024 Yellow Smoke Detections

Species	Individuals Detected	Total Detections
Franklin's gull	2	2
Ring-billed gull	1	1

Literature Cited

Missouri Department of Conservation. 2020. Broadening the Motus Wildlife Tracking Network and Tracking SGCN Movements in the Midwest and Neotropics. Grant proposal, U.S. Fish and Wildlife Service, Competitive State Wildlife Grant (C-SWG) Program.

Rosenberg, KV, AM Dokter, PJ Blancher, JR Sauer, AC Smith, PA Smith, JC Stanton, A Panjabi, L Helft, M Parr, and PP Marra. 2019. Decline of the North American avifauna. Science, 366(6461), 120-124.

Taylor, PD, TL Crewe, SA Mackenzie, D Lepage, Y Aubry, Z Crysler, G Finney, CM Francis, CG Guglielmo, DJ Hamilton, RL Holberton, PH Loring, GW Mitchell, D Norris, J Paquet, RA Ronconi, J Smetzer, PA Smith, LJ Welch, and BK Woodworth. 2017. The Motus Wildlife Tracking System: a collaborative research network to enhance the understanding of wildlife movement. Avian Conservation and Ecology 12:8.