Southeast Iowa Turkey Research Project Summary 2021–2024

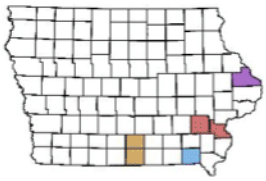
Summary Declines in the production of wild turkey chicks (poults) have occurred since the late 1980s, leading to population declines across the eastern USA. In 2021, the Iowa DNR began a 10-year study to understand wild turkey ecology in southeastern Iowa. This region is a mosaic of agriculture, forest, and grasslands. While these combine to make seemingly quality wild turkey habitat, populations in the region remain low. With the last rigorous wild turkey research in Iowa occurring over 25 years ago, this study aims to understand how modern factors influence population change, particularly female (hen) survival and nesting success in Iowa.

Methods Hens (adults >1 year old and juveniles <1 year old) are captured each winter from December to March in four parts of southeastern Iowa. Each hen is marked with a global positioning system (GPS) transmitter, which allows researchers to collect their locations up to every 15 minutes. During the nesting season, hens are tracked daily to determine when they start nesting and to monitor their survival. Upon nest completion, the outcome or fate of each nest is determined, remaining eggs and shells are collected for study, and habitat features around the nests are measured.

Objectives The purpose of this study is to monitor adult, juvenile, and poult wild turkeys to better understand population processes, including survival, mortality, nesting, and hatching, disease exposure and prevalence rates, seasonal and annual movements, size and distribution of home ranges, and habitat use. This information will be used to evaluate how various factors affect population growth and change, as well as to inform habitat management for wild turkeys in Iowa.

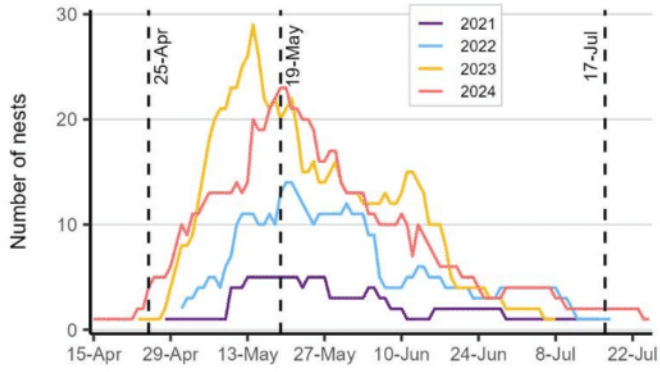
Turkey Capture Summary

- 143 adult and 47 juvenile hens captured
- 30 total females tracked with VHF (radio) transmitters
- 102 adult and 31 juveniles tracked with GPS transmitters
- Turkeys are monitored in portions of Jackson, Washington, Louisa, Van Buren, Lucas, and Wayne counties.



Timing of the Nesting Season

- The median start, peak, and end dates of the nesting season were April 25, May 19, and July 17, respectively
- Average nest incubation was 28 days for hatched nests



Clutch Size, Sex Ratio, and Egg Fertilization (adult nests)

- Clutch size for first nests was 10.7 eggs (range 4–18 eggs)
- Clutch size for second nests was 7.9 eggs (range 4–10 eggs)
- Genetic (DNA) analysis indicated that the sex ratio of eggs was 51% female and 49% male, although ratios varied considerably among nests (preliminary results)
- 97% (1.5 unhatched eggs per nest) and 87% (1.8) of eggs hatched in first and second nests, respectively
- Of 123 usable unhatched eggs inspected, all were fertilized

Nest Success

- 156 total nests confirmed from 90 different hens
- 38 nests successfully hatched at least 1 poult (24%)
- 17%–34% of nests hatched each year
- 25% of GPS-marked adults that lost their first nest re-nested
- 78% of nests were first attempts, 20% second, and 2% third

Hen Success (for GPS-marked adults alive April 15 each year)

- 21% of adults successfully hatched a nest (range 14–27%)
- 8% of juveniles successfully hatched a nest
- 72% of adults incubated at least 1 nest (range 64–80%)
- 28% of adults did not incubate a nest (range 20–36%); it is unknown if they started a nest but lost it during egg laying

Nest Fate

- Predation accounted for 61% of nest loss and was similar to the rate seen during the 1990s in Iowa
- Nest abandonment accounted for 3% of nest loss
- Hay mowing and livestock accounted for 3% of nest loss

Nesting Habitat

- 37% of nests were in forest, 45% in grass fields (prairie, Conservation Reserve Program [CRP], and grass waterways)
- 10% of nests were in road ditches, 2% in row or cover crops

Poult and Brood Survival

- In 2021 and 2022, 58 eggs (79%) hatched from 8 nests; about 38% of poults survived to an average of 3 days
- In 2023 and 2024, about 10% of broods survived to 4 weeks

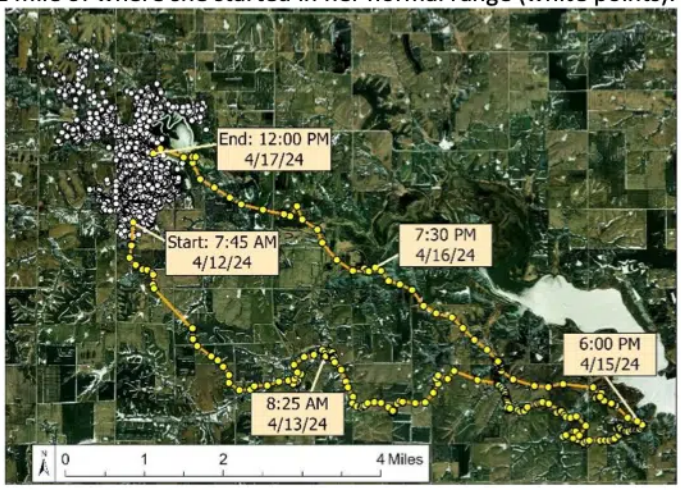
Annual Hen Survival

- Annual adult survival averaged 58% across years
- Annual juvenile survival was >77% each year
- 79% of mortality occurred between April and August
- Predation (60%) and disease (13%) were the leading causes of mortality

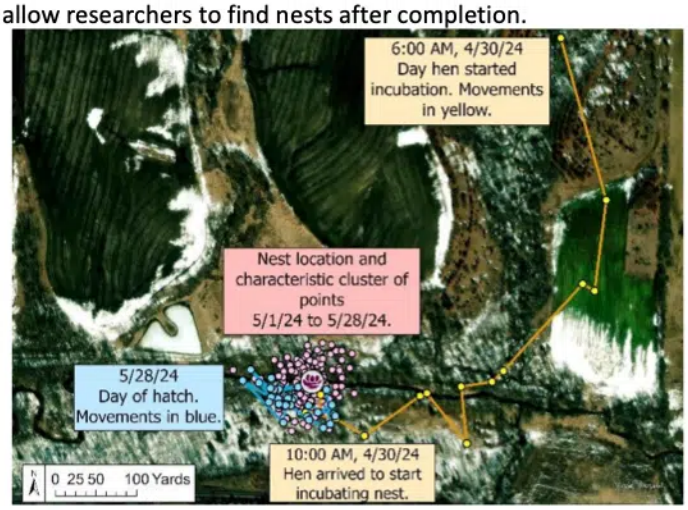
What This Mean for Turkeys in Iowa

- Turkey numbers likely fluctuate because of varying nest success and survival rates each year.
- The record high spring harvest in 2024 indicates that when conditions are good, turkey populations can thrive.
- Hen and poult survival are low suggesting that dense understory cover is lacking. Forest management, like harvest and prescribed fire, creates diverse forest ages and understory plants that are beneficial for turkeys.
- Predation rates on hens and nests are similar to the 1990s when populations were high. Despite poor fur markets and low carnivore harvest, predation rates remain unchanged.
- Population declines may be linked to a high use of grasslands for nesting. Since 1990, 2,600 square miles of grasslands (hay, pasture, CRP) were lost in Iowa – equivalent to a strip of grass 9 miles wide from Davenport to Omaha.
- The use of road ditches for nesting appears problematic as 10% of all nests were in ditches, yet all of these nests failed.

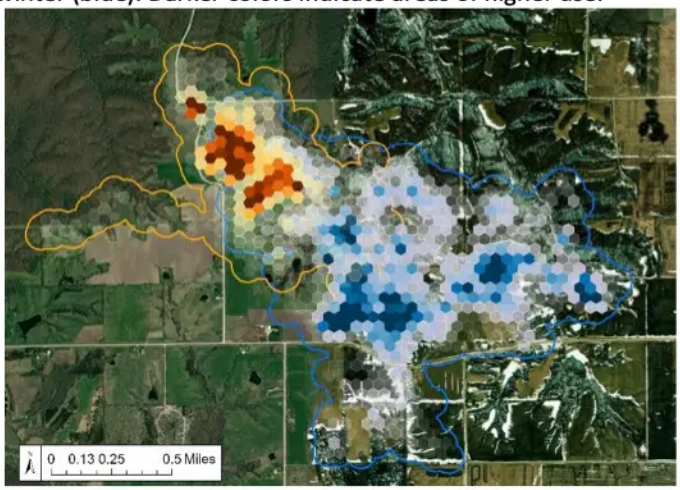
Hen Exploration Starting on April 12th, this adult hen traveled 20 miles over 5 days (yellow points) before returning to within 1 mile of where she started in her normal range (white points).



Hen Nesting Typical nesting movements for an adult hen. GPS transmitters collect clusters of points during incubation which allow researchers to find nests after completion.



Home Range This adult hen has a range of 1,140 acres (>1.75 square miles) and uses distinct areas in summer (orange) and winter (blue). Darker colors indicate areas of higher use.



Hatched Nest Nest successfully hatched on May 30, 2024. Unhatched eggs are opened to determine fertilization. Genetics are pulled from each egg to determine the sex ratio of clutches.



Transmitter Female wild turkeys are fit with backpack GPS transmitters. Transmitters collect hen locations up to every 15 minutes and transmit data to researchers via cell towers.



Thank you to our generous partners who have contributed funding and support for this project, including the Cooperative Fish and Wildlife Research Unit at Iowa State University, National Wild Turkey Federation, Turkeys For Tomorrow, Luther College, University of Tennessee, and USDA National Wildlife Research Center.