MARYLAND WILD TURKEY RESEARCH PROJECT

Progress Report – September 2024

The first large-scale wild turkey research project in Maryland began in winter 2023 and will continue through 2025. This study will determine survival and reproductive success of females and investigate the impact of weather, predators, disease, and habitat. Gobbler survival and harvest rates, breeding season timing, and other valuable data is also being collected. Ultimately, the information will help guide wild turkey management into the future. This research is part of a multi-state collaborative project involving many agencies, universities, and partners throughout the Mid-Atlantic region in Pennsylvania, Maryland, New Jersey, Ohio, and West Virginia.

A brief project update and preliminary data are presented below. Please note that future data analysis will provide a more thorough and comprehensive view of results and allow for better interpretation of data.

Methodology and Captures

In January-March 2023 and 2024, field crews captured 531 wild turkeys in Maryland. GPS radio-transmitters were deployed on 146 females at 28 different capture sites across the 2 study areas. In the western region, turkeys were captured in Garrett, Allegany, and Washington Counties. In the Eastern Region, captures were made in Dorchester, Wicomico, Somerset, and Worcester Counties. An attempt was made to maintain a broad distribution of transmittered hens across counties and in varying landscapes, while balancing the logistics of the time and effort needed to collect data.

Transmitters collect hourly GPS locations. Additionally, an accelerometer feature continuously collects data that allows technicians to assess both the behavior of the bird (nesting, roosting, feeding, nesting, etc.) and status (alive or dead). Field technicians (2-4 depending on season) track the hens with radio-transmitters throughout the year to monitor survival, nesting, brooding, and habitat use. All hens are located using telemetry equipment at least 2 times per week, and more frequently during nesting, to reduce chances that scavengers disturb evidence at mortality and nest sites.

A total 254 male turkeys (gobblers) were banded to determine survival and harvest rates. The majority of gobblers were captured in the Western and Eastern Regions, but some males were captured in other regions in 2024. Reward bands were used on a portion of the males to allow for calculation of reporting rates.

Movements

Although most of the movement and habitat use data will be analyzed once field work is completed, some interesting findings are already evident. Most notable is the dispersal patterns of juvenile females. In the beginning of March, hen flocks break up into smaller groups. Adult hens typically stayed close to their winter range, but nearly every juvenile hen traveled long distances to find new territories. Most juveniles dispersed 5-10 miles from their winter range, but several hens travelled 15-20 miles, traversing over major rivers and highways, before settling down and attempting to nest.

Hen Survival

Hen survival did not significantly differ between regions so data were combined. Annual hen survival in 2023 was 37% for adults and 61% for juveniles. Survival for both adults and juveniles was high in winter (Jan-Mar; 94%), summer (Jul-Sep; 89%), and fall (Oct-Dec; 83%). Most mortality occurred during the spring, when hens were most vulnerable while nesting and raising young. Survival during spring 2023 (Apr-Jun) was 50% for adults and 82% for juveniles. Spring season survival was significantly higher in 2024 (Adults: 72%, Juveniles: 91%).
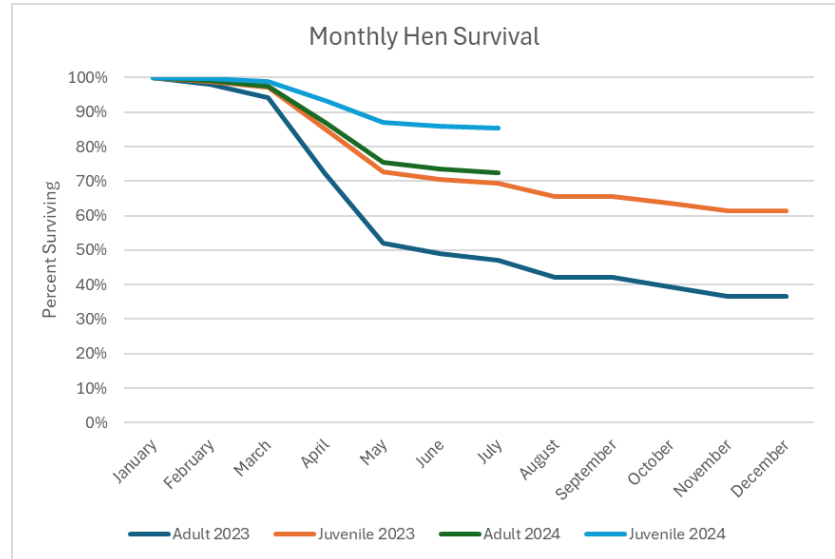

All mortality events were investigated as soon as discovered to determine cause of death. Predation was the primary source of mortality in both regions, accounting for 79% of deaths. But even with frequent checks, it was often difficult to determine the specific predator involved due to lack of evidence or scavenging. Mammals, including foxes, coyotes, and raccoons accounted for the majority of hen predation events, primarily while hens were nesting or brood-rearing. Great-horned owls were also a significant predator in both regions. Disease was confirmed in only 1 hen death. However, disease or toxin-related causes are suspected in several other hens where no signs of predation were found but the hen could not be tested due to decomposition; They were classified as an "unknown" source of mortality. Vehicles accounted for 6% of the deaths. Two hens were harvested, one was legally taken as a bearded hen and the other was illegally killed.
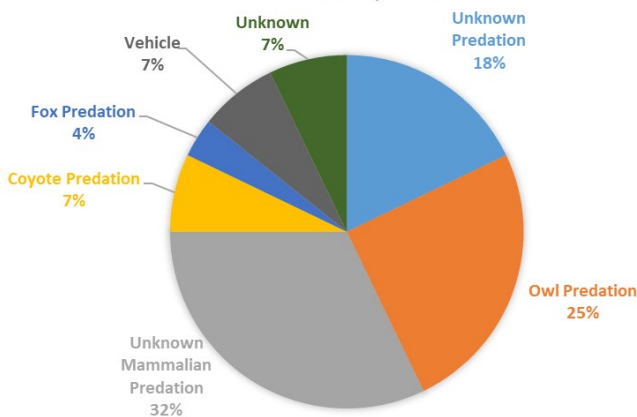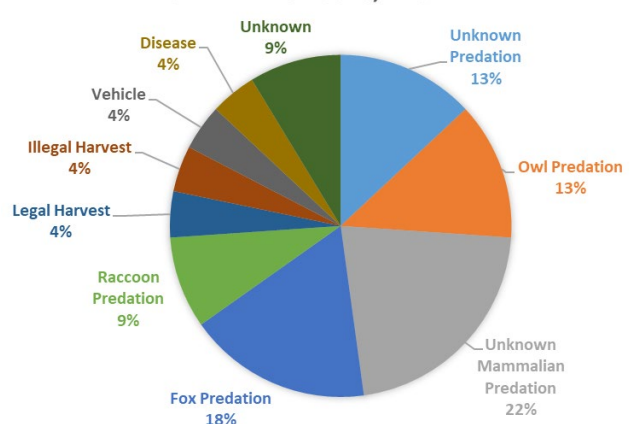
Reproductive Success

Technicians monitor hens more frequently beginning in early April to document any potential nesting activity. By downloading and viewing the data from a distance, egg-laying, incubation, and hatching can be determined without disrupting the hen. When a hen leaves a nest for a longer duration than a typical incubation recess, the nest is located and fate is determined. A total of 183 nests have been documented during the first 2 years of the project. If the nest was successful, non-intrusive tactics were used to determine if the brood was still alive at 2 weeks post-hatch. At 4 weeks post-hatch, a final count of poults alive was made, typically using thermal imaging scopes while the hen roosted with her surviving poults.

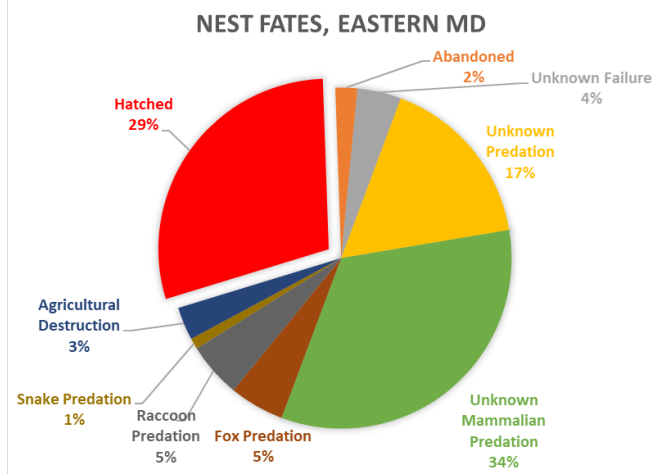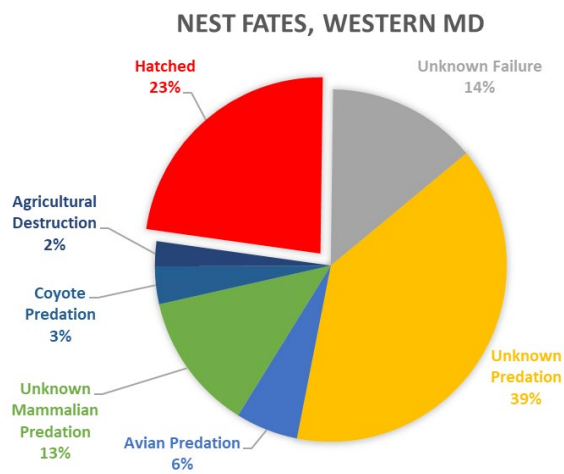Example of accelerometer data used to determine behavior.
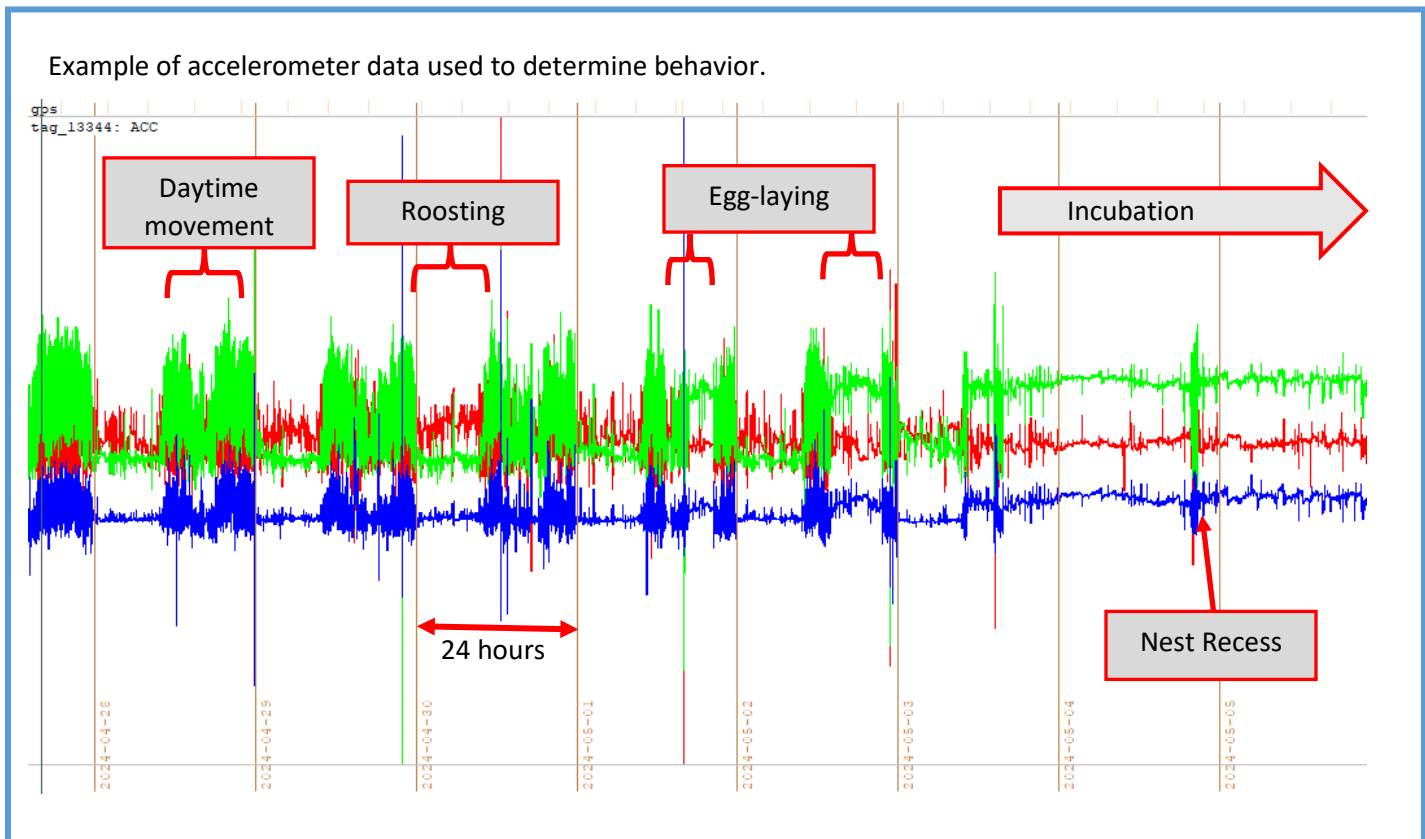
In both years, most hens attempted to nest. On average, 74% of nests failed. Determining the exact cause of failure was difficult in some cases due to lack of egg remnants or other evidence. However, predation was clearly responsible for most nest losses. Most hens that failed in their first attempt renested (55%) and 12 hens incubated 3 or 4 nests. Median date of incubation for first nests ranged between April 25 and May 2 depending on year and region. Hens in Eastern MD nested slightly earlier than in Western MD in both years (1-5 days).

Overall, poult production was very low in Eastern MD in 2023 with only 5 poults being produced from 23 hens. The percentage of nests that hatched (18%), the percentage of hens that nested successfully (26%), and the percentage of poults surviving to 4-weeks old (8%) were all low. Hens in Western MD fared better in 2023, with 32% of hens successful hatching a nest and 19% of poults surviving to 4 weeks.

In 2024, production in the Eastern region was significantly higher than in 2023, with 46% of hens successfully hatching a nest and 59% of those hens having at least some poults survive to 4 weeks old. Western MD saw lower nest success and lost many broods soon after hatching, but several large broods survived to 4 weeks old, boosting the total reproductive output.

Reproductive Parameter	2023		2024	
	Western MD	Eastern MD	Western MD	Eastern MD
Nesting Rate	19/25 (76%)	21/23 (91%)	38/54 (70%)	43/47 (91%)
Median Date of Nest Incubation	April 30	April 25	May 2	May 1
Renesting Rate	6/12 (50%)	7/16 (43%)	17/29 (58%)	17/27 (63%)
Nest Success Rate	8/25 (32%)	6/32 (18%)	12/62 (19%)	22/64 (34%)
Hen Success Rate	8/25 (32%)	6/23 (26%)	12/54 (22%)	22/47 (46%)
2-Week Brood Survival	5/8 (62%)	3/6 (50%)	5/12 (41%)	13/22 (59%)
4-Week Brood Survival	4/8 (50%)	3/6 (50%)	4/12 (33%)	13/22 (59%)
4-Week Poult Survival	12/61 (19%)	5/61 (8%)	24/92 (26%)	31/166 (18%)

NEST FATES, WESTERN MD

- Hatched 23%
- Unknown Failure 14%
- Agricultural Destruction 2%
- Coyote Predation 3%
- Unknown Mammalian Predation 13%
- Avian Predation 6%
- Unknown Predation 39%

NEST FATES, EASTERN MD

- Abandoned 2%
- Unknown Failure 4%
- Hatched 29%
- Unknown Predation 17%
- Agricultural Destruction 3%
- Snake Predation 1%
- Raccoon Predation 5%
- Fox Predation 5%
- Unknown Mammalian Predation 34%

Disease Testing

Blood from all hens receiving transmitters was tested for lymphoproliferative disease virus (LPDV) and reticuloendotheliosis virus (REV). On average, 42% of hens tested positive for LPDV at time of capture. Based on our data and previous research, LPDV does not appear to cause significant direct mortality in wild turkeys. However, the virus may impact survival or reproduction so further data analysis is planned. Additionally, all hens in the Eastern region were sampled for avian influenza in 2024, but no positives were detected.

Gobbler Harvest and Survival

Survival and harvest estimates did not significantly differ between regions. Harvest rates for adult gobblers were 28% in 2023 and 35% in 2024. Juvenile (jake) harvest rates were lower, ranging from 13% to 17%. Adult annual survival rate was estimated to be 60% and juvenile survival rate was 69% in 2023.

Future Plans

Field data collection will be conducted through 2025. At that point, final summary results will be compiled and distributed. Additionally, researchers at collaborating universities will be exploring various aspects of hen ecology using data from all participating states. The results will provide more insight into factors that influence turkey populations than the data presented here. For example, predation is clearly the primary source of nest and adult hen losses, but further analysis will be required to determine the relative impact on populations. Important underlying factors may also exist that have not been assessed at this point in the study. Does wet weather during nesting allow predators to scent incubating hens better? Are hens that nest in certain habitat types more successful? Answers to these types of questions will help us better understand what management actions to take to ensure that wild turkey populations remain strong for years to come.

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Thanks to the many landowners and partner agencies, organizations, and universities that have helped to make this project successful to this point!