



# GOBBLER BANDING PROJECT

## 2023 REPORT

PRESENTED TO:

TENNESSEE WILDLIFE  
RESOURCES AGENCY

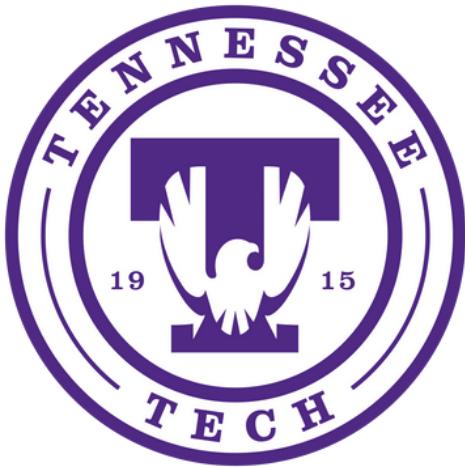
KENTUCKY DEPARTMENT  
OF FISH AND WILDLIFE  
RESOURCES



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Thank you to our funders and  
cooperators!



# Introduction

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In collaboration with Tennessee Wildlife Resource Agency (TWRA) and Kentucky Department of Fish and Wildlife Resources (KDFWR), Tennessee Technological University (TN Tech) is investigating the jake (juvenile) and gobbler (adult) harvest rates throughout Kentucky and Tennessee. As part of a five-year project, state agency staff and TN Tech researchers are uniquely banding male wild turkeys across both states. Capture goals were set within each state to mark 300 turkeys every year. In 2023, we aided in trapping and banding male wild turkeys within the two states. Currently, we are evaluating the data from harvested banded individuals to estimate harvest and survival rates as well as examine regulatory, biological, and landscape factors that drive these rates.

## Harvest Impact on Wild Turkey Populations

Wild turkey populations throughout the Southeast have been in a perceived decline for the past decade, with some speculating shifts in habitat availability, reduction in nesting success/effort, overharvest, or some combination therein are to blame. Of these reasons, state wildlife agencies have direct control over bag limits and season dates (collectively: harvest regulations) and can ensure regulations minimize any possible negative effects on wild turkey populations.

Overharvest of adult turkeys may have cascading consequences for turkey populations and increases reliance on annual recruitment for population stability. Additionally, wild turkeys are one of the only upland game birds to be harvested during their breeding season and preemptive removal of males before breeding may result in lower female nesting effort. Therefore, regulations such as season bag limit, timing, and length must be evaluated to ensure sustainable populations. Also, it is necessary to examine how landscape and environmental factors affect harvest rates. Understanding the factors that influence harvest and survival rates will help managers implement regulations that contribute to higher-quality turkey hunting experiences and stable turkey populations.

# Tennessee and Kentucky

Eastern wild turkey populations in Tennessee and Kentucky fall under separate harvest regulations despite residing in geographically similar areas. Prior to 2023, Tennessee's spring harvest season had a 3 bird bag limit with a long season and earlier start date; a more liberal approach than Kentucky. In 2023, Tennessee changed their regulations, lowering the bag limit and shifting the start date later. Excluding season length, this change shifted Tennessee's spring harvest season to closely resemble Kentucky's (Table 1).



## Varying Harvest Regimes

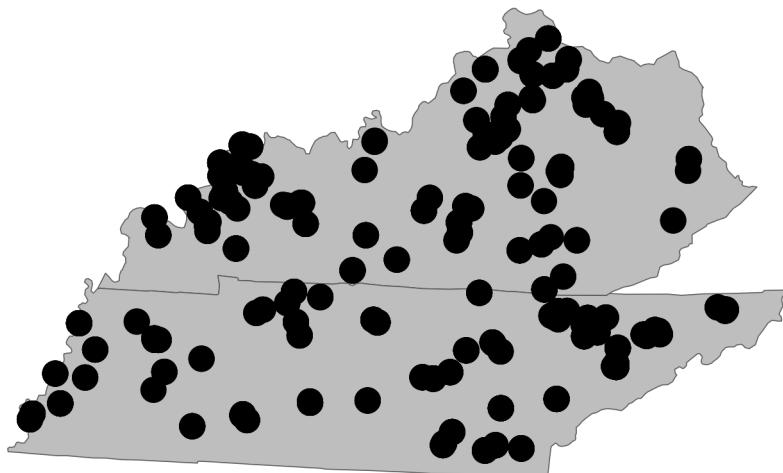
	Bag Limit	Start Date	End Date	Season Length		Bag Limit	Start Date	End Date	Season Length
<b>2021</b>	3	April 3	May 16	44		2	April 17	May 9	23
<b>2022</b>	3	April 2	May 15	44		2	April 16	May 8	23
<b>2023</b>	2	April 15	May 28	44		2	April 15	May 7	23
<b>TENNESSEE</b>					<b>KENTUCKY</b>				

**Table 1.** Comparison of spring wild turkey season from 2021-2023 across both states. Excludes select counties and public lands. Season length is in days and bag limit is restriction to males.



# CAPTURE EFFORTS

From 2021-2023, staff and researchers from TWRA, KDFWR, and TN Tech trapped at a total of 194 unique trap locations throughout the two states. To represent a thorough landscape distribution throughout the states, sites were placed across both public and private lands. In Kentucky, there were 112 unique individual trap locations caught on, 16% of the trap locations were on public land. For Tennessee, 82 unique individual trap locations, 30% of the trap locations were public land.



**Figure 1.** Trapping Locations in Kentucky and Tennessee from 2021-2023.

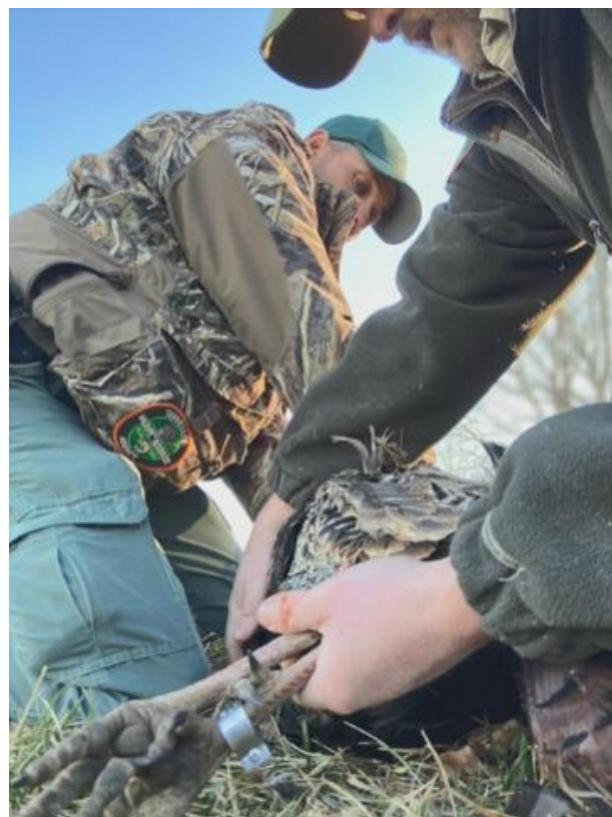
## Techniques

Gobbler captures were conducted using both flat and box set rocket nets. During capture, male birds were aged into two different categories (juveniles <1 yr old or adults  $\geq 1$ ) following protocol laid out in Pelham and Dickson 1992.

Additionally, captured birds were weighed and outfitted with an aluminum rivet band. To inform reporting rates, bands were either non-reward (silver) or reward (green) with a monetary value of \$75.



# TWRA Capture Efforts



# KDFWR Capture Efforts



# TN Tech Capture Efforts



# Preliminary Results

After trapping, banded turkeys are reported to surveys on ArcGIS Survey123 by agency and university staff. A harvested banded turkey is reported by members of the public to an additional survey through Survey123 found on states agency's website. Raw numbers of turkeys banded and harvested by year can be found on page 13.

## Harvest Rates

Our naïve harvest rates were calculated using only raw numbers from turkeys and are uninformed. In Kentucky, average naïve harvest rates for adults and juveniles were 0.24 and 0.04, respectively. For Tennessee, average naïve harvest rates for adults and juveniles were 0.25 and 0.07, respectively.



	Adults			Juveniles		
	Birds on Landscape	Birds Harvested	Naïve Harvest Rate	Birds on Landscape	Birds Harvested	Naïve Harvest Rate
2021	122	39	0.32	57	3	0.05
2022	238	54	0.23	108	12	0.11
2023	416	87	0.21	145	7	0.05
TENNESSEE						

**Table 2.** Naïve harvest estimates for Tennessee for both adults and juveniles. Naïve harvest are calculated incorporating previous years adults and juveniles.

	Adults			Juveniles		
	Birds on Landscape	Birds Harvested	Naïve Harvest Rate	Birds on Landscape	Birds Harvested	Naïve Harvest Rate
2022	149	34	0.23	114	4	0.04
2023	495	117	0.24	131	6	0.05
KENTUCKY						

**Table 3.** Naïve harvest estimates for Kentucky for both adults and juveniles. Naïve harvest are calculated incorporating previous years adults and juveniles.





## Estimated Harvest Rates

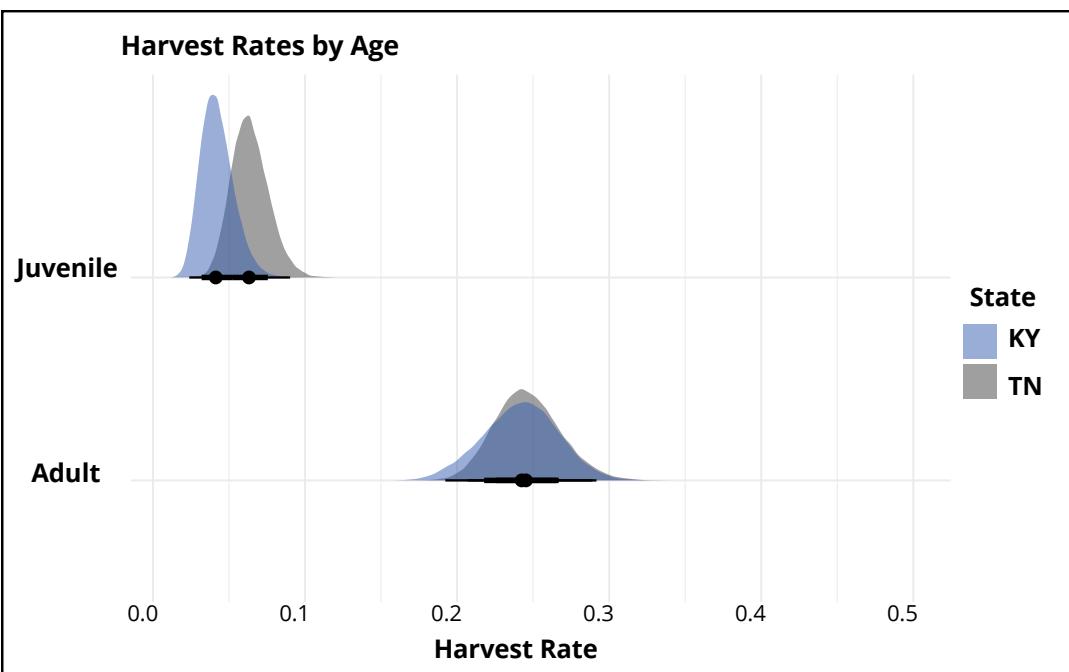
We developed a preliminary state-space model under a brownie parameterization to estimate harvest rates by age class. Similar to the naïve harvest estimates, our current model estimates that harvest rates varies by age-class and state. Across years, adult harvest rates were similar between the two states, however, Tennessee had slightly higher rates for juveniles (Tables 4 and 5). It is generally thought that a spring harvest with rates greater than 30-35% can decrease the proportion of adults in the population and adversely affect hunter satisfaction (Vanglader and Kurzejeski 1995). Our estimated harvest rates fall below that range.

Adults		Juveniles	
Estimated Harvest Rate	95% CI	Estimated Harvest Rate	95% CI
0.25	0.21-0.29	0.06	0.04-0.09
<b>TENNESSEE</b>			

**Table 4.** Estimated harvest rates for Tennessee by age class.

Adults		Juveniles	
Estimated Harvest Rate	95% CI	Estimated Harvest Rate	95% CI
0.24	0.19-0.28	0.04	0.02-0.07
<b>KENTUCKY</b>			

**Table 5.** Estimated harvest rates for Kentucky by age class.



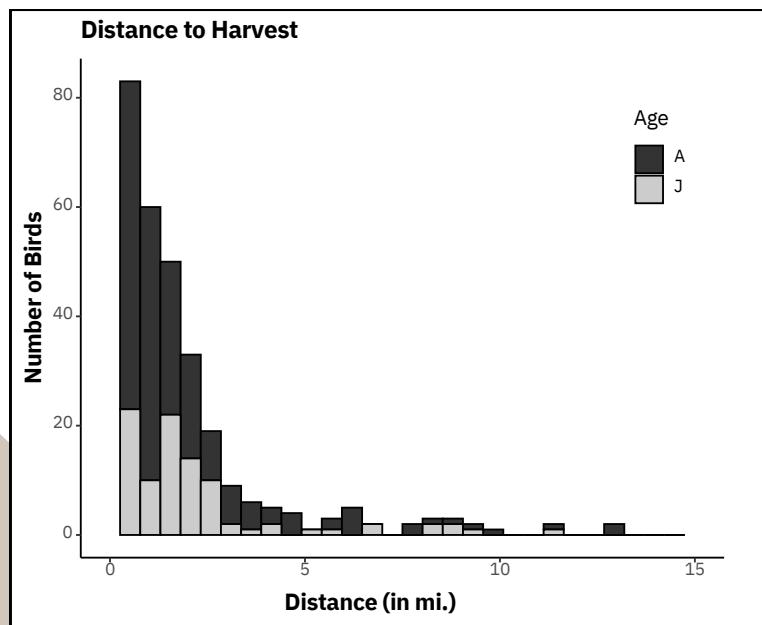
**Figure 2.** Distribution of estimated harvest rates for Kentucky and Tennessee by age class.

## Public and Private Lands

In Kentucky, 126 turkeys were caught on public lands (19% of the total birds caught) and 26 turkeys were recovered on public land (16% of the total birds recovered). In Tennessee, 183 turkeys were caught on public lands (27% of the total birds caught) and 23 turkeys were recovered on public land (11% of the total birds recovered).

The majority of birds harvested were taken within 5 miles of their original trapping locations (Figure 2). Public land areas that were not caught on but had bands recovered on it had neighboring private lands that were trapped on.

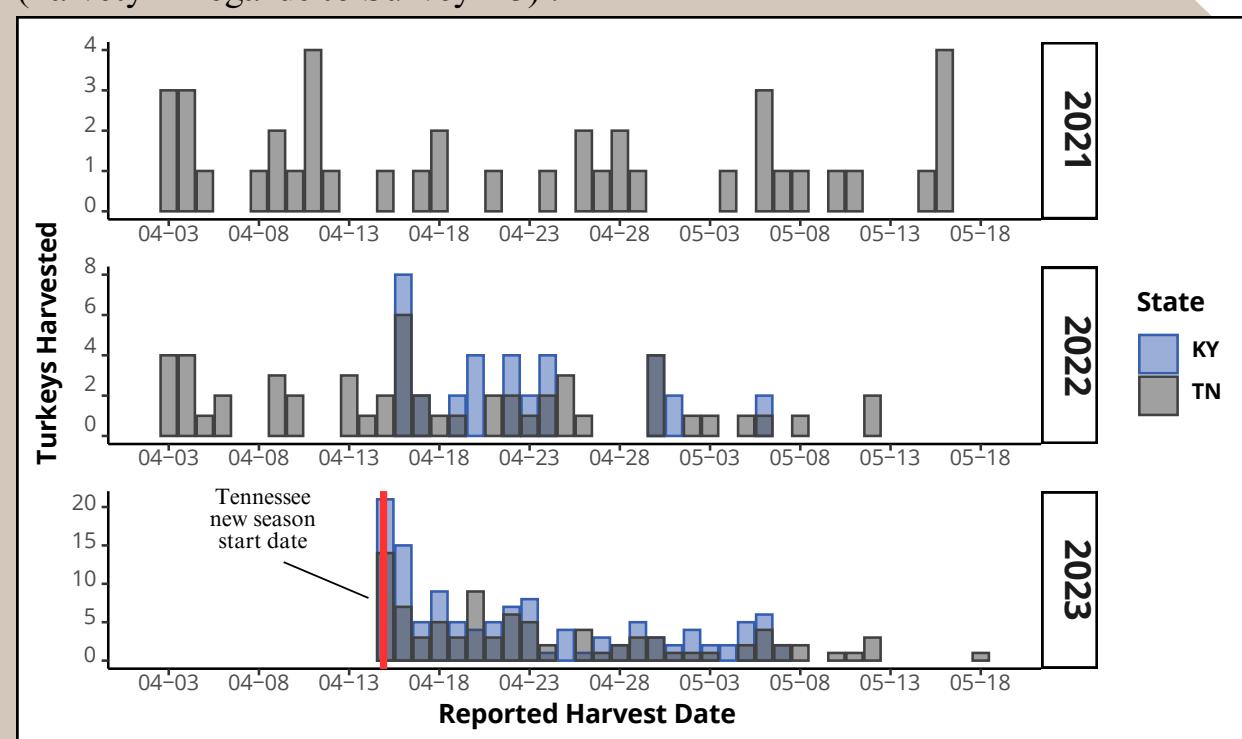
**Figure 3.** Average distance from capture to harvest location for the majority of birds in Kentucky and Tennessee.



## Season Length

The amount of birds taken each day corresponded with the start of season and weekends. Recovered dates are reported by the hunters and accuracy of report is up to hunter discretion. Inaccuracies may arise intentionally (illegal harvest outside of season) or unintentionally (naivety in regards to Survey123).

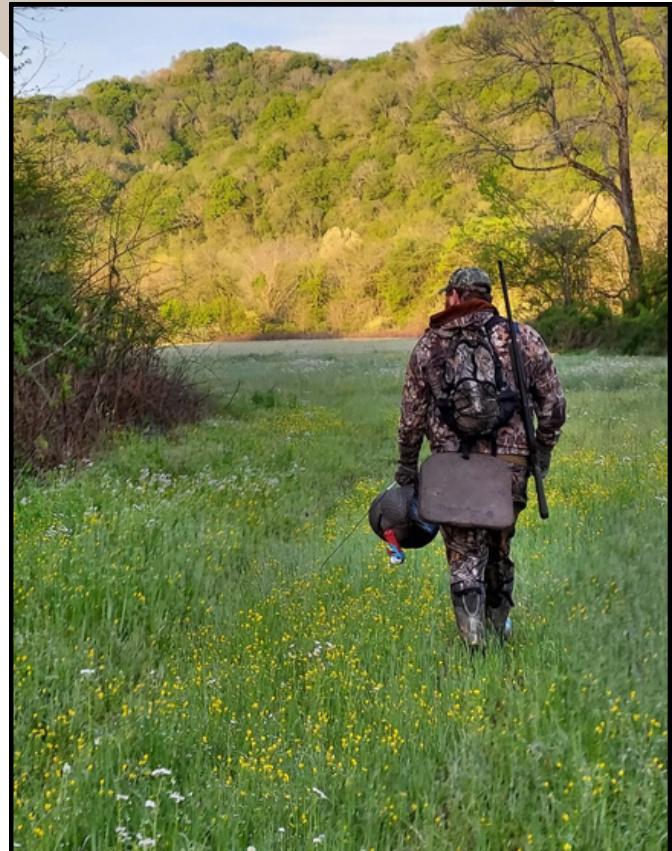
**Figure 4.** Plot of turkeys harvested by day throughout spring harvest season.



# Moving Forward

Our preliminary analyses suggest approximately 20-30% of gobblers are harvested each year. Additionally, approximately 4-6% of jakes are harvested each year. However, out of the total jakes banded, 20% were harvested by the end of their second year.

Moving forward, in 2024, we plan to have an additional year of trapping for the banding project. Kentucky will have an additional year of capture in Spring 2025. We plan to finalize the current harvest model to provide accurate estimates of survival, reporting, and natural mortality rates. Additionally, the flexibility of the state-space model allows us to incorporate and examine the impact of regulatory (bag limit, season length, etc.,) and landscape factors (private vs. public, etc.,) on these rates.



We hope the results from this research will be used to help establish sustainable regulations that will allow for quality turkey hunting within the two states.



## For Additional Information:



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<b>Totals</b>			
Birds Caught: 669		Birds Harvested: 202	
Adults: 359		Adults: 127	
Juveniles: 310		Juveniles: 75 *	

\*This number includes birds harvested as adults.

			Adults			Juveniles			
2021	Captured	Harvested			Captured	Harvested			
	122	In 2021:	In 2022:	In 2023:		57	In 2021:	In 2022:	
		39	9	3			3	18	
2022	Captured	Harvested			Captured	Harvested			
	101	In 2022:	In 2023:			108	In 2022:	In 2023:	
		27	14				12	31	
2023	Captured	Harvested			Captured	Harvested			
	136	In 2023:				145	In 2023:		
		35					7		

**Table 7.** Tennessee capture result from 2021-2023.



<b>Totals</b>			
Birds Caught: 664		Birds Harvested: 161	
Adults: 419		Adults: 119	
Juveniles: 245		Juveniles: 42*	

\*This number includes birds harvested as adults.

			Adults		Juveniles	
2022	Captured	Harvested		Captured	Harvested	
	149	In 2022:	In 2023:	114	In 2022:	In 2023:
		34	15		4	32
2023	Captured	Harvested		Captured	Harvested	
	270	In 2023:		131	In 2023:	
		70			6	

**Table 6.** Kentucky capture results from 2021-2023.





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