

Spring Turkey Harvest Survey Report 2023



Neelam C. Poudyal and Sweta Dixit
Department of Forestry, Wildlife and Fisheries
University of Tennessee Knoxville

TWRA Wildlife Technical Report 23-5, November 2023
Revised April 2024



Equal opportunity to participate in and benefit from programs of the Tennessee Wildlife Resources Agency is available to all persons without regard to their race, color, national origin, sex, age, disability, or military service. TWRA is also an equal opportunity/equal access employer. Questions should be directed to TWRA, Human Resources Office, 5107 Edmondson Pike, Nashville, TN 37211, (615) 781-6594 (TDD 781-6691), or to the U.S. Fish and Wildlife Service, Office for Human Resources, 4401 N. Fairfax Dr., Arlington, VA 22203.

2023 Spring Turkey Harvest Survey Report



Submitted to:

Roger Shields

Turkey Program Coordinator
Tennessee Wildlife Resources Agency
5107 Edmondson Pike
Nashville, TN

Submitted by:

Neelam C. Poudyal, Sweta Dixit, and Kevin Cavasos
Department of Forestry, Wildlife and Fisheries
University of Tennessee
Knoxville, TN 37996

November 16, 2023 (Revision: April 3, 2024)

THIS PROJECT WAS SUPPORTED by Wildlife Restoration Grants administered by the U.S. Fish and Wildlife Service, Wildlife and Sport Fish Restoration Program: *Partnering to fund conservation and connect people with nature.*



Abstract

Following the 2023 spring turkey hunting season, a stratified random sample of statewide big game hunting license holders (both resident and non-resident) was contacted by a combination of email and mail surveys to estimate the turkey hunting participation, hunting effort, and harvest in Tennessee. Of 17,499 total license-holders contacted, 4,045 responses were received. During the spring 2023 turkey hunting season, an estimated 111,975 hunters (83,545 adults and 28,430 youth) statewide participated in turkey hunting and spent 724,364 days afield. Adult and youth hunters statewide harvested an estimated 56,785 turkeys (50,724 adult gobblers, 5,536 jakes, and 525 bearded hens). Nearly all hunters used a shotgun, and about 82% of the hunters who used shotguns utilized a 12 ga. The most used technique when turkey hunting was patterning gun prior to the season. About 52% of adult hunters and 41% of youth hunters who hunted at least a day on any type of land were successful at harvesting at least one bird. Overall, 33% of the statewide respondents were somewhat or very satisfied with the timing of the 2023 spring turkey hunting season (opening on April 15th). Forty-two percent of the respondents perceived the turkey population in areas they hunt to have decreased over the years.

Table of Contents

Abstract	1
List of Tables	3
List of Figures.....	4
Introduction.....	5
Methods.....	5
Results.....	8
Respondent characteristics.....	8
Statewide estimation of hunters, hunting days and harvest.....	9
Estimates of hunting effort and harvest by land type	10
TMU level estimates of hunting effort and harvest.....	13
Turkeys shot but not killed or recovered by hunters.....	15
Satisfaction with turkey hunting experience	16
Perceived change in turkey populations.....	17
Tools and techniques used	18
Shotgun gauge used and comfortable shooting distance	20
References	21
Appendix A: Survey questionnaire	22

List of Tables

Table 1: Estimated number of hunters, average hunting hours, and total days spent hunting during the 2023 spring turkey hunting season in Tennessee.....	9
Table 2: Estimated number of turkeys harvested by adult and youth hunters during the 2023 spring turkey hunting season in Tennessee.....	10
Table 3: Estimated number of hunters, days afield and turkeys harvested by land type during the 2023 spring turkey hunting season in Tennessee.....	12
Table 4: Estimated average number of days afield and hunting hours per day for adult and youth hunters during the 2023 spring turkey hunting season in Tennessee	13
Table 5: Estimated harvest rates for adult and youth hunters by land types during the 2023 spring turkey hunting season in Tennessee.....	13
Table 6: Estimated number of adult hunters, average days afield by land types, and birds harvested by TMU during the 2023 spring turkey hunting season in Tennessee	14
Table 7: Estimated number of youth hunters, average days afield by land types, and birds harvested by TMU during the 2023 spring turkey hunting season in Tennessee	15
Table 8: Estimated harvest rates for adult and youth hunters by TMU during the 2023 spring turkey hunting season in Tennessee.....	15
Table 9: Relationship between the tools used and hunter success/efficient (i.e., turkey per day) in 2023 spring turkey hunting season in Tennessee.....	19

List of Figures

Figure 1: Map of TWRA turkey management units (TMUs) (Source: Tennessee Wildlife Resources Agency)	5
Figure 2: Survey respondents' reported satisfaction with the 2023 spring turkey hunting experience by type of land hunted (From top: n1 = 189, n2 = 136, n3 = 1254, n4 = 1,588).....	16
Figure 3: Survey respondents' reported satisfaction with the 2023 spring turkey hunting experience by TMU (From top: n1 = 366, n2 =253, n3 =719, n4 = 288, n5 = 66, n6 = 1,588).....	17
Figure 4: Survey respondents' perception of how turkey populations in the areas they hunt have changed over the years (From top: n1 = 304, n2 = 221, n3 = 646, n4 =262, n5 =60, n6= 1,417)	18
Figure 5: Percentage of survey respondents indicating the types of techniques and tools used in turkey hunting in 2023 in Tennessee (From top: n1 = 1,553, n2= 1,506, n3= 1,521, n4= 1,527, n5= 1,570)).....	19
Figure 6: Percentage of survey respondents indicating the type of shotgun gauge they generally used to hunt turkey in spring 2023 in Tennessee (n = 1,559).....	20

Introduction

The Tennessee Wildlife Resources Agency (TWRA) is a state agency in Tennessee responsible for the management of game species including turkey, deer, etc. For better monitoring of the turkey population and harvest trends over time, the agency benefits from understanding annual hunting participation, hunting effort, and harvest estimates for all game species including wild turkey. Estimating participation, effort, and harvest by types of land (e.g., private and public) and by turkey management units (TMUs) (West, Midwest, Central, Southeast, Northeast) as shown in Figure 1 allows for comparing effort and success and devising programs to enhance the hunting experience. In addition to participation and harvest, it is also important to continue monitoring hunters' satisfaction and perception of population trends. Estimating harvest often involves designing a systematic survey of randomly selected hunters to collect data on seasonal hunting participation and harvests.

In order to meet the above-mentioned needs, the primary objective of this turkey hunters survey was to estimate hunter numbers, hunting effort, and harvest at the statewide level as well as by TMUs. The other objective was to assess satisfaction and perception of the population in the areas hunted.

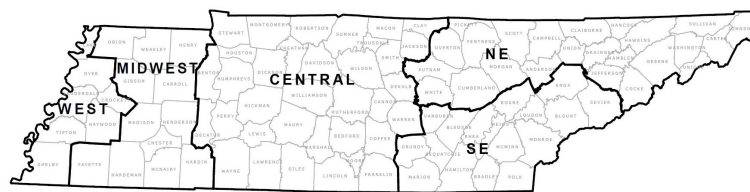


Figure 1: Map of TWRA turkey management units (TMUs) (Source: Tennessee Wildlife Resources Agency)

Methods

This study utilized a mixed-mode survey of resident and non-resident hunters in Tennessee for the 2023 spring turkey hunting season. The sampling frame used for this survey was the population of individuals aged 18 years and older who had a valid license to hunt turkeys, or who reported harvesting a turkey in Tennessee during the 2023 spring turkey hunting season. Because of the wide variety of license types that include turkey hunting

privileges in Tennessee, a stratified random sampling approach was adopted to ensure representation of all license categories in the survey sample. Based on expected differences in response rate and a general similarity in license types, license holders and hunters who reported to have harvested a turkey during the 2023 spring turkey hunting season were assigned to one of six sampling strata (Annual, Disability, Lifetime, Non-resident, Permanent Senior, and Harvest). Youth hunting license types were not considered in the sampling because only hunters who were at least 18 years of age were surveyed. The first stratum (Annual) included licenses that are annually renewable (types: 04, 09, 10, 11, 164, 167). The second stratum (Disability) included licenses that are available to individuals with physical or intellectual disabilities (types: 169, 189, 198). The third stratum (Lifetime) included all lifetime licenses that did not require annual renewal (types: 401, 402, 403, 404, 405, 406). Those under 18 years of age in lifetime license categories were excluded from the study.

Because of the change in annual license system in 2023, it was found that the response rate as well as the participation rate was different between those who bought their license before and after February 18 (traditional start of the license year). Hence, the annual license strata was further divided into two groups (i.e., Annual Early and Annual Late) to allow the statistical analysis to account for the difference in survey response rate and participation rate between these two groups of respondents. Similar adjustment was made with the Non-residential license strata (i.e., Non-resident- Early, Non-resident- Late).

A separate question was asked of adult respondents in the sample to collect data on turkeys harvested by youth guided or mentored during the 2023 spring turkey hunting season. The fourth stratum (Non-resident) included non-junior, non-resident licenses (types: 73, 74). The fifth stratum (Permanent Senior) included the permanent senior citizen hunting license only available to those 65 years and older (type: 166). The final stratum (Harvest) included the individuals who reported to have harvested a turkey in Tennessee during the 2023 spring turkey hunting season.

A total of 17,499 contacts were selected for the mixed-mode survey that was administered in June-July of 2023. Following a modified Tailored Design Method for mail and

internet surveys (Dillman et al. 2009), individuals who had an email address on file were first invited to complete the online survey at Qualtrics.com, a secure online survey program housed at the University of Tennessee's website. A two-page survey questionnaire (Appendix A) was developed in collaboration with TWRA staff and then approved by the University of Tennessee's Institutional Review Board for human subject research (Approval #: UTK IRB-20-05821-XM). Those who did not respond to the initial email survey invitation were sent three follow-up reminder emails during a period of two weeks. After the email survey concluded, non-respondents, or those who did not have an email address on file, were contacted by mail. The initial mail survey packet included a personalized cover letter, survey questionnaire, and a business reply envelope. A week later, a final reminder packet including a copy of the survey questionnaire and a business reply envelope was mailed to encourage participation.

Thirteen out of 17,499 license holders contacted for the survey were undeliverable and another 25 were deceased. At the end of survey administration, 4,045 responses (1,627 from email and 2,418 from mail) were received. After adjusting for the undeliverable mails and deceased respondents, the adjusted response rate for the survey was 23%. Although less than ideal, this response rate is attributable to the nature of the sampling frame used. In Tennessee, many sportsmen license types include turkey hunting rights and, consequently, possessors of these licenses are considered potential hunters in the sampling design. However, many in the sample do not use the turkey hunting privilege included in their license, and therefore, may not respond to a turkey harvest survey request. Nevertheless, this response rate is higher than the range reported in several recent hunter surveys in the southeastern U.S. (Watkins et al. 2018; Mingie et al. 2019; Poudyal et al. 2020).

A statewide number of hunters, days afield, and harvest were calculated separately for adults and youths. In addition, estimates for these metrics were also calculated for the types of land hunted (private, public, both) and the TMU (e.g., West, Midwest, Central, Southeast, Northeast). Any harvest reported without the location of the hunt was recorded in the "Unknown" category. Estimates of harvest were also calculated separately by type of turkey harvested (adult gobblers, jakes, bearded hens). Estimates for relevant variables of hunting

effort and harvest metrics were calculated following a stratified random sampling design (Chochran 1977).

As in any survey research, the estimates are subject to sampling error. Where applicable, 95% confidence limits (CL) around the estimates were also reported. Theoretically, the 95% confidence interval can be estimated by adding and subtracting the CL from the estimate. It should be noted that many sources of errors that are beyond researchers' control can influence results in survey studies. Those could include participants failing to provide complete or accurate answers, measurement error due to misinterpretation of questions by respondents, etc. However, we do not expect those issues to have substantial effects on the results.

Results

Respondent characteristics

Of 4,045 survey recipients who responded, 90% were male and 96% were white. The average age of the respondents was 54 years. It should be noted that only adults (18 or older) were surveyed. These statistics are very similar to the key demographics of the original sampling frame sample of 17,499 (male: 88%, white: 94%, average age: 50 years). About 36.27% of the overall respondents indicated they hunted turkeys during the 2023 spring turkey hunting season and 4.4% indicated they hunted as well as guided a youth. Another 1.41% indicated they did not hunt but guided a youth, whereas the remaining 57.82% indicated they did not hunt or guide a youth for turkey hunting in 2023. Those who said they did not hunt turkeys in 2023 were asked about the reason. About 34% indicated they are not a hunter, 19% indicated they do not hunt turkeys during the spring, 15% indicated they typically hunt turkeys but 2023 was an exception, 2% indicated they hunted in another state in 2023, and 10% indicated they stopped hunting to allow the populations to rebuild/restore. The remaining 19% indicated other reasons including health, time, work, and personal/family circumstances as the most frequently mentioned reasons.

Statewide estimation of hunters, hunting days and harvest

An estimated 83,545 ($\pm 4,692$) adult hunters participated in turkey hunting in Tennessee during the 2023 spring turkey hunting season (Table 1). Based on the number of adult respondents who indicated they guided or mentored youth during the spring season, 28,430 ($\pm 3,847$) mentored youth hunters (hereafter referred to as simply youth hunters) also participated in turkey hunting. Of note, it is possible there are likely additional youth hunters not accounted for because some under 18 years may hunt without adult supervision. Taken together, the total number of adult and youth turkey hunters in Tennessee in the 2023 spring turkey hunting season was estimated to be 111,975 ($\pm 8,538$). When the license-exempt stratum is excluded, estimated proportions that reported hunting turkeys in the 2023 spring turkey hunting season were 28% in Annual_Early and 51% in Annual_Late, 10% in Disability, 37% in Lifetime, 42% in Non-resident_Early, 86% in Non-resident_Late, and 6% in Permanent Senior strata.

In terms of hunting effort, the average days afield per hunter was 7.83 (± 0.45) for adult hunters and 4.33 (± 0.53) for youth hunters. During the entire 2023 spring turkey hunting season, adult and youth turkey hunters respectively spent 633,079 ($\pm 36,538$) and 91,285 ($\pm 15,529$) in total days afield.

Table 1: Estimated number of hunters, average hunting hours, and total days spent hunting during the 2023 spring turkey hunting season in Tennessee

	Adult		Youth		Adult and Youth Combined
	Estimate	95% CL	Estimate	95% CL	Estimates
Hunters	83,545	4,692	28,430	3,847	111,975
Total days	633,079	36,538	91,285	15,529	724,364
Average days/hunter	7.83	0.45	4.33	0.53	6.51

With regard to harvest, adult hunters statewide harvested an estimated 42,976 ($\pm 3,412$) adult gobblers, 3,400 ($\pm 1,078$) jakes, and 511 (± 670) bearded hens in the 2023 spring turkey hunting season (Table 2). Similarly, harvest by youth hunters was estimated at 7,748 ($\pm 1,914$) adult gobblers, 2,136 (± 944) jakes, and 14 (± 25) bearded hens. Taken together, adult and youth

hunters in Tennessee took 50,724 adult gobblers, 5,536 jakes, and 525 bearded hens during the 2023 spring turkey hunting season. Overall, based only on the sample of license holders, 52% of adult hunters and 41% of youth hunters harvested at least one turkey during the 2023 spring turkey hunting season. Among all successful adult hunters, 73% reported harvesting only one bird, 27% reported exactly two birds, and the remaining <1% reported three birds. The average number of days per bird was 7.02 (± 0.58) for successful adult hunters. Among the mentors of successful youth hunters, 72% reported youth harvesting only one bird, 21% reported exactly two birds being harvested, and the remaining 7% reported three or four. It should be noted that adult mentors could have mentioned more than 1 youth during the season. The average number of days per bird was 4.16(± 0.82) for successful youth hunters.

To calculate a harvest rate, the number of birds harvested was divided by the total number of days spent hunting. This metric was computed at the individual respondent level and the mean value was estimated for the statewide sample. For the 2023 spring turkey hunting season, 0.15 birds were harvested per day by adult hunters statewide and 0.18 birds per day by youth hunters.

Table 2: Estimated number of turkeys harvested by adult and youth hunters during the 2023 spring turkey hunting season in Tennessee

	Adult		Youth		Adult and Youth Combined
	Estimate	95% CL	Estimate	95% CL	Estimates
Adult Gobblers	42,976	3,412	7,748	1,914	50,724
Jakes	3,400	1,078	2,136	944	5,536
Bearded Hens	511	670	14	25	525
Total	46,887	3,720	9,898	2,428	56,785
Harvest rate	0.15	0.02	0.19	0.04	0.17

Estimates of hunting effort and harvest by land type

Statewide estimates of hunters, days afield, and harvest by land type are presented in table 3. About 75% of adult and 88% of youth hunters exclusively hunted on private land. Only 8% of adults and 5% of the youth hunted exclusively on public land. Consequently, in terms of the land types where hunting took place, respondents reported hunting more days on private

lands. A comparison of total hunting days by adult hunters between land types showed over two-thirds (69%) of total hunting days were by those hunting on private lands only, 8% for those hunting on public land only, and the remaining 23% of total days for those who hunted on both land types. In terms of harvest, those hunting on only private land accounted for an estimated 81% of total birds harvested, 3% of the total harvest was by those hunting on public land only, and 15% of the total harvest was by those who hunted on both land types. The remaining <1% of total birds harvested was represented by harvest on an unreported (i.e., unknown) land type. Jakes accounted for 6% of the total gobblers harvested by adult hunters who hunted private land only. This metric was 12% among adult hunters who hunted public land only and 9% for those who hunted both lands.

A comparison of total hunting days and total bird harvest by youth hunters between land types showed about 77% of total hunting days were estimated for those hunting on private lands only, 5% for those hunting on public land only, and the remaining 18% of total days for those who hunted on both land types. In terms of harvest, 90% of the total birds harvested were estimated to have been taken by those hunting on private land only, 4% by those hunting on public land only, and 5% by those who hunted on both land types. The remaining (<1%) of total bird harvest was estimated for unreported (i.e., unknown) land types. Jakes accounted for 21% of the total gobblers harvested by youth hunters who hunted private land only. This metric (i.e., percent jakes) was 0% for those youth hunters who hunted public land only and 38% for those who hunted both lands.

The percentage of adult hunters that harvested at least one bird was 62% for those hunting on private lands only, 34% for those hunting on public land only, and 53% for those hunting on both land types. Among successful adult hunters that hunted on private land only, 73% reported harvesting only one bird, nearly 27% reported exactly two birds, and the remaining <1% reported three birds. Similarly, among the successful adult hunters that hunted on public land only, 86% reported bagging only one bird, and the remaining 14% reported two birds. For those who hunted both types of land and successfully harvested, 64% reported bagging only one bird, 35% reported two birds, and the remaining 1% reported three birds.

Among youth hunters, the percentage harvesting at least one bird was 42% for those hunting on private land only, 20% for those hunting on public land only, and 32% for those hunting both types of land. Among the successful youth hunters that hunted on private land only, 70% reported harvesting only one bird, 23% reported exactly two birds, and the remaining 7% reported three or four birds. Of the successful youth hunters who hunted on public land only, all reported bagging only one bird. Finally, for those youth hunters who hunted both types of land and killed at least one bird, 69% reported harvesting only one bird, 23% reported two birds, and the remaining 8% reported more than two birds.

Table 3: Estimated number of hunters, days afield and turkeys harvested by land type during the 2023 spring turkey hunting season in Tennessee

		Hunters	Days Afield	Adult Gobblers	Jakes	Bearded Hens
Adult Hunters						
Private only	Estimate	64,046	445,104	35,381	2,491	465
	95% CL	4,754	43,076	3,965	987	664
Public only	Estimate	6,417	43,811	1,284	171	-
	95% CL	1,307	14,135	586	164	-
Both	Estimate	10,683	144,164	6,265	688	-
	95% CL	1,660	28,251	1,585	427	-
Youth Hunters						
Private only	Estimate	25,065	70,481	6,995	1,913	14
	95% CL	3,786	12,633	1,824	909	25
Public only	Estimate	1,201	4,313	425	-	-
	95% CL	629	2,842	523	-	-
Both	Estimate	2,039	16,491	327	218	-
	95% CL	887	9,065	329	262	-

Notes: Number of hunters does not add up to the state total because some respondents did not disclose the type of land their harvest was from

Compared to those who hunted turkeys on private land only, the average days of hunting were higher for those adults who hunted on public land only (Table 4), but average days of hunting were highest among those who hunted both land types. A similar pattern was observed in the average days spent afield by youth hunters.

Table 4: Estimated average number of days afield and hunting hours per day for adult and youth hunters during the 2023 spring turkey hunting season in Tennessee

	Adult Hunters		Youth Hunters	
	Days		Days	
	Estimate	95% CL	Estimate	95% CL
Private only	6.95	0.43	3.85	0.47
Public only	7.20	1.86	3.74	1.25
Both	13.41	1.56	10.26	3.60

Compared to those adults who hunted on both types of lands, the harvest rate was higher among adult hunters who hunted exclusively on private lands or public lands (Table 5). For example, adult hunters who hunted on only private lands harvested 0.17 birds per day of hunting, whereas adult hunters who hunted on both land types harvested 0.09 birds per day. For youth, the harvest rate was much higher for those hunting public lands only. Youth hunters hunting only on private lands bagged 0.19 birds compared to 0.30 and 0.13 birds per day for youth hunters hunting public land only or both public and private, respectively. It should be noted that this difference may be trivial considering the confidence intervals.

Table 5: Estimated harvest rates for adult and youth hunters by land types during the 2023 spring turkey hunting season in Tennessee

	Adult Hunters		Youth Hunters	
	Estimate	95% CL	Estimate	95% CL
Private only	0.17	0.02	0.19	0.04
Public only	0.12	0.06	0.30	0.49
Both	0.09	0.02	0.13	0.08

TMU level estimates of hunting effort and harvest

The estimated number of adult hunters, hunting effort, and harvest at the TMU level was determined based on survey respondents' indication that they participated in at least one day of hunting in a given unit during the 2023 spring turkey hunting season (Table 6). The estimated number of adult hunters was largest in Central (34,277) and smallest in West (4,191). Except in Central and Southeast, the average days afield per hunter were higher on private land compared to public land in all units.

In terms of harvest, the highest number of birds harvested by adult hunters was in Central unit. Compared to Southeast, other units had a comparatively lower percentage of jakes in the harvest (Table 6). Jakes accounted for 11.26% of the total gobblers harvested by adult hunters who hunted in Southeast. This metric was lowest (3.41%) among those who hunted in West.

Table 6: Estimated number of adult hunters, average days afield by land types, and birds harvested by TMU during the 2023 spring turkey hunting season in Tennessee

TMU		Total Adult Hunters	Average Days (Private)	Average Days (Public)	Average Days (Both)	Total Birds Harvested	Percent Jakes
West	Estimate	4,191	7.37	6.41	11.27	1,465	3.41%
	95% CL	1,234	2.29	4.17	3.47	604	
Midwest	Estimate	13,893	7.77	5.01	11.98	7,093	8.20%
	95% CL	2,018	0.92	3.74	2.57	1,162	
Central	Estimate	34,277	6.58	7.04	12.23	21,875	5.40%
	95% CL	3,214	0.61	2.82	2.20	2,375	
Southeast	Estimate	14,246	7.71	8.84	15.74	6,066	11.26%
	95% CL	2,357	1.29	4.61	3.76	1,323	
Northeast	Estimate	19,468	7.68	7.44	14.56	9,947	8.37%
	95% CL	2,616	1.04	2.49	266.56	2,081	

Note: Number of hunters does not add up to the state total because some respondents report hunting in multiple units or did not disclose their hunting location.

The estimated number of hunters, average days, and birds harvested were also calculated for youth hunters (Table 7). It should be noted that since the survey did not collect data on location of youth hunting, the TMU level breakdown of these metrics relied on the assumption that the youth hunted in the same TMU where their supervising adult hunted. However, interpretation of these estimates is cautioned since not all adult hunters guide their youth hunters in the same TMU in which they hunt. Moreover, many adult respondents who provided data for their youth in the survey did not hunt themselves, and therefore no location information was available to place them in a unit. Nevertheless, the TMU level breakdown of youth hunting participation and harvest metrics shown in Table 7 is similar to that of adult hunters (Table 6). Central unit had the highest number of youth hunters and birds harvested. West, Northeast and Midwest units had higher average days per hunter on private land than on

public land whereas the opposite was true in other units. Jakes accounted for about 10% of the total gobblers harvested by youth hunters who hunted in Southeast unit, which was the lowest of all units. This metric was more than double of this unit in all other units.

Table 7: Estimated number of youth hunters, average days afield by land types, and birds harvested by TMU during the 2023 spring turkey hunting season in Tennessee

TMU		Youth Hunters	Average Days (Private)	Average Days (Public)	Average Days (Both)	Total Birds Harvested	Percent Jakes
West	Estimate	1,398	3.91	5.21	.	215	17.22%
	95% CL	882	1.61	4.16		441	
Midwest	Estimate	4,846	3.08	5.33	8.06	2,193	19.37%
	95% CL	1,591	0.76	2.82	1.88	1,205	
Central	Estimate	9,590	3.41	2.06	9.29	3,286	22.46%
	95% CL	2,105	0.78	1.33	4.23	1,160	
Southeast	Estimate	5,290	4.19	4.07	5.25	1,472	9.91%
	95% CL	1,777	1.27	2.29	1.43	731	
Northeast	Estimate	5,393	4.70	3.65	14.32	1,913	21.60%
	95% CL	1,644	0.21	2.31	8.35	909	

Note: Number of hunters does not add up to the state total because some respondents report hunting in multiple units or did not disclose their hunting location.

The harvest rate was tabulated for hunters across TMUs (Table 8). This metric was higher (although not statistically) among youth hunters than adult hunters in all units except West.

Table 8: Estimated harvest rates for adult and youth hunters by TMU during the 2023 spring turkey hunting season in Tennessee

TMU	Adult Hunters		Youth Hunters	
	Estimate	95% CL	Estimate	95% CL
West	0.09	0.02	0.04	0.06
Midwest	0.12	0.02	0.18	0.08
Central	0.18	0.03	0.26	0.08
Southeast	0.13	0.02	0.15	0.06
Northeast	0.13	0.02	0.15	0.06

Turkeys shot but not killed or recovered by hunters

Respondents were also asked to report the number of turkeys that were shot but not killed or recovered. Based on the data provided, an estimated 12,588 (\pm 3,092) turkeys were

shot but not killed or recovered by hunters during the 2023 spring turkey hunting season. Similarly, an estimated 10,305 ($\pm 2,444$) birds were reported to be cleanly missed. It should be noted that this question was modified slightly from previous years and could have been confusing to many respondents in terms of how to report (shot at vs. missed). As a result, a measurement error, which cannot be ruled out, may have led to overestimation of this metric compared to previous years.

Satisfaction with the timing of turkey hunting season in 2023

When asked how satisfied they were with the timing of the 2023 spring turkey hunting season (opening on April 15), 33% of respondents from the statewide sample indicated they were somewhat or very satisfied, and another 21% indicated being neither dissatisfied nor satisfied (Figure 2). When compared across land types, the highest percentage (42%) of respondents who indicated being somewhat or very satisfied were those who hunted on public lands only, and the lowest percentage (25%) were those hunting on both types of land. Compared to other lands, the highest percentage of respondents (26%) who indicated neutrality on this satisfaction question hunted on both types of land.

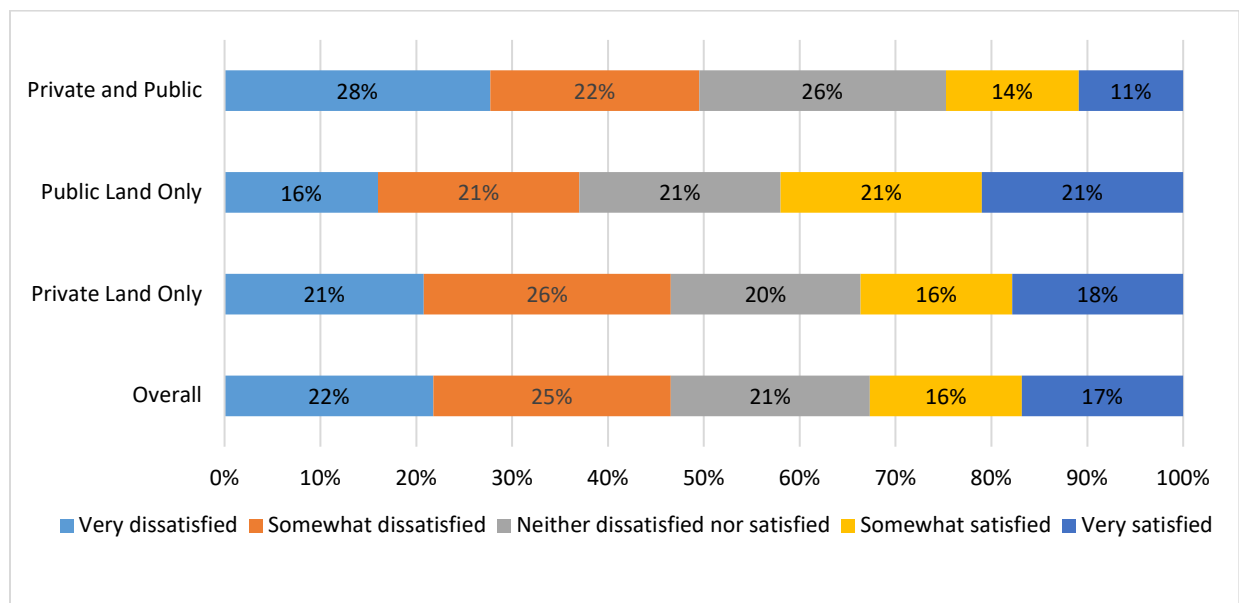


Figure 2: Survey respondents' reported satisfaction with the 2023 spring turkey hunting experience by type of land hunted (From top: n1 = 189, n2 = 136, n3 = 1254, n4 = 1,588)

A comparison of satisfaction with the 2023 spring turkey season timing among the respondents across the different TMUs showed notable similarity (Figure 3). Compared to other units, a slightly lower proportion in Midwest indicated being somewhat or very satisfied.

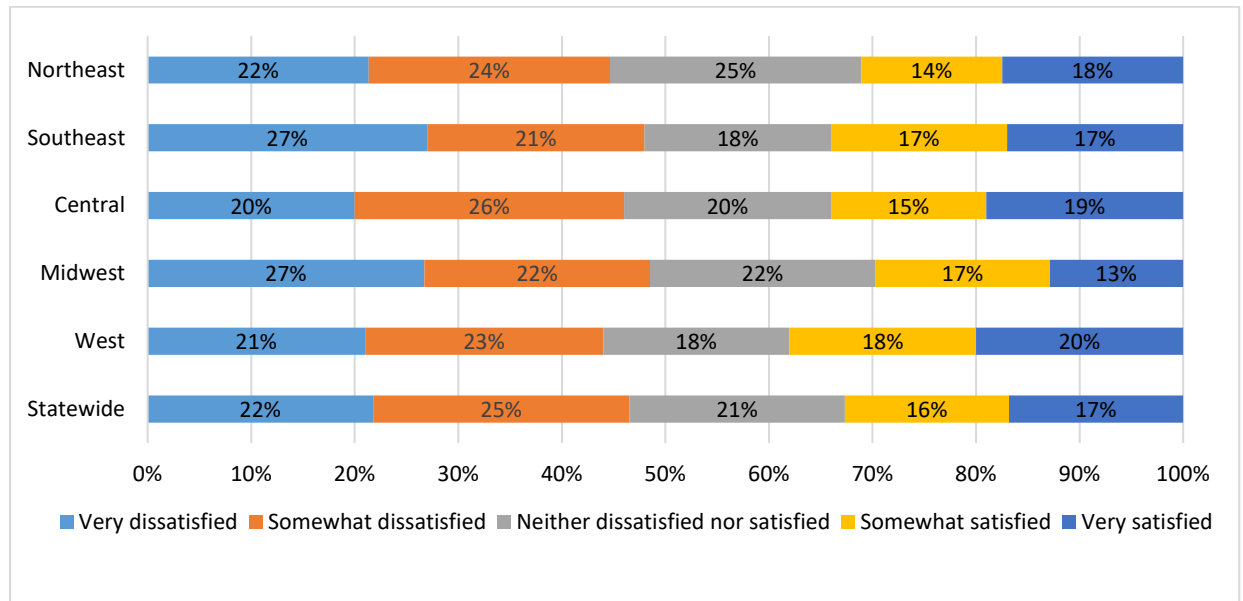


Figure 3: Survey respondents' reported satisfaction with the 2023 spring turkey hunting experience by TMU (From top: n1 = 366, n2 = 253, n3 = 719, n4 = 288, n5 = 66, n6 = 1,588)

Perceived change in turkey populations

Respondents were asked to indicate (based on their experience over the years) how they perceive the change in turkey populations in areas they hunted. Slightly less than half (48%) of the respondents statewide indicated to have perceived a decline in turkey populations, whereas another 22% indicated seeing an increase (Figure 4). A relatively higher proportion (58%) of those hunting in Northeast indicated witnessing declining populations of turkey in the areas they hunt.

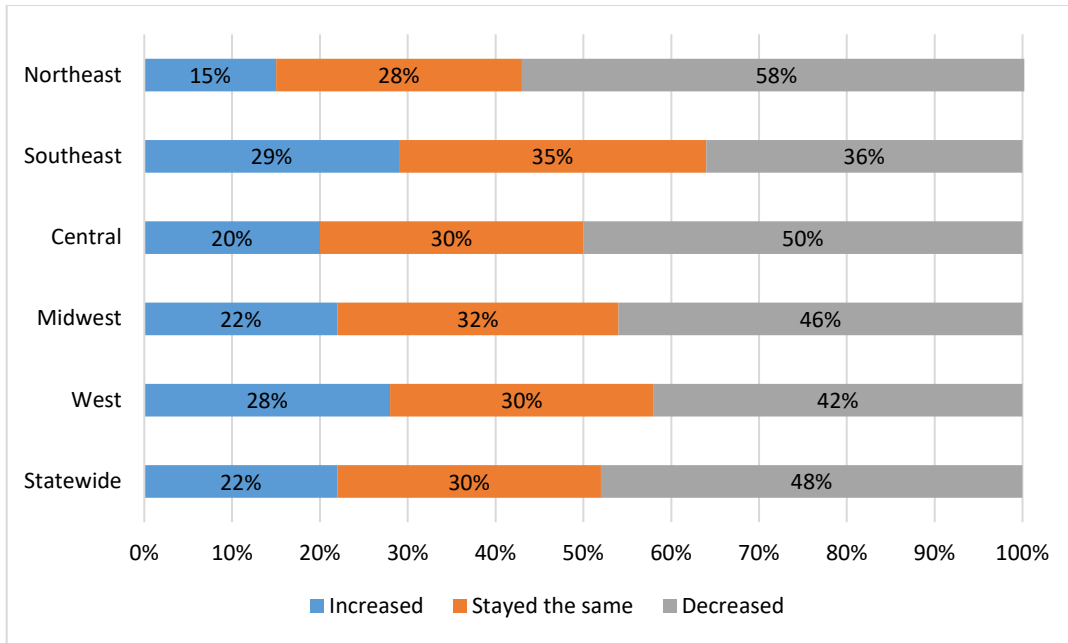


Figure 4: Survey respondents' perception of how turkey populations in the areas they hunt have changed over the years (From top: n1 = 304, n2 = 221, n3 = 646, n4 = 262, n5 = 60, n6 = 1,417)

Tools and techniques used

Respondents were asked about how often they used various tools and devices while turkey hunting in 2023. The most used techniques appear to be “patterning gun prior to the season” and “Hen or nonstrutting male decoys” (Figure 5). A large majority (83%) indicated they never used “The fanning or reaping” technique.

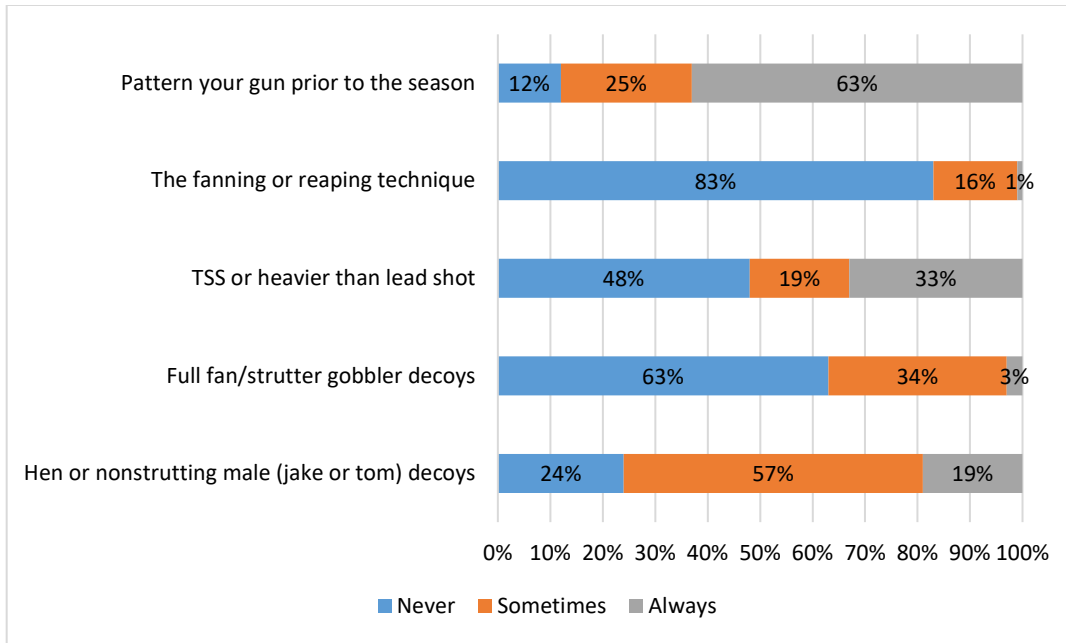


Figure 5: Percentage of survey respondents indicating the types of techniques and tools used in turkey hunting in 2023 in Tennessee (From top: n1 = 1,553, n2= 1,506, n3= 1,521, n4= 1,527, n5= 1,570))

An ANOVA analysis of hunter success/efficiency (measured in term of turkey per day) with respect to the tools and techniques used indicated no statistically significant difference except in the case of “Pattern gun prior to the season” (Table 9). This method is the most used method by hunters in 2023 turkey hunting season.

Table 9: Relationship between the tools used and hunter success/efficiency (i.e., turkey per day) in 2023 spring turkey hunting season in Tennessee.

Tools/technique/device	Never	Sometimes	Always	ANOVA F test (P value)	n
Hen or nonstrutting male (jake or tom) decoys	0.21	0.18	0.19	0.18	1444
Full fan/strutter gobbler decoys	0.19	0.17	0.20	0.45	1409
TSS or heavier than lead shot	0.18	0.19	0.20	0.38	1402
The fanning or reaping technique	0.18	0.22	0.22	0.15	1390
Pattern your gun prior to the season	0.25	0.20	0.17	0.00	1427

Shotgun gauge used and comfortable shooting distance

Nearly all (98%) of the respondents (n = 1,589) indicated that they used a shotgun to hunt turkey. When asked about the type of gauge, overwhelming majority (81%) of those who used shotgun reported using 12 ga (Figure 6). The other two common types were 20 ga and .410.

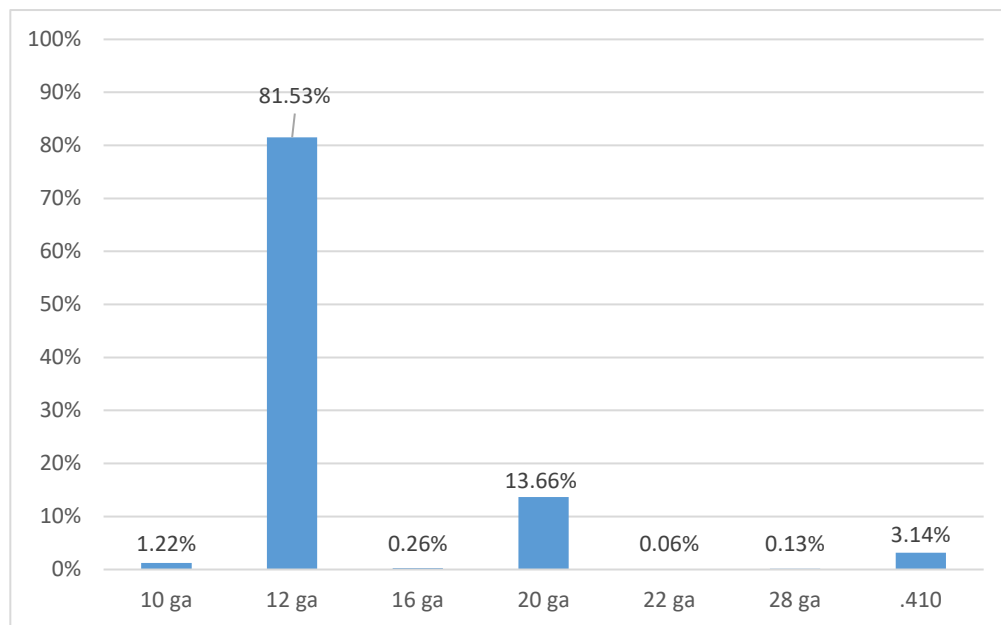


Figure 6: Percentage of survey respondents indicating the type of shotgun gauge they generally used to hunt turkey in spring 2023 in Tennessee (n = 1,559)

When asked about the farthest distance they feel comfortable shooting at a turkey (for a clean kill), the mean distance reported was 43 yards and the median was 40 yards (n = 1,569). In other words, average comfortable distance was 43 yards and most respondents indicated 40 yards or less. Reported distance values at the 25th and 75th percentiles were 40 yards and 50 yards respectively.

An analysis of the relationship of the frequency of wounding (not recovering) with the comfortable distance as well as shot type (i.e., use of TSS or heavier than lead shot) indicated that the relationships are not statistically significant.

References

- Cochran, W. G. 1977. *Sampling techniques*. John Wiley & Sons, Inc. Canada.
- Dillman, D. A., J. D. Smyth, and L. M. Cristian. 2009. *Internet, mail, and mixed-mode surveys: The tailored design method (3rd edi.)*. John Wiley & Sons Inc.
- Mingie, J. C., N.C. Poudyal, J. M. Bowker, M. T. Mengak, and J. P. Siry. 2019. Comparing the net benefit of forestland access for big-game hunting across landownership types in Georgia, USA. *Forest Science* 65(2): 189-200.
- Poudyal, N. C., C. Watkins, and O. Joshi. 2020. Economic contribution of wildlife management areas to local and state economies. *Human Dimensions of Wildlife* 25(3): 291-295.
- Watkins, C., N. C. Poudyal, C. Caplenor, D. Buehler, and R. D. Applegate. 2018. Motivations and support for regulations: A typology of eastern wild turkey hunters. *Human Dimensions of Wildlife* 23(5): 433-445.

Appendix A: Survey questionnaire

2023 Tennessee Spring Turkey Harvest Survey



You are one of a few randomly selected sportsmen and sportswomen in Tennessee to be invited to participate in this survey. Your response will help the Tennessee Wildlife Resources Agency (TWRA) and other stakeholders understand hunters' effort and success in turkey hunting, and your opinion and attitude regarding various aspects of turkey hunting will help them make informed decisions. *Even if you did not hunt in the 2023 spring turkey season, please complete the first few questions and return the survey.*

This is a University of Tennessee study with the support of the Tennessee Wildlife Resources Agency



1. Did you yourself hunt or did you take a youth (under 18 years of age) hunting in Tennessee during the 2023 spring turkey season (which includes the 2-day Young Sportsman hunt)?
 - ☐ No, please answer **Q2** and return this survey
 - ☐ Yes, I hunted, go to **Q3**
 - ☐ I did not personally hunt but I took a youth hunting, go to **Q10**
2. If you did not turkey hunt in Tennessee during any of the 2023 spring season, which best describes your reason for not hunting?
 - ☐ I typically hunt turkeys during the spring season but 2023 was an exception
 - ☐ I typically do not hunt turkeys during the spring
 - ☐ I am not a hunter
 - ☐ I hunted in another state in 2023
 - ☐ I stopped hunting to allow the population to rebuild/restore
 - ☐ Other (please specify): _____

3. In the table below, please report only **your own** (do not include information for others in your party or those you may have guided) turkey hunting activities for the 2023 spring turkey season. Report harvest and days hunted in different counties on separate rows, even if you did not harvest any turkeys in that county. For each harvest, indicate the type (bearded hen, jake, adult gobbler).

County Hunted	Number of days hunted on private land	Number of days hunted on public land	Number of turkeys harvested		
			Bearded Hens	Jakes	Adult Gobblers
<i>Example: Knox</i>	<i>16</i>	<i>5</i>	<i>0</i>	<i>1</i>	<i>1</i>

4. During the 2023 spring turkey season, how many turkeys did you shoot but not kill or recover (do not include clean misses)? _____ Shot at, but cleanly missed? _____
5. What is the farthest you feel comfortable shooting at a turkey (for a clean kill)? _____ yards
6. What gauge shotgun did you generally use to hunt this spring? _____ ga ☐ I didn't use a gun
7. How satisfied were you with the **timing** of the 2023 spring turkey season (opening on April 15th)?
- ☐ Very dissatisfied ☐ Somewhat dissatisfied ☐ Neither dissatisfied nor satisfied ☐ Somewhat satisfied ☐ Very satisfied
8. Based on your experience over the years, how have turkey populations changed in areas you hunt?
 ___ Decreased ___ Stayed the same ___ Increased ___ Don't know
9. How often did you use the following tools, techniques and devices when turkey hunting in 2023?

Tools/technique/device	Never	Sometimes	Always
Hen or nonstrutting male (jake or tom) decoys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Full fan/strutter gobbler decoys	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TSS or heavier than lead shot	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The fanning or reaping technique	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Pattern your gun prior to the season	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

10. Did you take a youth (under 18 years of age) hunting during the 2023 spring turkey hunting season?
☐ Yes, go to Q11 ☐ No, stop here and return the survey
11. Please report only turkey hunting activities for **youth you mentored** during the 2023 spring turkey season. Report days hunted, even if they did not harvest any turkeys.

Number of youth mentored	Number of days hunted on private land	Number of days hunted on public land

12. How many turkeys were harvested by youth hunters that you mentored in the 2023 season?
 Bearded Hens: _____ Jakes: _____ Adult Gobblers: _____

Thank you for taking the time to complete this important survey.

