

2024

Missouri Wild Turkey Harvest and Population Status Report



Missouri Department of Conservation
Science Branch



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Population Status

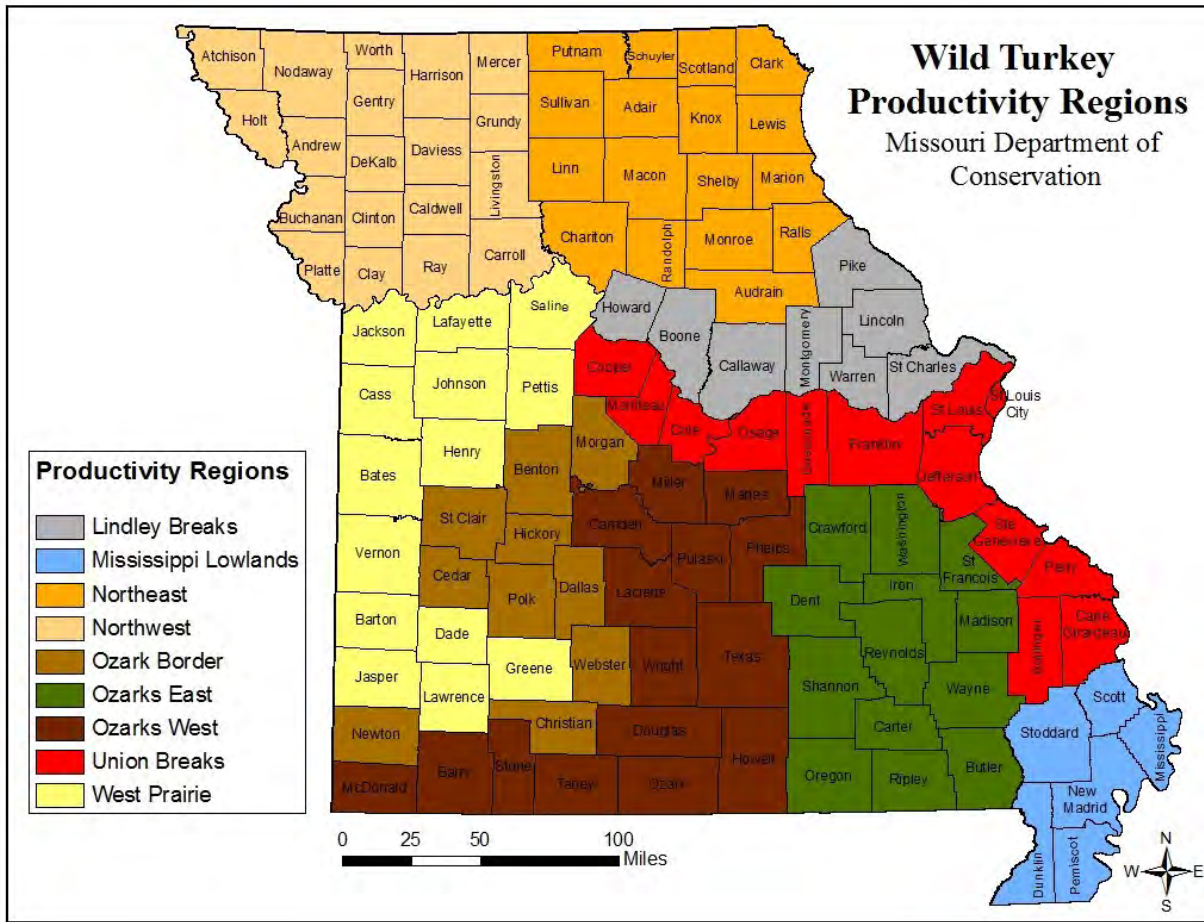
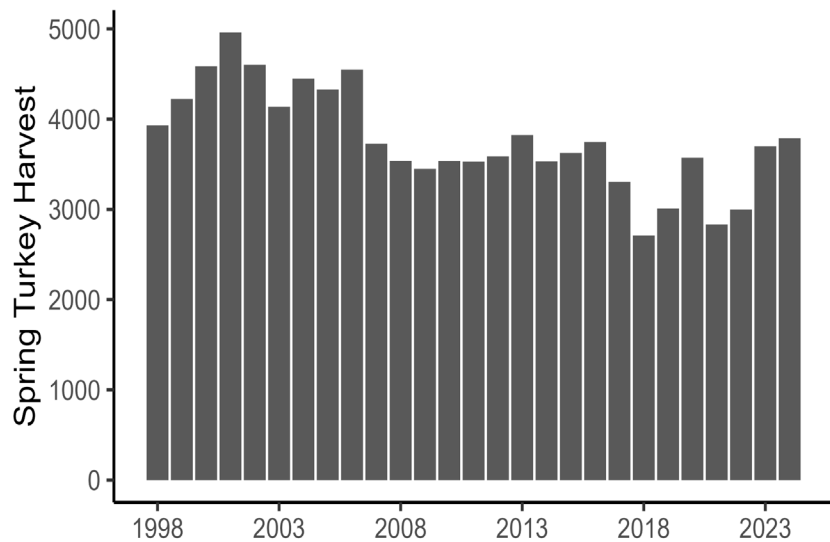


Figure 1. Turkey Productivity Regions in Missouri. Regions consist of counties grouped by similar land cover composition.

Lindley Breaks Region

Turkey abundance in the Lindley Breaks Region peaked in the early 2000s before declining about 30% from 2001-2009. Abundance stabilized from 2010-2015 before declining sharply from 2016-2018. Harvest has increased each of the last three years. The current five-year trend shows an increasing population, while the 10-year trend shows a stable population in the Lindley Breaks Region.

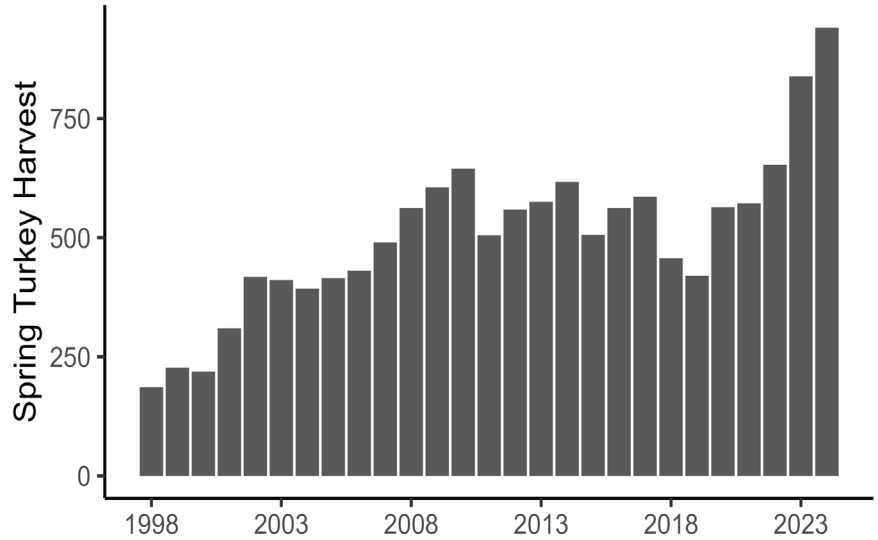
Spring Turkey Harvest: Lindley Breaks



Mississippi Lowlands Region

The turkey population in the Mississippi Lowlands Region has increased during the 2000s. However, turkey abundance in this region has always been low compared to the other regions, and because of this, harvest tends to vary greatly on an annual basis. The five- and ten-year trends indicate an increasing population in the Mississippi Lowlands Region.

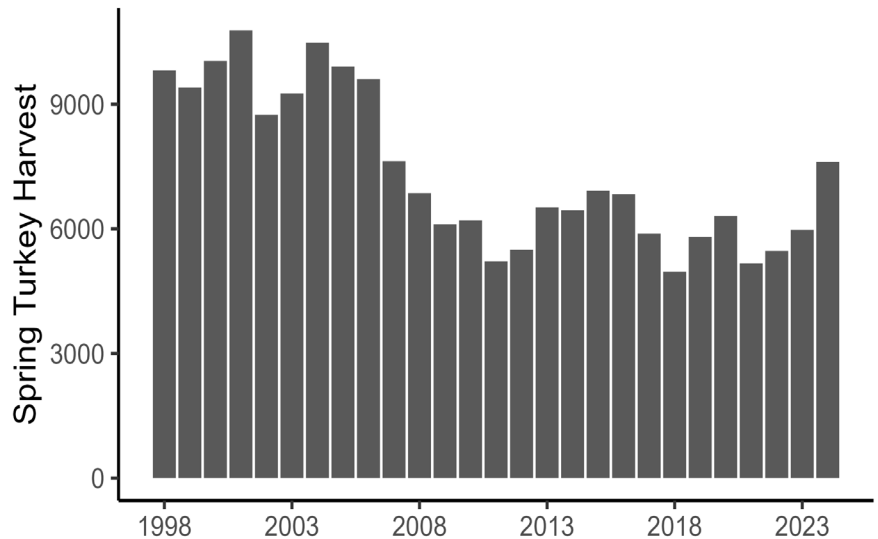
Spring Turkey Harvest: Mississippi Lowlands



Northeast Region

The Northeast Region experienced six consecutive years of poor production, leading to a roughly 40% decline in abundance during the late 2000s. However, improved production in 2011 and 2014 caused abundance to increase and stabilize. Harvest did decline from 2016-2018 but has increased in recent years. The five-year trend indicates a slight increase in population, while the picture looking back over ten years shows a stable population in the Northeast Region.

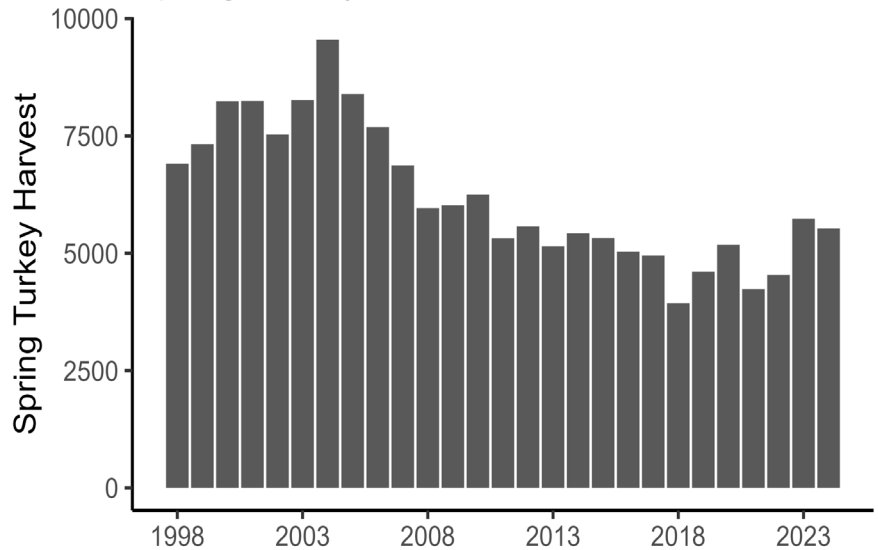
Spring Turkey Harvest: Northeast



Northwest Region

The Northwest Region experienced a sharp decline in abundance in the late 2000s due to poor production. Abundance appeared to stabilize from 2011-2015, and after a decline in harvest from 2017-2018, harvests in recent years have stabilized. The five- and 10-year spring turkey harvest trends in the Northwest Region indicate a stable population.

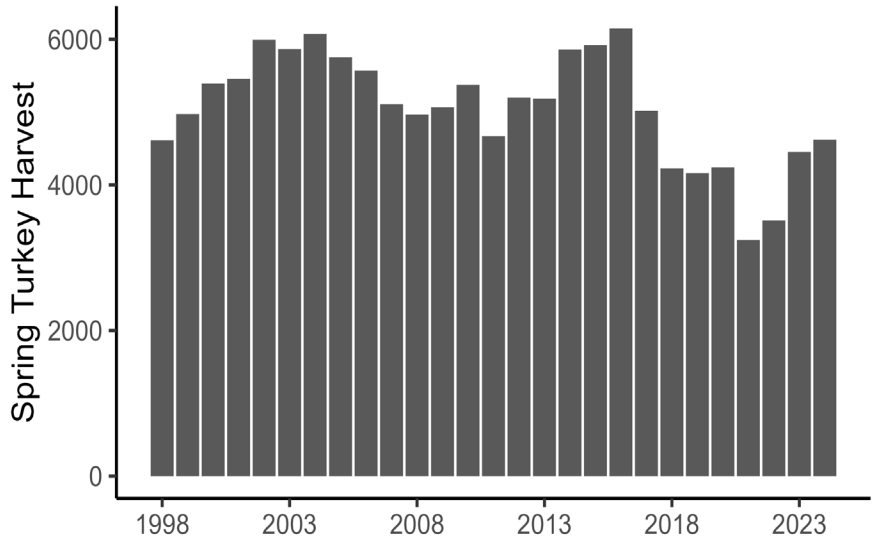
Spring Turkey Harvest: Northwest



Ozark Border Region

Turkey abundance in the Ozark Border Region peaked in the early 2000s before declining during the mid-to-late 2000s. Abundance increased from 2011-2016 before sharply dropping from 2016-2018. Harvest numbers took another downturn in 2021 with a modest increase in 2022. The five trend shows a slight increase in population. The ten year trend, however, shows a decreasing population in the Ozark Border Region.

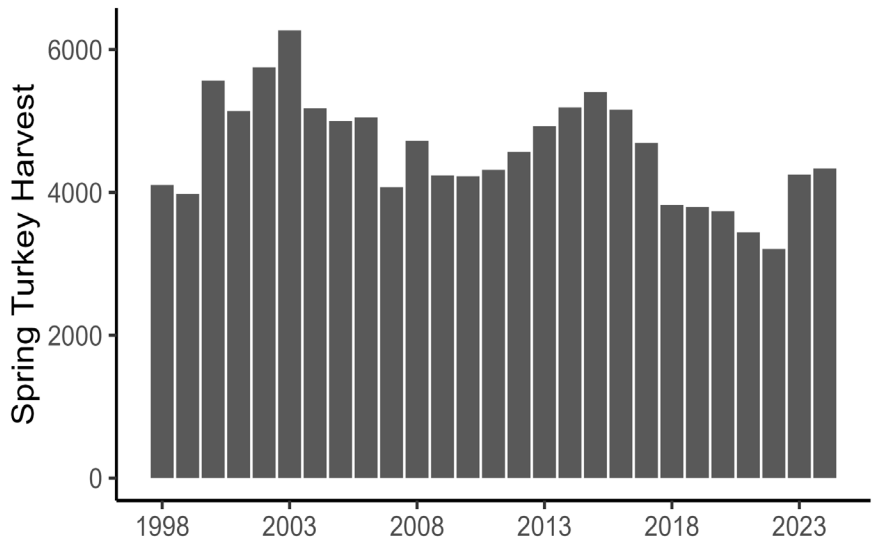
Spring Turkey Harvest: Ozark Border



Ozarks East Region

The turkey population in the Ozarks East Region declined during the late 2000s, but after several years of improved production, abundance increased from 2011-2015. The harvest declined again from 2016-2018 and after a few years of relative stability, declined again in 2021 and 2022. 2023 and 2024 was a year of good harvest in the East Region. The five-year harvest trend is stable while the ten-year trend indicates a declining population.

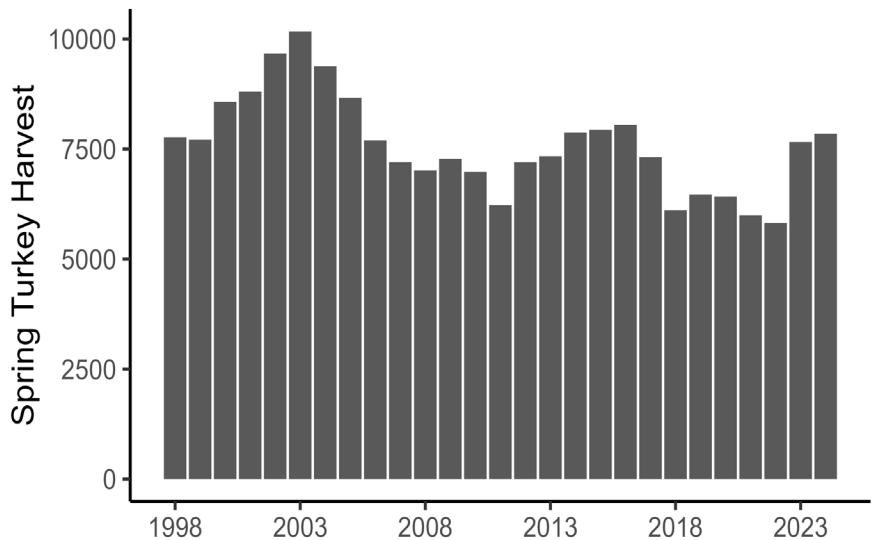
Spring Turkey Harvest: Ozarks East



Ozarks West Region

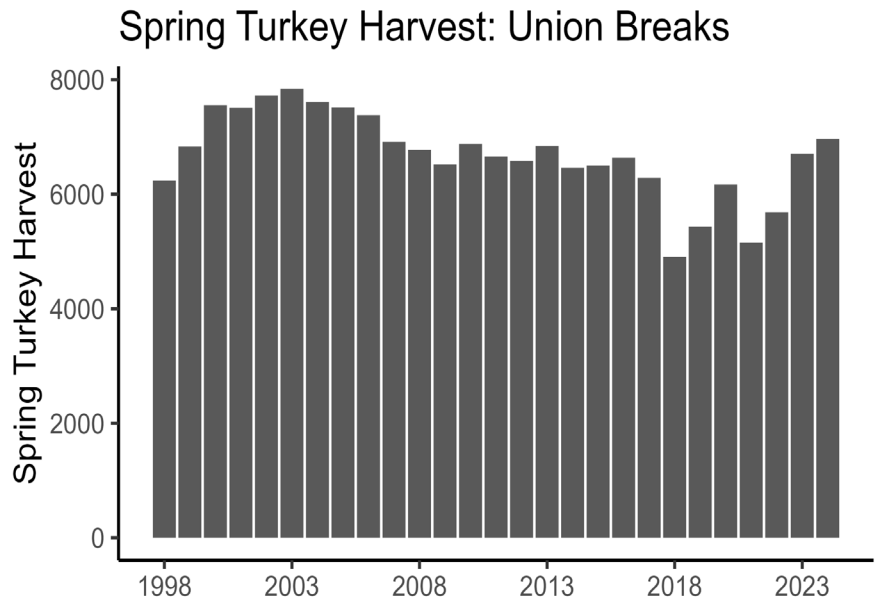
Turkey abundance in the Ozarks West Region peaked in the early 2000s, followed by sharp declines during the mid-to-late 2000s. Improved production resulted in an increasing trend in spring harvest from 2011-2016. The harvest declined again from 2016-2018 but has leveled-off in recent years. 2024 was a good year in the Ozarks West, where harvest returned to a level seen during the mid-2010s. The five-year trend indicates an increasing population, while the ten-year trend is stable.

Spring Turkey Harvest: Ozarks West



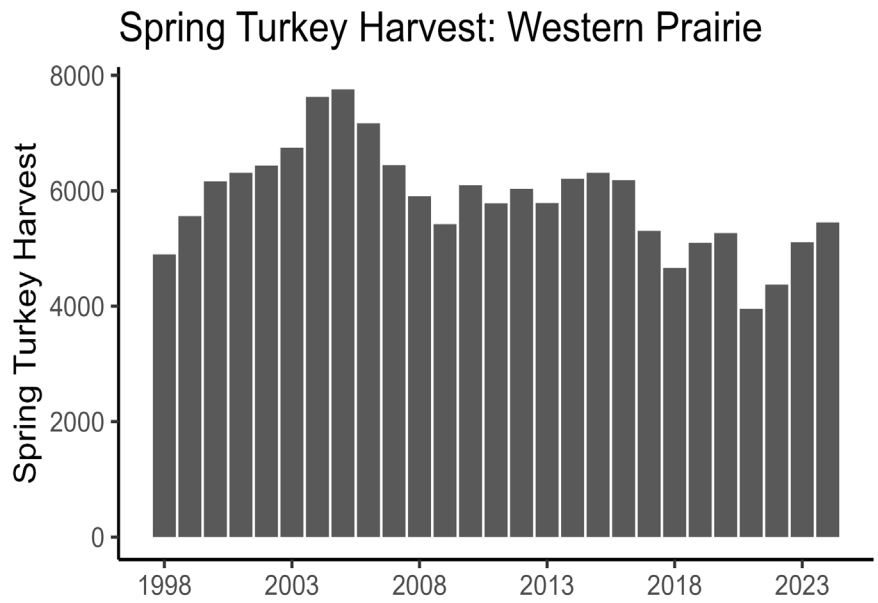
Union Breaks Region

Turkey abundance in the Union Breaks Region peaked in the early 2000s. Abundance gradually declined during the mid-to-late 2000s and was stable from 2009-2017. After a sharp decline in harvest during 2018, harvest has increased during the past couple of years. The five-year trend shows an increasing population while the ten-year trend shows stability in the Union Breaks Region.



West Prairie Region

The West Prairie Region turkey population peaked in the early-to-mid 2000s, and after declining from 2006-2009, abundance increased from 2010-2015. Harvest did decline from 2016-2021 but did tick up in 2023 and 2024. The five year trend is stable. The ten year spring turkey harvest trend in the West Prairie Region indicate declining abundance.



PRODUCTION – WILD TURKEY BROOD SURVEY

The Missouri Department of Conservation (MDC) has been conducting a Wild Turkey Brood Survey annually since 1959. During the survey, Department staff and citizen volunteers record observations of hens, poults, and gobblers during June, July, and August. Turkey sightings are recorded on observation cards, which the MDC mails to participants at the beginning of each survey month. By recording observations of hens and poults, survey participants provide information that serves as an index to turkey production. It is through this survey that the MDC determines the success of each year’s turkey hatch. Turkey observations are collected at the county-level and analyzed by Turkey Productivity Region (**Figure 1**), which are counties grouped by similar land cover composition. Conservation Department staff determines the percentage of hens observed with and without poults, and the average number of poults per hen for those hens observed with a brood. Observations of hens and poults are used to determine the poult-to-hen ratio (PHR), which is the average number of poults per hen. The PHR includes observations of hens with a brood and those observed without a brood.

In 2023, MDC staff and citizen volunteers recorded observations of over 78,000 turkeys during the three-month survey. The 2023 statewide poult-to-hen ratio (PHR) was 1.4, which was 46% greater than the 2022 PHR and 43% greater than the previous five-year average (Figure 1, Figure 2, Table 1). This year’s PHR was also 30% greater than the 10-year average and 19% greater than the 20-year average (Table 1). Regional PHRs in 2023 ranged from 1.2 in the West Prairie Region to 2.6 in the Mississippi Lowlands Region (Figure 1, Table 1). Production in 2023 was greater in every region of the state compared to the five-, ten- and 20-year averages; the lone exception being in the Lindely Breaks region, where the 20-year average was slightly higher than the 2023 figure (Table 1).

At the statewide scale, 45% of hens were observed with a brood, which was up from 38% in 2022 (Table 2). The percentage of hens observed with a brood ranged from 40% in the Northwest Region to 74% in the Mississippi Lowlands Region (Table 2). Statewide, the average number of poults per brood was 4.4, which was up from 3.8 in 2022 (Table 2). The average number of poults per brood ranged from 3.9 in the West Prairie Region to 5.0 in the Ozarks East Region (Table 2).

Table 1. Index (poult-to-hen ratio) of Missouri wild turkey production by Turkey Productivity Region (**Figure 1**). Data were obtained during the Conservation Department’s Wild Turkey Brood Survey in 2023 and are compared to the previous year and the average for periodic intervals.

Productivity Region	2023 Index	1-Year (2022) Change	5-Year (2018-2022) Change	10-Year (2013-2022) Change	20-Year (2003-2022) Change
Lindley Breaks	1.3	10%	15%	5%	-3%
MS Lowlands	2.6	8%	43%	72%	43%
Northeast	1.5	10%	22%	22%	13%
Northwest	1.3	33%	11%	3%	3%
Ozark Border	1.3	45%	64%	31%	19%
Ozarks East	2.2	176%	141%	81%	55%
Ozarks West	1.3	30%	43%	29%	7%
Union Breaks	1.5	43%	48%	34%	14%
West Prairie	1.2	97%	78%	56%	25%
Statewide^a	1.4	46%	43%	30%	19%

^aStatewide totals include observations where Productivity Region was not recorded on the survey form.

Table 2. Data obtained during the Missouri Department of Conservation’s Wild Turkey Brood Survey, listed by Turkey Productivity Region (**Figure 1**), 2022.

Productivity Region	% Hens w/ Brood	Average Brood Size	Poult-to-Hen Ratio	Gobbler-to-Hen Ratio
Lindley Breaks	42%	4.1	1.3	0.5
MS Lowlands	74%	4.8	2.6	1.9
Northeast	43%	4.7	1.5	0.6
Northwest	40%	4.2	1.3	0.7
Ozark Border	43%	4.4	1.3	0.8
Ozarks East	42%	5.0	2.2	0.3
Ozarks West	43%	4.5	1.3	0.6
Union Breaks	47%	4.3	1.5	0.6
West Prairie	46%	3.9	1.2	0.3
Statewide^a	45%	4.4	1.4	0.6

^aStatewide totals include observations where Productivity Region was not recorded on the survey form.

Poult-to-Hen Ratio: Statewide

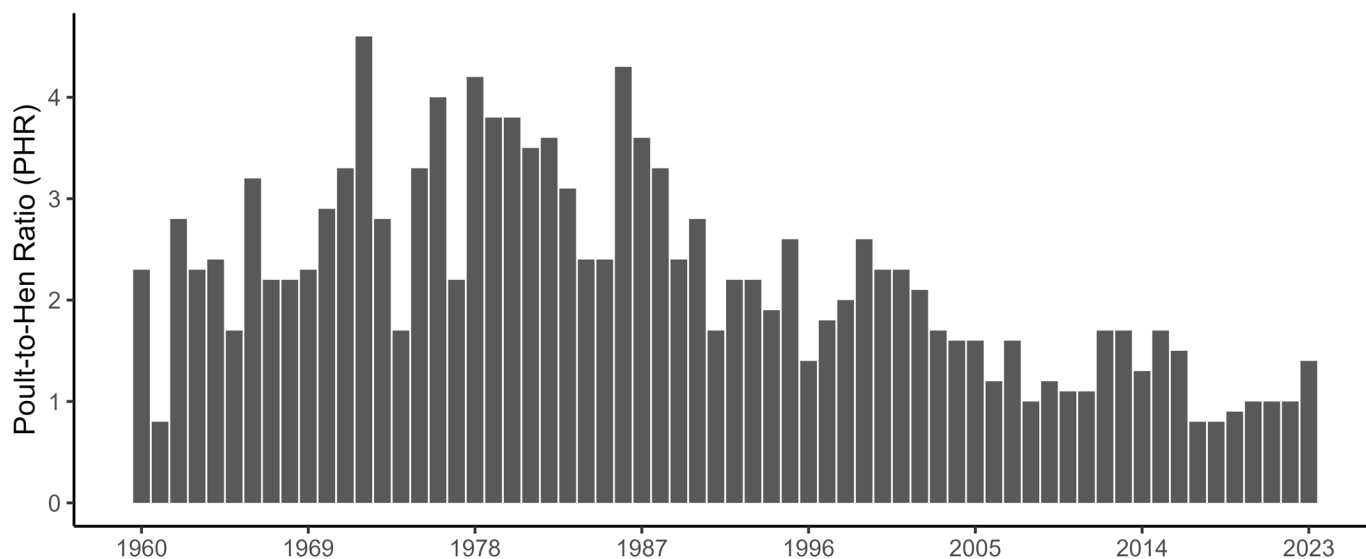


Figure 2. Missouri statewide poult-to-hen ratios derived from the Wild Turkey Brood Survey conducted in June, July, and August, 1959-2023.

HARVEST

2024 Spring Turkey Season

During the 2024 youth spring turkey season, which took place April 6-7, hunters harvested 3,704 turkeys. This harvest total represented a 45% increase from the 2023 youth season but was in line with the previous five-year average youth season harvest total. In 2024, a total of 17,025 youth permits were sold which included 16,068 resident youth and 957 non-resident youth permits. The total number of youth permits sold in 2024 was 9.5% greater than the number sold in 2023.

During the 2024 regular spring turkey season, which took place April 15 – May 5, hunters harvested 43,380 turkeys. This harvest total represented an 3% increase from the 2023 regular season. Juvenile male turkeys represented 20% of the regular season harvest, which was 8% higher than the previous five-year average. The total 2024 spring

turkey harvest, including both the youth and regular seasons was 47,097 (Figure 3). This harvest total was 6% higher than the 2023 harvest total and 20% higher than the previous five-year average. Harvest was concentrated in the middle of the state, with areas in the northwest, southwest and southeast seeing lower harvest (Figure 4).

Total permit sales for the 2024 spring turkey season (107,624; excluding no-cost landowner permits) were 5.31% higher than in 2023 and 5.21% higher than the previous five-year average (Figure 3). Spring turkey permit sales in 2024 included 97,174 (90%) resident permits and 10,450 (10%) nonresident permits. An additional 22,560 no-cost permits were distributed to landowners. The total number of unique spring turkey hunters in Missouri in 2024 was 127,371. The number of spring turkey hunters in 2024 was 5% more than in 2023 and 3% greater than the previous five-year average.

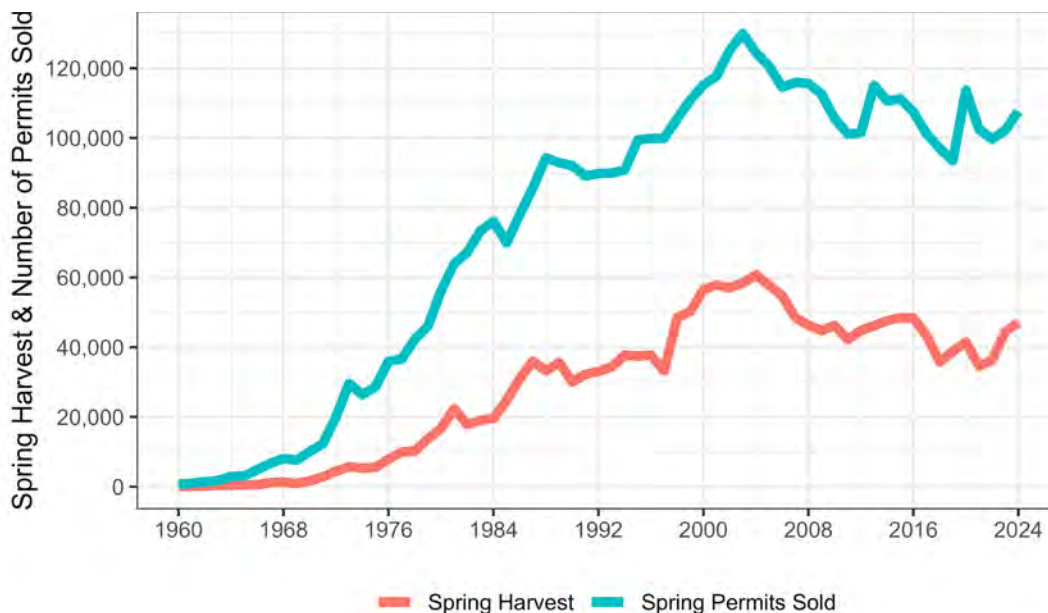


Figure 3. Number of wild turkeys harvested during the spring season (youth and regular season) in Missouri and the number of turkey hunting permits sold for the spring season, 1960-2024. Permit sales do not include no-cost landowner permits.

Total Spring Harvest per 1000 acres

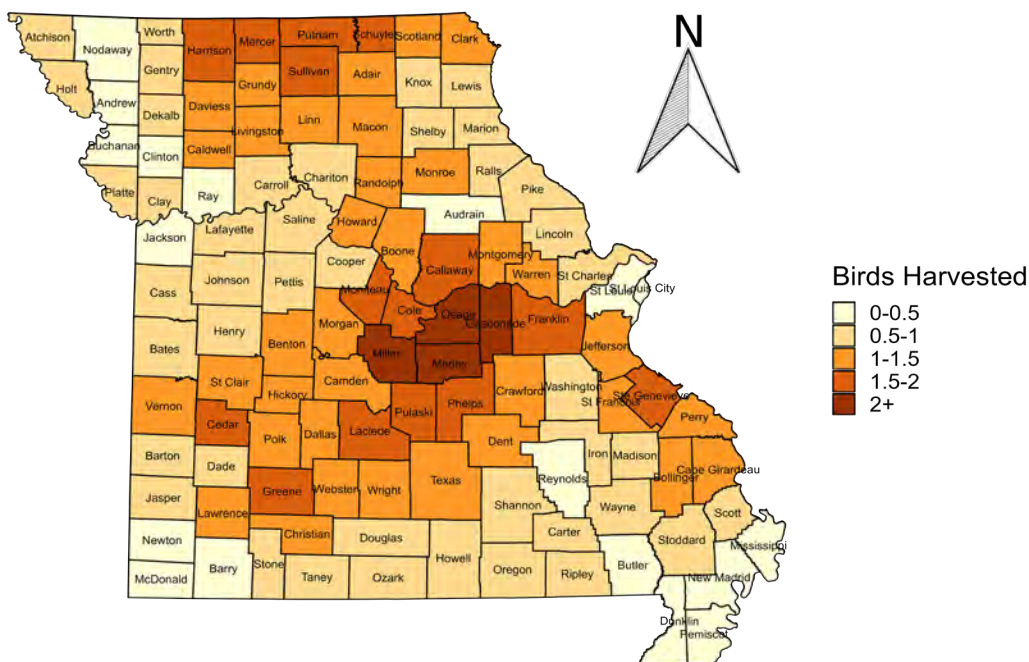
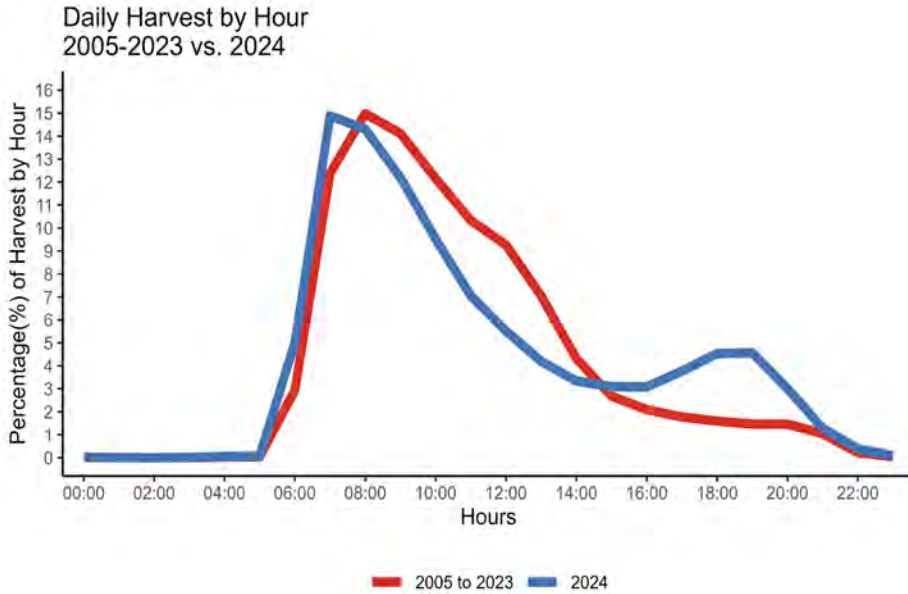


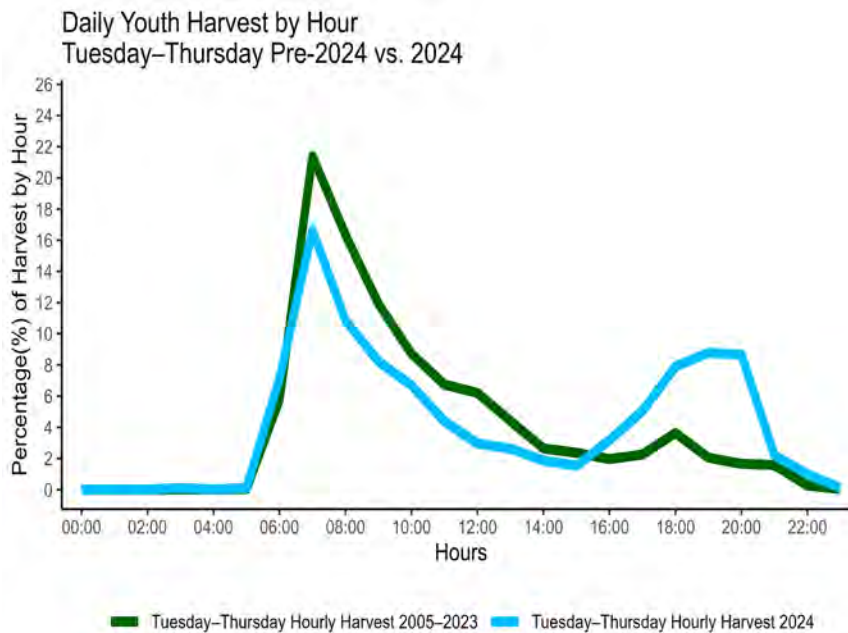
Figure 4. Total (youth and regular season) spring wild turkey harvest in Missouri, 2024.

In 2024, hunters had the opportunity to hunt turkeys on private land until sunset for the first time during the regular spring turkey season. This regulation change was proposed and eventually passed in an effort to address the decline in hunter participation in Missouri. Our data indicated that younger hunters were disproportionately impacted by the historical 1 PM closure, and introducing youth hunters to the sport is one of the best ways to create lifelong hunters. The push to recruit more hunters may seem paradoxical when harvest is lower than in years past, though the last two years show signs for optimism. However, hunters are the largest and most effective advocates for hunting, so declines in hunter participation are concerning.

After the 2024 season, we saw that recruitment was 15% higher than the 2023 season and 20% higher than the 2022 season. We also found that participation among 6-17-year-old hunters has 9% and 6% higher than the 2023 and 2022 season respectively.



Many are curious to know how the additional opportunity impacted harvest. For that, we turn to the telecheck system, where we can look at the time that a bird was checked. While this is not a perfect analog to the precise time of harvest, we can look at this year's harvest per hour compared to years past to get a sense for what took place. Between the years of 2005 and 2023, 17% of all turkeys telechecked were done so after 1 PM — even though it was illegal to harvest a bird after 1 PM during those years, you could check your bird as late as 10 PM the day it was harvested. In 2024, the number of birds telechecked on private land after 1 PM was 27% (Figure 5). Knowing that in years past around 17% of hunters checked their birds after 1 PM, assuming that the regulation change did not change telecheck behavior, you can surmise that around 10-15% of the private land harvest came after 1 PM. This level of afternoon harvest is similar to what other states that have moved to an all-day season have seen, too.



One of the methods by which we expected participation to increase was via youth participation after school. To explore the effect the regulation change had on school-aged kids, we compared the 2024 hourly TeleCheck on Tuesdays, Wednesdays, and Thursdays to the hourly Telecheck from 2005 to 2023 (Figure 6). There is a clear increase in TeleChecks starting around 5 PM in 2024 compared to previous years. This indicates that youth hunters were, indeed, taking advantage of the extra opportunity to go out in the field after school.

Figure 6. Youth harvest during the regular season broken down by hour.

2023 Fall Firearms Turkey Season

The 2023 fall firearms turkey harvest total of 2,220 was 20% greater (377 total birds) than the 2022 harvest total and was 13% above the previous five-year average (Figure 7). Most fall firearms harvest occurs south of the Missouri River, though areas in North Central Missouri see above average harvest as well (Figure 8). Permit sales for the fall firearms season (n = 12,743) were slightly higher than the number sold in 2022 (n = 12,043). There is, however, a long-term declining trend in fall firearms turkey hunting participation in Missouri.

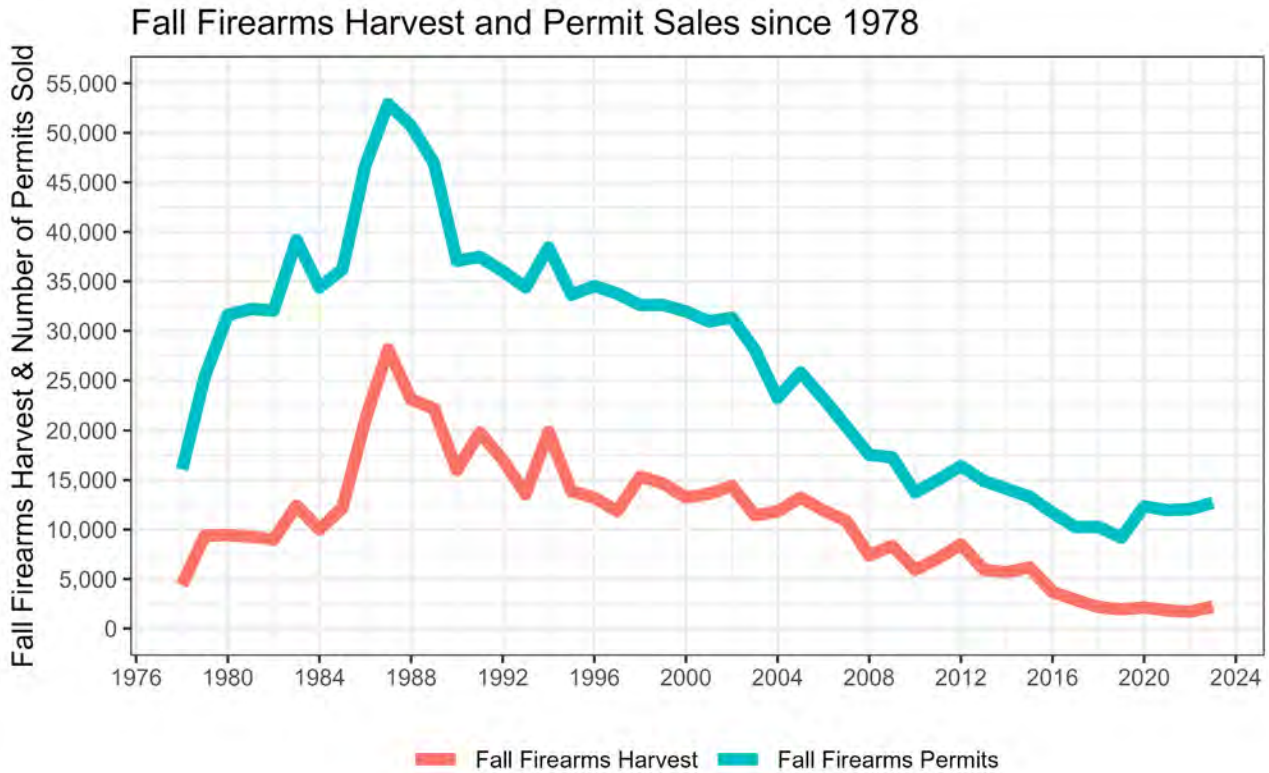


Figure 7. Number of wild turkeys harvested during the fall firearms turkey season in Missouri and the number of fall firearms permits sold, 1978-2023. Permit sales do not include no-cost landowner permits.



Fall Firearms Harvest per 10,000 acres

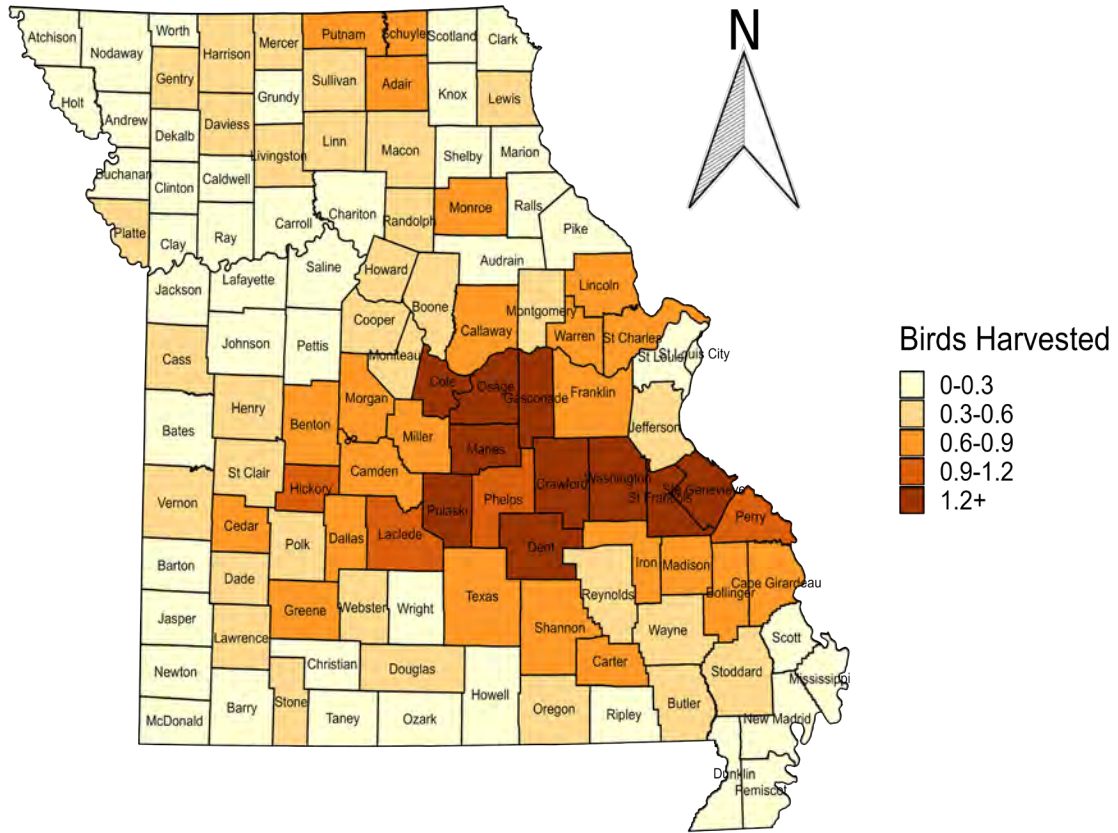


Figure 8. Missouri fall firearms wild turkey harvest per 10,000 acres, 2023.



2023 Fall Archery Turkey Season

Hunters harvested 2,860 turkeys during the 2023 fall archery deer and turkey season (**Figure 9**). The 2023 archery turkey harvest total was 17% greater (414 total birds) than the 2022 harvest total and 16% greater than the previous five-year average. Unlike the fall firearms turkey harvest, which has shown a declining trend since the late 1980s, the fall archery harvest increased steadily until the mid-2000s. Since 2005, annual archery turkey harvests have fluctuated but show a stable to slightly declining trend, overall. The poor production in 2016 and 2017 likely resulted in low harvest in the proceeding years, with 2020 being a deviation from that trend. In 2020, 156,342 fall archery hunting permits were sold, the highest number since the season's inception, while permit sales numbers were down slightly from that high point the last two years, the 2023 sales figure (150,968 permits sold) was still 6% higher than the five-year average (**Figure 9**). Archery harvest is well distributed across the state (**Figure 10**). This may be attributed to opportunistic take by hunters who are primarily targeting white-tailed deer.

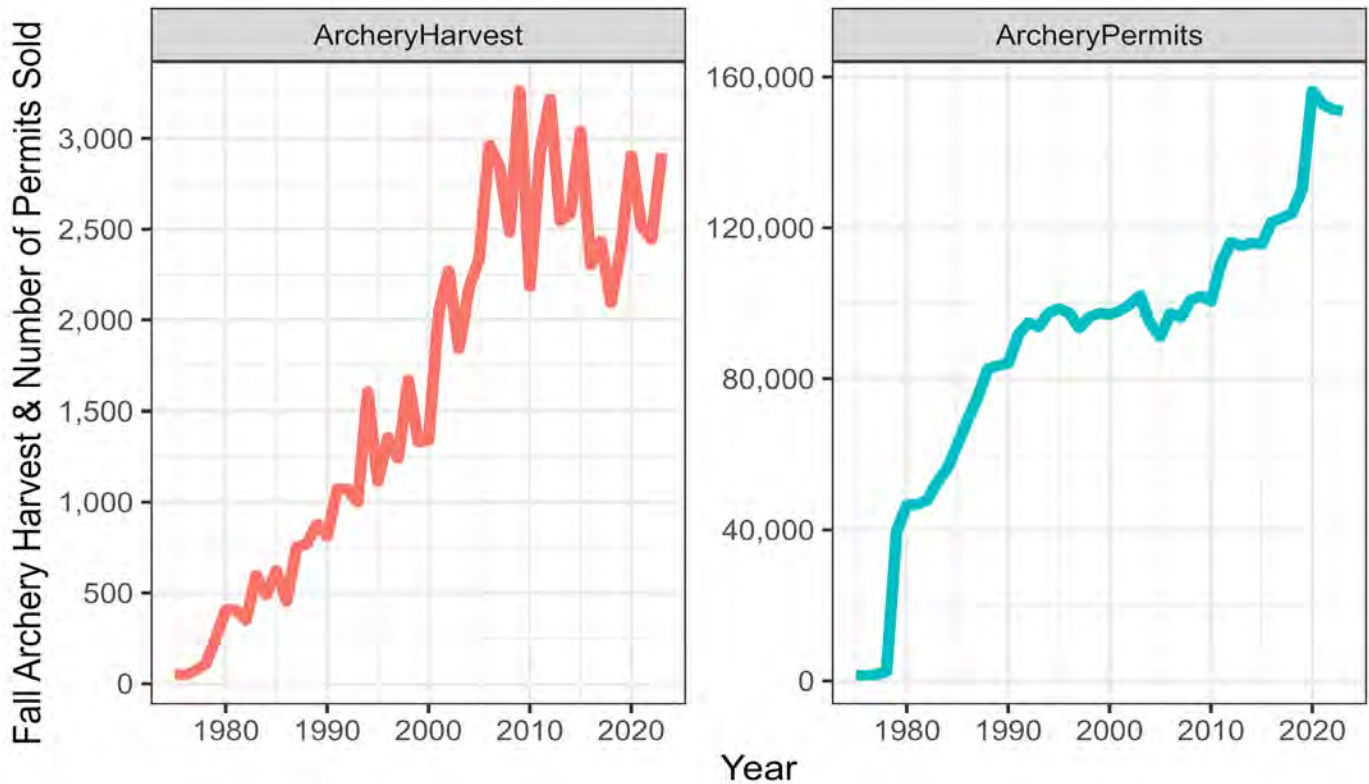
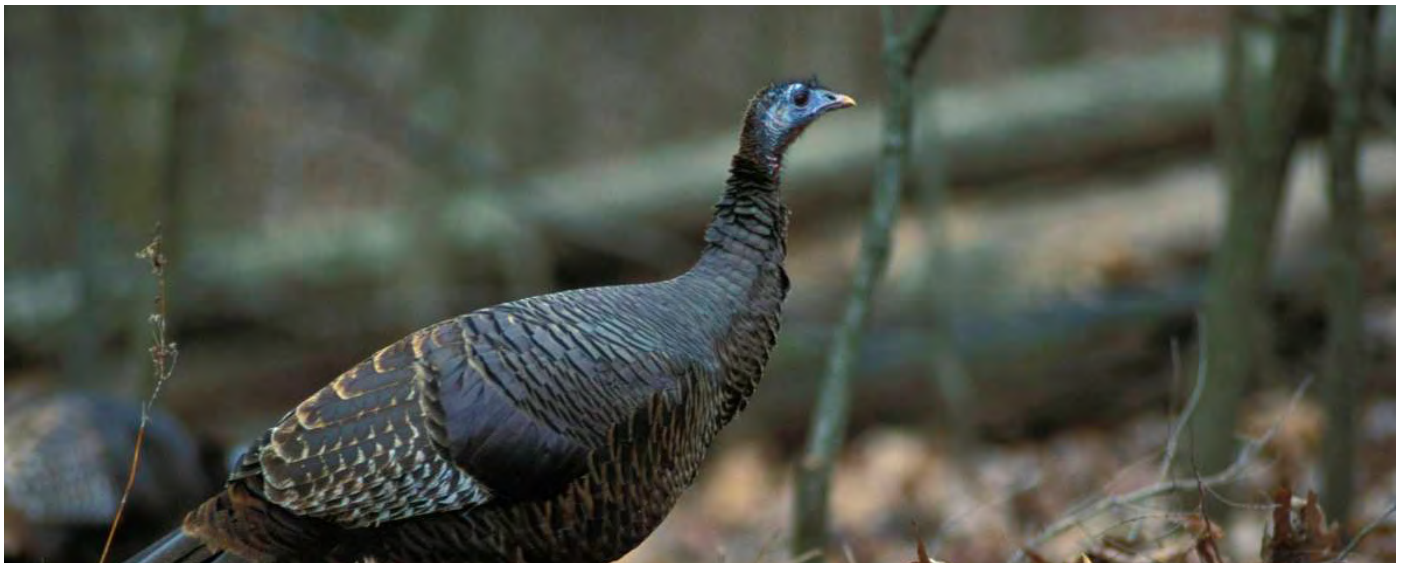


Figure 9. Missouri fall archery permit sales, 1975-2023, compared to fall archery turkey harvest 1975-2022. Permit sales do not include no-cost landowner permits. In 1979, the archery deer and archery turkey permits were combined into one permit.



Fall Archery Harvest per 10,000 acres

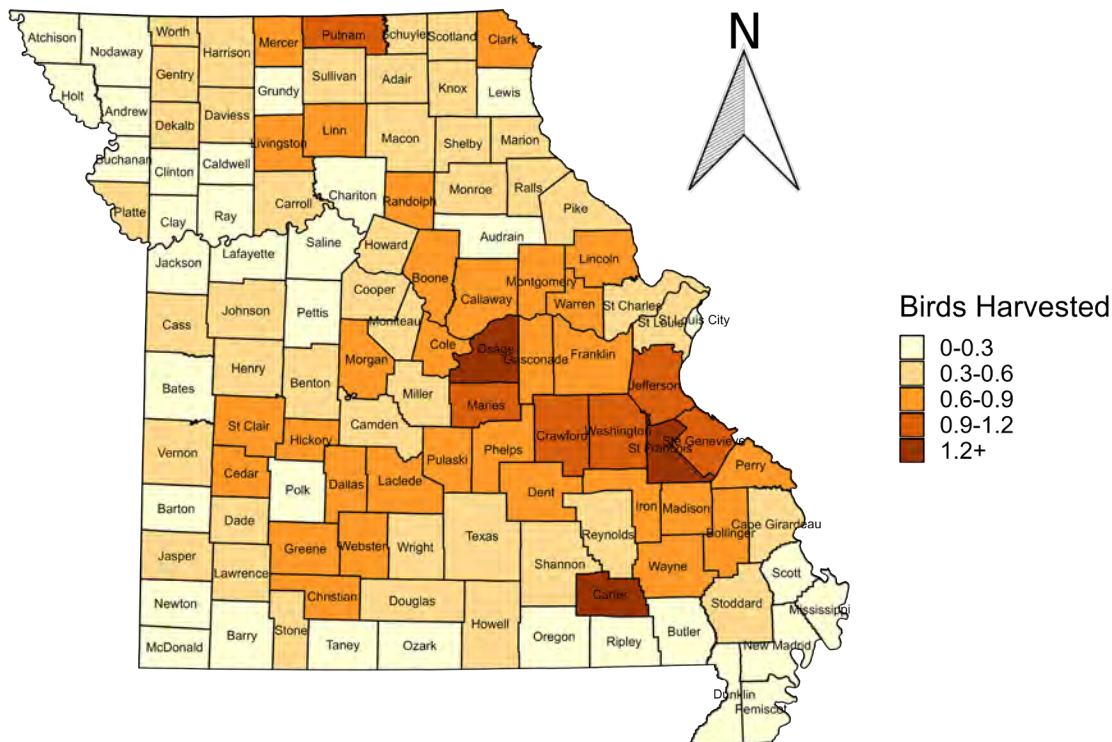


Figure 10. Wild turkey harvest in Missouri during the 2023 fall archery season.

Permit Sales

Spring resident turkey permit sales have averaged 109,941 between 2016 and 2024 (Table 3). Non-resident spring permit sales have averaged 8,995, meaning that around 92% of permits have been sold to residents across that period of time. While resident permit sales are likely driven by the hunters local turkey population and factors close to home, non-resident sales can fluctuate due to a variety of factors. The regulations other states, especially those of Missouri’s neighbors,

Table 3. Comparison of resident and non-resident harvest and permit sales during the youth and regular turkey seasons since 2016. Permit sales do not include no-cost landowner permits.

Spring Turkey Season	Number of Permits Issued		Number of Turkey Harvested	
	Resident	Non-Resident	Resident (% of harvest)	Non-Resident
2016	117,520	9,153	43,947 (91%)	4,303
2017	110,346	9,000	44,253 (91%)	4,219
2018	102,673	8,999	32,200 (90%)	3,561
2019	99,249	8,832	34,769 (90%)	3,963
2020	123,736	8,046	38,036 (92%)	3,353
2021	108,843	8,767	30,675 (89%)	3,890
2022	106,491	8,260	32,349 (89%)	3,852
2023	107,373	9,444	39,472 (89%)	5,087
2024	113,242	10,450	41,620 (88%)	5,576

Table 4. Comparison of resident and non-resident harvest and permit sales during the fall turkey season since 2015. Permit sales do not include no-cost landowner permits.

Fall Turkey Season	Number of Permits		Number of Turkey Harvested	
	Resident Archery/Firearms/Total	Non-Resident Archery/Firearms/Total	Resident	Non-Resident
2015	105,761/13,084/118,845	9,881/219/10,100	8,948	289
2016	111,039/11,469/122,508	10,405/227/10,677	5,818	186
2017	111,465/9,975/121,440	11,119/268/11,387	5,108	207
2018	112,071/10,039/122,110	11,811/223/12,034	4,017	194
2019	116,899/9,014/125,913	13,382/181/13,563	4,141	197
2020	141,513/12,110/153,623	14,829/219/15,048	4,749	262
2021	136,592/11,731/148,323	16,241/231/16,472	4,102	246
2022	135,050/11,804/146,854	16,357/239/16,596	4,045	250
2023	134,037/12,479/146,516	16,931/237/17,168	4,846	246

can impact non-resident permit sales. So can regulation changes in Missouri and other states. Over the last two years, its clear that there has been an increase in non-resident permit sales. However, its worth noting that as a percentage of the total permits sold, non-residents only make up between 8% and 12% of the total permit sales since 2016.

Fall permit sales are driven, in large part, by the historical inclusion of archery turkey permits with archery deer permits.

Spring Resident and Non-Resident Permit Sales: Statewide

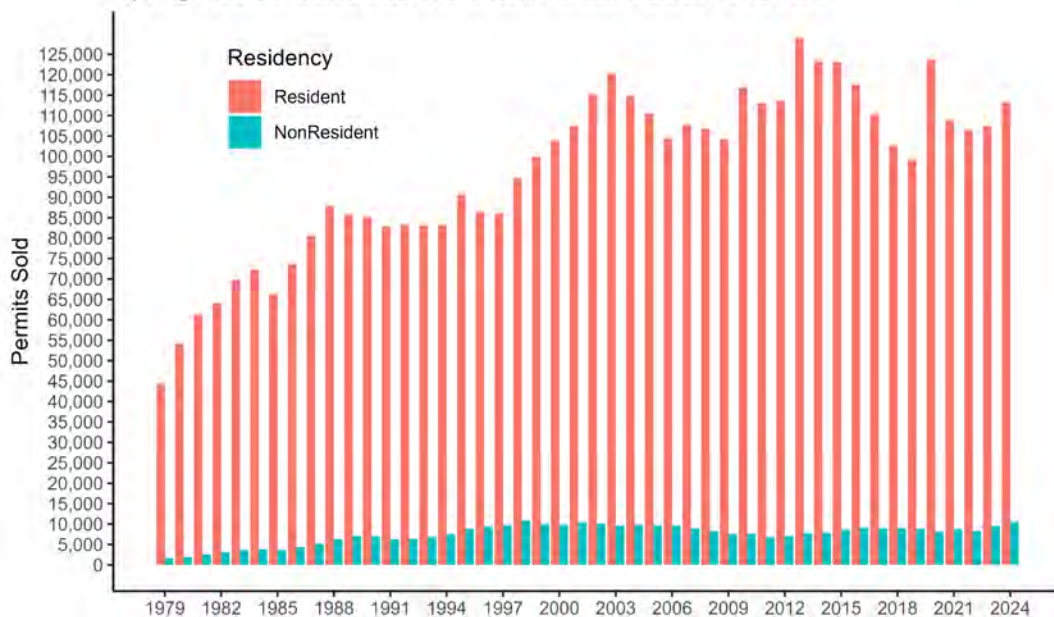


Figure 11. Comparison of resident and non-resident spring turkey hunting permit sales (does not include no-cost landowner permits) since 1979.

Firearms permits have remained fairly stable since 2015, with an average of 11,300 over that time period (Table 4). Non-resident archery permit sales have steadily increased since 2015, but non-resident fall firearms permits have remained stable with an average over that time period of 216.

While permit sales do give us an idea about the level of participation we are seeing, it does little to indicate the level of effort that individual hunters put forward. Similarly, harvest can provide clues as to the health of the population, but without a measure of effort or participation, there are too many other

factors that may influence harvest to rely on the harvest number alone. Luckily, Missouri has been collecting effort data for many years via our annual spring turkey hunter survey. With this data, we can estimate how many “trips” a hunter takes each season and compare that to the number of birds harvested. Since 1998 harvest per 1,000 trips peaked in 2000 at 112 turkeys. In 2000, resident hunters who purchased a permit took an estimated 446,650 trips while harvesting 50,090. By comparison, in 2004, when total statewide harvest peaked, resident hunters took an estimated 554,470 trips while harvesting 50,661 birds (the total harvest was just over 60,000 in 2004, but non-residents, landowners who are eligible to receive no-cost permits and youths who harvest birds during the youth season are not included). That comes out to a statewide harvest per 1,000 trips of 91 — an 18% decline compared to the 2000 number. That doesn’t mean, in isolation, that the population had declined between 2000 and 2004, it simply means that individual hunters spent less

time in the field for each bird harvested. In 2024, the number of birds harvested per 1,000 trips was 79. Compared to 2000 or even 2004, that equates to a 30% and 14% decline respectively. However, for context, the average harvest per 1,000 trips since 1998 is 80 and the five years following 2004 saw an average harvest per 1,000 trips of 73.

Clearly, there was a decline in harvest per trip starting after the 2000 hunting season, but accelerating after the 2004 season. This closely aligns with a downturn in production in 2003 — where you would expect to see a decline in harvest two years later. However, by 2007 or 2008, things remained relatively stable until a slight uptick in harvest per trip in 2015. That was short-lived, unfortunately, when several years of poor production between 2016 and 2021 resulted in low harvest and low harvest per trip numbers. Over the last two years, harvest per trip rates have returned to the long-term average. With good production in 2023 and optimism for good production in 2024, there a good likelihood that the harvest per 1,000 trips will remain around or above the long-term average.

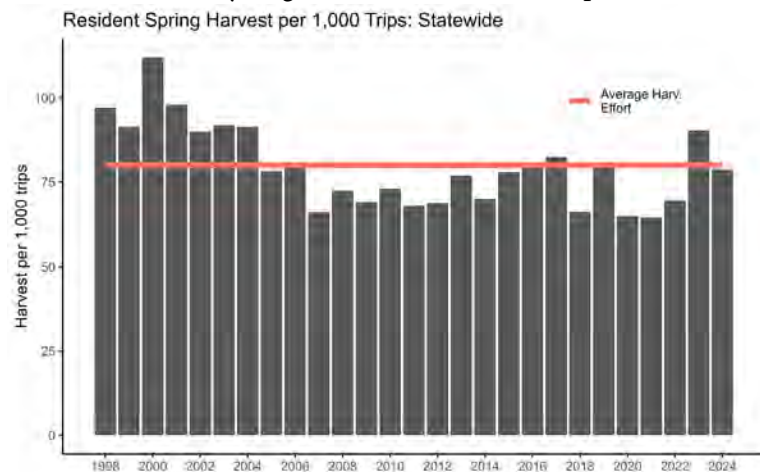


Figure 12. Resident spring harvest per 1,000 trips statewide 1998 to 2024.

Hunting Incidents

There was one, non-fatal, hunting incidents during the 2024 spring turkey season. The number of spring turkey hunting incidents in Missouri has declined considerably over the course of the last three decades. During the late 1980s, more than 30 incidents occurred annually for every 100,000 permits sold. During the last five hunting seasons, the average number of incidents per 100,000 permits sold is 1.3 (Figure 13).

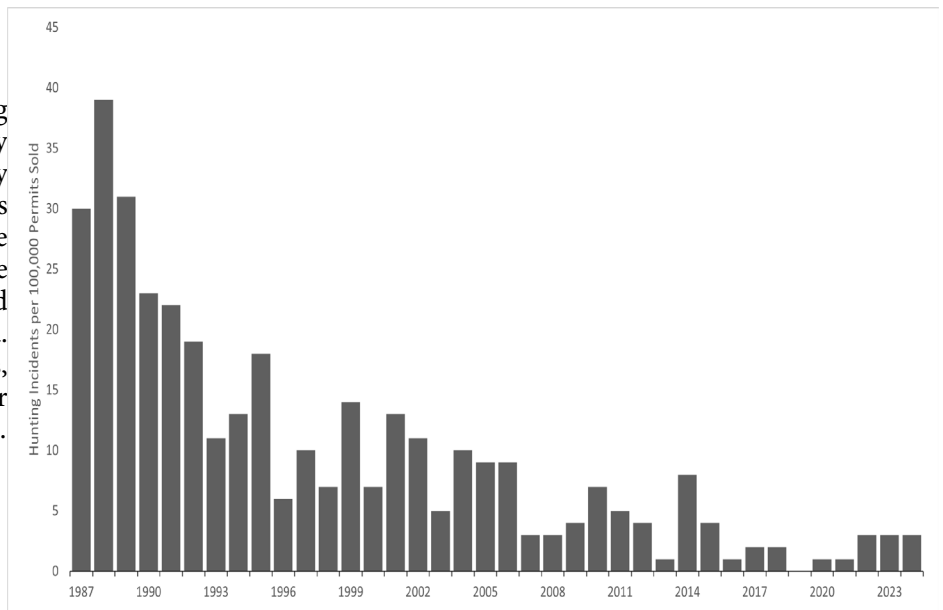


Figure 13. Hunting incidents during the spring turkey season in Missouri per 100,000 permits sold, 1987-2024.

Recent Regulation Changes

The change to the structure of the spring season — in which hunters on private land were able to hunt until sunset was covered in the spring harvest update. In 2024, changes to the fall season were also made. The fall season will now

be organized into a single season, with a single permit, with two portions. Historically, fall firearms turkey hunters purchased a stand-alone tag and fall archery turkey hunters received two turkey permits when they acquired their fall archery permit (along with two deer permits). Under the new structure, all turkey hunters will need to acquire a Fall Turkey Hunting Permit. Further, under the old system, hunters were allowed to take two birds with a shotgun and two birds with archery equipment. The new bag limit will be two, irrespective of the method used. The timing of the seasons will be the same as in years past.

Changes to the fall turkey season were made for several reasons. The primary reason is that hen harvest, comprising around 50% of the total fall harvest, is increasingly perceived as detrimental to the overall turkey population. At the statewide level, the number of birds harvested during the fall season is unlikely to have a negative effect. At the property scale, however, it may have some impact. By combining the permits into a single permit, archery hunters will need to acquire a turkey specific permit to harvest a bird. This is likely to reduce the number of birds taken opportunistically by hunters focused on deer, but willing to harvest a turkey if the opportunity arises. The restructuring of the permits also creates more flexibility for the avid fall hunter, who can now, with a single permit, pursue turkeys during both portions. Ultimately, this regulation change was precipitated by the desire to maintain a traditional hunting opportunity while addressing the concern of the turkey hunting community.

Research Update

Factors Influencing Wild Turkey Nest Success and Poults Survival in North Missouri Research Project

Overview

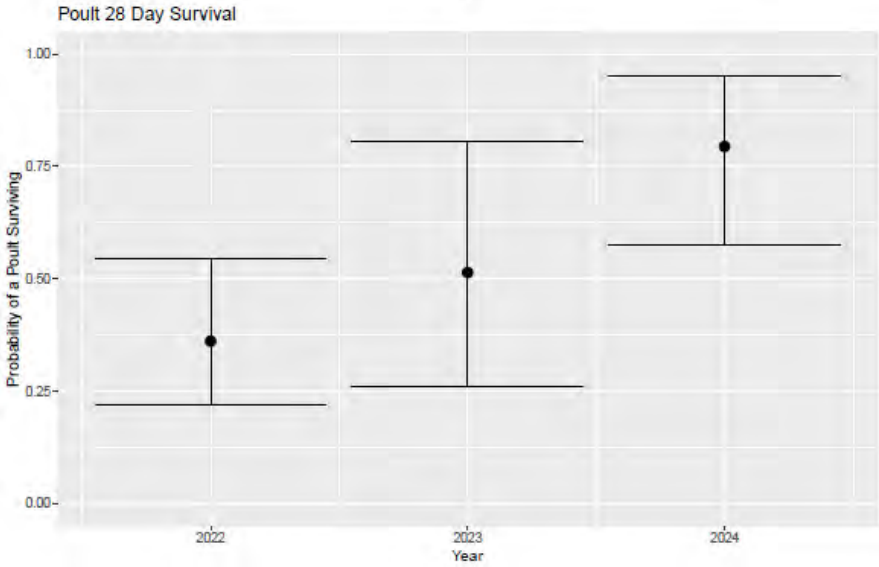
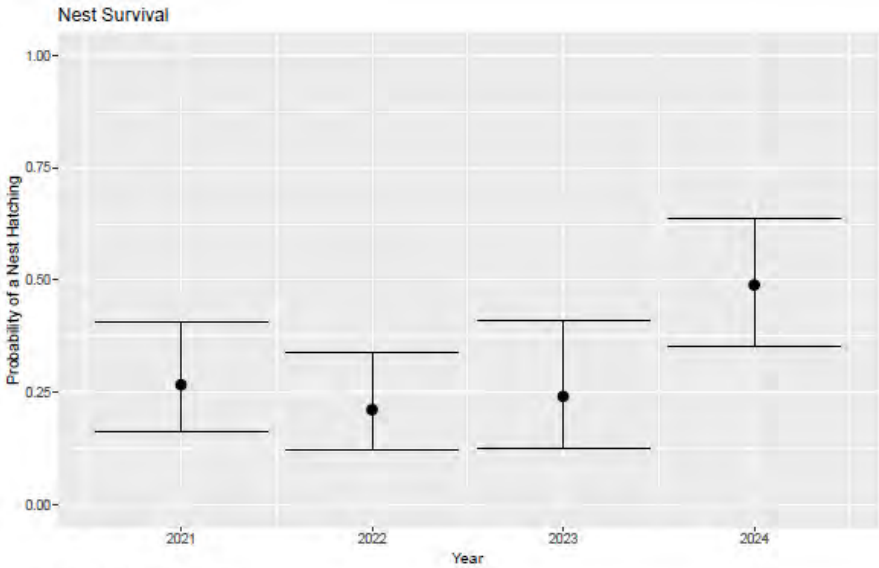
Wild turkey production has exhibited a long-term declining trend, with recent hatches being especially poor. Density dependence, large-scale landscape change, changing weather patterns, decreasing insect abundance, and increasing populations of some mesocarnivores could be adversely affecting turkey production. Since these factors have traditionally been studied in isolation, there is an incomplete understanding of how these factors are affecting turkey populations. Improving our understanding of factors affecting turkey nest success and poults survival will provide important information when communicating about declining turkey production and abundance with concerned stakeholders. This information will also inform habitat management efforts on public and private lands in Missouri to increase turkey recruitment and ultimately abundance.

To investigate turkey nest success, poults survival, and brood-rearing habitat selection, captive turkeys, both hens and poults were fitted with the appropriate radio transmitters. In a captive trail it was determined that a suture method proved to be most effective in attaching the transmitters onto turkey poults. Hens were also fitted with a transmitter and video recorded to gather information to determine where, when, and how wild turkey hens are engaging in specific behaviors.

In total, over 4 field seasons, 174 hens were captured and tagged with GPS radio transmitters, and 170 nests were located. During the first 3 field seasons nest success staggered around 25% successful, with the last field season seeing an increase to around 50%. 82 poults were captured and tagged within 48 hours of hatching. The probability of a poults surviving to 28 days was around 45% during the 2022 and 2023 season, with an increase shown in 2024 to around 75%.

In addition to capturing turkeys the team also conducted a mark-recapture effort of raccoons and opossums at sites across the county. The team has deployed trail cameras with scent stations to determine occupancy of larger poults predators (i.e., coyote, fox) in different land cover types. Weather stations were also deployed to monitor variation in precipitation and temperature across the area. Vegetation surveys were conducted at nest sites, at foraging sites used by hens with broods, and at random sites throughout the study area. These surveys will allow the team to determine if vegetative cover influences whether a nest successfully hatches and what sorts of vegetation hens with broods are selecting for versus what is available in the area. The team is also collecting insect samples at the foraging sites used by hens with broods and the random sites to determine which land cover types provide the most food for poults.

Project Update





Left: Researchers from the University of Missouri capture day-old wild turkey poults in order to attach VHF transmitters to them. This allows the researchers to track their movements and more quickly respond to a mortality event.

Right: Researchers release a banded adult turkey in an effort to monitor harvest demographics.



Left: Researchers from the University of Missouri and MDC carefully attach a battery-powered GPS-ACC-UHF transmitter to a wild turkey hen captured in Putnam County during February 2021.

Male Harvest Rate Estimation Project

To improve a statistical population reconstruction (SPR) model, via the inclusion of auxiliary studies, MDC is capturing and banding male turkeys in two different turkey productivity regions—regions with high interspersions of forested and open habitats—and monitoring the band returns. During the 2022 winter, 76 males were banded altogether. Half of the banded birds were adults and half were juvenile birds. In 2023, 117 males were banded, 56 adults and 61 juveniles. During the 2024 trapping season, 73 males were banded, 45 adults and 28 juveniles. Of the 238 total males banded, 79 have been reported as harvested, eight of which were jakes, thus far.

Hunter Reported Fall Harvest Demographics Project

Like the male harvest rate estimation study, the harvest demographic study is designed to reduce uncertainty in the SPR model. Hunters had the option to opt into the study while securing permits (regular or no-cost landowner permits). Participants were asked to submit the 9th and 10th primary wing feathers and 3-5 breast feathers from birds harvested during the 2022 fall turkey season, both firearms and archery portions. From those feather samples, the turkey program assistant identified the true age and sex from birds and compared those results to what the hunter submitted via telecheck. Efforts were made to avoid describing the project in detail to avoid biasing the sample, though information on how to correctly age and sex turkeys in the fall is, and has been, readily available on the MDC website.

To date, 587 viable samples were submitted. Overall accuracy across all age and sex classes was 65%. Unsurprisingly, samples submitted from adult (AHY) gobblers had the highest balanced accuracy—the arithmetic mean between sensitivity and specificity—of 92%. Hatch year (HY) hens had the second highest balanced accuracy (73%), followed by AHY hens (68%) and finally HY gobblers (66%). Hatch year and AHY hens had the lowest and second lowest specificity scores, respectively, meaning that there were more false positives for female classes than male classes. For example, 97% of the gobblers submitted as gobblers were indeed gobblers. Only 47% of juvenile hens, by contrast, were accurately identified as such. Overall, the age/sex class that was most often incorrectly identified was HY males. Of the 87 HY male samples submitted, 37% were telechecked as AHY females, 40% were accurately identified and 23% were telechecked as HY females. The final takeaway from these preliminary data is that the ratio of harvested males to females was about 60:40. The average male:female ratio, historically, has been around 40:60 according to hunter reported Telecheck records. Whether this inversion was an aberration brought on by a relatively small sample size or not should become clearer over the final year of the project.



APPENDIX A.

2024 Missouri spring turkey harvest (youth and regular seasons combined).

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank ^a
Adair	566	76	7	649	17
Andrew	117	13	0	130	109
Atchison	132	41	3	176	101
Audrain	185	53	2	240	87
Barry	158	47	1	206	93
Barton	258	84	2	344	67
Bates	242	47	4	293	79
Benton	415	122	4	541	29
Bollinger	401	129	8	538	30
Boone	477	109	11	597	19
Buchanan	119	19	0	138	107
Butler	116	36	0	152	104
Caldwell	245	39	0	284	82
Callaway	657	230	11	898	2
Camden	522	157	15	694	15
Cape Girardeau	447	98	5	550	26
Carroll	288	71	2	361	65
Carter	153	41	1	195	96
Cass	358	70	1	429	47
Cedar	408	119	7	534	31
Chariton	349	63	5	417	50
Christian	296	97	6	399	56
Clark	358	46	3	407	54
Clay	128	18	1	147	54
Clinton	89	12	0	101	113
Cole	407	149	9	565	23
Cooper	248	64	6	318	72
Crawford	441	146	6	593	21
Dade	268	96	3	367	63
Dallas	344	148	1	493	38
Daviess	464	62	7	533	32
Dekalb	155	37	2	194	97
Dent	460	132	5	597	20
Douglas	388	103	5	496	37
Dunklin	21	6	0	27	114
Franklin	801	210	18	1029	1
Gasconade	593	174	13	780	7
Gentry	206	40	4	250	86
Greene	505	168	1	674	16
Grundy	337	52	3	392	58

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank ^a
Harrison	686	74	4	764	8
Henry	381	104	2	487	39
Hickory	307	103	1	411	52
Holt	213	24	3	240	88
Howard	321	66	3	390	59
Howell	283	120	5	408	53
Iron	139	50	1	190	100
Jackson	144	15	2	161	102
Jasper	226	87	4	317	73
Jefferson	417	93	6	516	34
Johnson	379	96	6	516	41
Knox	254	43	0	297	77
Laclede	543	186	15	744	9
Lafayette	214	45	4	263	85
Lawrence	349	101	6	456	44
Lewis	292	39	1	332	69
Lincoln	330	84	7	421	48
Linn	484	61	4	549	27
Livingston	381	81	4	466	43
Macon	692	115	8	815	5
Madison	188	85	2	275	83
Maries	542	164	10	716	13
Marion	240	52	2	294	78
McDonald	115	27	0	142	106
Mercer	539	46	5	590	22
Miller	608	185	7	800	6
Mississippi	113	15	2	130	110
Moniteau	341	95	4	441	45
Monroe	372	96	7	475	42
Montgomery	318	114	8	440	46
Morgan	397	101	3	501	36
New Madrid	113	21	0	134	108
Newton	157	66	1	224	91
Nodaway	130	29	2	161	103
Oregon	231	81	2	314	75
Osage	621	209	11	841	4
Ozark	234	81	1	316	74
Pemiscot	97	5	0	102	112
Perry	416	125	6	547	28
Pettis	193	40	3	236	89

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank ^a
Phelps	570	153	16	739	10
Pike	306	62	5	373	62
Platte	178	23	3	204	95
Polk	361	119	4	484	40
Pulaski	445	103	4	552	25
Putnam	668	54	4	726	11
Ralls	226	45	4	275	84
Randolph	361	49	4	414	51
Ray	152	39	1	192	99
Reynolds	174	44	3	221	92
Ripley	170	54	1	225	90
Saint Charles	246	43	4	293	80
Saint Clair	390	110	6	506	35
Saint Francois	303	86	1	390	60
Saint Louis	107	14	0	121	111
Sainte Genevieve	568	144	9	721	12
Saline	274	51	1	326	70
Schuyler	300	33	5	338	68
Scotland	342	52	2	396	57
Scott	161	33	0	194	98
Shannon	275	85	4	364	64
Shelby	240	45	3	288	81
Stoddard	275	74	5	354	66
Stone	241	62	1	304	76
Sullivan	642	52	7	701	14
Taney	213	101	7	321	71
Texas	683	164	11	858	3
Vernon	473	137	7	617	18
Warren	298	72	6	376	61
Washington	330	81	8	419	49
Wayne	312	86	3	401	55
Webster	396	126	8	530	33
Worth	182	20	3	205	94
Wright	423	121	9	553	24

^aRank based on total harvest in Missouri's 114 counties.

APPENDIX B.

2023 Missouri fall turkey harvest (firearms and archery seasons combined).

County	Adult Males	Subadult Males	Adult Females	Subadult Females	Total	Rank ^a
Adair	16	4	13	13	44	39
Andrew	0	4	0	1	5	108
Atchison	1	0	6	1	8	103
Audrain	3	2	5	11	21	84
Barry	3	2	2	4	11	98
Barton	3	0	9	3	15	89
Bates	6	3	6	8	23	76
Benton	13	8	12	14	47	37
Bollinger	6	7	16	20	49	34
Boone	6	9	19	13	47	38
Buchanan	1	0	4	0	5	109
Butler	8	5	8	7	28	64
Caldwell	4	2	6	0	12	95
Callaway	26	3	33	18	80	10
Camden	10	7	22	19	58	23
Cape Girardeau	13	6	12	9	40	47
Carroll	6	4	10	7	27	67
Carter	8	8	25	21	62	19
Cass	10	1	18	3	32	58
Cedar	11	12	15	14	52	31
Chariton	6	5	7	6	24	73
Christian	8	5	17	4	34	54
Clark	9	1	7	6	23	77
Clay	4	0	3	1	8	104
Clinton	4	0	1	2	7	106
Cole	17	8	20	25	70	14
Cooper	7	2	15	7	31	61
Crawford	22	14	36	56	128	1
Dade	4	1	13	10	28	65
Dallas	13	5	20	13	51	32
Daviess	8	3	13	13	37	51
Dekalb	7	1	4	5	17	87
Dent	17	19	47	40	123	3
Douglas	5	8	11	15	39	48
Dunklin	0	0	0	0	0	114
Franklin	20	7	41	29	97	5
Gasconade	31	10	23	28	92	7
Gentry	5	2	6	10	23	78
Greene	26	9	22	13	70	15

County	Adult Males	Subadult Males	Adult Females	Subadult Females	Total	Rank ^a
Grundy	5	1	1	2	9	101
Harrison	17	3	14	7	41	45
Henry	8	11	15	14	48	36
Hickory	9	12	14	8	43	41
Holt	5	1	4	3	13	94
Howard	6	0	10	6	22	81
Howell	12	8	8	8	36	52
Iron	13	6	20	17	56	26
Jackson	4	0	9	1	14	91
Jasper	4	0	15	3	22	82
Jefferson	15	8	23	17	63	18
Johnson	8	5	11	3	27	68
Knox	6	2	5	4	17	88
Laclede	18	15	34	24	91	8
Lafayette	5	2	4	3	14	92
Lawrence	6	4	16	6	31	59
Lewis	6	1	6	12	25	71
Lincoln	9	14	21	11	55	71
Linn	7	5	20	10	42	42
Livingston	5	3	15	13	36	53
Macon	15	9	12	13	49	35
Madison	7	8	14	25	54	30
Maries	17	17	31	25	90	9
Marion	9	1	8	5	23	79
McDonald	0	1	2	0	3	111
Mercer	12	3	6	8	29	63
Miller	11	5	14	21	51	33
Mississippi	3	1	4	0	8	105
Moniteau	7	5	8	4	24	74
Monroe	16	7	21	11	55	28
Montgomery	14	6	13	11	44	40
Morgan	16	7	21	11	55	28
New Madrid	0	0	3	0	3	112
Newton	3	0	4	0	7	107
Nodaway	2	3	3	4	12	96
Oregon	4	7	5	11	27	69
Osage	25	8	28	39	100	4
Ozark	3	1	5	6	15	90
Pemiscot	2	0	2	0	4	110

County	Adult Males	Subadult Males	Adult Females	Subadult Females	Total	Rank ^a
Perry	13	9	18	18	58	24
Pettis	8	2	5	5	20	85
Phelps	9	18	32	18	77	12
Pike	8	1	13	6	28	66
Platte	8	2	6	6	22	83
Polk	4	3	16	7	30	62
Pulaski	18	14	21	16	69	17
Putnam	29	3	13	15	60	22
Ralls	4	4	11	5	24	75
Randolph	11	3	11	8	33	55
Ray	4	0	4	3	11	99
Reynolds	12	8	9	10	39	49
Ripley	4	1	4	3	12	97
Saint Charles	10	9	11	11	41	46
Saint Clair	11	10	19	15	55	29
Saint Francois	11	11	19	33	74	13
Saint Louis	9	1	12	3	25	72
Sainte Genevieve	24	4	25	25	78	11
Saline	1	0	7	1	9	102
Schuyler	4	2	9	5	20	86
Scotland	8	2	1	3	14	93
Scott	0	1	1	1	3	113
Shannon	13	14	21	22	70	16
Shelby	10	2	8	6	26	70
Stoddard	19	9	18	16	62	20
Stone	9	2	17	5	33	56
Sullivan	11	2	13	7	33	57
Taney	2	2	16	3	23	80
Texas	28	10	38	18	94	6
Vernon	16	4	11	7	38	50
Warren	11	5	17	9	42	43
Washington	36	21	31	36	124	2
Wayne	12	10	23	13	58	25
Webster	15	6	13	8	42	44
Worth	4	1	3	2	10	100
Wright	7	6	15	4	32	60

^aRank based on total harvest in Missouri's 114 counties.



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