Missouri Wild Turkey Harvest and Population Status Report 2020

Missouri Department of Conservation – Resource Science Division

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Table of Contents

POPULATION STATUS

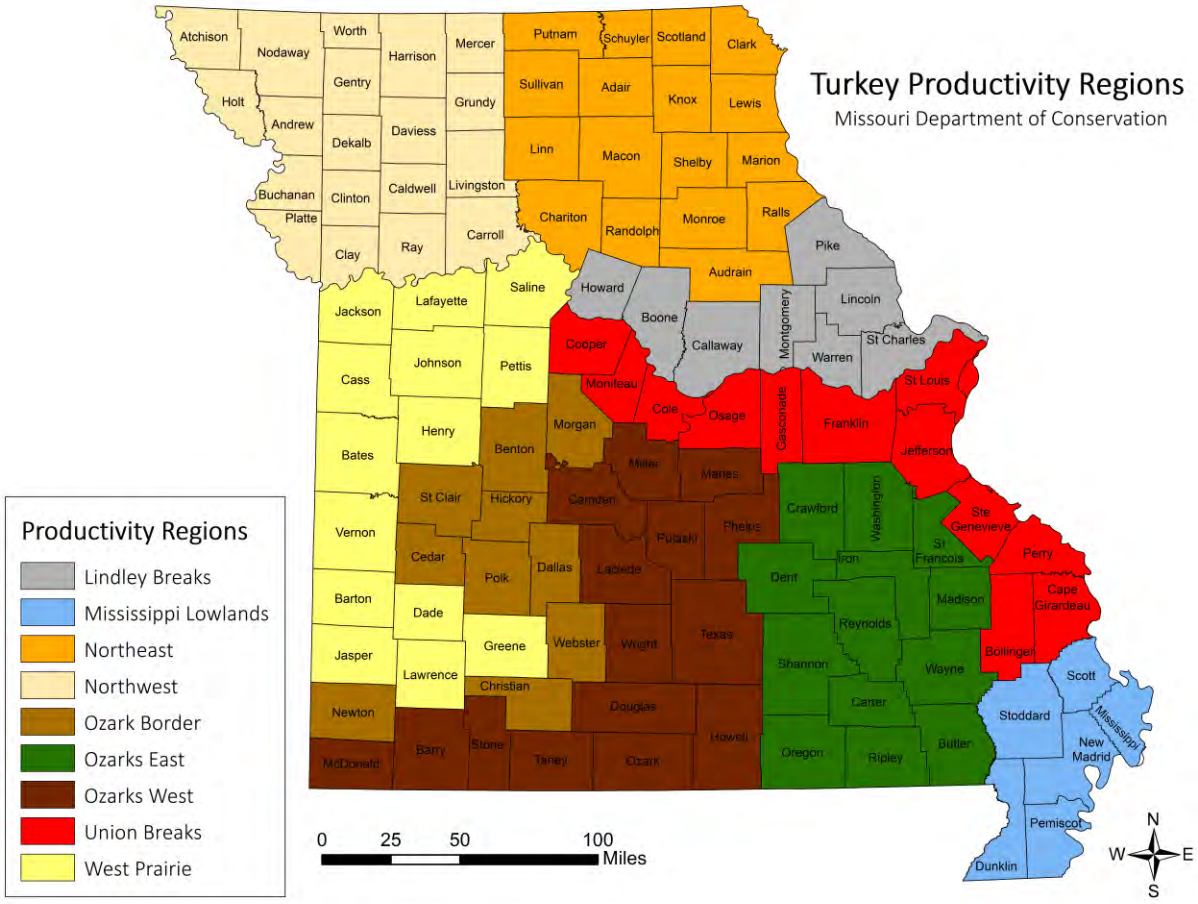
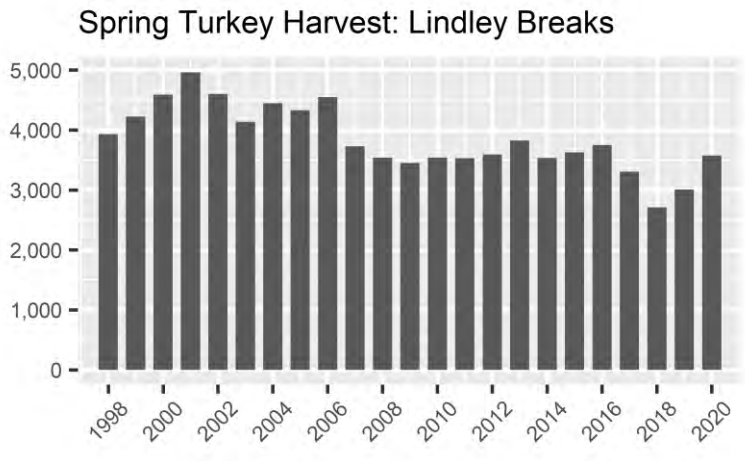
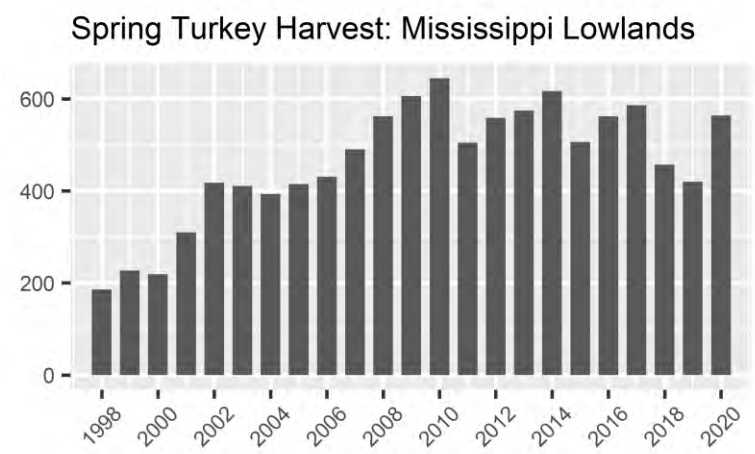


Figure 1. Turkey Productivity Regions in Missouri. Regions consist of counties grouped by similar land cover composition.

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 2010-2016 before declining sharply from 2016-2018. Though harvest has increased the past two years, the five- and ten-year spring turkey harvest trends in the Lindley Breaks Region indicate a declining population.



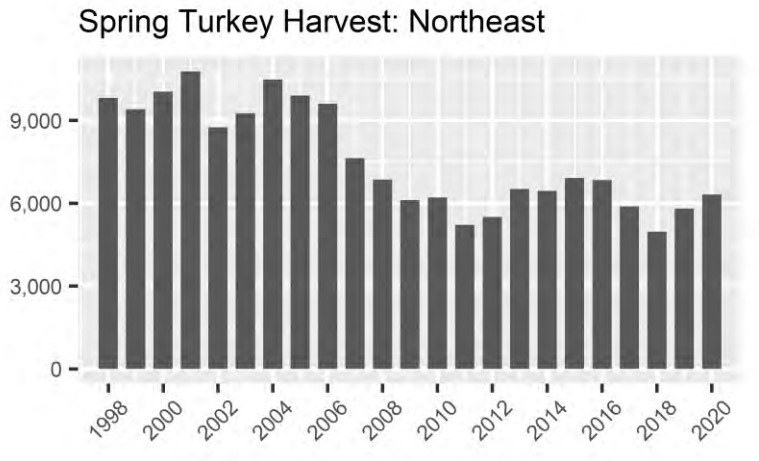


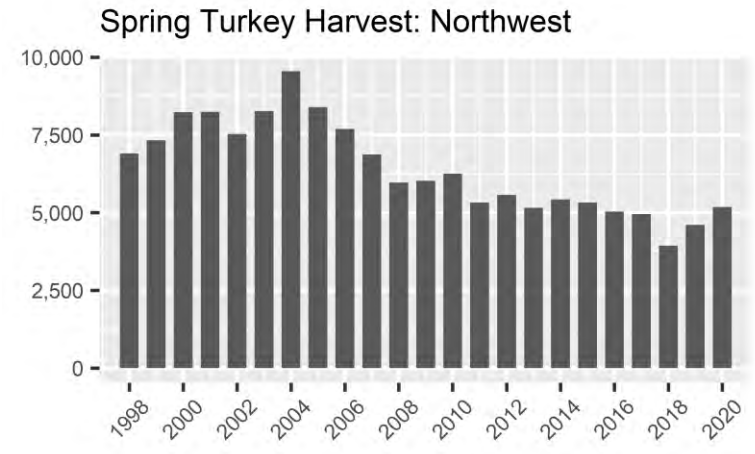
Mississippi Lowlands Region

The turkey population in the Mississippi Lowlands Region increased in 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 spring turkey harvest trends in the Mississippi Lowlands Region indicate a declining population.

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 spring turkey harvest trend in the Northeast Region indicates a declining population while the ten-year trend indicates a stable population.



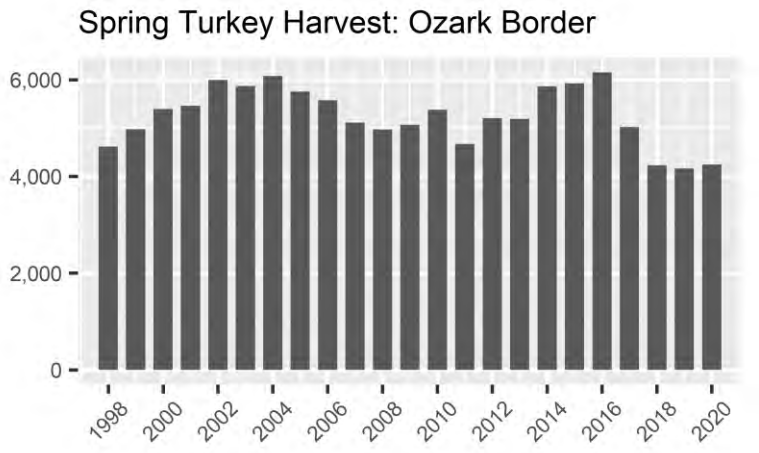


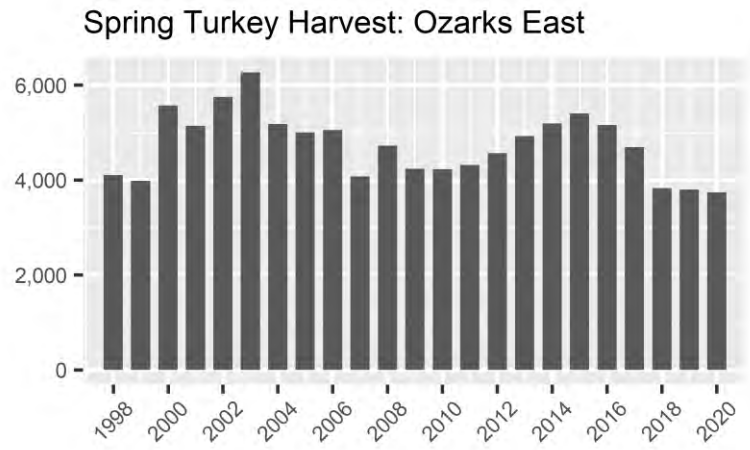
Northwest Region

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 increased. The five-year spring turkey harvest trend in the Northwest Region indicates a stable population, while the ten-year trend indicates a declining population.

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. Harvests have stabilized in recent years. The five- and ten-year spring turkey harvest trends in the Ozark Border Region indicate a declining population.



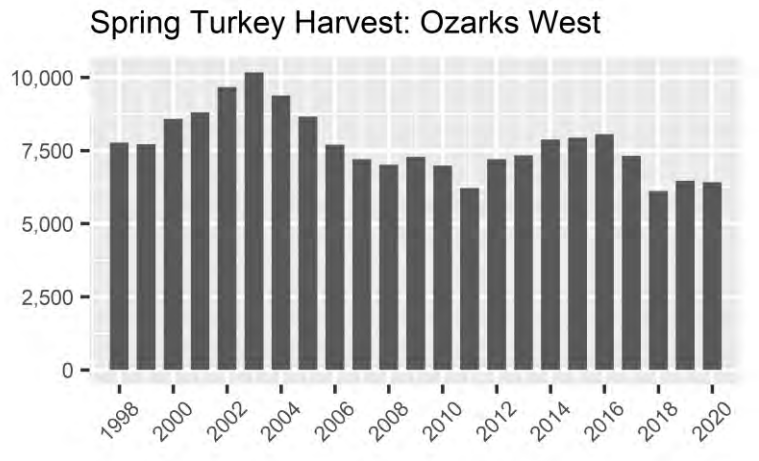


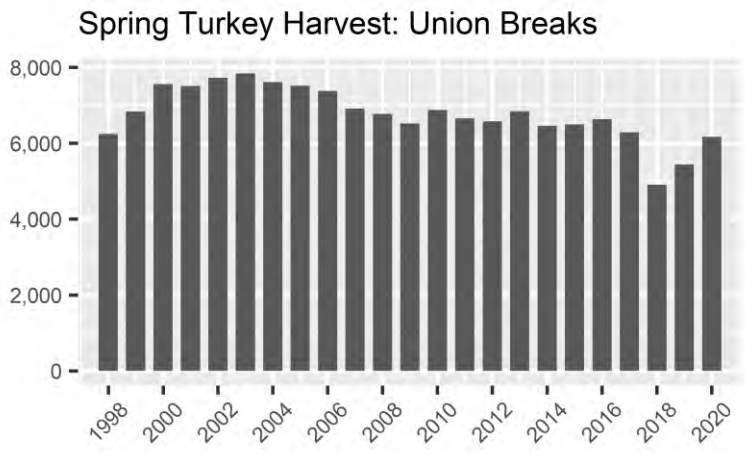
Ozarks East Region

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 but has leveled-off in recent years. The five- and ten-year spring turkey harvest trends in the Ozarks East Region indicate a declining population.

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. The five- and ten-year spring turkey harvest trends in the Ozarks West Region indicate a declining population.



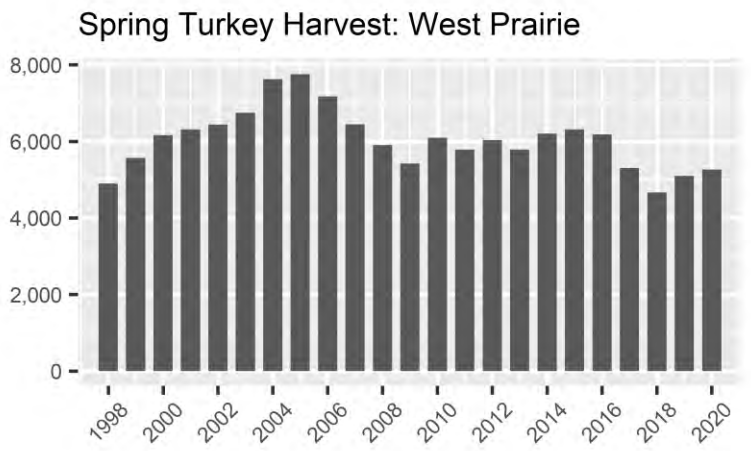


Union Breaks Region

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- and ten-year spring turkey harvest trends in the Union Breaks Region indicate a declining population.

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 2016-2018 but has increased in recent years. The five- and ten-year spring turkey harvest trends 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 2020, MDC staff and citizen volunteers recorded observations of over 62,000 turkeys during the three-month survey. The 2020 statewide poult-to-hen ratio (PHR) was 1.0, which was 11% greater than the 2019 PHR and equal to the previous five-year average (Figure 2, Table 1). However, this year's PHR was 17% lower than the 10-year average and 29% lower than the 20-year average (Table 1). Regional PHRs in 2020 ranged from 0.7 in the Ozark Border, Ozarks West, and West Prairie Regions to 1.4 in the Northeast and Northwest Regions (Figure 1, Table 1). Compared to the five-year averages, production in 2020 was higher in the Northeast, Northwest, and Union Breaks Regions and lower in the Mississippi Lowlands, Ozark Border, Ozarks East, Ozarks West, and West Prairie Regions (Table 1). Production in the Lindley Breaks Region was equal to the five-year average for that region (Table 1).

At the statewide scale, 38% of hens were observed with a brood, which was up from 34% in 2019 and was 11% greater than the 5-year average (Table 2). The percentage of hens observed with a brood ranged from 29% in the Ozark Border Region to 50% in the Mississippi Lowlands Region (Table 2). Statewide, the average number of poults per brood was 3.8, which was up from 3.7 in 2019 and 2% greater than the five-year average (Table 2). The average number of poults per brood ranged from 3.2 in the West Prairie Region to 4.3 in the Mississippi Lowlands, Northeast, and Northwest Regions (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 2020 and are compared to the previous year and the average for periodic intervals.

Productivity Region	2020 Index	1-Year (2019) Change	5-Year (2015-2019) Change	10-Year (2010-2019) Change	20-Year (2000-2019) Change
Lindley Breaks	1.1	22%	No Change	-21%	-27%
MS Lowlands	1.1	-35%	-21%	-27%	-48%
Northeast	1.4	75%	40%	8%	No Change
Northwest	1.4	56%	8%	No Change	-7%
Ozark Border	0.7	No Change	-22%	-36%	-46%
Ozarks East	1.0	No Change	-9%	-33%	-38%
Ozarks West	0.7	-22%	-22%	-42%	-50%
Union Breaks	1.2	20%	20%	No Change	-14%
West Prairie	0.7	-13%	-13%	-36%	-42%
Statewide[a]	**1.0**	**11%**	**No Change**	**-17%**	**-29%**

[a]Statewide 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), 2020.

Productivity Region	% Hens w/ Brood	Average Brood Size	Poult-to-Hen Ratio	Gobbler-to-Hen Ratio
Lindley Breaks	37%	3.8	1.1	0.7
MS Lowlands	50%	4.3	1.1	0.6
Northeast	38%	4.3	1.4	0.7
Northwest	39%	4.3	1.4	0.8
Ozark Border	29%	3.6	0.7	0.7
Ozarks East	35%	3.8	1.0	0.4
Ozarks West	36%	3.3	0.7	0.7
Union Breaks	46%	3.9	1.2	0.5
West Prairie	32%	3.2	0.7	0.8
Statewide[a]	**38%**	**3.8**	**1.0**	**0.6**

[a]Statewide totals include observations where Productivity Region was not recorded on the survey form.

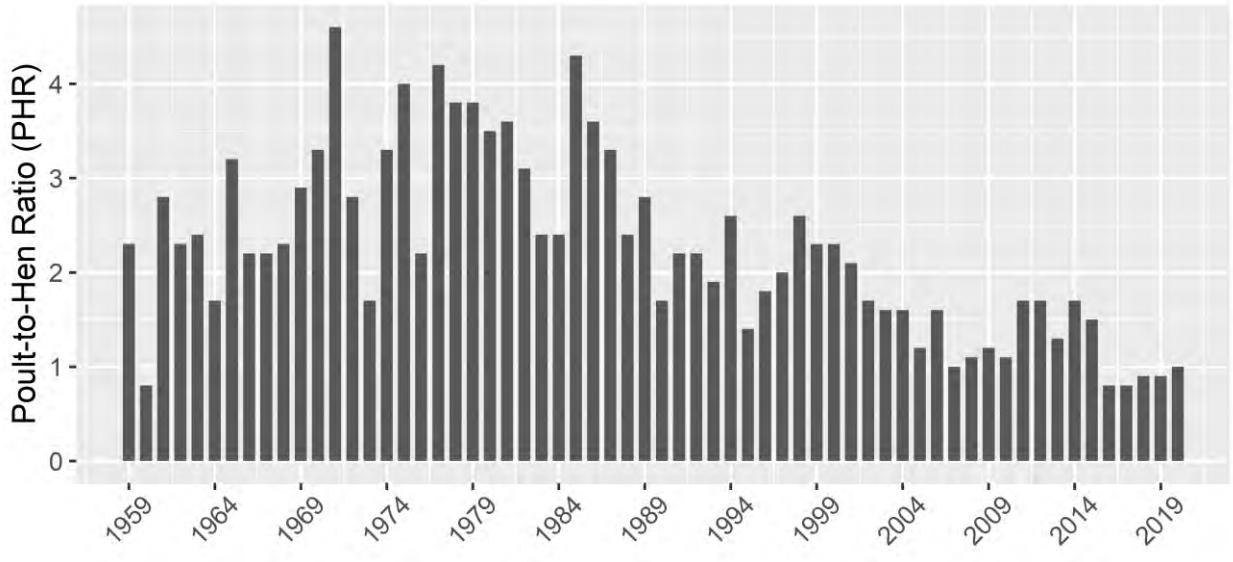


Figure 2. Missouri statewide poult-to-hen ratios derived from the Wild Turkey Brood Survey conducted in June, July, and August, 1959-2020.

HARVEST

2020 Spring Turkey Season

During the 2020 youth spring turkey season, which took place April 4-5, hunters harvested 2,724 turkeys. This harvest total represented a 7% increase from the 2019 youth season but was 19% less than the previous five-year average youth season harvest total. In 2020, a total of 18,133 youth permits were sold which included 17,172 resident youth and 961 non-resident youth permits. The total number of youth permits sold in 2020 was 24% greater than the number sold in 2019.

During the 2020 regular spring turkey season, which took place April 20 – May 10, hunters harvested 38,737 turkeys. This harvest total represented a 7% increase from the 2019 regular season. Juvenile male turkeys represented 17% of the regular season harvest (Figure 3), which was 4% less than the previous five-year average.

The total 2020 spring turkey harvest, including both the youth and regular seasons was 41,461. This harvest total was 7% more than the 2019 harvest total but was 3% less than the previous five-year average (Figure 4). Counties with the highest total spring harvest were Franklin, Callaway, and Miller where 962, 760, and 714 turkeys were harvested, respectively (Figure 5). Total permit sales for the 2020 spring turkey season (113,649; excluding no-cost landowner permits) were 22% greater than in 2019 and 11% greater than the previous five-year average (Figure 4). Spring turkey permits sales in 2019 included 106,564 (94%) resident permits and 7,085 (6%) nonresident permits. An additional 21,614 no-cost permits were distributed to landowners. The total number of unique spring turkey hunters in Missouri in 2020 was 133,022, which was 8% more than in 2019 but 3% less than the previous five-year average. Note that the total number of hunters does not equal the permit sales total because some hunters purchase a permit in addition to receiving a no-cost landowner permit.

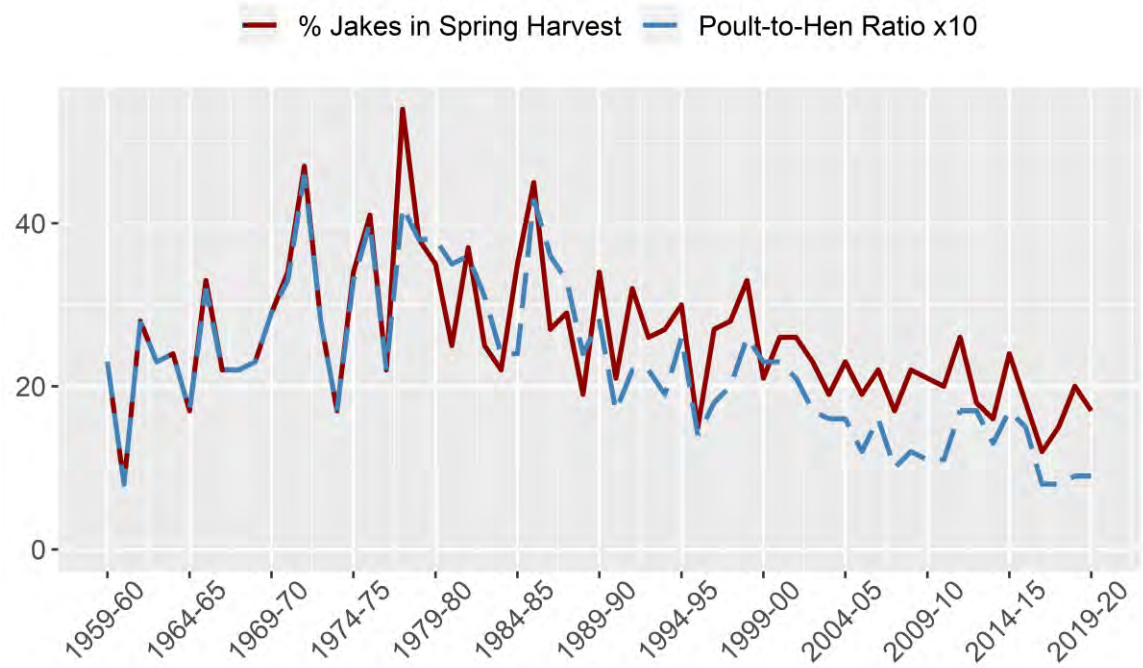


Figure 3. Missouri's statewide poult-to-hen ratio multiplied by 10, compared with the percentage of jakes in the following year's regular season spring harvest, 1959-2020.

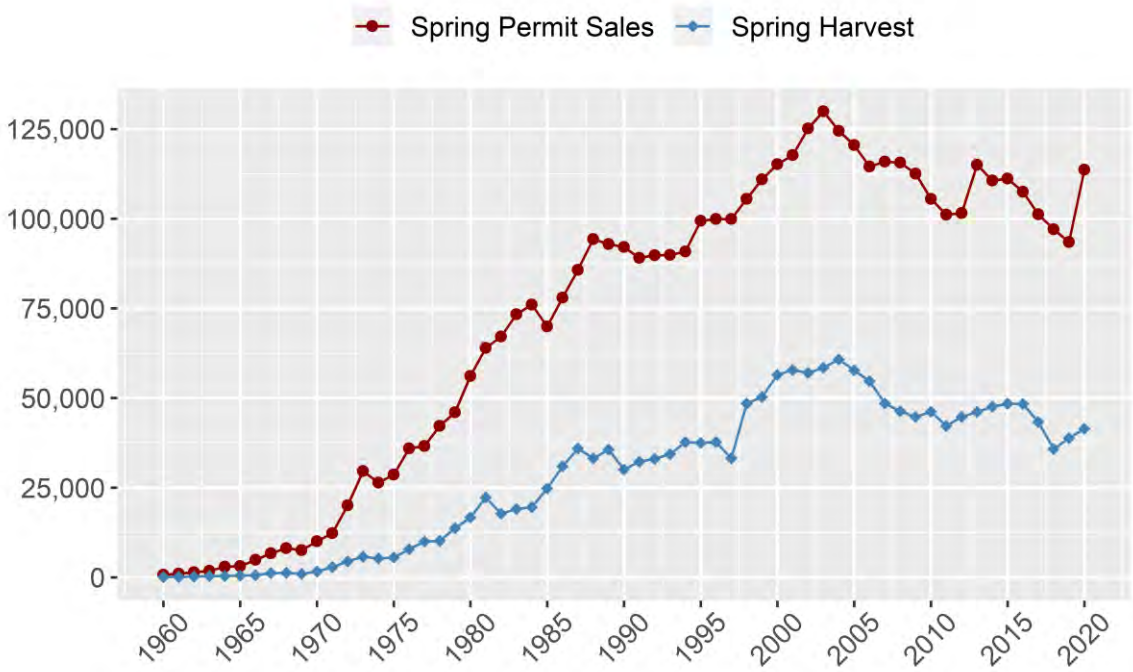


Figure 4. Number of wild turkeys harvested during the spring season (youth and regular season) in Missouri and the number of turkey hunting permits sold for the spring season, 1960-2020. Permit sales do not include no-cost landowner permits.

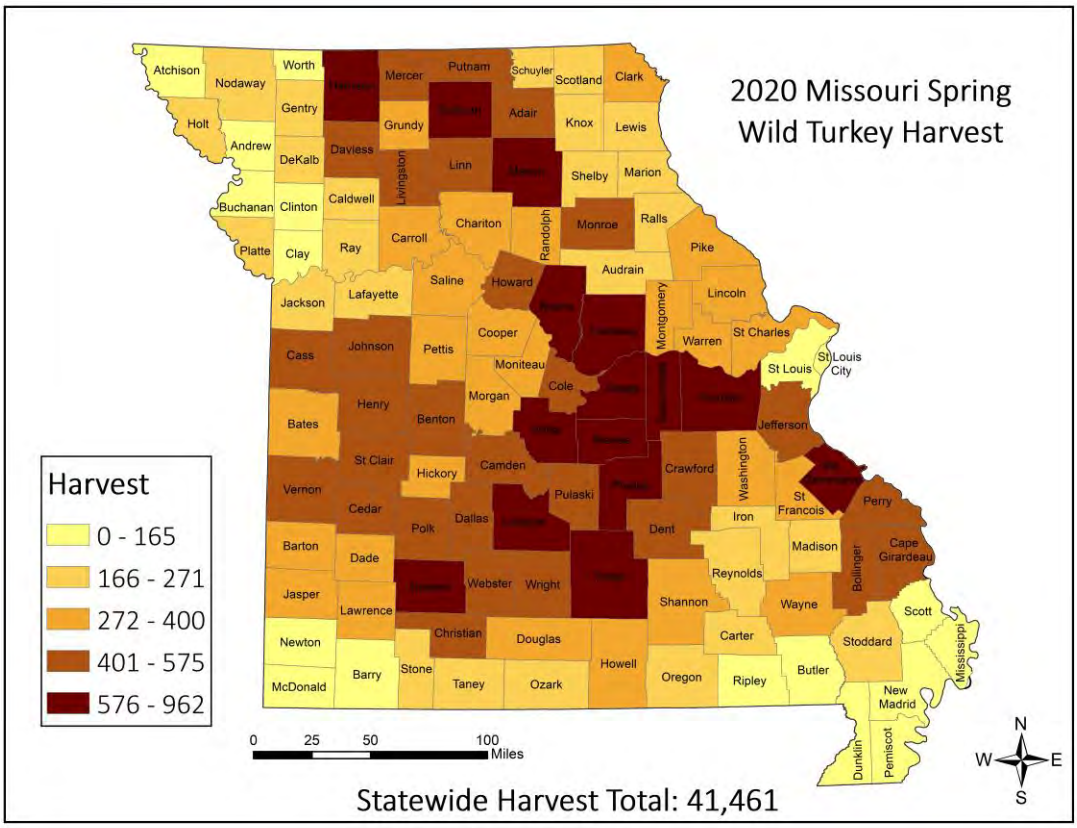


Figure 5. Total (youth and regular season) spring wild turkey harvest in Missouri, 2020.

2020 Fall Firearms Turkey Season

The 2020 fall firearms turkey harvest total of 2,125 was 9% greater than the 2019 harvest total but was 37% below the previous five-year average (Figure 6). The majority of the fall firearms harvest occurred in southern Missouri (Figure 7). The top harvest counties were Greene (70), Maries (58), and Franklin (55).

The fall firearms turkey permit sales total in 2020 (12,329) was 34% greater than the record-low 2019 permit sales total (9,195). This year was an exception to the long-term declining trend in fall firearms turkey hunting participation in Missouri (Figure 6).

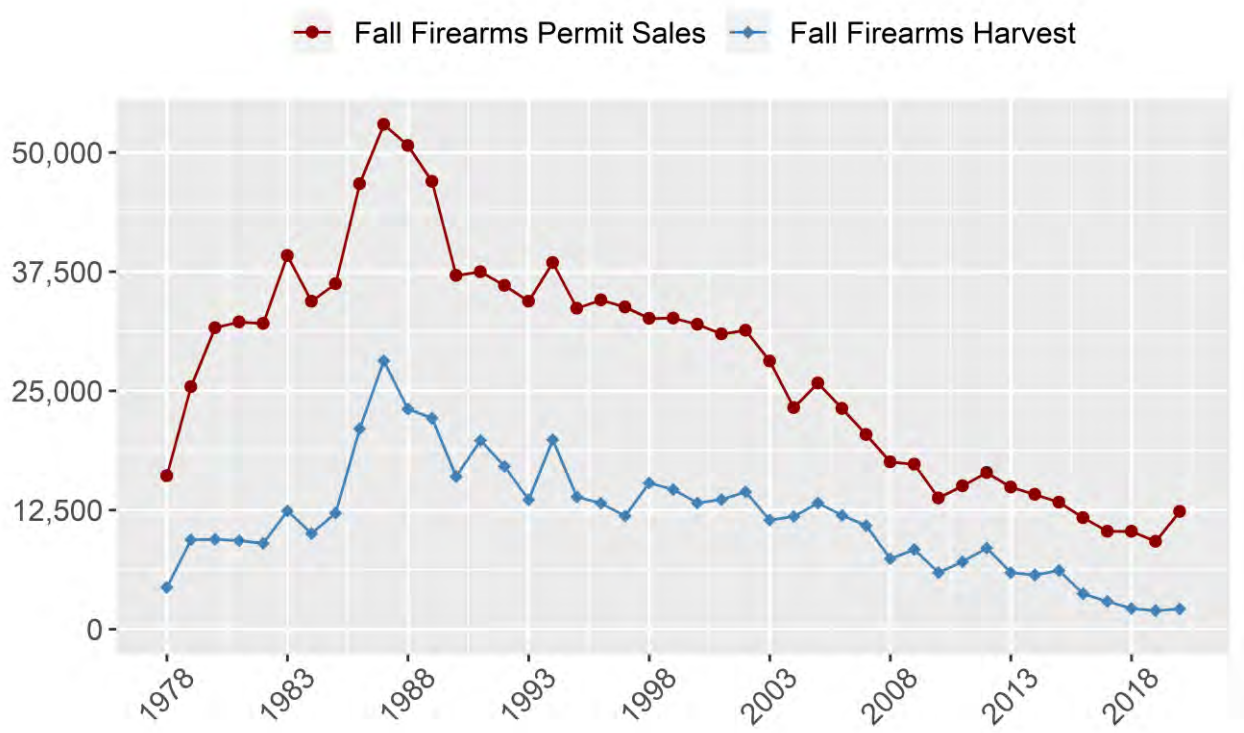


Figure 6. Number of wild turkeys harvested during the fall firearms turkey season in Missouri and the number of fall firearms permits sold, 1978-2020. Permit sales do not include no-cost landowner permits.

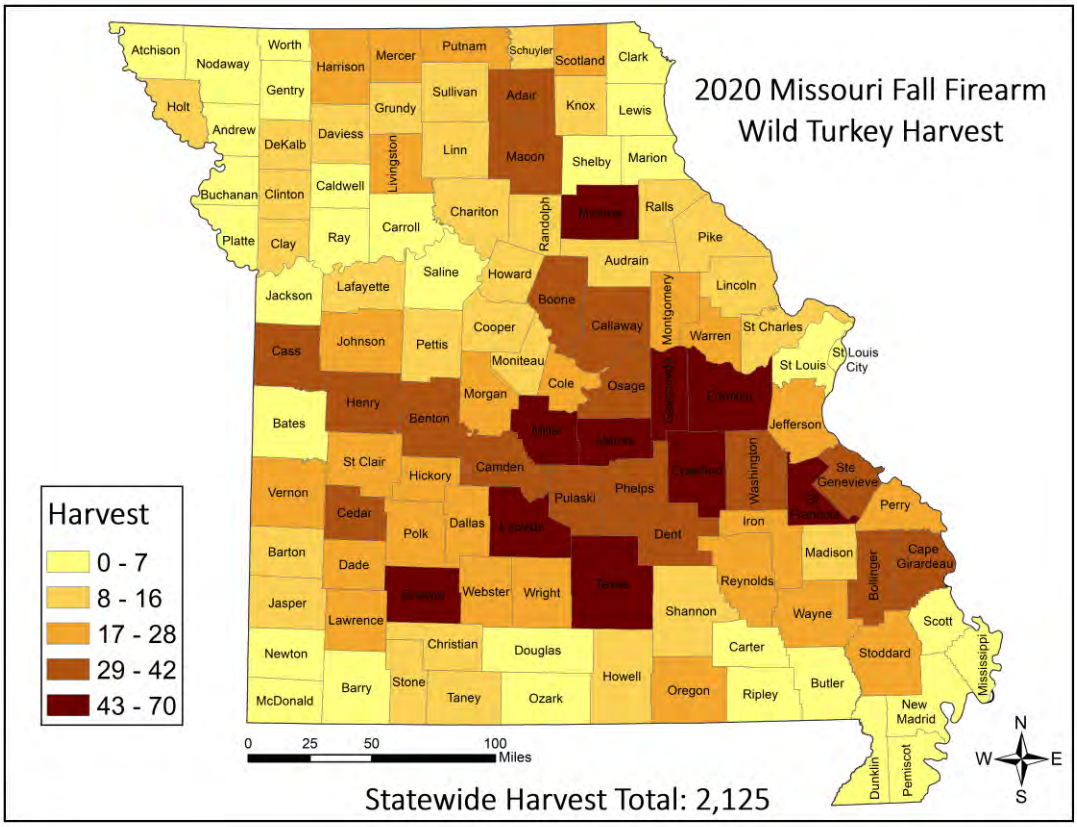


Figure 7. Missouri fall firearms wild turkey harvest, 2020.

2020 Fall Archery Turkey Season

Hunters harvested 2,905 turkeys during the 2020 fall archery deer and turkey season (Figures 8). The 2020 archery turkey harvest total was 21% greater than the 2019 harvest total and 18% greater than the previous five-year average (Figure 8). The top three harvest counties were Greene (84), Franklin (78), and Texas (61) (Figure 9). Unlike the fall firearms turkey harvest, which has shown a declining trend since the late 1980s (Figure 6), the fall archery harvest increased until the mid-2000s. Since 2005, archery turkey harvests have fluctuated substantially on an annual basis, while exhibiting an increasing trend over the last two years (Figure 8).

Although archery permit sales were relatively stable from the mid-1990s through the mid-2000s, sales have since shown an increasing trend. In 2020, 156,342 fall archery hunting permits were sold, the highest number since the season's inception, and a 20% increase from the 2019 permit sales total (130,281) (Figure 8).

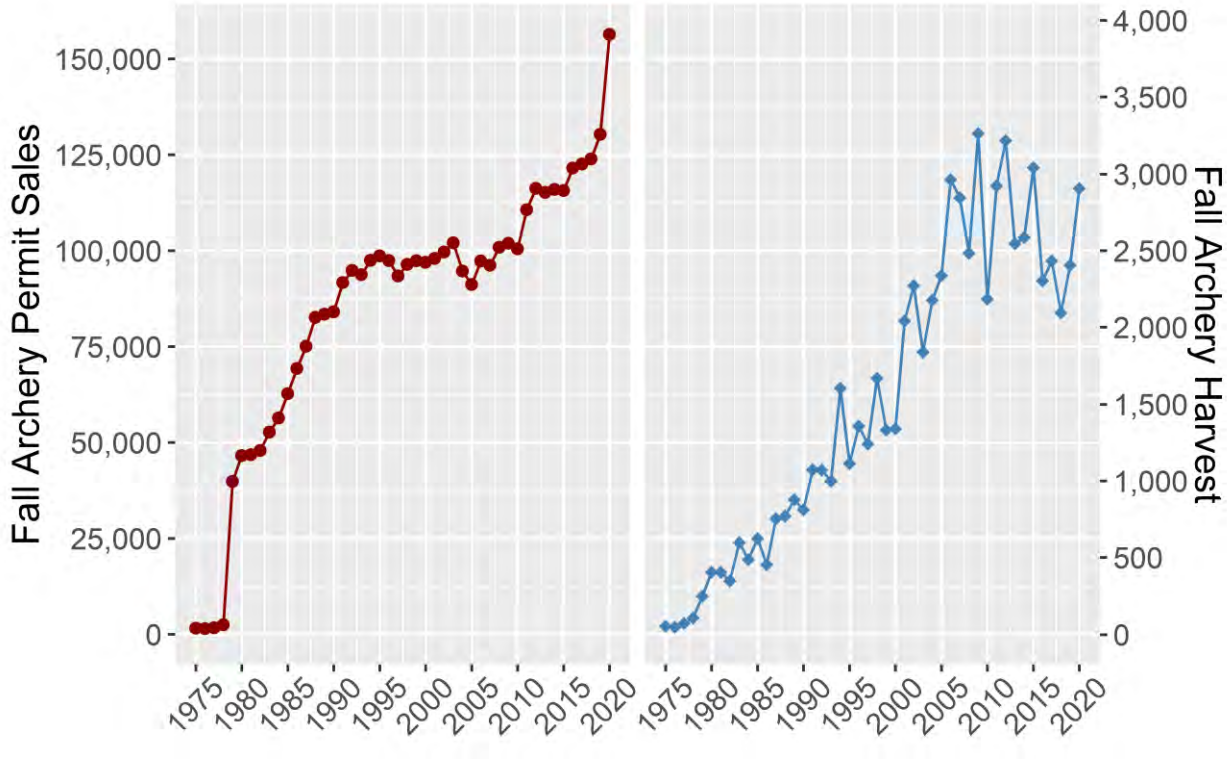


Figure 8. Missouri fall archery permit sales, 1975-2020, compared to fall archery turkey harvest 1975-2020. Permit sales do not include no-cost landowner permits. In 1979, the archery deer and archery turkey permits were combined into one permit.

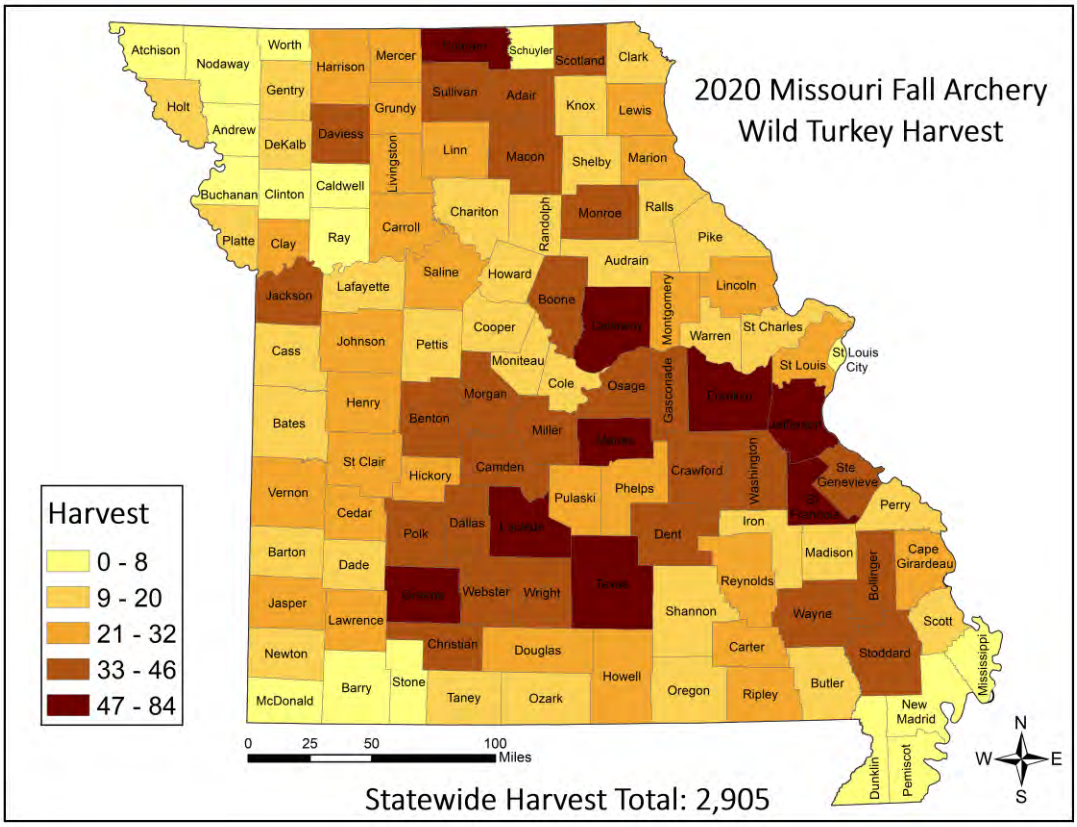


Figure 9. Wild turkey harvest in Missouri during the 2020 fall archery season.

HUNTING INCIDENTS

There was one hunting incident during the 2020 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 1.2 (Figure 10).

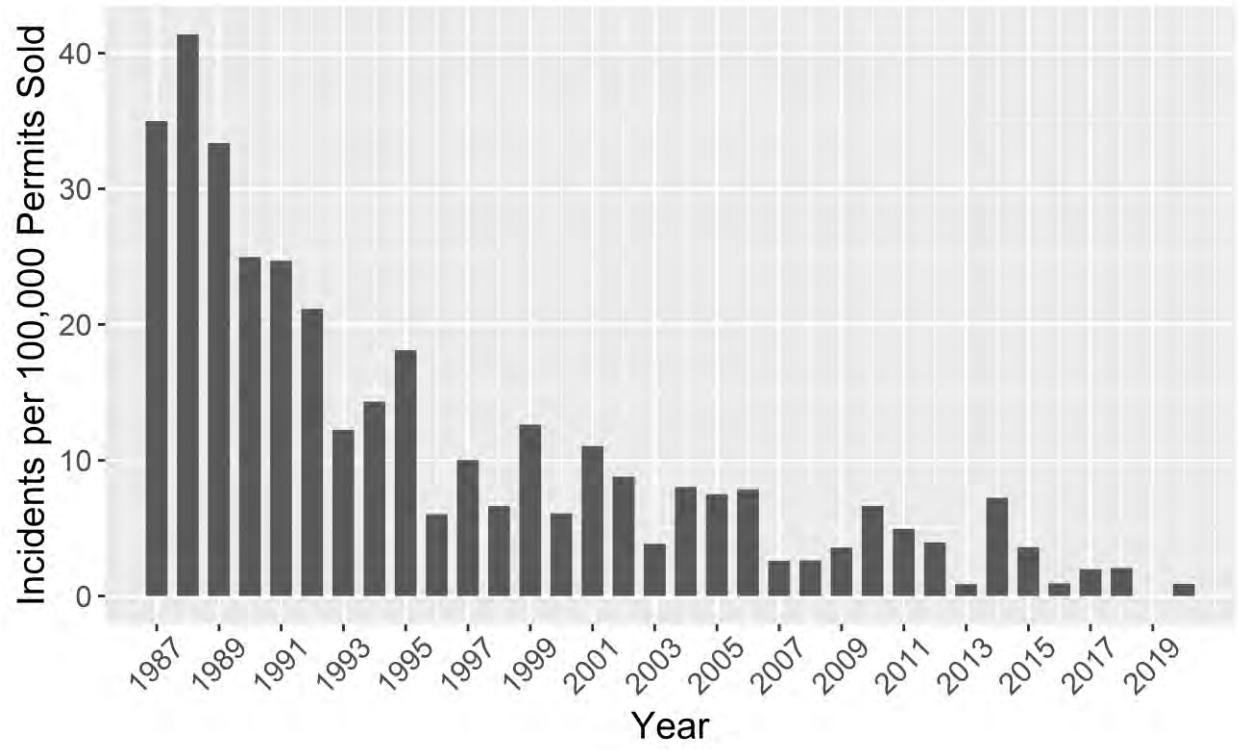


Figure 10. Hunting incidents during the spring turkey season in Missouri per 100,000 permits sold, 1987-2020.

RECENT REGULATION CHANGES

Other than changes to some Conservation Area regulations and managed spring turkey hunts, no turkey hunting regulation changes occurred in 2020.

FACTORS INFLUENCING WILD TURKEY NEST SUCCESS AND POULT SURVIVAL IN NORTH MISSOURI RESEARCH PROJECT

Overview

Wild turkey production has exhibited a long-term declining trend, with recent hatches being especially poor. Nest success and poult survival rates from the previous north Missouri study were lower than many previously reported estimates from the literature, and the poult-to-hen ratios calculated from the summer brood survey during the past 4 years are some of the lowest in the state's history. Because of low recruitment, turkey abundance in Missouri could be at its lowest level in decades, generating concern about long-term population viability. 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 poult survival would provide important information when communicating about declining turkey production and abundance with concerned stakeholders. This information would also inform habitat management efforts on public and private lands in Missouri to increase turkey recruitment and ultimately abundance.

Objectives of this five- and one-half-year cooperative research project with the University of Missouri include:

1. Determine the most effective method of attaching radio-transmitters to turkey poults.
2. Determine how weather (temperature and precipitation), landscape characteristics, predator densities, and their interactions affect turkey nest success.
3. Determine how weather (temperature and precipitation), landscape characteristics, predator densities, and invertebrate abundance affect poult survival, and identify the main causes of poult mortality.
4. Assess turkey brood-rearing habitat selection and determine habitats where turkeys and predators are most likely to interact.

To investigate poult survival and cause-specific mortality, we will deploy Very High Frequency (VHF) radio transmitters onto wild turkey poults. To reduce the potential of researcher-induced poult mortality, we will determine the least invasive and most effective technique for transmitter attachment by testing two methods—glue-on and suture—on captive turkey poults prior to the first field season.

To investigate turkey nest success, poult survival, and brood-rearing habitat selection, we will deploy Global Positioning System-Acceleration-Ultra High Frequency (GPS-ACC-UHF) transmitters on wild turkey hens. Translating ACC data into behavior requires known instances of acceleration attributed to specific behaviors. Thus, we plan to deploy GPS-ACC-UHF tracking devices on captive turkey hens and film >100 instances of common behaviors (e.g., feeding, walking, resting/stationary). We will be able to use the information gathered from the captive turkey hens to determine where, when, and how often wild turkey hens are engaging in specific behaviors.

Field work for this project will cover 4 nesting and brood-rearing seasons (to capture annual variability in covariates), and work will be conducted in Putnam County, Missouri. Hens will be monitored for productivity and poults will be monitored for survival. Wild turkey nest and poult predators will be monitored for occupancy and density. We will evaluate the effects of habitat, weather, and food availability on turkey reproduction by conducting vegetation surveys, collecting temperature and precipitation data, and collecting insects at systematic locations throughout the study area.

Project Update

In late summer and fall of 2020, researchers at the University of Missouri and MDC constructed an aviary at the University of Missouri's South Farm Research Center. The aviary was designed to house heritage breed domestic poults and hens during the captive trials portion of the project. Eight broods of at least 9 heritage breed domestic poults were obtained within 48 hours of hatching. Within each brood, 3 poults were fit with a VHF radio transmitter that was attached using a glue-on method, 3 poults were fit with a VHF transmitter that was attached using a suture method, and at least 3 poults were not fit with a transmitter (control group). The broods were monitored daily for survival, growth, and transmitter retention. The suture method proved to be the most effective method of transmitter attachment during this captive trial.

After the poult captive trial was complete, the research team obtained 3 heritage breed domestic turkey hens. These hens were fit with the same GPS-ACC-UHF transmitters that would be placed on wild turkey hens that winter. The research team recorded over 40 hours of video of the hens performing various behaviors—foraging, walking, preening, etc. The timing of the video recording, when matched up with the timing of ACC data collection, will allow the research team to translate the ACC data signatures into behaviors. This was an important data collection step, as it will allow the research team to convert ACC data collected from wild turkey hens into known behaviors. This will allow the research team to determine where, when, and for how long wild turkey hens are engaging in certain activities—seeking shelter/cover, foraging for food, etc.—which will be important for evaluating brood-rearing habitat selection.

In January, the research team began locating, baiting, and capturing flocks of wild turkey hens in Putnam County. About 100 hens were captured at 4 different sites across the county. A sample of 51 hens were fitted with transmitters. Forty-eight of the transmitters were battery-powered units and three of the transmitters were experimental solar powered units. So far, the solar powered units have only been transmitting data intermittently, so the sample size for the purpose of data analysis will be the 29 adult and 19 immature hens (48 total) that were marked with the more reliable battery-powered units.

During the 2021 winter trapping season, the research team recaptured 5 hens that were banded and/or radio-marked during a study of wild turkey survival, harvest rates, and reproduction that occurred from 2014-2019 in MDC's Northeast Region (hereafter referred to as the "NEMO turkey study"). Two of the recaptured hens were initially captured in March 2018 as adults, which would mean they are at least 5 years old this year. One of the recaptured hens was initially captured in January 2016 as an adult, which would mean she will be at least 7 years old this year. These three hens were recaptured about 1 mile from their initial capture site during the NEMO turkey study. The remaining two recaptured hens were initially captured as immature females in December 2017 and January 2018, which means they will be 4 years old this year. One of these hens was recaptured ~8 miles from her initial capture site during the NEMO turkey study; the other hen was recaptured ~10 miles from her initial capture site during the NEMO turkey study. The 8–10-mile distance between initial capture and recapture can be explained by the juvenile dispersal period that occurs after a turkey survives their first winter.

Since the completion of the capture season, the research team has been monitoring the reproductive attempts of the GPS-marked hens. The team conducted a mark-recapture effort of raccoons and opossums at sites across the county to determine how nest predator densities vary by land cover type (i.e., larger tracts of forest versus more open, agriculturally dominated areas). The team has deployed trail cameras with scent stations across the county to determine occupancy of larger poult predators (i.e., coyote, fox) in different land cover types. The team has also deployed weather stations to monitor variation in precipitation and temperature across the area. Vegetation surveys are being conducted at nest sites, at foraging sites used by hens with broods, and at random sites around the 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.

We are currently in the middle of the first field season for this research project. We will summarize and share preliminary results from this work as those results become available. We will also provide an update on this project in our annual Wild Turkey Population Status Report for the duration of this effort.

Above: Researchers from the University of Missouri and MDC weigh and measure captive turkey poults to determine if transmitter attachment method influences poult development.

Below: A researcher from the University of Missouri gently encourages captive turkey hens that are fitted with accelerometers to walk in order to capture the data signature for "walking" which informed programming of the GPS-ACC-UHF transmitters that were attached to wild turkey hens.

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.

APPENDIX A.

2019 Missouri spring turkey harvest (youth and regular seasons combined).

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank[a]
Adair	465	47	3	515	25
Andrew	126	20	1	147	101
Atchison	137	26	1	164	99
Audrain	179	32	2	213	92
Barry	86	34	3	123	108
Barton	287	34	1	322	63
Bates	284	43	3	330	62
Benton	366	82	3	451	37
Bollinger	394	99	9	502	27
Boone	498	85	4	587	15
Buchanan	108	24	0	132	105
Butler	79	20	0	99	109
Caldwell	197	58	3	258	75
Callaway	596	156	8	760	2
Camden	450	123	2	575	16
Cape Girardeau	405	110	12	527	20
Carroll	313	45	2	360	54
Carter	144	27	1	172	97
Cass	360	72	2	434	41
Cedar	453	58	7	518	24
Chariton	300	41	4	345	58
Christian	330	110	9	449	39
Clark	287	33	2	322	64
Clay	125	16	2	143	102
Clinton	109	28	1	138	104
Cole	365	63	4	432	42
Cooper	259	51	2	312	68
Crawford	313	137	8	458	36
Dade	269	63	3	335	60
Dallas	371	113	7	491	29
Daviess	402	75	3	480	31
Dekalb	163	29	4	196	96
Dent	358	123	7	488	30
Douglas	296	81	4	381	49
Dunklin	10	1	0	11	114
Franklin	716	235	11	962	1
Gasconade	467	138	8	613	10
Gentry	200	29	0	229	88
Greene	501	131	9	641	7
Grundy	367	27	6	400	45
Harrison	541	73	8	622	9

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank[a]
Henry	386	67	6	459	35
Hickory	287	54	3	344	59
Holt	208	23	1	232	85
Howard	358	63	10	431	43
Howell	215	78	2	295	71
Iron	176	31	1	208	93
Jackson	161	33	5	199	95
Jasper	281	34	3	318	66
Jefferson	436	109	11	556	18
Johnson	385	84	8	477	33
Knox	249	22	0	271	72
Laclede	532	158	12	702	4
Lafayette	192	52	3	247	80
Lawrence	297	54	8	359	55
Lewis	205	25	1	231	86
Lincoln	290	75	7	372	53
Linn	479	44	3	526	21
Livingston	396	49	1	446	40
Macon	513	74	8	595	13
Madison	209	39	1	249	77
Maries	453	131	10	594	14
Marion	232	27	1	260	74
Mcdonald	56	11	2	69	110
Mercer	405	40	6	451	38
Miller	602	106	6	714	3
Mississippi	56	9	0	65	111
Moniteau	307	70	7	384	47
Monroe	434	71	7	512	26
Montgomery	297	80	6	383	48
Morgan	303	67	3	373	52
New Madrid	63	1	0	64	112
Newton	105	19	1	125	106
Nodaway	180	39	2	221	90
Oregon	179	73	2	254	76
Osage	549	121	8	678	5
Ozark	158	56	4	218	91
Pemiscot	22	1	0	23	113
Perry	366	106	2	474	34
Pettis	257	43	2	302	69
Phelps	483	134	11	628	8
Pike	289	53	8	350	57
Platte	190	31	2	223	89
Polk	446	71	2	519	23

County	Adult Males	Subadult Males	Bearded Hens	Total	Rank[a]
Pulaski	374	97	8	479	32
Putnam	528	38	3	569	17
Ralls	206	24	1	231	87
Randolph	309	45	4	358	56
Ray	159	40	1	200	94
Reynolds	212	32	1	245	82
Ripley	133	30	2	165	98
Saint Charles	258	38	5	301	70
Saint Clair	475	62	12	549	19
Saint Francois	300	73	2	375	51
Saint Louis	115	9	0	124	107
Sainte Genevieve	461	141	3	605	12
Saline	264	56	2	322	65
Schuyler	226	21	2	249	78
Scotland	242	19	1	262	73
Scott	116	34	2	152	100
Shannon	270	59	2	331	61
Shelby	210	28	3	241	83
Stoddard	190	58	1	249	79
Stone	187	50	3	240	84
Sullivan	561	41	7	609	11
Taney	170	74	2	246	81
Texas	482	170	8	660	6
Vernon	462	51	8	521	22
Warren	312	72	5	389	46
Washington	296	80	2	378	50
Wayne	248	67	1	316	67
Webster	332	79	12	423	44
Worth	114	22	3	139	103
Wright	373	115	7	495	28

[a]Rank based on total harvest in Missouri's 114 counties.

APPENDIX B.

2019 Missouri fall turkey harvest (firearms and archery seasons combined).

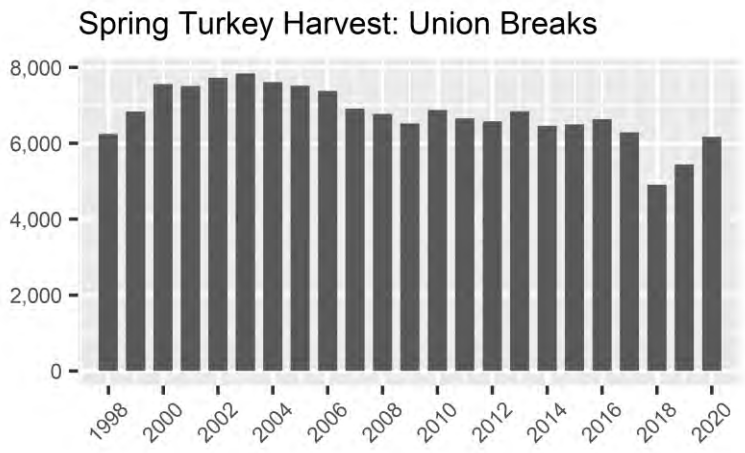
County	Adult Males	Adult Females	Subadult Males	Subadult Females	Total	Rank[a]
Adair	13	23	5	25	66	28
Andrew	2	3	2	4	11	103
Atchison	2	2	2	2	8	108
Audrain	8	11	0	1	20	93
Barry	2	4	2	1	9	106
Barton	8	12	2	5	27	73
Bates	8	12	3	1	24	81
Benton	16	35	4	16	71	20
Bollinger	13	25	10	22	70	22
Boone	16	20	12	22	70	23
Buchanan	4	2	1	2	9	107
Butler	3	9	1	5	18	96
Caldwell	1	7	2	3	13	102
Callaway	24	37	10	23	94	7
Camden	25	26	9	16	76	17
Cape Girardeau	15	19	18	15	67	25
Carroll	6	10	7	7	30	67
Carter	8	5	4	6	23	86
Cass	15	11	8	16	50	40
Cedar	18	24	9	16	67	26
Chariton	2	5	8	11	26	75
Christian	11	25	7	7	50	41
Clark	8	6	1	9	24	82
Clay	11	12	3	4	30	68
Clinton	1	7	0	2	10	104
Cole	8	15	5	11	39	58
Cooper	5	11	3	4	23	87
Crawford	16	27	14	22	79	15
Dade	10	19	4	12	45	46
Dallas	21	21	9	20	71	21
Daviess	18	14	4	8	44	48
Dekalb	5	10	4	5	24	83
Dent	22	19	15	25	81	10
Douglas	7	14	4	4	29	71
Dunklin	0	1	0	1	2	114
Franklin	35	45	14	39	133	2
Gasconade	22	18	10	31	81	11
Gentry	3	8	2	6	19	94
Greene	35	64	14	41	154	1
Grundy	9	8	5	11	33	61
Harrison	12	17	5	10	44	49

County	Adult Males	Adult Females	Subadult Males	Subadult Females	Total	Rank[a]
Henry	13	15	8	18	54	35
Hickory	6	12	14	8	40	55
Holt	9	9	1	4	23	88
Howard	7	8	3	8	26	76
Howell	18	12	6	7	43	50
Iron	13	11	4	14	42	52
Jackson	5	25	3	7	40	56
Jasper	11	12	7	4	34	60
Jefferson	30	28	4	11	73	18
Johnson	7	26	8	11	52	37
Knox	10	8	0	8	26	77
Laclede	26	40	14	25	105	4
Lafayette	3	11	1	6	21	91
Lawrence	19	17	8	6	50	42
Lewis	7	9	3	6	25	79
Lincoln	10	21	9	1	41	54
Linn	7	16	4	13	40	57
Livingston	13	13	7	15	48	44
Macon	19	33	11	17	80	13
Madison	5	14	3	11	33	62
Maries	19	42	12	36	109	3
Marion	6	14	3	3	26	78
McDonald	3	0	1	0	4	113
Mercer	15	24	3	10	52	38
Miller	21	24	11	24	80	14
Mississippi	1	3	0	2	6	111
Moniteau	3	12	2	6	23	89
Monroe	23	30	9	26	88	8
Montgomery	11	18	5	9	43	51
Morgan	23	18	5	21	67	27
New Madrid	1	2	1	2	6	112
Newton	7	4	2	2	15	100
Nodaway	1	4	0	3	8	109
Oregon	5	6	7	15	33	63
Osage	20	32	12	17	81	12
Ozark	6	2	4	6	18	97
Pemiscot	1	7	0	0	8	110
Perry	9	16	9	11	45	47
Pettis	9	10	2	2	23	90
Phelps	12	24	9	18	63	30
Pike	3	10	1	14	28	72
Platte	4	10	3	2	19	95
Polk	19	21	8	11	59	33

County	Adult Males	Adult Females	Subadult Males	Subadult Females	Total	Rank[a]
Pulaski	20	14	12	18	64	29
Putnam	24	37	6	17	84	9
Ralls	5	8	5	6	24	84
Randolph	4	19	1	6	30	69
Ray	4	8	2	0	14	101
Reynolds	15	9	5	13	42	53
Ripley	7	14	6	6	33	64
Saint Charles	11	12	3	6	32	65
Saint Clair	9	24	1	15	49	43
Saint Francois	26	27	16	33	102	6
Saint Louis	7	14	2	8	31	66
Sainte Genevieve	0	0	0	0	0	115
Saline	18	26	13	20	77	16
Schuyler	9	8	3	10	30	70
Scotland	5	1	3	7	16	98
Scott	15	22	5	10	52	39
Shannon	8	6	1	1	16	99
Shelby	7	5	9	6	27	74
Stoddard	7	11	0	7	25	80
Stone	9	25	7	20	61	31
Sullivan	5	9	5	2	21	92
Taney	15	17	6	10	48	45
Texas	9	7	3	5	24	85
Vernon	31	32	14	28	105	5
Warren	7	23	11	14	55	34
Washington	11	12	4	11	38	59
Wayne	28	20	5	20	73	19
Webster	23	23	6	17	69	24
Worth	17	19	7	11	54	36
Wright	0	5	3	2	10	105

[a]Rank based on total harvest in Missouri's 114 counties.

Table of Contents

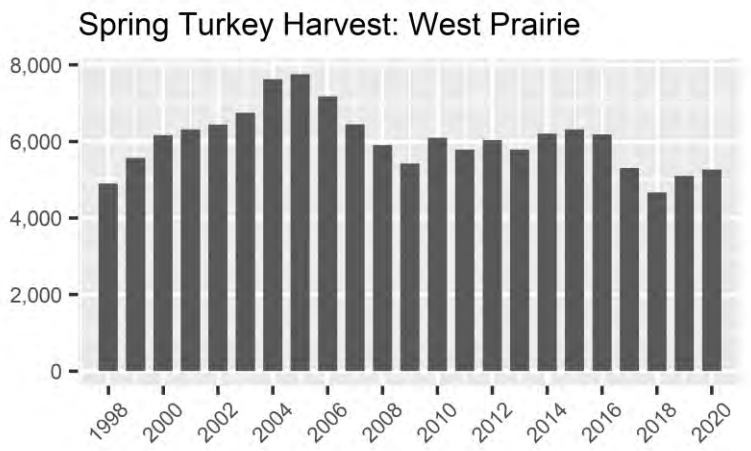


Union Breaks Region

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- and ten-year spring turkey harvest trends in the Union Breaks Region indicate a declining population.

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 2016-2018 but has increased in recent years. The five- and ten-year spring turkey harvest trends in the West Prairie Region indicate declining abundance.



The total 2020 spring turkey harvest, including both the youth and regular seasons was 41,461. This harvest total was 7% more than the 2019 harvest total but was 3% less than the previous five-year average (Figure 4). Counties with the highest total spring harvest were Franklin, Callaway, and Miller where 962, 760, and 714 turkeys were harvested, respectively (Figure 5). Total permit sales for the 2020 spring turkey season (113,649; excluding no-cost landowner permits) were 22% greater than in 2019 and 11% greater than the previous five-year average (Figure 4). Spring turkey permits sales in 2019 included 106,564 (94%) resident permits and 7,085 (6%) nonresident permits. An additional 21,614 no-cost permits were distributed to landowners. The total number of unique spring turkey hunters in Missouri in 2020 was 133,022, which was 8% more than in 2019 but 3% less than the previous five-year average. Note that the total number of hunters does not equal the permit sales total because some hunters purchase a permit in addition to receiving a no-cost landowner permit.

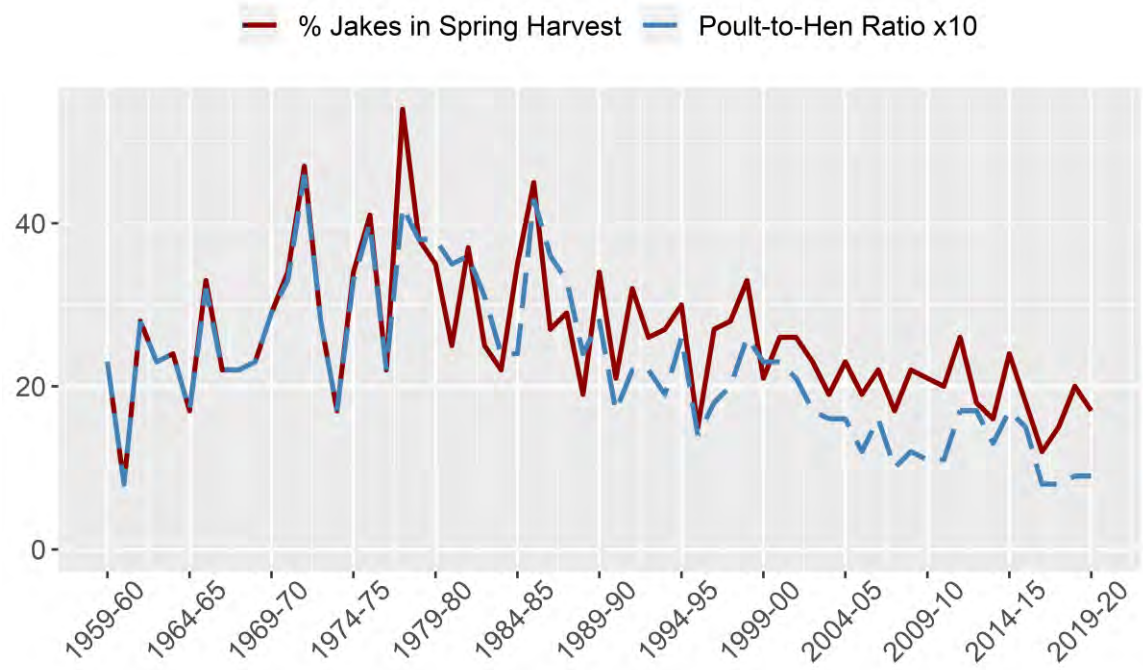


Figure 3. Missouri's statewide poult-to-hen ratio multiplied by 10, compared with the percentage of jakes in the following year's regular season spring harvest, 1959-2020.

2020 Fall Firearms Turkey Season

The 2020 fall firearms turkey harvest total of 2,125 was 9% greater than the 2019 harvest total but was 37% below the previous five-year average (Figure 6). The majority of the fall firearms harvest occurred in southern Missouri (Figure 7). The top harvest counties were Greene (70), Maries (58), and Franklin (55).

The fall firearms turkey permit sales total in 2020 (12,329) was 34% greater than the record-low 2019 permit sales total (9,195). This year was an exception to the long-term declining trend in fall firearms turkey hunting participation in Missouri (Figure 6).

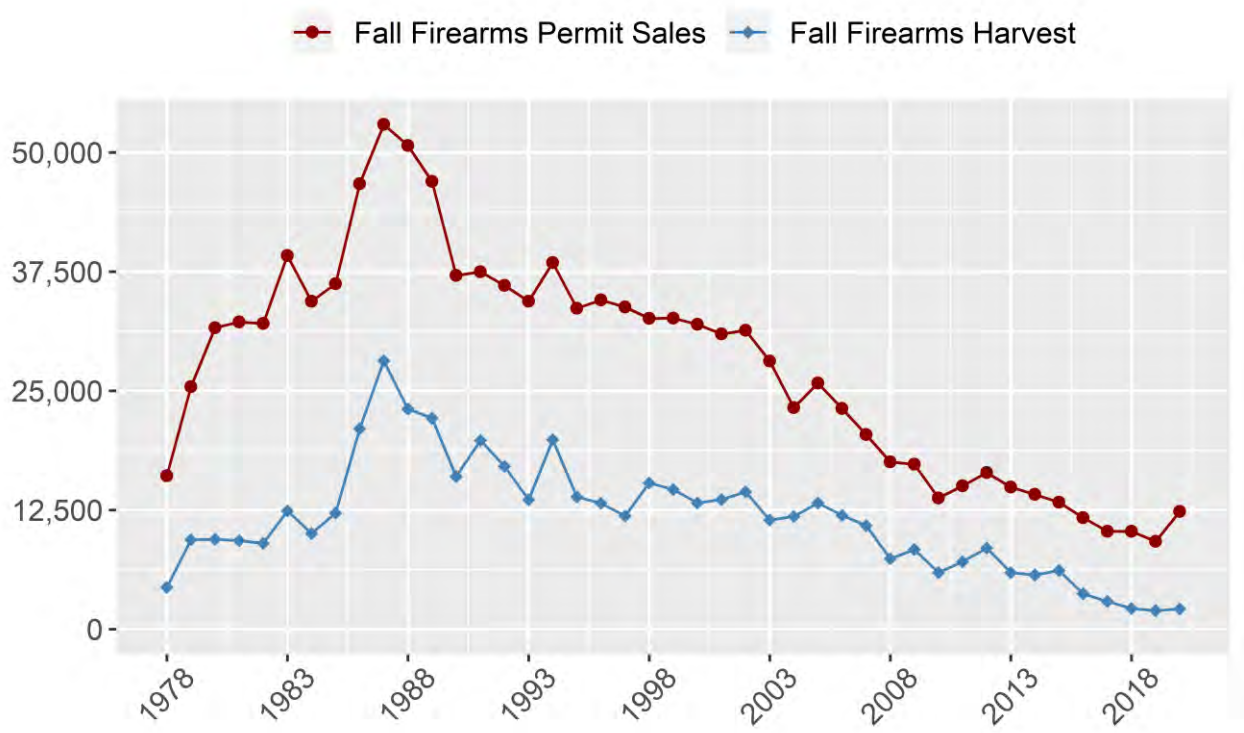


Figure 6. Number of wild turkeys harvested during the fall firearms turkey season in Missouri and the number of fall firearms permits sold, 1978-2020. Permit sales do not include no-cost landowner permits.

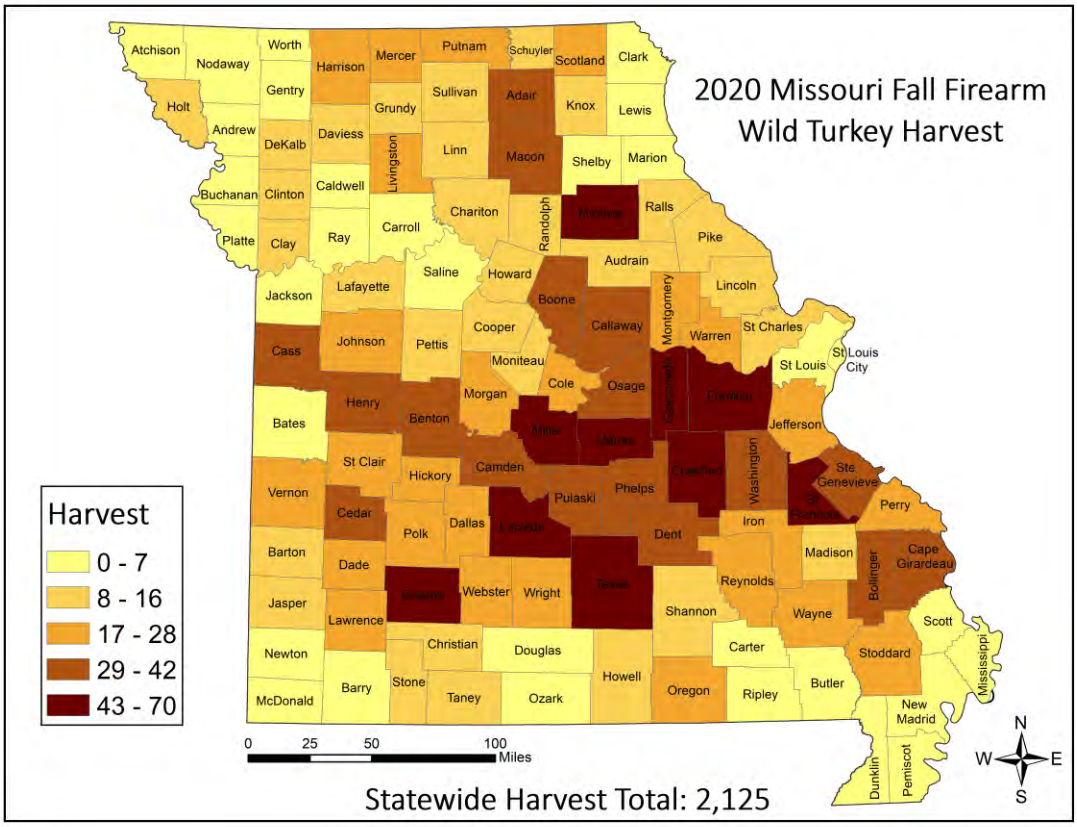


Figure 7. Missouri fall firearms wild turkey harvest, 2020.

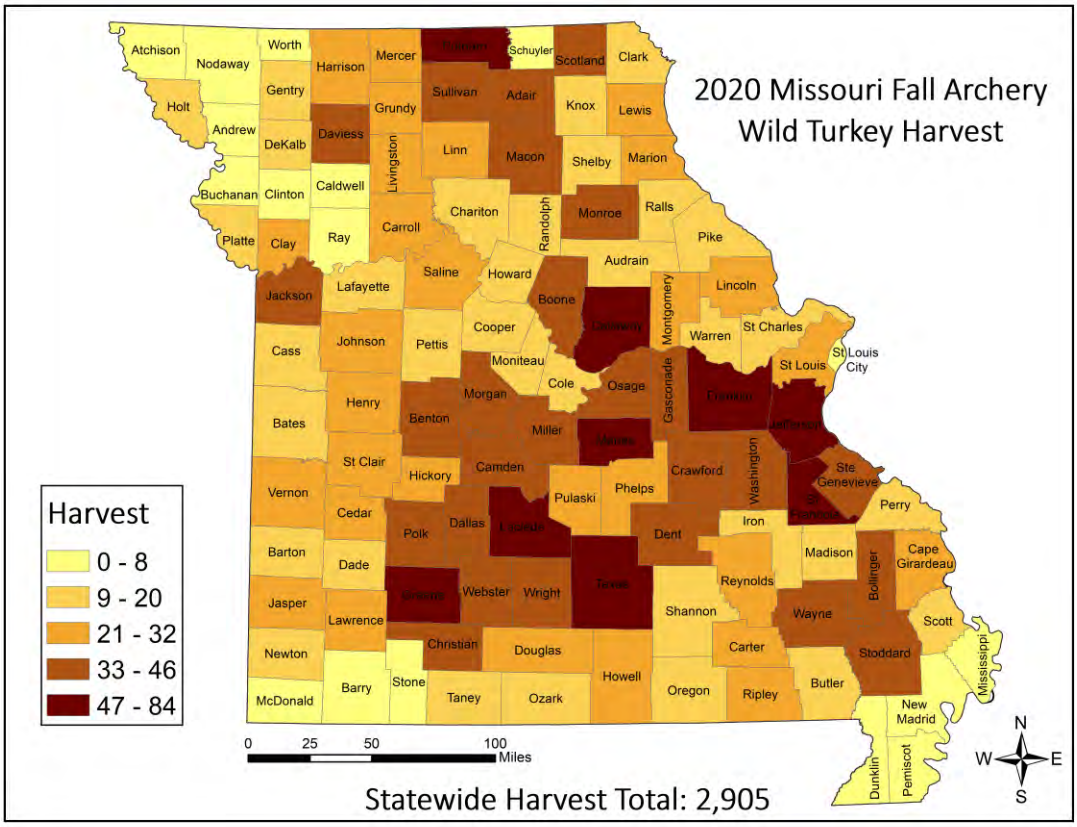


Figure 9. Wild turkey harvest in Missouri during the 2020 fall archery season.

HUNTING INCIDENTS

There was one hunting incident during the 2020 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 1.2 (Figure 10).

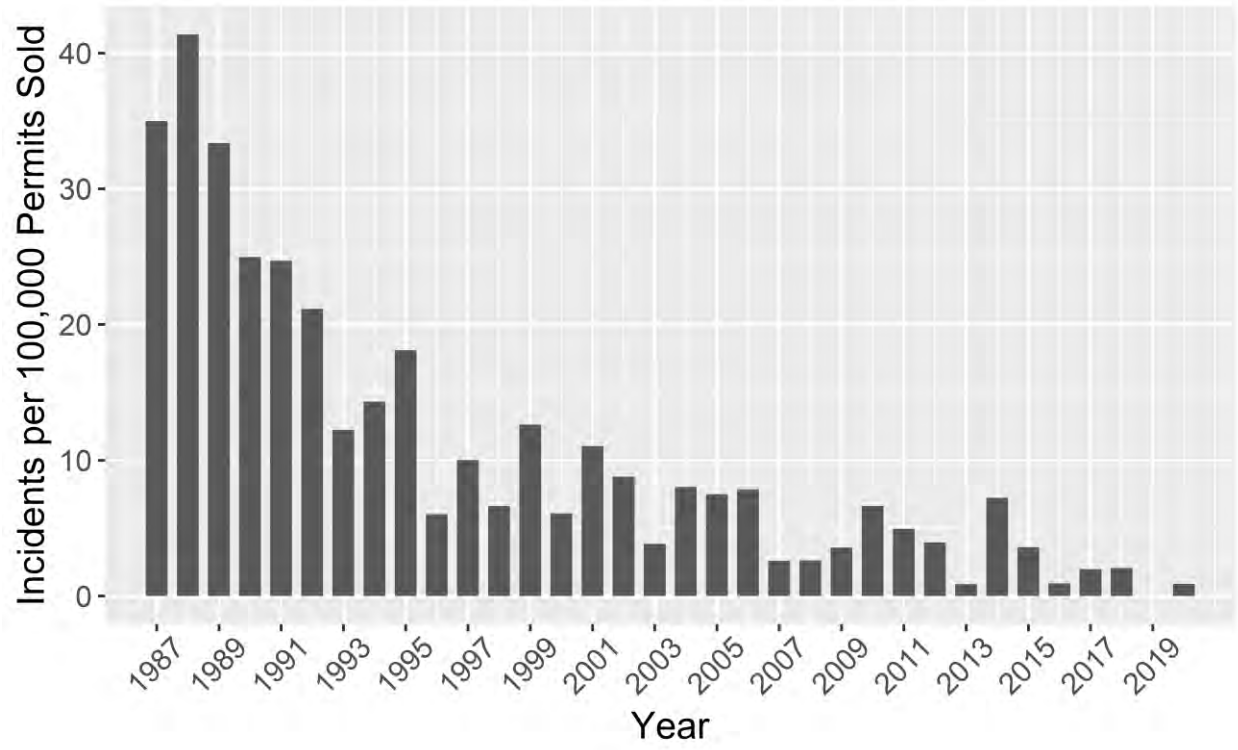


Figure 10. Hunting incidents during the spring turkey season in Missouri per 100,000 permits sold, 1987-2020.

RECENT REGULATION CHANGES

Other than changes to some Conservation Area regulations and managed spring turkey hunts, no turkey hunting regulation changes occurred in 2020.