2022

Missouri Deer Season Summary & Population Status Report

Missouri Department of Conservation

Prepared by:

Deer and Wildlife Health Program Staff

Science Branch

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Deer Program Mission and Vision

The mission of MDC's Deer Program is to use science-based wildlife management to maintain biologically and socially balanced deer populations that provide sustainable recreation and that minimize conflicts with humans and the potential for negative impacts on ecosystem health. To put this mission into action, the Deer Program is guided by four management goals:

Goal 1: Deer Population Management – Proactively manage deer populations for a balanced sex and age structure while maintaining densities at or below the biological and social carrying capacity within the defined management units using science-based wildlife management practices.

Goal 2: Hunting and Recreation – Provide opportunities for all citizens to enjoy deer and related recreational activities and promote hunting as a socially and culturally important tradition which is the primary tool for achieving deer population goals.

Goal 3: Health and Disease Management – Ensure the maintenance of healthy deer populations and minimize the threat and impacts of disease on deer populations in Missouri.

Goal 4: Education, Communication, and Public Engagement – Provide adequate information to the public about all aspects of deer management in Missouri and create opportunities for additional public engagement in decisions about the management of Missouri's deer resource.

The Deer Program, managed by the Science Branch within MDC, develops annual regulation recommendations based on harvest data, hunter and landowner surveys, MDC staff surveys, public comments, population models, and the Chronic Wasting Disease (CWD) Surveillance and Management Plan. The conservation of all of Missouri's valuable wildlife is made possible thanks to private landowners and all others supporting the one-eighth of one percent Conservation Sales Tax, permit sales, and income generated by fish and wildlife tourism.

Thank you!




Equal Opportunity to Participate

Equal opportunity to participate in, and benefit from, programs of the Missouri Department of Conservation is available to all individuals without regard to their race, color, nationality, sex, age, or disability. Questions should be directed to the Department of Conservation, PO Box 180, Jefferson City, MO 65102, 573-751-4115 (voice) or 800-735-2966 (TTY), or to the U.S. Fish and Wildlife Service Division of Federal Assistance, 4401 N. Fairfax Drive, Mail Stop: MBSP-4020, Arlington, VA 22203.

Statewide Deer Management Overview

Deer populations across much of Missouri are currently at desired levels; however, many counties have steadily increasing deer numbers. Therefore, statewide deer management goals are largely focused on stabilizing deer numbers through increased antlerless harvest to prevent deer populations from becoming undesirably high. Additionally, new programs such as the Deer Management Assistance Program (DMAP) have been created to assist landowners in meeting local deer management objectives (see Pg. 23 for more information). Statewide deer management also continues to be focused on minimizing the impacts of CWD. Surveillance for CWD is ongoing across the state to detect new areas of infection as early as possible. Where CWD is known to occur, large-scale and localized management is conducted to limit disease spread and protect Missouri's deer population.

2022 Deer Season Summary

Season	Dates	What Was New for 2022?
Archery Deer and Turkey Season	Sept. 15 - Nov. 11, 2022 Nov. 23, 2022 - Jan. 15, 2023	• Barton, Greene, Ripley, and Vernon counties were added to the CWD Management Zone. • During Nov. 12-13, hunters who harvested a deer in CWD Management Zone counties (except Gasconade, Knox, St. Charles, and Warren counties) were required to take the deer (or its head) on the day of harvest to a mandatory CWD sampling station. • Hunters who were 15 years or younger on Sept. 15, 2022 were exempt from the antler-point restriction during the archery deer season and all portions of the firearms deer season. • The antler-point restriction was removed for Barton and Vernon counties. • Hunters could fill one firearms antlerless permit in Iron County. • Hunters could fill additional firearms antlerless permits in 18 counties.
Firearms Deer Early Youth Portion	Oct. 29-30, 2022	
Firearms Deer November Portion	Nov. 12-22, 2022	
Firearms Deer Late Youth Portion	Nov. 25-27, 2022	
Firearms Deer Antlerless Portion	Dec. 3-11, 2022	
Firearms Deer Alternative Methods Portion	Dec. 24, 2022 - Jan. 3, 2023	

Firearms Deer Season Summary

Total deer harvest during the 2022 deer season (299,719) was 2% higher than the 2021 harvest total (**Table 1**) and was the 5th highest deer harvest on record. Firearms deer harvest (240,827) was 3% higher than during 2021, mostly due to a 5% increase in harvest over the previous year during the November portion (**Table 1**). The November portion is the most popular portion of firearms deer season, typically accounting for roughly 65% of the total deer season harvest. Weather during mid- to late-November in 2022 was chilly, but not frigid, and was ideal for encouraging deer movement and hunters spending time afield, contributing to the high harvest numbers during the November portion. Harvest during the Antlerless portion of firearms deer season was also up more than 1,200 deer (8%) compared to the 2021 total (**Table 1**). The remainder of the firearms portions of deer season were down in 2022 compared to the previous year. The Early and Late Youth portions were down 12% and 19%, respectively (**Table 1**). These portions are short-duration and tend to fluctuate considerably from year to year mostly due to weather and its effect on deer movement and hunter effort. Harvest during the Alternative Methods portion (8,724) was down 13% from the previous year (**Table 1**). Christmas Eve and Christmas Day comprised the first weekend of this portion, and New Year's Eve and New Year's Day comprised the second weekend, likely limiting participation during this portion of deer season.

Table 1. Deer harvest by portion and deer type in Missouri, 2021-2022.

Season Portion	Antlered Bucks			Button Bucks			Does			Total		
	2021	2022	Change	2021	2022	Change	2021	2022	Change	2021	2022	Change
Archery	26,644	24,140	-9%	5,010	4,896	-2%	27,844	27,647	-1%	59,498	56,683	-5%
Managed Hunts	592	610	3%	338	282	-17%	1,390	1,317	-5%	2,320	2,209	-5%
Early Youth	10,192	8,866	-13%	1,162	1,213	4%	4,452	3,798	-15%	15,806	13,877	-12%
Late Youth	1,498	1,298	-13%	390	322	-17%	1,646	1,250	-24%	3,534	2,870	-19%
November	102,054	103,377	1%	16,537	17,058	3%	70,337	78,680	12%	188,928	199,115	5%
Alternative Methods	2,760	2,358	-15%	1,135	978	-14%	6,143	5,388	-12%	10,038	8,724	-13%
Antlerless[1]	75	86	15%	2,178	2,279	5%	12,766	13,876	9%	15,019	16,241	8%
Total	**143,815**	**140,735**	**-2%**	**26,750**	**27,028**	**1%**	**124,578**	**131,956**	**6%**	**295,143**	**299,719**	**2%**

[1] Antlered bucks taken during this portion had antlers < 3" in length.

Archery Deer Season Summary

The archery deer season harvest increased considerably in 2019, largely due to a calendar shift that gave archers an extra week of hunting during the peak of the rut before the November portion of firearms deer season opened (**Table 2**). Another increase in archery harvest occurred in 2020 as a result of increased participation during the era of COVID-19 when many businesses were closed, and people were seeking outdoor forms of recreation. In 2020, Archery Any-Deer Permit sales were up 20% compared to 2019 and Archery Antlerless Permit sales were up 26%. Since then, archery harvest has declined steadily, but still remains above the 10-year average. We may see another slight decrease in archery season harvest in 2023 as the opening day of the November portion of firearms deer season shifts a day earlier; however, another major calendar shift will occur in 2024, pushing the opening day of the November firearms portion back and providing an additional week of prime archery hunting, like in 2019.

The 2022 archery deer season marked the seventh year of crossbows being a legal method for all archery hunters in Missouri. MDC began allowing crossbows during the archery season in 2016 to increase hunter participation. During the 2022 archery season, 51% of the deer harvested were taken with crossbows, identical to the previous year. The percentage of the archery season harvest attributed to crossbows increased each year from 2016-2021 (**Figure 1**), albeit with smaller gains each year, and appears to be plateauing at current levels. Allowing crossbows during the archery season has not affected the statewide composition of the archery harvest greatly. During the five years prior to allowing crossbows (2011-2015), the average percentage of antlered bucks, button bucks, and does in the archery harvest was 39%, 11%, and 50%, respectively. From 2016-2022, these averages were fairly similar (43%, 9%, and 48%, respectively) (**Figure 2**).

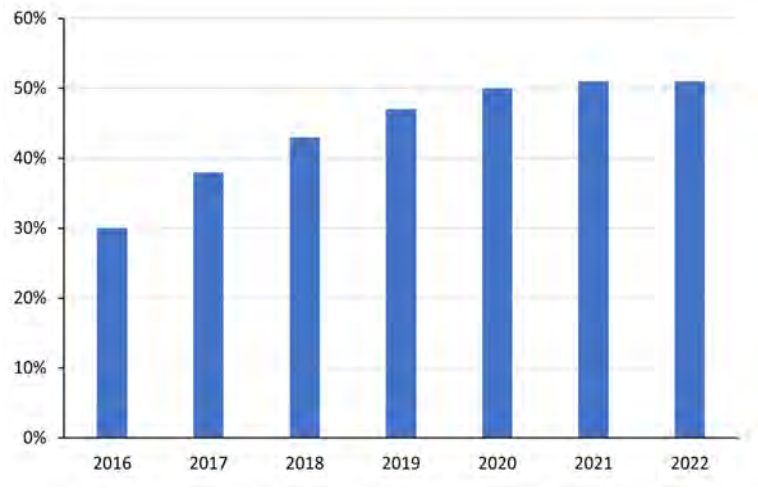

Figure 1. Percentage of the Missouri archery season harvest comprised of deer harvested using a crossbow, 2016-2022. Crossbows became a legal method for all archery hunters to use starting in 2016.

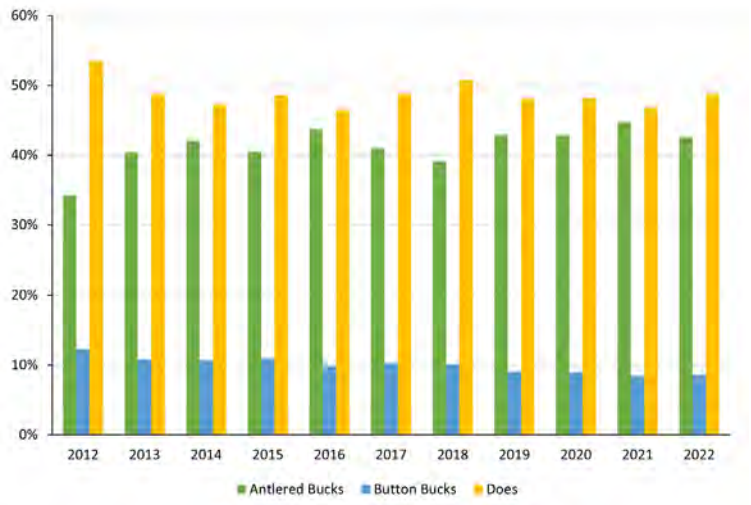

Figure 2. Percentage of antlered bucks, button bucks, and does in the archery deer season harvest in Missouri, 2012–2022.

Deer Hunter and Harvest Trends

In 2022, Missouri had roughly 203,000 archery deer hunters and 444,000 firearms deer hunters. Most archery hunters also hunt with a firearm, so there were a total of about 475,000 deer hunters in 2022. This total is roughly 43,000 (8%) fewer than the peak in deer hunter numbers in 2012 (**Figure 3**). Since then, there has been a slow and steady decline in hunters on nearly an annual basis. Archery deer hunter numbers peaked a little later than firearms hunter numbers, between 2016-2019 following the allowance of crossbows as a legal archery method; however, since then archery hunter numbers have also slowly declined (**Figure 3**). The trend in Missouri is part of a larger, national decline in hunters as the baby boomer generation ages out of hunting and is replaced at a slower rate by younger hunters. This has prompted many R3 (recruitment, retention, reactivation) efforts to try and slow or reverse the trend.

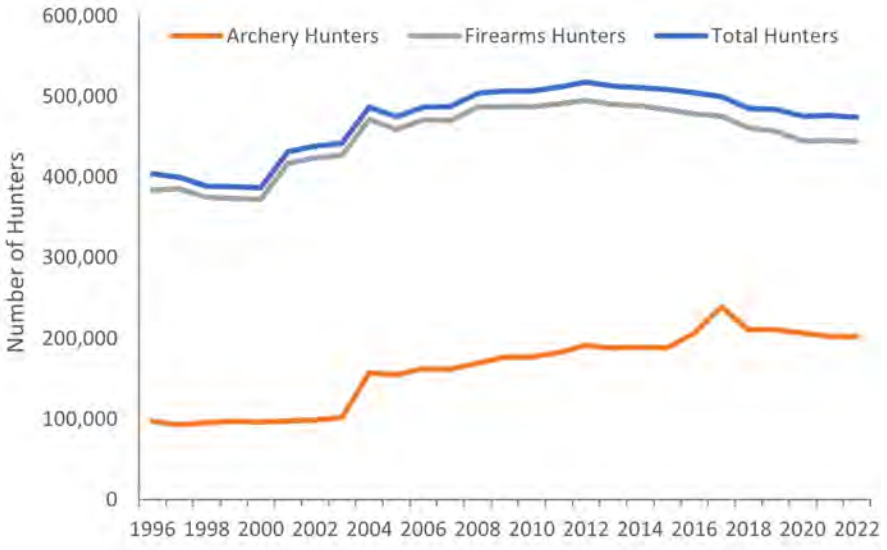

Figure 3. Trends in archery, firearms, and total deer hunter numbers in Missouri, 1996-2022.

Despite declining hunter numbers, hunter success in 2022 remained high. We define hunter success as the percentage of permitted hunters who reported harvesting at least one deer. Firearms hunters exceeded 42% success for the first time in recent years (**Figure 4**), and archers had a success rate of 21%.

Table 2. Annual deer harvest summary by hunter residency, deer type, and hunting method in Missouri, 2006-2022.

Year	Residency[1]		Deer Type			Method[2]		Total
	Resident	Non-Resident	Antlered Bucks	Button Bucks	Does	Archery	Firearm	
2006	308,103	17,167	125,193	47,372	152,892	41,942	281,011	**325,457**
2007	285,333	17,207	121,059	41,748	139,931	39,698	260,556	**302,738**
2008	266,599	17,106	100,682	40,574	142,737	42,914	239,094	**283,993**
2009	284,956	13,835	107,931	43,441	147,687	49,614	247,633	**299,059**
2010	261,134	14,290	104,794	38,473	132,426	42,467	231.466	**275,693**
2011	274,695	15,103	114,607	39,697	135,830	49,594	238,700	**290,134**
2012	293,825	15,713	120,491	42,155	147,214	51,122	256,927	**309,860**
2013	238,084	13,800	104,853	31,002	116,149	50,140	200,114	**252,004**
2014	242,020	14,930	114,409	29,943	112,720	48,566	206,885	**257,072**
2015	264,230	15,430	125,248	32,362	122,294	50,242	228,194	**279,904**
2016	249,339	16,542	128,311	28,016	110,267	47,734	217,508	**266,594**
2017	265,682	18,504	136,127	30,602	117,747	51,991	231,124	**284,476**
2018	269,948	20,119	136,849	30,115	123,260	52,915	235,732	**290,224**
2019	265,637	20,088	134,092	27,970	123,811	61,407	222,820	**285,873**
2020	274,746	22,333	140,855	28,652	127,707	67,487	227,833	**297,214**
2021	270,765	24,240	143,815	26,750	124,578	59,498	233,325	**295,143**
2022	273,140	24,815	140,735	27,029	131,955	56,683	240,827	**299,719**

[1] Does not include harvests where residency specifications were not available.
[2] Does not include deer harvested during managed hunts.

Figure 4. Success rates of firearms and archery deer hunters in Missouri, 2013-2022.

Table 3. Deer observations during the 2022 deer season by archery hunters participating in MDC's bowhunter observation survey.

Region	Hours Hunted	Bucks Seen	Does Seen	Fawns Seen	Unknown Deer Seen	Total Deer Seen per Hour	Does per Buck	Fawns per Doe
Central	6,827	2,067	3,483	1,613	492	1.12	1.69	0.46
Kansas City	5,144	1,661	2,751	1,393	356	1.20	1.66	0.51
Northeast	8,303	2,993	4,471	2,200	673	1.25	1.49	0.49
Northwest	3,691	1,376	2,254	772	271	1.27	1.64	0.34
Ozark	4,343	709	1,586	547	246	0.71	2.24	0.34
Southeast	4,243	652	1,769	759	236	0.81	2.71	0.43
Southwest	4,267	1,152	2,428	967	248	1.12	2.11	0.40
St. Louis	6,589	1,456	2,730	1,035	390	0.85	1.88	0.38
Total/Avg.	**43,406**	**12,066**	**21,472**	**9,286**	**2,912**	**1.04**	**1.93**	**0.42**

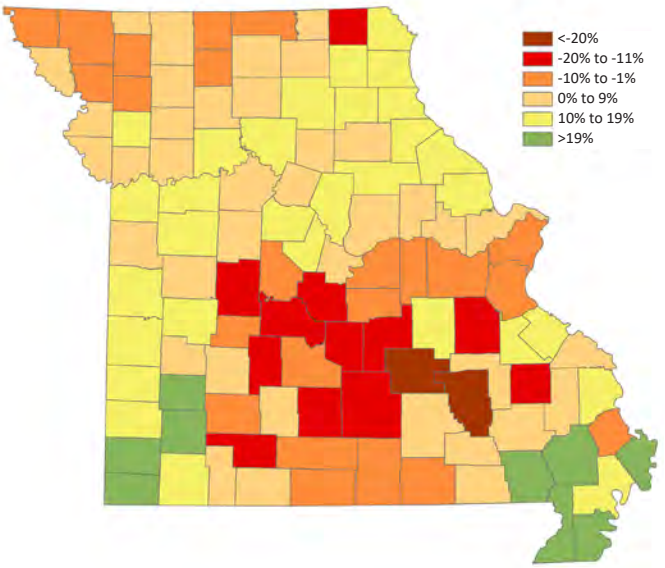

Figure 5. Percent change in total deer harvest in Missouri by county in 2022 compared to the 2021 deer season.

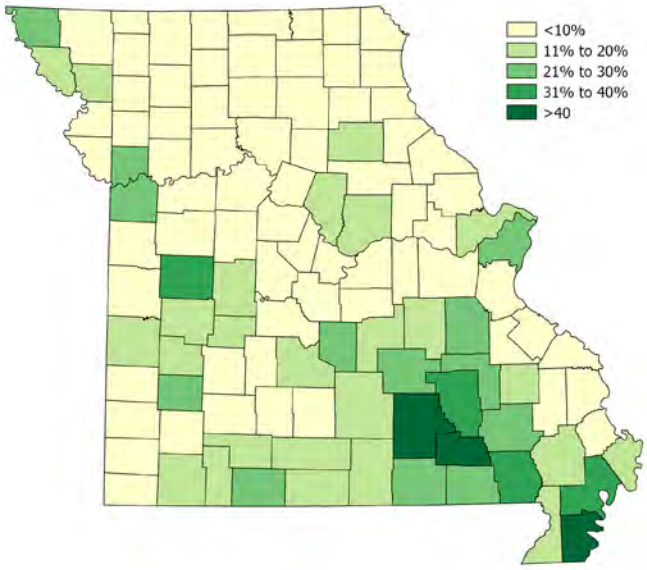

Figure 6. Percentage of deer harvest on public land in Missouri during the 2022 hunting season.

Table 4. Permits issued and deer harvested by permit type in Missouri, 2021-2022.

Permit Type[1]	Number of Permits Issued			Number of Deer Harvested		
	2021	2022	Change	2021	2022	Change
Archery Any-Deer	142,901	141,464	-1%	31,247	28,551	-9%
Landowner Archery Any-Deer	52,482	53,789	2%	3,885	3,452	-11%
Youth Archery Any-Deer	10,688	10,673	-<1%	1,736	1,694	-2%
Archery Antlerless	78,113	80,966	4%	17,634	18,102	3%
Landowner Archery Antlerless	102,560	105,970	3%	4,020	3,767	-6%
Youth Archery Antlerless	5,548	5,875	6%	896	890	-1%
Firearms Any-Deer	316,564	314,870	-1%	95,236	95,582	+<1%
Landowner Firearms Any-Deer	82,484	83,409	1%	20,929	20,135	-4%
Youth Firearms Any-Deer	58,402	57,939	-1%	22,491	21,575	-4%
Firearms Antlerless	228,867	238,940	4%	68,342	75,569	11%
Landowner Firearms Antlerless	97,766	98,683	1%	14,664	15,380	5%
Youth Firearms Antlerless	32,314	33,400	3%	9,459	9,358	-1%
Resident Firearms	777,435	786,413	1%	214,533	219,978	3%
Nonresident Firearms	38,962	40,828	5%	16,588	17,621	6%
Resident Archery	370,835	377,083	2%	52,535	49,973	-5%
Nonresident Archery	21,457	21,654	1%	6,883	6,483	-6%

[1] Not an inclusive list of permit types.

Table 5. Deer hunter and harvest statistics in Missouri, 2022.

	Archery	Firearms	Archery & Firearms
Age Distribution of Hunters	**Number of Hunters**		**Number of Hunters[1]**
10 or younger	3,249	21,366	21,787
11-15	10,903	41,992	43,022
16-40	82,459	164,865	180,410
41 or older	106,198	215,722	228,701
Total Hunters	202,809	443,945	473,920
Any-Deer Permits Issued	**Number of Hunters**		**Number of Hunters[1]**
Resident	135,587	346,260	365,537
Nonresident	16,550	26,549	38,313
Landowner	53,789	83,409	83,920
Antlerless Permit Sales[2]	**Number of Hunters**		**Number of Hunters[3]**
1	48,769	164,624	149,439
2	11,234	41,791	56,989
3	2,458	4,418	13,971
4 or more	1,690	2,432	11,228
Deer Harvested	**Number of Hunters**		**Number of Hunters[4]**
0	159,691	256,319	264,470
1	33,861	145,251	149,338
2	6,818	33,902	42,689
3	1,564	7,121	11,820
4 or more	875	1,352	5,603
Antlered Bucks Harvest[5]	**Number of Hunters**		**Number of Hunters[4]**
0	179,295	328,830	342,346
1	23,005	114,401	123,597
2	509	714	7,977
Deer Harvested	**Percent of Hunters**		**Percent of Hunters[4]**
0	78.7%	57.7%	55.8%
1	16.7%	32.7%	31.5%
2	3.4%	7.6%	9.0%
3 or more	1.2%	1.9%	3.7%
Antlered Bucks Harvested[5]	**Percent of Hunters**		**Percent of Hunters[4]**
0	88.4%	74.1%	72.2%
1	11.3%	25.8%	26.1%
2	0.3%	0.2%	1.7%

[1] Number of individuals that held an archery and/or firearms any-deer permit.
[2] Excludes no-cost landowner permits.
[3] Number of hunters that purchased the specified number of permits when combining their archery and firearms permits.
[4] Number/percent of hunters that harvested the specified number when combining their archery and firearms harvest.
[5] Includes hunters that harvested antlered bucks during managed hunts.

Regional Deer Population Status and Summaries

Statewide deer population trends are important; however, regional trends are more informative to most landowners and hunters. It is also important to recognize that deer populations can vary considerably within a region and even within a county. Regional and local diversity in deer numbers can be a result of differences in land cover and use, harvest regulations, hunter goals and density, and disease events. Therefore, regional information should be considered as a starting point when evaluating deer populations within a localized area.

Regional Offices

Central Region
3500 East Gans Road
Columbia, MO 65201
573-815-7900

Kansas City Region
12405 SE Ranson Road
Lee's Summit, MO 64082
816-622-0900

Northwest Region
701 James McCarthy Drive
St. Joseph, MO 64507
816-271-3100

Ozark Region
551 Joe Jones Blvd.
West Plains, MO 65775
417-256-7161

Southeast Region
2302 County Park Drive
Cape Girardeau, MO 63701
573-290-5730

Northeast Region
3500 S. Baltimore
Kirksville, MO 63501
660-785-2420

Southwest Region
2630 N. Mayfair
Springfield, MO 65803
417-895-6880

St. Louis Region
2360 Highway D
St. Charles, MO 63304
636-441-4554

Central Region Deer Summary

In 2022, Central Region had the highest regional deer harvest (46,238) which was 1% lower than in 2021 (**Table 6, Figure 7**). In 2022, Central Region ranked 3rd among regions for the number of deer harvested per square mile (5.6). Top harvest counties within the region were Callaway, Osage, and Morgan. The deer population across most of the Central Region has fully recovered from a low point in 2013 following a particularly severe outbreak of hemorrhagic disease in 2012.

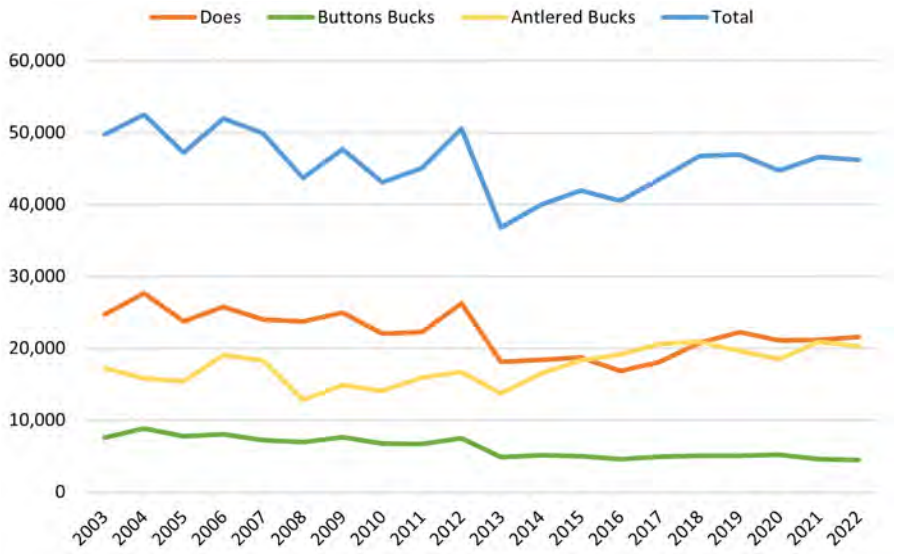

Figure 7. Central Region deer harvest trend, 2003-2022.

Table 6. Central Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Audrain	2,534	3.9	5.2	7.4	1.6	15.0
Boone	3,653	6.0	10.6	12.0	3.0	18.4
Callaway	5,438	6.9	9.7	9.6	2.3	17.4
Camden	2,953	4.9	8.8	13.4	1.9	13.8
Cole	1,940	5.6	9.2	9.2	3.1	31.2
Cooper	2,464	4.6	6.1	7.9	1.3	16.2
Gasconade	3,685	7.4	11.1	8.9	1.9	15.5
Howard	2,671	6.1	10.9	10.4	2.1	25.2
Maries	2,328	4.5	6.0	8.8	0.9	23.6
Miller	2,699	4.8	6.3	10.1	0.9	12.4
Moniteau	1,984	5.0	5.8	5.1	1.5	16.5
Montgomery	3,426	6.8	9.6	9.0	2.7	24.2
Morgan	3,998	7.0	8.9	8.3	1.7	10.6
Osage	4,173	7.2	9.4	10.2	1.7	20.9
Saline	2,292	3.3	4.3	8.6	1.2	17.2
Total (t)/Avg (a)	**t = 46,238**	**a = 5.6**	**a = 8.1**	**a = 9.3**	**a = 1.9**	**a = 18.5**

Kansas City Region Deer Summary

Total deer harvest for the Kansas City Region in 2022 was 32,924 which was 5% greater than in 2021 (**Table 7, Figure 8**). The deer harvest in Kansas City Region ranked 6th among regions and 5th for the number of deer harvested per square mile (4.6). Top harvest counties within the region were Benton, St. Clair, and Henry. The deer population across much of the region continues to increase from a low point in 2013 following a particularly severe outbreak of hemorrhagic disease in 2012.

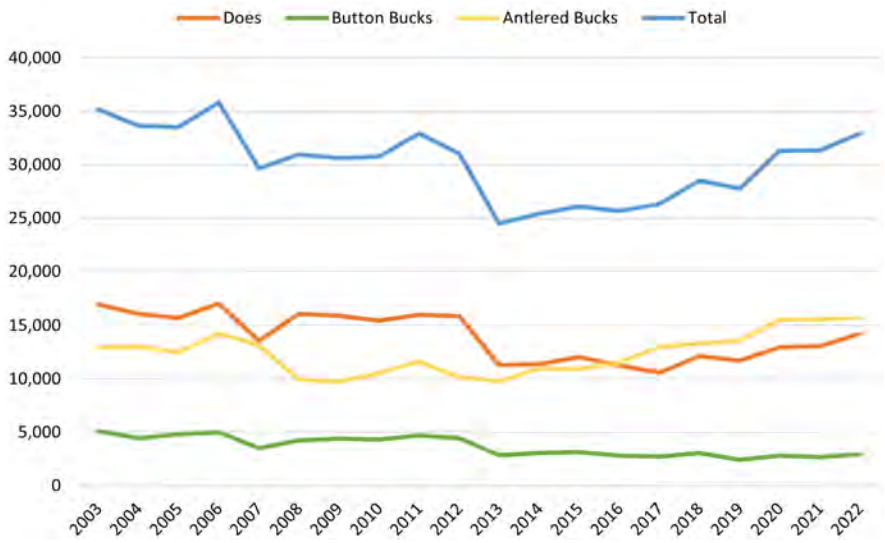

Figure 8. Kansas City Region deer harvest trend, 2003-2022.

Table 7. Kansas City Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Bates	2,521	3.3	4.5	8.5	0.9	8.6
Benton	4,148	6.2	9.2	11.0	2.4	21.3
Cass	2,675	4.3	5.7	10.2	2.1	22.5
Clay	1,146	3.8	6.4	10.3	3.5	44.3
Henry	3,754	6.2	8.8	9.2	2.5	15.1
Jackson	2,110	5.6	5.2	12.0	4.8	35.6
Johnson	3,443	4.5	5.0	7.5	1.4	20.9
Lafayette	1,696	2.9	4.0	8.8	1.0	19.6
Pettis	3,081	4.8	5.8	7.3	1.1	11.5
Platte	1,161	3.3	5.9	12.9	2.9	33.0
St. Clair	3,762	5.9	7.1	8.4	1.9	11.1
Vernon	3,427	4.8	4.4	5.6	1.3	6.5
Total (t)/Avg (a)	**t = 32,924**	**a = 4.6**	**a = 6.0**	**a = 9.3**	**a = 2.2**	**a = 20.8**

Northeast Region Deer Summary

Total deer harvest for the Northeast Region in 2022 was 43,739, which was 11% higher than in 2021 and marks the largest change in deer harvest of any region (**Table 8, Figure 9**). The deer harvest ranked 3rd among regions, and the Northeast Region ranked 2nd for the number of deer harvested per square mile (5.8). Top harvest counties were Macon, Pike, and Monroe. Following a considerable decline in deer numbers caused by a severe hemorrhagic disease outbreak in 2012, deer numbers in the Northeast Region have been slowly rebounding.

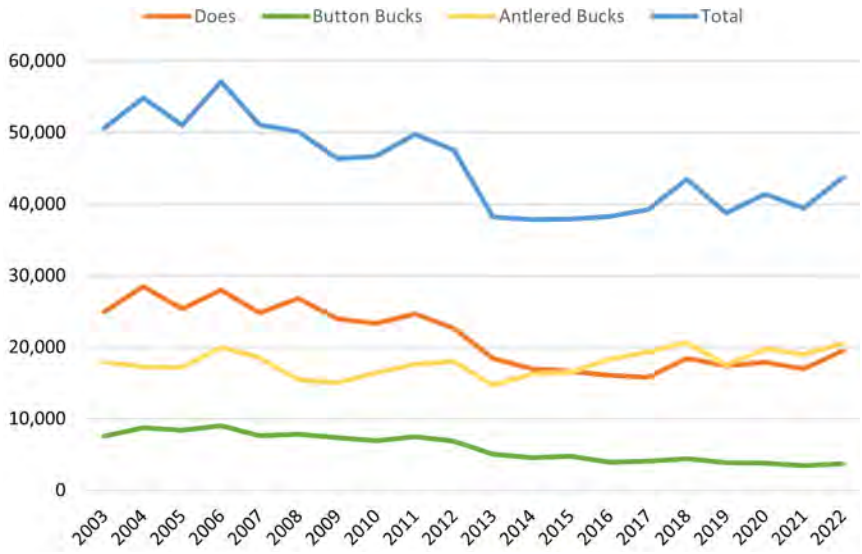

Figure 9. Northeast Region deer harvest trend, 2003-2022.

Table 8. Northeast Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Adair	2,727	5.2	7.7	9.9	2.4	19.1
Clark	2,625	5.5	5.7	7.7	2.0	9.4
Knox	2,445	5.2	6.1	7.1	1.7	10.2
Lewis	2,449	5.2	5.3	6.4	1.6	12.4
Macon	4,631	6.2	7.2	7.3	2.2	15.7
Marion	2,522	6.2	8.2	9.8	1.3	12.4
Monroe	3,872	6.4	7.5	7.1	2.1	17.5
Pike	4,567	7.3	8.4	7.4	2.2	10.9
Putnam	2,562	5.3	5.6	7.3	2.1	6.6
Ralls	2,825	6.3	8.2	9.7	1.6	5.1
Randolph	2,885	6.5	8.1	6.5	2.8	23.0
Schuyler	1,608	5.5	5.8	6.1	2.3	14.0
Scotland	2,797	6.8	7.4	7.5	2.2	6.5
Shelby	2,721	5.8	6.4	5.9	2.0	10.0
Sullivan	2,503	4.1	5.3	9.3	1.7	11.7
Total (t)/Avg (a)	**t = 43,739**	**a = 5.8**	**a = 6.9**	**a = 7.7**	**a = 2.0**	**a = 12.3**

Northwest Region Deer Summary

In 2022, total deer harvest for the Northwest Region was 33,343, which was 3% higher than the 2021 harvest total (**Table 9, Figure 10**). The Northwest Region ranked 5th in total deer harvest and 8th in deer harvested per square mile (3.6). Top harvest counties were Harrison, Linn, and Daviess. From the early 2000s until about 2016, deer population estimates and harvest in the Northwest Region declined more sharply than any other region. These declines are attributed to habitat loss through conversion of grassland to row-crop agriculture, as well as a particularly severe hemorrhagic disease outbreak in 2012. Conservative harvest regulations have allowed the population to rebound although the deer population in extreme Northwestern Missouri remains below desired levels.

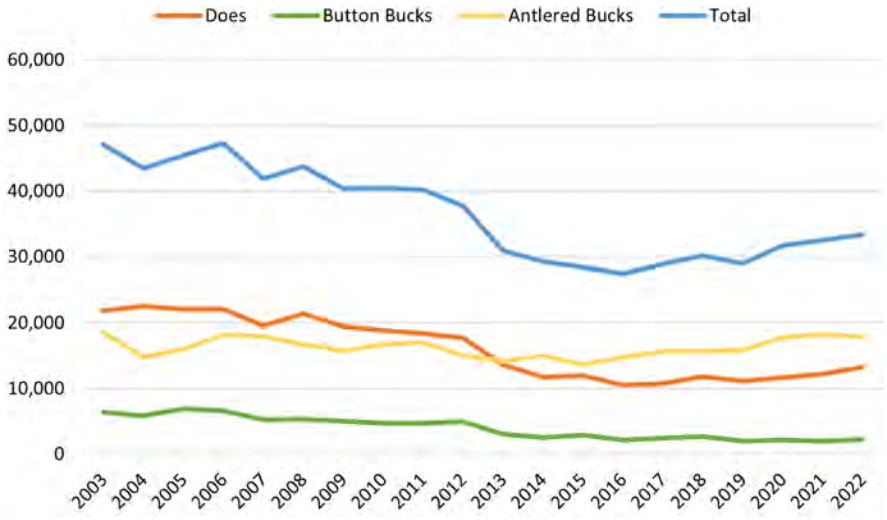

Figure 10. Northwest Region deer harvest trend, 2003-2022.

Table 9. Northwest Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Andrew	1,091	2.7	5.8	12.6	1.9	45.8
Atchison	508	1.0	3.3	19.9	1.0	21.4
Buchanan	861	2.5	4.1	13.9	1.1	41.6
Caldwell	1,825	4.6	7.2	9.2	1.7	18.5
Carroll	2,674	4.1	5.3	7.7	1.1	15.0
Chariton	2,266	3.5	4.3	6.5	1.2	22.5
Clinton	978	2.6	4.9	11.5	1.4	32.5
Daviess	2,781	5.2	5.4	4.9	2.0	20.7
DeKalb	970	2.4	5.1	11.5	1.5	51.5
Gentry	1,516	3.2	4.6	9.5	1.2	18.9
Grundy	1,843	4.6	4.6	6.1	1.1	18.1
Harrison	3,509	5.1	5.9	7.5	1.4	8.2
Holt	987	2.3	4.6	11.1	1.1	19.4
Linn	2,994	5.3	5.7	6.4	1.6	14.9
Livingston	2,113	4.4	5.3	8.5	1.3	15.3
Mercer	1,989	4.7	4.8	8.2	1.8	13.0
Nodaway	1,557	1.9	3.3	10.3	1.1	18.7
Ray	1,699	3.2	5.8	12.7	1.0	17.6
Worth	1,182	4.6	4.9	7.8	2.5	18.9
Total (t)/Avg (a)	**t = 33,343**	**a = 3.6**	**a = 5.0**	**a = 9.8**	**a = 1.4**	**a = 22.8**

Ozark Region Deer Summary

Total deer harvest in the Ozark Region in 2022 was 38,429, which was 8% lower than in 2021 (**Table 10, Figure 11**). There was particularly high acorn production across much of Missouri in 2022. Acorns are a preferred fall food source for deer, so when acorns are abundant, deer spend more time in the timber and travel less to seek out food compared to years when acorns are less abundant. Decreased deer movement leads to fewer deer sightings and opportunities for harvest by hunters, so harvest tends to decline during years with an abundant acorn crop. The Ozark Region ranked 4th in total harvest and 6th in harvest per square mile (4.3). Top harvest counties were Texas, Howell, and Oregon. The deer population in the Ozark Region has been increasing steadily for many years, as has been the case across much of southern Missouri, due to historically conservative harvest regulations.

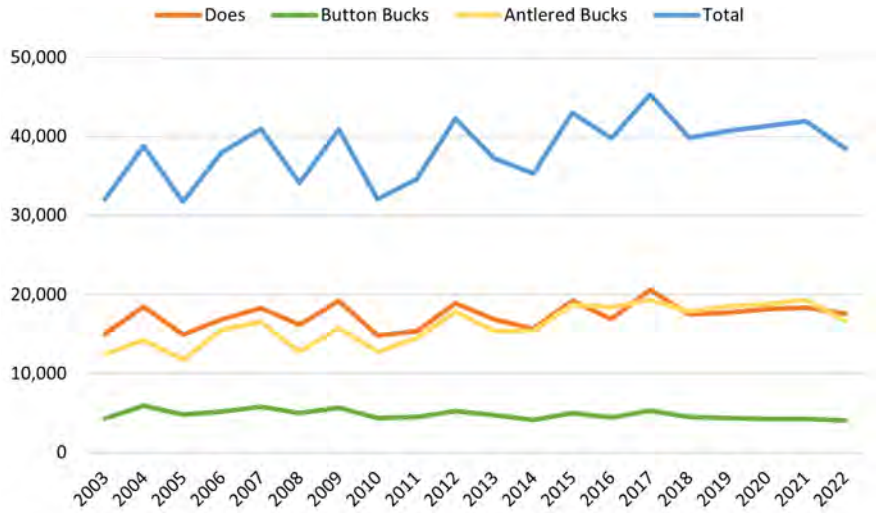

Figure 11. Ozark Region deer harvest trend, 2003-2022.

Table 10. Ozark Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Carter	1,852	3.7	7.9	13.5	1.8	18.6
Dent	3,351	4.5	7.1	11.6	1.1	16.5
Douglas	3,349	4.2	5.3	6.8	0.8	11.3
Howell	4,544	5.1	5.4	6.8	1.1	9.1
Oregon	3,643	4.7	5.0	7.4	0.7	5.6
Ozark	2,473	3.5	5.5	10.5	0.7	8.1
Phelps	2,538	3.9	7.7	12.6	1.5	19.8
Pulaski	2,371	4.6	8.3	14.4	2.0	26.7
Ripley	3,144	5.2	6.9	9.1	1.4	13.7
Shannon	3,222	3.3	4.1	7.3	1.2	15.6
Texas	4,700	4.1	5.4	8.3	0.7	20.1
Wright	3,242	4.9	5.4	6.8	1.5	16.3
Total (t)/Avg (a)	**t = 38,429**	**a = 4.3**	**a = 6.2**	**a = 9.6**	**a = 1.2**	**a = 15.1**

Southeast Region Deer Summary

The total deer harvest within the Southeast Region in 2022 was 31,683, which was 3% higher than in 2021 (**Table 11, Figure 12**). Among regions, Southeast ranked 7th in total deer harvest and 7th in harvest per square mile (3.6). Top harvest counties were Bollinger, Wayne, and Cape Girardeau. The region has some of the most diverse habitat in the state causing the deer population and harvest to vary dramatically across the region. Like much of southern Missouri, the deer population in the Southeast Region has been growing steadily for many years.

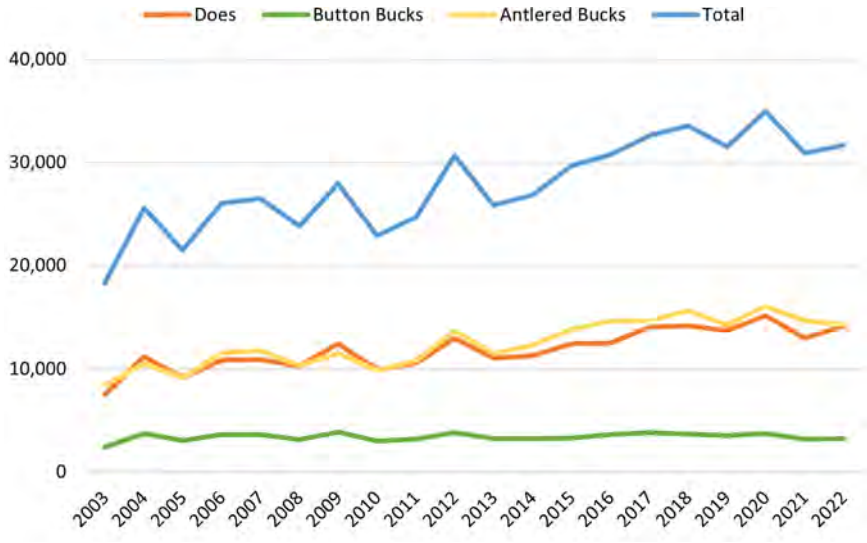

Figure 12. Southeast Region deer harvest trend, 2003-2022.

Table 11. Southeast Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Bollinger	4,273	7.2	10.8	10.5	2.1	15.1
Butler	1,916	3.0	4.5	9.2	0.8	10.4
Cape Girardeau	3,136	5.8	10.8	13.3	2.6	32.1
Dunklin	540	1.1	1.1	5.9	0.4	23.7
Iron	1,534	2.9	5.5	10.8	1.2	23.1
Madison	2,259	4.7	8.5	11.7	1.6	25.0
Mississippi	263	0.7	1.1	7.0	0.3	51.8
New Madrid	350	0.5	1.2	13.4	0.3	27.8
Pemiscot	199	0.4	0.9	20.1	0.4	91.1
Perry	3,066	6.8	10.7	13.2	1.8	21.8
Reynolds	2,310	2.9	4.6	9.4	0.9	15.3
St. Francois	2,461	6.1	9.4	9.9	3.0	28.3
Ste. Genevieve	2,679	5.6	12.7	20.9	2.0	29.4
Scott	815	2.1	2.7	9.3	1.1	22.6
Stoddard	2,647	3.4	3.9	8.5	1.2	15.9
Wayne	3,235	4.5	8.1	10.4	2.0	16.6
Total (t)/Avg (a)	**t = 31,683**	**a = 3.6**	**a = 6.0**	**a = 11.5**	**a = 1.4**	**a = 28.1**

Southwest Region Deer Summary

During the 2022 hunting season, 43,898 deer were harvested in the Southwest Region. This total was 4% higher than the 2021 harvest (**Table 12, Figure 13**). Regional deer harvest ranked 2nd among regions, and the number of deer harvested per square mile ranked 4th (4.7). Top harvest counties were Webster, Polk, and Laclede. The deer population has exhibited a slowly increasing trend over time, due in large part to historically conservative harvest regulations within the region.

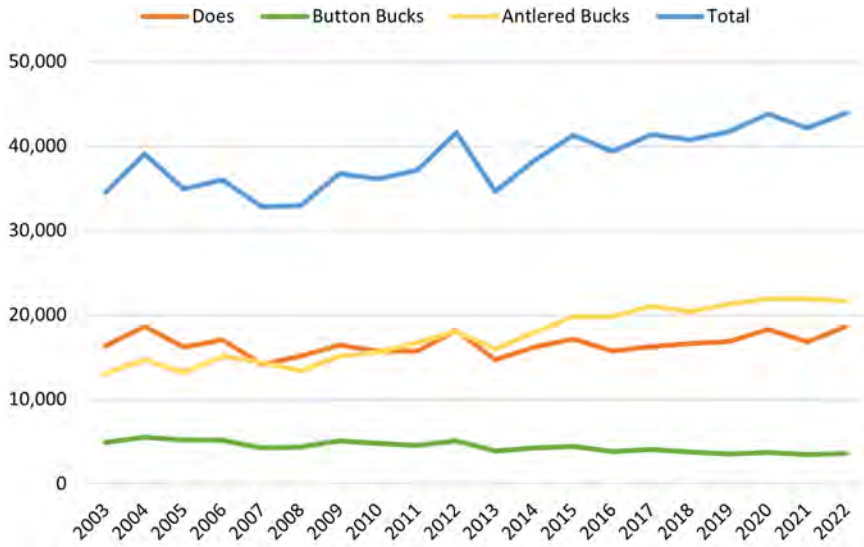

Figure 13. Southwest Region deer harvest trend, 2003-2022.

Table 12. Southwest Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Barry	2,428	3.2	5.7	12.1	1.0	24.3
Barton	2,093	3.8	5.7	10.2	1.3	16.5
Cedar	2,705	5.9	6.9	6.1	1.6	10.1
Christian	2,220	4.2	7.8	9.8	1.7	9.2
Dade	2,118	4.4	4.5	4.8	1.2	10.8
Dallas	3,140	6.0	6.7	6.8	1.9	10.1
Greene	2,887	5.0	9.7	13.6	3.2	12.6
Hickory	2,451	6.3	8.7	9.7	3.0	17.0
Jasper	2,744	4.9	6.2	7.0	1.3	7.3
Laclede	3,185	4.3	6.8	10.0	1.2	14.1
Lawrence	2,371	4.0	5.3	9.2	1.4	10.3
McDonald	1,961	3.8	5.9	12.5	0.8	6.2
Newton	2,954	5.0	6.7	8.9	1.6	14.5
Polk	3,216	5.2	7.1	6.4	1.8	15.3
Stone	1,884	4.3	5.6	7.8	1.7	13.8
Taney	2,225	3.9	5.6	10.2	1.1	13.2
Webster	3,316	5.8	6.8	7.8	1.0	6.4
Total (t)/Avg (a)	**t = 43,898**	**a = 4.7**	**a = 6.6**	**a = 9.0**	**a = 1.6**	**a = 12.4**

St. Louis Region Deer Summary

A total of 29,465 deer were harvested in the St. Louis Region in 2022, which was 3% lower than the 2021 harvest (**Table 13, Figure 14**). The St. Louis Region ranked 8th in total deer harvest among regions, but 1st in deer harvest per square mile (6.9). Top harvest counties were Franklin, Jefferson, and Lincoln. The deer population in the St. Louis Region has been increasing slowly over time.

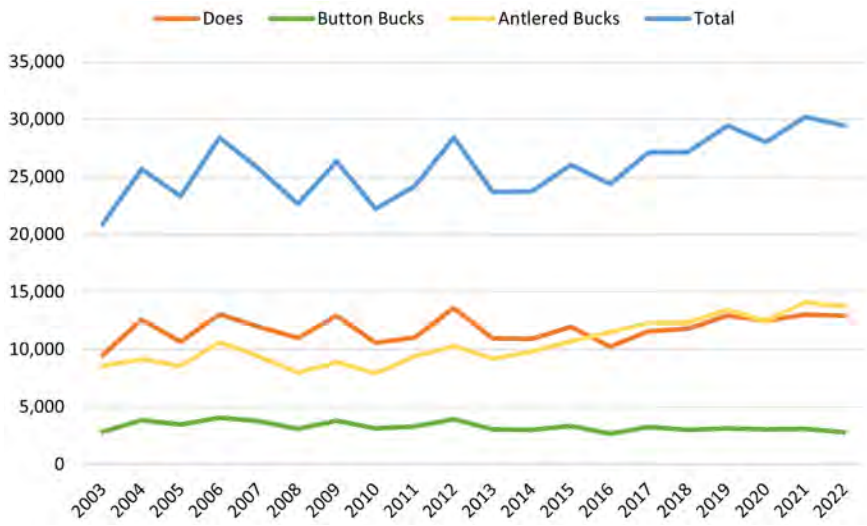

Figure 14. St. Louis Region deer harvest trend, 2003-2022.

Table 13. St. Louis Region deer harvest and hunting effort, 2022.

County	Total Harvest	Harvest per Square Mile	Firearms Hunters per Square Mile	Trips per Kill (Firearms)	Archery Hunters per Square Mile	Trips per Kill (Archery)
Crawford	3,501	4.9	8.7	12.6	1.5	10.5
Franklin	6,471	7.6	10.6	10.1	2.7	21.5
Jefferson	4,966	8.7	10.2	8.0	4.9	23.5
Lincoln	4,310	7.5	8.1	7.5	2.9	22.6
St. Charles	2,248	5.3	5.9	8.7	3.9	32.5
St. Louis	2,144	9.7	4.4	7.8	6.5	12.3
Warren	2,834	7.0	11.5	10.5	3.1	11.9
Washington	2,991	4.1	6.3	9.7	1.6	18.4
Total (t)/Avg (a)	**t = 29,465**	**a = 6.9**	**a = 8.2**	**a = 9.4**	**a = 3.4**	**a = 19.1**

County Deer Population Status

Deer populations can be highly variable within a region and even within a county due to variation in habitat availability, harvest regulations, local hunter goals and density, amount of public and private land, and disease outbreaks (e.g., hemorrhagic disease). Therefore, county-wide assessments of deer population trends are not applicable to every local situation but are a general representation of the status and population trend.

The Deer Program evaluates a variety of data to assess county-specific deer populations and for hunting regulation development including:

- **Harvest data —The total number and composition (antlered bucks, does, and button bucks) of harvested deer.**
- **Population data — Population simulations incorporating age-at-harvest data and estimated survival and reproduction rates.**
- **Hunter, landowner, and staff surveys — Hunters and landowners are randomly selected to receive mail surveys.**
- **Public and staff input — Input is received via email, the MDC website, public meetings, and phone calls.**

Survey data are critical when assessing the deer population in relation to public acceptance levels. In cooperation with the USDA, we send out surveys statewide to agricultural producers to assess perceptions and attitudes toward deer populations and regulations. Additionally, we survey deer hunters annually to estimate hunter effort, hunter density, and opinions concerning deer populations and regulations. We also consider public comments received throughout the year via the web, letters, calls, social media, public meetings, and emails.

The Deer Program reviews this information annually on a county-by-county basis to classify the deer population status and trends. Socially acceptable levels (cultural carrying capacity) are the first thing we look at when classifying the status of the deer population. Although biological carrying capacity, or the landscapes limitations on the number of deer that can be supported, is included within our assessment, cultural carrying capacity is typically much lower. We aim for this goal because when deer populations are at biological carrying capacity, numbers are high enough to increase deer-human conflict. By monitoring population trends for each county, we can gain an understanding of population status and adjust harvest regulations accordingly.

The goal of MDC's Deer Program is to maintain stable deer populations within each county that are at a socially acceptable level for most stakeholders. Currently, deer populations are increasing across most of Missouri and are generally at socially acceptable levels. Exceptions include portions of northwestern Missouri that are still recovering from a severe outbreak of hemorrhagic disease that occurred in 2012 as well as habitat loss due to conversion of grassland to row-crop agriculture. Across most of the state, the deer population has recovered from the population decline that occurred because of the hemorrhagic disease outbreak of 2012.

Table 14. County deer harvest totals by method of take and deer type, 2022.

	Archery				Firearms				Totals[1]			
County	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total
Adair	290	30	256	576	1,099	167	885	2,151	1,389	197	1,141	2,727
Andrew	100	9	69	178	548	59	306	913	648	68	375	1,091
Atchison	58	7	51	116	307	16	69	392	365	23	120	508
Audrain	173	47	238	458	956	223	897	2,076	1,129	270	1,135	2,534
Barry	176	39	192	407	1,103	154	764	2,021	1,279	193	956	2,428
Barton	172	35	195	402	884	114	690	1,688	1,057	149	887	2,093
Bates	222	29	205	456	1,149	163	752	2,064	1,372	192	957	2,521
Benton	302	83	373	758	1,406	330	1,598	3,334	1,729	416	2,003	4,148
Bollinger	244	88	423	755	1,552	380	1,586	3,518	1,796	468	2,009	4,273
Boone	390	64	397	851	1,346	207	1,249	2,802	1,736	271	1,646	3,653
Buchanan	74	10	54	138	405	55	263	723	479	65	317	861
Butler	213	52	265	530	818	101	461	1,380	1,032	153	731	1,916
Caldwell	162	11	142	315	813	112	585	1,510	975	123	727	1,825
Callaway	410	80	473	963	1,875	396	2,036	4,307	2,304	506	2,628	5,438
Camden	300	47	295	642	1,099	205	1,007	2,311	1,399	252	1,302	2,953
Cape Girardeau	146	53	330	529	1,081	242	1,280	2,603	1,228	295	1,613	3,136
Carrol	191	33	211	435	1,176	143	920	2,239	1,367	176	1,131	2,674
Carter	197	69	246	512	707	121	434	1,262	941	199	712	1,852
Cass	273	45	273	591	1,140	170	774	2,084	1,413	215	1,047	2,675
Cedar	196	42	243	481	1,105	167	893	2,165	1,318	218	1,169	2,705
Chariton	144	17	142	303	1,079	141	729	1,949	1,233	158	875	2,266
Christian	193	43	247	483	868	139	729	1,736	1,061	183	976	2,220
Clark	253	26	238	517	1,037	166	902	2,105	1,292	192	1,141	2,625
Clay	197	34	148	379	373	63	228	664	594	108	444	1,146
Clinton	89	13	69	171	451	60	286	797	545	74	359	978
Cole	149	33	168	350	636	171	780	1,587	785	204	951	1,940
Cooper	159	29	206	394	1,001	189	880	2,070	1,160	218	1,086	2,464
Crawford	254	71	274	599	1,379	308	1,213	2,900	1,633	379	1,489	3,501
Dade	118	35	181	334	847	169	763	1,779	967	205	946	2,118
Dallas	229	38	269	536	1,208	237	1,159	2,604	1,437	275	1,428	3,140
Daviess	210	40	300	550	1,096	188	947	2,231	1,306	228	1,247	2,781
DeKalb	76	7	58	141	455	58	316	829	531	65	374	970
Dent	162	29	195	386	1,287	340	1,280	2,907	1,457	381	1,513	3,351

[1]Includes deer harvested during managed hunts.

Table 14. County deer harvest totals by method of take and deer type, 2022 (continued).

	Archery				Firearms				Totals[1]			
County	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total
Douglas	151	41	202	394	1,411	303	1,238	2,952	1,563	345	1,441	3,349
Dunklin	46	13	60	119	254	21	146	421	300	34	206	540
Franklin	501	99	592	1,192	2,614	495	2,109	5,218	3,125	600	2,746	6,471
Gasconade	231	50	264	545	1,530	308	1,302	3,140	1,761	358	1,566	3,685
Gentry	130	22	89	241	656	95	524	1,275	786	117	613	1,516
Greene	345	49	368	762	1,017	184	872	2,073	1,374	237	1,276	2,887
Grundy	149	20	140	309	746	113	630	1,489	901	139	803	1,843
Harrison	383	33	313	729	1,531	199	1,050	2,780	1,914	232	1,363	3,509
Henry	229	78	435	742	1,358	305	1,349	3,012	1,587	383	1,784	3,754
Hickory	204	48	199	451	889	214	896	1,999	1,093	263	1,095	2,451
Holt	104	13	89	206	415	57	304	776	523	70	394	987
Howard	188	20	245	453	1,042	134	1,028	2,204	1,231	156	1,284	2,671
Howell	281	69	337	687	1,613	379	1,862	3,854	1,895	448	2,201	4,544
Iron	130	28	136	294	604	123	512	1,239	734	151	649	1,534
Jackson	384	62	358	804	547	82	360	989	1,020	178	912	2,110
Jasper	253	35	303	591	1,184	136	832	2,152	1,437	171	1,136	2,744
Jefferson	557	128	710	1,395	1,838	307	1,419	3,564	2,398	435	2,133	4,966
Johnson	299	55	282	636	1,377	261	1,168	2,806	1,676	316	1,451	3,443
Knox	231	36	207	474	963	196	812	1,971	1,194	232	1,019	2,445
Laclede	252	49	208	509	1,303	227	1,144	2,674	1,556	276	1,353	3,185
Lafayette	98	16	131	245	712	139	599	1,450	811	155	730	1,696
Lawrence	203	33	188	424	1,006	160	770	1,936	1,210	194	967	2,371
Lewis	185	43	171	399	939	200	908	2,047	1,125	243	1,081	2,449
Lincoln	306	77	406	789	1,531	306	1,563	3,400	1,851	403	2,056	4,310
Linn	262	34	292	588	1,212	152	1,004	2,368	1,478	190	1,326	2,994
Livingston	184	24	174	382	888	119	724	1,731	1,072	143	898	2,113
Macon	408	66	438	912	1,912	339	1,468	3,719	2,320	405	1,906	4,631
Madison	146	51	174	371	768	246	873	1,887	914	297	1,048	2,259
Maries	143	36	173	352	858	220	897	1,975	1,001	256	1,071	2,328
Marion	170	24	228	422	902	177	1,021	2,100	1,072	201	1,249	2,522
McDonald	177	20	148	345	921	95	599	1,615	1,099	115	747	1,961

[1]Includes deer harvested during managed hunts.

Table 14. County deer harvest totals by method of take and deer type, 2022 (continued).

	Archery				Firearms				Totals[1]			
County	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total
Mercer	254	21	224	499	814	82	594	1,490	1,068	103	818	1,989
Miller	197	38	169	404	913	284	1,096	2,293	1,111	322	1,266	2,699
Mississippi	14	3	34	51	150	10	52	212	164	13	86	263
Moniteau	108	30	136	274	701	200	809	1,710	809	230	945	1,984
Monroe	280	69	321	670	1,388	326	1,422	3,136	1,676	411	1,785	3,872
Montgomery	206	59	291	556	1,260	262	1,347	2,869	1,466	322	1,638	3,426
Morgan	278	72	367	717	1,300	389	1,592	3,281	1,578	461	1,959	3,998
New Madrid	23	6	34	63	184	19	84	287	207	25	118	350
Newton	281	47	257	585	1,232	153	963	2,348	1,522	202	1,230	2,954
Nodaway	166	3	98	267	838	53	398	1,289	1,005	56	496	1,557
Oregon	212	65	318	595	1,160	361	1,527	3,048	1,372	426	1,845	3,643
Osage	256	70	352	678	1,439	344	1,712	3,495	1,695	414	2,064	4,173
Ozark	139	34	180	353	1,016	209	867	2,092	1,172	243	1,058	2,473
Pemiscot	26	1	22	49	95	9	46	150	121	10	68	199
Perry	114	49	207	370	1,135	268	1,292	2,695	1,250	317	1,499	3,066
Pettis	216	48	281	545	1,228	220	1,088	2,536	1,444	268	1,369	3,081
Phelps	184	48	198	430	872	247	987	2,106	1,057	295	1,186	2,538
Pike	323	69	474	866	1,587	348	1,750	3,685	1,912	420	2,235	4,567
Platte	210	19	172	401	460	46	254	760	670	65	426	1,161
Polk	248	48	278	574	1,350	196	1,096	2,642	1,598	244	1,374	3,216
Pulaski	235	50	234	519	866	197	788	1,851	1,102	247	1,022	2,371
Putnam	332	36	298	666	1,016	115	765	1,896	1,348	151	1,063	2,562
Ralls	222	50	284	556	961	224	1,082	2,267	1,183	275	1,367	2,825
Randolph	205	33	255	493	1,143	175	1,074	2,392	1,348	208	1,329	2,885
Ray	153	17	123	293	820	104	482	1,406	973	121	605	1,699
Reynolds	171	55	224	450	850	184	825	1,859	1,021	239	1,050	2,310
Ripley	223	60	252	535	1,036	285	1,285	2,606	1,260	345	1,539	3,144
St. Charles	209	39	272	520	741	119	567	1,427	1,066	207	975	2,248
St. Clair	265	94	384	743	1,456	267	1,293	3,016	1,722	362	1,678	3,762
St. Francois	199	63	252	514	930	214	791	1,935	1,129	277	1,055	2,461
St. Louis	386	78	604	1,068	374	53	270	697	861	174	1,109	2,144

[1]Includes deer harvested during managed hunts.

Table 14. County deer harvest totals by method of take and deer type, 2022 (continued).

	Archery				Firearms				Totals[1]			
County	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total	Antlered Bucks	Button Bucks	Does	Total
Ste. Genevieve	160	41	185	386	1,197	205	890	2,292	1,358	246	1,075	2,679
Saline	151	40	195	386	959	137	810	1,906	1,110	177	1,005	2,292
Schuyler	153	16	133	302	601	150	555	1,306	754	166	688	1,608
Scotland	278	40	232	550	982	235	1,030	2,247	1,260	275	1,262	2,797
Scott	52	22	106	180	337	52	246	635	389	74	352	815
Shannon	186	60	231	477	1,099	291	1,339	2,729	1,295	351	1,576	3,222
Shelby	246	41	263	550	1,019	182	970	2,171	1,265	223	1,233	2,721
Stoddard	191	94	410	695	856	220	830	1,906	1,068	318	1,261	2,647
Stone	165	28	158	351	832	119	581	1,532	997	147	740	1,884
Sullivan	276	22	257	555	1,089	104	755	1,948	1,365	126	1,012	2,503
Taney	186	31	202	419	913	165	728	1,806	1,099	196	930	2,225
Texas	249	64	259	572	1,852	410	1,864	4,126	2,101	475	2,124	4,700
Vernon	268	63	366	697	1,409	235	1,084	2,728	1,678	298	1,451	3,427
Warren	268	37	258	563	1,203	196	869	2,268	1,472	234	1,128	2,834
Washington	211	79	276	566	1,095	288	1,039	2,422	1,308	367	1,316	2,991
Wayne	311	94	379	784	1,257	239	924	2,420	1,583	337	1,315	3,235
Webster	229	41	260	530	1,322	277	1,187	2,786	1,551	318	1,447	3,316
Worth	166	9	140	315	531	53	283	867	697	62	423	1,182
Wright	206	41	256	503	1,291	283	1,165	2,739	1,497	324	1,421	3,242
Regional												
Central	3,339	715	3,969	8,023	16,915	3,669	17,442	38,026	20,275	4,417	21,546	46,238
Kansas City	2,963	626	3,408	6,997	12,615	2,281	10,547	25,443	15,716	2,956	14,252	32,924
Northeast	3,852	601	4,055	8,508	16,638	3,104	15,399	35,141	20,503	3,725	19,511	43,739
Northwest	3,055	343	2,778	6,176	14,781	1,859	10,414	27,054	17,866	2,213	13,264	33,343
Ozark	2,425	630	2,908	5,963	14,210	3,426	14,636	32,272	16,712	4,079	17,638	38,429
Southeast	2,186	713	3,241	6,140	12,068	2,533	10,838	25,439	14,294	3,254	14,135	31,683
Southwest	3,627	661	3,896	8,184	17,984	2,906	14,666	35,556	21,655	3,586	18,657	43,898
St. Louis	2,692	608	3,392	6,692	10,775	2,072	9,049	21,896	13,714	2,799	12,952	29,465
Statewide												
Totals	**24,139**	**4,897**	**27,647**	**56,683**	**115,986**	**21,850**	**102,991**	**240,827**	**140,735**	**27,029**	**131,955**	**299,719**

[1]Includes deer harvested during managed hunts.

Deer Research Projects

MSU Regenerative Agriculture Project

Launched in the spring of 2023, this is a 4-year, multi-state project led by researchers at Mississippi State University investigating differences between conventional and regenerative agricultural practices. For the purposes of this study, conventional practices include pre-planting tillage as well as fertilizer and herbicide applications, as needed. Regenerative practices involve a no-till planting method and inputs (i.e., fertilizer and herbicide) are excluded or greatly reduced. Study sites in Mississippi, Tennessee, and Missouri will be used to examine the impacts of these different agricultural practices on soil properties, plant production and nutrient density, invertebrate communities, wildlife use, and economics across different latitudinal bands.

Each study site contains several plots that will receive different treatments over the course of the project (**Figure 15**) to investigate not only the differences between the agricultural practices, but also the nuanced impacts of different crop rotation frequencies where some are planted only in spring, some only in fall, and some are planted in both spring and fall. There are also plots left fallow, with only occasional disturbance to keep them in an early successional state, to act as a control in the study.

Figure 15. A study site in Missouri with treatment plots laid out to investigate the differences between conventional and regenerative agricultural practices.

Results of this project will help inform everyone from large-scale row crop farmers to those managing food plots recreationally for wildlife as to the most efficient and effective means of accomplishing their goals.

Survival, Recruitment, and Movement Patterns of White-tailed Deer in Missouri

This was a 5-year study (2015-2019) designed to estimate reproduction and survival rates, and examine movement patterns, of white-tailed deer in two contrasting landscapes: the glaciated plains of northern Missouri and the Ozarks of southern Missouri. Field work and data collection efforts have completed, but researchers continue to analyze data and provide new findings as they become available.

A paper was recently published using GPS collar data from this and another Missouri deer study to look at how the results of habitat selection studies can differ depending on the spatial scale at which the data are examined, as well as characteristics of individual deer (i.e., sex, age, home range size) and the landscape they occupy (i.e., forest cover, distance to roads).

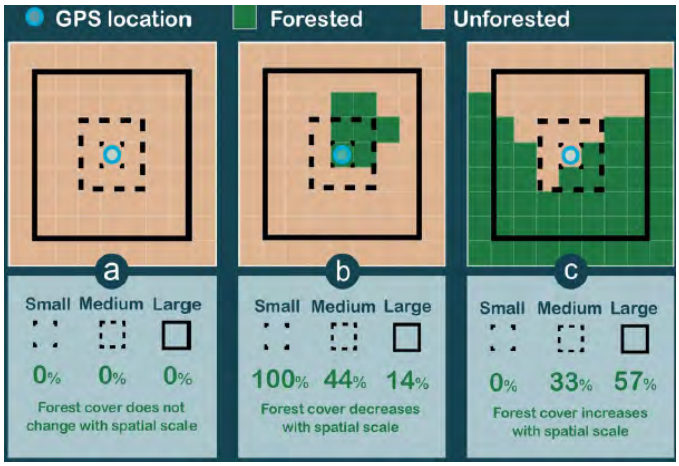

Figure 16. Three examples of how different spatial scales can lead to different outcomes in habitat selection studies.

The study found that individual deer view their landscape and select habitats at differing spatial scales. This seems to be driven, at least in part, by memory of individuals. Those with larger home ranges, that spend less time overall in any given part of their range, selected habitats at a smaller scale than those with smaller home ranges that may have greater spatial recall of the space they more frequently travel. Forest cover was also important, where deer in more homogeneously forested landscapes selected habitat at larger spatial scales compared to those in more fragmented landscapes. Overall, this study underscores the importance of considering multiple spatial scales when investigating habitat selection to account for animal individuality and different landscape features that impact how deer view their surroundings and make decisions about where to spend time. The full article can be found at **https://doi.org/10.1007/s10980-023-01631-z** or by contacting Kevyn.Wiskirchen@mdc.mo.gov.

Deer Management Assistance Program (DMAP)

In 2022, the Missouri Department of Conservation completed its fourth year of offering the Deer Management Assistance Program (DMAP) to landowners and hunters. The program is designed to enable landowners to meet deer management goals on their property by offering additional firearms antlerless deer harvest opportunities during deer season. Deer management objectives of those seeking to enroll in DMAP generally fall within 1 of 2 categories: 1) to reduce damage caused by deer browsing on agricultural, forest, or other plant communities, or 2) to achieve recreational deer management goals. Notably, 2022 was the first year that DMAP was available to landowners statewide (**Table 15**). A total of 125 properties were enrolled during 2022, 38 (30%) of which were co-ops involving multiple landowners. Ninety-one (73%) properties were enrolled to address deer damage concerns and 34 (27%) were enrolled to achieve recreation deer management goals. The total enrolled acreage was approximately 172,672 acres, compared to 86,182 acres in 2021. Fifty-seven (50%) counties had at least one property enrolled in DMAP in 2022. Across all enrolled properties, 882 hunters were issued a total of 4,146 DMAP permits, 1,217 (29%) of which were filled (**Table 15**).

To continue improving DMAP, enrolled landowners are asked to participate in a yearly post-season survey. Following the 2022 deer season when participants were asked on a scale of 1–10 whether they would recommend DMAP to a friend or colleague, 77% responded with an 8 or higher and 93% of respondents agreed that DMAP is an effective program for managing deer populations. Many suggested changes for DMAP were also provided through the survey, and MDC is considering these suggestions as it continues to look for ways to improve the program.

Those interested in enrolling in DMAP should contact the Private Lands Deer Biologist (Kevyn.Wiskirchen@mdc.mo.gov). In addition to having clearly defined deer management goals that cannot be met with other deer hunting permits already available, a minimum of 500 acres are needed to enroll in rural areas and at least 40 acres within municipalities. Individual parcels of land, regardless of ownership, may be combined to satisfy the acreage requirement. However, each parcel must be within ½ mile (by air) of the boundary of another parcel being combined to form an enrolled DMAP property. The annual DMAP enrollment period extends from May 15 through September 15. To learn more about DMAP, visit **https://mdc.mo.gov/dmap**.

Table 15. Summary of 2019-2022 Missouri Deer Management Assistance Program (DMAP) enrollment and harvest data.

	2019	2020	2021	2022
Eligible Counties	7	41	89	114
Enrolled Properties	13	28	56	125
Enrolled Landowners[1]	23	45	89	251
Enrolled Acreage	11,496	36,788	86,182	172,672
Authorized Permits/ Hunters	311/89	587/147	1,583/338	4,146/882
Filled Permits	96 (31%)	366 (62%)	613 (39%)	1,217 (29%)

[1]Some enrolled properties were comprised of multiple landowners who combined their acreage for DMAP enrollment.

Chronic Wasting Disease Overview

Chronic wasting disease (CWD) is a contagious, always fatal disease of deer, elk, and other members of the deer family. It spreads by direct animal-to-animal contact through urine, saliva, feces, and carcass parts of infected animals, and by animal contact with contaminated soil, water, or plant material. There is no known cure, treatment, or vaccine for CWD. Over time, CWD can spread widely and infect a large percentage of a deer population. When CWD becomes widely established, deer survival rates decrease, and population impacts are expected. The best way to manage CWD is to prevent its introduction into new areas and limit its spread.

Routine, statewide CWD surveillance began in Missouri in 2002. Since that time, more than 243,000 deer have been tested for CWD. The disease was first detected in captive deer in Linn County in 2010, in captive deer in Macon County in 2011, and in free-ranging deer in Macon County in 2012. As of June 2023, CWD has been detected in a total of 410 free-ranging deer in 31 counties (**Figure 17**). While the continued spread of CWD into new areas of Missouri is concerning, the percentage of CWD-positive deer where CWD has been found remains low.

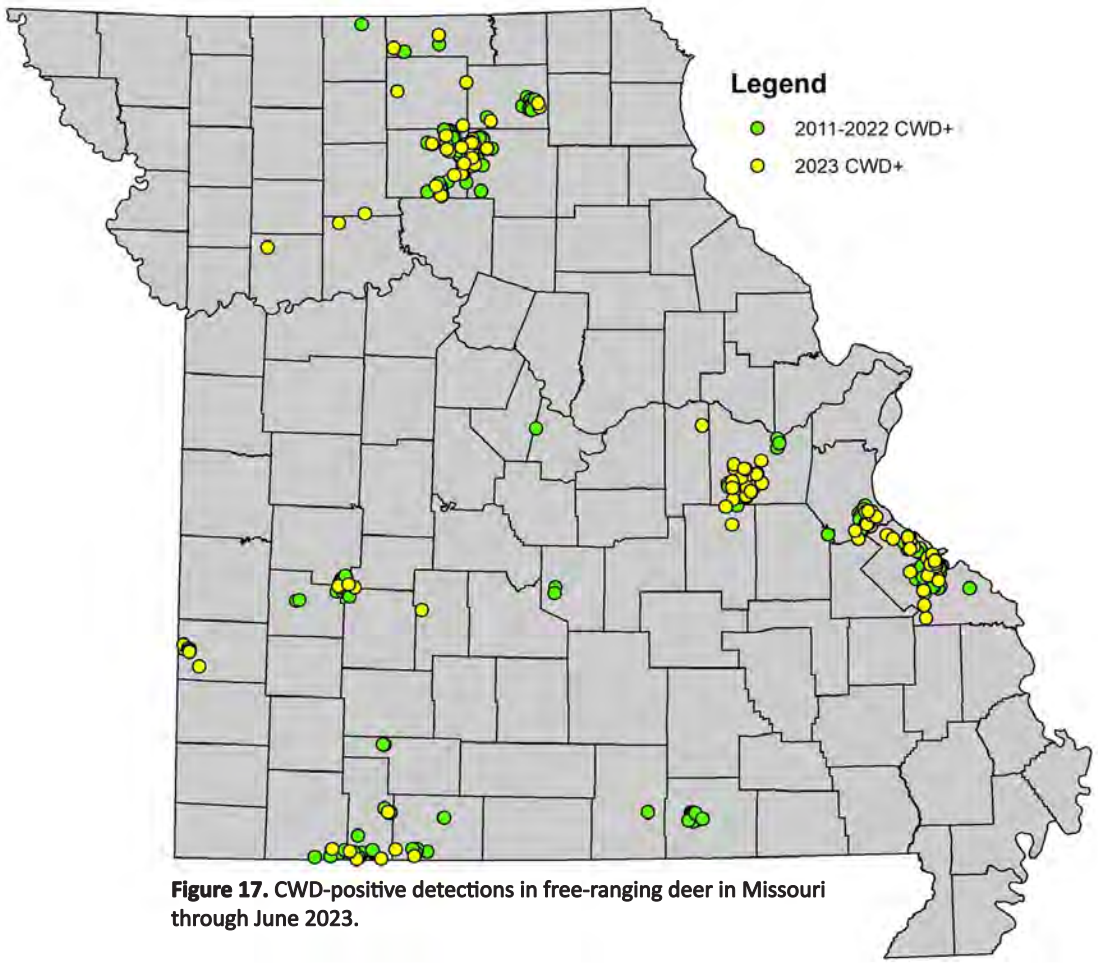

Figure 17. CWD-positive detections in free-ranging deer in Missouri through June 2023.

There have been no known cases of CWD infection in humans, but research is ongoing and potential risks are unknown at this time. The Centers for Disease Control and Prevention (CDC) recommends that hunters have their deer tested before consuming it if hunting in an area where CWD has been found. The CDC also recommends not consuming meat from known CWD-positive animals. For more information, visit **https://www.cdc.gov/prions/cwd/index.html**.

2022-23 CWD Surveillance and Monitoring

More than 33,000 free-ranging deer were tested for CWD across Missouri during the 2022-23 CWD surveillance year (July 1, 2022 - June 30, 2023). Roughly 19,500 deer were tested during mandatory sampling within portions of the CWD Management Zone on opening weekend of the November portion of firearms deer season. Another 3,500 were sampled through post-season targeted removal efforts (see below). Partnering taxidermists and meat processors collected the majority of the remaining samples. Sixty-nine sick deer were also sampled during the 2022-23 surveillance year, none of which tested positive for CWD.

Of the deer sampled for CWD during the 2022-23 CWD surveillance year, 118 deer tested positive in the following 23 counties: Adair (3), Barry (1), Barton (9), Carroll (1), Cedar (1), Crawford (2), Dallas (1), Franklin (22), Gasconade (1), Hickory (1), Jefferson (7), Linn (15), Livingston (1), Macon (13), Perry (4), Putnam (3), Ray (1), St. Clair (1), St. Francois (1), Ste. Genevieve (21), Stone (4), Sullivan (3), and Taney (2). CWD detections in Barton, Carroll, Dallas, Gasconade, Hickory, Livingston, Ray, St. Francois, and Sullivan counties were the first detections to date in these counties. The 118 CWD-positive deer included 77 hunter-harvested and 41 removed during post-season targeted removals.

CWD Regulations Update

Regulations intended to slow CWD spread are implemented within CWD Management Zone counties. The CWD Management Zone includes counties within 10-miles of a CWD detection. For 2022-23, the CWD Management Zone included 38 counties (**Figure 18**). Regulations within the CWD management zone include a ban on feeding and minerals, mandatory sampling requirements (select counties), removal of the antler-point restriction, carcass transportation restrictions, and an increase in antlerless deer harvest opportunities designed to prevent population growth.

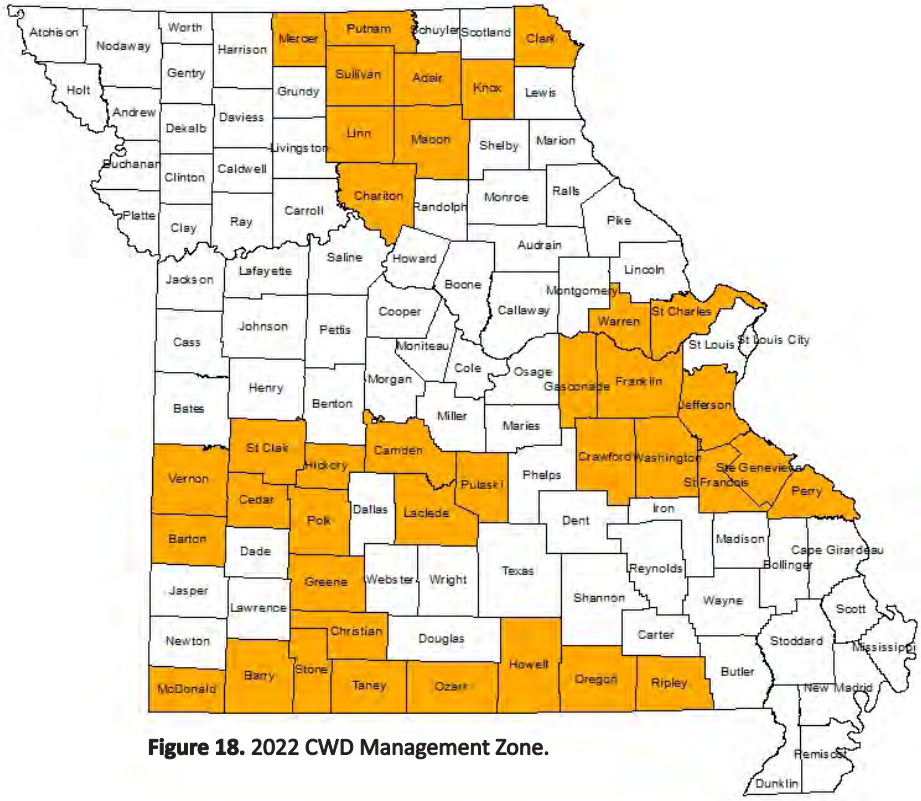

Figure 18. 2022 CWD Management Zone.

CWD Management Permits and Targeted Removal

CWD Core Areas are designated in localized areas where CWD is detected (**Figure 19**). CWD Core Areas include each section/land grant where a CWD detection occurs along with a 2-section buffer. Increasing deer harvest in CWD Core Areas can slow CWD transmission rates and limit the level of CWD in the environment by lowering deer densities and removing infected deer.

To increase harvest in CWD Core Areas, qualifying landowners are offered no-cost CWD Management Permits, allowing for harvest of deer of either sex during deer season. During the 2022-23 deer season, 1,260 deer were Telechecked on CWD Management Permits.

From January 16th through March 15th, 2023, MDC staff worked closely with cooperating landowners to remove additional deer within CWD Core Areas. Post-season targeted removal is one of the only known methods to slow the spread of CWD. Together, MDC staff and landowners removed over 3,500 deer within CWD Core Areas (**Figure 19**). Forty-one of the deer tested positive for CWD. Meat from deer in which CWD was not detected was returned to landowners or donated to the Share the Harvest venison donation program based on the landowners' wishes.

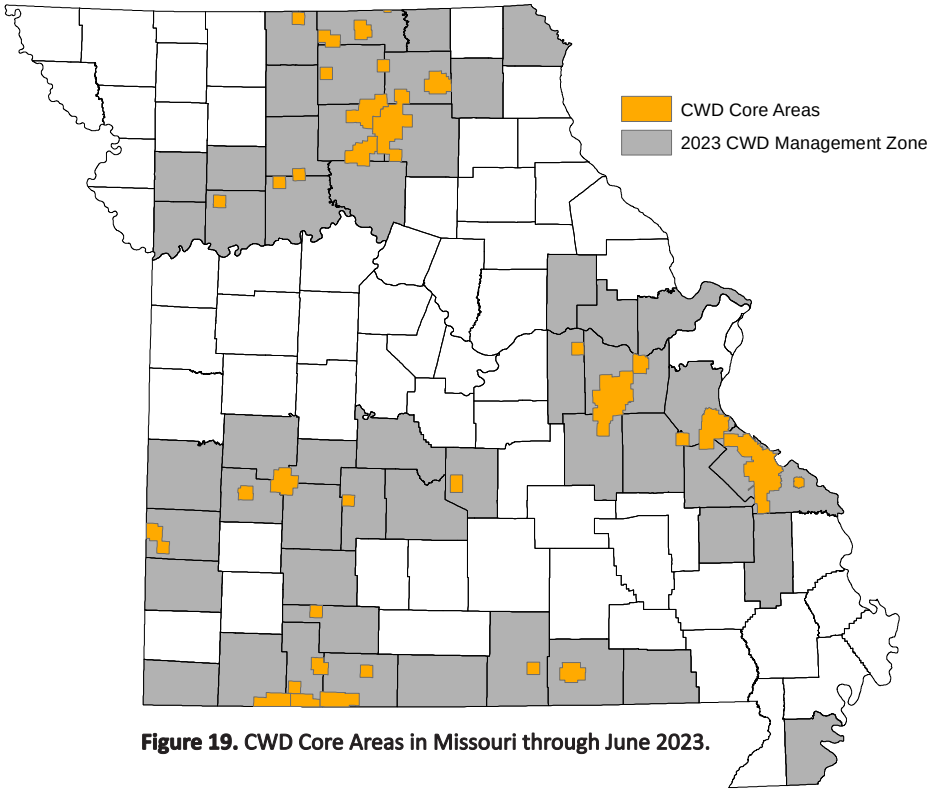

Figure 19. CWD Core Areas in Missouri through June 2023.

CWD Research Projects

Identifying and Understanding Landowner Motivations and Barriers to Participating in the CWD Targeted Removal Program

This ongoing research project has two objectives: 1) Identify and assess the barriers and motivations that affect landowner participation in targeted removals, and 2) Gain information to help design a program to recruit landowners and to retain their participation in targeted removals. During the project, MDC collaborated with DJ Case & Associates to conduct 12 focus group meetings with landowners in a subset of CWD Core Areas in four regions of Missouri during winter/spring 2022. These meetings provided focus group participants an opportunity to share their opinions about deer, CWD, CWD management, and a variety of other related topics. MDC used the information obtained during these meetings to create a mail survey that was sent to all landowners that own property within a CWD Core Area, which are areas within about two miles of where CWD has been detected. The survey, which was mailed to participants early in 2023, will provide additional information about landowner opinions about CWD, CWD management, and CWD communication to the public from MDC. Results of the survey will be analyzed during fall of 2023 and a final report will be completed during 2024.

Modeling the Effects and Risks of Common Harvest Strategies and Human Practices to Promote Effective Management of CWD

This research project was a collaborative effort between MDC and researchers at Emory University and the University of Montana. Objectives of the project were to: 1) Evaluate the effects of targeted removals on CWD prevalence rates, 2) Evaluate factors that would result in maximum effectiveness of the targeted removal strategy, 3) Identify trigger points to guide targeted removal efforts to help allocate limited agency resources where they are likely to be most successful, and 4) Identify alternative harvest strategies to implement when targeted removal efforts are no longer likely to be successful due to high CWD prevalence rates. The project was completed during 2023 and MDC will be using the results to prioritize future targeted removal efforts and determine the effect of removal efforts on lowering the transmission rate of CWD.

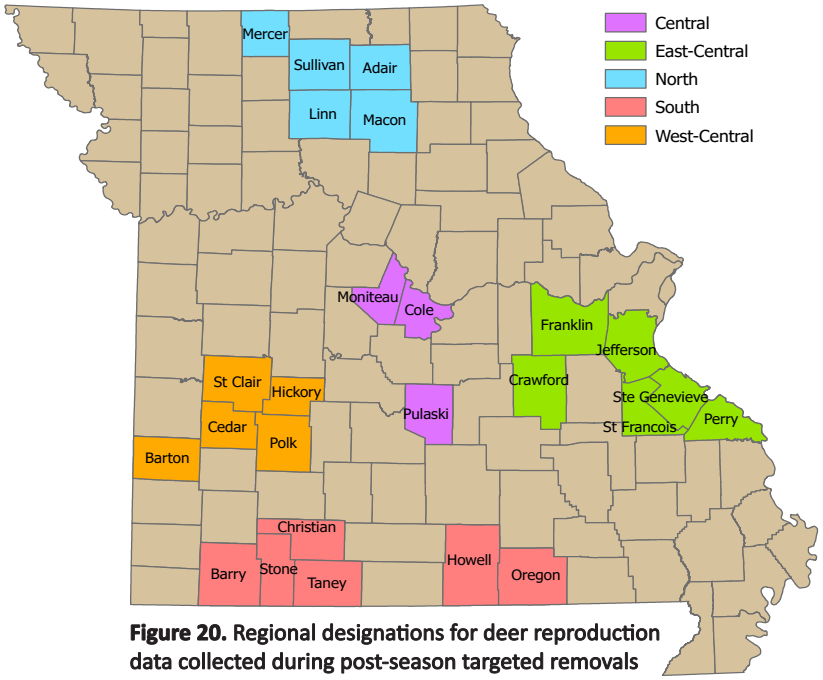

Figure 20. Regional designations for deer reproduction data collected during post-season targeted removals 2017-2023 (see **Table 16**).

Table 16. Reproductive data collected during post-season targeted removal operations in CWD Core Areas, 2017-2023.

Region[1]	Female Age	Number of Deer	Pregnancy Rate	Fetuses per Pregnant Female	Fetal Sex Ratio (M:F)	Average Conception	Average Parturition
Central	0.5	5	0.00	0.00	NA	NA	NA
	1.5	6	0.50	1.00	NA	5-Nov	22-May
	2.5+	137	0.92	1.90	1.23	7-Nov	24-May
	All	148	0.87	1.88	1.27	7-Nov	24-May
East-Central	0.5	103	0.13	1.23	2.25	3-Dec	19-Jun
	1.5	106	0.88	1.58	1.23	17-Nov	2-Jun
	2.5+	554	0.92	1.85	1.22	13-Nov	31-May
	All	764	0.80	1.80	1.24	14-Nov	1-Jun
North	0.5	259	0.04	1.27	1.00	24-Nov	10-Jun
	1.5	188	0.90	1.69	0.91	8-Nov	28-May
	2.5+	1,046	0.96	1.98	1.14	10-Nov	28-May
	All	1,496	0.79	1.93	1.11	10-Nov	28-May
South	0.5	85	0.06	1.40	0.33	14-Nov	31-May
	1.5	87	0.56	1.22	1.20	8-Nov	25-May
	2.5+	577	0.90	1.77	0.99	6-Nov	23-May
	All	749	0.77	1.72	1.00	6-Nov	23-May
West-Central	0.5	158	0.03	1.25	1.50	29-Nov	15-Jun
	1.5	96	0.85	1.52	0.87	15-Nov	1-Jun
	2.5+	549	0.95	1.87	1.17	12-Nov	29-May
	All	804	0.75	1.82	1.14	13-Nov	30-May
Statewide	0.5	610	0.05	1.27	1.25	28-Nov	14-Jun
	1.5	483	0.82	1.57	1.00	13-Nov	30-May
	2.5+	2,863	0.94	1.89	1.14	11-Nov	27-May
	All	3,961	0.79	1.84	1.12	11-Nov	28-May

[1]Refer to **Figure 20** for regional designations.

Missouri Department of Conservation