

2024 Minnesota August Roadside Survey

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Summary

The 2024 range-wide pheasant index (52.1 birds/100 mi) was similar to 2023 (51.2 birds/100 mi). Despite a mild winter with little snow, which should have been conducive to the overwinter survival of hens, excessively wetter conditions in spring and summer adversely affected nesting and brood-rearing in 2024. Pheasants increased in the West Central (6%), Central (34%), East Central (70%), and South Central (8%) regions but declined in the Southwest (29%) and Southeast (9%) regions compared to 2023. However, the pheasant index in the Southwest region (81.8 birds/100 mi) was still above the statewide average (52.1 birds/100 mi). Indices of other species exhibited variability in trends among regions. The statewide gray partridge index (1.8 birds/100 mi) was less than 2023 (4.3 birds/100 mi) and the 10-year average (2.7 birds/100 mi), but it increased in the West Central (200%) and Southwest (50%) regions. The mourning dove decreased range-wide and across all regions. The 2024 white-tailed deer range-wide index increased by 25% compared to 2023, was 16% above the 10-year average and increased by 1% to 50% across all regions except the South Central and Southeast regions, which decreased by 9% and 7%, respectively.

Introduction

This report summarizes the 2024 Minnesota August Roadside Survey (ARS). Since 1955, Minnesota Department of Natural Resources (MN DNR) wildlife and enforcement personnel have conducted the annual ARS during the first two weeks of August throughout Minnesota's farmland regions (Figure 1). There are 170 established routes, with 149 located within the pheasant range. The 2024 ARS consisted of 169 25-mile routes (1-4 routes/county), of which 148 were located in the ring-necked pheasant range. Routes were surveyed from 30 July – 15 August 2024. Observers drove each route during the early morning (starting at or near sunrise) at 15-20 mi/hr and recorded the number of pheasants, gray (Hungarian) partridge, eastern cottontail rabbits, white-tailed jackrabbits, white-tailed deer, mourning doves, sandhill cranes, and other wildlife they observed including information on sex and age of these species. Counts conducted on cool, clear, calm mornings with heavy dew yield the most consistent results because wildlife (especially pheasants, gray partridge, and rabbits) move to warm, dry areas (e.g., gravel roads) during early-morning hours. These data provide an **index of relative abundance** to monitor long-term trends in regional and range-wide populations. Results are reported by agricultural region and range-wide; however, population indices for species with low detection rates (e.g., white-tailed jackrabbits, gray partridge) are imprecise and unreliable.

Habitat Conditions

Grassland wildlife habitat on public and private lands in the primary pheasant range increased by 9,781 acres in 2024. There was an approximately 4,000-acre decline in lands enrolled in the Conservation Reserve Program (CRP) compared to 2023; however, this was offset by increases in private lands enrolled in the Conservation Reserve Enhancement Program (CREP), Reinvest in Minnesota (RIM) and lands managed by the U. S. Fish and Wildlife Service (USFWS) and MN DNR for public use (Table 1). Private lands enrolled in the CREP and RIM programs increased by 1,545 and 3,713 acres, respectively (Table 1). Federally managed USFWS Waterfowl Production Areas, wildlife refuges, and conservation easements increased by approximately 6,000 acres, and Wildlife Management Areas managed by the DNR increased by approximately 2,300 acres (Table 1). Total protected lands account for 6.7% of lands within the pheasant range, similar to the value in 2023 (6.6%). The West Central and Southwest regions have the highest proportion of protected lands, 10.1% and 7.4%, respectively, and account for 40% of all protected land in the pheasant range (Table 1).

Minnesota's Walk-in Access (WIA) program continues to provide public hunting opportunities on private land already enrolled in existing conservation programs or with natural habitat. The program has grown each year since its inception. In 2024, it features more than 250 sites totaling more than 29,000 acres, primarily in the South Central, Southwest, and West Central regions but with additional sites within the Central, East Central, and Southeast regions. Sites are open to public hunting from 1 September – 31 May, where boundary signs are present. Hunters must purchase a \$3 WIA Validation that allows access to all WIA lands statewide. For more information on the WIA program, including the code of conduct for WIA lands, a printable atlas of enrolled sites by county, aerial photos of each site, interactive maps, and Global Positioning System (GPS) downloads, [visit the WIA program website](#). The WIA program is funded through a Natural Resource Conservation Service grant and the U.S. Department of Agriculture grant. Other funding sources are provided through a surcharge on nonresident hunting licenses, a one-time appropriation from the Minnesota Legislature in 2012, and donations from hunters.

Weather Summary

Following National Oceanic and Atmospheric Administration conventions, the 30-year period used to calculate normal temperatures now includes 1991-2020. Statewide weather conditions for pheasants were warmer in 2023-2024, with wetter spring and summer conditions. Winter conditions across the state were milder than average, primarily because of low snowfall levels throughout the state (Table 2). The average snow depth was 1 inch or less in all regions except the Northwest region, which averaged 1.9 inches (Table 2). All regions were 7.8 degrees or more warmer than average during winter (Table 2). Spring was warmer and wetter than average across the state (Table 2). Summer was also slightly warmer across the state, except for the Southeast region, and wetter, especially in the Southwest, South Central, and Southeast regions (Table 2).

Survey Conditions

Weather conditions during surveys were very good in 2024. Temperature, dew, wind, and sky cover conditions were all similar to 10-year averages. Thus, weather conditions in 2024 were unlikely to substantially influence survey results.

Species Reports

Ring-necked Pheasant

The 2024 range-wide total pheasant index (52.1 birds/100 mi) was similar to 2023 (51.2 birds/100 mi; Table 3, Figure 2A). Range-wide indices of hens and broods increased (32% and 10%, respectively) compared to 2023, whereas the rooster index remained similar (Table 3). The number of chicks per brood (4.2) and broods per 100 hens (76.9) declined from 2024 (Table 3). The total number of pheasants, hens, roosters, and broods per 100 miles all exceeded their 10-year averages, but the index of broods per 100 hens and chicks per brood declined by 21% and 12%, respectively, from the 10-year averages (98.8 and 4.7, respectively; Table 3). All range-wide indices in 2024 were below the long-term averages (Table 3). The index of chicks per brood in 2024 (5.0) is 12% less than the 10-year average (4.7) and 25% less than the long-term average (5.6; Table 3). This suggests that nesting and brood-rearing in 2024 was not as successful relative to last year (2023).

Despite the relatively stable index statewide, trends in the pheasant index varied among regions. The pheasant index increased the most from 2023 in the East Central region (70%), followed by the Central (34%), South Central (8%), and West Central (6%) regions (Table 4). Indices declined in the Southwest (-29%) and Southeast (-9%) regions (Table 4). Pheasant indices remain well below their long-term averages in all regions but are near or above their ten-year averages except for the East Central and Southeast regions (Table 4). The Southwest (81.8 birds/100 mi) and West Central (65.9 birds/100 mi) regions had the highest indices, followed by the South Central region (58.6 birds/100 mi). These regions should provide the best hunting opportunities in the state.

Gray Partridge

The 2024 range-wide gray partridge index (1.8 birds/100 mi) was less than 2023 (4.3 birds/100 mi) and the 10-year average (2.7 birds/100 mi). The partridge index remains 85% below the long-term average (12.1 birds/100 mi; Table 3, Figure 2B). Partridges are generally rare throughout the state but may be locally abundant. In 2024, the Southwest (11.4 birds/100 mi) region had the greatest number of observations and should provide the best opportunities for harvesting gray partridge (Table 4). All other regions had less than 1.3 birds/100 mi (Table 4).

Cottontail Rabbit and White-tailed Jackrabbit

Range-wide, the 2024 eastern cottontail rabbit index (8.7 rabbits/100 mi) increased from 2023 (5.5 rabbits/100 mi) and is above the 10-year average (5.8 rabbits/100 mi) and the long-term average (6.0 rabbits/100 mi; Table 3, Figure 3A). The West Central, Central, East Central, and South Central regions

saw the greatest increases in their cottontail index (Table 4). The greatest increase was in the South Central region, where the cottontail index increased 171% to 12.9 rabbits/100 mi. The best rabbit hunting opportunities will be in the South Central, Southeast, and East Central regions (Table 4).

White-tailed jackrabbits were observed on nine routes: Northwest (4 routes), West Central (3 routes), Southwest (1 route) and Central (1 route). Eight routes reported a single jackrabbit, while three jackrabbits were observed on one route. Jackrabbits are rarely detected, making annual or short-term trend comparisons difficult. Still, the jackrabbit index remains below the long-term average (Table 3, Figure 3B). Minnesota's jackrabbit population peaked in the late 1950s, declined to low levels in the 1980s, and has remained at low levels since then. The long-term decline in jackrabbits can primarily be attributed to the loss of preferred habitats (e.g., pasture, hayfields, and small grains).

White-tailed Deer

The 2024 white-tailed deer range-wide index (31.6 deer/100 mi) increased by 25% compared to 2023 (25.4 deer/100 mi) and was 16% above the 10-year average (Table 3, Figure 4A). The range-wide index was 172% above the long-term average (11.5 deer/100 mi; Table 3, Figure 4A). Regional indices for deer remained relatively similar in the Southwest, South Central, and Southeast regions and increased (range, 16-50%) in the other regions (Table 4).

Mourning Dove

The 2024 range-wide mourning dove index (142.5 doves/100 mi) decreased 38% compared to the 2023 index (230.7 doves/100 mi), was similar to the 10-year average (144.1 doves/100 mi), and was 41% below the long-term average (236.2 doves/100 mi; Table 3, Figure 4B). The dove index decreased across all regions (range, -16% to -51%; Table 4). Dove indices were greatest in the Southwest (214.8 doves/100 mi) and West Central (209.3 doves/100 mi) regions and should provide the greatest opportunities for harvesting doves.

Sandhill Crane

The 2024 statewide index of sandhill cranes (16.4 total cranes/100 mi) was 43% greater than in 2023 (11.5 total cranes/100 mi; Table 3). Annual changes in regional indices varied greatly. The Northwest and West Central regions saw a 211% and 189% increase in the total crane index, respectively (Table 4). Statewide, the total crane index was greater than the 10-year average (13.8 total cranes/100 mi; Table 3). Regionally, the Northwest and Central indices were 20% and 17% below their 10-year averages, respectively. However, the number of cranes increased in the South Central region by 99% (5.5 cranes/100 mi) compared to the 10-year average (2.8 cranes/100 mi) (Table 4). Crane observations during the ARS are less frequent in the West Central, South Central, and Southeast regions, however, and have yet to be reported in the Southwest region.

Other Species

Notable incidental sightings recorded by observers included sharp-tailed grouse (Red Lake County), red-headed woodpeckers (Freeborn, Pipestone, and Mower counties), and a black bear (Polk County).

Acknowledgments

We thank our many cooperators for completing the routes required for this survey; without their efforts, this survey would not be possible. Dusty VanThuyne (Minnesota Board of Water and Soil Resources) provided enrollment data on cropland retirement programs in Minnesota, and Lisa Rairdin (U.S. Fish and Wildlife Service) provided federal land acquisition data. Kate Carlson (MNIT Services Regional GIS Support) assisted with updating spatial layers. John Giudice (MN DNR Wildlife Research) was invaluable in assisting with the statistical analyses and reviewing an earlier draft of this report. Nicole Davros and Seth Gorham (MN DNR Wildlife Research) also reviewed an earlier draft of this report. This work was funded in part through the Federal Aid in Wildlife Restoration Act.

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Table 1. Abundance (total acres) and density (acres/mi²) of undisturbed grassland habitat within Minnesota's pheasant range, 2024, by agricultural region (AGREG).

AGREG	Cropland Retirement (private lands) ^a					Public Lands		Total	% of landscape	Density ac/mi ²
	CRP	CREP	RIM	RIM-WRP	WRP	USFWS ^b	MNDNR ^c			
WC	240,680	42,965	23,347	14,275	20,207	225,843	115,934	683,251	10.1%	64.4
SW	120,943	36,782	21,735	2,553	766	28,710	69,941	281,430	7.4%	47.6
C	122,968	21,743	51,457	7,026	3,190	95,227	56,126	357,737	5.9%	37.9
SC	102,416	37,016	13,917	10,780	9,107	12,754	40,023	226,013	5.6%	35.8
SE	75,600	4,020	7,290	1,070	1,577	37,294	59,469	186,320	5.0%	32.2
EC	2,463	0	1,948	0	4	4,994	97,459	106,868	3.3%	21.3
Total	665,070	142,526	119,694	35,704	34,851	404,822	438,952	1,841,619	6.7%	42.7

^a Unpublished data, BWSR, 2 August 2024.

^b Includes USFWS Waterfowl Production Areas (WPA), USFWS refuges, & USFWS conservation easements.

^c MN DNR Wildlife Management Areas (WMA). Comparisons to 2020 and earlier years are invalid due to data source changes.

Table 2. Average temperature, snow depth, and precipitation by season and agricultural region in Minnesota, 2024.

	Agricultural Region							STATE
	NW	WC	C	EC	SW	SC	SE	
Winter (December 1 - March 31)								
Temperature (average °F)	22.8	27.1	28.2	27.2	28.8	30.1	30.4	27.8
Departure from normal (°F) ^a	8.9	9.1	9.1	8.8	7.8	8.6	8.6	8.7
Snow Depth (average inches)	1.9	0.8	0.9	0.8	1.0	0.4	0.4	0.8
Spring (April 1 - May 31)								
Temperature (average °F)	49.5	52.4	52.8	50.5	53.6	54.1	53.0	52.3
Departure from normal (°F) ^a	2.1	2.5	2.6	1.9	2.6	2.4	1.8	2.3
Precipitation (total inches)	3.5	5.0	4.7	4.1	5.2	5.4	4.8	4.7
Departure from normal (inches) ^a	1.3	2.2	1.6	0.9	1.7	1.6	0.7	1.4
Summer (June 1 - July 31)								
Temperature (average °F)	66.7	69.1	68.9	67.1	69.8	70.2	68.9	68.7
Departure from normal (°F)	0.5	0.5	0.2	0.2	0.1	0.2	-0.2	0.2
Precipitation (total inches)	3.6	4.4	5.3	5.1	6.2	8.0	6.9	5.6
Departure from normal (inches) ^a	-0.3	0.3	1.0	0.7	2.0	3.3	2.0	1.3

^a Departures calculated using the 30-year NOAA average (1991-2020) over the respective time period.

Table 3. Range-wide trends (% change) in wildlife observed per 100 miles driven, Minnesota August roadside survey, 1955-2024.

Species Subgroup	Change from 2023 ^a					Change from 10-year average ^b				Change from long-term average (LTA) ^c			
	<i>n</i>	2023	2024	%	95% CI	<i>n</i>	2014-2023	%	95% CI	<i>n</i>	LTA	%	95% CI
Ring-necked pheasant													
Total pheasants	148	51.2	52.1	1	±17	148	43.7	19	±16	148	88.4	-44	±9
Cocks	148	8.6	8.8	2	±18	148	6.2	42	±21	148	10.3	-18	±15
Hens	148	7.7	10.2	32	±20	148	6.6	53	±22	148	12.9	-26	±12
Broods	148	7.2	8	10	±18	148	6.6	21	±16	148	11.7	-35	±9
Broods per 100 hens ^d	290	91.6	76.9				98.8	-21			89.7	12	
Chicks per brood ^d	290	5.0	4.2				4.7	-12			5.6	-25	
Median hatch date ^d	290	16-Jun	12-Jun				15-Jun				9-Jun		
Gray partridge	166	4.3	1.8	-58	±46	167	2.7	-33	±73	167	12.1	-85	±16
Eastern cottontail	166	5.5	8.7	57	±36	167	5.8	51	±34	167	6.0	44	±33
White-tailed jackrabbit^e	166	0.2	0.2			167	0.1			167	1.4		
White-tailed deer	166	25.4	31.6	25	±8	167	27.5	16	±7	167	11.5	172	±17
Mourning dove	166	230.7	142.5	-38	±1	167	144.1	-1	±1	167	236.2	-41	±1
Sandhill crane^f													
Total cranes	166	11.5	16.4	43	±17	167	13.8	25	±14				
Juveniles	166	0.7	2.3	243	±293	167	1.6	45	±126				

^a Includes Northwest region, except for pheasants. Estimates based on routes (*n*) surveyed in both years.

^b Includes Northwest region, except for pheasants. Estimates based on routes (*n*) surveyed at least 9 of 10 years.

^c LTA = long-term average during years 1955-2024, except for deer (1974-2024). Estimates for all species except deer based on routes (*n*) surveyed ≥40 years; estimates for deer based on routes surveyed ≥25 years. Thus, the Northwest region (8 counties in the Northwest) were added to the survey in 1982) included only deer.

^d Sample size is the total number of broods observed across all surveys rather than the number of routes run in 2024.

^e White-tailed jackrabbits are too rare to make annual or 10-year comparisons.

^f Sandhill cranes were added to the survey in 2009; thus, long-term averages are not calculated.

Table 4. Regional trends (% change) in number of wildlife observed per 100 miles driven, Minnesota August roadside survey, 1955-2024.

Region Species	Change from 2023 ^a				Change from 10-year average ^b				Change from long-term average (LTA) ^c				
	<i>n</i>	2023	2024	%	95% CI	<i>n</i>	2014-2023	%	95% CI	<i>n</i>	LTA	%	95% CI
Northwest^d													
Gray partridge ^e	18	14.9	1.3	-91	±14	19	2.8			19	3.2	-60	±66
Eastern cottontail ^e	18	1.3	1.3			19	1.1			19	0.9		
White-tailed jackrabbit ^e	18	0.7	0.7			19	0.2			19	0.5		
White-tailed deer	18	48.7	64.9	33	±4	19	58.1	9	±4	19	37.2	71	±6
Mourning dove	18	194.2	102.9	-47	±1	19	98.8	-1	±2	19	114.9	-15	±2
Sandhill crane ^f	18	18.8	58.4	211	±11	19	46.2	-20	±5				
West Central^e													
Ring-necked pheasant	39	62.4	65.9	6	±3	39	50.4	31	±4	37	90.7	-34	±2
Gray partridge ^e	39	0.1	0.3	200	±1974	39	0.5			37	8.2	-96	±25
Eastern cottontail	39	3.0	7.1	134	±69	39	2.9	137	±69	37	3.8	58	±53
White-tailed jackrabbit ^e	39	0.2	0.5			39	0.1			37	1.9	-72	±105
White-tailed deer	39	26.6	39.8	50	±8	39	30.6	30	±7	37	10.4	262	±20
Mourning dove	39	297.5	209.3	-30	±1	39	181.8	15	±1	37	340.4	-39	±0.6
Sandhill crane ^f	39	3.0	8.6	189	±68	39	3.5	148	±58				
Central													
Ring-necked pheasant	30	32.1	43.1	34	±5	30	37.9	14	±5	30	66.2	-35	±3
Gray partridge ^e	30	1.2	0.7	-44	±170	30	1.8			30	7.9	-92	±26
Eastern cottontail	30	5.6	8.9	59	±37	30	5.9	51	±35	30	6.2	44	±33
White-tailed jackrabbit ^e	30	0.1	0.1			30	0.1			30	1.0		
White-tailed deer	30	20.5	28.7	40	±10	30	27.1	6	±8	30	7.6	275	±27
Mourning dove	30	183.9	103.3	-44	±1	30	120.1	-14	±2	30	211.2	-51	±1
Sandhill crane ^f	30	20	19.9	-1	±10	30	23.9	-17	±9				
East Central													
Ring-necked pheasant	8	15	25.6	70	±9	8	26.4	-20	±9	10	77.7	-74	±3
Gray partridge ^e	8	0.0	0.0			8	0.3			10	0.2		
Eastern cottontail	8	4.5	9.1	101	±53	8	11.0	9.8	±22	10	9.7	7.2	±23
White-tailed jackrabbit ^e	8	0.0	0.0			8	0.0			10	0.2	-100	
White-tailed deer	8	42.5	49.4	16	±6	8	35.2	60	±7	10	11.3	339	±20
Mourning dove	8	76.0	59.0	-22	±3	8	63.6	8	±4	10	107.0	-39	±2
Sandhill crane ^f	8	92.5	57.2	-38	±3	8	58.3	33	±4				

Table 4. Continued.

Region Species	Change from 2023 ^a				Change from 10-year average ^b				Change from long-term average (LTA) ^c				
	<i>n</i>	2023	2024	%	95% CI	<i>n</i>	2014-2023	%	95% CI	<i>n</i>	LTA	%	95% CI
Southwest													
Ring-necked pheasant	19	114.7	81.8	-29	±3	19	70.4	16	±3	19	108.3	-25	±2
Gray partridge	19	7.6	11.4	50	±28	19	4.7	142	±45	19	34.8	-67	±6
Eastern cottontail	19	11.0	9.7	-12	±19	19	6.3	53	±33	19	7.8	25	±27
White-tailed jackrabbit ^e	19	0.6	0.2			19	0.3			19	3.2	-93	±66
White-tailed deer	19	19.9	20.0	1	±11	19	21.1	-5	±10	19	8.6	132	±24
Mourning dove	19	318.3	214.8	-33	±1	19	198.4	8	±1	19	292.2	-27	±1
Sandhill crane ^{e,f}	19	0.0	0.0			19	0.0						
South Central													
Ring-necked pheasant	32	54.1	58.6	8	±4	32	46.5	26	±4	32	114.5	-49	±2
Gray partridge	32	4.8	0.8	-84	±43	32	4.7	-84	±43	32	16.2	-95	±12
Eastern cottontail	32	4.8	12.9	171	±43	32	7.1	81	±29	32	7.6	-70	±27
White-tailed jackrabbit ^e	32	0.0	0.0			32	0.0			32	1.4		
White-tailed deer	32	12.4	11.2	-9	±17	32	10.2	10	±20	32	3.8	196	±54
Mourning dove	32	288.4	139.2	-51	±1	32	169.0	-18	±1	32	242.8	-43	±1
Sandhill crane ^{e,f}	32	2.5	5.5	119	±86	32	2.8	99	±74				
Southeast													
Ring-necked pheasant	20	11.8	10.8	-9	±19	20	16.4	-34	±13	20	61.9	-82	±3
Gray partridge	20	5.8	0.2	-97	±36	20	4.1	-95	±51	20	12.0	-98	±18
Eastern cottontail	20	10.8	10.8	0.4	±19	20	11.2	-4	±19	20	8.3	31	±25
White-tailed jackrabbit ^e	20	0.0	0.0			20	0.0			20	0.5		
White-tailed deer	20	28.6	26.6	-7	±7	20	23.7	12	±9	20	10.1	164	±21
Mourning dove	20	90.0	76.1	-16	±2	20	90.4	-16	±2	20	197.3	-61	±1
Sandhill crane ^{e,f}	20	1.4	5.0			20	0.8						

^a Based on routes (*n*) surveyed in both years.

^b Based on routes (*n*) surveyed at least 9 of 10 years.

^c LTA = long-term average during years 1955-2023, except for Northwest region (1982-2024) and white-tailed deer (1974-2024). Estimates based on routes (*n*) surveyed ≥40 years (1955-2024), except for Northwest (≥20 years) and white-tailed deer (≥25 years).

^d Eight Northwestern counties (19 routes) were added to the August roadside survey in 1982.

^e Species may be too infrequently observed to calculate some trends.

^f Sandhill cranes were added to the survey in 2009; thus, long-term averages are not calculated.

^g Two routes were added to the West Central region in 2014.

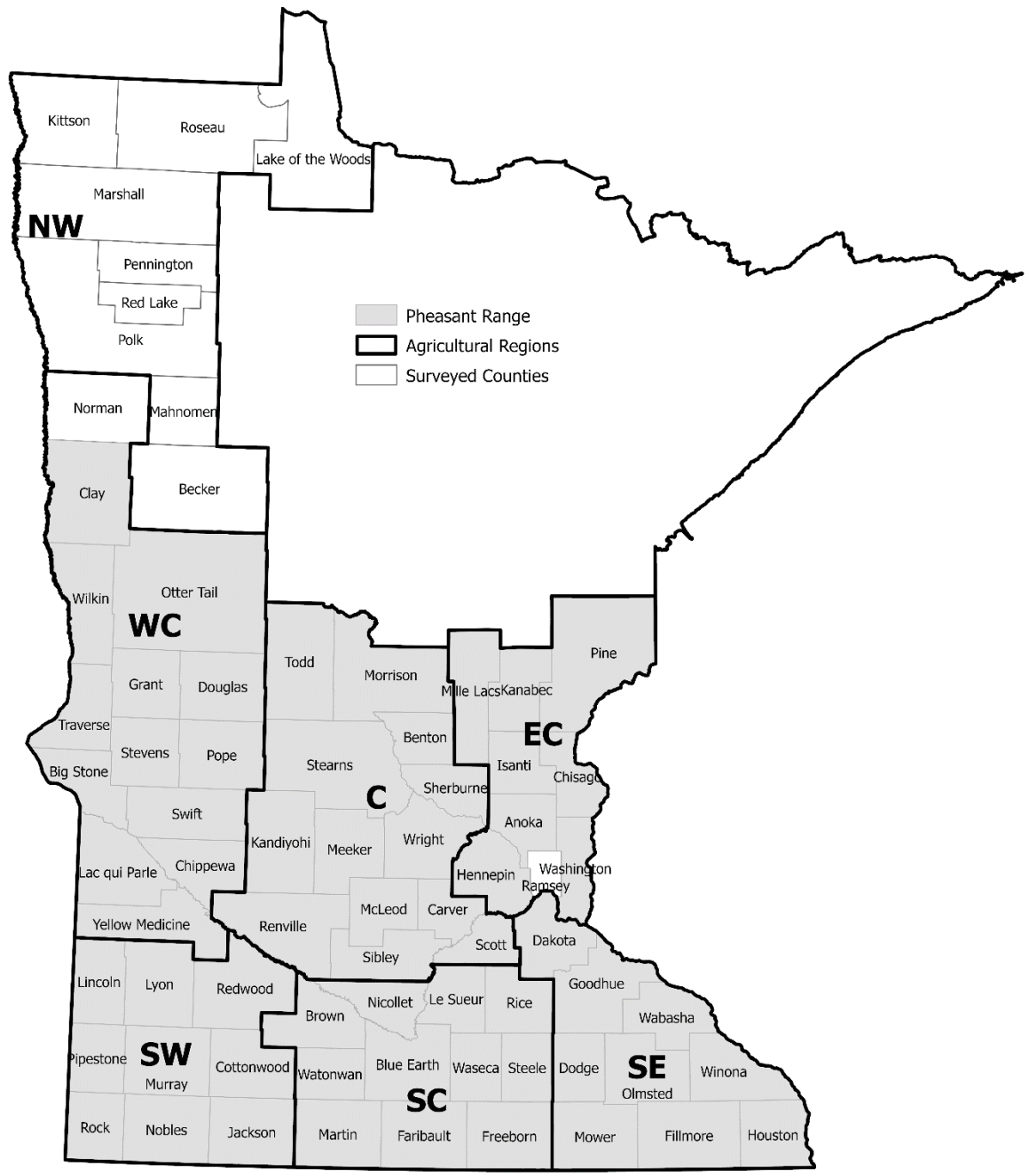


Figure 1. Survey regions and ring-necked pheasant range delineation for Minnesota's August roadside survey, 2024.

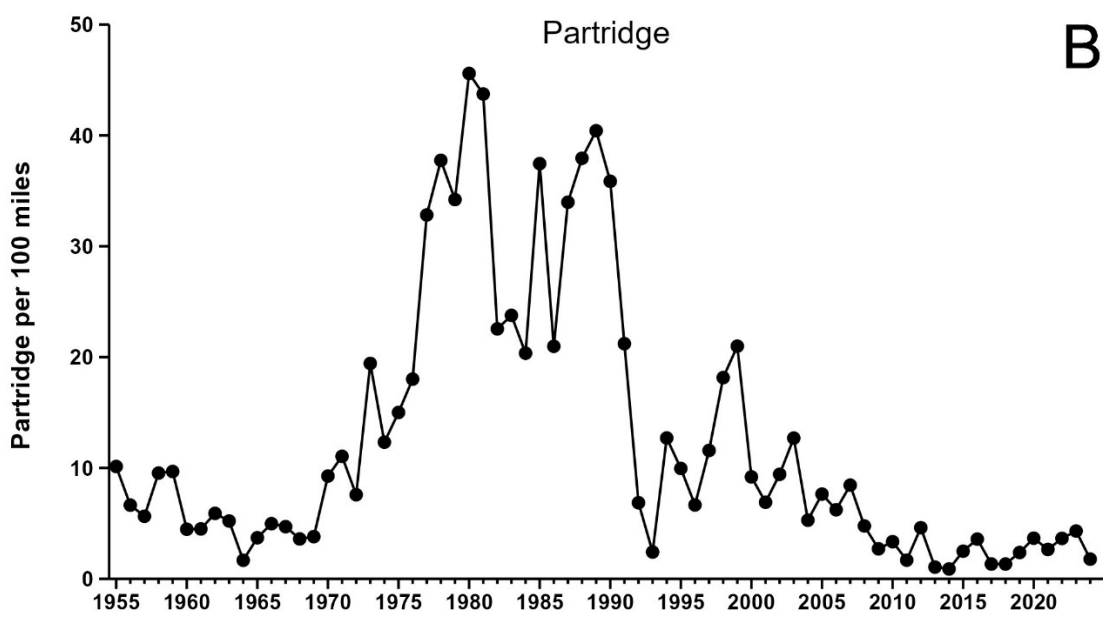
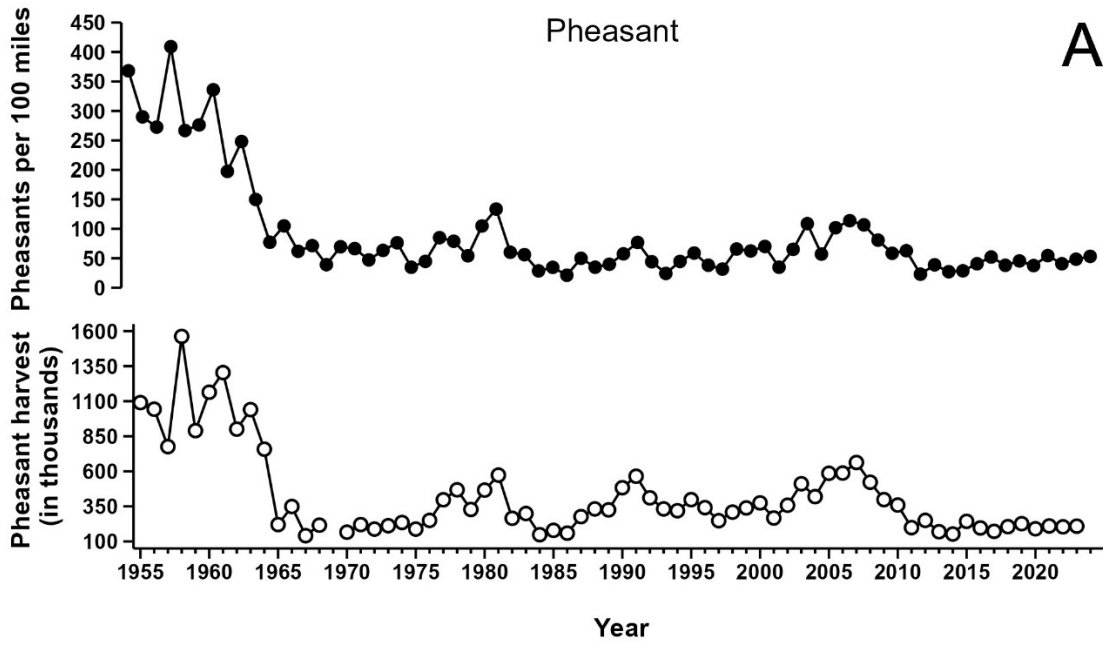


Figure 2. Range-wide index of ring-necked pheasants (A) and gray partridge (B) seen per 100 miles driven in Minnesota, 1955-2024. Based on all survey routes completed.

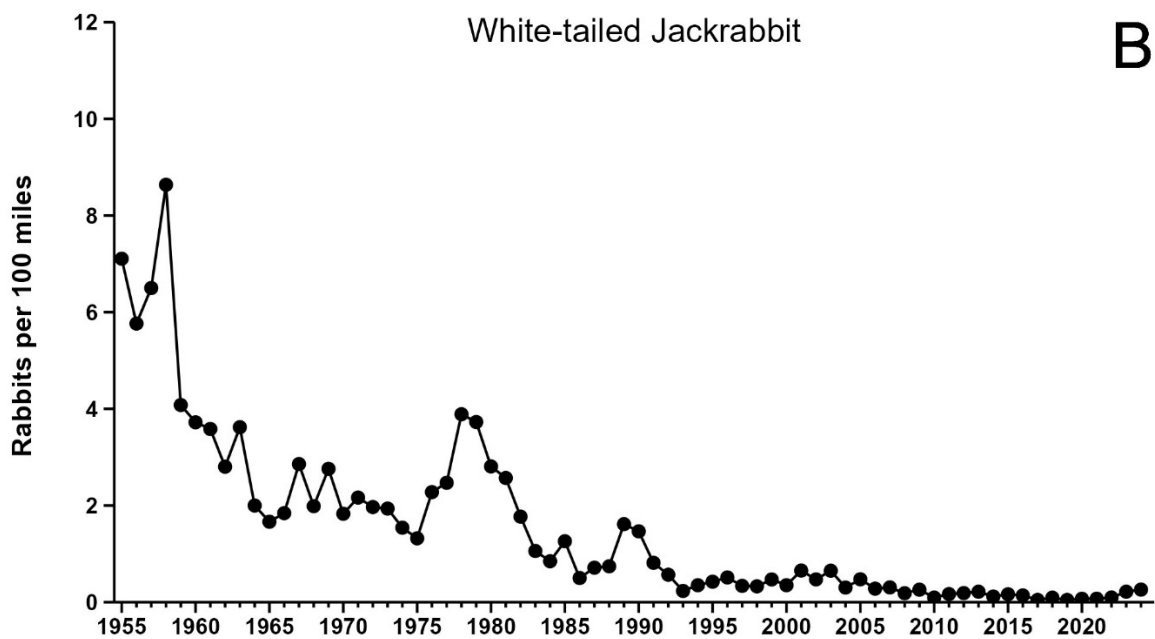
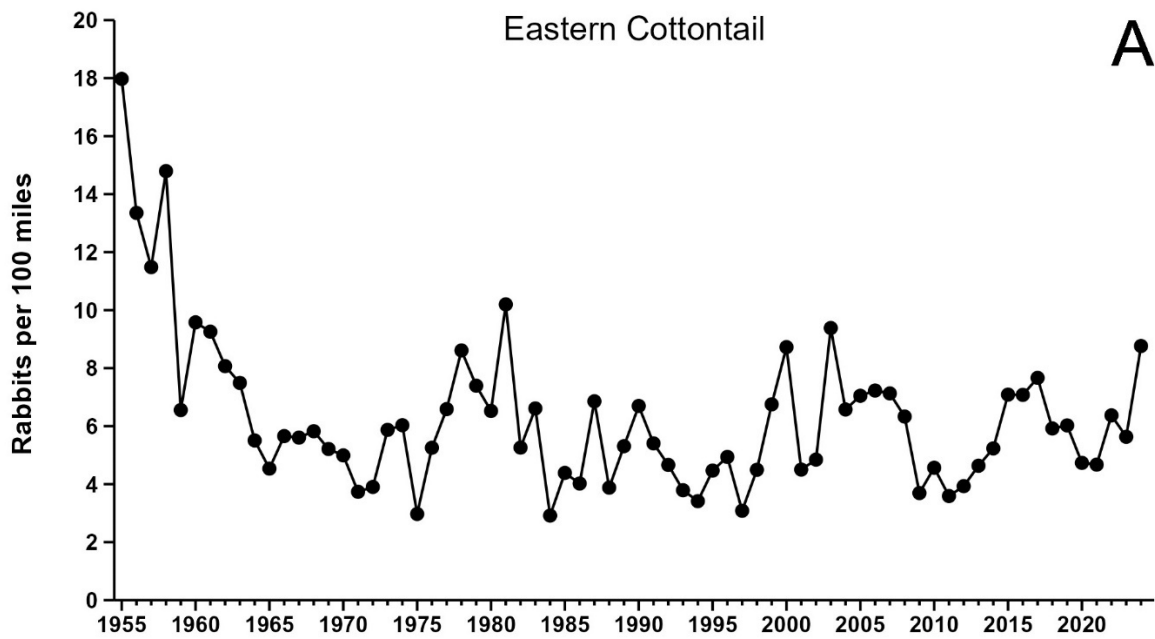


Figure 3. Range-wide index of eastern cottontail (A) and white-tailed jackrabbits (B) seen per 100 miles driven in Minnesota, 1955-2024. Based on all survey routes completed.

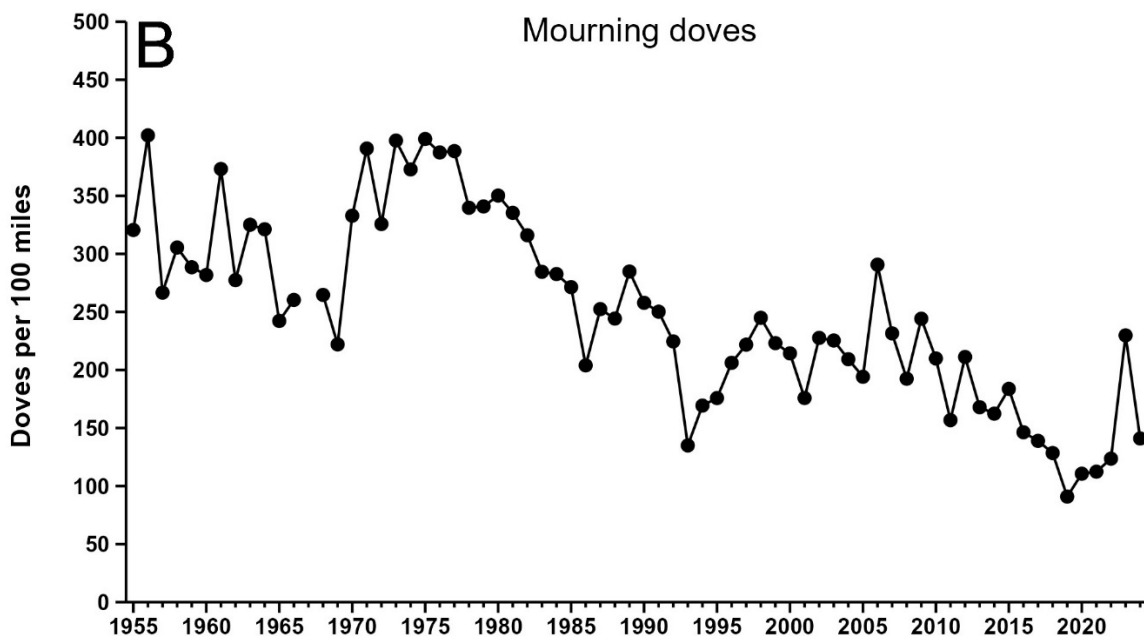
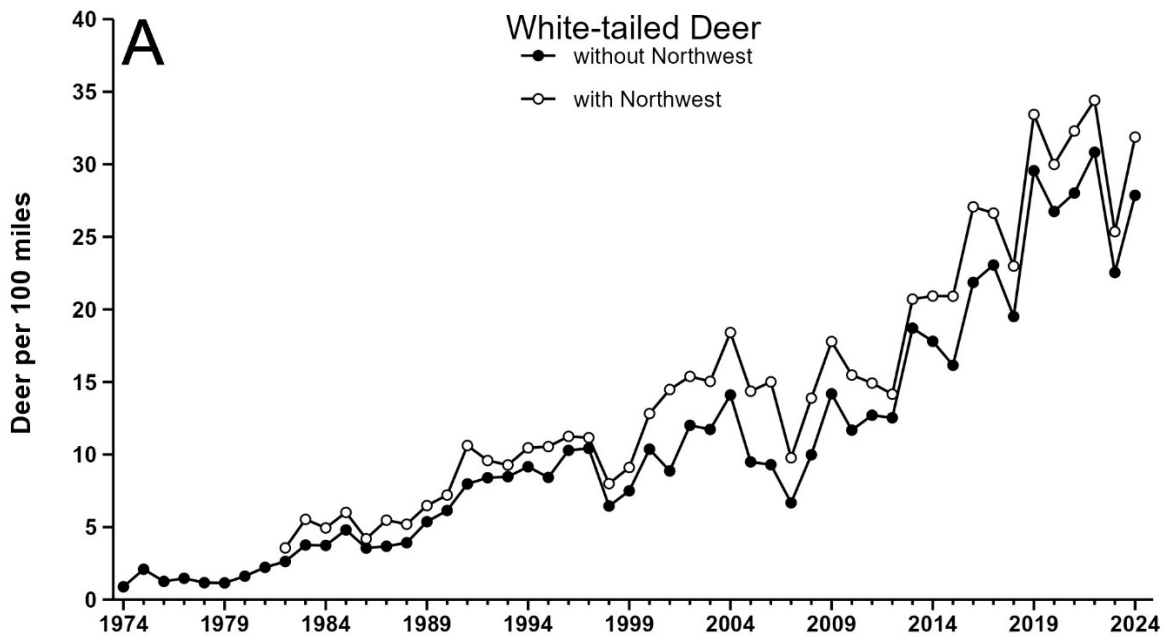


Figure 4. Range-wide index of (A) white-tailed deer seen per 100 miles driven in Minnesota, 1974-2024, with and without the Northwest region included; and (B) mourning doves seen per 100 miles driven in Minnesota, 1955-2024. Doves were not counted in 1967. Based on all survey routes completed.