2006 Minnesota August Roadside Survey

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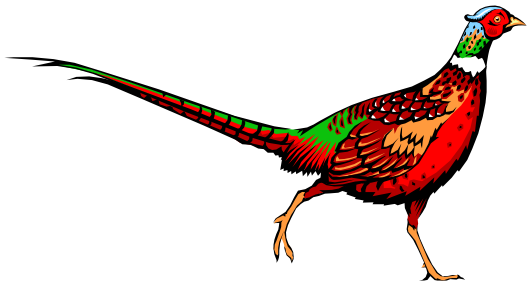

5 September 2006

ABSTRACT

Population indices for ring-necked pheasants in 2006 were similar to last year. Gray partridge, cottontail rabbit, white-tailed jackrabbit, and deer indices were also similar to 2005, whereas mourning dove increased by 50%. The winter of 2005-06 was average to mild throughout Minnesota's agricultural zone, and spring weather was warm and dry. Overwinter survival of farmland wildlife in 2006 was probably above average, and reproductive success was moderate.

Although the pheasant index (113.8 birds/100 mi) was similar to last year, it was 75% above the 10-year average, but remained 58% below the benchmark years of 1955-64 (soil-bank years with marginal cropland in long-term set-aside, a diversified agricultural landscape, more small grains and tame hay, and less pesticide use). Adult pheasants indices increased from 2005, which reflects improved overwinter survival from last year, whereas reproductive success was similar to last year. Overall, the size of the fall population will be close to 2005 levels. The best opportunity for harvesting pheasants appears to be in the Southwest region, although good opportunities will likely also be available in the West Central and Central regions.

The gray partridge index was similar to last year, 43% below the 10-year mean, and 58% below the long-term average. No significant changes were observed at the regional level. The number of adults observed was similar to last year, but broods/adult decreased in 2006. Gray partridge counts were highest in the Southwest region.

The cottontail rabbit index was similar to last year, increased from the 10-year average, and was similar to the long-term average. Counts of cottontail rabbits were highest in the Southwest, Central, Southeast, and South Central regions.

The jackrabbit index also held steady in 2006. The statewide index was also similar to the 10-year average, but was 86% below the long-term average. The range-wide jackrabbit population peaked in the late 1950's and declined to its lowest level in 1993, from which populations have not recovered. Counts of white-tailed jackrabbits were highest in the Southwest region.

The number of mourning doves observed in 2006 increased 50% from last year, 37% above the 10-year average, and was similar to the long-term average. Counts increased significantly in 5 of 7 regions.

INTRODUCTION

This report is a summary of the 2006 Minnesota August roadside survey. The annual survey is conducted during the first 2 weeks in August by Minnesota Department of Natural Resource (MNDNR) enforcement and wildlife personnel throughout the farmland region of Minnesota (Figure 1). The August roadside survey consists of 170 25-mile routes (1-4 routes/county); 151 routes are located in the ring-

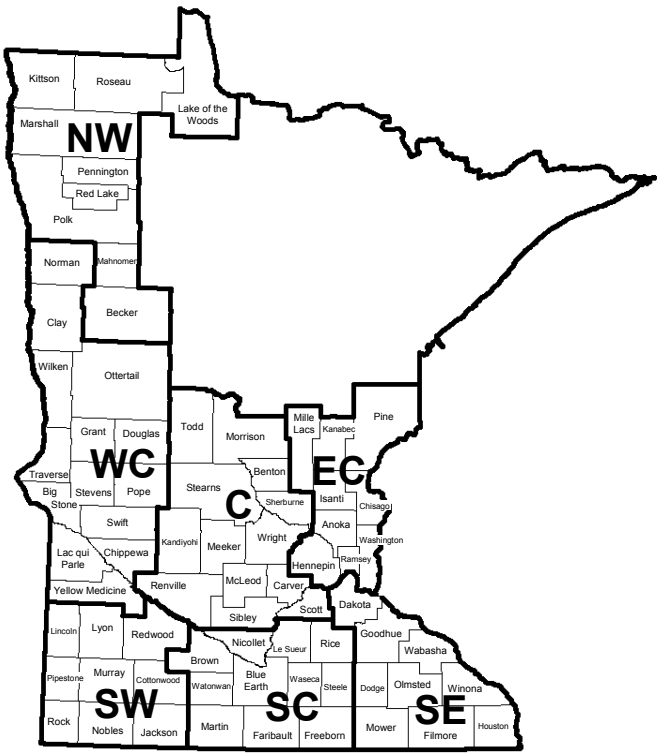

Figure 1. Survey regions for Minnesota's August Roadside Survey.

necked pheasant range.

Observers drove each route in the early morning at 15-20 miles/hour and recorded the number of pheasants, gray (Hungarian) partridge, cottontail rabbits, white-tailed jackrabbits, and other wildlife they saw. 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. The data provide an **index of relative abundance** and are used to monitor annual changes and long-term trends in regional and range-wide populations. Results were reported by agricultural region and range-wide; however, population indices for species with low detection rates are imprecise and should be interpreted cautiously.

ACKNOWLEDGMENTS

I thank all cooperators for their efforts in completing routes in 2006, without their help the survey would not be possible. Tonya Klinkner provided assistance with data entry. Kurt Haroldson reviewed and provided comments on drafts of this report. Tabor Hoek of the Minnesota Board of Water & Soil Resources (BWSR) provided enrollment data on cropland-retirement programs in Minnesota.

2005-2006 WEATHER SUMMARY

The severity of the winter of 2005-06 was moderate to mild throughout most of the pheasant range in Minnesota (the fifth consecutive mild winter). The winter started harshly with continuous snow cover through most of December (MCWG, http://climate.umn.edu/doc/snowmap.htm). However, a warm January (mean temperature 17 degrees above the long-term average; MCWG, http://climate.umn.edu/cawap/monsum/ monsum.asp) eliminated most snow from the southern pheasant range, whereas deep snow persisted in the northern half of Minnesota including the northern pheasant range. Northwestern Minnesota retained deep snow through the end of March. Temperature was above average statewide in April, setting the stage for conditions conducive to good wildlife production. Spring weather in May and June was generally warmer and drier than normal. One untimely bought of cold, wet weather occurred June 9-11, immediately following the normal peak of Minnesota's pheasant hatch. Overwinter survival of farmland wildlife was probably above average; reproductive success was likely average due to generally warm, dry conditions in May and June and continuing through the summer.

HABITAT CONDITIONS

Habitat conditions in the pheasant range continue to maintain their highest levels since the mid-1990s. Over 1 million acres of habitat are currently enrolled in farm programs (e.g., CRP, CREP, RIM, WRP), and another over 650,000 acres of habitat are protected as Wildlife Management Areas (WMA) and Waterfowl Protection Areas. Within the pheasant range, protected grasslands account for about 6.1% of the landscape (range: 2.9-10.5%; Table 1).

Farm programs make up the largest portion of protected grasslands in the state. Sign-up for the Minnesota CREP II began June 2005 targeting enrollment of up to 120,000 new acres of environmentally sensitive cropland in the Red River Watershed in northwestern Minnesota, the Lower Mississippi Watershed in southeastern Minnesota and the Missouri/Des Moines River Watershed in southwestern Minnesota. Although progress continues on the CRP and CREP II, the expiration of a large proportion of existing CRP contracts beginning in 2007 is still a major concern

for future wildlife populations. Re-enrollment and extension opportunities for CRP contracts expiring from 2007 to 2010, announced this year, may capture many of the contracts that will expire starting in 2007.

The MNDNR continues to expand the habitat base through accelerated WMA acquisition. In addition the Working Lands Initiative will attempt to protect and expand large wetland-grassland complexes in 12 counties in western Minnesota.

SURVEY CONDITIONS

Cooperators completed 170 routes in 2006; one route in Washington County was conducted, but the data were not received in time to include in this report. Weather conditions during the survey ranged from excellent (calm, heavy dew, clear sky) to medium (light dew and overcast skies). Medium-to-heavy dew conditions were present at the start of 96% of the survey routes, which was better than 2005 (91%) and the 7-year average (91%). Clear skies (<30% cloud cover) were present at the start of 89% of routes, with wind speeds <4 mph recorded for 76% of routes. The survey period was extended from July 27th to August 17th to allow all routes to be completed.

RING-NECKED PHEASANT

The average number of pheasants observed per 100 miles was similar to 2005 and 75% above the 10-year average (Table 2; Figure 2A). The pheasant index was similar to the long-term average (Table 2), but remained below the benchmark years of 1955-64 by 58%. Total pheasants observed per 100 miles ranged from 29.8 in the Southeast to 242.2 in the Southwest (Table 3, Figure 5). Changes from last year were not significant in any region (Table 3).

The range-wide hen index (hens/100 mi) increased 21% (95% CI: 7-35%) from last year (Table 2), and varied from 5.2 hens/100 miles in the Southeast to 41.2 hens/100 miles in the Southwest. The cock index also increased this year, up 49% (95% CI: 26-72%) from 2005 (Table 2). The 2006 hen:cock ratio was 1.6 compared to 2.0 in 2005 and 1.3 in 2004. Given the above-average fall population in 2005 and likely above-average overwinter survival, the spring breeding population should have been higher than average. Data from spring pheasant surveys, conducted as part of a CRP/pheasant study, indicated unusually high breeding pheasant populations, with a 95% increase in hen indices from 2005 (Kurt Haroldson, MNDNR, unpublished data). These surveys were conducted on 36 study areas located in Lincoln, Lyon, Cottonwood, and Jackson Counties in the Southwest; Pope County in the West Central; and LeSueur, and Rice Counties in the South Central region during April 20 – May 27.

The number of pheasant broods observed per 100 miles increased 13% from last year, 77% from the 10-year average, and 35% from the long-term average (Table 2). The brood index continues to remain below the benchmark years (1955-64). Regional brood indices ranged from 5.2 broods/100 miles in the Southeast to 37.8 broods/100 miles in the Southwest. Average brood size in 2006 (4.8 ± 0.1 [SE] chicks/brood) was similar to last year (5.0 ± 0.1 [SE] chicks/brood), the 10-year mean (5.0 chicks/brood), but below the long-term average (5.6 chicks/brood; Table 2). The median hatch date for pheasants was June 8 (n = 663), the same as last year and 1 day later than the 10-year average (Table 2). The distribution of estimated hatch dates for observed broods was unimodal and approximately normally distributed, which suggests that many early nesting attempts were successful (vs. wide-spread nest failure, which often leads to an extensive renesting effort and a bimodal peak in hatch dates). Average age of broods observed was 8.2 weeks (range: 1-16 wks).

A high range-wide pheasant index was expected given the mild winter and warm, dry

weather during the reproductive season. The combination of relatively high hen numbers and average reproductive success led to a large pheasant index for 2006. In addition the increase in the cock index indicates higher than average carryover from the 2005 reproductive season. Overall, the size of the fall population will be similar to 2005 levels. The best opportunity for harvesting pheasants appears to be in the Southwest region, although good opportunities will likely also be available in the West Central and Central regions.

GRAY PARTRIDGE

Rangewide, the gray partridge index (6.3 partridge/100 miles) was similar to last year. However, the 2006 index was 43% below the 10-year average and 58% below the long-term average (Table 2, Figure 2B). Within regions, the partridge index ranged from 0.0/100 miles in the East Central and Northwest to 28.6/100 miles in the Southwest (Table 3, Figure 6). There were no significant regional changes from last year (Table 3).

The number of adults observed per 100 miles was similar to last year, but 30% below the 10-year mean and 45% below the long-term average (Table 2). The proportion of adult partridge observed with broods (28%) decreased from 2005 (32%), the 10-year average (34%), and long-term average (33%). Average brood size in 2006 (7.5 chicks/brood) was larger than in 2005 (7.0 chicks/brood), but smaller than the 10-year average (7.9 chicks/brood) and the long-term average (8.9 chicks/brood). Total broods observed per 100 miles were similar to 2005, but 45% below the 10-year average, and 55% below the long-term average (Table 2). The median hatch date was June 26 (n = 24), which was 16 days later compared to 2005 and 7 days later than the 10-year average.

Conversion of diversified agricultural practices to more intense land-use with fewer haylands, pastures, small grain fields, and hedgerows have reduced the amount of suitable habitat for the gray partridge in Minnesota. The late median hatch date this year might indicate more renesting, possibly due to a short period of stormy weather during the nesting season. Gray partridge in their native range (southeastern Europe and northern Asia) are associated with arid climates and only produce well in the Midwest during dry or drought years. Consequently, gray partridge are more strongly affected by weather conditions during nesting and brood rearing than are pheasants. Clutches resulting from renesting can be smaller than initial nest attempts. The Southwest region offers the best opportunity for harvesting gray partridge in 2006.

COTTONTAIL RABBIT and WHITE-TAILED JACKRABBIT

The eastern cottontail rabbit index (7.2 rabbits/100 mi) was similar to last year, increased 19% from the 10-year average, and was similar to the long-term average (Table 2, Figure 3A). There continues to be high variability in counts and percent change by region (Table 3). The cottontail rabbit index ranged from 1.7 rabbits/100 miles in the Northwest to 10.9 rabbits/100 miles in the Southwest (Figure 7). The best opportunities for harvesting cottontail rabbits are in the Southwest, Central, Southeast, and South Central regions.

The index of white-tailed jackrabbits held steady in 2006. The statewide index (0.3 rabbits/100 mi) was also similar to the 10-year average (0.5), but remained 86% (95% CI: 72-100%) below the long-term average (2.0; Table 2, Figure 3B). The range-wide jackrabbit population peaked in the late 1950's and declined to its lowest level (0.2 rabbits/100 mi) in 1993, from which populations have not recovered (Figure 3B). The long-term decline in jackrabbits probably reflects the loss of their preferred habitats (i.e., small grains, pasture, and hayfields). The greatest potential for white-tailed jackrabbit hunting is likely in the Southwest region (Table 3, Figure 8). However,

indices of relative abundance and annual percent change should be interpreted cautiously because estimates are based on low numbers of sightings.

WHITE-TAILED DEER

The index of white-tailed deer (15.0 deer/100 mi) was comparable to last year and the 10-year average, and was 50% above the long-term average (1974-05; Table 2, Figure 4A). There were no significant regional changes from 2005. The farmland deer population index shows an increasing long-term trend since 1979 (Figure 4A). Modeling projections based on independent data also indicate an increasing trend for deer populations in the farmland zone.

MOURNING DOVE

The number of mourning doves observed per 100 miles in 2006 increased 50% from last year, 37% from the 10-year average, and was similar to the long-term average (Table 2, Figure 4B). The mourning dove index ranged from 136.5 doves/100 miles in the Northwest region to 533.4 doves/100 miles in the Southwest. Significant increases in dove counts were detected in all regions but the South Central and Southeast regions (Table 3). The number of mourning doves heard along U.S. Fish and Wildlife Service call-count survey (CCS) routes (n = 8) in Minnesota were similar to last year. Trend analyses indicated the number of mourning doves heard along the CCS routes declined 5.2% per year (90% CI: -10.2 to -0.3%) during 1997-2006 and 1.8% per year (90% CI: -3.3 to -0.3%) during 1966-2006 (Dolton and Rau 2006). In fall 2004, Minnesota held its first modern dove hunting season.

OTHER SPECIES

Notable incidental sightings: 1 badger (Swift County), 1 bald eagle (Polk County), 2 Cooper's hawks (LeSueur County), 4 coyotes (Goodhue, Kandiyohi, Pine, and Roseau Counties), 6 elk (Kittson County), 1 fallow deer (Cottonwood County), 1 gray fox (Chisago County), 1 great gray owl (Marshall County), 4 green heron (Dodge and Polk Counties), 1 prairie chicken (Clay County), 3 red fox (Chisago and Wilkin County), 9 ruffed grouse (Lake of the Woods, Marshall, and Red Lake Counties), 215 sandhill crane (14 counties), 5 sharp-tailed grouse (Pennington County), 6 striped skunk (Dodge, Goodhue, Polk, and Wilkin Counties), 6 trumpeter swan (Brown, Douglas, and Otter Tail Counties), 248 wild turkeys and 93 turkey poults (24 counties).

LITERATURE CITED

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[MCWG] Minnesota Climatology Working Group. 2006 Aug 14. MCWG Home Page http://climate.umn.edu. Accessed 2006 Aug 24.

Table 1. Abundance (total acres) and density (acres/mi^2) of undisturbed grassland habitat within pheasant range, 2006[a].

	Cropland Retirement									Density
AGREG	CRP	CREP	RIM	RIM-WRP	WRP	USFWS[c]	MNDNR[d]	Total	%	(ac/mi^2)
WC[b]	367,599	37,379	17,079	822	18,215	169,791	100,082	710,967	10.5	67.0
SW	125,446	22,040	12,214	579	766	15,307	51,182	227,533	6.0	38.5
C	141,425	14,490	17,028	714	2,976	83,257	44,480	304,370	5.0	32.2
SC	94,972	26,557	11,813	3,730	8,725	7,114	29,511	182,421	4.5	28.9
SE	92,132	0	5,554	554	620	18,438	46,883	164,181	4.4	28.4
EC	5,219	0	1,265	0	4	4,548	83,221	94,257	2.9	18.8
Total	826,793	100,465	64,953	6,398	31,306	298,456	355,358	1,683,729	6.1	39.1

[a] Unpublished data, Tabor Hoek, BWSR, 22 August 2006.

[b] Does not include Norman County.

[c] Includes Waterfowl Production Areas (WPA), USFWS easements, and USFWS refuges.

[d] MNDNR Wildlife Management Areas (WMA).

Table 2. Statewide trends (% change) in number of wildlife observed per 100 miles driven, Minnesota August roadside survey, 1955-2006.

Species	Change from 2005[a]					Change from 10-year average[b]				Change from long-term average[c]			
Subgroup	*n*	2005	2006	%	95% CI	*n*	1996-05	%	95% CI	*n*	LTA	%	95% CI
Ring-necked pheasant													
Total pheasants	148	101.5	113.8	12	±14	146	65.6	75	±26	145	103.5	11	±19
Cocks		7.4	11.0	49	±23		5.8	92	±30		11.7	-5	±17
Hens		14.5	17.6	21	±14		9.4	89	±26		14.9	18	±20
Broods		15.8	17.9	13	±13		10.1	77	±24		13.3	35	±22
Chicks per brood		5.0	4.8	-5			5.0	-5			5.6	-15	
Broods per 100 hens		109.0	101.7	-7			109.4	-7			101.6	0	
Median hatch date		Jun 08	Jun 08				Jun 07						
Gray partridge													
Total partridge	167	7.7	6.3	-18	±52	165	11.2	-43	±30	145	17.2	-58	±21
Adults		2.4	2.1	-14	±37		3.0	-30	±23		4.3	-45	±21
Broods		0.8	0.6	-25	±53		1.0	-45	±31		1.5	-55	±23
Chicks per brood		7.0	7.5	7			7.9	-5			8.9	-17	
Broods per 100 adults		32.0	27.9	-13			34.1	-18			33.3	-16	
Median hatch date		Jun 10	Jun 26				Jun 19						
Eastern cottontail	167	7.0	7.2	4	±22	165	6.1	19	±19	145	6.8	17	±20
White-tailed jackrabbit	167	0.5	0.3	-40	±54	165	0.5	-37	±35	145	2.0	-86	±14
White-tailed deer	167	14.3	15.0	4	±20	165	13.0	16.1	±22	148	6.1	50	±25
Mourning dove	167	194.0	291.1	50	±20	165	213.3	37	±18	145	278.1	12	±18

[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 = 1955-2005, except for deer = 1974-2005. Does not include Northwest region (8 counties in Northwest were added to survey in 1982). Estimates for all species except deer based on routes (*n*) surveyed ≥40 years; estimates for deer based on routes surveyed ≥25 years.

Table 3. Regional trends (% change) in number of wildlife observed per 100 miles driven, Minnesota August roadside survey, 1955-2006.

Region / Species	Change from 2005[a]					Change from 10-year average[b]					Change from long-term average[c]			
	n	2005	2006	%	95% CI	*n*	1996-05	%	95% CI	*n*	LTA	%	95% CI
Northwest[d]													
Gray partridge	19	0.0	0.0			19	0.0	0		19	4.3	-100	±71
Eastern cottontail		0.8	1.7	100	±394		0.9	86	±350		0.9	83	±314
White-tailed jackrabbit		1.1	0.4	-61	±139		0.6	-27	±115		0.8	-45	±88
White-tailed deer		52.8	60.4	14	±35		35.9	68	±56		25.8	134	±91
Mourning dove		57.7	136.5	137	±128		81.3	68	±81		130.4	5	±54
West Central													
Ring-necked pheasant	36	93.1	113.3	22	±30	34	47.6	151	±81	35	104.9	11	±41
Gray partridge		0.7	0.2	-67	±180		2.9	-92	±48		11.5	-98	±21
Eastern cottontail		3.9	3.6	-9	±50		2.8	34	±53		4.3	-15	±35
White-tailed jackrabbit		1.0	0.3	-67	±76		0.8	-56	±53		2.6	-87	±22
White-tailed deer		9.5	10.3	9	±52		11.5	-7	±33		7.9	31	±44
Mourning dove		208.5	312.6	50	±26		304.6	6	±16		396.2	-21	±18
Central													
Ring-necked pheasant	28	85.9	113.0	32	±34	28	52.8	109	±61	27	76.0	44	±57
Gray partridge		4.0	3.2	-20	±84		5.1	-37	±109		11.2	-71	±59
Eastern cottontail		6.7	10.2	51	±74		5.7	68	±74		6.6	54	±78
White-tailed jackrabbit		0.1	0.0	-100	±205		0.2	-100	±59		1.4	-100	±23
White-tailed deer		6.7	7.3	9	±50		6.2	17	±52		3.8	92	±82
Mourning dove		146.0	254.6	74	±49		180.0	41	±35		243.0	6	±31
East Central													
Ring-necked pheasant	13	58.5	82.3	41	±61	13	53.3	54	±75	13	91.6	-10	±46
Gray partridge		0.0	0.0				0.0	0			0.2	-100	±146
Eastern cottontail		9.2	7.5	-19	±66		9.4	-21	±33		8.3	-10	±41
White-tailed jackrabbit		0.0	0.0				0.0	0			0.3	-100	±64
White-tailed deer		12.0	10.5	-12	±106		13.7	-23	±63		7.2	47	±78
Mourning dove		64.9	150.7	132	±81		90.2	67	±60		119.9	26	±51

Table 3. Continued.

Region / Species	Change from 2005					Change from 10-year average				Change from long-term average			
	n	2005	2006	%	95% CI	*n*	1996-05	%	95% CI	*n*	LTA	%	95% CI
Southwest													
Ring-necked pheasant	19	225.8	242.2	7	±20	19	114.0	113	±56	19	114.5	112	±63
Gray partridge		42.5	28.6	-33	±80		38.0	-25	±72		44.9	-36	±53
Eastern cottontail		12.6	10.9	-13	±51		8.7	26	±51		8.4	30	±49
White-tailed jackrabbit		0.6	1.5	132	±127		0.7	98	±115		4.2	-65	±31
White-tailed deer		13.7	13.2	-3	±52		11.0	20	±54		7.2	83	±87
Mourning dove		322.9	533.4	65	±65		296.5	80	±90		310.3	72	±90
South Central													
Ring-necked pheasant	32	111.3	103.9	-7	±38	32	85.7	21	±41	31	139.0	-24	±29
Gray partridge		9.1	11.5	26	±91		22.2	-48	±28		20.5	-42	±36
Eastern cottontail		9.2	8.5	-8	±37		8.8	-4	±30		7.6	13	±35
White-tailed jackrabbit		0.1	0.0	-100	±204		0.4	-100	±43		2.0	-100	±26
White-tailed deer		3.1	4.5	44	±76		5.1	-12	±37		3.2	46	±67
Mourning dove		284.3	290.5	2	±33		232.1	25	±33		254.2	15	±36
Southeast													
Ring-necked pheasant	20	32.7	29.8	-9	±48	20	43.8	-32	±38	20	80.3	-63	±32
Gray partridge		2.8	2.6	-8	±235		8.9	-71	±82		14.9	-83	±44
Eastern cottontail		8.2	9.4	15	±60		8.1	16	±32		7.9	19	±45
White-tailed jackrabbit		0.2	0.0	-100	±209		0.2	-100	±104		0.7	-100	±42
White-tailed deer		17.3	12.2	-30	±57		17.1	-29	±21		9.3	31	±49
Mourning dove		181.9	312.5	72	±91		201.3	55	±57		228.0	37	±54

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

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

[c] LTA = 1955-2005, except for Northwest region (1982-2005) and white-tailed deer (1974-2005). Estimates based on routes (*n*) surveyed ≥40 years (1955-2005), 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.

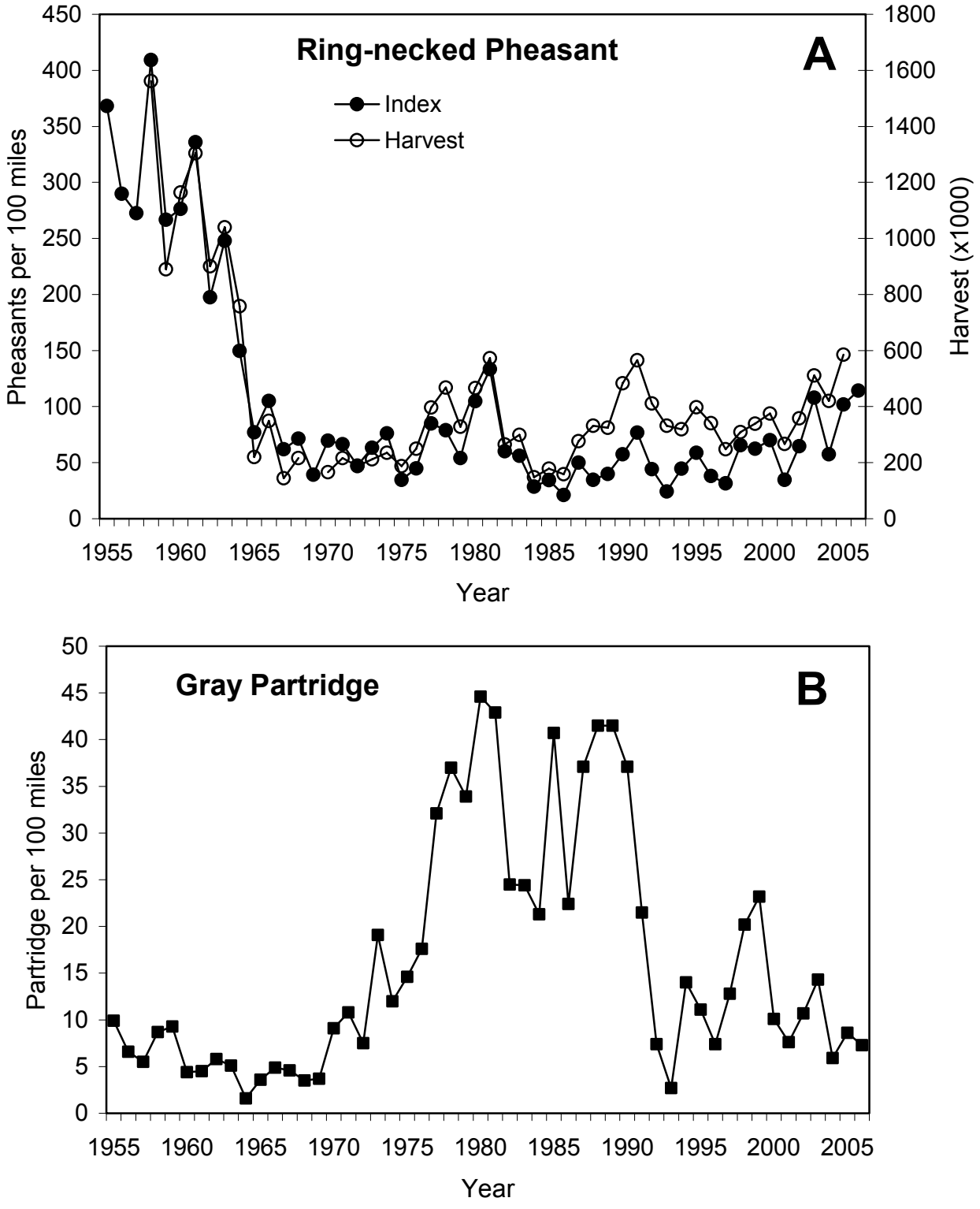

Figure 2. Statewide index of ring-necked pheasants (**A**) and gray partridge (**B**) seen per 100 miles driven. Does not include the Northwest region. Based on all survey routes completed.

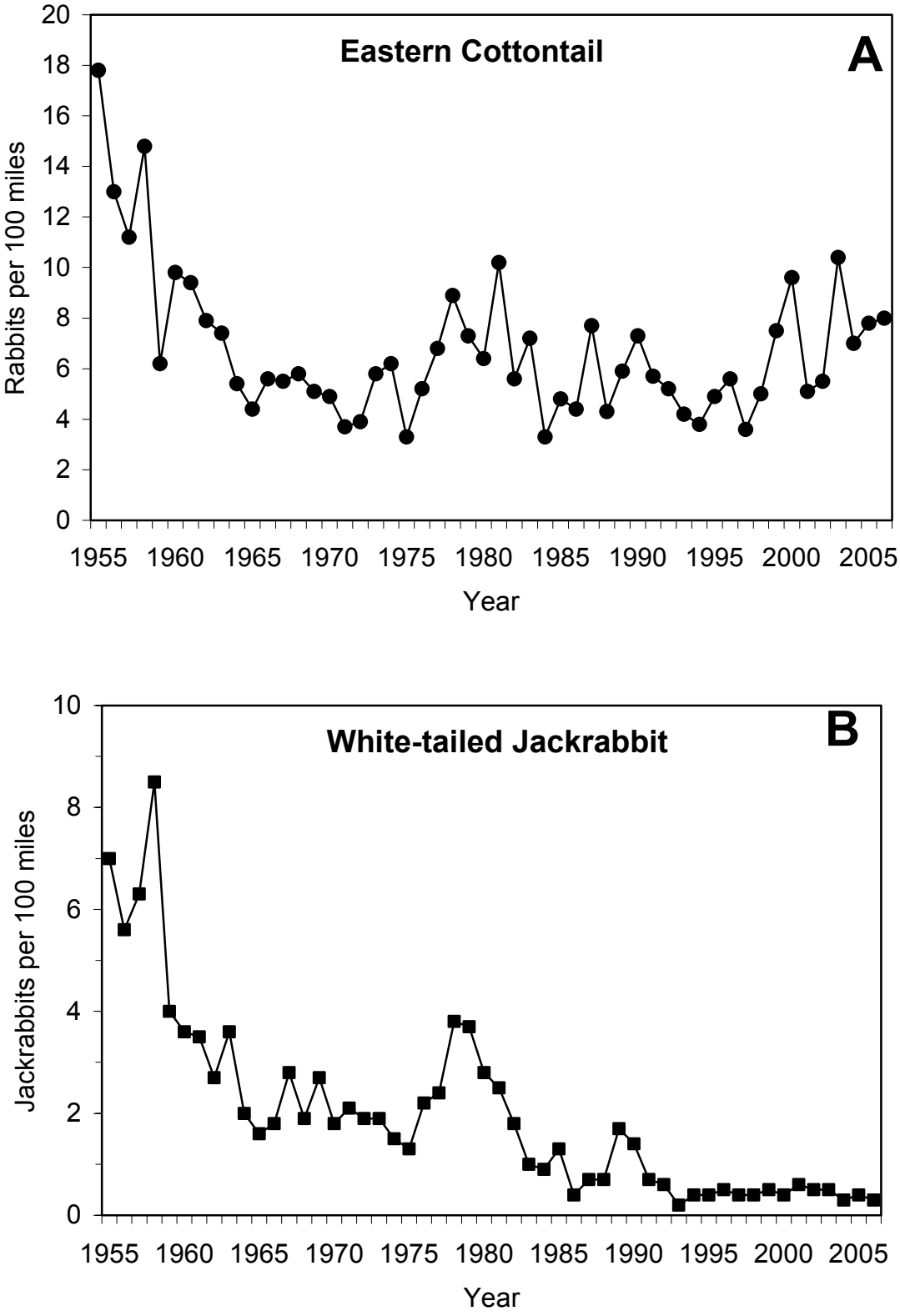

Figure 3. Statewide index of eastern cottontail (**A**) and white-tailed jackrabbits (**B**) seen per 100 miles driven. Does not include the Northwest region. Based on all survey routes completed.

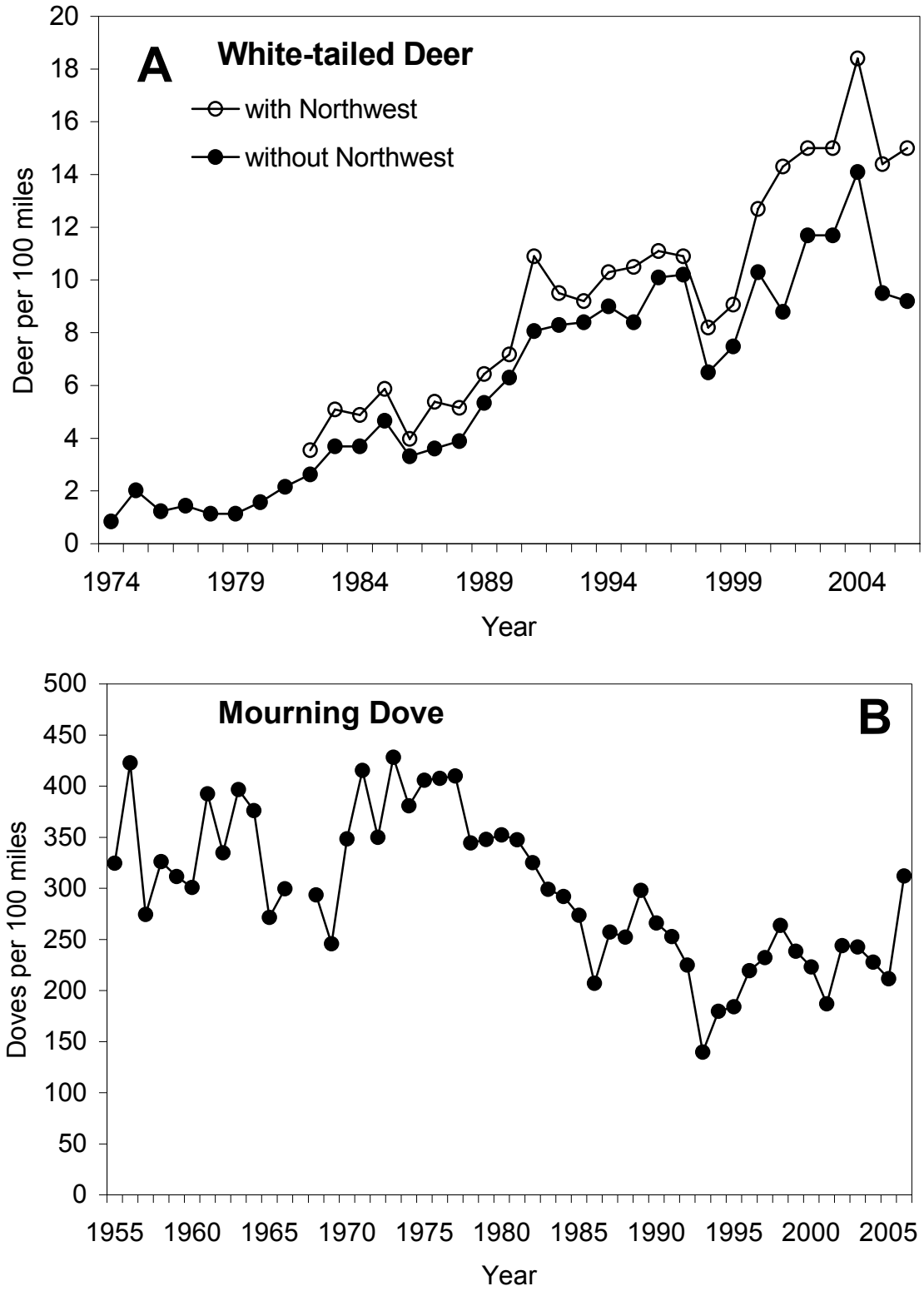

Figure 4. Statewide index of white-tailed deer (**A**) and mourning doves (**B**) seen per 100 miles driven. Doves were not counted in 1967 and the dove index does not include the Northwest region. Based on all survey routes completed.

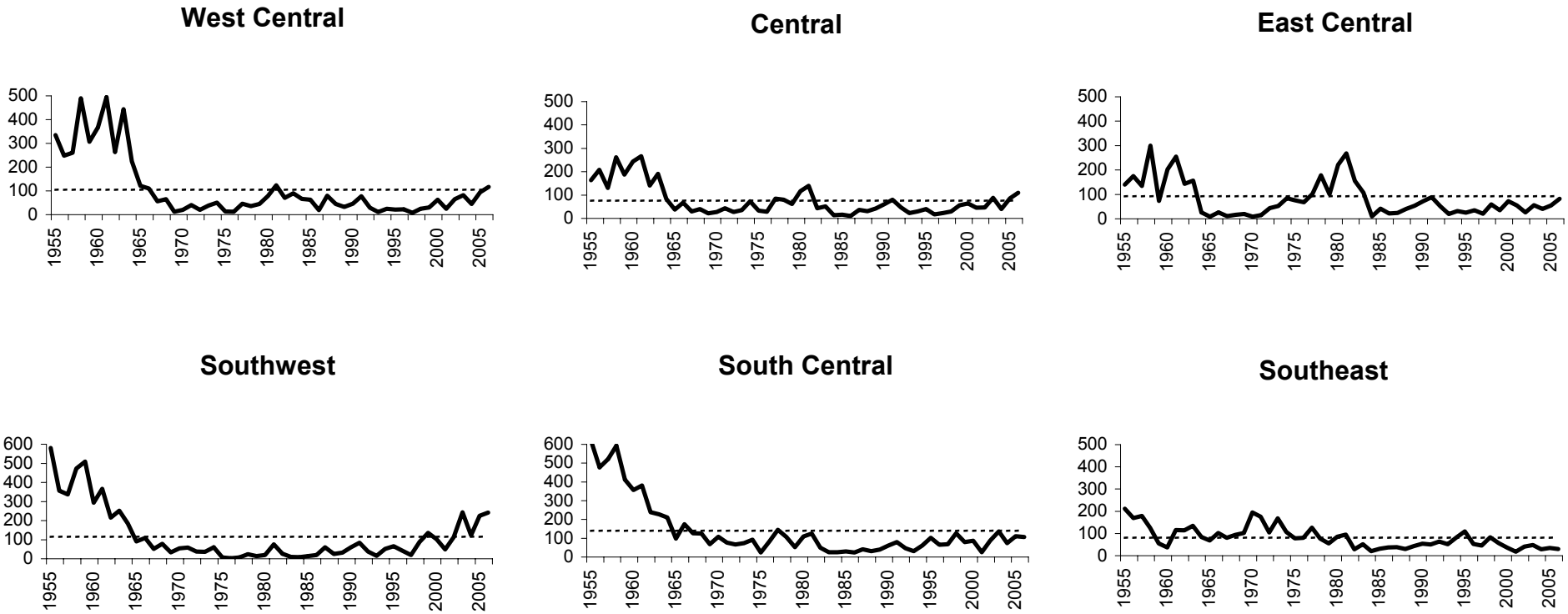

Figure 5. Regional index (——) and long-term average (·····) of **ring-necked pheasants seen per 100 miles driven**, Minnesota August roadside survey (1955-present). Based on all survey routes completed. **Note:** scale of vertical axis is not the same scale among survey regions.

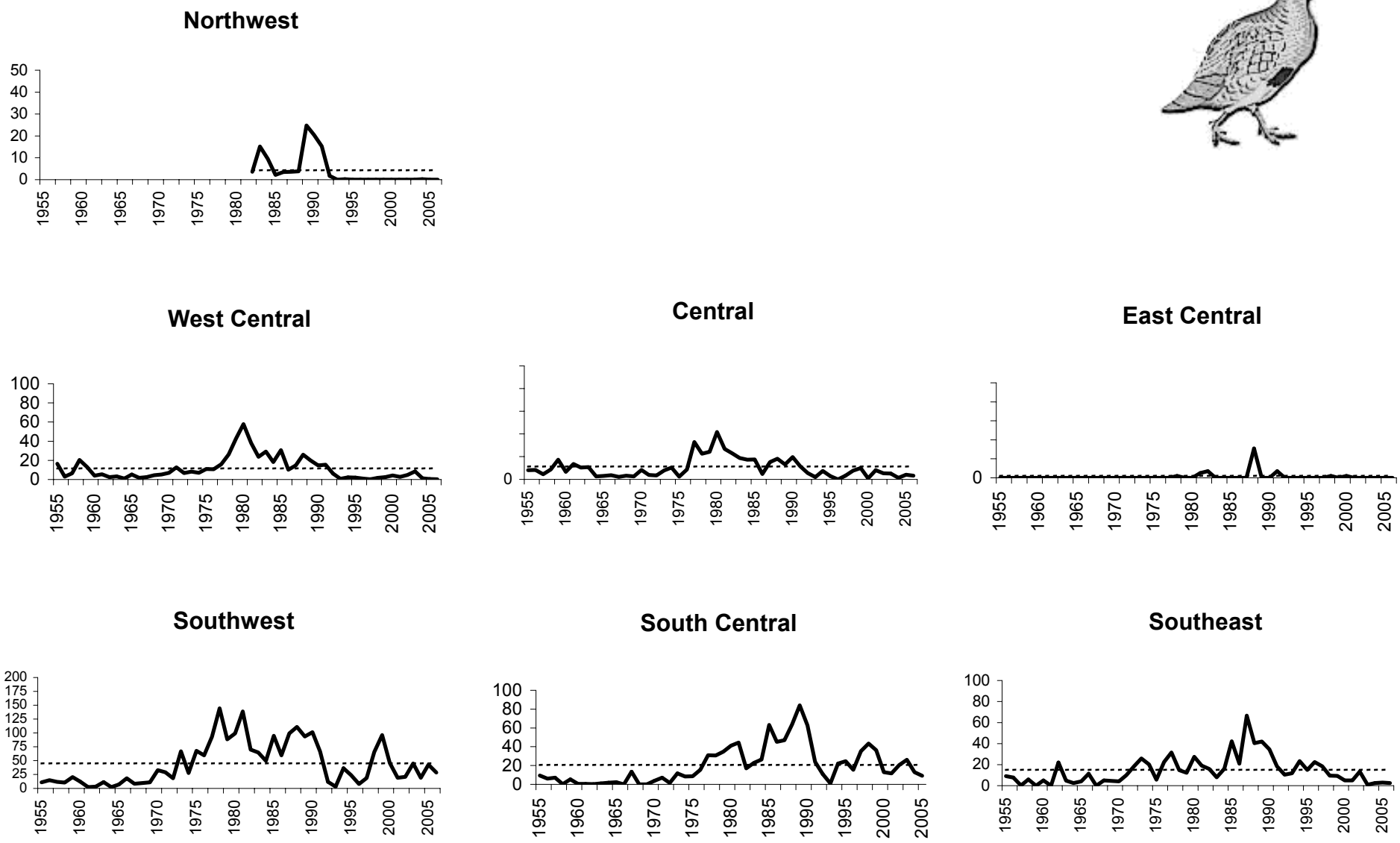

Figure 6. Regional index (——) and long-term average (·····) of **gray partridge seen per 100 miles driven**, Minnesota August roadside survey (1955-present). Based on all survey routes completed. **Note:** scale of vertical axis is not the same among survey regions.

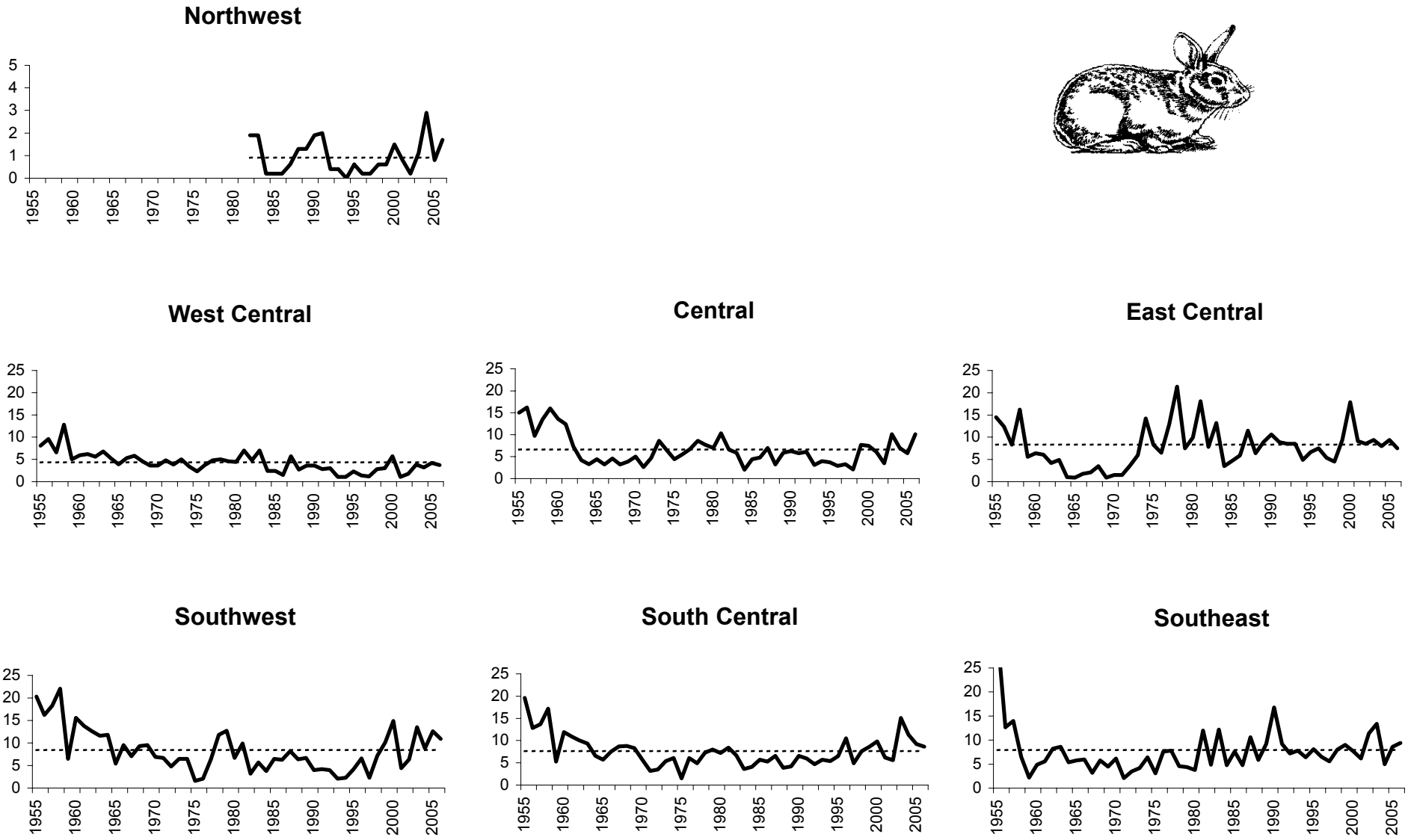

Figure 7. Regional index (——) and long-term average (·····) of **cottontail rabbits seen per 100 miles driven**, Minnesota August roadside survey (1955-present). Based on all survey routes completed. **Note:** scale of vertical axis is not the same among survey regions.

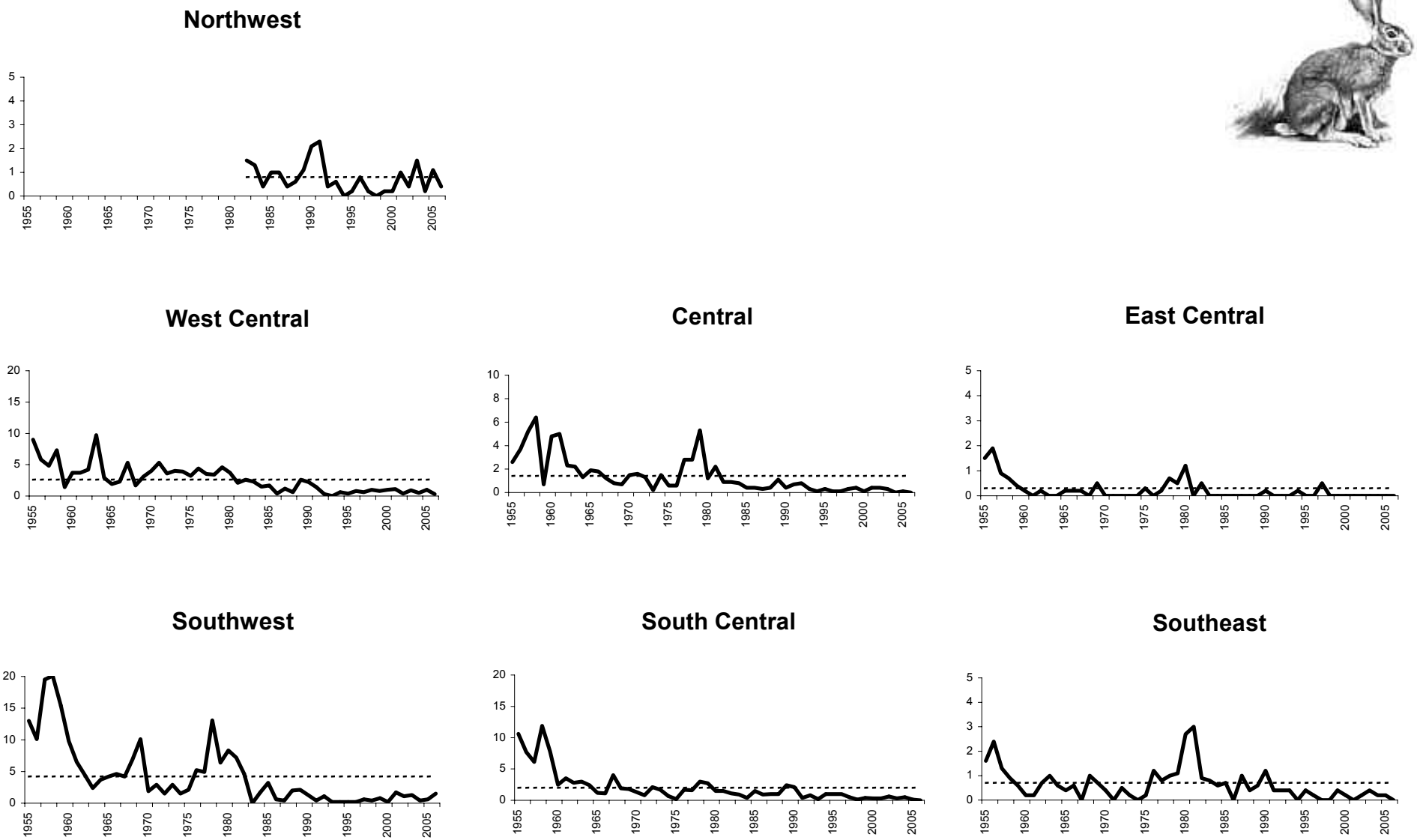

Figure 8. Regional index (____) and long-term average (.....) of **white-tailed jackrabbits seen per 100 miles driven**, Minnesota August roadside survey (1955-present). Based on all survey routes completed. **Note:** scale of vertical axis is not the same among survey regions.