

Rural Mail Carrier Survey Report

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**Mike Hayden
Secretary**

Prepared by

**Jim Pitman
Small Game Coordinator**

**Joe Kramer, Director
Fisheries and Wildlife
Division**

**Mike Mitchener, Chief
Wildlife Section**

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INTRODUCTION AND METHODS

The rural mail carrier survey (RMCS) was initiated in Kansas in 1962. In that first year, mail carriers were asked to record their observations of wildlife along their normal daily routes for 5 consecutive days during the third week of July (Summer). The following year the mail carriers were also asked to record observations during the 3rd weeks of January (Winter) and April (Spring). In 1966, a fourth survey period was added during the 2nd week of October (Fall). Since 1966, volunteer mail carriers from across the state have made observations during each of those 4 survey periods. In addition to recording wildlife observations the mail carriers also report their total mileage during each survey period and the primary county they traveled. The list of recorded wildlife species differs during each survey period. The species recorded during the summer RMCS includes ring-necked pheasants (cocks, hens, young, and uncertain), northern bobwhites (adults, young, and uncertain), wild turkeys (adult and young), prairie chickens, and eastern cottontails. The species recorded during the spring and winter surveys includes: ring-necked pheasants (cocks, hens, and uncertain), northern bobwhites, prairie chickens, eastern cottontails, jack rabbits, and wild turkeys. During the fall survey period, mail carriers record the total number of ring-necked pheasants, northern bobwhites, prairie chickens, eastern cottontails, jack rabbits, wild turkeys, and tree squirrels (fox and gray squirrels).

The collected information is used to develop standardized statewide and regional indices for each species. The index for each species is calculated as the average number of individuals observed for each 100 miles traveled. Data from the spring, summer, and winter surveys are used to develop sex ratios (Male:Female) for ring-necked pheasants. Additionally, the information collected during the summer survey period is used to develop production indices for ring-necked pheasants (Young:Hen), northern bobwhites (Young:Adult), and wild turkeys (Young:Adult). Regional calculations are made for each of these indices using species-specific regions (Figure 1). A t-test is used to draw statistical comparisons between indices. Simple linear regression is used to determine if there is a statistically significant trend for each species-season combination over the previous 10-year period.

RESULTS AND DISCUSSION

All of the spring indices increased from the previous year on a statewide scale indicating that Kansas' small game populations made it through the winter of 2008-2009 in good condition (Table 1). The statewide indices to production from the RMCS were all below average (Figures 2-4). This did not correlate with the inter-departmental brood survey that indicated production was above average for our upland birds. The discrepancy is probably due to differences in timing of the two surveys. The inter-departmental brood survey is conducted from mid-July through mid-August which extends nearly a month after the RMCS summer survey. The good vegetative conditions and late wheat harvest probably negatively affected the sight-ability of birds during the RMCS survey period resulting in counts that were biased low. The KDWP conducts multiple surveys of all our game species because these issues occasionally occur and make

interpretation difficult. Additional surveys are crucial for corroboration or as a means to refute a faulty index. Generally, the two methods to gauge game bird production produce similar results but when they don't some thought is required to determine which one is the most accurate. On a statewide scale, small game populations in Kansas have generally been stable over the last decade (Table 1). The exception would be the wild turkey population which has increased significantly over that time period.

Woodland-dependant species (i.e. turkeys) have increased over the last 10 year period on a statewide scale (Table 1). This is undoubtedly due to the fact that the amount of woodland habitat across the state also increased over the same time period. No statistically significant 10-year trends were detectable on a statewide scale for early successional grassland species such as pheasants, bobwhites, prairie chickens, cottontails, and jackrabbits (Table 1). True population trends are difficult to determine due to discrepancies that were apparent across some of the season-specific 10-year trends. To better understand changes in abundance of these species over time it is necessary to analyze additional data from other departmental surveys.

Ring-necked pheasants – The RMCS indices to the 2009 pheasant breeding population increased substantially from the previous year within every region of the state (Table 2). The increases were likely due to good production during summer 2008 and a relatively mild winter. The mail carriers again reported seeing more cocks than hens during each of the winter, spring, and summer survey periods (Figure 5). This indicates that plenty of roosters were still available to copulate with hens following the fall hunting season. The pheasant population appears to be stable or increasing in most regions of the state over the last 10-year period (Table 2). The exception would be the northeast region because 2 of the 4 indices show a significant decline over that time period. The declines in the northeast are likely real and related to land use changes (e.g. woody encroachment, conversion of native grass to brome, urbanization, etc.).

Northern bobwhites – The spring indices showed increases in the number of breeding bobwhites in every management region (Table 3). The increases were due to better production in 2008 and a relatively mild winter. Over the last 10-year period there hasn't been a statistically significant trend in the northern bobwhite population in any region. If trends were developed for a longer period (e.g. 25 years) the indices would undoubtedly show significant declines in the eastern management regions. The only region where a trend can be detected over the last 10 year period is the southeastern region where 1 of the 4 indices shows a decline in bobwhite abundance. The decline in that region is supported by other KDWP surveys and is the result of continued habitat degradation and excessively wet weather during the last several reproductive seasons.

Prairie chickens – The mail carriers generally see few prairie chickens during the 4 observation periods. Thus, the reliability of this survey for detecting annual or long-term changes in prairie chicken abundance on a regional scale is probably poor. However, the 10-year season-specific indices show generally stable populations within each of the prairie chicken management regions (Table 4). To better understand changes in prairie

chicken abundance it is necessary to use results from this survey along with results from other annual departmental surveys (e.g. annual prairie chicken lek survey).

Wild turkeys – The spring breeding populations were similar to 2008 or slightly improved across most of the state (Table 5). A substantial decline was observed in the southeast region due to poor production during 2008. According to the KDWP brood survey turkey production was much better during 2009 so numbers should improve somewhat next spring. However, hunting will still be difficult in southeast Kansas during spring 2010 because there will still be few adult gobblers. Hunting should improve for the 2011 season because there will be more 2-year old gobblers as a result of the improved production we observed this past summer. Over the last 10-year period the RMCS generally shows stable populations in the eastern management regions and increasing numbers in the central and western regions (Table 5).

Rabbits – Both eastern cottontail and black-tailed jackrabbit populations appear to be fairly stable over the last 10-year period on a statewide scale and within each of their management regions (Tables 1, 6, & 7). Rabbit production is affected similarly to that of game birds by excessive wet weather. The KDWP does not conduct a survey to gauge rabbit production but it is likely that production was good across most of the state during 2009 due to fairly normal precipitation in most areas.

Squirrels – The mail carriers only count squirrels during the fall survey period. The only significant annual change occurred in the southeast region where the population was up from the previous year (Table 8). The annual squirrel increase in southeast Kansas is likely due to several factors including: a good mast crop in fall 2008 and a relatively mild winter. Over the last 10-year period squirrel abundance has been stable in every management region.

Table 1. Statewide seasonal indices (birds/100 mi. traveled) to small game and wild turkey abundance in Kansas from the rural mail carrier survey, 2008-2009.

Species-Season ^a	n ^b	2008	n	2009	Annual Change (%)	10-year trend ^c
Ring-necked pheasant						
Winter	93	1.06	96	1.32	+24.5	Stable
Spring	97	1.61	99	2.02	+25.5	Stable
Summer	98	1.76	96	1.81	+2.8	Stable
Fall	100	1.97	97	1.38	-29.9	Stable
Northern bobwhite						
Winter	93	0.36	96	0.28	-22.2	Stable
Spring	97	0.18	99	0.26	+44.4	Stable
Summer	98	0.84	96	1.11	+32.1	Stable
Fall	100	0.50	97	0.50	0.0	Stable
Prairie chicken^d						
Winter	93	0.23	96	0.19	-17.4	Stable
Spring	97	0.10	99	0.11	+10.0	Stable
Summer	98	0.04	96	0.06	+50.0	Stable
Fall	100	0.05	97	0.08	+60.0	Stable
Wild turkey						
Winter	93	6.83	96	3.62	-47.0*	Stable
Spring	97	4.07	99	4.20	+3.2	Increasing
Summer	98	2.15	96	2.80	+30.2	Increasing
Fall	100	4.77	97	5.30	+11.1	Increasing
Eastern cottontail						
Winter	93	0.42	96	0.45	+7.1	Stable
Spring	97	0.53	99	0.68	+28.3	Stable
Summer	98	0.91	96	1.13	+24.2	Stable
Fall	100	0.50	97	0.47	-6.0	Stable
Black-tailed jackrabbit						
Winter	93	0.05	96	0.07	+40.0	Stable
Spring	97	0.05	99	0.08	+60.0	Stable
Fall	100	0.08	97	0.11	+37.5	Stable
Tree squirrels^e						
Fall	100	1.51	97	2.15	+42.4	Stable

^a Not all species are counted during all 4 seasons.

^b The number of counties from which data were collected.

^c Stable indicates that a statistically significant trend was not detectable ($P > 0.05$).

^d Includes both greater and lesser prairie chickens.

^e Includes both gray and fox squirrels.

* Index is significantly different than previous year; $P < 0.05$.

Table 2. Regional and seasonal indices (birds/100 mi. traveled) to ring-necked pheasant abundance in Kansas derived from the rural mail carrier survey, 2008-2009.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Northcentral						
Winter	13	2.30	14	2.05	-10.9	Stable
Spring	14	2.70	14	3.90	+44.4	Stable
Summer	14	3.54	14	3.23	-8.8	Stable
Fall	14	2.99	14	1.99	-33.4	Stable
Northeast						
Winter	18	0.84	18	0.44	-47.6	Stable
Spring	18	0.40	18	0.66	+65.0	Declining
Summer	18	0.46	18	0.68	+47.8	Stable
Fall	18	0.43	18	0.48	+11.6	Declining
Northwest						
Winter	9	1.20	10	2.80	+133.3	Stable
Spring	9	3.26	10	6.08	+86.5	Stable
Summer	10	3.17	10	3.63	+14.5	Stable
Fall	11	7.99	10	4.62	-42.2	Increasing
Southcentral						
Winter	12	0.75	12	0.84	+12.0	Stable
Spring	13	1.22	13	1.25	+2.5	Stable
Summer	13	1.36	12	1.38	+1.5	Stable
Fall	13	1.04	12	0.99	-4.8	Stable
Southeast						
Non-range	--	--	--	--	--	--
Southwest						
Winter	19	2.18	22	3.71	+70.2	Stable
Spring	21	4.70	22	4.88	+3.8	Increasing
Summer	22	4.40	20	4.91	+11.6	Increasing
Fall	22	4.71	21	2.93	-37.8	Stable

^aThe number of counties from which data were collected.

^b Stable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.

Table 3. Regional and seasonal indices (birds/100 mi. traveled) to northern bobwhite abundance in Kansas derived from the rural mail carrier survey, 2008-2009.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	0.74	11	0.37	-50.0	Stable
Spring	11	0.25	11	0.29	+16.0	Stable
Summer	11	1.05	10	2.09	+99.0*	Stable
Fall	11	0.92	11	0.91	-1.1	Stable
Northcentral						
Winter	16	0.57	15	0.47	-17.5	Stable
Spring	15	0.31	15	0.45	+45.2	Stable
Summer	15	0.93	15	1.35	+45.2	Stable
Fall	15	0.67	15	0.71	+6.0	Stable
Northeast						
Winter	13	0.19	13	0.15	-21.1	Stable
Spring	14	0.09	14	0.10	+11.1	Stable
Summer	14	0.94	14	1.04	+10.6	Stable
Fall	14	0.15	14	0.22	+46.7	Stable
Southcentral						
Winter	12	0.28	13	0.50	+78.6	Stable
Spring	14	0.26	14	0.42	+61.5	Stable
Summer	14	0.86	14	0.75	-12.8	Stable
Fall	14	0.84	13	0.78	-7.1	Stable
Southeast						
Winter	15	0.32	14	0.24	-25.0	Stable
Spring	15	0.12	15	0.19	+58.3	Stable
Summer	14	0.88	15	1.42	+61.4*	Stable
Fall	15	0.23	15	0.35	+52.2	Declining
Western						
Winter	26	0.08	30	0.09	+12.5	Stable
Spring	28	0.12	30	0.15	+25.0	Stable
Summer	30	0.56	28	0.26	-53.6	Stable
Fall	31	0.34	29	0.22	-35.3	Stable

^aThe number of counties from which data were collected.

^bStable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.

Table 4. Regional and seasonal indices (birds/100 mi. traveled) to prairie chicken abundance in Kansas derived from the rural mail carrier survey, 2008-2009.

Region-Season	n ^a	2008	n	2009	Annual Change (%)	10-year trend ^b
Blackjack (GPCH)						
Winter	10	0.008	10	0.000	-100.0	Stable
Spring	10	0.017	10	0.000	-100.0	Stable
Summer	10	0.000	10	0.000	NA	NA
Fall	10	0.000	10	0.000	NA	NA
Eastern Cropland (GPCH)						
Winter	18	0.003	17	0.140	+4,566.7	Stable
Spring	19	0.013	19	0.043	+230.8	Stable
Summer	18	0.000	19	0.002	NA	Stable
Fall	19	0.018	19	0.003	-83.3	Declining
Flint Hills (GPCH)						
Winter	10	0.753	10	0.054	-92.8	Stable
Spring	10	0.167	10	0.115	-31.1	Stable
Summer	10	0.086	9	0.071	-17.4	Stable
Fall	10	0.044	10	0.154	+250.0	Stable
Northwest (GPCH & LPCH)						
Winter	21	0.350	23	0.741	+111.7	Stable
Spring	22	0.346	23	0.320	-7.5	Stable
Summer	23	0.124	23	0.201	+62.1	Stable
Fall	24	0.169	23	0.260	+53.8	Stable
Southwest (LPCH)						
Winter	21	0.108	23	0.023	-78.7	Stable
Spring	23	0.003	24	0.033	+1,000.0	Stable
Summer	24	0.016	22	0.007	-56.3	Stable
Fall	24	0.020	22	0.010	-50.0	Stable
Western Cropland (GPCH)						
Winter	13	0.108	13	0.006	-94.4	Stable
Spring	13	0.046	13	0.088	+91.3	Stable
Summer	13	0.003	13	0.024	+700.0	Stable
Fall	13	0.028	13	0.026	-7.1	Stable

^aThe number of counties from which data were collected.

^bStable indicates that a statistically significant trend was not detectable ($P > 0.05$).

^dNA = not applicable.

GPCH = greater prairie-chicken, LPCH = lesser prairie-chicken

* Index is significantly different than previous year; $P < 0.05$.

Table 5. Regional and seasonal indices (birds/100 mi. traveled) to wild turkey abundance in Kansas derived from the rural mail carrier survey, 2008-2009.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Northcentral						
Winter	16	8.85	15	8.56	-3.3	Stable
Spring	15	8.24	15	7.13	-13.5	Increasing
Summer	15	3.59	15	4.65	+29.5	Increasing
Fall	15	9.61	15	9.84	+2.4	Increasing
Northeast						
Winter	15	11.73	15	5.30	-54.8	Stable
Spring	16	4.76	16	5.00	+5.0	Stable
Summer	16	2.05	16	4.31	+110.2	Stable
Fall	16	4.60	16	4.86	+5.7	Stable
Northwest						
Winter	14	11.24	17	2.95	-73.8	Increasing
Spring	16	3.50	16	5.23	+49.4	Increasing
Summer	17	2.60	15	2.40	-7.7	Increasing
Fall	18	5.40	16	8.30	+53.7	Increasing
Southcentral						
Winter	15	4.99	16	2.77	-44.5	Stable
Spring	16	3.76	16	4.23	+12.5	Stable
Summer	16	2.39	15	2.41	+0.8	Increasing
Fall	16	3.91	16	5.74	+46.8	Stable
Southeast						
Winter	14	4.29	13	1.40	-67.4*	Stable
Spring	14	2.59	14	1.68	-35.1	Stable
Summer	21	1.27	14	1.47	+15.7	Stable
Fall	14	2.68	14	2.04	-23.9	Stable
Southwest						
Winter	19	2.05	20	1.65	-19.5	Stable
Spring	20	1.86	22	2.79	+50.0	Increasing
Summer	21	1.11	21	1.22	+9.9	Increasing
Fall	21	3.29	20	2.24	-31.9	Increasing

^a The number of counties from which data were collected.

^b Stable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.

Table 6. Regional and seasonal indices (animals/100 mi. traveled) to eastern cottontail abundance in Kansas derived from the rural mail carrier survey, 2008-2009.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	0.50	11	0.38	-24.0	Stable
Spring	11	0.65	11	0.53	-18.5	Stable
Summer	11	0.98	10	1.72	+75.5	Stable
Fall	11	0.50	11	0.42	-16.0	Stable
Northcentral						
Winter	15	0.51	15	0.45	-11.8	Stable
Spring	15	0.55	15	0.70	+27.3	Stable
Summer	15	1.21	15	1.06	-12.4	Stable
Fall	15	0.51	15	0.44	-13.7	Stable
Northeast						
Winter	14	0.57	13	0.31	-45.6	Stable
Spring	14	0.41	14	0.41	0.0	Stable
Summer	14	0.96	14	0.97	+1.0	Stable
Fall	14	0.57	14	0.75	+31.6	Stable
Southcentral						
Winter	14	0.77	13	0.72	-6.5	Increasing
Spring	14	0.63	14	0.80	+27.0	Stable
Summer	14	0.84	14	1.18	+40.5	Stable
Fall	14	0.77	13	0.36	-53.2	Stable
Southeast						
Winter	15	0.25	14	0.28	+12.0	Stable
Spring	15	0.30	15	0.46	+53.3	Stable
Summer	14	0.59	15	0.94	+59.3	Stable
Fall	15	0.25	15	0.48	+92.0	Declining
Western						
Winter	31	0.49	30	0.55	+12.2	Stable
Spring	28	0.66	30	1.04	+57.6	Increasing
Summer	30	0.93	28	1.05	+12.9	Stable
Fall	31	0.49	29	0.42	-14.3	Stable

^aThe number of counties from which data were collected.

^bStable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.

Table 7. Regional and seasonal indices (animals/100 mi. traveled) to black-tailed jackrabbit abundance in Kansas derived from the rural mail carrier survey, 2008-2009. Jackrabbits are not counted during the summer survey period.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	0.006	11	0.000	-100.0	Stable
Spring	11	0.012	11	0.040	+233.3	Stable
Fall	11	0.008	11	0.005	-37.5	Stable
Northcentral						
Winter	16	0.042	15	0.022	-47.6	Stable
Spring	15	0.018	15	0.075	+316.7	Stable
Fall	15	0.089	15	0.045	-49.4	Stable
Northeast						
Winter	13	0.004	13	0.000	-100.0	Stable
Spring	14	0.000	14	0.004	NA	Stable
Fall	14	0.008	14	0.134	+1,575.0	Stable
Southcentral						
Winter	12	0.033	13	0.045	+36.4	Increasing
Spring	14	0.037	14	0.045	+21.6	Stable
Fall	14	0.047	13	0.048	+2.1	Stable
Southeast						
Winter	15	0.009	14	0.009	+0.0	Stable
Spring	15	0.005	15	0.033	+560.0	Stable
Fall	15	0.024	15	0.006	-75.0	Stable
Western						
Winter	26	0.172	30	0.256	+48.8	Stable
Spring	28	0.202	30	0.248	+22.8	Increasing
Fall	31	0.238	29	0.318	+33.6	Stable

^aThe number of counties from which data were collected.

^bStable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.

Table 8. Regional and seasonal indices (animals/100 mi. traveled) to tree squirrel (gray and fox squirrel) abundance in Kansas derived from the rural mail carrier survey, 2008-2009. Squirrels are only counted during the fall survey period.

Region-Season	n^a	2008	n	2009	Annual Change (%)	10-year trend^b
Flint Hills						
Fall	11	2.07	11	2.34	+13.0	Stable
Northcentral						
Fall	15	0.55	15	0.73	+32.7	Stable
Northeast						
Fall	14	2.84	14	4.03	+41.9	Stable
Southcentral						
Fall	14	1.35	13	1.26	-6.7	Stable
Southeast						
Fall	15	2.32	15	4.74	+104.3*	Stable
Western						
Fall	31	0.28	29	0.28	0.0	Stable

^aThe number of counties from which data were collected.

^b Stable indicates that a statistically significant trend was not detectable ($P > 0.05$).

* Index is significantly different than previous year; $P < 0.05$.



Figure 1. Kansas Department of Wildlife and Parks management regions for (A) ring-necked pheasant, (B) wild turkey, (C) northern bobwhite, eastern cottontail, black-tailed jackrabbit, and tree squirrel, and (D) prairie chickens.

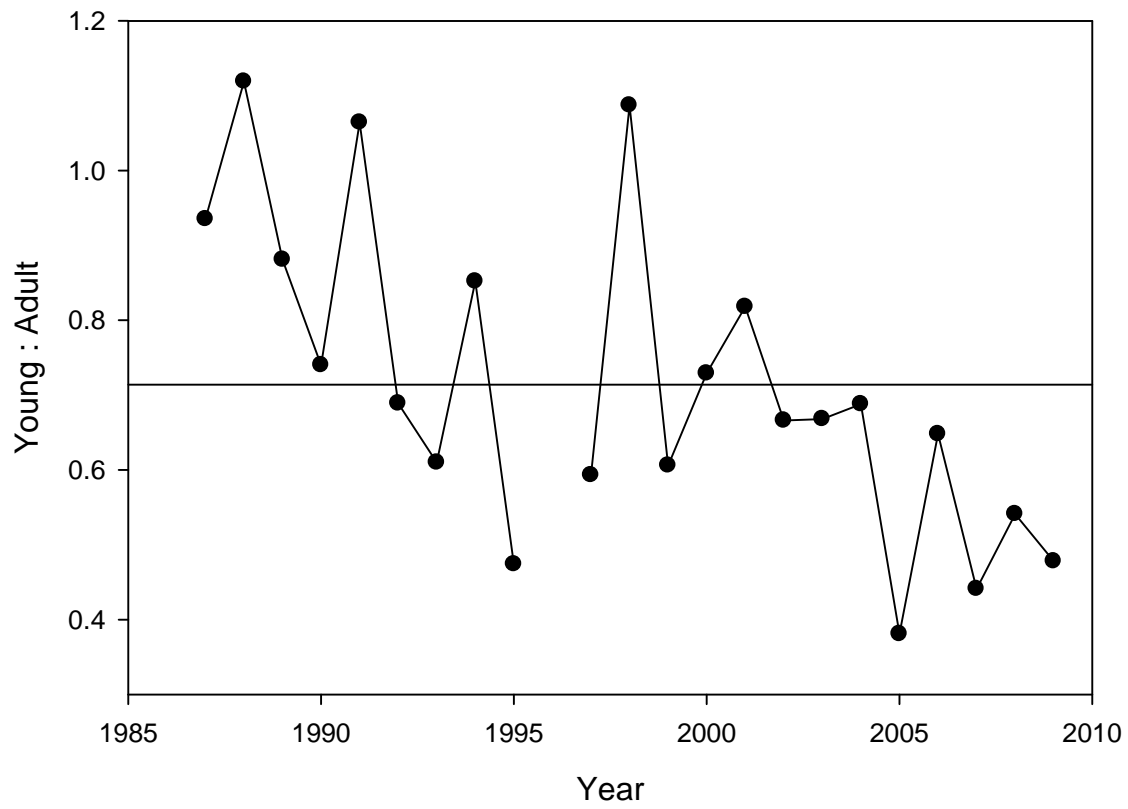


Figure 2. Statewide wild turkey production index (young:adult ratio) for Kansas derived from July rural mail carrier survey data. The horizontal line is the long-term average production index.

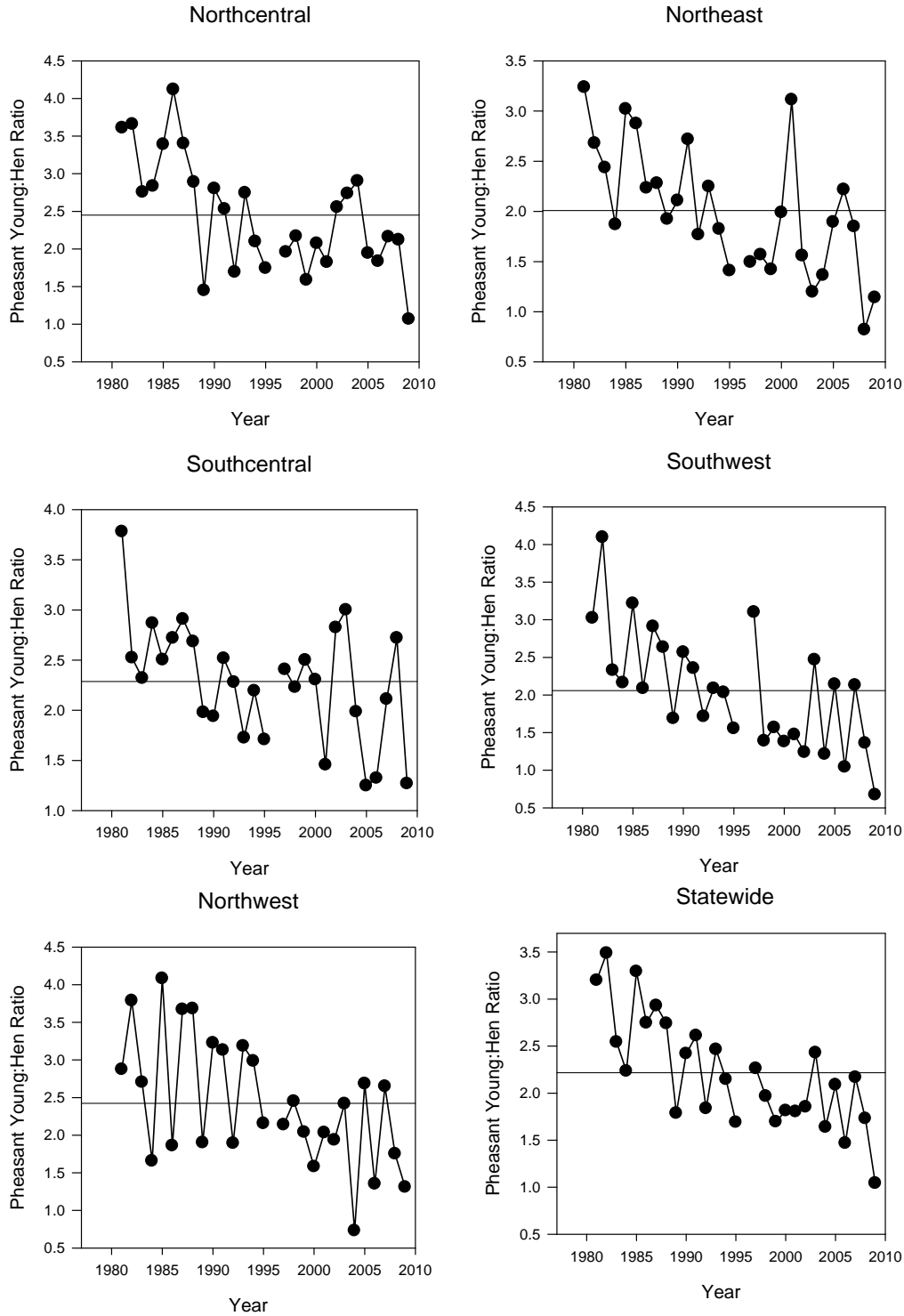


Figure 3. Regional and statewide ring-necked pheasant production indices (young:hen ratios) in Kansas derived from July rural mail carrier survey data. The horizontal lines are the long-term average production indices. Southeast region excluded because it is primarily non-range.

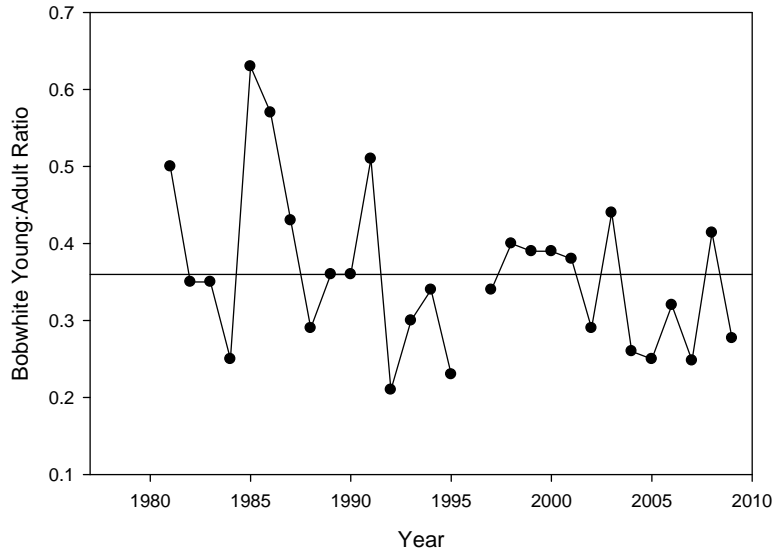


Figure 4. Statewide northern bobwhite production index (young:adult ratio) for Kansas derived from July rural mail carrier survey data. The horizontal line is the long-term average production index.

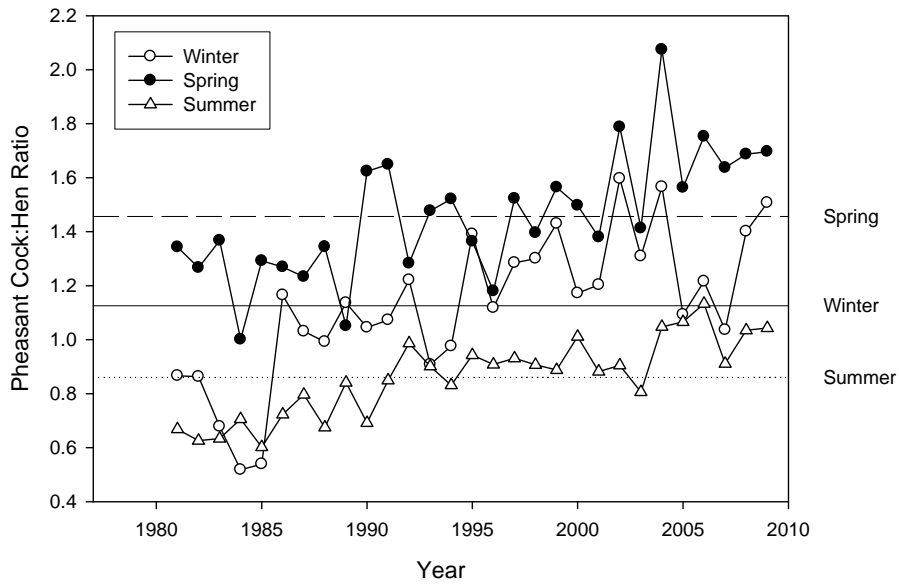


Figure 5. Statewide index to the sex ratio (Cocks:Hens) of Kansas' ring-necked pheasant population derived from rural mail carrier survey data. The horizontal lines represent the long-term average cock:hen ratios for the winter, spring, and summer survey periods.

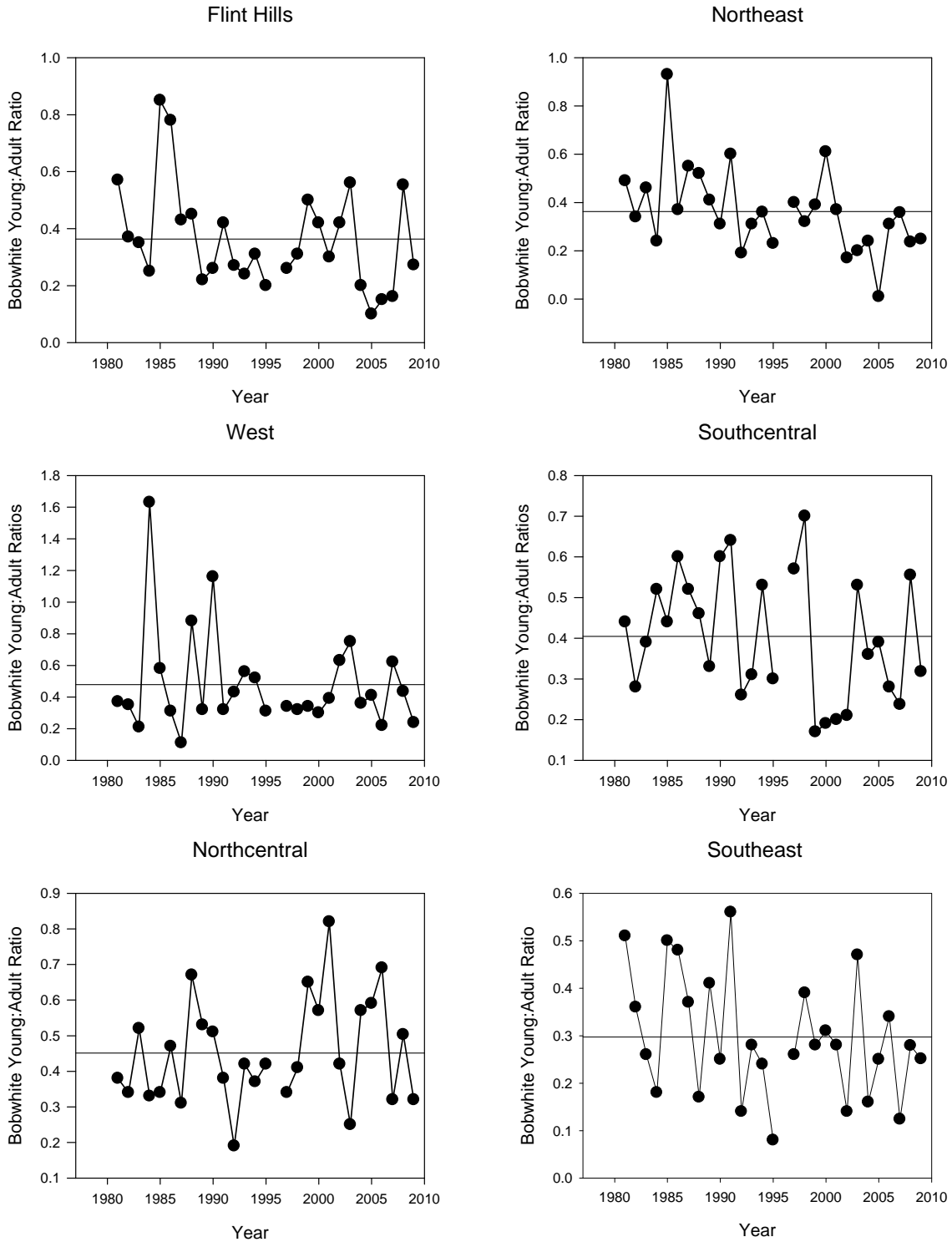


Figure 6. Regional northern bobwhite production indices (young:adult ratios) in Kansas derived from July rural mail carrier survey data. The horizontal line are the long-term average production indices.

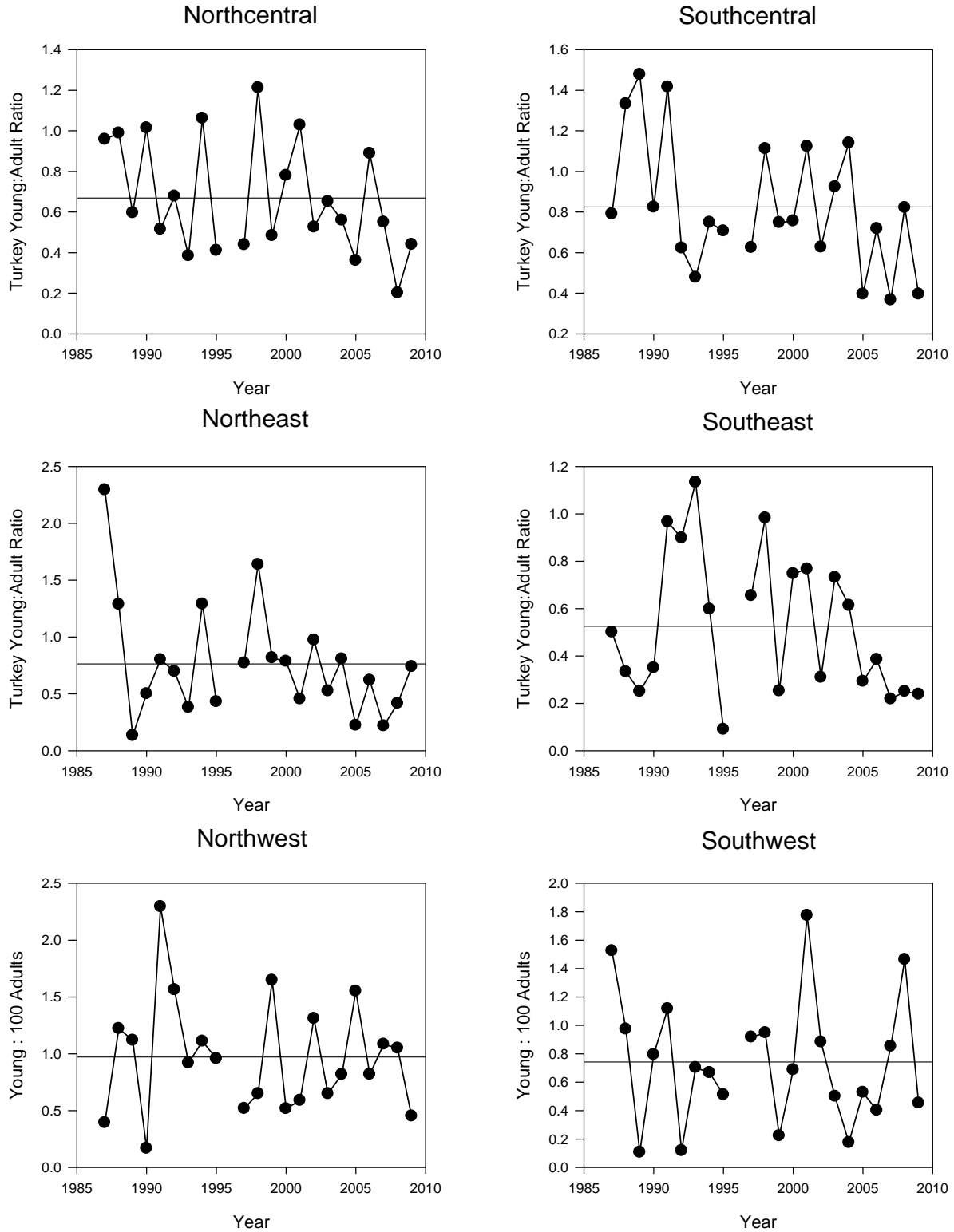


Figure 7. Regional wild turkey production indices (young:adult ratios) in Kansas derived from July rural mail carrier survey data. The horizontal line are the long-term average production indices.