

Rural Mail Carrier Survey Report

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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

The annual changes in the winter RMCS indices were difficult to interpret this year due to artificially inflated numbers in 2007. During the winter 2007 survey much of the western 1/3 of the state was covered with heavy snow. That heavy snow forced many wildlife species into open areas (e.g. roadways) and also improved sight-ability due to the sharp contrast between the white snow and darker colored animals. These conditions resulted in unusually high counts in the western 1/3 of the state and artificially inflated the western and statewide indices for the winter survey period in 2007. Thus, declines from 2007 to 2008 in the winter indices probably did not reflect true population declines on statewide scale or within the western management regions. The winter 2007 indices were valid in the regions that weren't blanketed by deep snow

in January 2007. The other 3 survey periods (spring, summer, and fall) were not affected and those indices were still reliable predictors of annual changes in abundance.

Generally, spring indices decreased from the previous year on a statewide scale indicating that most small game species were negatively affected by the torrential rain and flooding that occurred in eastern Kansas during June 2007 (Table 1). Ring-necked pheasants were the exception and their breeding population was similar or slightly improved from 2007. The major portion of the pheasant range lies outside of the area that was hit with rain and flooding in 2007. Unfortunately, much of the same area in eastern Kansas experienced heavy rain and flooding again in June 2008. The statewide indices to production were generally below average for most small game species again this year as a result of the wet weather in the east and severe drought in southwest Kansas (Figures 2-4). 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 populations 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. Few 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 index to the 2008 pheasant breeding population had decreased substantially from the previous year in northeast Kansas (Table 2). The decline in breeding numbers in northeast Kansas was likely due to below-average production in 2007 (Figure 3). A severe ice storm that hit much of northeast Kansas during December 2007 might have also impacted winter survival. The breeding populations in the other regions were generally similar or improved from the previous year due to average or above average production during 2007 and more normal weather conditions.

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. Pheasant production in central and northwest Kansas was generally good in 2008 due to a late wheat harvest and timely precipitation (Figure 3). Southwest Kansas was an exception in 2008 as drought conditions resulted in poor pheasant production in that region. Heavy rain and hail that hit parts of Northcentral and Northeast Kansas during late May also hurt production in 2008 in those localized areas. The pheasant population appears to be fairly stable in most regions of the state over the last 10-year period (Table 2).

Northern bobwhites – The spring indices showed declines in the number of breeding bobwhites in all but the Northcentral and Western regions (Table 3). The declines in the central and eastern portions of the state were likely due to two factors: 1.) poor production in 2007 as a result of heavy June rain and flooding and 2.) a severe ice storm that hit the region during December of 2007. Most of the Northcentral and Western regions missed these weather events and bobwhite populations in those areas came through the winter of 2007 in better shape. Generally, weather conditions for Bobwhite nesting and brood rearing were more favorable during 2008 across much of the state. The exceptions were the southwestern counties and the easternmost counties. Southwest Kansas experienced a severe drought last spring and summer and vegetative cover for nesting and brood rearing was poor. The eastern 1/3 of the state (especially southeast Kansas) was hit with heavy rain and flooding during June for the second year in a row. Fortunately, the heavy rains came in early June in 2008 as opposed to late June in 2007. The peak hatching period for bobwhites is toward the end of June so the wet weather had less of a negative effect in 2008. Bobwhite production during 2008 was near-average to above average in every region but there was a lot of variability within specific regions (Figures 4 and 6). The fall bobwhite populations in the eastern part of the state are at or near record lows due to continued habitat loss and weather related factors that resulted below average to very poor production over the last 2 years. More favorable weather in the western 2/3 of the state resulted in somewhat improved populations from a year ago in most areas with the major exception being drought-stricken southwest Kansas. The season-specific 10-year trends generally indicate stable bobwhite populations in each of the state's 6 management regions (Table 3). If trends were developed for a longer period (e.g. 25 years) the indices would undoubtedly show significant declines in the eastern management regions.

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 generally less than the previous year in most management regions (Table 5). Substantial declines were observed in the northeast, southeast, and southcentral regions. The declines were due to extremely wet weather during spring and summer of 2007 that resulted in near-record low production in those two regions. Production during 2008 in the eastern part of the state was slightly better than the previous year but still below the long-term averages (Figure 7). In the eastern 1/3 of the state there will be noticeably fewer birds available to hunters over at least the next couple of seasons due to 4 consecutive years of below average production. Turkey production is generally best when rainfall is near average or slightly below average. Those conditions were generally met in the Southcentral, Northwest, and Southwest management regions and production was average or above

average in those parts of the state. Much of the Northcentral region was hit with heavy rain and hail around the end of last May near the time when turkeys were hatching their nests. As a result of those weather conditions, the production index for the Northcentral region was at the lowest level ever recorded in the 22 years that data have been collected. Over the last 10-year period the RMCS generally shows statistically significant increases in turkey abundance in the Northcentral, Northwest, and Southwest regions (Table 5). Turkey populations in the other regions have begun to stabilize in recent years.

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). Apparent annual declines in the spring indices in the eastern management region suggests that rabbit production was also hurt by the heavy rain and flooding that hit the region in June 2007. The fall population in southeast Kansas was also down substantially in 2008 from the previous year suggesting that the wet weather of June 2008 had a similar effect on production.

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 down from the previous year (Table 8). The annual squirrel decline in southeast Kansas is likely due to several factors including: a poor mast crop in fall 2007, a heavy ice storm that hit much of the region in December 2007, and heavy rain and flooding that affected the area during each of the last 2 summers. 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, 2007-2008.

Species-Season ^a	n ^b	2007	n	2008	Annual Change (%)	10-year trend ^c
Ring-necked pheasant						
Winter	98	4.33	93	1.06	-75.5*	Stable
Spring	100	1.53	97	1.61	+5.2	Stable
Summer	101	2.19	98	1.76	-19.6	Stable
Fall	100	1.37	100	1.97	+43.8	Stable
Northern bobwhite						
Winter	98	1.18	93	0.36	-69.5*	Stable
Spring	100	0.24	97	0.18	-25.0	Stable
Summer	101	0.89	98	0.84	-5.6	Stable
Fall	100	0.49	100	0.50	+2.0	Declining
Prairie chicken^d						
Winter	98	0.45	93	0.23	-48.9	Stable
Spring	100	0.10	97	0.10	0.0	Stable
Summer	101	0.02	98	0.04	+100.0	Stable
Fall	100	0.07	100	0.05	-28.6	Stable
Wild turkey						
Winter	98	7.21	93	6.83	-5.3	Increasing
Spring	100	5.07	97	4.07	-19.7	Increasing
Summer	101	2.59	98	2.15	-17.0	Increasing
Fall	100	4.09	100	4.77	+16.6	Increasing
Eastern cottontail						
Winter	98	0.72	93	0.42	-41.7*	Stable
Spring	100	0.72	97	0.53	-26.4	Stable
Summer	101	0.98	98	0.91	-7.1	Stable
Fall	100	0.46	100	0.50	8.7	Stable
Black-tailed jackrabbit						
Winter	98	0.64	93	0.05	-92.2*	Stable
Spring	100	0.10	97	0.05	-50.0*	Stable
Fall	100	0.08	100	0.08	0.0	Stable
Tree squirrels^e						
Fall	100	2.04	100	1.51	-26.0	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, 2007-2008.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Northcentral						
Winter	14	2.30	13	2.30	0.00	Stable
Spring	14	2.47	14	2.70	+9.31	Stable
Summer	14	2.94	14	3.54	+20.41	Stable
Fall	14	2.17	14	2.99	+37.79	Stable
Northeast						
Winter	17	0.54	18	0.84	+55.56	Stable
Spring	18	0.87	18	0.40	-54.02*	Declining
Summer	18	0.72	18	0.46	-36.11	Stable
Fall	18	0.33	18	0.43	+30.30	Declining
Northwest						
Winter	10	20.23	9	1.20	-94.07	Stable
Spring	11	3.48	9	3.26	-6.32	Stable
Summer	12	3.32	10	3.17	-4.52	Stable
Fall	11	2.57	11	7.99	+210.89	Stable
Southcentral						
Winter	13	1.71	12	0.75	-56.14	Stable
Spring	13	1.12	13	1.22	+8.93	Stable
Summer	13	1.78	13	1.36	-23.60	Stable
Fall	13	0.87	13	1.04	+19.54	Stable
Southeast						
Non-range	--	--	--	--	--	--
Southwest						
Winter	22	13.79	19	2.18	-84.19*	Stable
Spring	22	3.58	21	4.70	+31.28	Stable
Summer	22	6.84	22	4.40	-35.67	Increasing
Fall	22	4.47	22	4.71	+5.37	Increasing

^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, 2007-2008.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	2.04	11	0.74	-63.73*	Stable
Spring	11	0.53	11	0.25	-52.83	Stable
Summer	11	1.40	11	1.05	-25.00	Stable
Fall	11	0.82	11	0.92	+12.20	Declining
Northcentral						
Winter	14	0.05	16	0.57	+1,040.00	Stable
Spring	15	0.11	15	0.31	+181.82	Declining
Summer	15	1.03	15	0.93	-9.71	Stable
Fall	15	0.48	15	0.67	+39.58	Stable
Northeast						
Winter	14	0.51	13	0.19	-62.75	Stable
Spring	14	0.25	14	0.09	-64.00	Stable
Summer	14	0.98	14	0.94	-4.08	Stable
Fall	14	0.41	14	0.15	-63.41	Stable
Southcentral						
Winter	14	0.89	12	0.28	-68.54	Stable
Spring	14	0.30	14	0.26	-13.33	Stable
Summer	14	1.02	14	0.86	-15.69	Stable
Fall	14	0.51	14	0.84	+64.71	
Southeast						
Winter	15	3.10	15	0.32	-89.68*	Stable
Spring	15	0.29	15	0.12	-58.62	Stable
Summer	15	0.90	14	0.88	-2.22	Stable
Fall	15	0.42	15	0.23	-45.24	Declining
Western						
Winter	30	0.26	26	0.08	-69.23	Stable
Spring	31	0.05	28	0.12	+140.00	Stable
Summer	32	0.38	30	0.56	+47.37	Stable
Fall	31	0.42	31	0.34	-19.05	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, 2007-2008.

Region-Season	n ^a	2007	n	2008	Annual Change (%)	10-year trend ^b
Blackjack (GPCH)						
Winter	10	0.019	10	0.008	-57.89	Stable
Spring	10	0.000	10	0.017	NA	Stable
Summer	10	0.000	10	0.000	NA	Stable
Fall	10	0.005	10	0.000	-100.00	Stable
Eastern Cropland (GPCH)						
Winter	19	0.035	18	0.003	-91.43	Stable
Spring	19	0.081	19	0.013	-83.95	Stable
Summer	19	0.021	18	0.000	-100.00	Stable
Fall	19	0.007	19	0.018	+157.14	Declining
Flint Hills (GPCH)						
Winter	10	3.324	10	0.753	-77.35	Stable
Spring	10	0.295	10	0.167	-43.39	Stable
Summer	10	0.033	10	0.086	+160.61	Stable
Fall	10	0.011	10	0.044	+300.00	Stable
Northwest (GPCH & LPCH)						
Winter	23	0.283	21	0.350	+23.67	Stable
Spring	24	0.170	22	0.346	+103.53	Stable
Summer	25	0.046	23	0.124	+169.57	Stable
Fall	24	0.145	24	0.169	+16.55	Stable
Southwest (LPCH)						
Winter	24	0.007	21	0.108	+1,442.86	Stable
Spring	24	0.015	23	0.003	-80.00	Stable
Summer	24	0.026	24	0.016	-38.46	Stable
Fall	24	0.034	24	0.020	-41.18	Stable
Western Cropland (GPCH)						
Winter	12	0.042	13	0.108	+157.14	Stable
Spring	13	0.062	13	0.046	-25.81	Stable
Summer	13	0.012	13	0.003	-75.00	Stable
Fall	13	0.164	13	0.028	-82.93	Stable

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

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

^d NA = 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, 2007-2008.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Northcentral						
Winter	14	7.63	16	8.85	+15.99	Stable
Spring	15	8.18	15	8.24	+0.73	Increasing
Summer	15	5.74	15	3.59	-37.46	Increasing
Fall	15	8.05	15	9.61	+19.38	Increasing
Northeast						
Winter	16	11.29	15	11.73	+3.90	Increasing
Spring	16	6.28	16	4.76	-24.20	Stable
Summer	16	2.97	16	2.05	-30.98	Stable
Fall	16	3.87	16	4.60	+18.86	Stable
Northwest						
Winter	17	8.45	14	11.24	+33.02	Increasing
Spring	18	4.03	16	3.50	-13.15	Increasing
Summer	19	1.85	17	2.60	+40.54	Increasing
Fall	18	4.75	18	5.40	+13.68	Increasing
Southcentral						
Winter	16	4.05	15	4.99	+23.21	Stable
Spring	16	4.75	16	3.76	-20.84	Stable
Summer	16	2.42	16	2.39	-1.24	Increasing
Fall	16	5.05	16	3.91	-22.57	Stable
Southeast						
Winter	14	9.70	14	4.29	-55.77*	Stable
Spring	14	4.80	14	2.59	-46.04*	Stable
Summer	14	2.01	21	1.27	-36.82	Stable
Fall	14	2.02	14	2.68	+32.67	Stable
Southwest						
Winter	21	3.35	19	2.05	-38.81	Stable
Spring	21	2.10	20	1.86	-11.43	Increasing
Summer	21	0.98	21	1.11	+13.27	Increasing
Fall	21	2.01	21	3.29	+63.68	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, 2007-2008.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	0.61	11	0.50	-18.03	Increasing
Spring	11	0.38	11	0.65	+71.05	Stable
Summer	11	1.12	11	0.98	-12.50	Stable
Fall	11	0.61	11	0.50	-18.03	Stable
Northcentral						
Winter	14	0.60	15	0.51	-15.00	Stable
Spring	15	0.55	15	0.55	0.00	Stable
Summer	15	0.94	15	1.21	+28.72	Stable
Fall	15	0.67	15	0.51	-23.88	Stable
Northeast						
Winter	14	0.70	14	0.57	-18.57*	Stable
Spring	14	0.81	14	0.41	-49.38*	Stable
Summer	14	1.07	14	0.96	-10.28	Stable
Fall	14	0.42	14	0.57	+35.71	Stable
Southcentral						
Winter	14	0.65	14	0.77	+18.46	Increasing
Spring	14	1.00	14	0.63	-37.00	Stable
Summer	14	1.43	14	0.84	-41.26	Stable
Fall	14	0.50	14	0.77	+54.00	Stable
Southeast						
Winter	15	0.82	15	0.25	-69.51	Stable
Spring	15	0.62	15	0.30	-51.61	Stable
Summer	15	0.72	14	0.59	-18.06	Stable
Fall	15	0.32	15	0.25	-21.88	Declining
Western						
Winter	30	0.87	31	0.49	-43.68*	Stable
Spring	31	0.86	28	0.66	-23.26	Stable
Summer	32	0.80	30	0.93	+16.25	Stable
Fall	31	0.41	31	0.49	+19.51	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, 2007-2008. Jackrabbits are not counted during the summer survey period.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Flint Hills						
Winter	11	0.009	11	0.006	-33.33	Stable
Spring	11	0.015	11	0.012	-20.00	Stable
Fall	11	0.029	11	0.008	-72.41	Stable
Northcentral						
Winter	14	0.029	16	0.042	+44.83	Stable
Spring	15	0.067	15	0.018	-73.13	Stable
Fall	15	0.118	15	0.089	-24.58	Stable
Northeast						
Winter	14	0.029	13	0.004	-86.21	Stable
Spring	14	0.022	14	0.000	-100.00	Stable
Fall	14	0.024	14	0.008	-66.67	Stable
Southcentral						
Winter	14	0.045	12	0.033	-26.67	Increasing
Spring	14	0.035	14	0.037	+5.71	Stable
Fall	14	0.066	14	0.047	-28.79	Stable
Southeast						
Winter	15	0.022	15	0.009	-59.09	Stable
Spring	15	0.062	15	0.005	-91.94	Stable
Fall	15	0.029	15	0.024	-17.24	Increasing
Western						
Winter	30	2.887	26	0.172	-94.04*	Stable
Spring	31	0.303	28	0.202	-33.33	Stable
Fall	31	0.185	31	0.238	+28.65	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, 2007-2008. Squirrels are only counted during the fall survey period.

Region-Season	n^a	2007	n	2008	Annual Change (%)	10-year trend^b
Flint Hills						
Fall	11	2.39	11	2.07	-13.39	Stable
Northcentral						
Fall	15	1.33	15	0.55	-58.65	Stable
Northeast						
Fall	14	3.22	14	2.84	-11.80	Stable
Southcentral						
Fall	14	1.28	14	1.35	+5.47	Stable
Southeast						
Fall	15	3.76	15	2.32	-38.30*	Stable
Western						
Fall	31	0.31	31	0.28	-9.68	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.

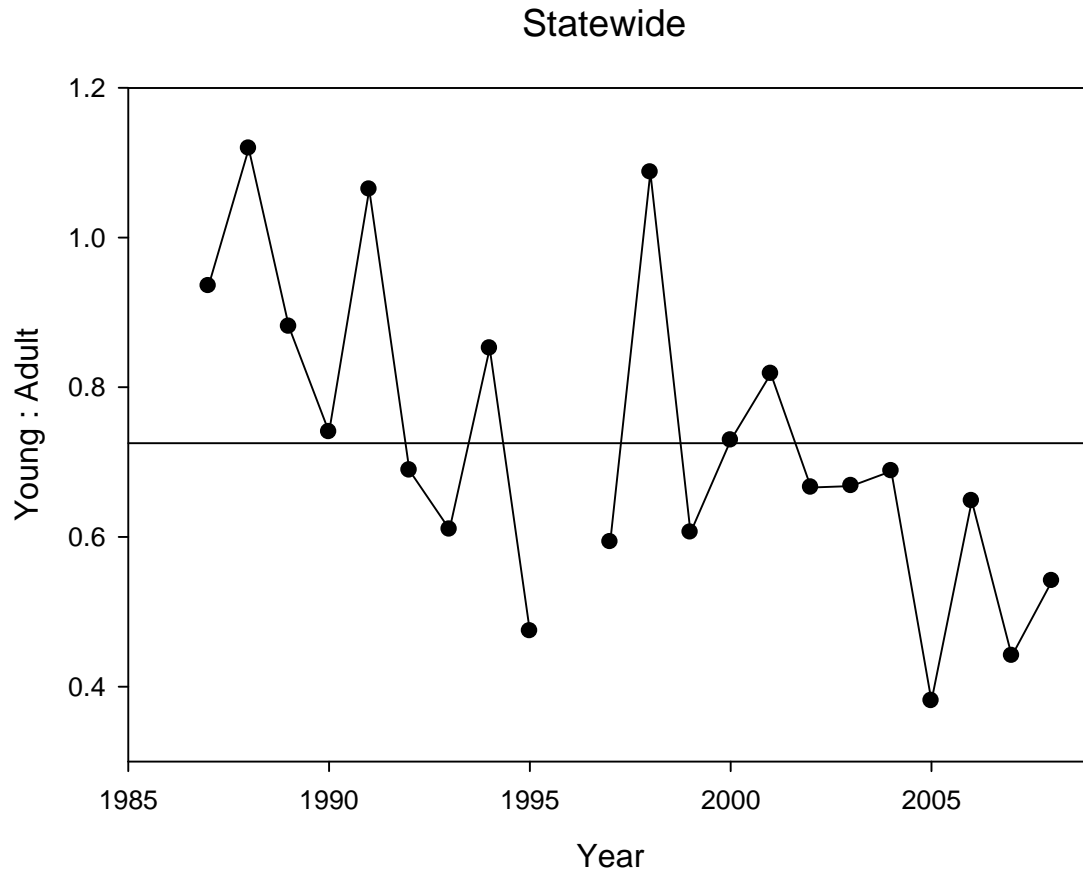


Figure 2. Statewide wild turkey production index (young:adult ratio) for Kansas derived from July rural mail carrier survey data. The horizontal line is the long-term average production index.

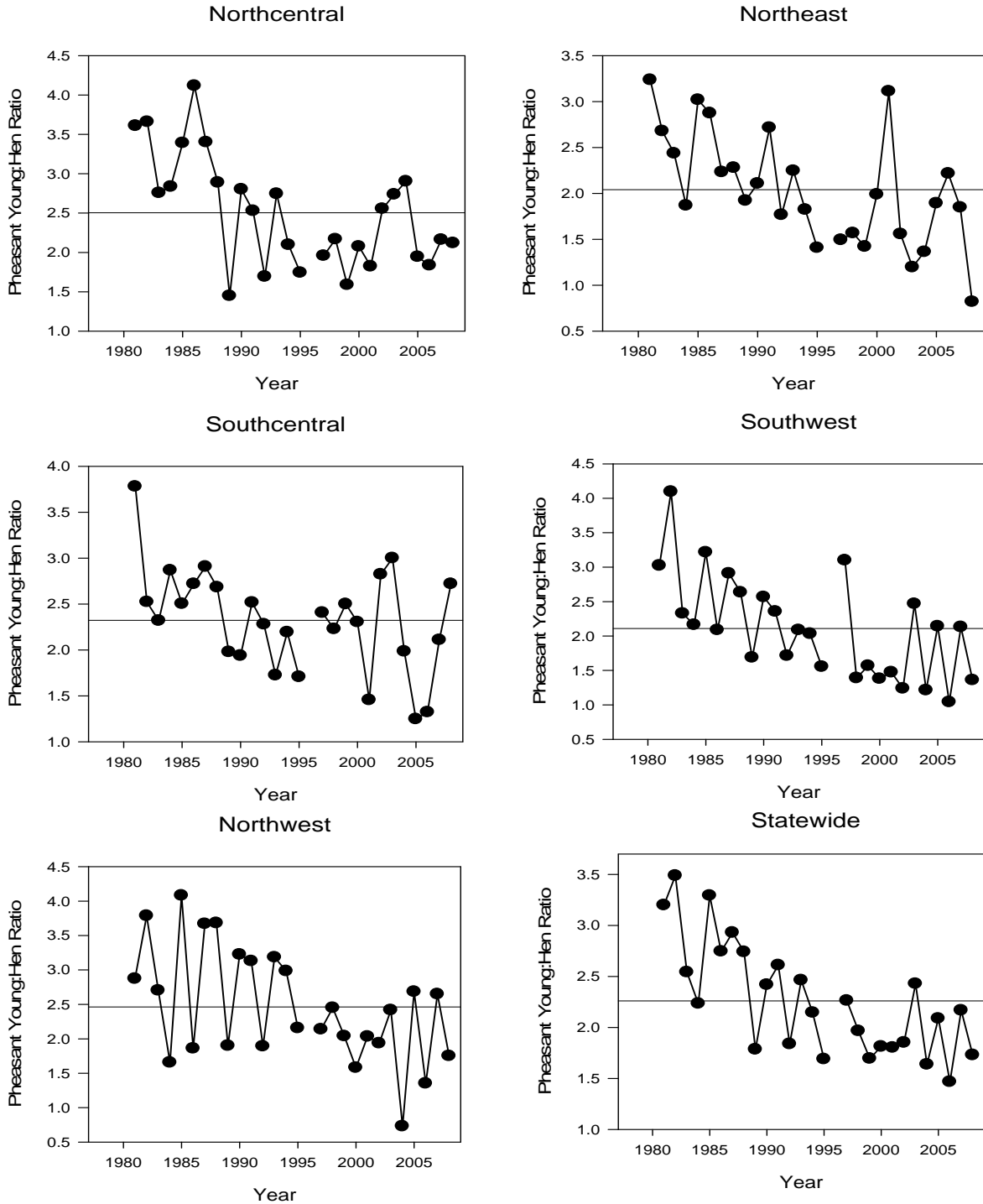


Figure 3. Regional and statewide ring-necked pheasant production indices (young:hen ratios) in Kansas derived from July rural mail carrier survey data. The horizontal lines are the long-term average production indices. Southeast region excluded because it is primarily non-range.

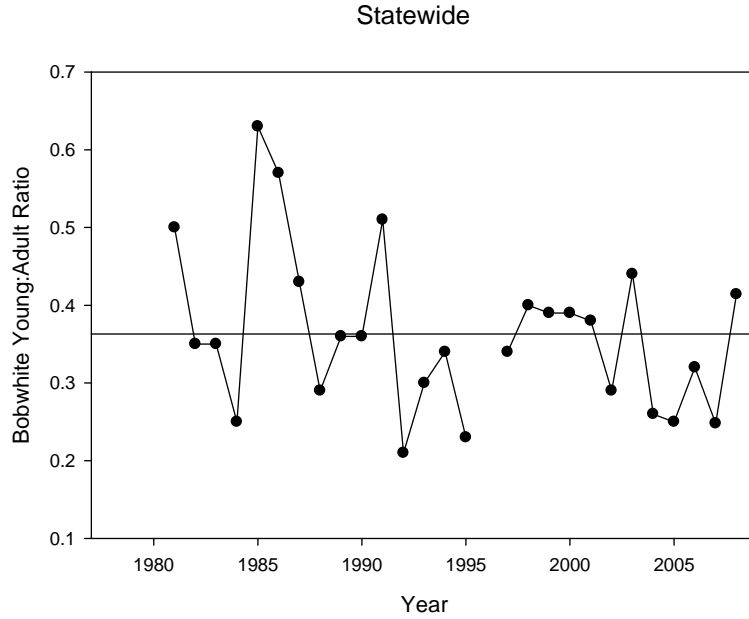


Figure 4. Statewide northern bobwhite production index (young:adult ratio) for Kansas derived from July rural mail carrier survey data. The horizontal line is the long-term average production index.

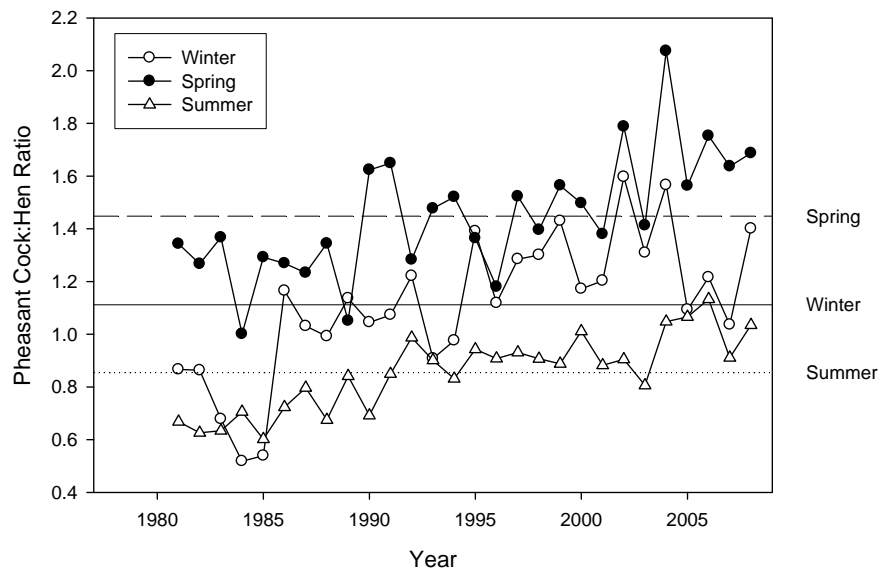


Figure 5. Statewide index to the sex ratio (Cocks:Hens) of Kansas' ring-necked pheasant population derived from rural mail carrier survey data. The horizontal lines represent the long-term average cock:hen ratios for the winter, spring, and summer survey periods.

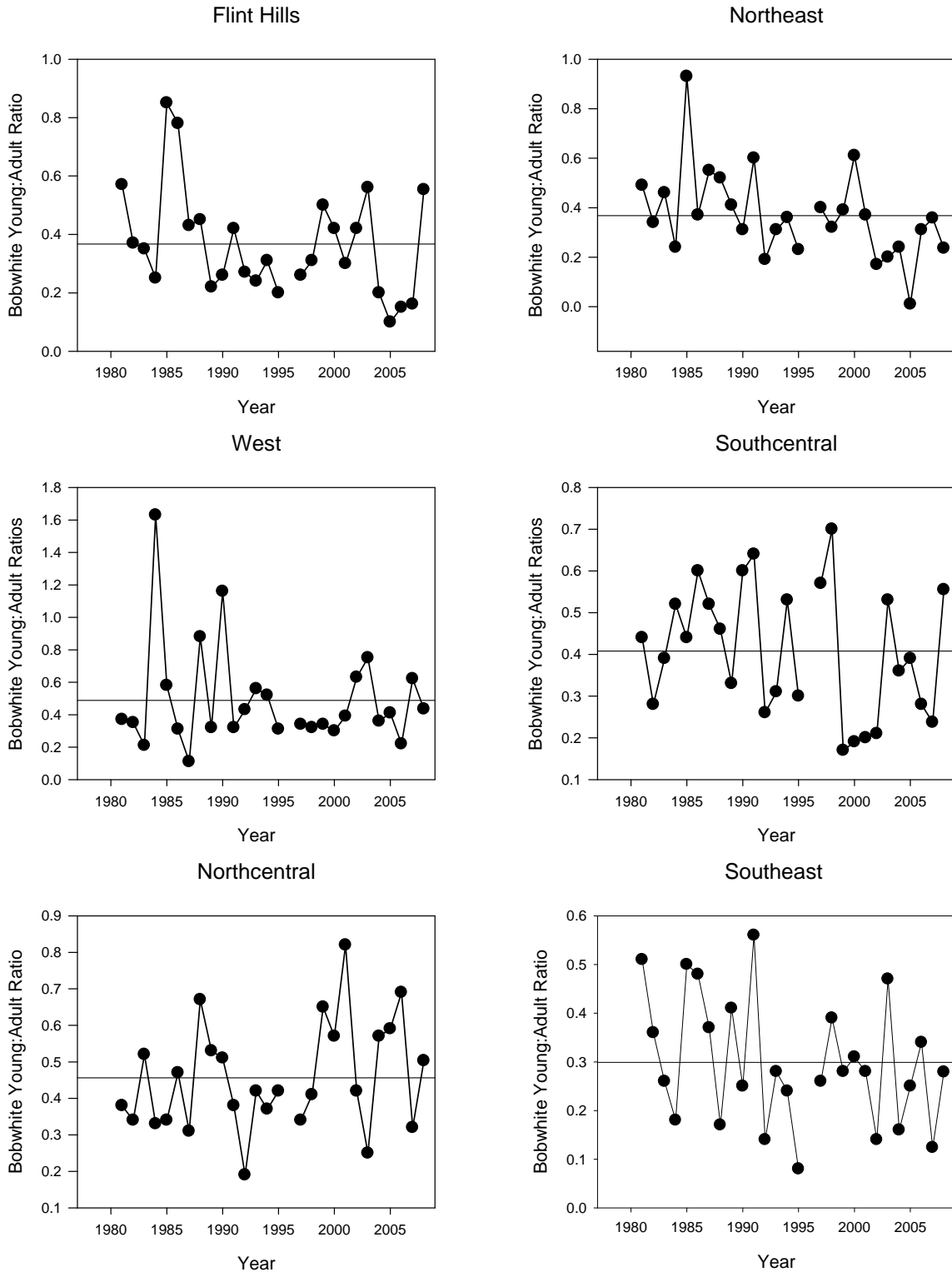


Figure 6. Regional northern bobwhite production indices (young:adult ratios) in Kansas derived from July rural mail carrier survey data. The horizontal line are the long-term average production indices.

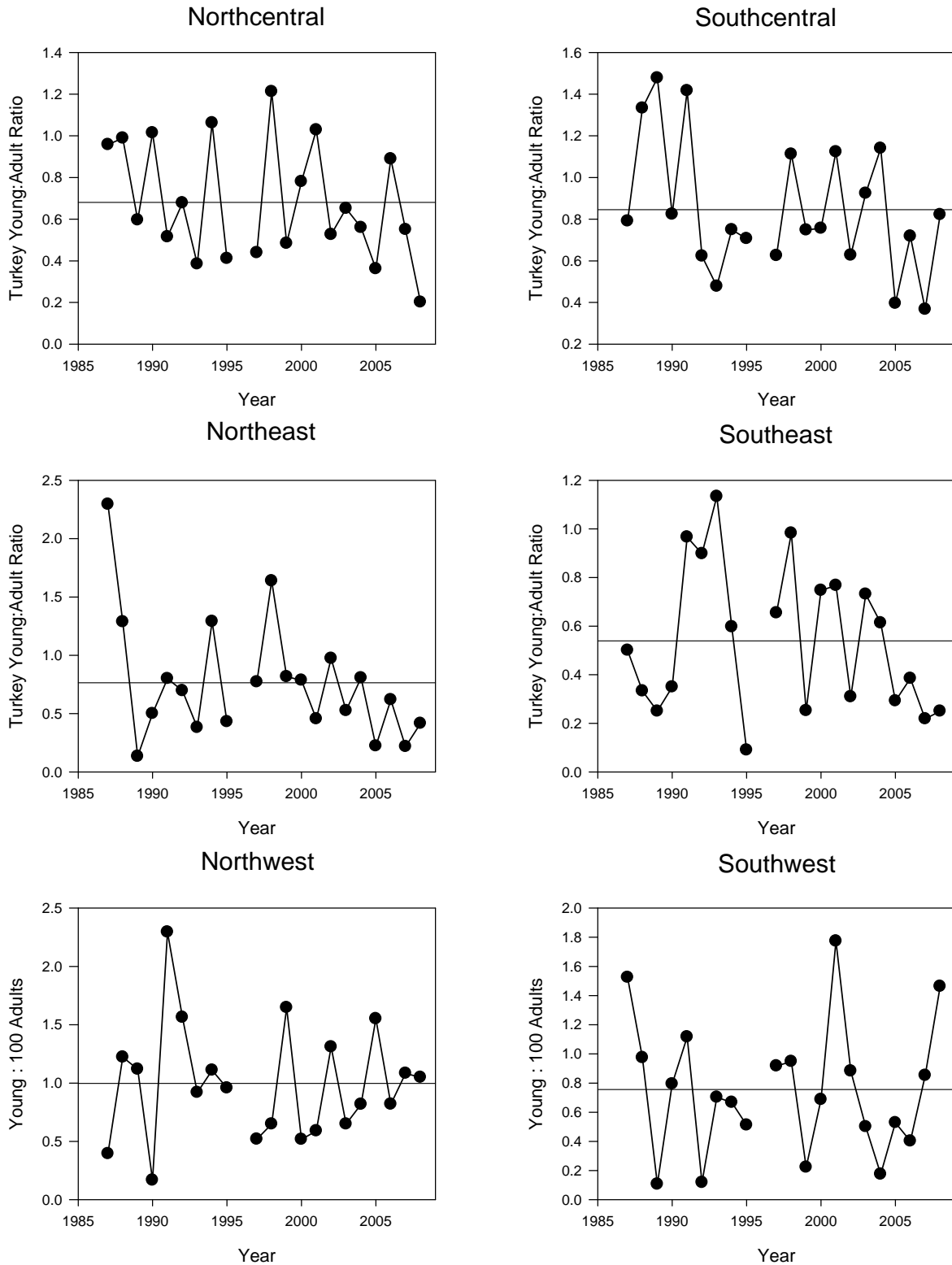


Figure 7. Regional wild turkey production indices (young:adult ratios) in Kansas derived from July rural mail carrier survey data. The horizontal line are the long-term average production indices.