

**2017 BOBWHITE WHISTLE COUNT**

**Performance Report**

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**KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM**

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## INTRODUCTION AND METHODS

To monitor changes in northern bobwhite abundance the spring whistle count was initiated in 1998. A total of 65 routes were established and surveyed annually from 1998 - 2005. Prior to the 2006 survey, the distribution of routes was adjusted to provide better coverage of the entire state, and thus a more accurate representation of bobwhite densities. This was accomplished by adding 16 new routes in areas not previously surveyed and eliminating 10 routes from areas where effort was clustered. Two more routes were added in 2011 to further improve sampling distribution. In 2016, observers were asked to survey 76 established routes during the 1-16 June survey period, starting at sunrise (Table 1). Due to weather constraints a one week extension was granted to 2 surveys to facilitate data collection on routes impacted by poor sampling conditions. Each route consisted of 11 stops spaced at approximately 1 mile intervals. Observers listened for 5 minutes at each stop and recorded the total number of different bobwhites heard calling and total number of calls.

The index to bobwhite abundance was calculated as the mean number of different bobwhites heard per listening stop per route (M/S). To prevent observer bias impacting results, only routes that were sampled by the same observer in consecutive years were used to assess changes in regional and statewide indices. Given that samples are taken on permanently established routes, samples are not independent and thus a paired-sample t-test was used to draw inter-annual comparisons. Additionally, a linear regression of the historical whistle count data was used to determine if bobwhite abundance had changed significantly from 1998 to 2017. All indices and analyses were calculated for each of the 7 small game regions (Figure 1).

Inverse Distance Weighting is a mapping technique that can be used to interpolate data between survey points, providing estimates to areas not surveyed. This technique has limitations

at smaller scales (e.g., within counties and townships) because no habitat variables are included (only count data), but is useful for large-scale interpretation of statewide data for regional comparisons. Inverse Distance Weighting was used by assigning the route-specific whistle index to the centroid of each route. All sampled routes were used to extrapolate data throughout Kansas.

## RESULTS

Observers surveyed 74 of the 76 assigned routes during 2017 for a statewide index of 3.40 calling males per stop. Routes 20 in Finney county and 46 in Neosho county were not completed during the allotted survey period. Among the 69 comparable routes, the 2017 statewide index to the breeding bobwhite population was 3% higher than in 2016 (Table 2) which was not a statistically significant increase. There were statistically significant ( $P < 0.10$ ) increases in the average number of calling males per stop in the Smoky Hills (40%) region from 2016 to 2017 (Table 2). The average number of calling males per stop was also greater in the South-Central Prairies, Flint Hills, Glaciated Plains, and Northern high plains in 2017; however these increases were not statistically significant ( $P > 0.10$ ). There were no statistically significant ( $P < 0.10$ ) decreases in the average number of calling males per stop among any of the 7 regions this year. There were non-significant decreases in the average males calling per stop in both the Osage Cuestas and the Southern High Plains (Table 2). Non-significant changes at the regional level could have been solely due to variability associated with the sampling methodology.

The statewide calling bobs/stop index has shown an increase at a rate of 0.012 calling males/year (Figure 2, Statewide), however this is not a significant rate of increase ( $P > 0.05$ ). The rate of change has been highly impacted by large increases in the indices in the last 3 years that has improved the estimated population trajectory. While these recent statewide increase are welcomed, there had been a declining trend in bobwhite abundance since the inception of this survey in 1998, particularly in the Glaciated Plains and Osage Cuestas regions of eastern Kansas

(Figure 2). These regions saw slight declines this year but remained above their respective long-term averages. However, despite the indices remaining above the long-term average in these regions, both still indicate a long-term declining trend. Bobwhite populations in the central and western regions have displayed more stable to increasing long term trends.

## **DISCUSSION**

Spring whistle counts are considered an index to the breeding population. As such, they reflect a combination of the previous breeding season's production and overwinter survival. The extreme drought observed in 2011-2014 severely depressed quail populations across much of the state. Early summer rains in 2014 greatly improved conditions for quail nesting and brood rearing. Since 2014, production conditions have remained good to excellent, and quail abundance has increased as a result. Kansas had a relatively mild 2016/2017 winter, which likely did not have widespread negative impacts on overwinter survival. The combination of good production conditions last summer and the mild winter maintained high statewide quail averages coming into the 2017 breeding season population (Figure 2). After achieving the highest regional densities ever observed in this survey, the Southern High Plains had decreased indices on most routes this year. The heavy snowstorm in western Kansas the first weekend of May is thought to have caused high mortality in these areas.

While the population trajectory is increasing across much of the state, largescale population declines began well before the inception of this survey in 1998. Historically, the eastern regions (Glaciated Plains and Osage Cuestas) produced the highest densities of bobwhites in the state. While the 2017 index in both of these regions is higher than short and long-term averages, both continue to indicate an overall decline in bobwhite abundance. Weather conditions and habitat recovery following the 2011-2014 drought have provided high quality conditions for quail across the state, but long-term landscape level changes (e.g., reduced quality and quantity of habitat) that caused populations to decline still exist and will likely contribute to

future population declines. Recent population increases have given us an opportunity to promote conservation practices that benefit quail and other grassland wildlife, and capitalize on revitalized interest in managing for upland game birds.

It is important to understand that annual changes to the breeding population do not necessarily reflect hunt quality for the upcoming season. The fall bobwhite population will predominantly depend on 2017 summer productivity. This survey is an index to the spring breeding population and is a measure of production potential, but fall populations are ultimately determined by weather and habitat conditions through the summer months. Localized bobwhite populations can increase nearly 300% from spring to fall when habitat and weather conditions are suitable for production. Beginning the spring with a larger breeding population creates the potential for a larger population increase when conditions are good, but doesn't guarantee it. Under correct conditions, fall densities in areas with lower breeding populations can surpass areas that had larger spring densities. Likewise, areas with high spring densities can have relatively low fall densities in the event of poor conditions.

The hunting outlook at this time is unpredictable for fall 2017. Several routes across the state showed great improvement from 2016 (Table 2), and the statewide population index is the highest that we have ever recorded on this survey (Table 2, Figure 3). Precipitation in spring of 2016 created good nesting conditions and widespread rains this year has provided ample soil moisture for the brooding season. Heavy rainfall and hail can negatively impact survival and reproduction, and we've seen several of these localized events. June has presented relatively mild temperatures that should benefit nesting birds that are exposed during this critical period. However, heavy and cool rain associated with this weather can also negatively impact chick survival. Conditions through the remainder of July and August will have large impacts on the realized fall densities. More accurate predictions about fall densities will be available following the completion of the summer brood survey in September.

Table 1. Northern bobwhite survey routes and observers in Kansas, 2017.

Route	County(s)	Observer	Route	County(s)	Observer
1	Allen	Jason Deal	40	Montgomery	Ed Miller
2	Atchinson/Doniphan	Tyler Warner	41	Morris	Brent Konen
3	Barber	Charlie Swank	42	McPherson/Marion	Jeremy Amos
4	Barton	Charlie Swank	43	Morton	Kraig Schultz
5	Bourbon	Justin Harbit	44	Morton	Kraig Schultz
6	Butler	Jeff Rue	45	Nemaha	Alex Thornburg
7	Chase	Kent Frike	46	Neosho	Travis Ratliff
8	Chautauqua	Darin Porter	47	Osage	Brad Niemann*
9	Cherokee	David Shanholtzer	48	Osborne	Jeff Prendergast
10	Clark	Jon Zuercher	49	Ottawa	Brian Serpan*
11	Clay	Clint Thornton	50	Pawnee	Charlie Swank
12	Cloud	Matt Farmer	51	Pawnee	Tom Bidrowski
13	Coffey	Alex Lyon	52	Phillips	Eric Wiens
14	Cowley	Kurt Grimm	53	Pottawatomie	Bryon Brown
15	Crawford	Logan Martin	54	Pratt	Todd Gatton
16	Douglas	Tim Urban	55	Rawlins	Kevin Klag
17	Elk	Victoria Cikanek	56	Reno	Kyle McDonald
18	Ellis	Jason Wagner	57	Rice	Steve Adams
19	Ellsworth	James Svaty	58	Riley	Corey Alderson
20	Finney	Manuel Torres	59	Rush	Jason Wagner
21	Ford	Aaron Baugh	60	Russell	Megan Rohweder
22	Greenwood	Victoria Cikanek	61	Saline	Matt Smith
23	Harvey	Charlie Cope	62	Shawnee	Brad Rueschhoff
24	Hodgeman	Aaron Baugh	63	Sheridan	Abby Athen*
25	Hodgeman	Abe Lollar*	64	Smith	Chris Lecuyer
26	Jefferson/Jackson	Tyler Warner	65	Stafford	Wes Sowards
27	Jewell	Luke Kramer	66	Stanton	Kraig Schultz
29	Kingman	Craig Curtis	67	Sumner	Jeff Rue
30	Kiowa	Charlie Swank	68	Trego	Kevin Shettle*
31	Leavenworth	Andy Friesen	69	Wabaunsee	Brad Rueschhoff
32	Lincoln	James Svaty	70	Washington	Clint Thornton
33	Linn	Jacob Coulter	71	Woodson	Jake Christiansen
34	Lyon	Cody Miller	72	Grand Osage WA	Rob Riggan
35	Marshall	Megan Smith	73	Hamilton	Kurt Meier
36	McPherson	Jason Black*	74	Wilson WA	Scott Thomasson
37	Meade	Jon Zuercher	75	TuttleCreek WA	Adam Bauer
38	Miami	Andy Friesen	76	Perry WA	Andrew Page
39	Mitchell	Luke Kramer	77	Clinton WA Wakarusa	Justin Hamilton

\*New observer for 2017

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2017.

Route	2016 M/S	2017 M/S	% $\Delta^a$	Route	2016 M/S	2017 M/S	% $\Delta^a$
<u>Flint Hills</u>				<u>Smoky Hills</u>			
06 Butler	3.82	5.18	36	04 Barton <sup>b</sup>	3.09	3.91	26
07 Chase	1.82	2.64	45	12 Cloud	4.38	5.78	32
08 Chautauqua	5.56	5.91	6	18 Ellis	4.45	5.18	16
11 Clay	3.00	4.45	48	19 Ellsworth	2.36	4.27	81
14 Cowley	9.45	9.27	-2	24 Hodgeman	1.36	1.18	-13
17 Elk	3.64	4.55	25	25 Hodgeman	2.20	2.82	28
22 Greenwood	4.27	4.55	6	27 Jewell	2.64	3.64	38
34 Lyon	5.45	1.20	-78	32 Lincoln	2.36	2.44	3
41 Morris	1.90	1.80	-5	36 McPherson	2.09	5.18	148
42 McPherson_Marion	3.30	2.50	-24	39 Mitchell	1.80	2.09	16
53 Pottawatomie	5.80	7.63	32	48 Osborne	3.45	2.55	-26
58 Riley	4.09	4.82	18	49 Ottawa <sup>b</sup>	3.80	5.86	54
69 Wabaunsee	2.10	2.80	33	52 Phillips	3.00	4.82	61
75 Tuttle Cr WA	2.18	3.91	79	57 Rice	4.82	5.80	20
<b>Region</b>	<b>4.03</b>	<b>4.37</b>	<b>8</b>	59 Rush	2.91	3.73	28
<u>Glaciated Plains</u>				60 Russell	2.20	2.91	32
02 Atchison_Doniphan	1.09	1.27	17	61 Saline	2.91	3.27	13
16 Douglas	3.00	3.70	23	64 Smith	1.73	2.80	62
26 Jefferson_Jackson	2.60	3.00	15	68 Trego <sup>b</sup>	NA	1.27	NA
31 Leavenworth	0.20	0.36	82	70 Washington	3.18	5.00	57
35 Marshall	3.40	1.82	-47	74_WilsonWA	5.18	6.45	25
45 Nemaha	2.00	3.22	61	<b>Region</b>	<b>3.09</b>	<b>3.98</b>	<b>40*</b>
62 Shawnee	2.44	3.25	33	<u>South-Central Prairies</u>			
76 Perry Wa	4.18	5.27	26	03 Barber	3.64	4.55	25
77 Clinton WA Wak	1.44	0.50	-65	10 Clark	4.45	4.18	-6
<b>Region</b>	<b>2.26</b>	<b>2.49</b>	<b>10</b>	23 Harvey	0.36	1.18	225
<u>Osage Cuestas</u>				29 Kingman	5.45	4.09	-25
01 Allen	2.55	4.18	64	30 Kiowa	2.64	1.82	-31
05 Bourbon	1.40	1.10	-21	50 Pawnee	3.82	5.00	31
09 Cherokee	0.64	1.18	86	51 Pawnee	3.00	4.45	48
13 Coffey	2.18	2.73	25	54 Pratt	4.30	4.63	8
15 Crawford	2.64	3.20	21	56 Reno	4.40	5.70	30
33 Linn	0.60	0.36	-39	65 Stafford	3.10	5.09	64
38 Miami	1.70	2.55	50	67 Sumner	4.18	3.90	-7
40 Montgomery	4.00	2.60	-35	<b>Region</b>	<b>3.62</b>	<b>3.95</b>	<b>9</b>
46 Neosho	2.78	NA	NA	<u>Southern High Plains</u>			
47 Osage <sup>b</sup>	5.40	1.18	-78	20 Finney	4.73	NA	NA
71 Woodson	3.27	3.45	6	21 Ford	2.27	1.82	-20
72 Grand Osage WA	0.50	0.88	75	37 Meade	4.91	3.78	-23
<b>Region</b>	<b>2.26</b>	<b>2.12</b>	<b>-6</b>	43 Morton	13.27	3.09	-77
<u>Northern High Plains</u>				44 Morton	11.10	2.80	-75
55 Rawlins	0.45	1.00	120	66 Stanton	0.36	0.36	0
63 Sheridan <sup>b</sup>	0.00	0.00	0	73_Hamilton	3.55	3.82	8
<b>Region</b>	<b>0.45</b>	<b>1.00</b>	<b>122</b>	<b>Region</b>	<b>5.91</b>	<b>2.61</b>	<b>-56</b>
				<b>STATEWIDE</b>	<b>3.29</b>	<b>3.40</b>	<b>3</b>

\*Values are significant at a  $P \leq 0.10$  level

<sup>a</sup>%  $\Delta$  = percent change

<sup>b</sup>New observer in 2017; not included in regional or state averages



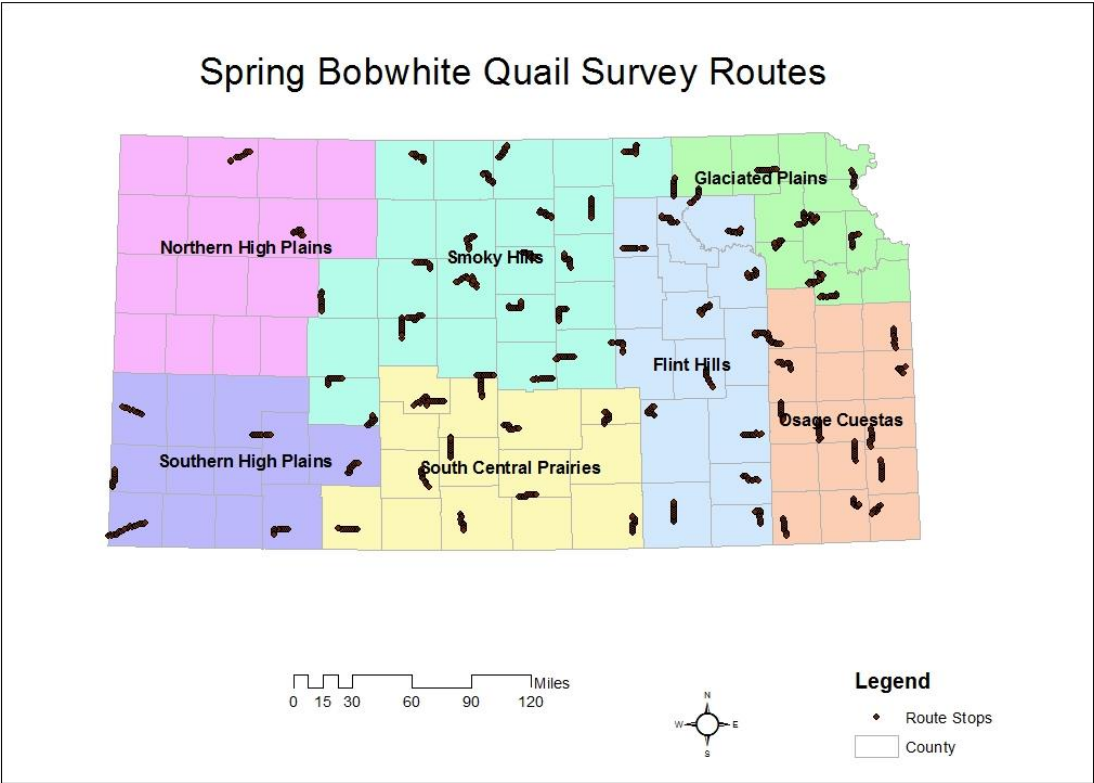


Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.

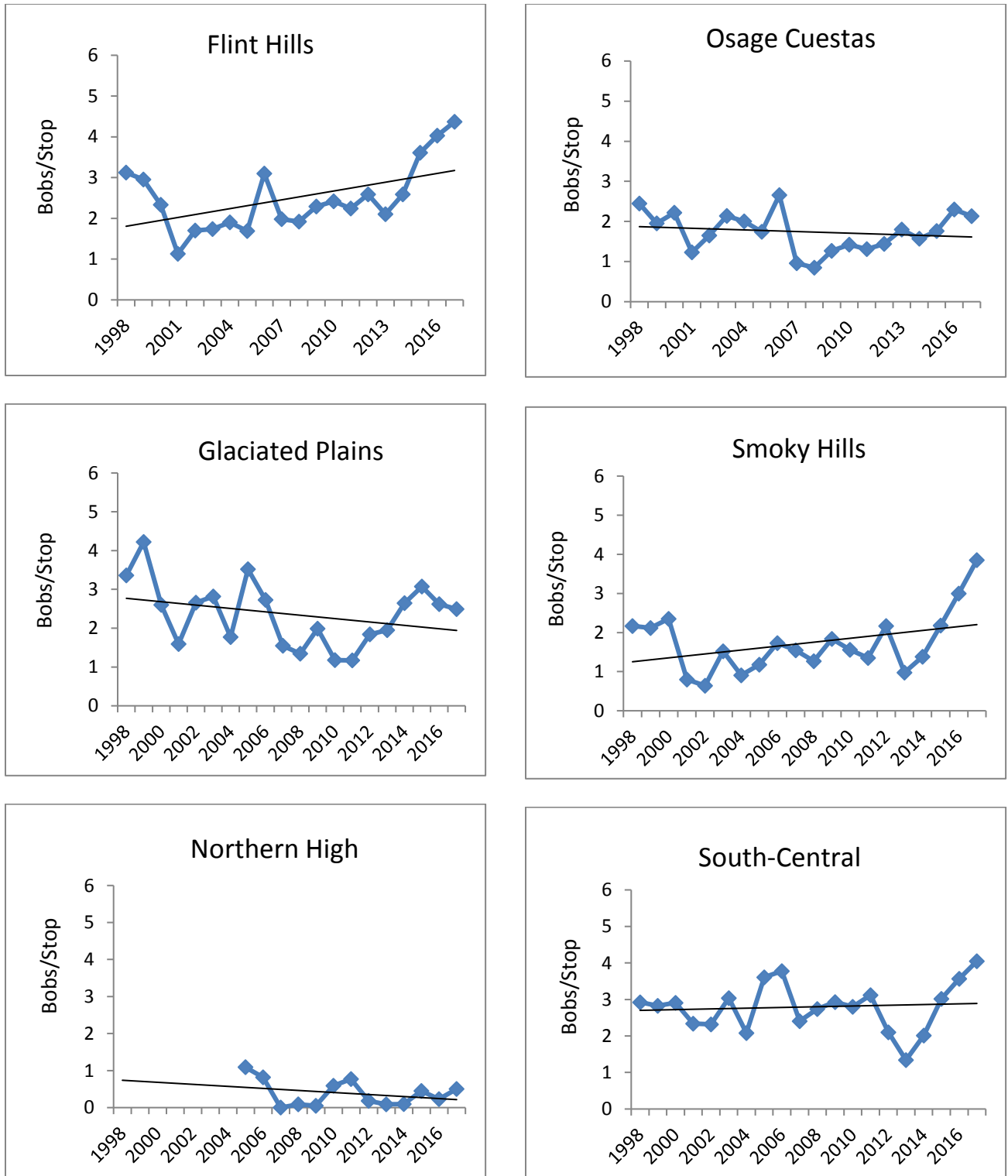


Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2016. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

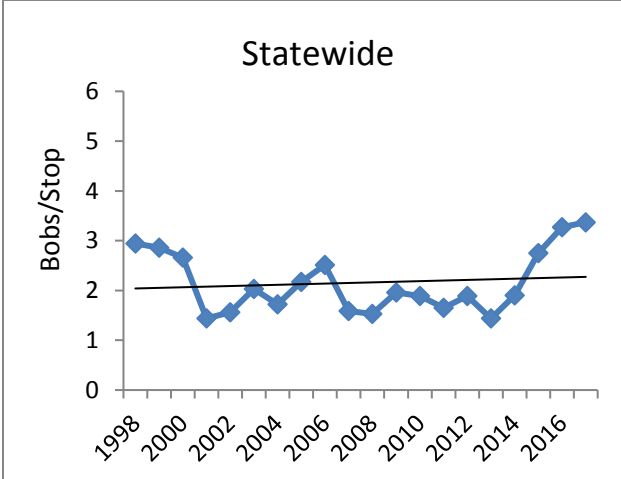
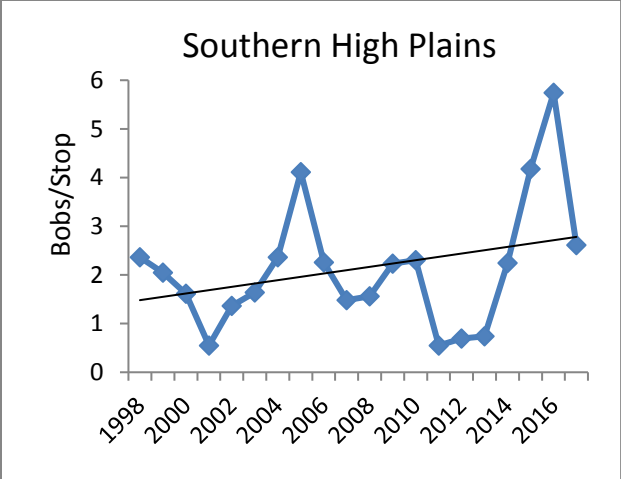


Figure 2. Continued.

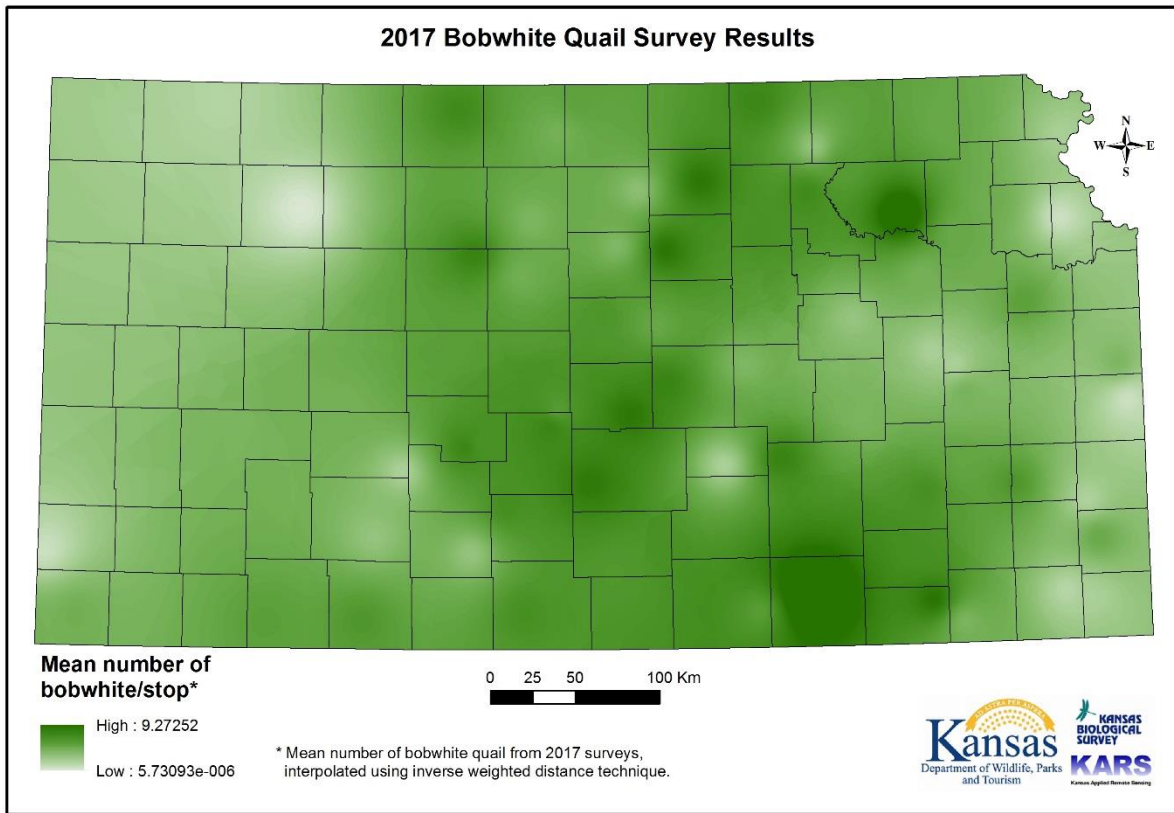


Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2017.

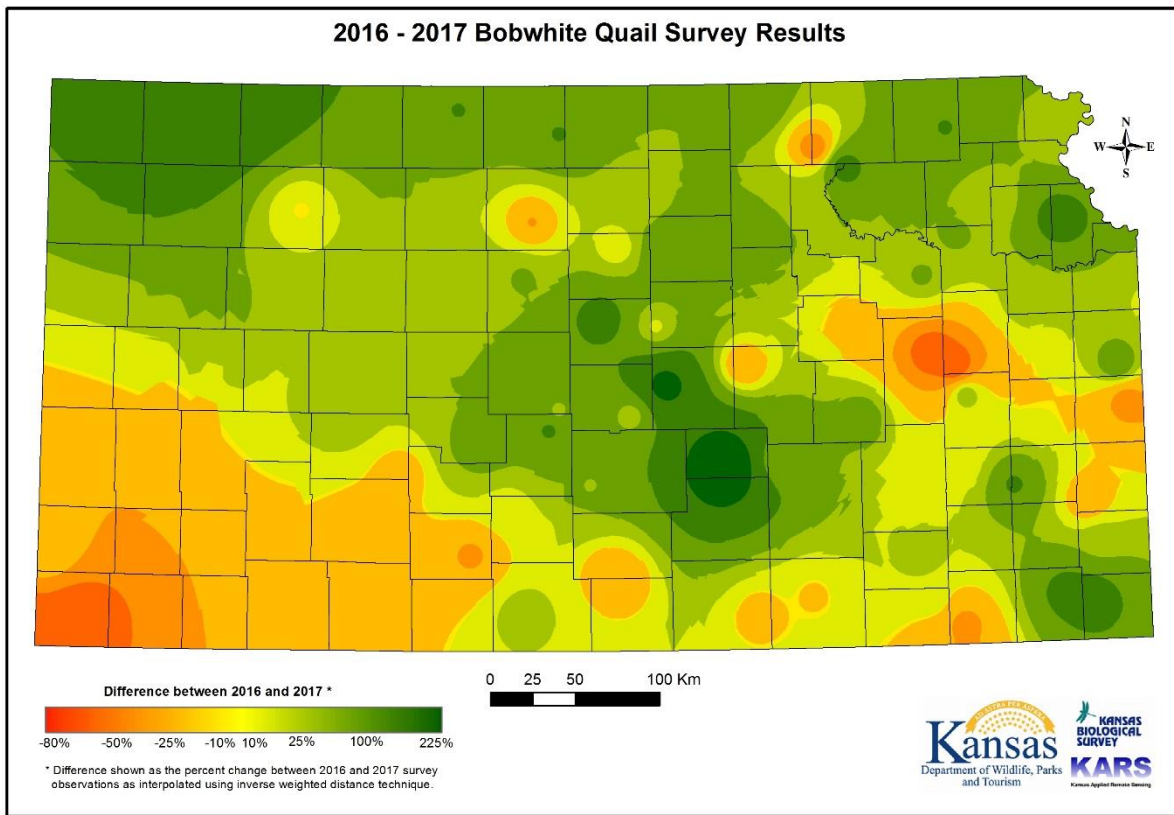


Figure 4. Relative change in Bobwhite breeding population index from 2016 to 2017 interpolated from route-specific indices across Kansas.