

**2013 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 established routes were surveyed annually 1998 - 2005. Prior to the 2006 survey, the distribution of routes was adjusted to provide better coverage of the entire state. This was accomplished by adding 16 new routes in areas not surveyed previously and eliminating 10 routes from areas where effort was clustered. Two more routes were added in 2011 to further improve sampling distribution. In 2013, observers were asked to survey 77 established routes during the 1-16 June survey period, starting at sunrise (Table 1). Due to weather constraints the survey period was extended 2 weeks for just a few routes. 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.

The index to bobwhite abundance was calculated as the mean number of different bobwhites heard per listening stop per route (M/R). A folded F-test was used to determine if the variance differed between the 2012 and 2013 indices. If unequal variance existed ( $P < 0.05$ ) then a Satterthwaite's adjustment was used to adjust the degrees of freedom prior to conducting a two sample t-test. If variance did not differ across years then a standard two sample t-test was used to draw comparisons. Additionally, a linear regression of the historical whistle count data was used to determine if bobwhite abundance had changed significantly from 1998 to 2013. All indices and analyses were calculated for each of the 7 small game regions (Figure 1).

Kriegering is a technique that can be used to interpolate data between known points, providing extrapolation 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 may be useful for large-scale interpretation of statewide data for regional comparisons. Kriegering was used by assigning the route-specific whistle index to the centroid of each route. Then all routes were used to extrapolate data throughout Kansas .

## RESULTS

Observers surveyed 74 of the 77 assigned routes during 2013. The 2013 statewide index to the breeding bobwhite population decreased 24% from 2012 (Table 2) which was a statistically significant decline. Statistically significant ( $P < 0.10$ ) decreases also occurred within two of the small game regions, the Smoky Hills (52%) and the South-Central Prairies (36%), while no region showed significant increases (Table 2). Apparent changes observed in the other regions could have been solely due to variability associated with the sampling scheme.

While there appears to have been small increases in the density of breeding bobwhites in eastern Kansas the last 2 years, there has been a significantly declining trend in bobwhite abundance since the inception of this survey in 1998 in the Glaciated Plains and Osage Cuestas (Table 2, Figures 2). Bobwhite populations in the central and western regions have more stable trends, although populations fluctuate across years. The statewide index has declined significantly ( $P < 0.05$ ) over this time span (Table 2, Figure 2).

## DISCUSSION

Spring whistle counts are considered an index to the breeding population. As such, they reflect overwinter survival and the previous breeding season production if overwinter survival was high. The extreme drought of 2011 intensified and expanded in 2012 and likely resulted in depressed breeding populations for 2013. Kansas had several late winter and spring storms in 2012-2013, which may have reduced overwinter survival, particularly in the Smoky Hills and South-Central Prairie regions where snow accumulations were highest. Other areas showed relatively little annual fluctuations, although long term trends indicate declining populations across Kansas (Figure 2).

It is important to understand that annual changes to the breeding population do not necessarily reflect hunt quality for the upcoming season, but rather reflect a combination of last year's productivity and overwinter survival. The fall bobwhite population depends not only on

the size of the spring breeding population but to a much greater extent the level of productivity. A bobwhite population can increase nearly 300% from spring to fall when habitat and weather conditions are suitable for productivity.

The hunting outlook at this time is unpredictable for Fall 2013. Areas of the Flint Hills and Osage Cuestas regions of Kansas seem to have the best breeding population densities for 2013 (Figure 3). The extreme drought across most of Kansas over the last few years created poor nesting conditions this spring in the western 2/3 of the state. Late summer rains across the state may have increased brood survival, especially for later hatches. However, these heavy rains across much of the South-Central prairies, Southern Flint Hills, and Osage Cuestas caused extensive flooding and could negatively impact populations in these regions. These rains have likely improved for the spring 2014 nesting season. More accurate predictions about fall densities will be available following the completion of the summer brood survey.

Table 1. Northern bobwhite survey routes and observers in Kansas, 2013.

Route	County(s)	Observer	Route	County(s)	Observer
1	Allen	Ben Womelsdorf*	40	Montgomery	Ed Miller
2	Atchinson/Doniphan	Tim Urban*	41	Morris	Brent Konen
3	Barber	Charlie Swank	42	McPherson/Marion	Jeremy Amos*
4	Barton	Curran Salter (USDA)	43	Morton	Kraig Schultz
5	Bourbon	Justin Harbit	44	Morton	Kraig Schultz
6	Butler	Jeff Rue	45	Nemaha	Megan Smith*
7	Chase	Jim Pitman	46	Neosho	Bryan Sorenson*
8	Chautauqua	Darin Porter	47	Osage	Clint Bowman
9	Cherokee	David Shanholtzer	48	Osborne	Victoria Cikanek
10	Clark	Jon Zuercher	49	Ottawa	Pat Riese
11	Clay	Clint Thornton	50	Pawnee	Charlie Swank
12	Cloud	Pat Riese	51	Pawnee	Tom Bidrowski
13	Coffey	Bob Culbertson	52	Phillips	Marc Gray
14	Cowley	Kurt Grimm	53	Pottawatomie	Nathan Henry
15	Crawford	Logan Martin*	54	Pratt	Todd Gatton
16	Douglas	Tim Urban	55	Rawlins	Kurt Meier
17	Elk	No observer*	56	Reno	Kyle McDonald*
18	Ellis	Dave Dahlgren	57	Rice	Steve Adams
19	Ellsworth	Matt Smith	58	Riley	Corey Alderson
20	Finney/Gray	Jon Heistand	59	Rush	Jeremy Salter (volunteer)
21	Ford	Aaron Baugh	60	Russell	Victoria Cikanek *
22	Greenwood	No observer*	61	Saline	Pat Riese
23	Harvey	Charlie Cope	62	Shawnee	Brad Rueschhoff
24	Hodgeman	Aaron Baugh	63	Sheridan	Wes Sowards*
25	Hodgeman	Jon Heistand	64	Smith	Chris Lecuyer
26	Jefferson/Jackson	Justin Anderson	65	Stafford	Karl Grover
27	Jewell	Aaron Deters	66	Stanton	Kraig Schultz
29	Kingman	Craig Curtis	67	Sumner	Jeff Rue
30	Kiowa	Charlie Swank	68	Trego	Dave Dahlgren*
31	Leavenworth	Andy Friesen	69	Wabaunsee	Brad Rueschhoff
32	Lincoln	Matt Smith	70	Washington	Clint Thornton
33	Linn	Jacob Coulter	71	Woodson	Jeff Prendergast
34	Lyon	Clint Bowman	72	Hamilton	Daryl Fisher
35	Marshall	James Svaty	73	Grand Osage WA	Rob Riggan
36	McPherson	Brent Theede	74	Wilson WA	Scott Thomasson
37	Meade	Jon Zuercher	75	TuttleCreek WA	James Svaty
38	Miami	Andy Friesen	76	Perry WA	Justin Anderson
39	Mitchell	Aaron Deters	77	Clinton WA Deer Cr	Jason Tarwater
			78	Clinton WA Wak	Jason Tarwater

\*New 2013; only routes sampled in consecutive years were used in analysis

Table 2. Regional Changes in calling Bobwhite males per route (M/R), 2013.

Route	2012 M/R	2013 M/R	<sup>a</sup> %Δ	Route	2012 M/R	2013 M/R	<sup>a</sup> %Δ
<u>Flint Hills</u>				<u>Smoky Hills</u>			
06 Butler	1.73	3.90	+126	04 Barton	1.90	0.90	-53
07 Chase	0.82	0.82	0	12 Cloud	2.00	1.33	-33
08 Chautauqua	3.60	2.18	-39	18 Ellis	3.82	1.67	-56
11 Clay	2.45	2.36	-4	19 Ellsworth	1.36	0.09	-93
14 Cowley	6.27	5.00	-20	24 Hodgeman	0.55	0.00	-100
17 Elk	2.20	NA	NA	25 Hodgeman	1.45	1.64	+13
22 Greenwood	3.18	NA	NA	27 Jewell	1.27	1.45	+14
34 Lyon	2.00	0.91	-55	32 Lincoln	1.78	0.91	-49
41 Morris	2.00	1.60	-20	36 McPherson	3.00	0.50	-83
42 McPherson_Marion	3.27	0.56	-83	39 Mitchell	1.38	0.91	-34
53 Pottawatomie	1.36	0.73	-47	48 Osborne	1.18	0.18	-85
58 Riley	3.00	3.36	+12	49 Ottawa	3.00	1.36	-55
69 Wabaunsee	1.82	1.20	-34	52 Phillips	2.18	1.36	-38
75 Tuttle Cr WA	2.36	2.64	+12	57 Rice	2.10	2.40	+14
<b>Region</b>	<b>2.58</b>	<b>2.10</b>	<b>-18</b>	59 Rush	1.43	NA	NA
<u>Glaciated Plains</u>				60 Russell	4.27	0.45	-89
02 Atchison_Doniphan	0.27	0.27	0	61 Saline	4.25	0.73	-83
16 Douglas	2.36	2.36	0	64 Smith	0.82	0.45	-44
26 Jefferson_Jackson	2.55	3.10	+22	68 Trego	2.91	0.45	-84
31 Leavenworth	1.75	0.11	-94	70 Washington	2.09	2.27	+9
35 Marshall	2.09	2.40	+15	74_WilsonWA	2.82	0.55	-81
45 Nemaha	2.50	2.73	+9	<b>Region</b>	<b>2.06</b>	<b>0.98</b>	<b>-52*</b>
62 Shawnee	2.75	3.67	+33	<u>South-Central Prairies</u>			
76 Perry WA	3.27	3.40	+4	03 Barber	1.82	1.91	+5
77 Clinton WA Wak	0.50	1.27	+155	10 Clark	0.18	0.18	0
78 Clinton WA Deer Cr	0.33	0.22	-33	23 Harvey	1.78	0.73	-59
<b>Region</b>	<b>2.01</b>	<b>1.95</b>	<b>-3</b>	29 Kingman	2.10	0.67	-68
<u>Osage Cuestas</u>				30 Kiowa	2.64	0.91	-66
01 Allen	1.27	4.36	+243	50 Pawnee	3.27	2.91	-11
05 Bourbon	0.75	0.90	+20	51 Pawnee	1.73	0.09	-95
09 Cherokee	0.45	0.55	+20	54 Pratt	1.86	1.00	-46
13 Coffey	2.45	1.91	-22	56 Reno	3.55	3.27	-8
15 Crawford	2.10	3.27	+56	65 Stafford	2.09	1.73	-17
33 Linn	0.64	0.73	+14	67 Sumner	2.36	1.55	-35
38 Miami	1.73	0.91	-47	<b>Region</b>	<b>2.10</b>	<b>1.34</b>	<b>-36*</b>
40 Montgomery	2.45	2.91	+19	<u>Southern High Plains</u>			
46 Neosho	1.00	2.09	+109	20 Finney	0.73	0.00	-100
47 Osage	2.27	1.64	-28	21 Ford	0.44	0.60	+35
71 Woodson	1.91	2.27	+19	37 Meade	0.67	0.40	-40
72 Grand Osage WA	0.00	0.10	NA	43 Morton	1.45	1.73	+19
<b>Region</b>	<b>1.42</b>	<b>1.80</b>	<b>+27</b>	44 Morton	1.18	2.45	+108
<u>Northern High Plains</u>				66 Stanton	0.09	0.00	-100
55 Rawlins	0.00	0.09	NA	73_Hamilton	0.25	0.00	-100
63 Sheridan	0.36	0.09	-75	<b>Region</b>	<b>0.69</b>	<b>0.74</b>	<b>+8</b>
<b>Region</b>	<b>0.18</b>	<b>0.09</b>	<b>-50</b>	<b>STATEWIDE</b>	<b>1.89</b>	<b>1.44</b>	<b>-24*</b>

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

<sup>a</sup>%Δ = percent change

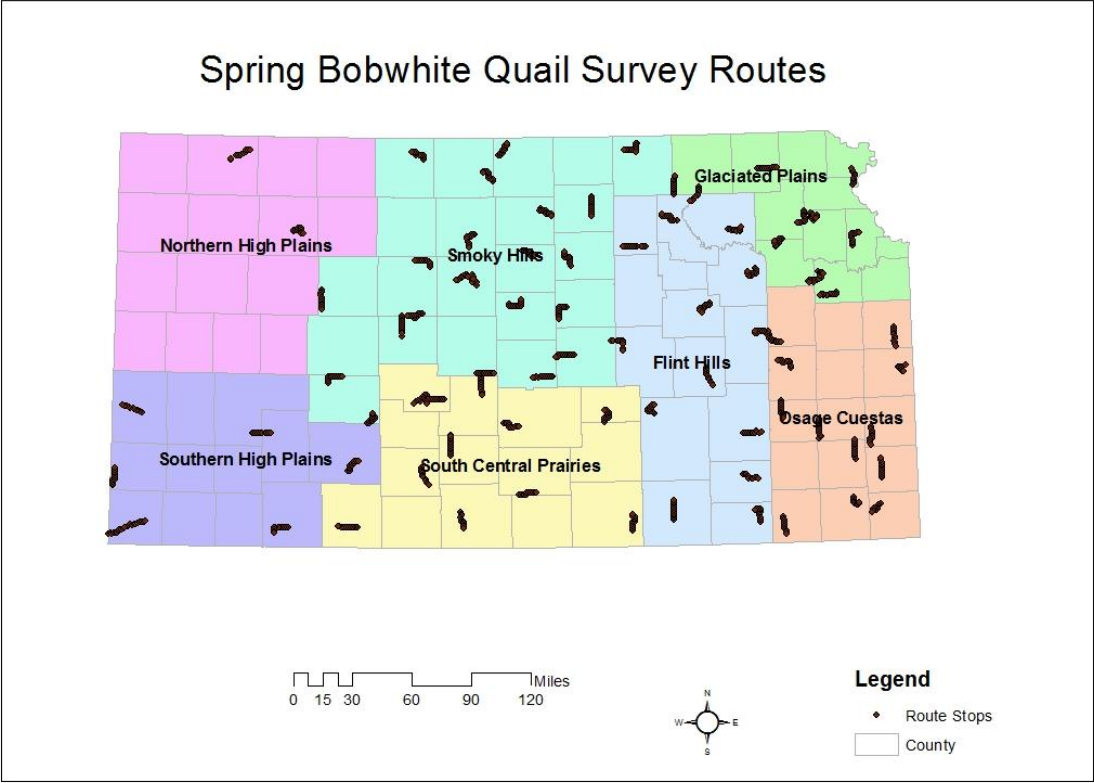


Figure 1. Locations of listening stops within the Kansas Small Game survey regions.



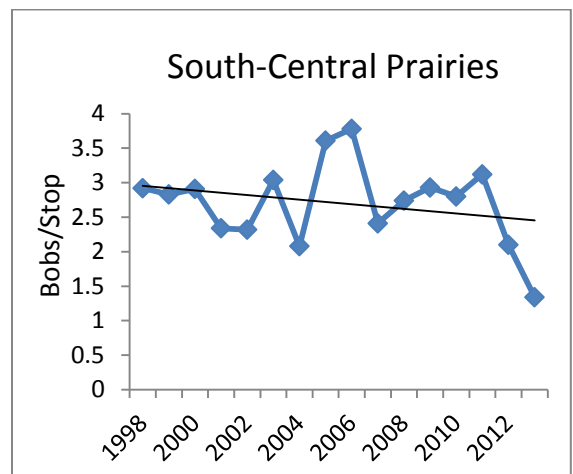
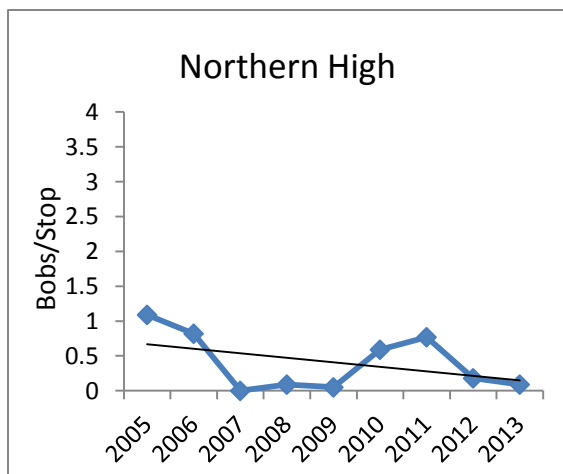
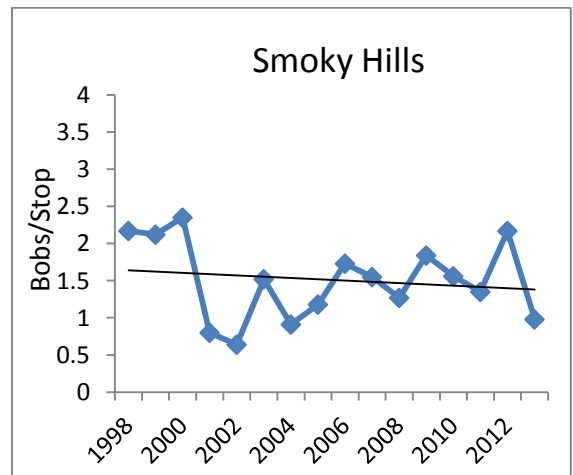
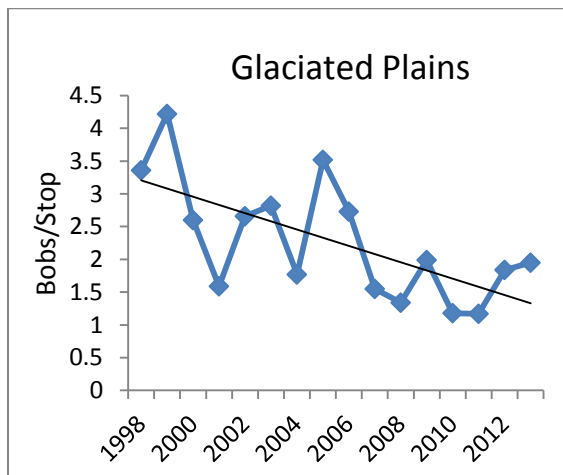
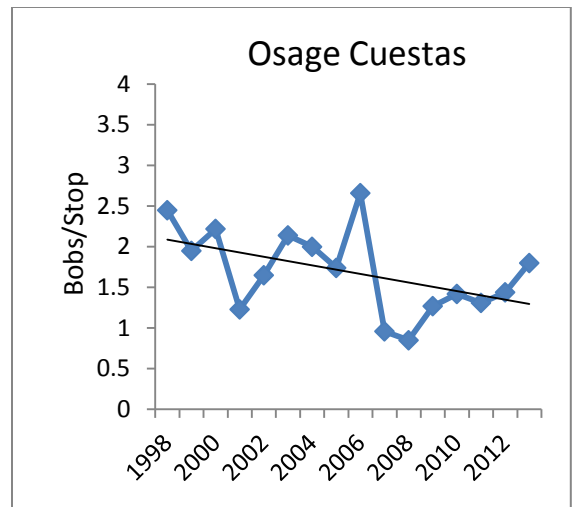
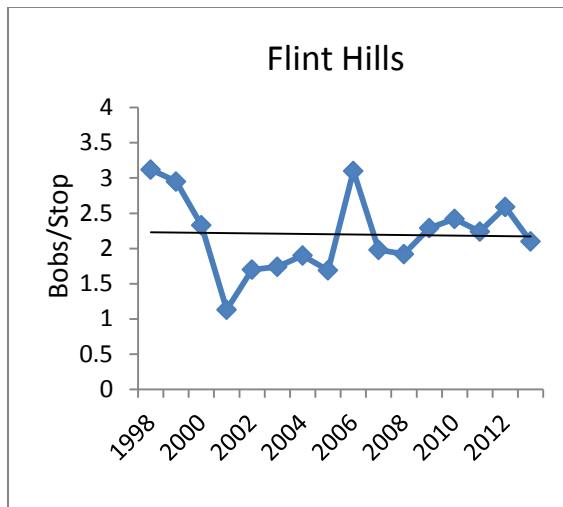


Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2013. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

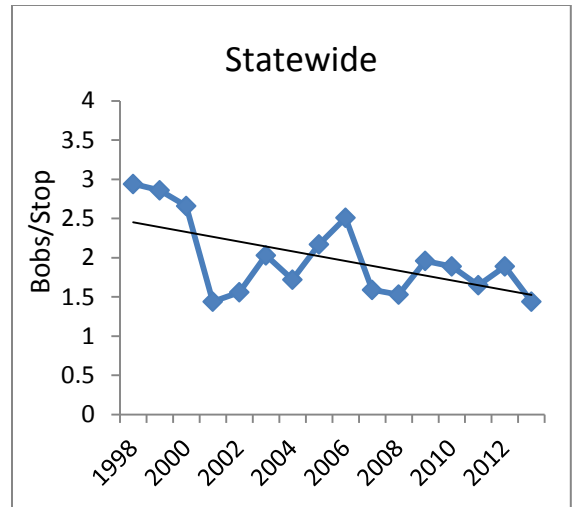
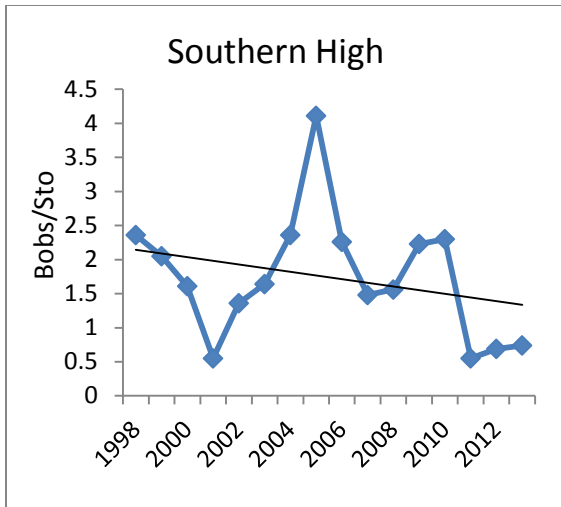


Figure 2. continued.

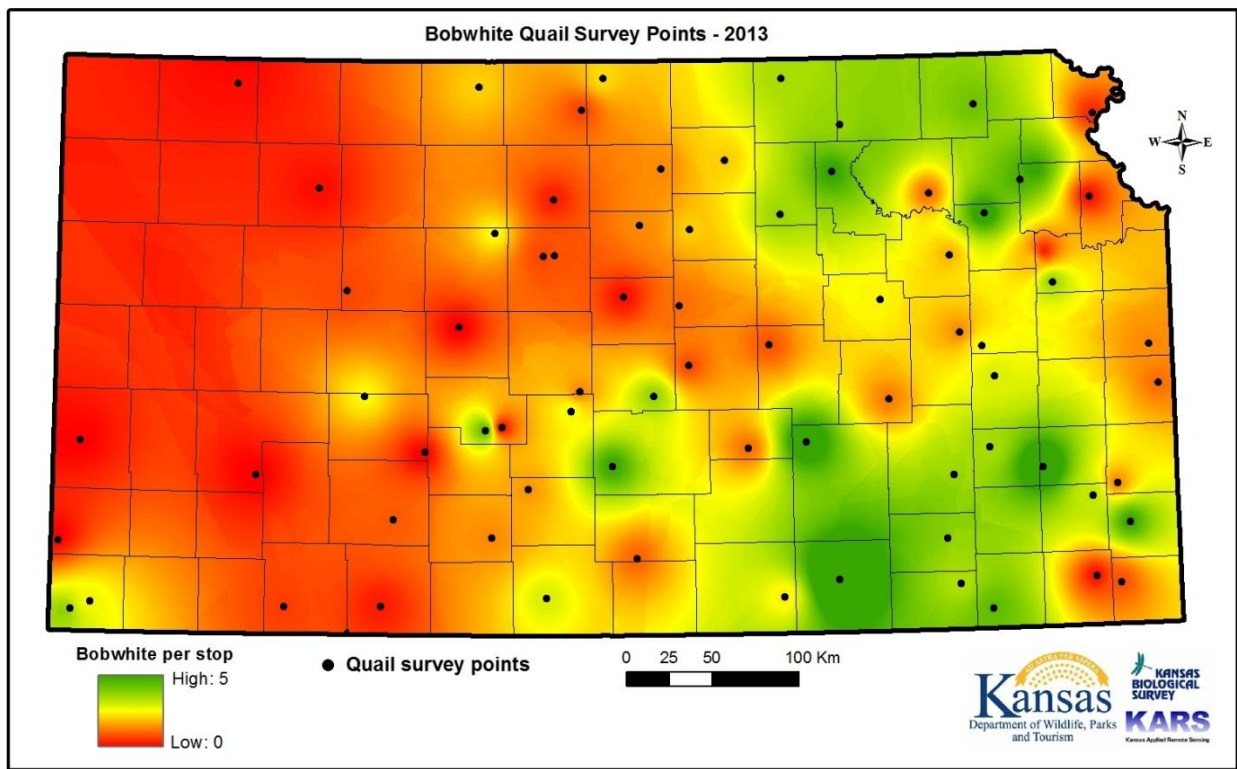


Figure 3. Bobwhite quail breeding population index interpolated from route-specific indices across Kansas, 2013.