

2016 BOBWHITE WHISTLE COUNT

Performance Report

**A Contribution in Part of Pittman-Robertson
Federal Aid in Wildlife Restoration
Grant W-39-R-22**

KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM

**Robin Jennison
Secretary**

**Keith Sexson
Assistant Secretary Wildlife, Fisheries, and Boating**

**Jake George
Wildlife Division Director**

Prepared by:

**Jeff Prendergast
Small Game Specialist**

July 2016



PERMISSION TO QUOTE

This is an annual progress report that may contain information that is subject to future modification or revision. Persons wishing to quote from this report, for reproduction or reference, should first obtain permission from the Chief of the Wildlife Section, Kansas Department of Wildlife and Parks, 512 SE 25th Avenue, Pratt, KS 67124.

EQUAL OPPORTUNITY STATEMENT

This program receives Federal financial assistance from the U. S. Fish and Wildlife Service. Under Title VI of the Civil Rights Act of 1964, Section 504 of the Rehabilitation Act of 1973, Title II of the Americans with Disabilities Act of 1990, the Age Discrimination Act of 1975, and Title IX of the Education Amendments of 1972, the U. S. Department of the Interior and its bureaus prohibit discrimination on the basis of race, color, national origin, age, disability or sex (in educational programs). If you believe that you have been discriminated against in any program, activity or facility, or if you desire further information, please write to:

**U. S. Fish and Wildlife Service
Office of Diversity and Civil Rights Programs- External Programs
4040 North Fairfax Drive, Suite 130
Arlington, VA 22203**

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 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 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 the survey period was extended 1 day to facilitate data collection on 1 route. 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 is 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 2016. 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 75 of the 76 assigned routes during 2016 for a statewide index of 3.26 calling males per stop. Route 68 in Trego county was not completed during the survey period. Among the 57 comparable routes, the 2016 statewide index to the breeding bobwhite population was 23% higher than in 2015 (Table 2) which was a statistically significant increase. There were statistically significant ($P < 0.10$) increases in the average number of calling males per stop in both the Southern High Plains (41%) and Smoky Hills (40%) regions from 2015 to 2016 (Table 2). There was also a statistically significant ($P < 0.10$) decrease in the average number of calling males per stop in the Glaciated Plains region. The average number of calling males per stop was also greater in the South-Central Prairies, Flint Hills, and Osage Cuestas regions in 2016; however these increases were not statistically significant ($P > 0.10$). Non-significant changes at the regional level could have been solely due to variability associated with the sampling methodology.

While 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). In these regions, indices have increased above the long-term average, but still indicate a declining trend. Bobwhite populations in the central and western regions have displayed more stable trends. The statewide index has shown a decline at a rate of $-0.007/\text{year}$ (Figure 2, Statewide), however this is not a significantly significant rate of decline ($P > 0.05$). The rate of decline has been highly impacted by high indices in the last 2 years that has improved the estimated population trajectory.

DISCUSSION

Spring whistle counts are considered an index to the breeding population. As such, they reflect a combination of the previous breeding season 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 created remarkable population abundance recovery has increased as a result across the state~~. Kansas had a relatively mild 2015/2016 winter, which likely did not have widespread negative impacts on overwinter survival. The combination of good production conditions last summer and the mild winter facilitated another statewide increase in the the 2016 breeding season population (Figure 2).

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 2016 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, 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 necessary reflect hunt quality for the upcoming season, but rather a combination of last year's productivity and overwinter survival. The fall bobwhite population will predominantly depend on 2016 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 available 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 2016. Several routes across the state showed great improvement from 2015 (Table 2), and the population index is the highest that we have ever recorded on this survey for most regions of the state (Table 2, Figure 3). Precipitation in spring of 2015 improved nesting conditions coming into this spring 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 there has already been some of these localized events. June also presented some extreme temperatures that can have direct and indirect impacts on the population at an even larger scale. 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, 2016.

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 Fricke*	46	Neosho	Travis Ratliff*
8	Chautauqua	Darin Porter	47	Osage	Cody Miller*
9	Cherokee	David Shanholtzer	48	Osborne	Jeff Prendergast*
10	Clark	Jon Zuercher	49	Ottawa	James Svaty*
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	Wes Sowards
25	Hodgeman	Anna Walkowiak*	64	Smith	Chris Lecuyer
26	Jefferson/Jackson	Tyler Warner	65	Stafford	Karl Grover
27	Jewell	Luke Kramer	66	Stanton	Kraig Schultz
29	Kingman	Craig Curtis	67	Sumner	Jeff Rue
30	Kiowa	Charlie Swank	68	Trego	Luke Winge
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	Kyle McDonald	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 2016

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2016.

Route	2015 M/S	2016 M/S	% Δ^a	Route	2015 M/S	2016 M/S	% Δ^a
<u>Flint Hills</u>				<u>Smoky Hills</u>			
06 Butler	4.90	3.82	-22	04 Barton	1.55	3.09	100
07 Chase ^b	2.30	1.82	-21	12 Cloud	3.50	4.38	25
08 Chautauqua	5.20	5.56	7	18 Ellis	3.30	4.45	35
11 Clay	2.64	3.00	14	19 Ellsworth ^b	1.09	2.36	117
14 Cowley	7.00	9.45	35	24 Hodgeman	0.27	1.36	400
17 Elk ^b	4.36	3.64	-17	25 Hodgeman	0.00	2.20	NA
22 Greenwood ^b	4.09	4.27	4	27 Jewell	1.55	2.64	71
34 Lyon ^b	1.82	5.45	200	32 Lincoln ^b	2.70	2.36	-12
41 Morris	2.55	1.90	-25	36 McPherson	2.18	2.09	-4
42 McPherson_Marion	3.00	3.30	10	39 Mitchell	0.40	1.80	350
53 Pottawatomie ^b	0.27	5.80	2027	48 Osborne ^b	2.82	3.45	23
58 Riley	4.00	4.09	2	49 Ottawa ^b	2.00	3.80	90
69 Wabaunsee	1.70	2.10	24	52 Phillips ^b	1.27	3.00	136
75 Tuttle Cr WA	NA	2.18	NA	57 Rice	5.30	4.82	-9
Region	3.46	4.37	26	59 Rush	2.27	2.91	28
<u>Glaciated Plains</u>				60 Russell ^b	2.55	2.20	-14
02 Atchison_Doniphan	0.36	1.09	200	61 Saline	1.27	2.91	129
16 Douglas	3.67	3.00	-18	64 Smith	1.50	1.73	15
26 Jefferson_Jackson	4.09	2.60	-36	68 Trego	1.64	NA	NA
31 Leavenworth	0.55	0.20	-63	70 Washington	3.18	3.18	0
35 Marshall	1.82	3.40	87	74_WilsonWA	3.27	5.18	58
45 Nemaha ^b	3.00	2.00	-33	Region	2.21	3.10	40*
62 Shawnee	4.38	2.44	-44	<u>South-Central Prairies</u>			
76 Perry Wa	5.36	4.18	-22	03 Barber	4.30	3.64	-15
77 Clinton WA Wak ^b	0.88	1.44	65	10 Clark	3.73	4.45	20
Region	3.07	2.25	-27*	23 Harvey	0.64	0.36	-43
<u>Osage Cuestas</u>				29 Kingman	2.90	5.45	88
01 Allen	3.64	2.55	-30	30 Kiowa	2.73	2.64	-3
05 Bourbon	1.64	1.40	-14	50 Pawnee	3.64	3.82	5
09 Cherokee	0.45	0.64	40	51 Pawnee	1.45	3.00	106
13 Coffey ^b	1.45	2.18	50	54 Pratt	3.67	4.30	17
15 Crawford	2.36	2.64	12	56 Reno	4.64	4.40	-5
33 Linn	0.67	0.60	-10	65 Stafford	3.55	3.10	-13
38 Miami	3.40	1.70	-50	67 Sumner	2.00	4.18	109
40 Montgomery	3.73	4.00	7	Region	3.02	3.58	19
46 Neosho	2.75	2.78	1	<u>Southern High Plains</u>			
47 Osage ^b	1.91	5.40	183	20 Finney	4.40	4.73	7
71 Woodson ^b	1.91	3.27	71	21 Ford	0.45	2.27	400
72 Grand Osage WA	0.40	0.50	25	37 Meade	0.91	4.91	440
Region	1.78	2.12	19	43 Morton	10.82	13.27	23
<u>Northern High Plains</u>				44 Morton	10.55	11.10	5
55 Rawlins	0.73	0.45	-38	66 Stanton	0.00	0.36	NA
63 Sheridan	0.18	0.00	-100	73_Hamilton ^b	2.36	3.55	50
Region	0.45	0.23	-49	Region	4.18	5.91	41*
				STATEWIDE	2.74	3.38	23*

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

^a% Δ = percent change

^bNew observer in 2016; not included in regional or state averages

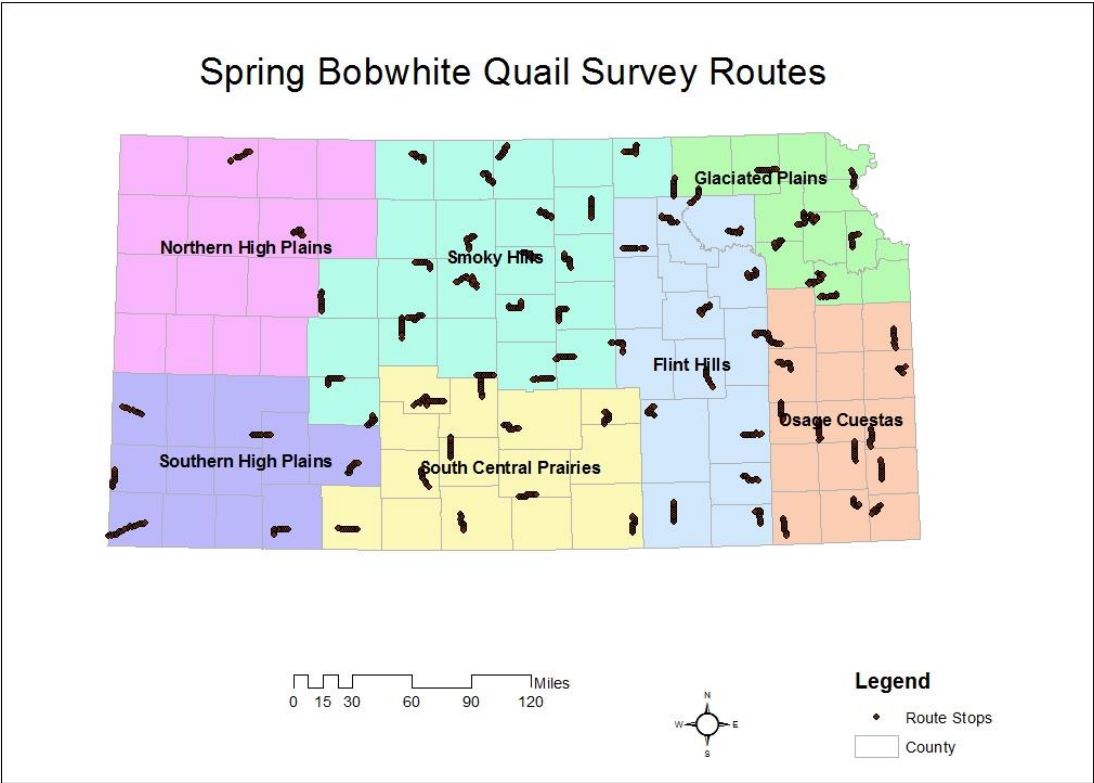


Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.

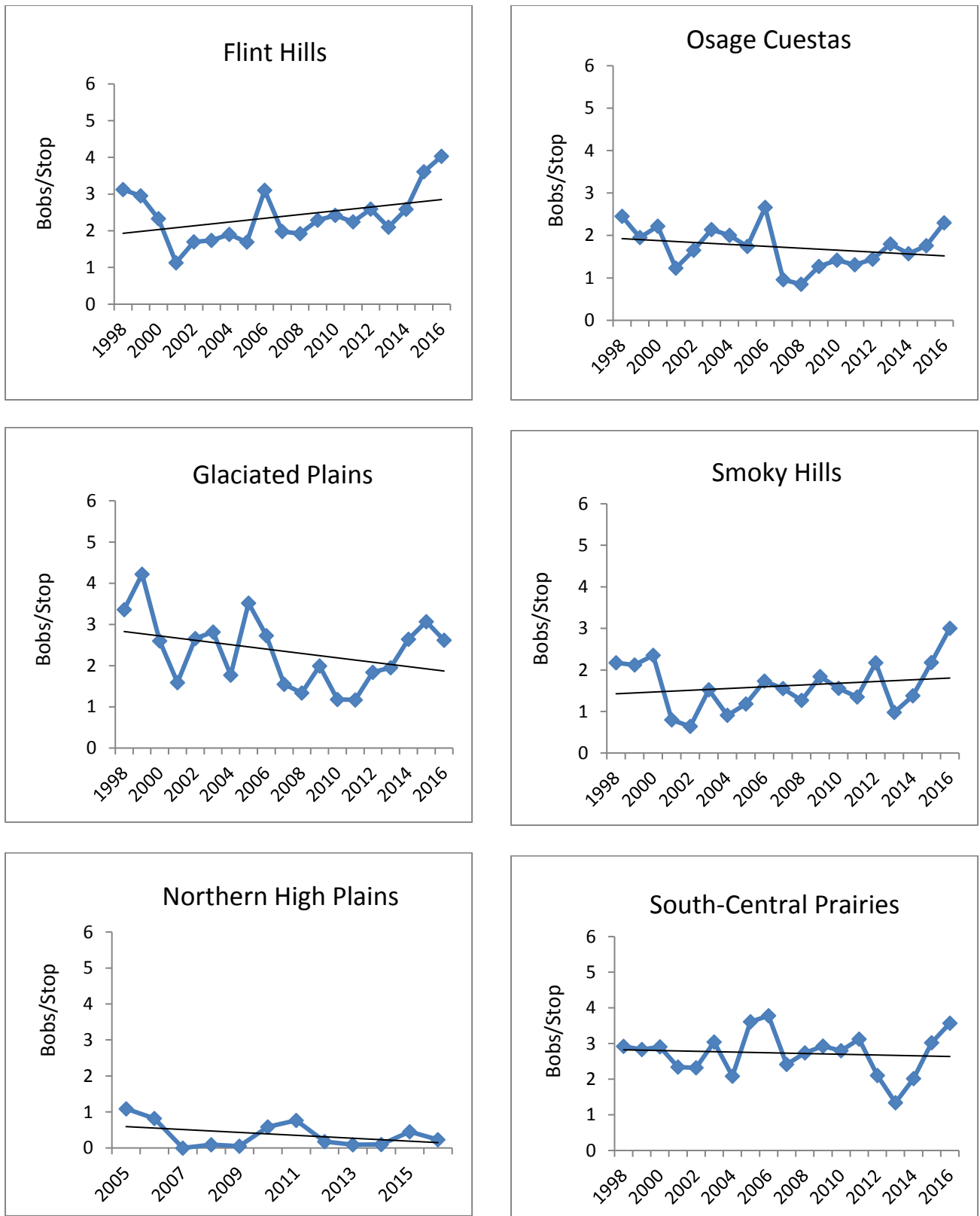


Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2016. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

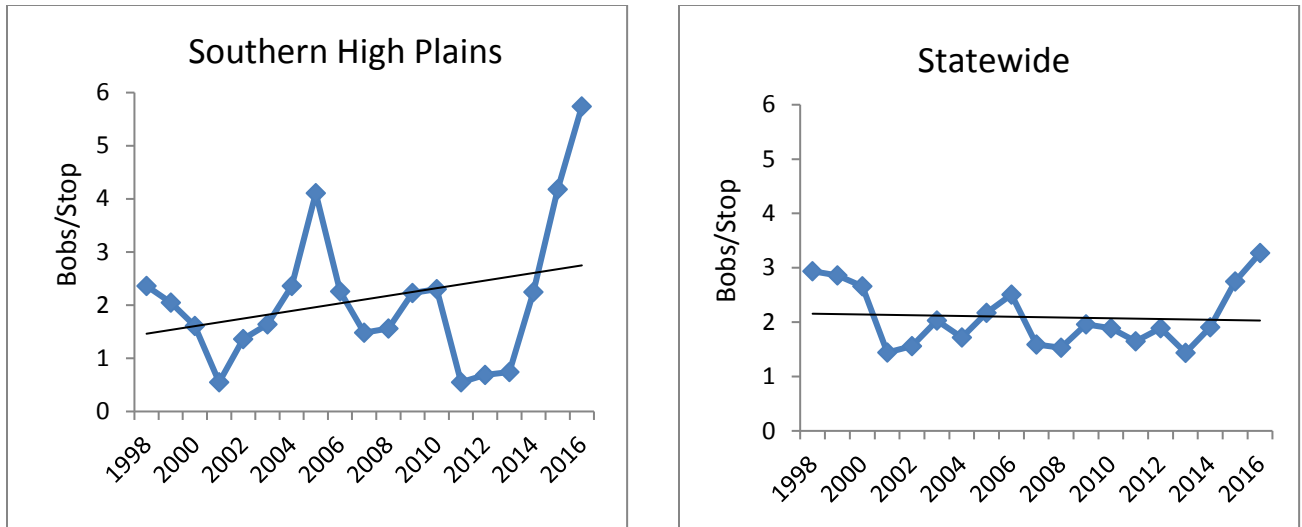


Figure 2. continued.

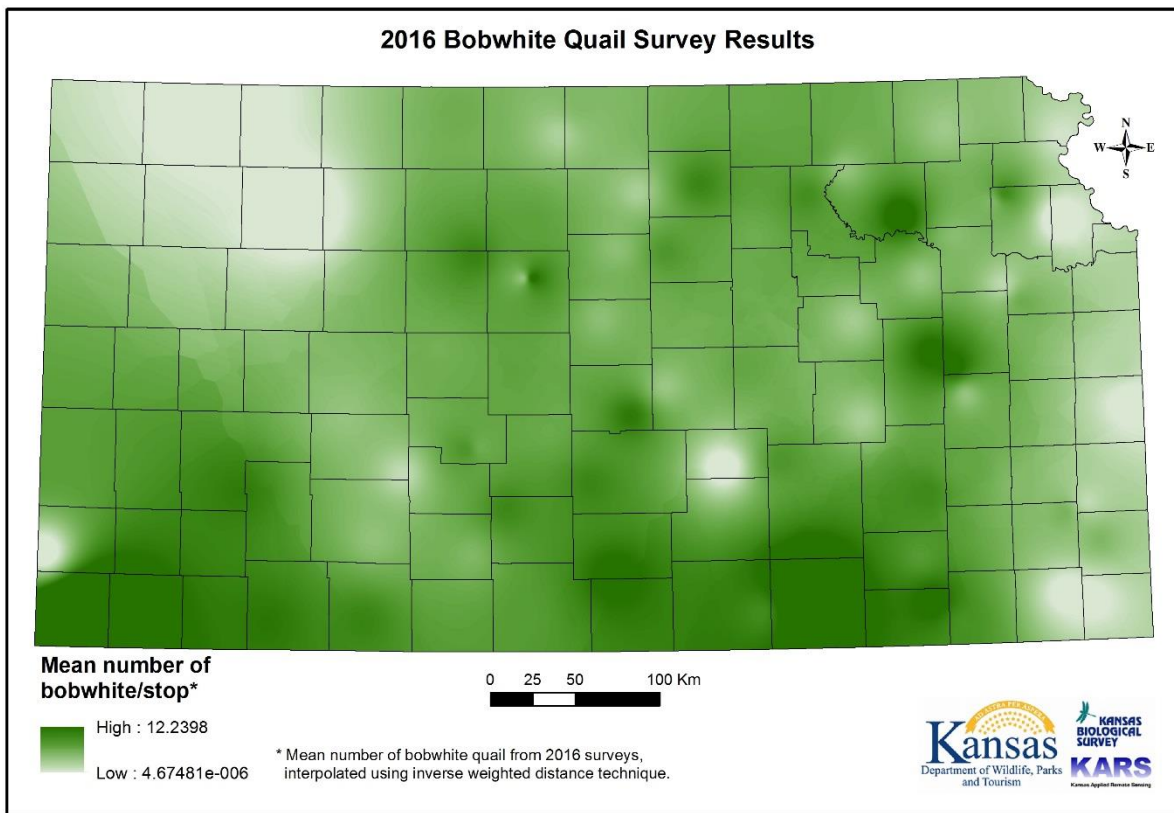


Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2016.

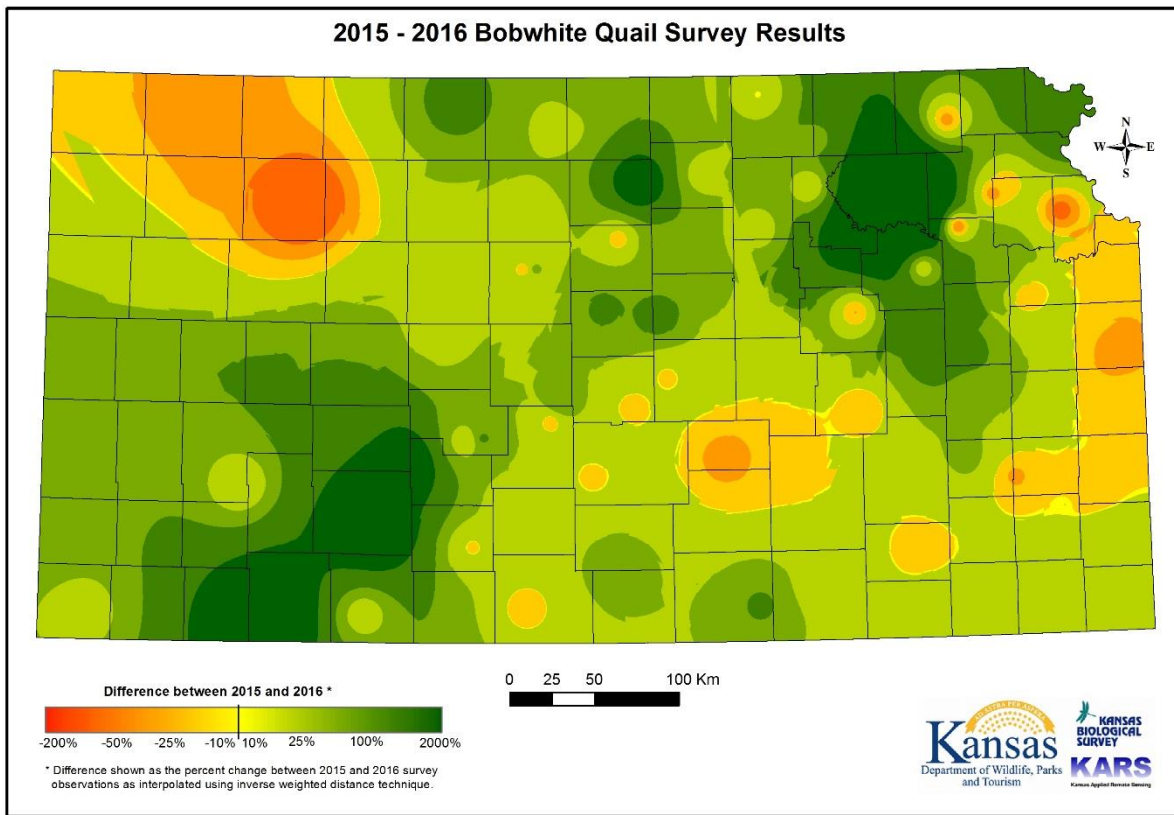


Figure 4. Relative change in Bobwhite breeding population index from 2015 to 2016 interpolated from route-specific indices across Kansas.