2018 BOBWHITE WHISTLE COUNT

Performance Report

A Contribution in Part of Pittman-Robertson
Federal Aid in Wildlife Restoration
Grant W-39-R-24

KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM

Robin Jennison
Secretary

Keith Sexson
Assistant Secretary Wildlife, Fisheries, and Boating

Jake George
Wildlife Division Director

Rich Schultheis
Wildlife Research Supervisor

Prepared by:

Jeff Prendergast
Small Game Specialist

July 2018

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 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 2018, observers were asked to survey 76 established routes during the 1-16 June survey period, starting at sunrise (Table 1). A one-week extension was granted for 6 routes 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 2018. 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 all 76 assigned routes during 2018 for a statewide index of 3.01 calling males per stop. Among the 70 comparable routes, the 2018 statewide index to the breeding bobwhite population was 10% lower than in 2017 (Table 2) which was a statistically significant decrease. There was a statistically significant ($P < 0.10$) increase in the average number of calling males per stop in the Southern High Plains region (60%) from 2017 to 2018 (Table 2). There were statistically significant ($P < 0.10$) decreases in the average number of calling males per stop in both the Smoky Hills (-14%) and Southern High Plains (-32%) regions this year. There were non-significant decreases in the average males calling per stop in both the Flint Hills, Glaciated Plains, and Northern High Plains regions with Osage cuestas indicated no change from 2017 (Table 2).

The statewide calling males/stop index has shown an increase at a rate of 0.022 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 fluctuations in the indices through time associated with the boom and bust cycles of bobwhite quail. We're currently experiencing an extended population boom over the last 4 years associated with habitat improvements following recovery from the 2011-14 drought. While recent statewide increases are welcomed, the Glaciated Plains and Osage Cuestas regions of eastern Kansas (Figure 2) that were historically considered strongholds for bobwhite continue to struggle. 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, the Glaciated Plains region still indicates a long-term declining trend associated with habitat loss during the timeframe.

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. Vegetation response coming out of the drought in 2014 created conditions that were good to excellent for production which have been maintained for several consecutive years. Quail abundance responded as a result, increasing to high densities. Kansas had a relatively mild 2017/2018 winter, which did not likely have widespread negative impacts on overwinter survival. The combination of good production conditions last summer and the mild winter maintained high statewide quail averages, albeit slightly lower than last year, coming into the 2018 breeding season. (Figure 2). After steep declines in the Southern High Plains last year in association with a late blizzard, the regional index rebounded greatly this year and the region had the highest regional density in the state. This response is thought to be due to relatively good production conditions for birds surviving the blizzard.

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 2018 index in both regions remain higher than short and long-term averages for this survey, both continue to remain below the other major quail regions, and the glaciated plains continues to indicate an overall decline in bobwhite abundance. Weather conditions and habitat recovery over the last several years 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 predict quality of the upcoming season. The fall bobwhite population will predominantly depend on 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 conditions through the summer months. Localized bobwhite populations can increase nearly 300% from spring to fall when conditions are suitable for production. Entering 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 low fall densities in the event of poor conditions.

The hunting outlook currently is unpredictable for fall 2018. Several routes across the state showed great improvement from 2017 (Table 2), and the statewide population index remained much higher than our long-term average for this survey (Table 2, Figure 3). Precipitation observed in early summer of 2018 across the western and central regions created abundant weedy habitat for the brooding season. Heavy rainfall, hail and flooding can negatively impact survival and reproduction, and we've seen several of these localized events. June temperatures were above average this year however vegetation response from rainfall should have benefit nesting birds that were exposed during this critical period. 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, 2018.

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	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	Andy Nelson*	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	Jeff Seim*	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	Kelly Newman*
34	Lyon	Brad Nieman	72	Grand Osage WA	Rob Riggin
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 2018

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2018.

Route	2017 M/S	2018 M/S	% Δ[a]	Route	2017 M/S	2018 M/S	% Δ[a]
	Flint Hills				Smoky Hills		
06 Butler	5.18	6.36	23	04 Barton	3.91	2.64	-33
07 Chase	2.64	1.45	-45	12 Cloud	5.78	3.90	-33
08 Chautauqua	5.91	3.00	-49	18 Ellis[b]	5.18	1.40	-73
11 Clay	4.45	3.45	-22	19 Ellsworth	4.27	2.73	-36
14 Cowley	9.27	6.82	-26	24 Hodgeman	1.18	0.45	-62
17 Elk	4.55	3.45	-24	25 Hodgeman[b]	2.82	3.30	17
22 Greenwood	4.55	2.64	-42	27 Jewell	3.64	2.73	-25
34 Lyon	1.20	1.91	59	32 Lincoln	2.44	1.64	-33
41 Morris	1.80	1.60	-11	36 McPherson	5.18	5.30	2
42 McPherson_Marion	2.50	5.56	122	39 Mitchell	2.09	2.40	15
53 Pottawatomie	7.63	7.50	-2	48 Osborne	2.55	4.40	73
58 Riley	4.82	4.64	-4	49 Ottawa[b]	5.86	2.91	-50
69 Wabaunsee	2.80	2.75	-2	52 Phillips	4.82	4.55	-6
75 Tuttle Cr WA	3.91	3.67	-6	57 Rice	5.80	5.00	-14
Region	**4.37**	**3.91**	**-10**	59 Rush	3.73	4.64	24
	Glaciated Plains			60 Russell	2.91	2.91	0
02 Atchison_Doniphan	1.27	2.00	57	61 Saline	3.27	1.82	-44
16 Douglas	3.70	2.55	-31	64 Smith	2.80	2.45	-12
26 Jefferson_Jackson	3.00	3.82	27	68 Trego	1.27	1.45	14
31 Leavenworth	0.36	0.64	75	70 Washington	5.00	4.10	-18
35 Marshall	1.82	2.73	50	74 WilsonWA	6.45	4.73	-27
45 Nemaha	3.22	2.82	-13	**Region**	**3.73**	**3.21**	**-14***
62 Shawnee	3.25	3.89	20		South-Central Prairies		
76 Perry Wa	5.27	3.09	-41	03 Barber	4.55	3.20	-30
77 Clinton WA Wak	0.50	0.09	-82	10 Clark	4.18	2.55	-39
Region	**2.49**	**2.40**	**-3**	23 Harvey	1.18	0.22	-81
	Osage Cuestas			29 Kingman	4.09	4.45	9
01 Allen	4.18	1.73	-59	30 Kiowa	1.82	2.91	60
05 Bourbon	1.10	0.64	-42	50 Pawnee	5.00	3.18	-36
09 Cherokee	1.18	0.55	-54	51 Pawnee	4.45	1.64	-63
13 Coffey	2.73	2.64	-3	54 Pratt	4.63	1.60	-65
15 Crawford	3.20	2.80	-13	56 Reno	5.70	4.27	-25
33 Linn	0.36	0.64	75	65 Stafford	5.09	2.30	-55
38 Miami	2.55	1.73	-32	67 Sumner	3.90	3.78	-3
40 Montgomery	2.60	2.70	4	**Region**	**4.05**	**2.74**	**-32***
46 Neosho	NA	1.36	NA		Southern High Plains		
47 Osage	1.18	4.20	255	20 Finney	NA	6.43	NA
71 Woodson[b]	3.45	3.55	3	21 Ford	1.82	1.91	5
72 Grand Osage WA	0.88	2.30	163	37 Meade	3.78	3.00	-21
Region	**2.00**	**1.99**	**0**	43 Morton	3.09	8.09	162
	Northern High Plains			44 Morton	2.80	5.90	111
55 Rawlins	1.00	0.55	-45	66 Stanton	0.36	0.00	-100
63 Sheridan	0.00	0.00	0	73 Hamilton	3.82	6.10	60
Region	**0.50**	**0.27**	**-45**	**Region**	**2.61**	**4.17**	**60***
				STATEWIDE	**3.31**	**3.00**	**-10***

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

[a] % Δ = percent change

[b] New observer in 2017; not included in regional or state averages

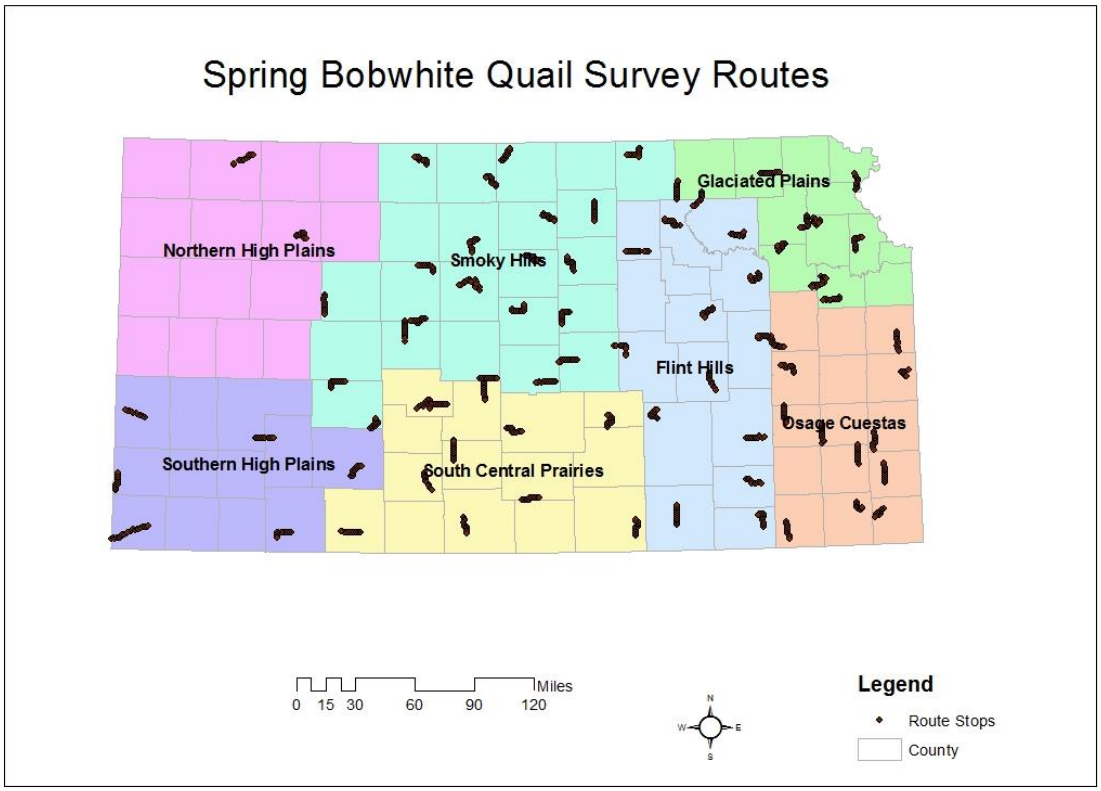

Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.

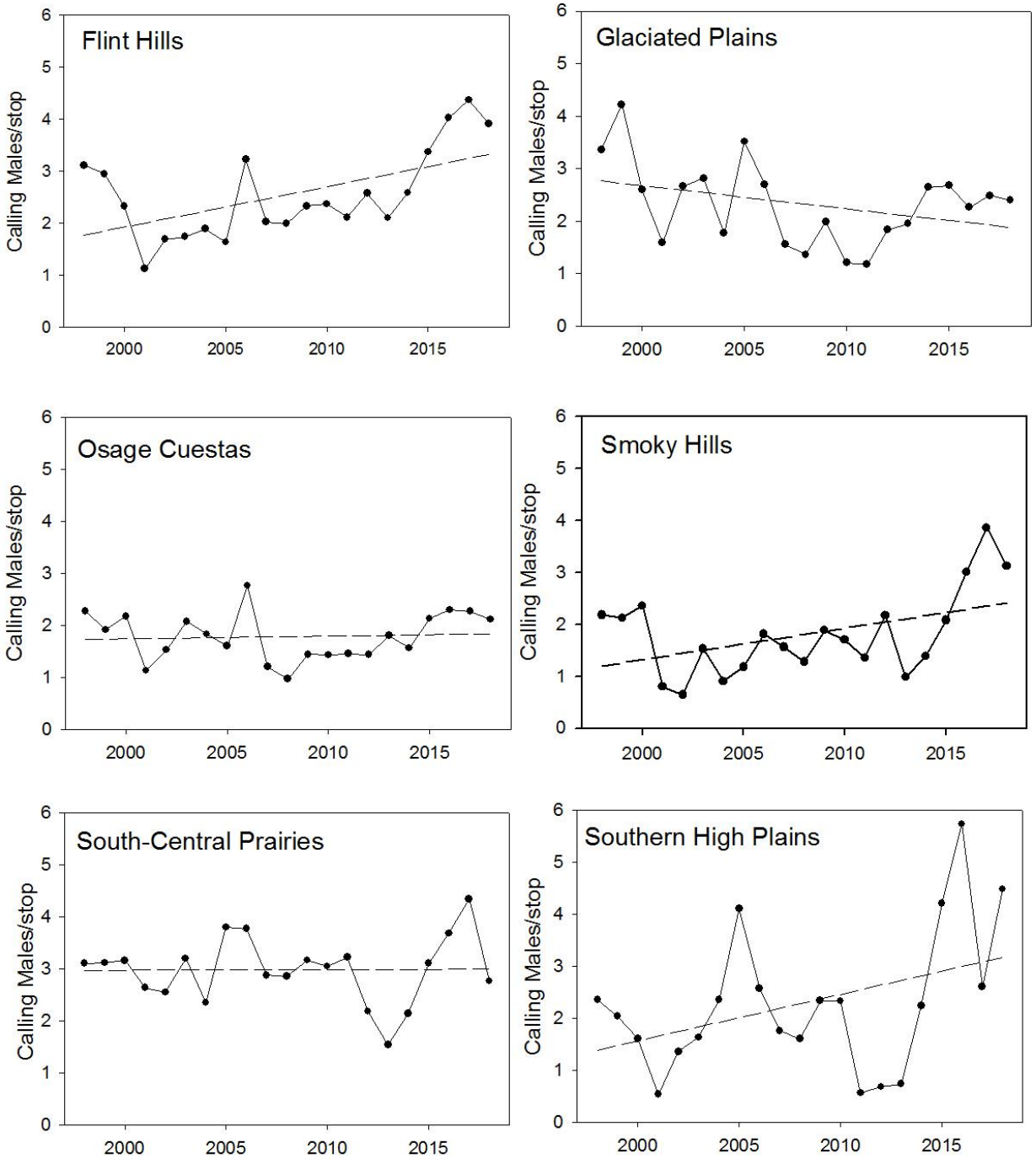

Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2018. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

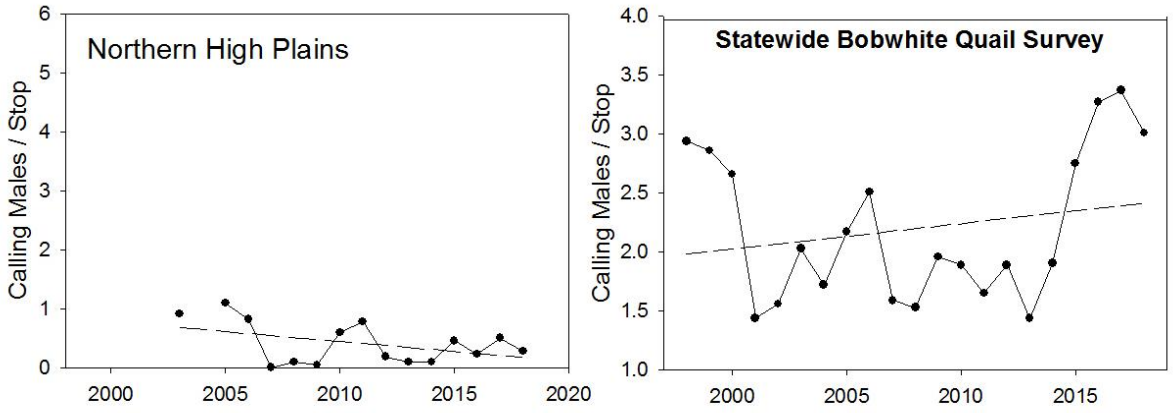

Figure 2. continued

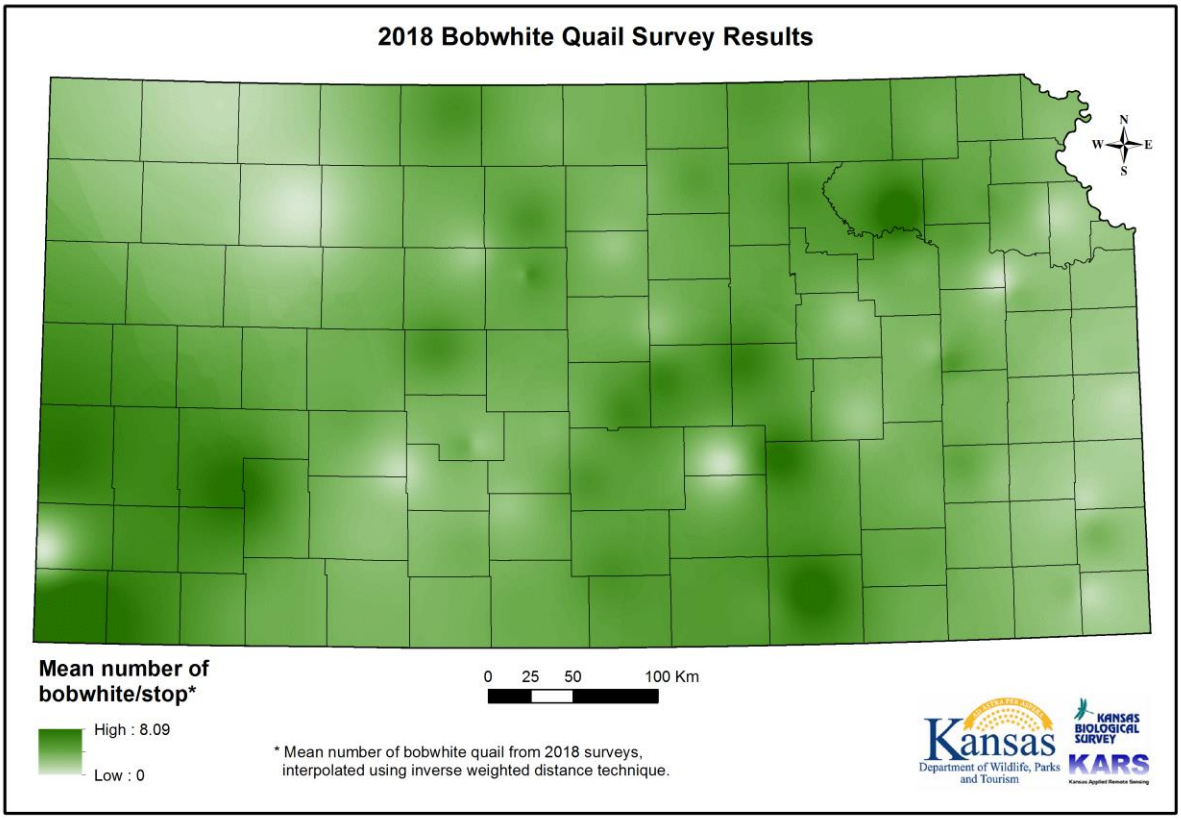

Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2018.

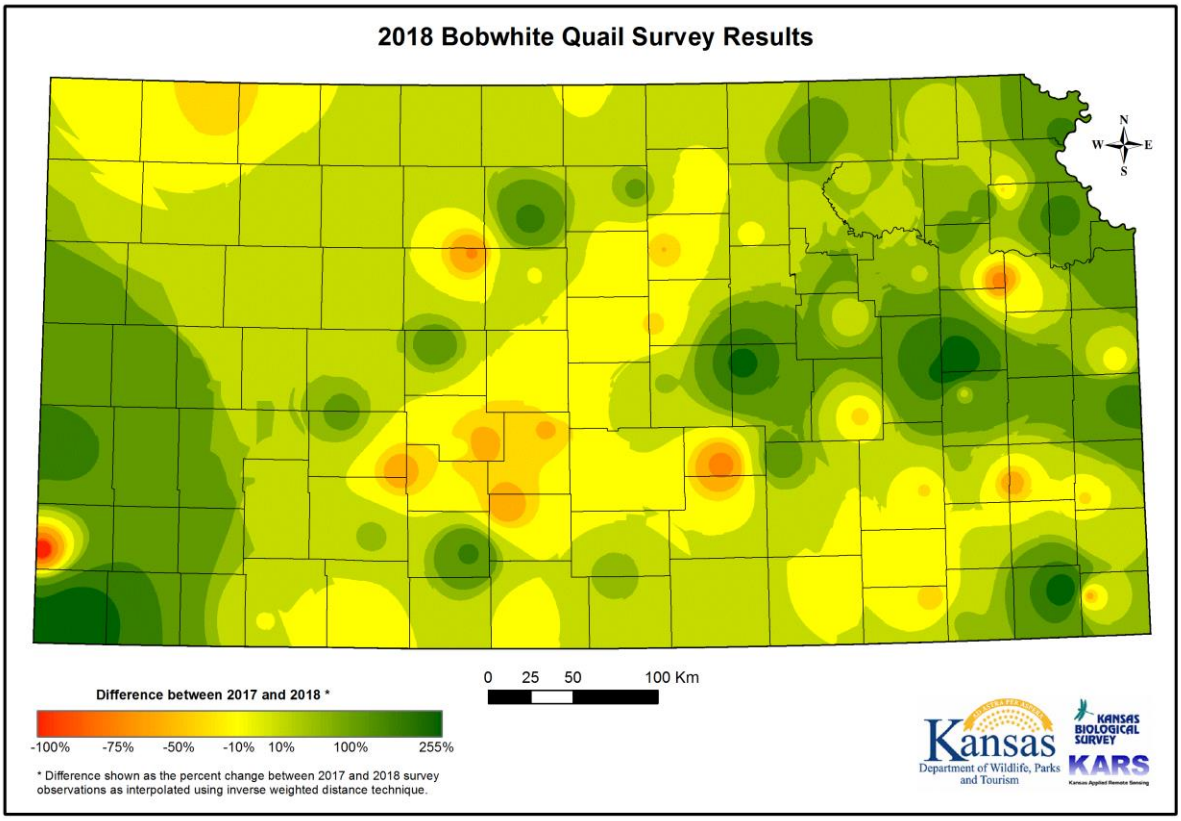

Figure 4. Relative change in Bobwhite breeding population index from 2017 to 2018 interpolated from route-specific indices across Kansas.