

2019 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 2019, 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 2 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 2019. 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 73 of 76 assigned routes during 2019 for a statewide index of 3.01 calling males per stop. Among the 67 comparable routes, the 2019 statewide index to the breeding bobwhite population was 25% lower than in 2018 (Table 2) which was a statistically significant decrease. There was a statistically significant ($P < 0.10$) decreases in the average number of calling males per stop in the Smoky Hills (-34%), South Central Prairies (-15%) and Southern High Plains (-35%) regions from 2018 to 2019 (Table 2). There were no regions that showed statistically significant ($P < 0.10$) increases in the average number of calling males per stop this year. There were non-significant decreases in the average males calling per stop in the Flint Hills, Glaciated Plains, and Osage Cuestas, with the Northern High Plains region indicating a non-significant increase from 2018 (Table 2).

The statewide calling males/stop index has shown an increase at a rate of 0.021 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. The current index is slightly above average following an extended population boom over the last 4 years associated with habitat improvements as conditions improved 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 again this year with Glaciated Plains slipping back below its' long-term average. Despite the indices improvements in recent years the long-term average in 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. The weedy conditions produced from this event have begun to mature and we are likely returning to more pre-drought habitat and associated quail densities. Kansas had a few blizzard type events during the winter of 2018/2019, with potential to impact overwinter survival. However, these events were mostly short lived and changes to the Spring calling survey were similar to those observed on last year's summer brood survey suggesting that there was unlikely any widespread mortality related to these storms. The high densities of quail entering the breeding season last year allowed us to maintain above average densities again this year despite poor production conditions, albeit not as high as the past few years. All major quail regions saw declines this year.

While the population trajectory is still 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. After several consecutive years of these regions being above long term average the Glaciated Plains fell back below average and while the Osage Cuestas remained just slightly above. 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 2019. Several routes across the state showed large decreases from 2018, but densities remained high in some areas (Table 2), and the statewide population index remained above average for this survey (Table 2, Figure 3). Precipitation observed through winter created abundant nesting habitat. Heavy rainfall, hail and flooding can negatively impact survival and reproduction, and there have been several of these widespread events this spring. 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, 2019.

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	Logan Shoup*	42	McPherson/Marion	Jeremy Amos
4	Barton	Logan Shoup*	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	Pat Riese*
11	Clay	Clint Thornton	50	Pawnee	Logan Shoup*
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	Kevin Luman*	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	Logan Shoup*	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	Kelley Newman
34	Lyon	Brad Nieman	72	Grand Osage WA	Rob Riffin
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	Justin Hamilton

*New observer for 2019

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2019.

Route	2018 M/S	2019 M/S	% Δ^a	Route	2018 M/S	2019 M/S	% Δ^a
<u>Flint Hills</u>				<u>Smoky Hills</u>			
06 Butler	6.36	2.70	-58	04 Barton ^b	2.64	4.00	52
07 Chase	1.45	0.91	-38	12 Cloud	3.90	1.36	-65
08 Chautauqua	3.00	3.30	10	18 Ellis	1.40	3.36	140
11 Clay	3.45	2.55	-26	19 Ellsworth	2.73	2.00	-27
14 Cowley	6.82	NA	NA	24 Hodgeman	0.45	1.45	220
17 Elk	3.45	4.00	16	25 Hodgeman ^b	3.30	3.09	-6
22 Greenwood	2.64	2.55	-3	27 Jewell	2.73	2.18	-20
34 Lyon	1.91	5.30	178	32 Lincoln	1.64	1.73	6
41 Morris	1.60	0.91	-43	36 McPherson	5.30	2.00	-62
42 McPherson_Marion	5.56	2.44	-56	39 Mitchell	2.40	1.33	-44
53 Pottawatomie	7.50	3.90	-48	48 Osborne	4.40	1.00	-77
58 Riley	4.64	4.09	-12	49 Ottawa ^b	2.91	1.92	-34
69 Wabaunsee	2.75	2.40	-13	52 Phillips	4.55	0.36	-92
75 Tuttle Cr WA	3.67	NA	NA	57 Rice	5.00	5.10	2
Region	3.69	2.92	-21	59 Rush	4.64	1.64	-65
<u>Glaciated Plains</u>				60 Russell	2.91	2.91	0
02 Atchison_Doniphan	2.00	1.27	-36	61 Saline	1.82	1.55	-15
16 Douglas	2.55	1.73	-32	64 Smith	2.45	1.00	-59
26 Jefferson_Jackson	3.82	1.45	-62	68 Trego	1.45	NA	NA
31 Leavenworth	0.64	0.09	-86	70 Washington	4.10	1.73	-58
35 Marshall	2.73	2.36	-13	74 WilsonWA	4.73	5.55	17
45 Nemaha	2.82	1.67	-41	Region	3.24	2.13	-34*
62 Shawnee	3.89	1.90	-51	<u>South-Central Prairies</u>			
76 Perry Wa	3.09	5.36	74	03 Barber ^b	3.20	4.64	45
77 Clinton WA Wak	0.09	0.11	22	10 Clark	2.55	2.36	-7
Region	2.40	1.77	-26	23 Harvey	0.22	0.09	-59
<u>Osage Cuestas</u>				29 Kingman	4.45	3.82	-14
01 Allen	1.73	3.70	114	30 Kiowa ^b	2.91	3.64	25
05 Bourbon	0.64	1.67	162	50 Pawnee ^b	3.18	3.73	17
09 Cherokee	0.55	0.64	17	51 Pawnee	1.64	1.45	-11
13 Coffey	2.64	2.18	-17	54 Pratt	1.60	0.91	-43
15 Crawford	2.80	2.55	-9	56 Reno	4.27	3.00	-30
33 Linn	0.64	0.73	14	65 Stafford	2.30	2.60	13
38 Miami	1.73	1.18	-32	67 Sumner	3.78	3.55	-6
40 Montgomery	2.70	1.91	-29	Region	2.60	2.22	-15*
46 Neosho	1.36	1.60	17	<u>Southern High Plains</u>			
47 Osage	4.20	3.50	-17	20 Finney	6.43	2.73	-58
71 Woodson	3.55	1.09	-69	21 Ford	1.91	1.64	-14
72 Grand Osage WA	2.30	0.50	-78	37 Meade	3.00	1.45	-52
Region	2.07	1.77	-14	43 Morton	8.09	5.44	-33
<u>Northern High Plains</u>				44 Morton	5.90	3.45	-41
55 Rawlins	0.55	0.64	17	66 Stanton	0.00	0.45	NE
63 Sheridan	0.00	0.64	NE	73 Hamilton	6.10	5.40	-11
Region	0.27	0.64	133	Region	4.49	2.94	-35*
				STATEWIDE	2.97	2.21	-25*

*Values are significant at a $P \leq 0.10$ level^a% Δ = percent change^bNew observer in 2019; not included in regional or state averages

NA = Not available, route not completed

NE = % change Not Estimable, Denominator = zero

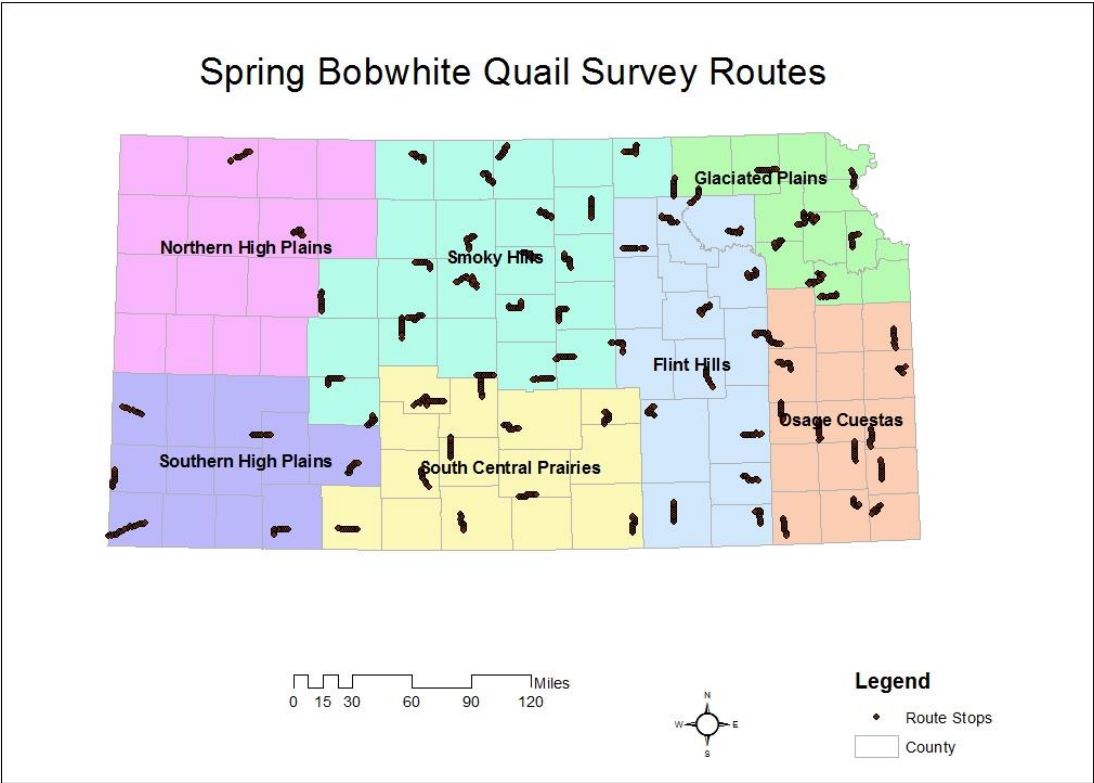


Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.

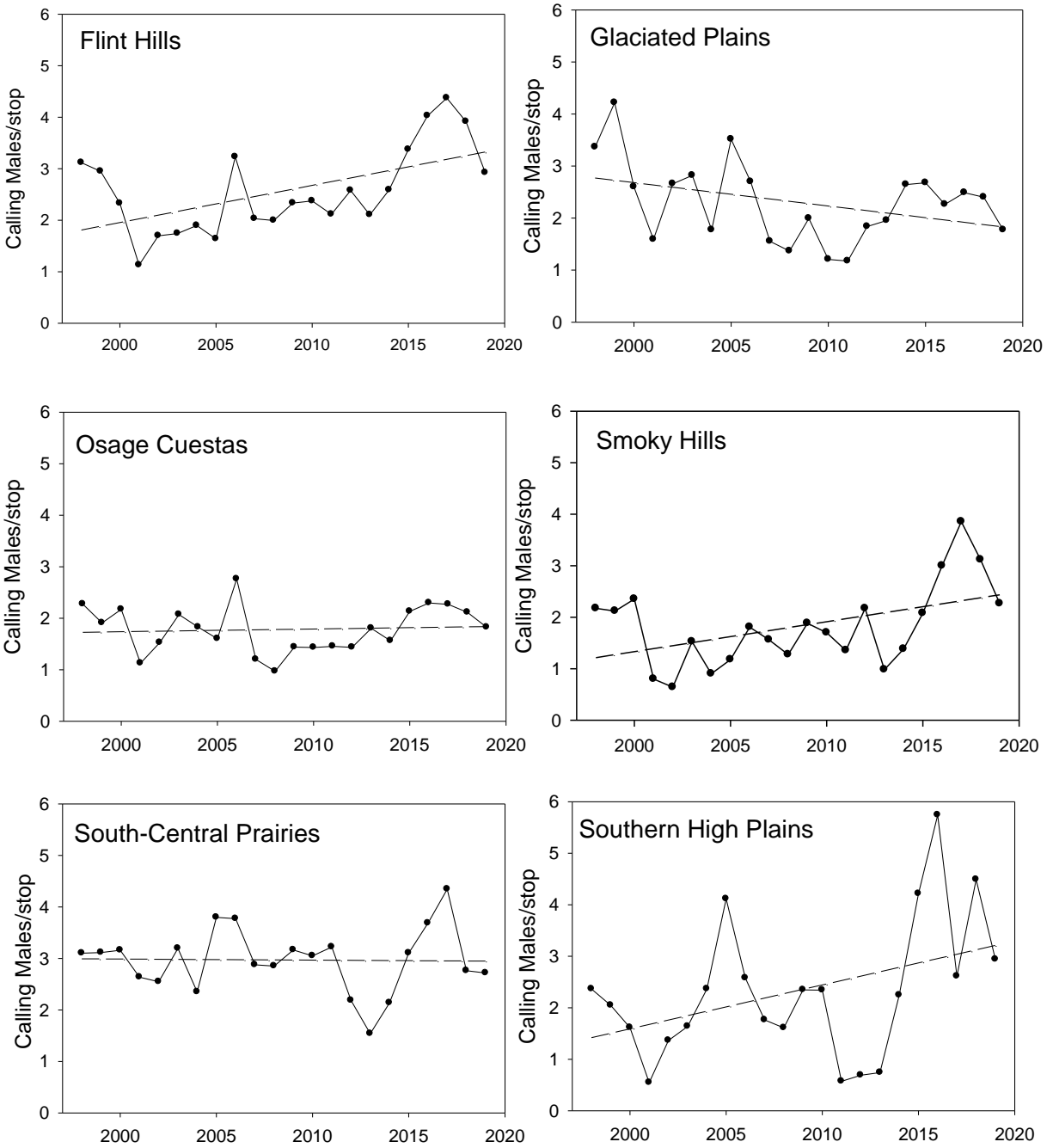


Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2019. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

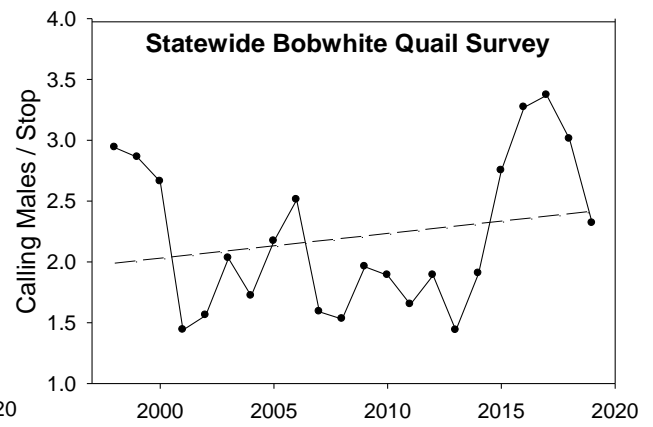
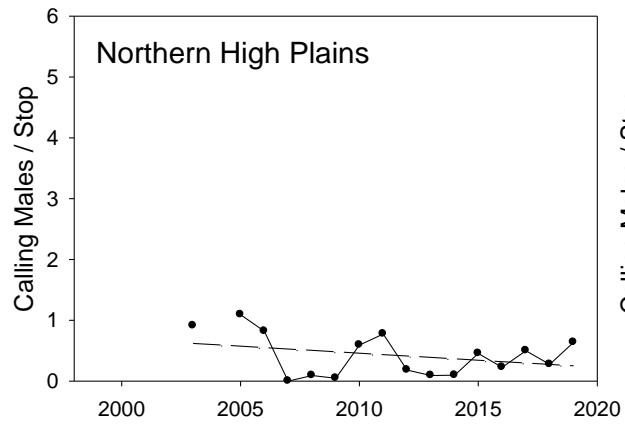
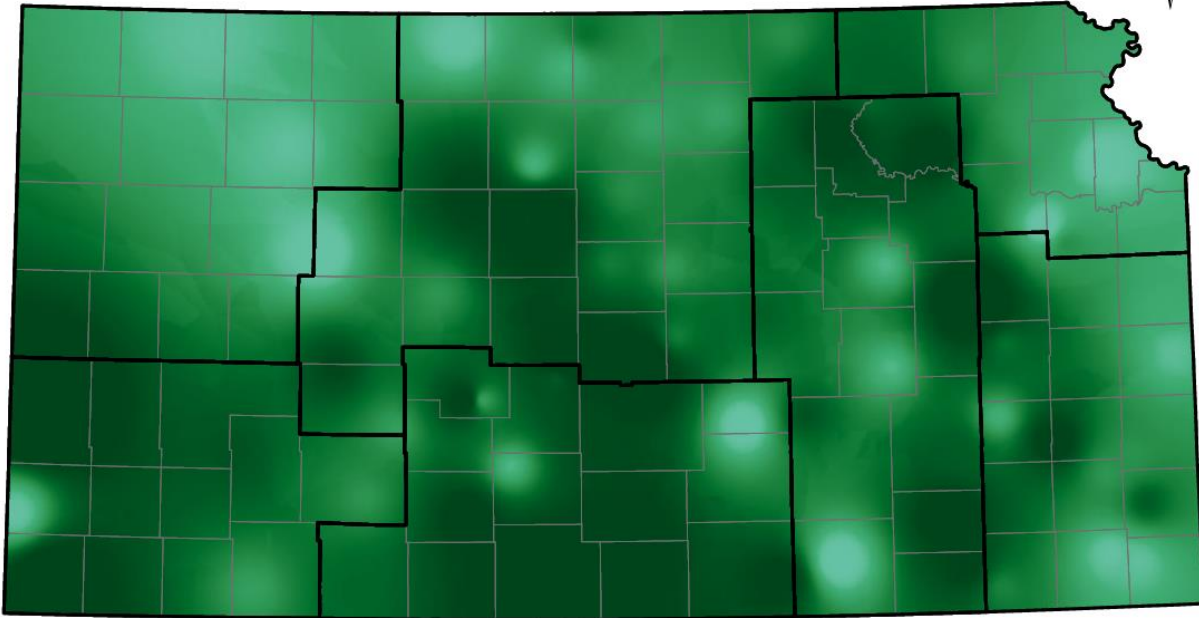


Figure 2. continued

2019 Bobwhite Quail Whistle Survey Results



 Small Game Regions

Mean Number of
Bobwhite/Stop*



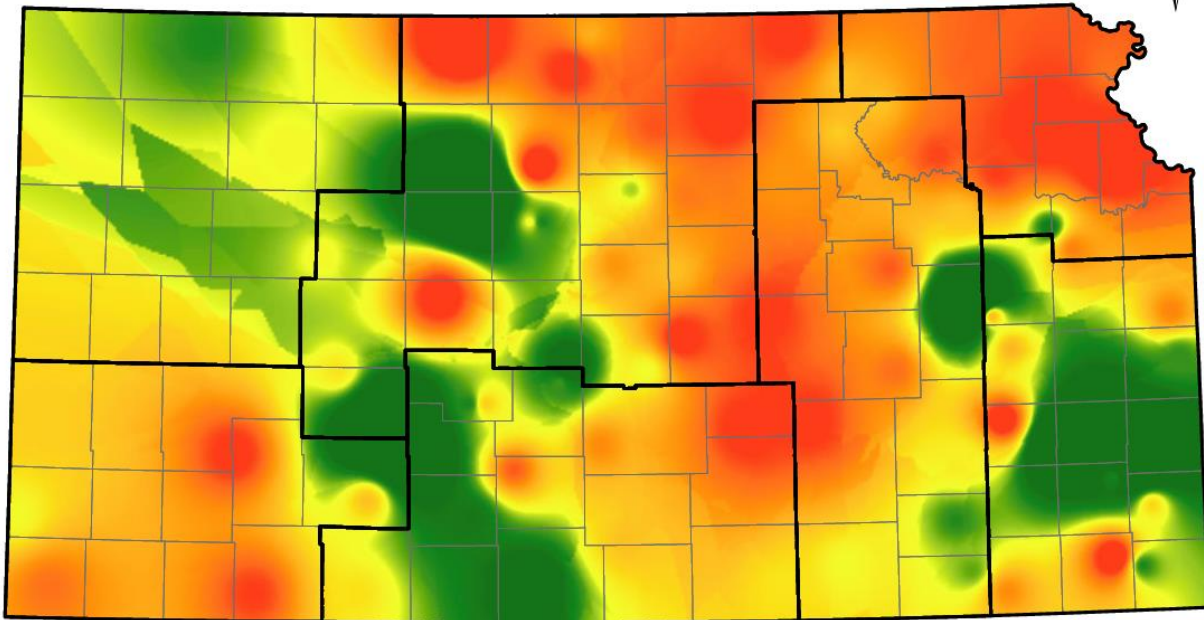
0 25 50 100
Kilometers

* Mean number of bobwhite quail from 2019 surveys, interpolated using inverse distance weighted technique.



Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2019.

2018-2019 Bobwhite Quail Whistle Percent Change



 Small Game Regions

0 25 50 100
Kilometers

Difference between 2018 and 2019*



* Difference shown as the percent change between 2018 and 2019 survey observations as interpolated using inverse distance weighting technique.



Figure 4. Relative change in Bobwhite breeding population index from 2018 to 2019 interpolated from route-specific indices across Kansas.