2020 BOBWHITE WHISTLE COUNT

Performance Report

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KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM

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PERMISSION TO QUOTE

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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 2020, observers were asked to survey 76 established routes during the 1-16 June survey period, starting at sunrise (Table 1). 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 2020. 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 76 assigned routes during 2020 for a statewide index of 2.58

calling males per stop. Among the 66 comparable routes, the 2020 statewide index to the

breeding bobwhite population was 19% higher than in 2019 (Table 2) which was a statistically

significant increase. There was a statistically significant ($P < 0.10$) increases in the average

number of calling males per stop in the Smoky Hills (37%) and South-Central Prairies (42%)

regions from 2019 to 2020 (Table 2). There were no regions that showed statistically significant

($P < 0.10$) decreases 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 Glaciated Plains, Osage

Cuestas, and Northern High Plains, with the Flint Hills region indicating a non-significant

increase from 2018 (Table 2).

The statewide calling males/stop index has shown an increase at a rate of 0.022 calling

males/year over 22 years (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 5 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 and are back below 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 as indicated by index lower then the 5 year average. Kansas had a relatively mild winter of 2019/2020, with limited potential to impact overwinter survival. Good production conditions in the central regions of the state last year allowed us to maintain above average densities again this year despite poor reduced production I the remaining regions. production conditions.

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 averages both have fallen back below. 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. This will likely be exasperated by changes in the conservation programs in the Farm Bill, most notably CRP. 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 2020. Several routes across the state showed large changes from 2019, with densities increasing across much of the central regions (Table 2), and the statewide population index remained above average for this survey (Table 2, Figure 3). Heavy precipitation last summer created an abundance of residual vegetation for good nesting habitat. While we have experienced several periods of hot dry weather this spring/summer, periodic showers have may have created conditions that could support ample production in 2020. 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, 2020.

Route	County(s)	Observer	Route	County(s)	Observer
1	Allen	Jason Deal	40	Montgomery	Ryan Lies*
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	Pat Riese*
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	Brandon Tritch*	66	Stanton	Kraig Schultz
29	Kingman	Jon Beckman*	67	Sumner	Jeff Rue
30	Kiowa	Logan Shoup	68	Trego	Cale Hedges*
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 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	Nathan Henry
38	Miami	Andy Friesen	76	Perry WA	Andrew Page
39	Mitchell	Brandon Tritch*	77	Clinton WA	Justin Hamilton

*New observer for 2020

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2020.

Route	2019 M/S	2020 M/S	% Δ[a]	Route	2019 M/S	2020 M/S	% Δ[a]
Flint Hills				Smoky Hills			
06 Butler	2.70	4.50	67	04 Barton	4.00	4.91	23
07 Chase	0.91	1.27	40	12 Cloud	1.36	4.40	223
08 Chautauqua	3.30	3.70	12	18 Ellis	3.36	4.55	35
11 Clay	2.55	3.08	21	19 Ellsworth	2.00	1.64	-18
14 Cowley	NA	4.36	NA	24 Hodgeman	1.45	2.27	56
17 Elk	4.00	3.73	-7	25 Hodgeman	3.09	3.00	-3
22 Greenwood	2.55	4.73	86	27 Jewell[b]	2.18	2.64	21
34 Lyon	5.30	1.00	-81	32 Lincoln	1.73	2.20	27
41 Morris	0.91	0.91	0	36 McPherson	2.00	3.45	73
42 McPherson_Marion	2.44	2.75	13	39 Mitchell[b]	1.33	0.82	-39
53 Pottawatomie	3.90	4.45	14	48 Osborne	1.00	1.73	73
58 Riley	4.09	3.00	-27	49 Ottawa	1.92	1.91	0
69 Wabaunsee	2.40	3.73	55	52 Phillips	0.36	3.18	775
75 Tuttle Cr WA	NA	0.27	NA	57 Rice	5.10	5.00	-2
Region	**2.92**	**3.07**	**5**	59 Rush	1.64	3.45	111
Glaciated Plains				60 Russell	2.91	5.00	72
02 Atchison_Doniphan	1.27	1.27	0	61 Saline[b]	1.55	2.73	76
16 Douglas	1.73	1.73	0	64 Smith	1.00	1.91	91
26 Jefferson_Jackson	1.45	2.00	38	68 Trego[b]	NA	2.82	NA
31 Leavenworth	0.09	0.36	300	70 Washington	1.73	1.45	-16
35 Marshall	2.36	2.50	6	74 WilsonWA	5.55	4.82	-13
45 Nemaha	1.67	1.91	15	**Region**	**2.36**	**3.23**	**37***
62 Shawnee	1.90	2.33	23	South-Central Prairies			
76 Perry Wa	5.36	2.50	-53	03 Barber	4.64	6.36	37
77 Clinton WA Wak	0.11	0.22	100	10 Clark	2.36	2.82	19
Region	**1.77**	**1.65**	**-7**	23 Harvey	0.09	0.33	267
Osage Cuestas				29 Kingman	3.82	1.27	-67
01 Allen	3.70	1.70	-54	30 Kiowa	3.64	6.09	68
05 Bourbon	1.67	0.90	-46	50 Pawnee	3.73	5.09	37
09 Cherokee	0.64	0.50	-21	51 Pawnee	1.45	3.64	150
13 Coffey	2.18	2.09	-4	54 Pratt	0.91	1.70	87
15 Crawford	2.55	3.00	18	56 Reno	3.00	4.09	36
33 Linn	0.73	0.64	-13	65 Stafford	2.60	2.36	-9
38 Miami	1.18	1.82	54	67 Sumner	3.55	4.36	23
40 Montgomery[b]	1.91	2.36	24	**Region**	**2.60**	**3.69**	**42***
46 Neosho	1.60	1.09	-32	Southern High Plains			
47 Osage	3.50	3.45	-1	20 Finney	2.73	NA	NA
71 Woodson	1.09	2.73	150	21 Ford	1.64	2.64	61
72 Grand Osage WA	0.50	0.50	0	37 Meade	1.45	2.60	79
Region	**1.77**	**1.46**	**-18**	43 Morton	5.44	2.09	-62
Northern High Plains				44 Morton	3.45	2.27	-34
55 Rawlins	0.64	0.36	-43	66 Stanton	0.45	0.27	-40
63 Sheridan	0.64	0.82	29	73 Hamilton	5.40	3.91	-28
Region	**0.64**	**0.59**	**-7**	**Region**	**2.97**	**2.30**	**-23**
				STATEWIDE	**2.21**	**2.62**	**19***

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

[a] % Δ = percent change

[b] New observer in 2020; not included in regional or state averages

NA = Not available, route not completed

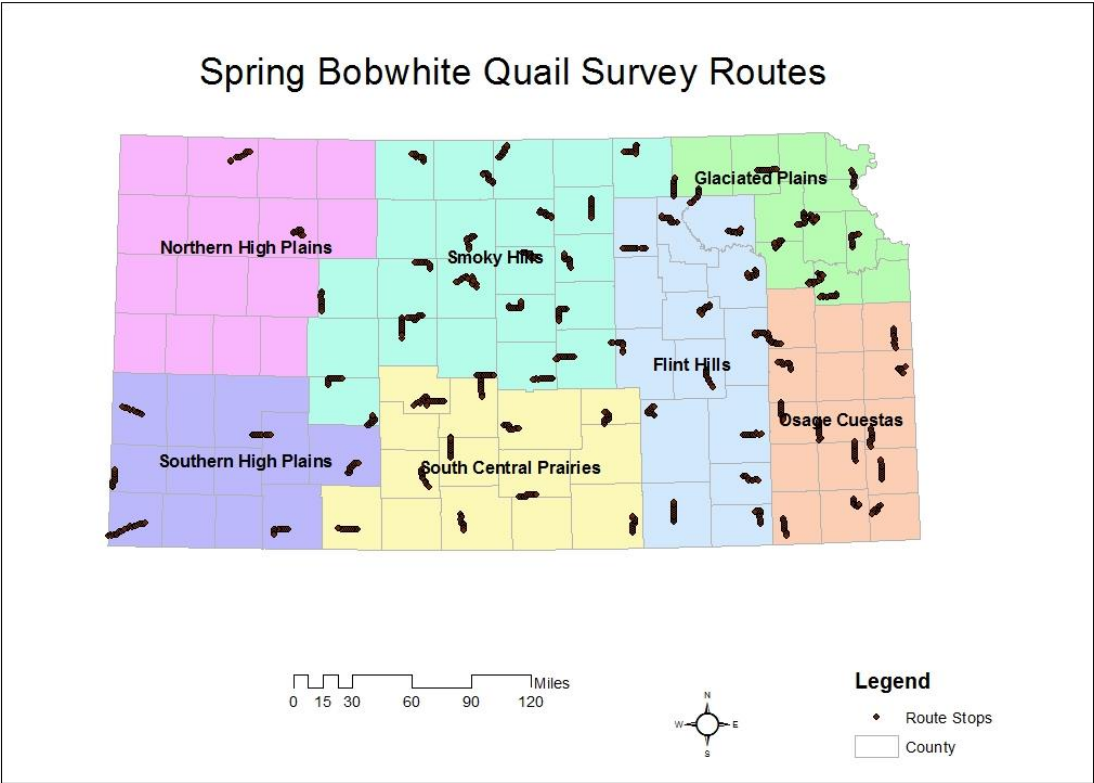NE = % change Not Estimable, Denominator = zero

Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.
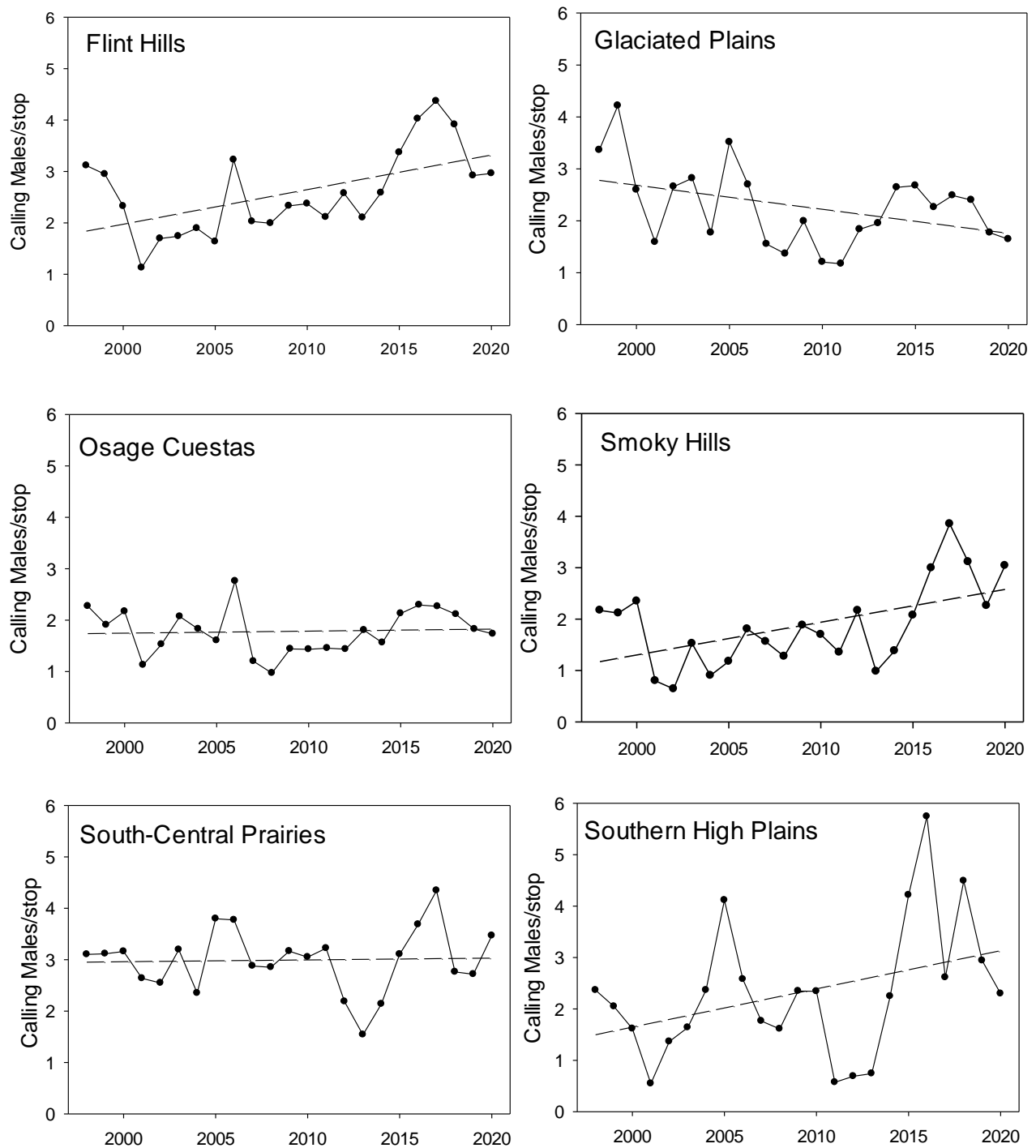
Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2020. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.
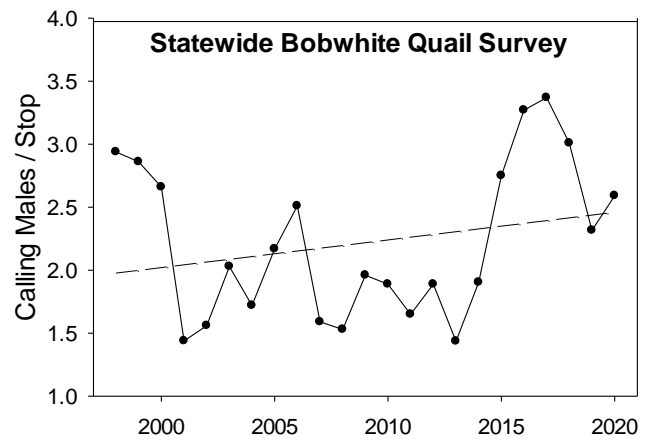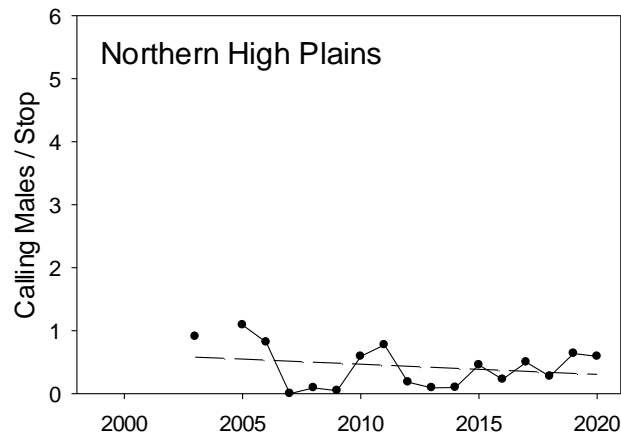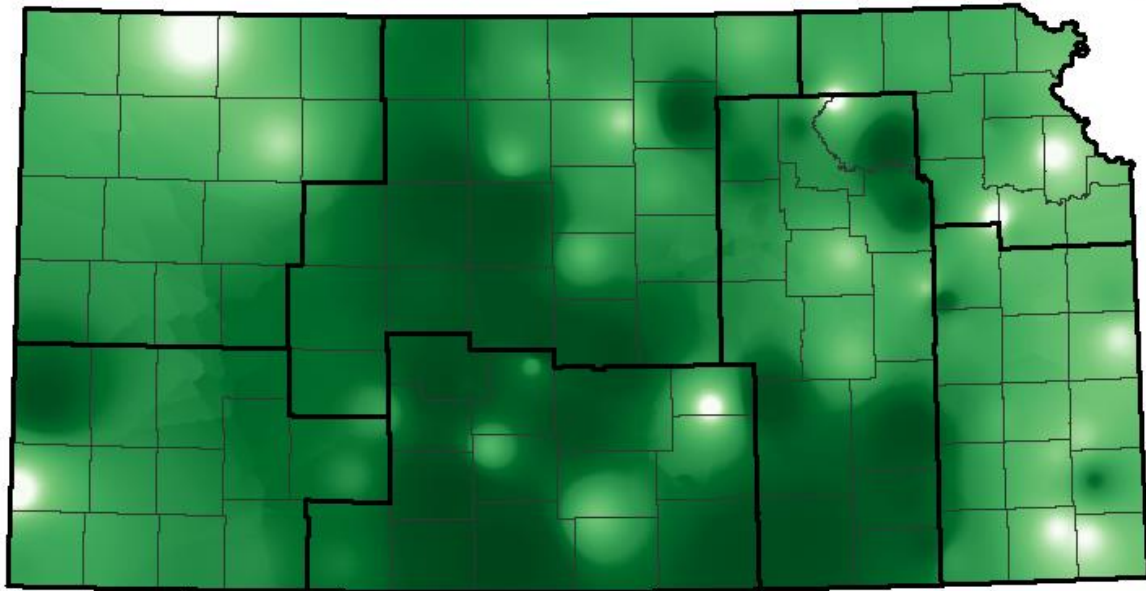
Figure 2. continued

Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2020.
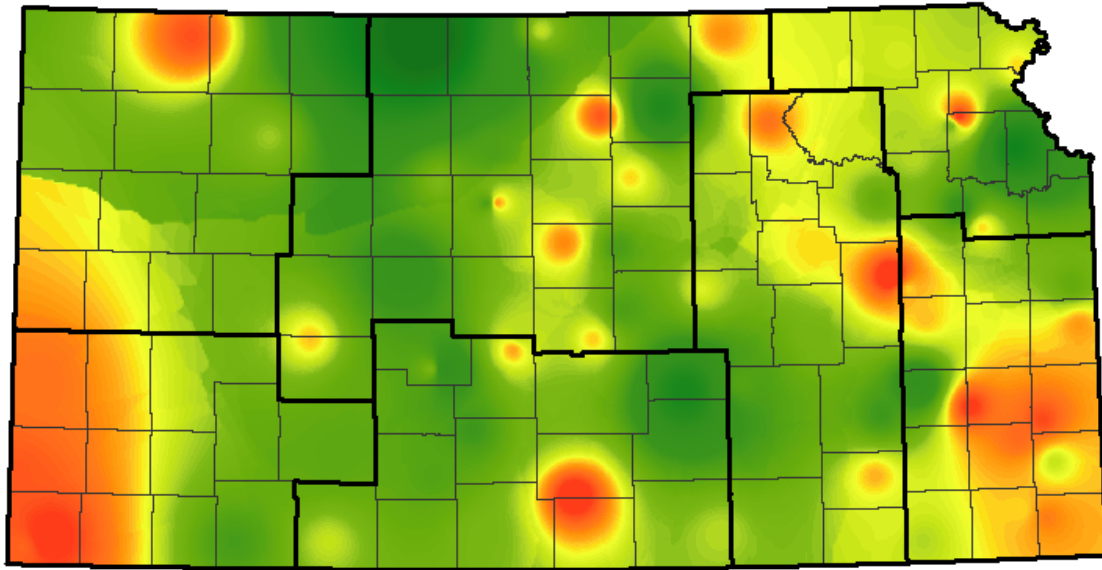
Figure 4. Relative change in Bobwhite breeding population index from 2019 to 2020 interpolated from route-specific indices across Kansas.