2021 BOBWHITE WHISTLE COUNT

Performance Report

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KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM

Brad Loveless
Secretary

Mike Miller
Assistant Secretary Wildlife, Fisheries, and Boating

Jake George
Wildlife Division Director

Rich Schultheis
Wildlife Research Supervisor

Prepared by:

Jeff Prendergast
Small Game Specialist

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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. Since then routes have occasionally been added or removed as necessary to supply the most representative data within staff availability. In 2021, observers were asked to survey 77 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 statewide M/S estimate since the 1998 establishment of the survey to evaluate longterm trend in this index. 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 77 of the assigned routes during 2021 for a statewide index of 2.63 calling males per stop. Among the 68 comparable routes, the 2021 statewide index to the breeding bobwhite population was 2% lower than in 2020 (Table 2) which was not a statistically significant change. There was a statistically significant ($P < 0.10$) increases in the average number of calling males per stop in the Smoky Hills (23%) and Flint Hills (37%) regions from 2020 to 2021 (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.

The statewide calling males/stop index has shown an increase at a rate of 0.023 calling males/year over 23 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 than the 5 year average. However, densities have remained strong compared to long term average (Figure 2). Kansas had a relatively mild winter of 2020/21, with limited potential to impact overwinter survival. One extreme cold event in February caused initial concern but survival through the event was high likely attributed to lack of snow and ice as well as good condition of the birds.

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. Despite some improvements in recent years both regions 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 hunting 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 2021. Several routes across the state showed large changes from 2020, with densities increasing across much of the Flint Hills and North-Central Kansas (Table 2), and the statewide population index remained above average for this survey (Table 2, Figure 3). Good spring precipitation this year has kept us out of drought and produced quality nesting cover across the state. While we have experienced some periods of hot dry weather this summer, periodic showers have may have created conditions that could support ample production in 2021. 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, 2021.

Route	County(s)	Observer	Route	County(s)	Observer
1	Allen	Jason Deal	40	Montgomery	Ryan Lies
2	Atchison/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	Ben Couchman*
7	Chase	Kent Fricke	46	Neosho	Travis Ratliff
8	Chautauqua	Ryan Lies*	47	Osage	Matt PeeK
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	Keith Murrow*
18	Ellis	Andy Nelson	57	Rice	Steve Adams
19	Ellsworth	James Svaty	58	Riley	Corey Alderson
20	Finney	Kevin Luman*	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	Darin Porter*
24	Hodgeman	Aaron Baugh	63	Sheridan	Abby McGuire
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	Matt Schmidt*
31	Leavenworth	Andy Friesen	69	Wabaunsee	Darin Porter*
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 2021

Table 2. Regional Changes in calling Bobwhite males per stop (M/S), 2021.

Route	2020 M/S	2021 M/S	% Δ[a]	Route	2020 M/S	2021 M/S	% Δ[a]
Flint Hills				Smoky Hills			
06 Butler	4.50	6.55	45	04 Barton	4.91	5.36	9
07 Chase	1.27	2.09	64	12 Cloud	4.40	2.22	-49
08 Chautauqua[b]	3.70	3.82	3	18 Ellis	4.55	2.91	-36
11 Clay	3.08	3.73	21	19 Ellsworth	1.64	2.09	28
14 Cowley	4.36	5.18	19	24 Hodgeman	2.27	0.45	-80
17 Elk	3.73	4.27	15	25 Hodgeman	3.00	2.00	-33
22 Greenwood	4.73	4.73	0	27 Jewell	2.64	2.09	-21
34 Lyon	1.00	4.50	350	32 Lincoln	2.20	1.91	-13
41 Morris	0.91	1.55	70	36 McPherson	3.45	3.63	5
42 McPherson_Marion	2.75	3.55	29	39 Mitchell	0.82	2.36	189
53 Pottawatomie	4.45	5.91	33	48 Osborne	1.73	0.82	-53
58 Riley	3.00	4.27	42	49 Ottawa	1.91	1.82	-5
69 Wabaunsee[b]	3.73	3.33	-11	52 Phillips	3.18	2.36	-26
75 Tuttle Cr WA	0.27	2.27	733	57 Rice	5.00	3.00	-40
Region	**3.07**	**4.21**	**37***	59 Rush	3.45	3.91	13
Glaciated Plains				60 Russell	5.00	3.82	-24
02 Atchison_Doniphan	1.27	0.73	-43	61 Saline	2.73	1.00	-63
16 Douglas	1.73	2.45	42	64 Smith	1.91	1.90	0
26 Jefferson_Jackson	2.00	2.36	18	68 Trego[b]	2.82	2.90	NA
31 Leavenworth	0.36	0.30	-18	70 Washington	1.45	1.91	31
35 Marshall	2.50	3.22	29	74 WilsonWA	4.82	4.18	-13
45 Nemaha[b]	1.91	2.82	48	**Region**	**2.40**	**2.96**	**23***
62 Shawnee[b]	2.33	5.86	151	South-Central Prairies			
76 Perry Wa	2.50	3.73	49	03 Barber	6.36	5.09	-20
77 Clinton WA Wak	0.22	0.56	150	10 Clark	2.82	0.64	-77
Region	**1.51**	**1.91**	**26**	23 Harvey	0.33	0.63	88
Osage Cuestas				29 Kingman	1.27	1.00	-21
01 Allen	1.70	1.82	7	30 Kiowa	6.09	3.27	-46
05 Bourbon	0.90	0.63	-31	50 Pawnee	5.09	6.27	23
09 Cherokee	0.50	0.64	27	51 Pawnee	3.64	2.50	-31
13 Coffey	2.09	1.45	-30	54 Pratt	1.70	2.36	39
15 Crawford	3.00	2.18	-27	56 Reno[b]	4.09	2.55	-38
33 Linn	0.64	0.45	-29	65 Stafford	2.36	1.20	-49
38 Miami	1.82	1.55	-15	67 Sumner	4.36	4.55	4
40 Montgomery	2.36	3.18	35	79 Edwards	4.73	5.10	8
46 Neosho	1.09	1.80	65	**Region**	**3.52**	**2.96**	**-16**
47 Osage	3.45	2.64	-24	Southern High Plains			
71 Woodson	2.73	2.60	-5	20 Finney[b]	NA	3.9	NA
72 Grand Osage WA	0.50	0.22	-56	21 Ford	2.64	0.55	-79
Region	**1.73**	**1.60**	**-8**	37 Meade	2.60	3.57	37
Northern High Plains				43 Morton	2.09	3.45	65
55 Rawlins	0.36	0.18	-50	44 Morton	2.27	2.45	8
63 Sheridan	0.82	0.18	-78	66 Stanton	0.27	0.18	-33
Region	**0.59**	**0.18**	**-69**	73 Hamilton	3.91	3.36	-14
				Region	**2.30**	**2.26**	**-2**
				STATEWIDE	**2.58**	**2.51**	**-2**

*Values are significant at a $P \leq 0.10$ 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;
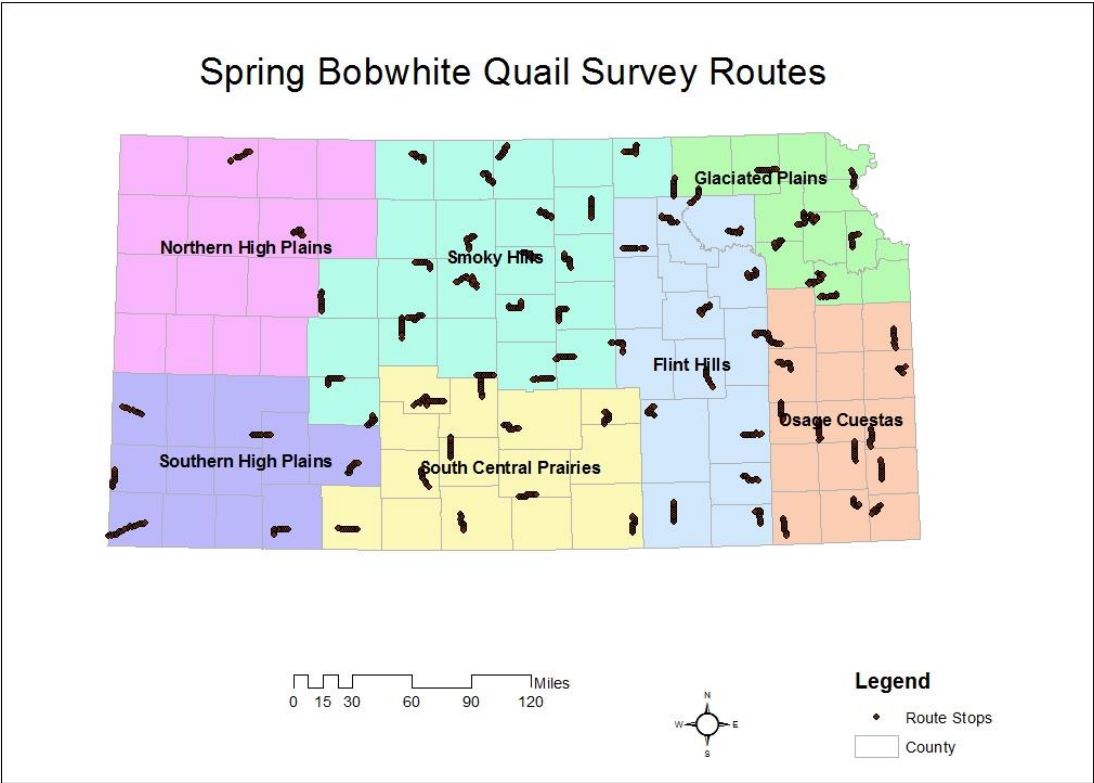
Figure 1. Locations of Bobwhite Survey listening stops within the 7 Kansas Small Game regions.
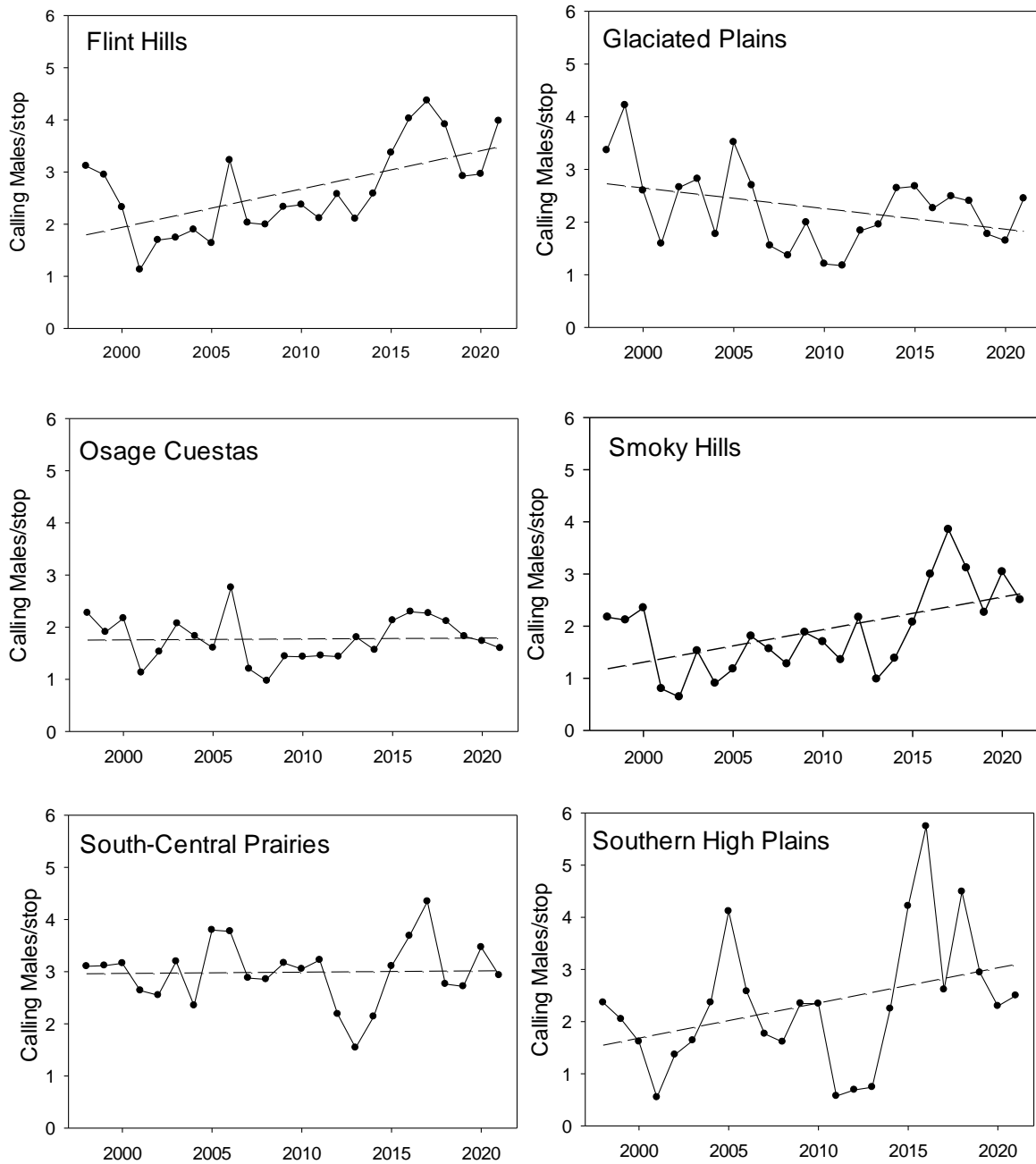
Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2021. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.
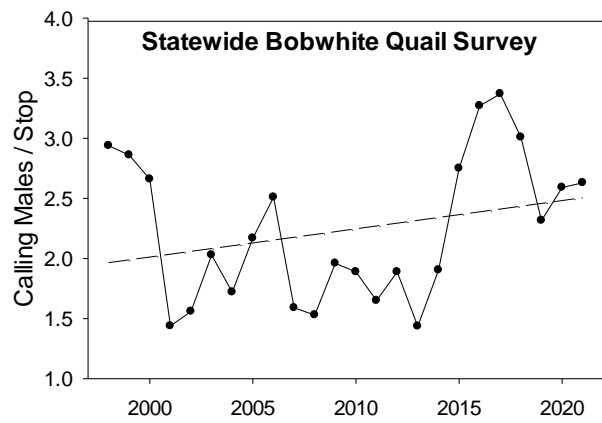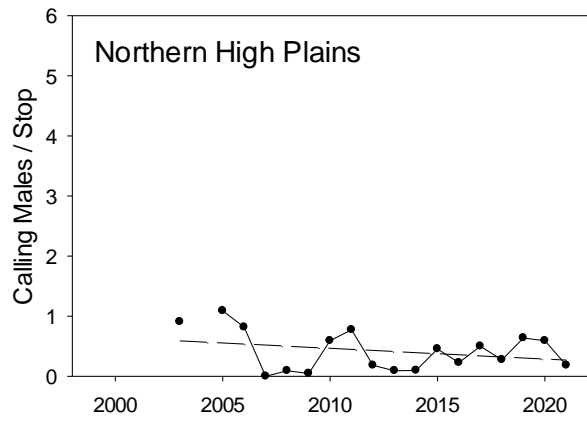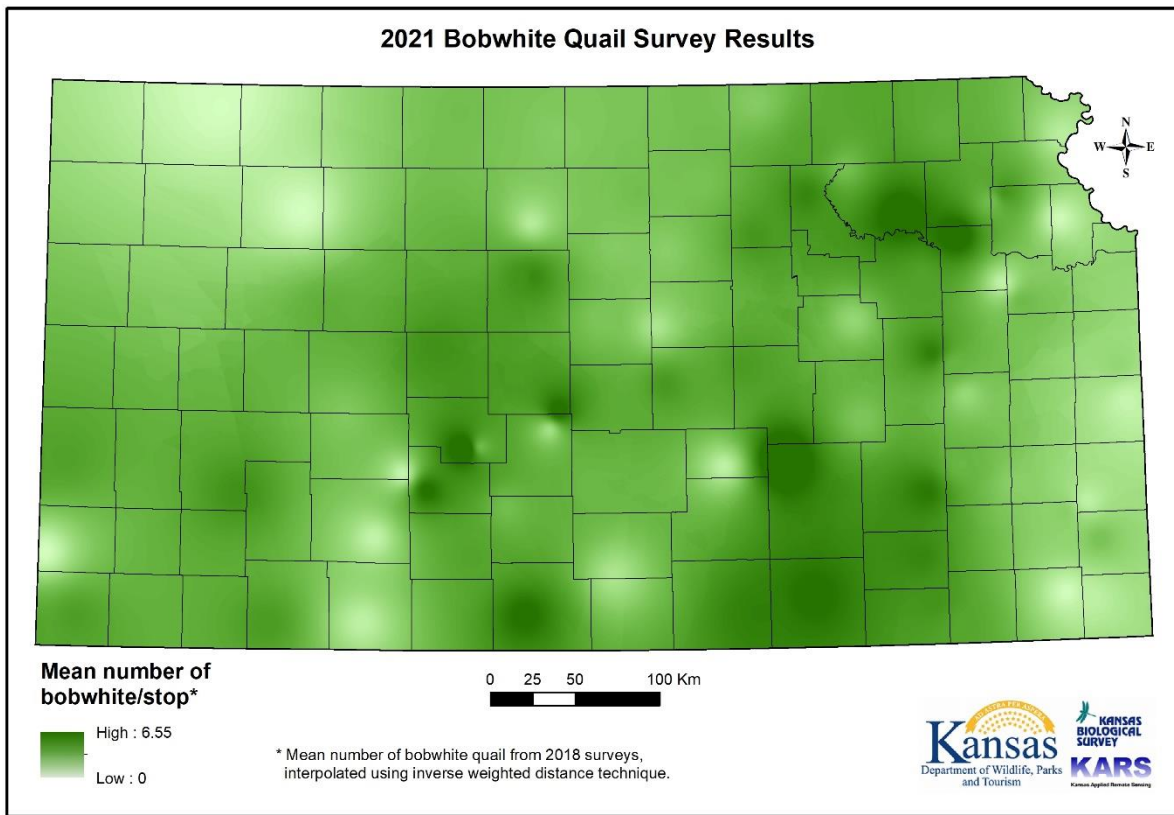
Figure 2. continued

Figure 3. Bobwhite breeding population index interpolated from route-specific indices across Kansas, 2021.
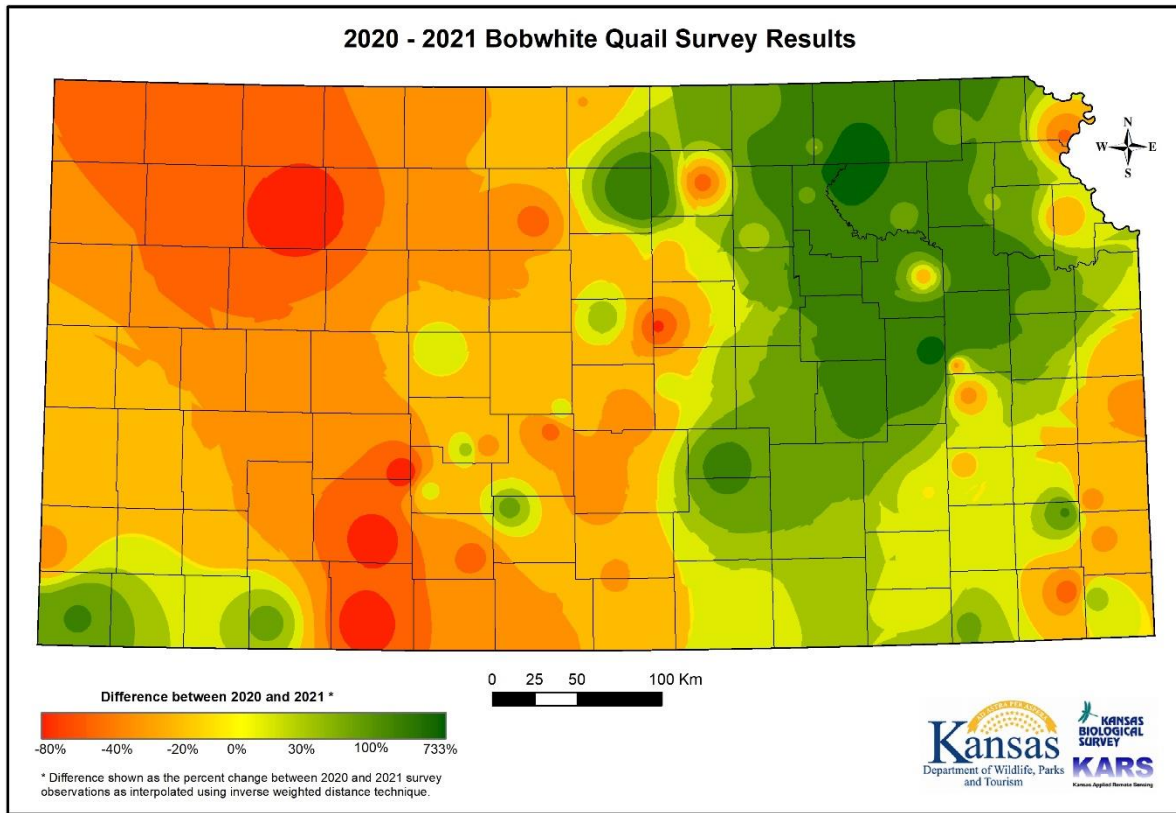
Figure 4. Relative change in Bobwhite breeding population index from 2020 to 2021 interpolated from route-specific indices across Kansas.