2012 BOBWHITE WHISTLE COUNT

Performance Report

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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 established routes were surveyed annually 1998 - 2005. Prior to the 2006 survey, the distribution of routes was adjusted to provide better coverage of the entire state. This was accomplished by adding 16 new routes in areas not surveyed previously and eliminating 10 routes from areas were effort was clustered. Two more routes were added in 2011. In 2012, observers were asked to survey 77 established routes during the 1-16 June survey period, starting at sunrise (Table 1). Due to weather constraints the survey period was extended 2 weeks for just a few routes. Four routes were added this year at wildlife areas at Tuttle Creek, Clinton, and Perry (Figure 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.

The index to bobwhite abundance was calculated as the mean number of different bobwhites heard per listening stop per route (M/R). A folded F-test was used to determine if the variance differed between the 2010 and 2011 indices. If unequal variance existed ($P < 0.05$) then a Satterthwaite's adjustment was used to adjust the degrees of freedom prior to conducting a two sample t-test. If variance did not differ across years then a standard two sample t-test was used to draw comparisons. Additionally, a linear regression of the historical whistle count data was used to determine if bobwhite abundance had changed significantly from 1998 to 2012. All indices and analyses were calculated for each of the 7 small game regions (Figure 1).

Krieging is a technique that can be used to interpolate data between known points, providing extrapolation 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 may be useful for large-scale interpretation of statewide data for regional comparisons.

Krieging was used by assigning the route-specific whistle index to the centroid of each route. Then all routes were used to extrapolate data throughout Kansas (Figure 3).

RESULTS

Observers surveyed all 77 assigned routes during 2012. The 2012 statewide index to the breeding bobwhite population increased slightly from 2011 (Table 2). Two statistically significant ($P < 0.10$) increases occurred in the Smoky Hills (61%) and Glaciated Plains (60%), while the South-Central Prairies (-33%) decreased (Table 2). Apparent changes observed in the other regions could have been solely due to variability associated with the sampling scheme.

From 1998 to 2012, bobwhite abundance has declined significantly in eastern Kansas in the Glaciated Plains and Osage Cuestas (Table 2, Figures 1 and 2). Bobwhite populations in central and western regions have more stable trends, although populations fluctuate across years. The statewide index has declined significantly ($P < 0.05$) over this time span (Table 2, Figure 2).

DISCUSSION

Spring whistle counts are considered an index to the breeding population. As such, they reflect overwinter survival and the previous breeding season production if overwinter survival was high. Kansas had a relatively mild winter in 2011-2012, likely resulting in higher overwinter survival.

Production in 2011 was likely higher in the Smoky Hills (north-central) and the Glaciated Plains (north-east), and is reflected in the 2012 breeding index. The long-term trend in the Smoky Hills has been stable and/or increasing since the early 2000s (Figure 2). The South-Central Prairies and the Southern High Plains (south-west) experienced an extreme drought in 2011, which likely resulted in depressed breeding populations for 2012. Other areas had relatively stable populations, although long terms trends are still declining across Kansas (Figure 2).

It is important to understand that annual changes to the breeding population do not necessary reflect hunt quality for the upcoming season, but rather reflect a combination of last year's productivity and overwinter survival. The fall bobwhite population depends not only on the size of the spring breeding population but to a much greater extent the level of productivity. A bobwhite population can increase nearly 300% from spring to fall when habitat and weather conditions are suitable for productivity.

The hunting outlook at this time is unpredictable for Fall 2012. Kansas is currently experiencing another extreme drought over much of the state. Many areas are considered as emergency drought status. This does not look favorable for quail reproduction, though some areas of north-central and north-east Kansas have relatively good potential in their breeding population numbers. If timely precipitation and subsequent vegetation and arthropod response do not occur, the fall population could be limited this year. Currently areas of north-central, south-central, and the Flint Hills region of Kansas seem to have the best densities of breeding populations (Figure 3).

Table 1. Northern bobwhite survey routes and observers in Kansas, 2012.

Route	County(s)	Observer	Route	County(s)	Observer
1	Allen	Jeff Prendergast	40	Montgomery	Ed Miller
2	Atchinson/Doniphan	Randy Whiteaker	41	Morris	Brent Konen
3	Barber	Charlie Swank*	42	McPherson/Marion	Brent Theede*
4	Barton	Curran Salter (USDA)	43	Morton	Kraig Schultz
5	Bourbon	Justin Harbit	44	Morton	Kraig Schultz
6	Butler	Jeff Rue	45	Nemaha	Darren Brown
7	Chase	Jim Pitman	46	Neosho	J.R. Glenn
8	Chautauqua	Darin Porter	47	Osage	Clint Bowman
9	Cherokee	David Shanholtzer*	48	Osborne	Victoria Cikanek*
10	Clark	Jon Zuercher	49	Ottawa	Pat Riese
11	Clay	Clint Thornton	50	Pawnee	Charlie Swank
12	Cloud	Pat Riese	51	Pawnee	Tom Bidrowski*
13	Coffey	Bob Culbertson	52	Phillips	Marc Gray
14	Cowley	Kurt Grimm	53	Pottawatomie	Nathan Henry*
15	Crawford	Allen Reed	54	Pratt	Todd Gatton
16	Douglas	Tim Urban*	55	Rawlins	Josh Williams
17	Elk	Rick Tush	56	Reno	Kyle McDonald*
18	Ellis	Dave Dahlgren	57	Rice	Steve Adams
19	Ellsworth	Matt Smith	58	Riley	Corey Alderson
20	Finney/Gray	Jon Heistand*	59	Rush	Jeremy Salter
21	Ford	Aaron Baugh	60	Russell	Dave Dahlgren*
22	Greenwood	Rick Tush	61	Saline	Pat Riese
23	Harvey	Charlie Cope	62	Shawnee	Brad Rueschhoff
24	Hodgeman	Aaron Baugh	63	Sheridan	Matt Bain
25	Hodgeman	Jon Heistand*	64	Smith	Chris Lecuyer
26	Jefferson/Jackson	Randy Whiteaker	65	Stafford	Karl Grover
27	Jewell	Aaron Deters	66	Stanton	Kraig Schultz
29	Kingman	Craig Curtis	67	Sumner	Jeff Rue
30	Kiowa	Charlie Swank	68	Trego	Jason Hawman
31	Leavenworth	Andy Friesen	69	Wabaunsee	Brad Rueschhoff
32	Lincoln	Matt Smith*	70	Washington	Clint Thornton
33	Linn	Karl Karrow	71	Woodson	Jeff Prendergast
34	Lyon	Clint Bowman	72	Hamilton	Daryl Fisher
35	Marshall	James Svaty	73	Grand Osage WA	Rob Riggin
36	McPherson	Brent Theede	74	Wilson WA	Scott Thomasson
37	Meade	Jon Zuercher	75	TuttleCreek WA*	James Svaty
38	Miami	Andy Friesen	76	Clinton WA Deer Creek*	Jason Tarwater
39	Mitchell	Aaron Deters	77	Perry WA*	Justin Anderson
			78	Clinton WA Wakarusa*	Jason Tarwater

*New 2012; only routes sampled in consecutive years were used in analysis

Table 2. Changes in calling Bobwhite males per route (M/R), Kansas, 2012.

Route	2011 M/R	2012 M/R	[a]% Δ	Route	2011 M/R	2012 M/R	[a]% Δ
Flint Hills				Smoky Hills			
06 Butler	2.64	1.73	-34	04 Barton	1.27	1.90	49
07 Chase	0.73	0.82	13	12 Cloud	0.70	2.00	186
08 Chautauqua	2.60	3.60	38	18 Ellis	1.64	3.82	133
11 Clay	2.27	2.45	8	19 Ellsworth	1.55	1.36	-12
14 Cowley	5.64	6.27	11	24 Hodgeman	0.18	0.55	200
17 Elk	2.36	2.20	-7	25 Hodgeman	1.36	1.45	7
22 Greenwood	2.00	3.18	59	27 Jewell	0.64	1.27	100
34 Lyon	0.73	2.00	175	32 Lincoln	1.91	1.78	-7
41 Morris	1.55	2.00	29	36 McPherson	2.67	3.00	13
42 McPherson_Marion	1.18	3.27	177	39 Mitchell	0.64	1.38	116
53 Pottawatomie	2.09	1.36	-35	48 Osborne	0.91	1.18	30
58 Riley	2.82	3.00	6	49 Ottawa	1.10	3.00	173
69 Wabaunsee	0.55	1.82	233	52 Phillips	1.82	2.18	20
Tuttle Cr WA	NA	2.36	NA	57 Rice	3.00	2.10	-30
Region	**2.09**	**2.59**	**24**	59 Rush	0.60	1.43	138
Glaciated Plains				60 Russell	1.00	4.27	327
02 Atchison_Doniphan	0.18	0.27	50	61 Saline	1.73	4.25	146
16 Douglas	1.80	2.36	31	64 Smith	1.64	0.82	-50
26 Jefferson_Jackson	1.36	2.55	87	68 Trego	1.09	2.91	167
31 Leavenworth	0.18	1.75	863	70 Washington	1.64	2.09	28
35 Marshall	0.64	2.09	229	74_WilsonWA	1.27	2.82	121
45 Nemaha	1.73	2.50	45	**Region**	**1.35**	**2.17**	**61***
62 Shawnee	2.33	2.75	18	South-Central Prairies			
Clinton WA Deer Creek	NA	0.33	NA	03 Barber	3.64	1.82	-50
Clinton WA Wakarusa	NA	0.50	NA	10 Clark	1.64	0.18	-89
Perry WA	NA	3.27	NA	23 Harvey	1.18	1.78	50
Region	**1.17**	**1.84**	**60***	29 Kingman	6.45	2.10	-67
Osage Cuestas				30 Kiowa	2.27	2.64	16
01 Allen	2.18	1.27	-42	50 Pawnee	2.27	3.27	44
05 Bourbon	0.90	0.75	-17	51 Pawnee	3.90	1.73	-56
09 Cherokee	0.36	0.45	25	54 Pratt	4.45	1.86	-58
13 Coffey	2.00	2.45	23	56 Reno	3.82	3.55	-7
15 Crawford	2.18	2.10	-4	65 Stafford	1.55	2.09	35
33 Linn	0.55	0.64	17	67 Sumner	4.27	2.36	-45
38 Miami	1.27	1.73	36	**Region**	**3.12**	**2.10**	**-33***
40 Montgomery	2.10	2.45	17	Southern High Plains			
46 Neosho	1.50	1.00	-33	20 Finney	0.20	0.73	264
47 Osage	1.09	2.27	108	21 Ford	0.80	0.44	-44
71 Woodson	1.64	1.91	17	37 Meade	0.45	0.67	47
72 Grand Osage WA	1.00	0.00	NA	43 Morton	0.36	1.45	300
Region	**1.31**	**1.44**	**10**	44 Morton	1.00	1.18	18
Northern High Plains				66 Stanton	0.00	0.09	NA
55 Rawlins	0.00	0.00	NA	73_Hamilton	0.00	0.25	NA
63 Sheridan	1.55	0.36	-76	**Region**	**0.40**	**0.69**	**71**
Region	**0.77**	**0.18**	**-76**	**STATEWIDE**	**1.65**	**1.89**	**15**

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

[a] % Δ = percent change

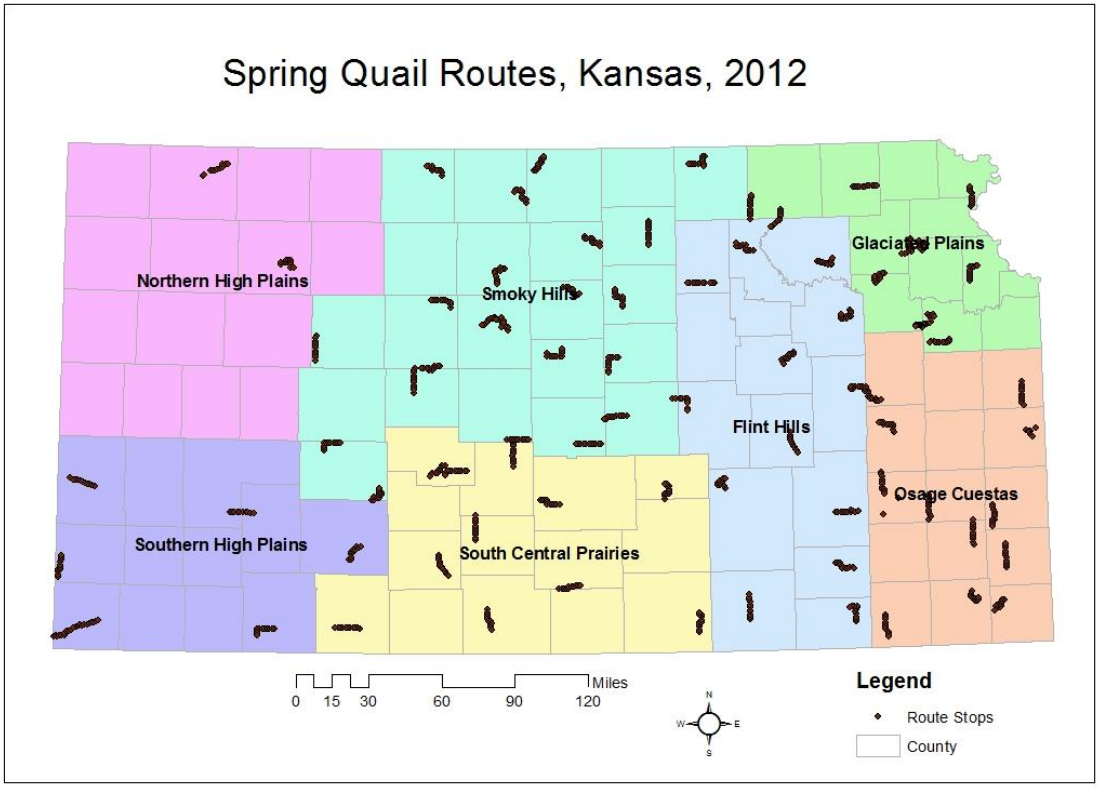
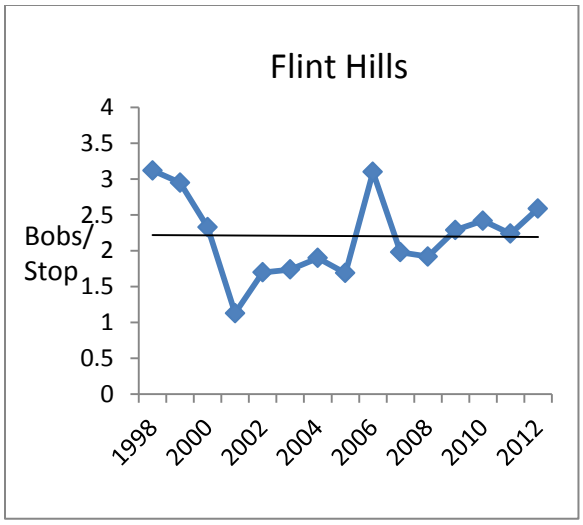
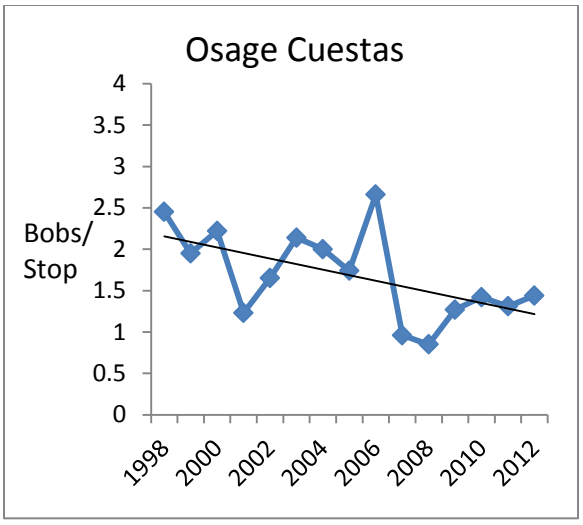
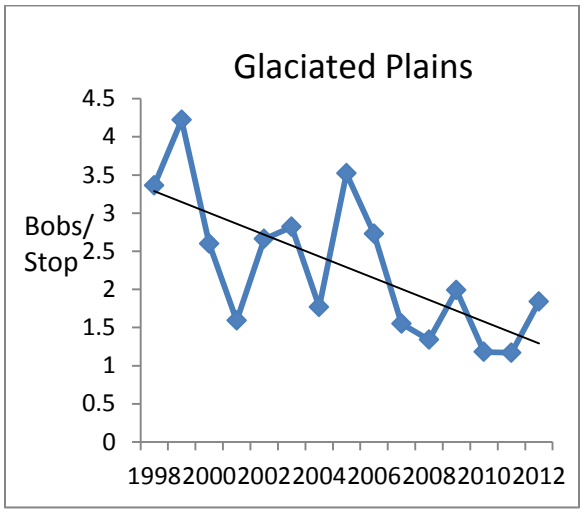
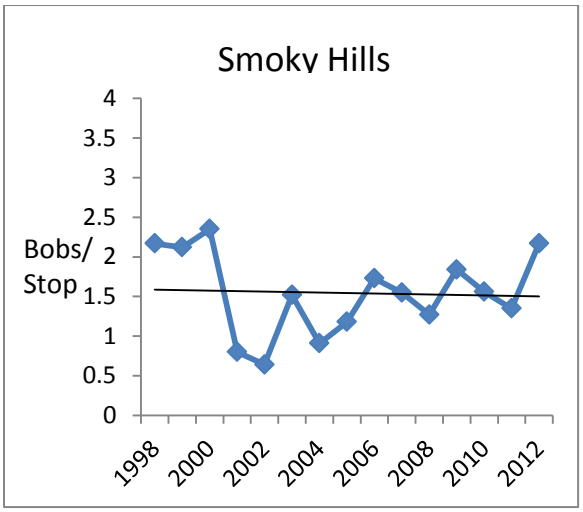


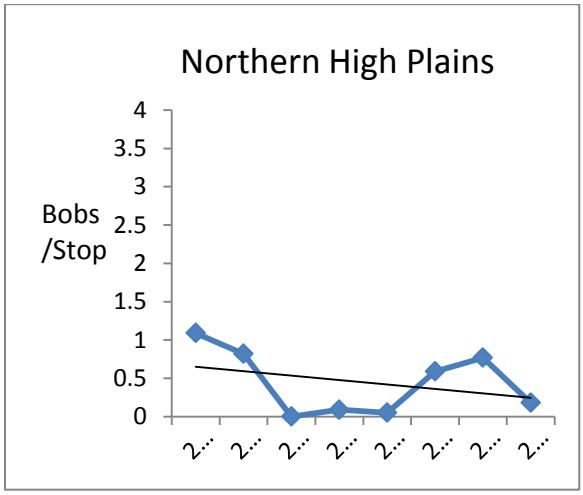
Figure 1. Small Game survey regions in Kansas.

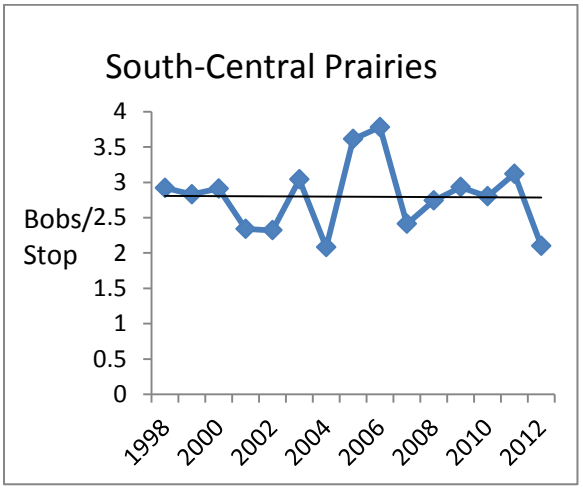

Flint Hills
Bobs/ Stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
2000
2002
2004
2006
2008
2010
2012


Osage Cuestas
Bobs/ Stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
2000
2002
2004
2006
2008
2010
2012


Glaciated Plains
Bobs/ Stop
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
2000
2002
2004
2006
2008
2010
2012


Smoky Hills
Bobs/ Stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
2000
2002
2004
2006
2008
2010
2012


Northern High Plains
Bobs /Stop
4
3.5
3
2.5
2
1.5
1
0.5
0


South-Central Prairies
Bobs/ Stop
4
3.5
3
2.5
2
1.5
1
0.5
0
1998
2000
2002
2004
2006
2008
2010
2012

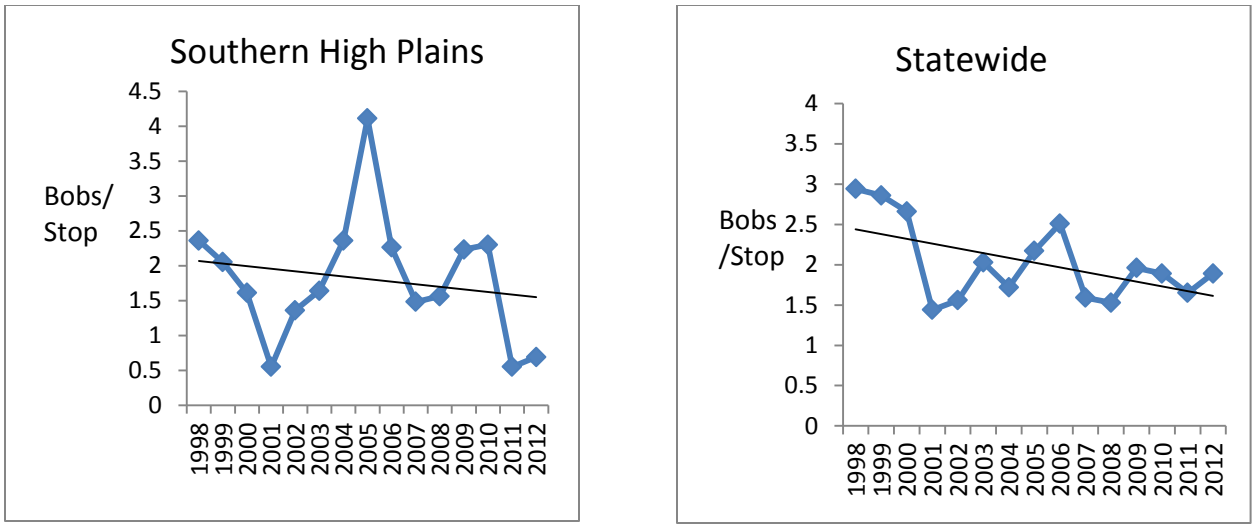


Figure 2. Mean number of northern bobwhites heard per survey stop within Kansas' 7 management regions and statewide, 1998-2012. These data can only be used to approximate long-term trends because the same set of routes was not surveyed in every year.

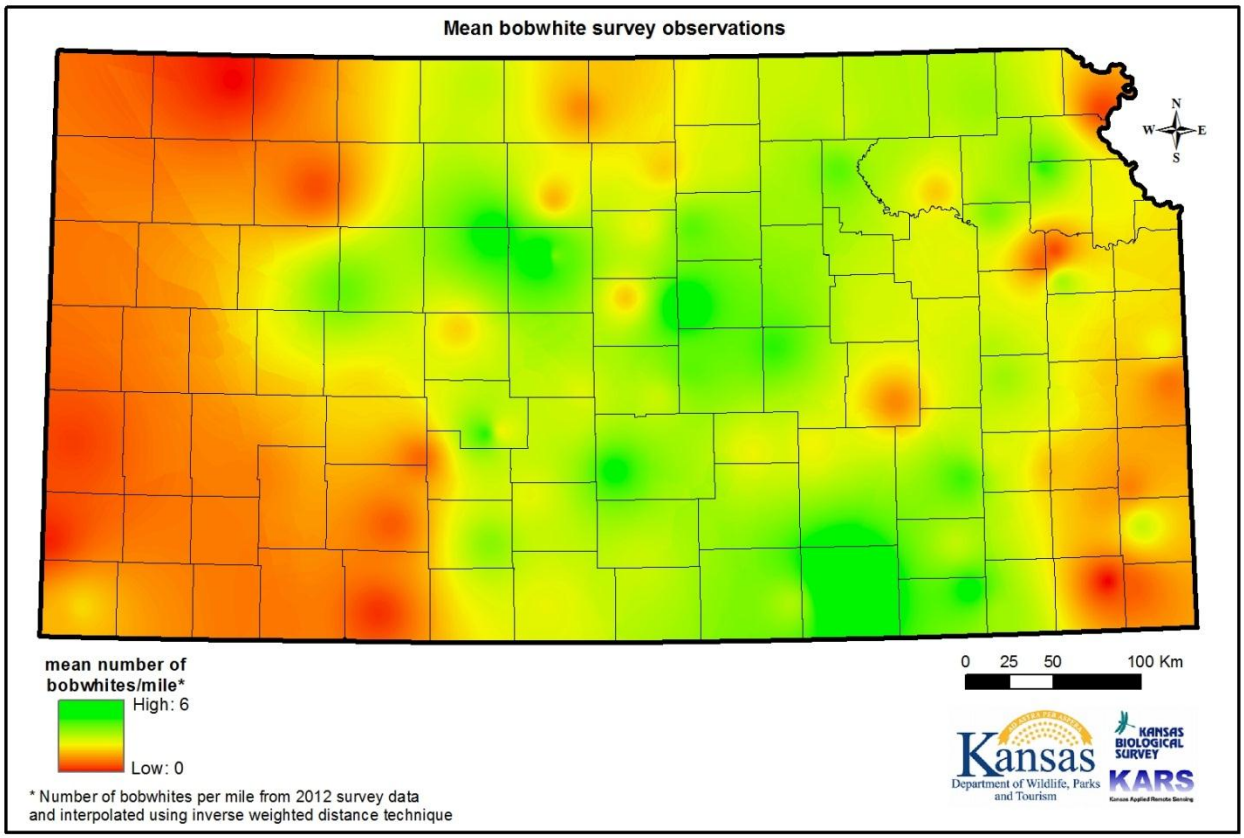


Figure 3. Bobwhite quail breeding population index interpolated from route-specific indices across Kansas, 2012.