PHEASANT CROWING SURVEY - 2017

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KANSAS PHEASANT CROWING SURVEY – 2017
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INTRODUCTION

The Kansas Department of Wildlife, Parks, and Tourism (KDWPT) collects breeding population data for pheasant (*Phasianus colchicus*) by conducting crow counts throughout the pheasant range in the state. Measurable wild pheasant populations do not occur in south-east Kansas (Osage Cuestas Region). Pheasants are an extremely important wildlife resource for Kansas, and these indices help monitor population change through time.

METHODS

The survey period was from April 25 through May 15, 2017. Pheasant routes are ~20 mile transects, with at least 2 miles between each of the 11 stops. At stops, observers listen for 2 minutes and count all the audible 2-note (syllable) crows heard from male pheasants. The Pheasant Crow Survey Index (PCSI) is the mean number of crows per 2-minute stop for each route. The first stop begins 45 minutes before sunrise and continues through the last stop. Noise interference is taken into consideration, and data are censored if the observer feels noise is severely inhibiting their ability to count crows.

The results of the 2017 survey and comparisons to the 2016 data are presented in Table 1. Of the 65 established routes, 63 were assigned for 2017 (routes in Osage and Coffey counties are run only in even-numbered years), and 61 were successfully completed. Due to heavy rainfall throughout the initial survey period a one week extension was granted to allow for further data collection and 7 routes were surveyed during this time. Personnel assigned to these surveys are noted in Table 2. Range wide and regional trends since the survey's 1997 initiation are shown in Figure 1. Location of routes within the state are shown in Figure 2.

Data Analysis
Given that samples are taken on permanently established routes, samples are not independent and thus a paired-sample t-test is used to draw inter-annual comparisons. A two-tailed test with an alpha level 0.10 was used to identify statistically significant differences between years at regional and statewide scales. Routes that do not have consistent observers are removed from analysis of inter-annual comparisons to remove observer bias in analysis.

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 PCSI to the centroid of each route. All sampled routes were used to extrapolate data throughout Kansas' pheasant range (Figure 3). For comparison, the interpolated percent change of the PCSI from 2016 to 2017 is also included where observers are consistent (Figure 4).

RESULTS

Range-wide
The 2017 PCSI was 15.02 crows per stop across all 61 surveyed routes. Among the 53 comparable routes (sampled both years by same observer), there was an increase ($P \leq 0.001$) in the statewide mean from 2016 (29%). The PCSI increased or remained the same on 37 of the comparable routes and decreased on the remaining 16 routes relative to 2016 (Table 1).

Osage Cuestas: Only sampled in even years. **Flint Hills:** All 7 routes were completed. The regional PCSI was 2.86, indicating no significant change from 2016 ($P = 0.18$). **Glaciated Plains:** All 6 routes

were completed. The regional PCSI was 0.82, indicating no significant change from 2016 ($P = 0.69$). **Northern High Plains:** All 12 routes were completed. The regional PCSI was 19.52, indicating no significant change from 2016 ($P = 0.56$). **Smoky Hills:** All 20 routes were completed, the regional PCSI was 17.36 indicating a statistically significant increase of 55% from 2016 ($P \leq 0.001$). **Southern High Plains:** Six of the 7 survey routes were completed in this region. The regional PCSI was 36.72, indicating no significant change from 2016 ($P = 0.26$). **South-Central Prairies:** 10 of the 11 routes were completed this year. The regional PCSI was 14.44 indicating no significant change from 2016 ($P = 0.19$).

DISCUSSION

The spring pheasant survey results can represent two important life stages for pheasant populations. Spring surveys can indicate over-winter survival for a population. During extended harsh conditions, winter can be a bottleneck for some upland game populations. However, unlike states in the northern portion of the pheasant range, Kansas rarely has winter weather that is extreme enough to have significant impacts on survival. When overwinter survival is high, spring surveys also reflect the previous breeding season success (i.e., production) for the population. Spring crow counts usually do not predict fall populations well, but rather indicate breeding population potential.

The winter of 2016-2017 was relatively mild in Kansas and was unlikely to have any significant impact on the population. In 2016, spring initially started off dry but precipitation improved through April and May greatly improving nesting conditions throughout much of the pheasant range of western Kansas. The improved precipitation was adequate throughout the season to create favorable conditions for nesting and brooding hens, without being heavy enough to be detrimental chick survival. As a result, reproductive success was improved again last year. This success has been reflected in a statistically significant PCSI increase over parts of the central portion of the state in 2017 (Figure 4). The majority of the areas surveyed in the eastern half of the state witnessed an apparent decrease, although statistically insignificant, which often follows average and above average rainfall in these regions as it reaches levels that reduce chick survival. Among the comparable routes there was a statewide increase of 27% for the 2017 PCSI (Figure 1).

The spring PCSI in Kansas went from the highest recorded value in 2011, through a precipitous decline into 2014. Extreme drought plagued the primary KS pheasant range during this time, causing severe population declines. Since 2014, drought conditions improved giving way to our current wet conditions. With these improved conditions the reproductive output of the Kansas pheasant population has increased, as indicated by PCSI, in 3 consecutive years. This has returned the 2017 statewide PCSI above the pre-drought average. Optimal breeding conditions for pheasants are near average precipitation and temperatures, while extreme climatic events such as flooding, hail, or drought generally cause declines. The early May snowstorm observed in western Kansas and heavy spring rainfall may impact nesting and brood success this year, however during wet cycles pheasants increase renesting attempts and tend to be more successful in producing broods from these attempts. In good conditions, renesting efforts can mitigate losses due to early unfavorable environmental conditions. Managing for quality habitat, such as properly managed Conservation Reserve Program (CRP) tracts and pheasant-friendly agriculture practices, are the best tool that wildlife managers and wildlife enthusiasts have for sustaining and improving long-term populations despite environmental variability.

Kansas pheasant populations continues to thrive across the primary range. As weather has improved, pheasant populations have demonstrated their ability to recover quickly, with indices on many routes increasing > 100% in a single year (Table 1) and several regions reaching near record highs from record lows merely 3 years ago. Spring rains have created excellent nesting cover and should produce good brood habitat across the primary pheasant range in 2017, but conditions from late-June through August will dictate survival. Fall pheasant populations are highly dependent on production and survival of young of the year. Brood survey data will be collected in late July and August, and summarized in early September. Fall population estimates will be much more accurate once this data is available.

Table 1. Regional changes in pheasant crow counts in Kansas from 2016 to 2017.

Flint Hills

Route	2016 C/S	2017 C/S	% Δ
Butler-Marion	1.45	0.78	-47
Cowley-Sumner	5.55	4.73	-15
Dickinson-Clay	7.55	7.82	4
McPherson-Marion	5.82	2.73	-53
Morris	0.60	1.00	67
Riley	3.55	3.00	-15
Wabaunsee	0.18	0.00	-100
Region Mean	**3.53**	**2.86**	**-19**

Glaciated Plains

Route	2016 C/S	2017 C/S	% Δ
Brown-Nemaha	1.09	0.27	-75
Jackson-Jefferson	0.73	0.44	-39
Marshall**	2.20	1.20	-45
Perry WA	3.00	2.00	-33
Shawnee	0.10	0.50	400
Tuttle Creek WA	0.36	1.73	375
Region Mean	**1.06**	**0.83**	**-22**

Northern High Plains

Route	2016 C/S	2017 C/S	% Δ
Cheyenne**	23.08	16.18	-30
Decatur	20.50	22.42	9
Gove SW**	5.90	4.10	-31
Graham	21.36	22.36	5
Logan SE	5.55	6.73	21
Norton	22.00	21.45	-2
Rawlins-Thomas**	20.18	9.09	-55
Scott	19.30	46.20	139
Sheridan**	4.00	10.00	150
Sherman**	17.09	11.50	-33
Thomas	23.36	13.36	-43
Wichita-Greeley**	6.70	19.91	197
Region Mean	**16.85**	**19.52**	**16**

Southern High Plains

Route	2016 C/S	2017 C/S	% Δ
Finney	45.64	61.18	34
Ford	33.00	38.33	16
Gray	18.30	NA	NA
Kearny-Hamilton	12.91	12.82	-1
Morton-Stanton	1.45	3.64	150
Seward-Haskell**	31.18	46.78	50
Stevens	66.50	57.56	-13
Region Mean	**31.78**	**36.72**	**16**

Smoky Hills

Route	2016 C/S	2017 C/S	% Δ
Barton	13.64	16.27	19
Cloud	1.09	7.00	542
Ellis	12.00	20.73	73
Ellsworth	4.90	6.82	39
Hodgeman	13.20	19.64	49
Lincoln	19.82	28.00	41
McPherson	6.64	4.64	-30
Mitchell	12.30	16.27	32
Ness-Lane	6.27	15.73	151
Osborne	17.45	22.55	29
Ottawa**	11.45	11.38	-1
Phillips	5.00	5.18	4
Republic	15.55	18.90	22
Rice	7.09	15.18	114
Rooks	10.36	23.18	124
Rush	27.00	37.09	37
Smith	16.00	18.91	18
Trego	10.27	37.73	267
Washington	3.73	3.82	2
Wilson WA	10.18	12.18	20
Region Mean	**11.18**	**17.36**	**55***

South-Central Prairies

Route	2016 C/S	2017 C/S	% Δ
Clark	8.73	2.57	-71
Comanche	1.27	NA	NA
Edwards	8.36	13.55	62
Harper	9.80	6.36	-35
Kingman-Reno	5.36	6.64	24
Pawnee	9.80	19.18	96
Pawnee (Irrig.)	27.18	40.30	48
Pratt	10.45	14.55	39
Reno	17.82	13.82	-22
Sedgwick-Harvey	1.78	0.64	-64
Stafford-Barton	14.45	26.80	85
Region Mean	**11.37**	**14.44**	**27**

Statewide	**12.31**	**15.84**	**29***

*Note: C/S = Mean Crows per Station; % Δ = percent change; * = significant change (P ≤ 0.10)*

**Route not included in regional or state means, info. is presented for descriptive purposes only
Osage Cuestas region is only surveyed biennially thus info is excluded from inter-annual comparison

Table 2. Pheasant crow survey routes and observers in Kansas, 2017.

Route	Observer	Route	Observer
Barton	Gene Schneweis	Norton	Luke Winge
Brown-Nemaha	Tyler Warner	*Osage***	*Matt Peek*
Butler-Marion	Charles Cope	Osborne	Toby Marlier
Cheyenne	Abigal Athen~	Ottawa	Brian Serpan~
Clark	Jon Zuercher	Pawnee	Charlie Swank
Cloud	Luke Kramer	Pawnee (Irrig)	Tom Bidrowski
*Coffey***	*Alex Lyon*	Perry WA	Andrew Page
Comanche	Matt Hanvey	Phillips	Mark Shaw
Cowley-Sumner	Kurt Grimm	Pratt	Charlie Swank
Decatur	Daniel Howard	Rawlins-Thomas	Kevin Klag~
Dickinson-Clay	Clint Thornton	Reno	Kyle McDonald
Edwards	Charlie Swank	Republic	Rob Unruh
Ellis	Mike Nyhoff	Rice	Steve Adams
Ellsworth	James Svaty	Riley	Corey Alderson
Finney	Kurtis Meier	Rooks	Michael Zajic
Ford	Aaron Baugh	Rush	Jason Wagner
Gove SW	Lynn Davignon	Scott	Abe Lollar
Graham	Eric Wiens	Sedgwick-Harvey	Charles Cope
Gray	Manuel Torres	Seward-Haskell	Abe Lollar~
Harper	Craig Curtis	Shawnee	Brad Rueschhoff
Hodgeman	Aaron Baugh	Sheridan	Abigal Athen~
Jackson-Jefferson	Tyler Warner	Sherman	Abigal Athen~
Kearny-Hamilton	Kurtis Meier	Smith	Luke Kramer
Kingman-Reno	Kyle McDonald	Stafford-Barton	Charlie Swank
Lincoln	James Svaty	Stevens	Kraig Schultz
Logan SE	Randy Rodgers	Thomas	Kevin Klag
Marshall	Megan Smith~	Trego	Kent Hensley
McPherson	Jason Black	Tuttle Creek WA	Nathan Henry
McPherson-Marion	Jeff Rue	Wabaunsee	Brad Rueschhoff
Mitchell	Chris Lecuyer	Washington	Megan Smith
Morris	Brent Konen	Wichita-Greeley	Abe Lollar~
Morton-Stanton	Kraig Schultz	Wilson WA	Scott Thommason
Ness-Lane	Randy Rodgers		

Note: ~ new observer for route; Osage and Coffey only run on even years

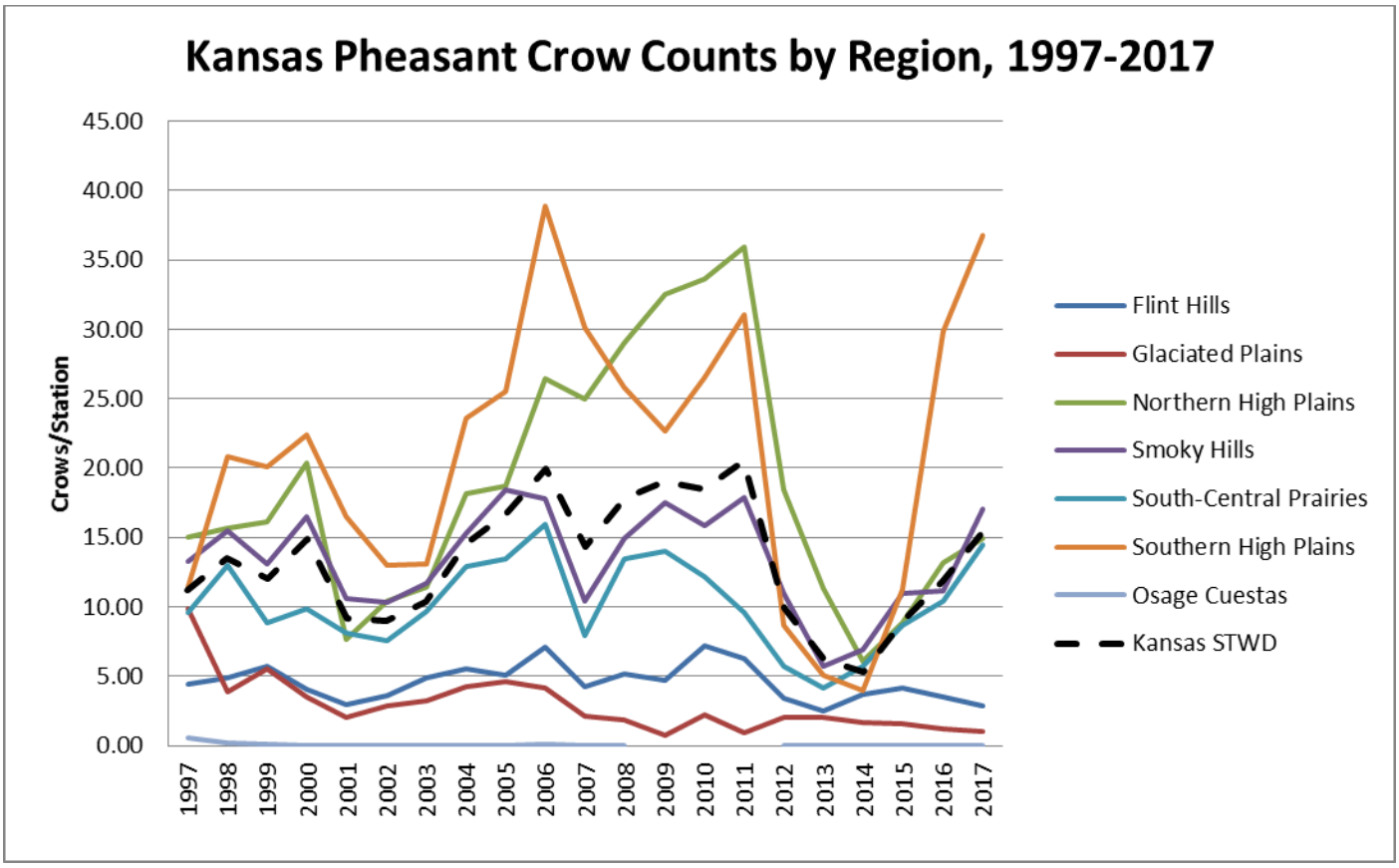

Figure 1. Regional trends for pheasant crow survey index in Kansas, 1997-2017.

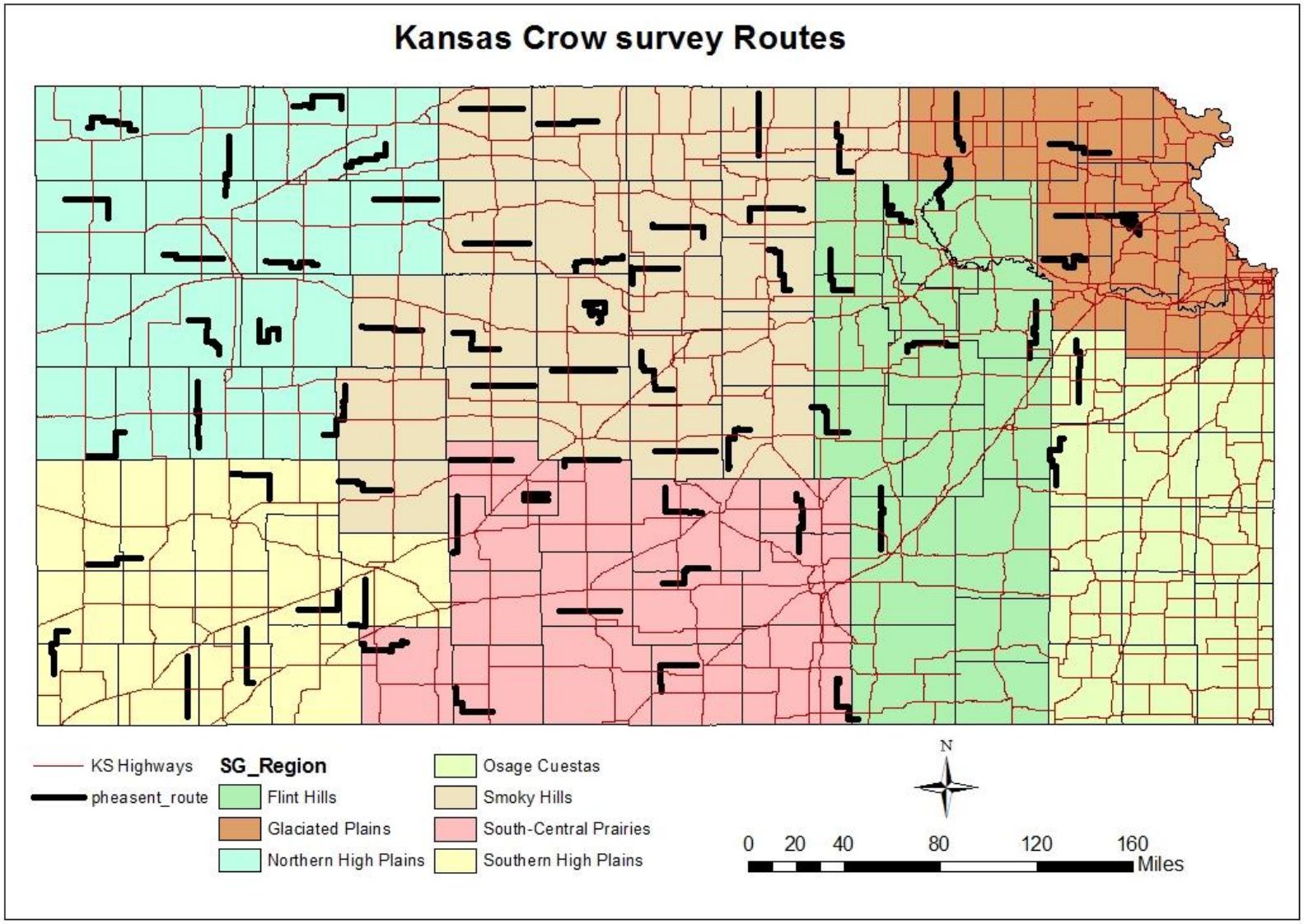

Figure 2. Current pheasant crow survey routes and management region boundaries.

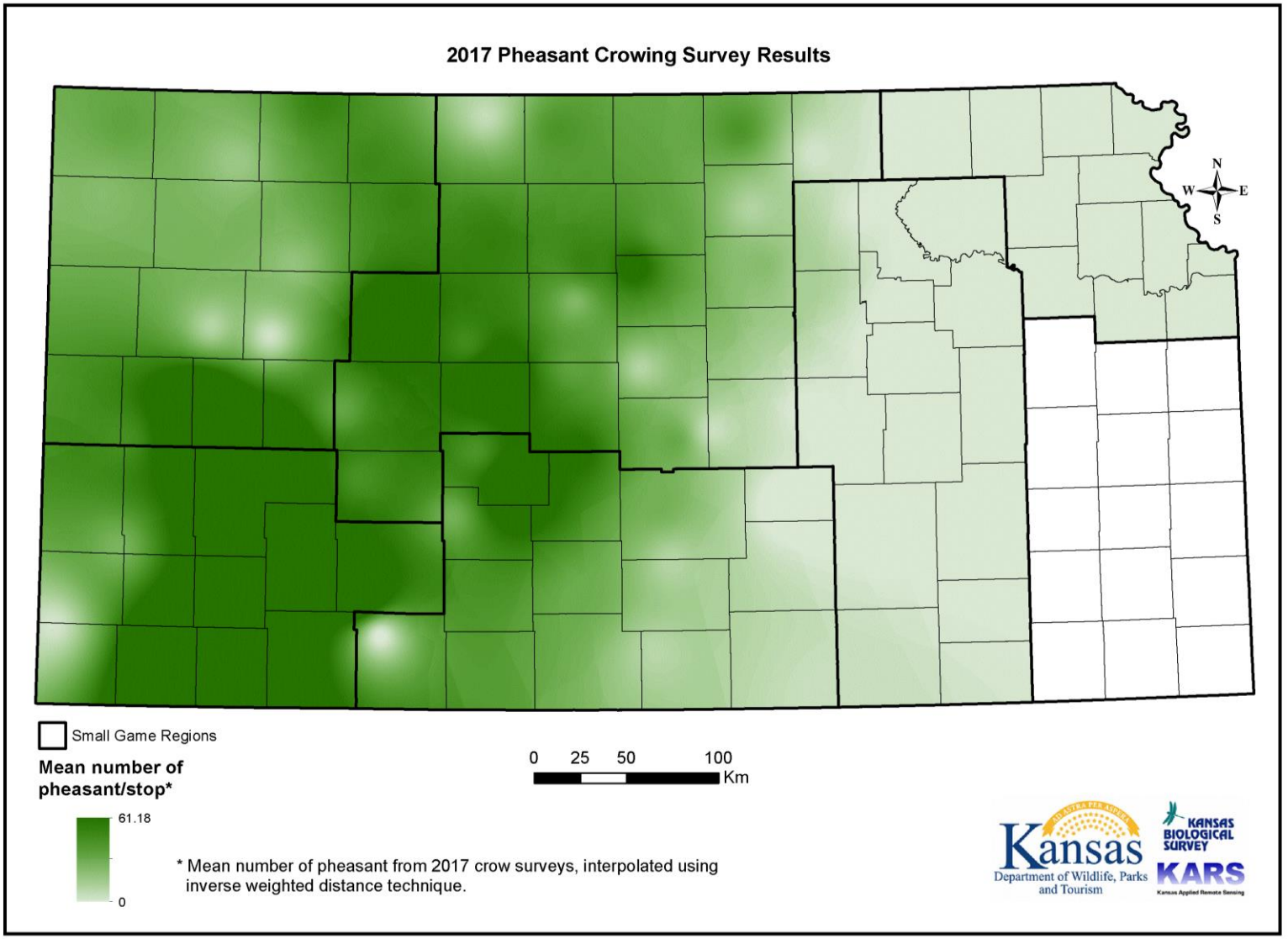

Figure 3. Pheasant breeding population index (crows per station) interpolated from route-specific indices across pheasant range in Kansas, using Inverse Distance Weighting technique, 2017.

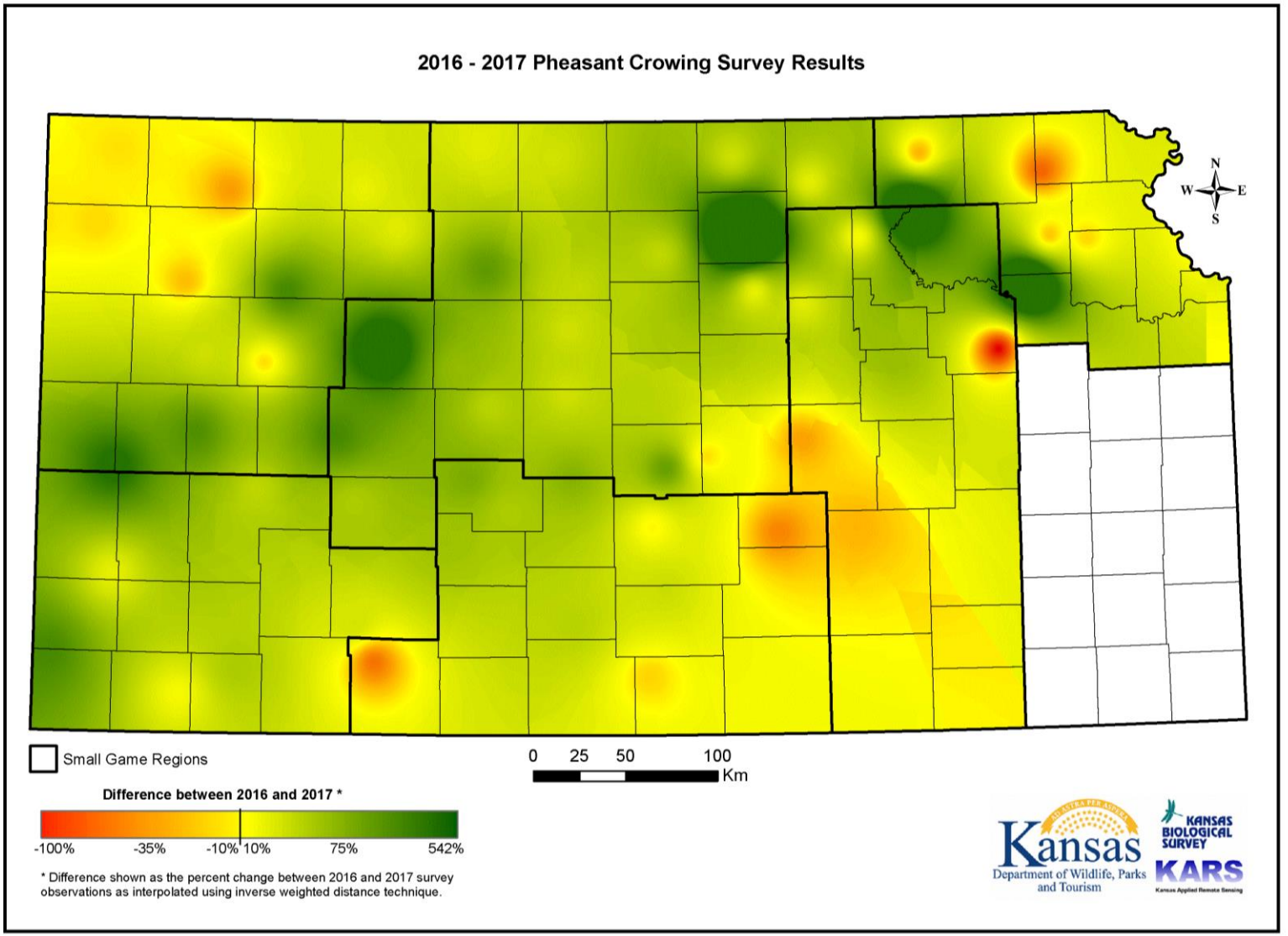

Figure 4. Percent change (2016 to 2017) in pheasant breeding index (crows per station) interpolated across pheasant range in Kansas.