PHEASANT CROWING SURVEY - 2018

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Kansas Department of Wildlife, Parks, & Tourism

Robin Jennison
Secretary

Keith Sexson

Assistant Secretary Wildlife, Fisheries, and Boating

Jake George

Wildlife Division Director

Prepared by:

Jeff Prendergast
Small Game Specialist

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KANSAS PHEASANT CROWING SURVEY – 2018
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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, 2018. 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 2018 survey and comparisons to the 2017 data are presented in Table 1. All 65 established routes were assigned for 2018 (routes in Osage and Coffey counties are run only in even-numbered years), and 65 were successfully completed. A one-week extension was to allow for further data collection and 5 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 the previous year's survey is also included where observers are consistent (Figure 4).

RESULTS

Range-wide
The 2018 PCSI was 12.45 crows per stop across all 65 surveyed routes. Among the 58 comparable routes (sampled both years by same observer), there was a decrease ($P \leq 0.014$) in the statewide mean from 2017 (-21%). The PCSI increased or remained the same on 28 of the comparable routes and decreased on the remaining 30 routes relative to 2017 (Table 1).

Osage Cuestas: Both routes were completed. No crows were detected on either route. **Flint Hills:** All 7 routes were completed. The regional PCSI was 2.94, indicating no significant change from 2017 (P = 0.89). **Glaciated Plains:** All 6 routes were completed. The regional PCSI was 0.59, indicating significant

decrease of -42% from 2017 (P = 0.07). **Northern High Plains:** All 12 routes were completed. The regional PCSI was 16.82, indicating no significant change from 2017 (P =0.95). **Smoky Hills:** All 20 routes were completed, the regional PCSI was 15.13 indicating no significant change from 2017 (P =0.16). **Southern High Plains:** All 7 survey routes were completed in this region. The regional PCSI was 15.97, indicating a significant decrease of -54% from 2017 (P = 0.09). **South-Central Prairies:** All 11 routes were completed this year. The regional PCSI was 9.96 indicating no significant change from 2017 (P = 0.14).

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 2017-2018 was relatively mild in Kansas and was unlikely to have had any significant impact on the population. There was little snowfall in winter of 2016-2017, so last spring initially started off dry. This quickly changed as heavy rains through March and April across the state primed habitat and provided much promise about potential production last year. However, a late blizzard event occurred on April 30th-May 1st 2017 during peak laying activity across a large portion of western Kansas that accumulated as much as 24 inches of snowfall. While the snow melted quickly and had little impact on adult survival, there were undoubtedly large nest losses during this event. Following this blizzard, heavy rains continued throughout much of May and June during the peak hatching period reducing both nest success and chick survival. The precipitation did create favorable conditions for brooding hens, for those hens that were successful at hatching chicks. As a result, reproductive success reduced last year but populations were able to remain relatively stable in most regions. The impacts of these events were most evident in SW Kansas where crow surveys had achieved near record levels for this survey in 2017 but dropped by over 50% after the effects of the snowstorm (Figure 4). Despite the 21% decline in the state-wide pheasant crow index the 2018 survey was only slightly below the long-term average of 13.26 crows/stop (-6%; 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.

In general pheasant production is optimized in Kansas during near average rainfall years, with wet years reducing survival of young and dry years reducing food and cover available for production. 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. From 2014-2016, drought conditions improved giving way to improved habitat conditions. With these improved conditions the reproductive output of the Kansas pheasant population increased, as indicated by increasing PCSI, in 3 consecutive years. With these conditions, the 2017 statewide PCSI reached above the pre-drought average. In 2018 the pheasant range has suffered from limited winter precipitation and early spring rainfall again, which has the potential to limit production this year. However, some periodic rainfall events in late April and early May greatly improved conditions. At this point we don't know if these events were large enough or happened soon enough to sustain production for this year. 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.

Despite fluctuation Kansas pheasant populations remained viable across the primary range. As weather has improved, pheasant populations have demonstrated their ability to recover quickly, with indices returning to near average levels after dramatic declines (Figure 1). Fall pheasant populations are highly dependent on production and survival of young of the year. With habitat conditions this year it difficult to

speculate what production to expect. 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 2017 to 2018.

Flint Hills

Route	2017 C/S	2018 C/S	% Δ
Butler-Marion	0.78	0.91	17
Cowley-Sumner	4.73	7.00	48
Dickinson-Clay	7.82	8.30	6
McPherson-Marion	2.73	2.73	0
Morris	1.00	0.80	-20
Riley	3.00	0.73	-76
Wabaunsee	0.00	0.09	NA
Region Mean	**2.86**	**2.94**	**3**

Glaciated Plains

Route	2017 C/S	2018 C/S	% Δ
Brown-Nemaha	0.27	0.55	100
Jackson-Jefferson	0.44	0.20	-55
Marshall	1.20	1.45	21
Perry WA	2.00	0.80	-60
Shawnee	0.50	0.00	-100
Tuttle Creek WA	1.73	0.55	-68
Region Mean	**1.02**	**0.59**	**-42***

Northern High Plains

Route	2017 C/S	2018 C/S	% Δ
Cheyenne	16.18	19.14	18
Decatur	22.42	29.25	30
Gove SW	4.10	4.22	3
Graham	22.36	26.91	20
Logan SE	6.73	7.20	7
Norton	21.45	21.91	2
Rawlins-Thomas	9.09	14.70	62
Scott	46.20	26.22	-43
Sheridan	10.00	10.00	0
Sherman	11.50	13.91	21
Thomas	13.36	11.55	-14
Wichita-Greeley**	19.91	19.60	-2
Region Mean	**16.67**	**16.82**	**1**

Southern High Plains

Route	2017 C/S	2018 C/S	% Δ
Finney	61.18	31.55	-48
Ford	38.33	7.50	-80
Gray	NA	28.4	N/A
Kearny-Hamilton	12.82	16.09	26
Morton-Stanton	3.64	4.36	20
Seward-Haskell**	46.78	10.56	-77
Stevens	57.56	20.33	-65
Region Mean	**34.71**	**15.97**	**-54***

Smoky Hills

Route	2017 C/S	2018 C/S	% Δ
Barton	16.27	16.27	0
Cloud	7.00	2.90	-59
Ellis	20.73	24.27	17
Ellsworth	6.82	4.10	-40
Hodgeman	19.64	21.40	9
Lincoln	28.00	14.91	-47
McPherson	4.64	6.82	47
Mitchell	16.27	10.67	-34
Ness-Lane**	15.73	31.00	97
Osborne	22.55	11.73	-48
Ottawa	11.38	11.64	2
Phillips	5.18	10.18	96
Republic	18.90	15.30	-19
Rice	15.18	12.45	-18
Rooks	23.18	22.91	-1
Rush	37.09	36.64	-1
Smith	18.91	26.40	40
Trego	37.73	22.18	-41
Washington	3.82	4.30	13
Wilson WA	12.18	12.45	2
Region Mean	**17.13**	**15.13**	**-12**

South-Central Prairies

Route	2017 C/S	2018 C/S	% Δ
Clark	2.57	3.60	40
Comanche	NA	0.73	NA
Edwards	13.55	13.22	-2
Harper	6.36	8.27	30
Kingman-Reno	6.64	5.45	-18
Pawnee	19.18	19.00	-1
Pawnee (Irrig.)	40.30	12.73	-68
Pratt	14.55	5.09	-65
Reno	13.82	9.25	-33
Sedgwick-Harvey	0.64	1.50	136
Stafford-Barton	26.80	21.45	-20
Region Mean	**14.44**	**9.96**	**-31**

Statewide	**14.71**	**11.66**	**-21***

*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, 2018.

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	Jeff Seim~
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	Jeff Seim~
Morton-Stanton	Kraig Schultz	Wilson WA	Scott Thomasson
Ness-Lane	Andy Nelson~		

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

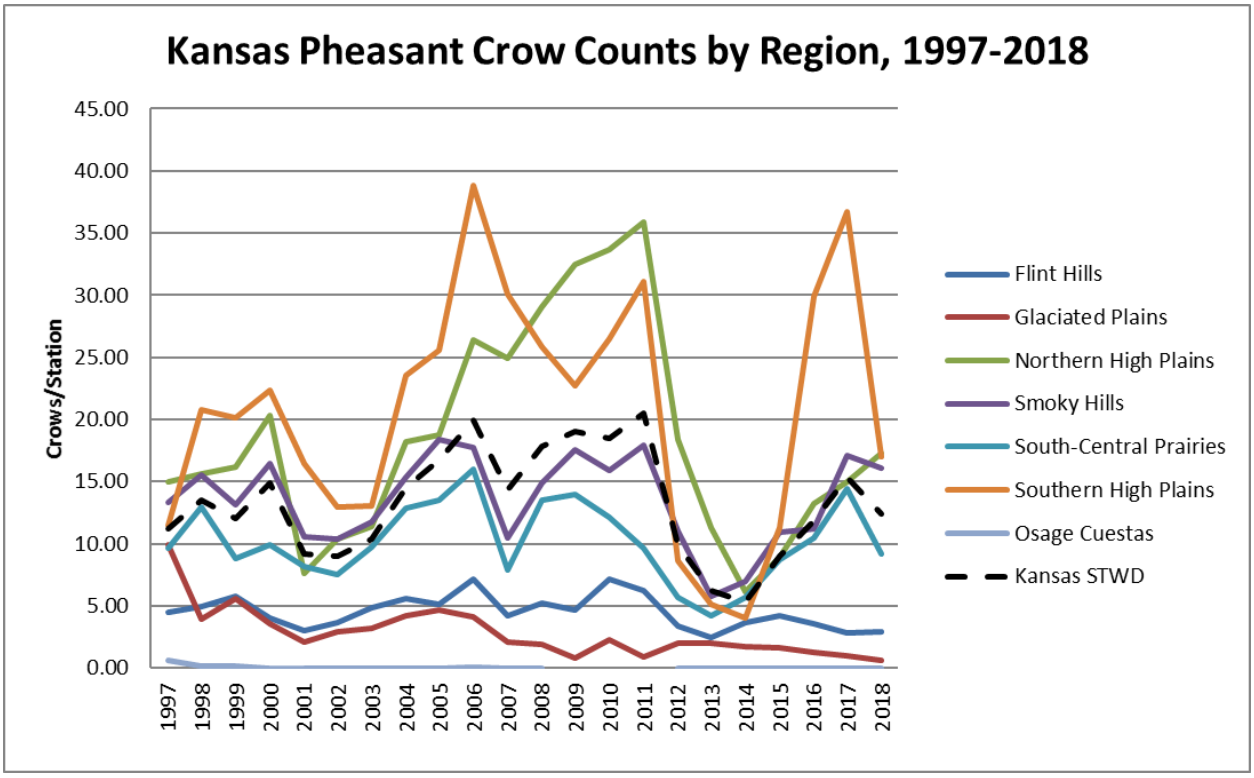

Figure 1. Regional trends for pheasant crow survey index in Kansas, 1997-2018.

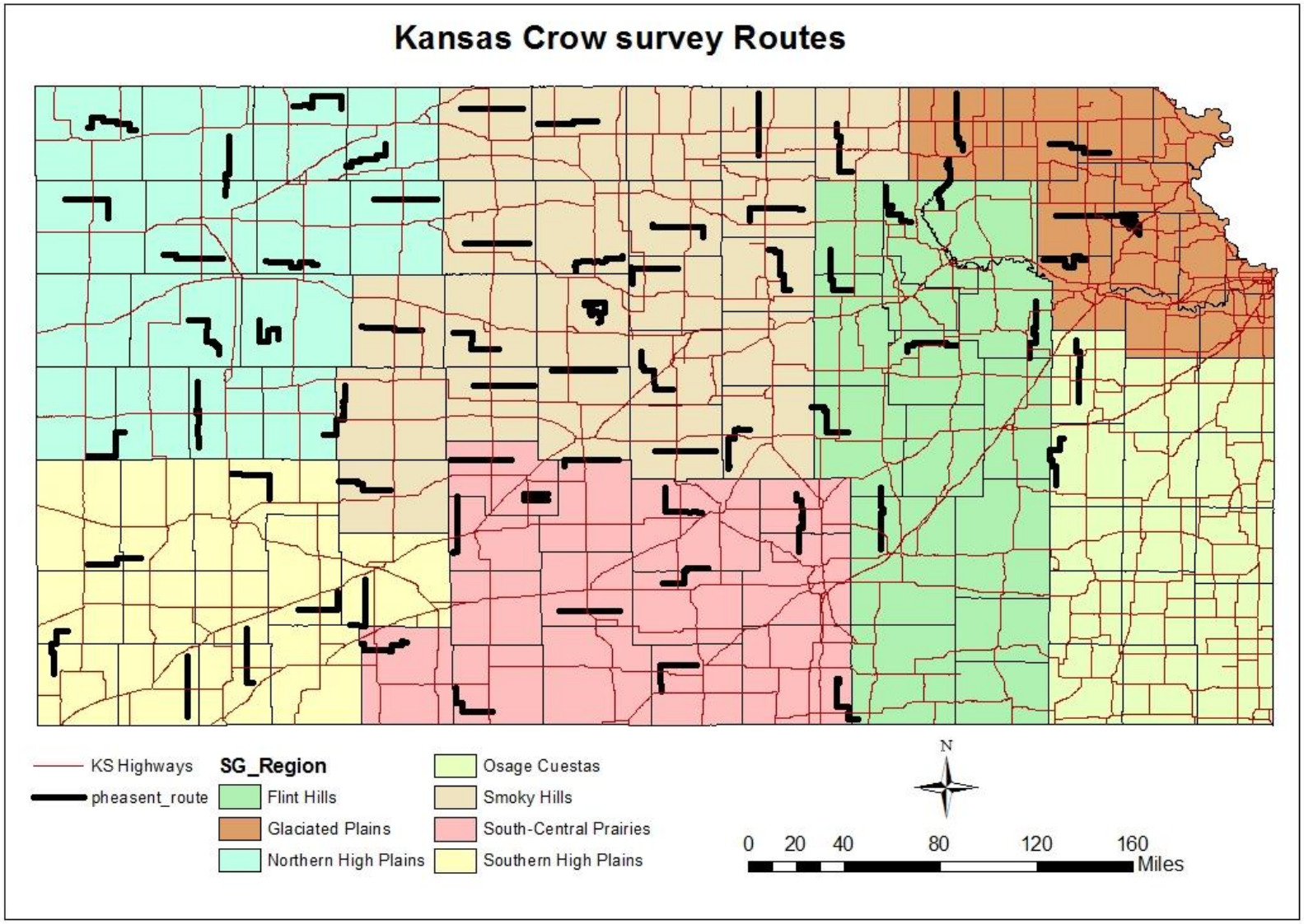

Figure 2. Current pheasant crow survey routes and management region boundaries.

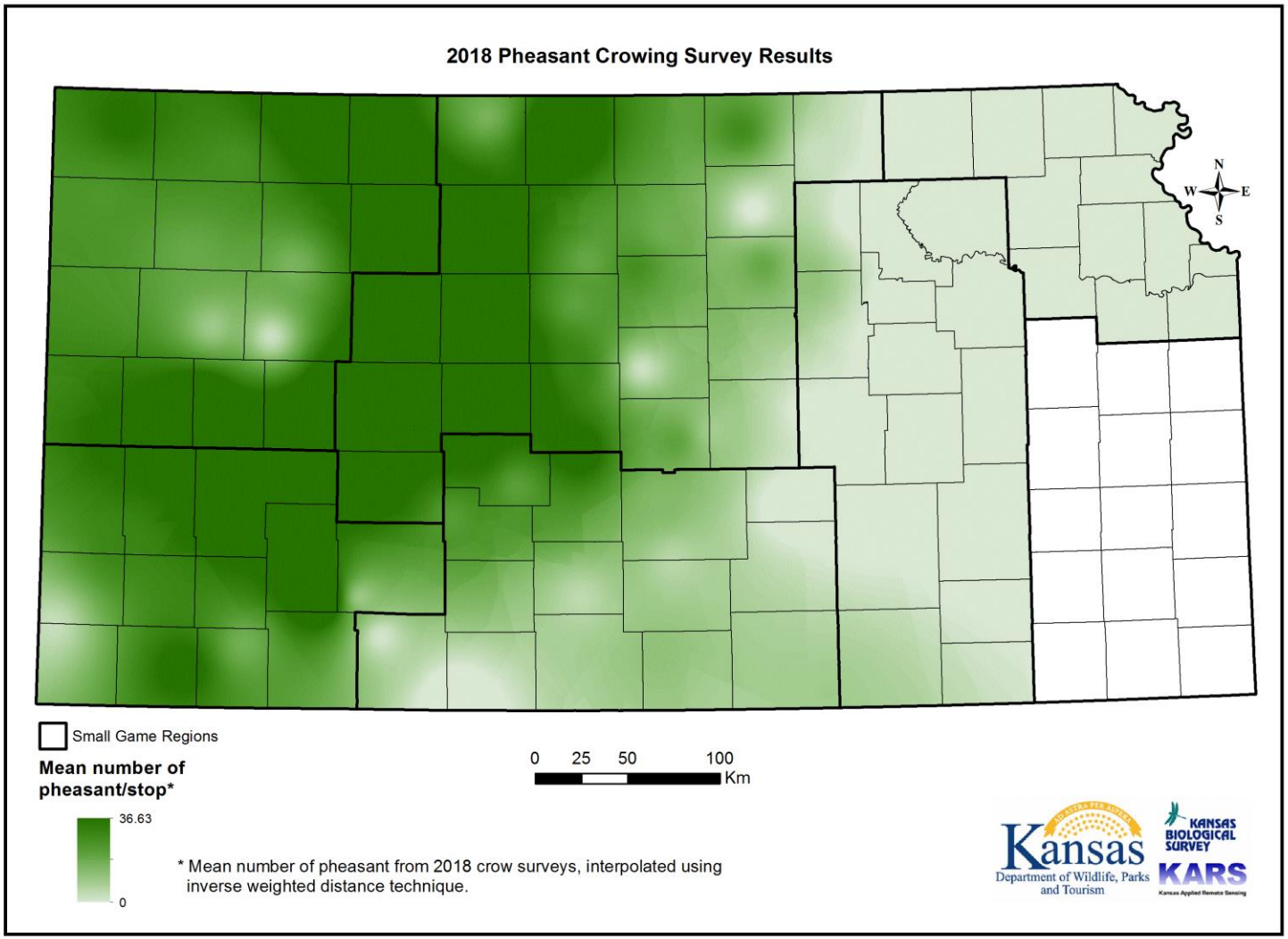

Figure 3. Pheasant breeding population index (crows per station) interpolated from route-specific indices across pheasant range in Kansas, using Inverse Distance Weighting technique, 2018.

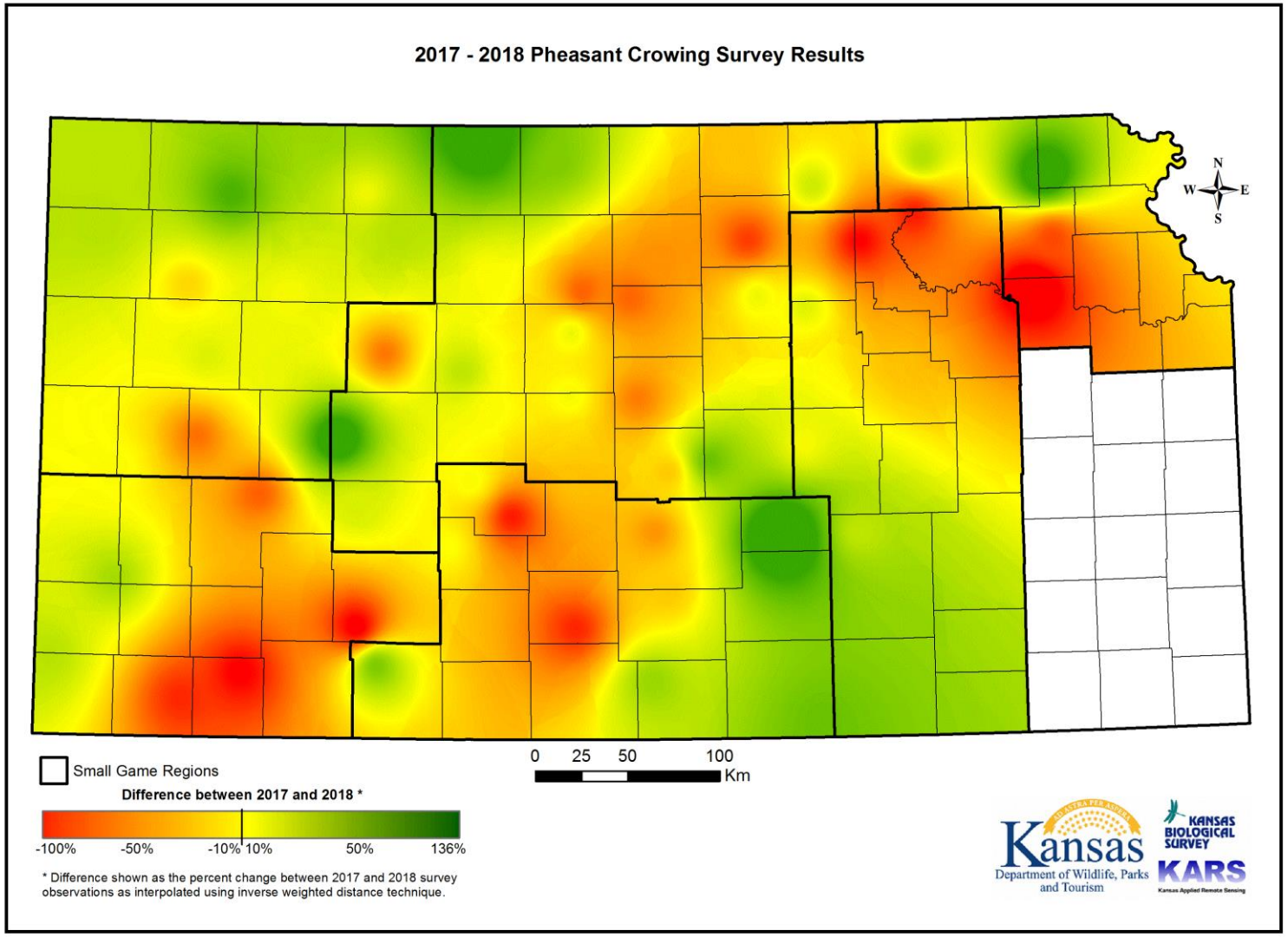

Figure 4. Percent change (2017 to 2018) in pheasant breeding index (crows per station) interpolated across pheasant range in Kansas.