PHEASANT CROWING SURVEY - 2021

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KANSAS PHEASANT CROWING SURVEY – 2021
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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, 2021. 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 2021 survey and comparisons to the 2020 data are presented in Table 1. There were 63 of the 65 established routes assigned for 2021 (routes in Osage and Coffey counties are run only in even-numbered years), and 61 of the 63 were successfully completed. Widespread heavy precipitation impacting roads led to a one-week extension to allow for further data collection and 6 routes were surveyed during this late 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 2021 PCSI was 8.12 crows per stop across all 61 surveyed routes. Among the 53 comparable routes (sampled both years by same observer), there was a significant decrease (P >0.001) in the statewide mean from 2020 (-31%). The PCSI decreased on 43 of the comparable routes and increased on the remaining 10 routes relative to 2020 (Table 1).

Flint Hills: Of the 7 established routes 7 were completed. The regional PCSI was 1.66, indicating no significant change from 2020 (P = 0.13). **Glaciated Plains:** Of the 6 established routes 6 were

completed. The regional PCSI was 0.63, indicating a significant decrease from 2020 ($P = 0.04$). **Northern High Plains:** All 12 of the established routes were completed. The regional PCSI was 13.31, indicating a significant decrease from 2020 ($P = 0.03$). **Smoky Hills:** Of 20 established routes, 19 were completed, the regional PCSI was 10.27,indicating a significant decrease from 2020 ($P > 0.01$). **Southern High Plains:** Of the 7 established survey routes 6 were completed in this region. The regional PCSI was 8.61, indicating a significant decrease from 2020 ($P > 0.01$). **South-Central Prairies:** All 12 routes were completed this year. The regional PCSI was 9.38 indicating no significant change from 2020 ($P = 0.16$).

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.

In 2020 the majority of the state was dry through May. Late Summer rains in 2019 left good residual nesting cover from the previous year, but annual nesting cover (e.g. winter wheat) was lacking due to lack of spring moisture. As June began scattered precipitation began across much of the northern and central portions of the state. Timing of these rains was critical in providing adequate brood cover for chicks that were hatching. However, the scattered nature of these storms lead to a patchwork of habitat and generally poor production across much of the area. In Southwest Kansas Dry conditions held on much longer pushing much of the area into extreme drought conditions and reducing production throughout the region. In addition to the poor habitat conditions, CRP enrollments dropped again after another round of expirations outpaced enrollment. CRP enrollment in the state is now roughly half of what it was at it's peak. As agriculture has continued to intensify this habitat has become more important to maintaining pheasant populations. Losses of this residual nesting cover as CRP transitioned back into cropland or was used as hay further reduces productive potential, particularly when dry springs limits annual nesting cover. All this combined to result in reduced production and fewer pheasants heading into the fall last year. We had a relatively mild winter in Kansas with assumed high overwinter survival but the significant lack of production last year led to a predictable decline in our spring crowing index for 2021 (Table 2). When 2021 began much of the state was in drought conditions and was predicted to stay that way. However, precipitation picked up throughout the spring and has led to excellent nesting conditions.

Despite the recent decline in Kansas pheasant numbers, populations remain 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. While habitat conditions are good this year, weather throughout the spring and summer can impact brood survival and thus it is 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. Pheasant crow survey routes and observers in Kansas, 2021.

Route	Observer	Route	Observer
Barton	Gene Schneweis	Norton	Luke Winge
Brown-Nemaha	Tyler Warner	*Osage***	*Matt Peek*
Butler-Marion	Charles Cope	Osborne	Chris Lecuyer~
Cheyenne	Abigal McGuire	Ottawa	Pat Riese
Clark	Jon Zuercher	Pawnee	Logan Shoup
Cloud	Brandon Tritsch	Pawnee (Irrig)	Tom Bidrowski
*Coffey***	*Alex Lyon*	Perry WA	Andrew Page
Comanche	Matt Hanvey	Phillips	Mark Shaw
Cowley-Sumner	Kurt Grimm	Pratt	Logan Shoup
Decatur	Daniel Howard	Rawlins-Thomas	Kevin Klag
Dickinson-Clay	Clint Thornton	Reno	Keith Murrow~
Edwards	Logan Shoup	Republic	Rob Unruh
Ellis	Mike Nyhoff	Rice	Steve Adams
Ellsworth	James Svaty	Riley	Corey Alderson
Finney	Kurtis Meier	Rooks	Joe Lambert
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	Lazar Kelly
Harper	Jon Beckman	Shawnee	Darin Porter~
Hodgeman	Aaron Baugh	Sheridan	Abigal Athen
Jackson-Jefferson	Tyler Warner	Sherman	Abigal Athen
Kearny-Hamilton	Kurtis Meier	Smith	Brandon Tritsch
Kingman-Reno	Keith Murrow~	Stafford-Barton	Logan Shoup
Lincoln	James Svaty	Stevens	Kraig Schultz
Logan SE	Kevin Klag~	Thomas	Kevin Klag
Marshall	Megan Smith	Trego	Matt Schmidt~
McPherson	Jason Black	Tuttle Creek WA	Nathan Henry
McPherson-Marion	Jeff Rue	Wabaunsee	Darin Porter~
Mitchell	Chris Lecuyer	Washington	Megan Smith
Morris	Brent Konen	Wichita-Greeley	Kevin Luman
Morton-Stanton	Kraig Schultz	Wilson WA	Scott Thomason
Ness-Lane	Andy Nelson		

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

Table 2. Regional changes in pheasant crow counts in Kansas from 2020 to 2021.

Flint Hills

Route	2020 C/S	2021 C/S	% Δ
Butler-Marion	0.73	0.45	-38
Cowley-Sumner	2.73	2.09	-23
Dickinson-Clay	4.33	4.09	-6
McPherson-Marion	1.92	1.80	-6
Morris	0.27	0.55	100
Riley	2.09	1.00	-52
Wabaunsee**	0.00	0.09	NE
Region Mean	**2.01**	**1.66**	**-17**

Glaciated Plains

Route	2020 C/S	2021 C/S	% Δ
Brown-Nemaha	0.73	0.56	-24
Jackson-Jefferson	1.10	0.56	-49
Marshall	1.55	0.60	-61
Perry WA	1.73	0.82	-53
Shawnee**	0.00	0.00	NE
Tuttle Creek WA**	NA	0.80	NA
Region Mean	**1.28**	**0.63**	**-50***

Northern High Plains

Route	2020 C/S	2021 C/S	% Δ
Cheyenne	19.09	7.09	-63
Decatur	21.09	22.36	6
Gove SW	NA	7.60	NA
Graham	23.18	22.00	-5
Logan SE**	5.25	5.18	-1
Norton	32.73	27.27	-17
Rawlins-Thomas	12.64	7.91	-37
Scott	20.58	14.33	-30
Sheridan	11.82	8.64	-27
Sherman	10.64	12.18	15
Thomas	7.91	7.18	-9
Wichita-Greeley	5.82	4.09	-30
Region Mean	**16.55**	**13.31**	**-20***

Southern High Plains

Route	2020 C/S	2021 C/S	% Δ
Finney	32.82	17.09	-48
Ford	28.00	16.30	-42
Gray**	22.92	NA	NA
Kearny-Hamilton	23.73	5.45	-77
Morton-Stanton	7.91	1.55	-80
Seward-Haskell	14.36	3.73	-74
Stevens	13.10	7.55	-42
Region Mean	**19.99**	**8.61**	**-57***

Smoky Hills

Route	2020 C/S	2021 C/S	% Δ
Barton	13.82	9.18	-34
Cloud	0.90	1.30	44
Ellis	24.00	10.45	-56
Ellsworth	4.00	2.80	-30
Hodgeman	28.73	22.64	-21
Lincoln	14.55	8.18	-44
McPherson	5.55	8.82	59
Mitchell	21.25	13.09	-38
Ness-Lane	21.90	19.91	-9
Osborne**	17.18	17.20	0
Ottawa	4.00	4.73	18
Phillips	9.73	6.50	-33
Republic	9.70	NA	NA
Rice	7.55	5.45	-28
Rooks	32.8	17.09	-48
Rush	25.36	20.45	-19
Smith	21.36	12.09	-43
Trego**	28.00	9.09	-68
Washington	2.00	1.00	-50
Wilson WA	3.82	4.00	5
Region Mean	**14.19**	**9.86**	**-31***

South-Central Prairies

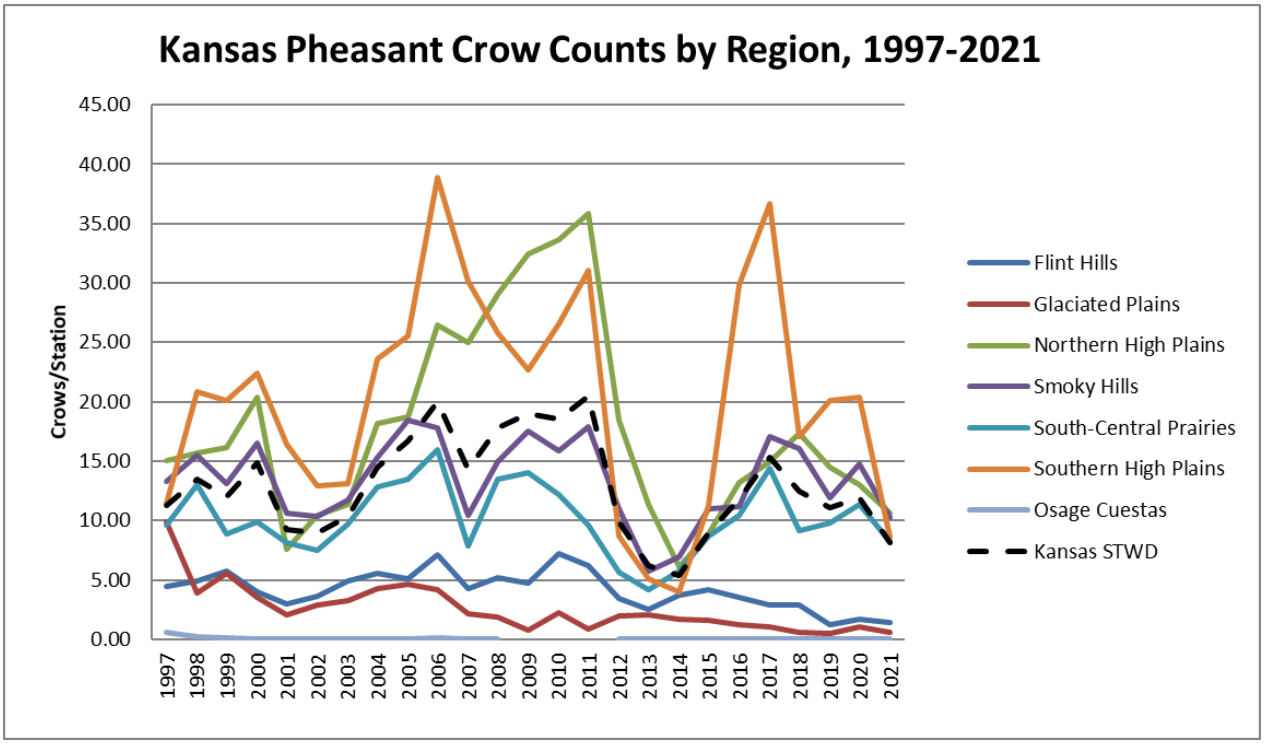
Route	2020 C/S	2021 C/S	% Δ
Clark	5.89	2.18	-63
Comanche	0.91	0.27	-70
Edwards	19.45	10.73	-45
Harper	0.91	2.82	210
Kingman-Reno**	4.55	2.91	-36
Kiowa	26.40	10.36	-61
Pawnee	26.27	30.64	17
Pawnee (Irrig.)	14.36	19.27	34
Pratt	12.36	7.36	-40
Reno**	6.09	2.09	-66
Sedgwick-Harvey	1.40	0.29	-80
Stafford-Barton	17.45	9.91	-43
Region Mean	**12.54**	**9.38**	**-25**

Statewide	**12.63**	**8.66**	**-31***

*Note: C/S = Mean Crows per Station; % Δ = percent change; * = significant change (P ≤ 0.10), NA = Not available, NE = Not estimable*

**Route not included in regional or state means, info. is presented for descriptive purposes only

Figure 1. Regional trends for pheasant crow survey index in Kansas, 1997-2021.



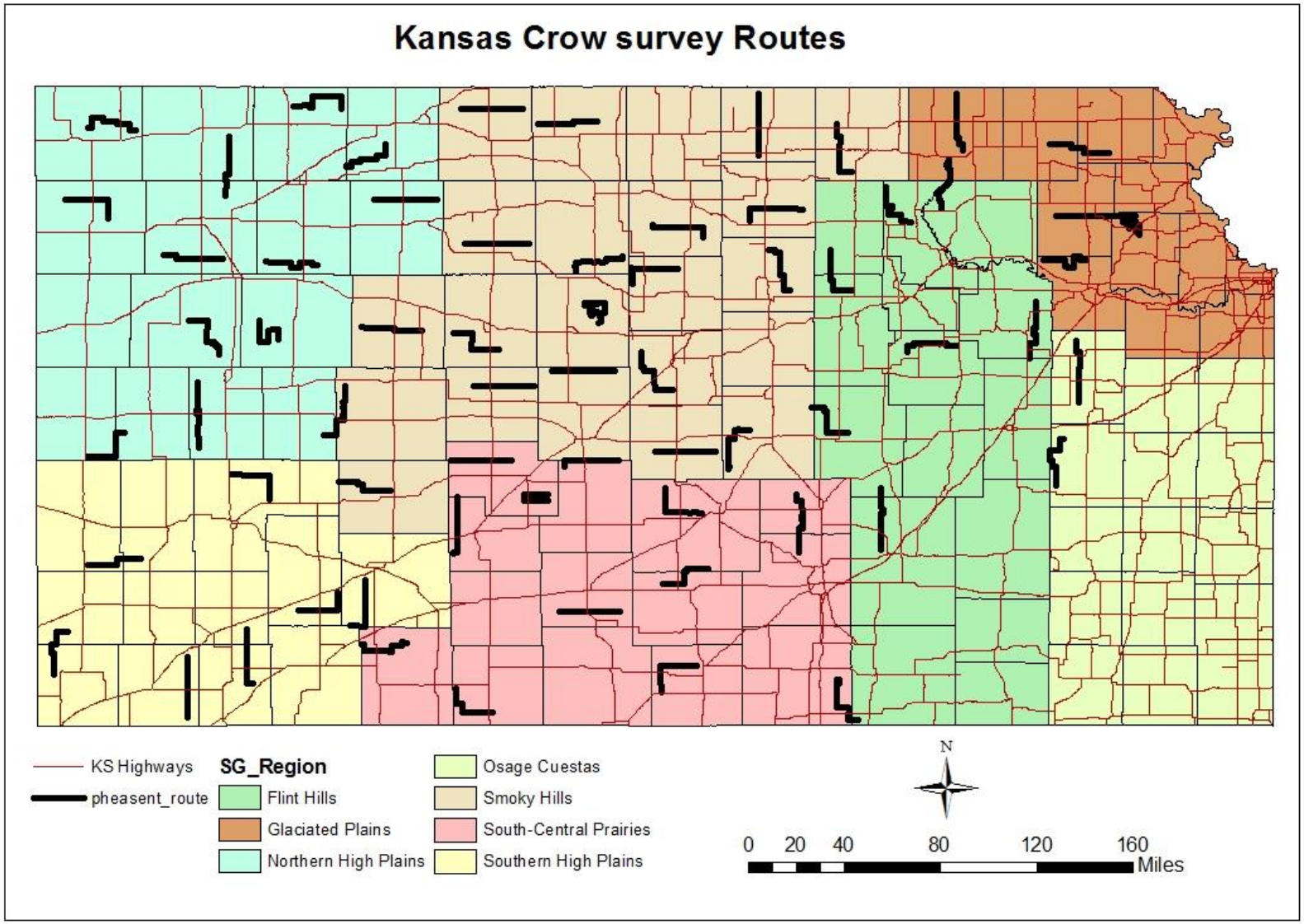


Figure 2. Current pheasant crow survey routes and management region boundaries.

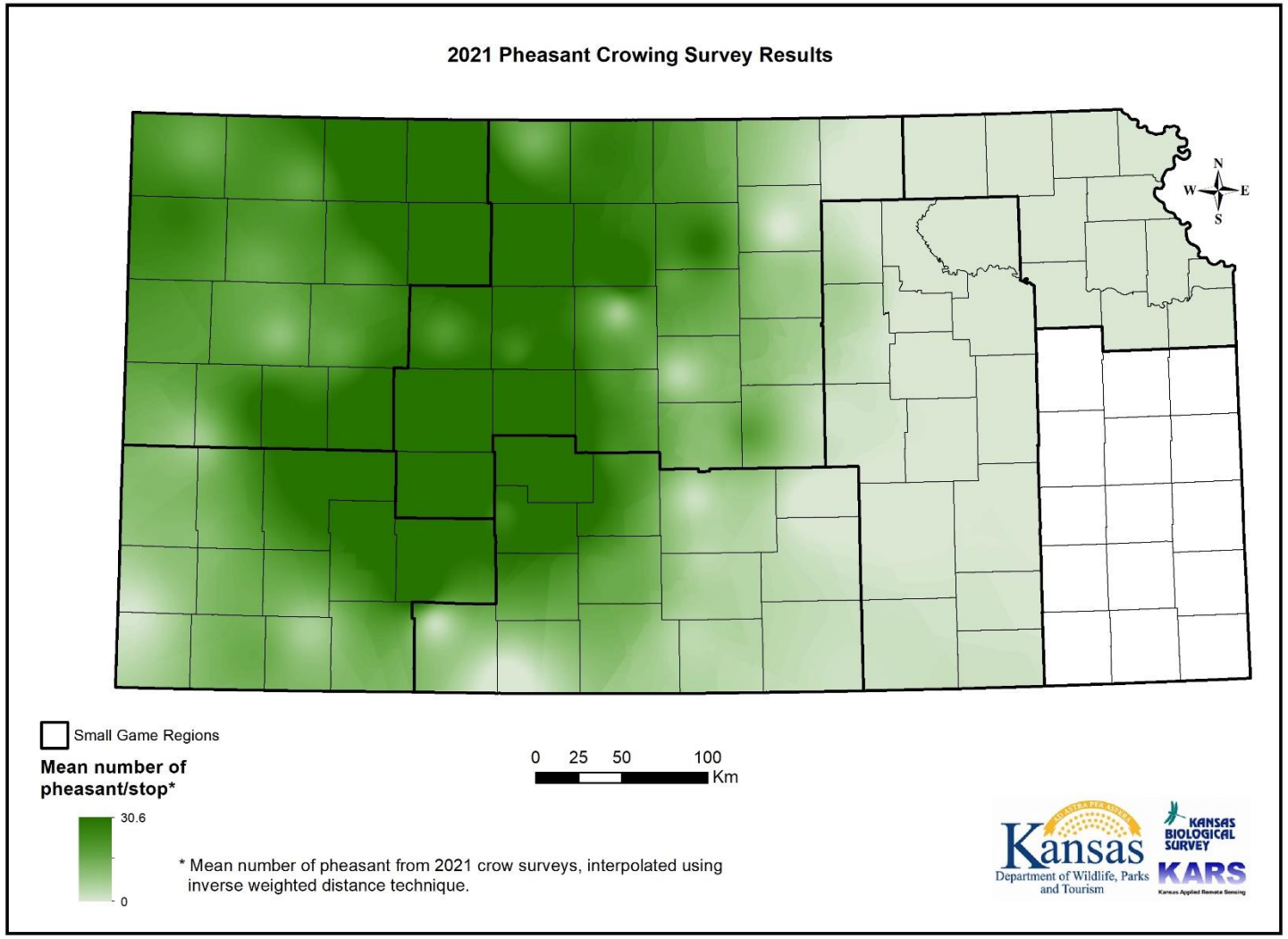


Figure 3. Pheasant breeding population index (crows per station) interpolated from route-specific indices across pheasant range in Kansas, using Inverse Distance Weighting technique, 2021.

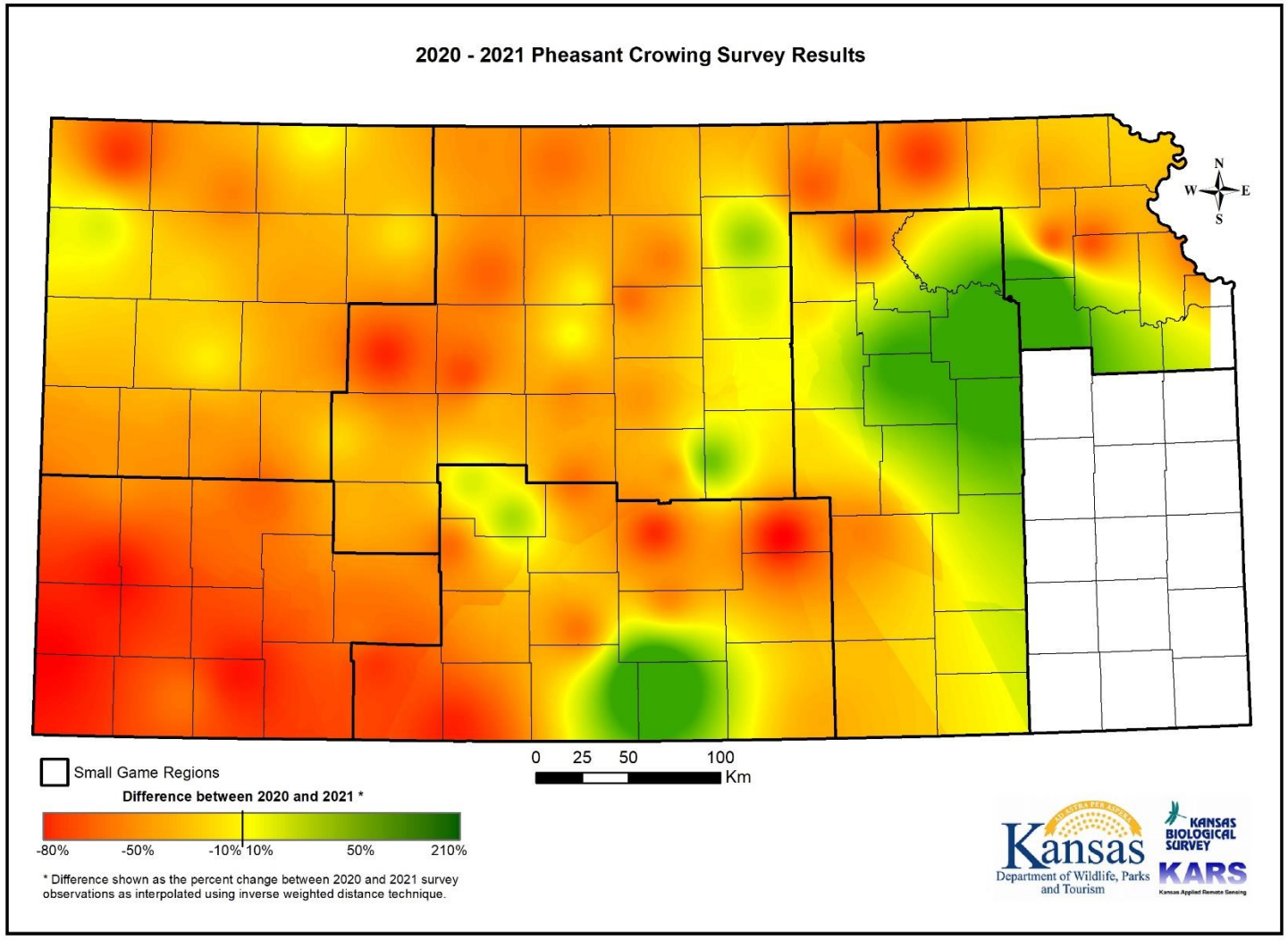


Figure 4. Percent change (2020 to 2021) in pheasant breeding index (crows per station) interpolated across pheasant range in Kansas.