PHEASANT CROWING SURVEY - 2020

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KANSAS PHEASANT CROWING SURVEY – 2020
Federal Aid in Wildlife Restoration Grant W-39-R-26

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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, 2019. 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 2020 survey and comparisons to the 2019 data are presented in Table 1. All 65 of the established routes were assigned for 2020 (routes in Osage and Coffey counties are run only in even-numbered years), and 63 of the 65 were successfully completed. One additional routes was completed (Gove), however data were not entered correctly into the collector and thus was unrecoverable. Some localized heavy precipitation led to a one-week extension to allow for further data collection and 2 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 2020 PCSI was 12.12 crows per stop across all 63 surveyed routes. Among the 53 comparable routes (sampled both years by same observer), there was no significant change ($P = 0.53$) in the statewide mean from 2019 (+3%). The PCSI increased or remained the same on 30 of the comparable routes and decreased on the remaining 22 routes relative to 2019 (Table 1).

Flint Hills: Of the 7 established routes 7 were completed. The regional PCSI was 1.56, indicating no significant change from 2019 (P = 0.31). **Glaciated Plains:** Of the 6 established routes 5 were completed. The regional PCSI was 1.02, indicating no significant change from 2019 (P = 0.14). **Northern High Plains:** Of the 12 established routes, 11 were completed. The regional PCSI was 16.55, indicating no significant change from 2019 (P =0.45). **Smoky Hills:** All 20 established routes were completed, the regional PCSI was 13.27, no significant change from 2019 (P =0.12). **Southern High Plains:** All 7 established survey routes were completed in this region. The regional PCSI was 19.99, indicating no significant change from 2019 (P = 0.98). **South-Central Prairies:** All 12 routes were completed this year. The regional PCSI was 10.87 indicating no significant change from 2019 (P = 0.55).

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 spring of 2019 was an extremely wet year. This began with heavy snowfall in the late winter and continued with heavy showers through the core of the nesting season. Initially this had provided for optimism for summer production last year. Soil moisture was very good which helped in the providing good nesting cover and associated insect production for broods. However, as the showers continued into the nesting season heavy rainfall resulted in high rates of nest abandonment and flooding damaged nesting cover in low lying areas. As a result, the first nesting attempts for pheasants across much of the state were unsuccessful. The habitat was in good enough condition though to support renesting and provide excellent brood cover for nests that were successful. The result of this was that production was high enough to maintain our densities but not enough to produce any significant increases in our crowing index for 2020 (Table 2). Perennial cover, such as CRP, benefited from the heavy rains observed in 2019 producing good residual cover for nesting pheasants coming into 2020. In general pheasant production is optimized in Kansas with near average rainfall, with conditions that are too wet or too dry reducing success. Early spring in 2020 was relatively dry across the primary pheasant range through March and April. This initially resulted in concern for annual nesting cover, such as wheat, and brood cover, such as annual weeds. However, some widespread moderate showers in May greatly improved the habitat conditions. Currently we have been experiencing a hot and dry spell in early June. This sort of weather can cause earlier wheat harvest, which is typically viewed as bad for pheasant production, as well as evaporating soil moisture and desiccating pheasant chicks. The weather conditions in the remaining summer will largely determine what the densities are this fall.

Despite recent fluctuations 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, 2020.

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	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	Kyle McDonald
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	Brad Rueschhoff
Hodgeman	Aaron Baugh	Sheridan	Abigal Athen
Jackson-Jefferson	Tyler Warner	Sherman	Abigal Athen
Kearny-Hamilton	Kurtis Meier	Smith	Brandon Tritsch~
Kingman-Reno	Kyle McDonald	Stafford-Barton	Logan Shoup
Lincoln	James Svaty	Stevens	Kraig Schultz
Logan SE	Jared Ireland~	Thomas	Kevin Klag
Marshall	Megan Smith	Trego	Cale Hedges
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	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 2019 to 2020.

Flint Hills

Route	2019 C/S	2020 C/S	% Δ
Butler-Marion	0.55	0.73	33
Cowley-Sumner**	NA	2.73	NA
Dickinson-Clay	2.64	4.33	64
McPherson-Marion	2.18	1.92	-12
Morris	0.36	0.27	-25
Riley	1.64	2.09	28
Wabaunsee	0.00	0.00	NE
Region Mean	**1.23**	**1.56**	**27**

Glaciated Plains

Route	2019 C/S	2020 C/S	% Δ
Brown-Nemaha	0.82	0.73	-11
Jackson-Jefferson	0.45	1.10	142
Marshall	0.64	1.55	143
Perry WA	0.27	1.73	533
Shawnee	0.13	0.00	-100
Tuttle Creek WA**	NA	NA	NA
Region Mean	**0.46**	**1.02**	**121**

Northern High Plains

Route	2019 C/S	2020 C/S	% Δ
Cheyenne	15.00	19.09	27
Decatur	25.08	21.09	-16
Gove SW	4.89	NA	NA
Graham	26.27	23.18	-12
Logan SE**	4.27	5.25	23
Norton	34.45	32.73	-5
Rawlins-Thomas	4.45	12.64	184
Scott	20.44	20.58	1
Sheridan	10.09	11.82	17
Sherman	24.27	10.64	-56
Thomas	14.18	7.91	-44
Wichita-Greeley	6.09	5.82	-4
Region Mean	**18.03**	**16.55**	**-8**

Southern High Plains

Route	2019 C/S	2020 C/S	% Δ
Finney	33.64	32.82	-2
Ford	28.00	28.00	0
Gray**	NA	22.92	NA
Kearny-Hamilton	13.20	23.73	80
Morton-Stanton	3.18	7.91	149
Seward-Haskell	15.27	14.36	-6
Stevens	27.09	13.10	-52
Region Mean	**20.06**	**19.99**	**0**

Smoky Hills

Route	2019 C/S	2020 C/S	% Δ
Barton	9.27	13.82	49
Cloud**	2.64	0.90	-66
Ellis	16.64	24.00	44
Ellsworth	4.36	4.00	-8
Hodgeman**	NA	28.73	NA
Lincoln	11.64	14.55	25
McPherson	2.64	5.55	110
Mitchell	11.36	21.25	87
Ness-Lane	25.00	21.90	-12
Osborne	9.73	17.18	77
Ottawa	5.90	4.00	-32
Phillips	8.40	9.73	16
Republic	12.22	9.70	-21
Rice	4.91	7.55	54
Rooks**	14.73	32.8	123
Rush	26.45	25.36	-4
Smith**	22.82	21.36	-6
Trego	30.55	28.00	-8
Washington	1.55	2.00	29
Wilson WA	5.18	3.82	-26
Region Mean	**11.61**	**13.27**	**14**

South-Central Prairies

Route	2019 C/S	2020 C/S	% Δ
Clark	7.00	5.89	-16
Comanche	0.91	0.91	0
Edwards	19.09	19.45	2
Harper**	2.45	0.91	-63
Kingman-Reno	2.18	4.55	108
Kiowa**	NA	26.40	NA
Pawnee	30.36	26.27	-13
Pawnee (Irrig.)	13.64	14.36	5
Pratt	8.86	12.36	40
Reno	5.45	6.09	12
Sedgwick-Harvey	1.00	1.40	40
Stafford-Barton	16.30	17.45	7
Region Mean	**10.48**	**10.87**	**4**

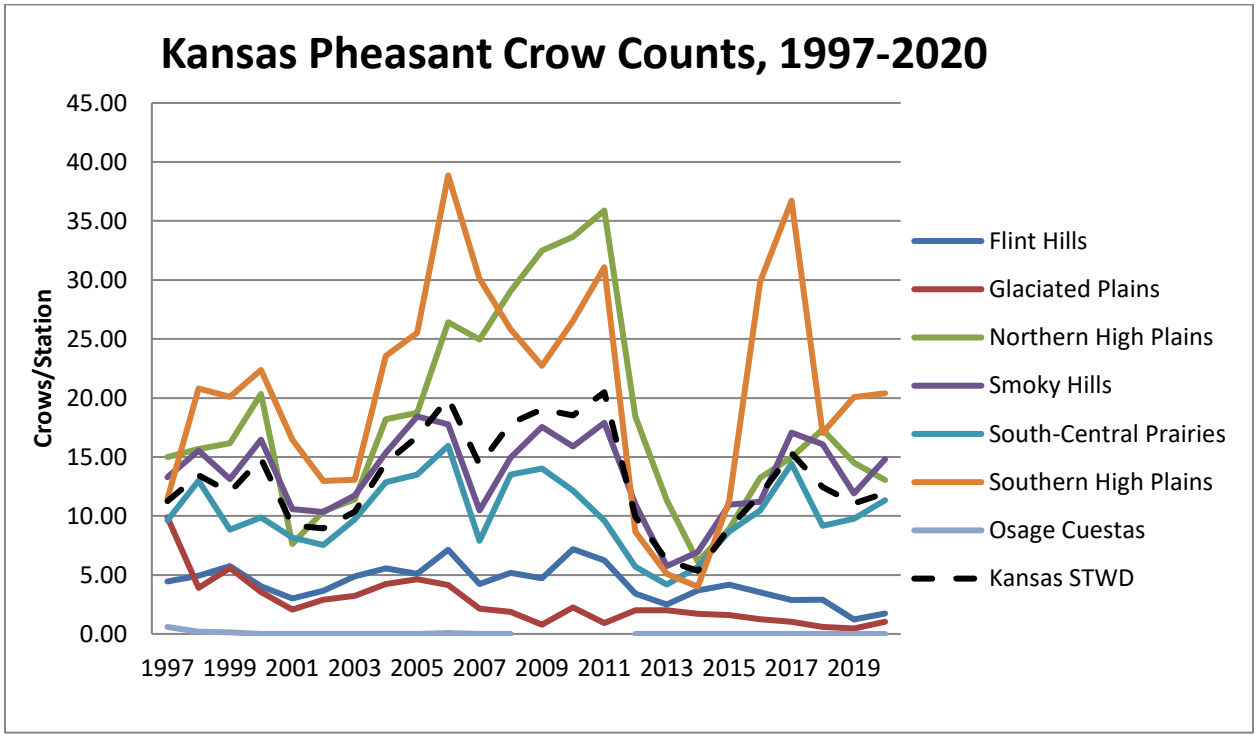
Statewide	**11.34**	**11.72**	**3**

*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

Figure 1. Regional trends for pheasant crow survey index in Kansas, 1997-2020.



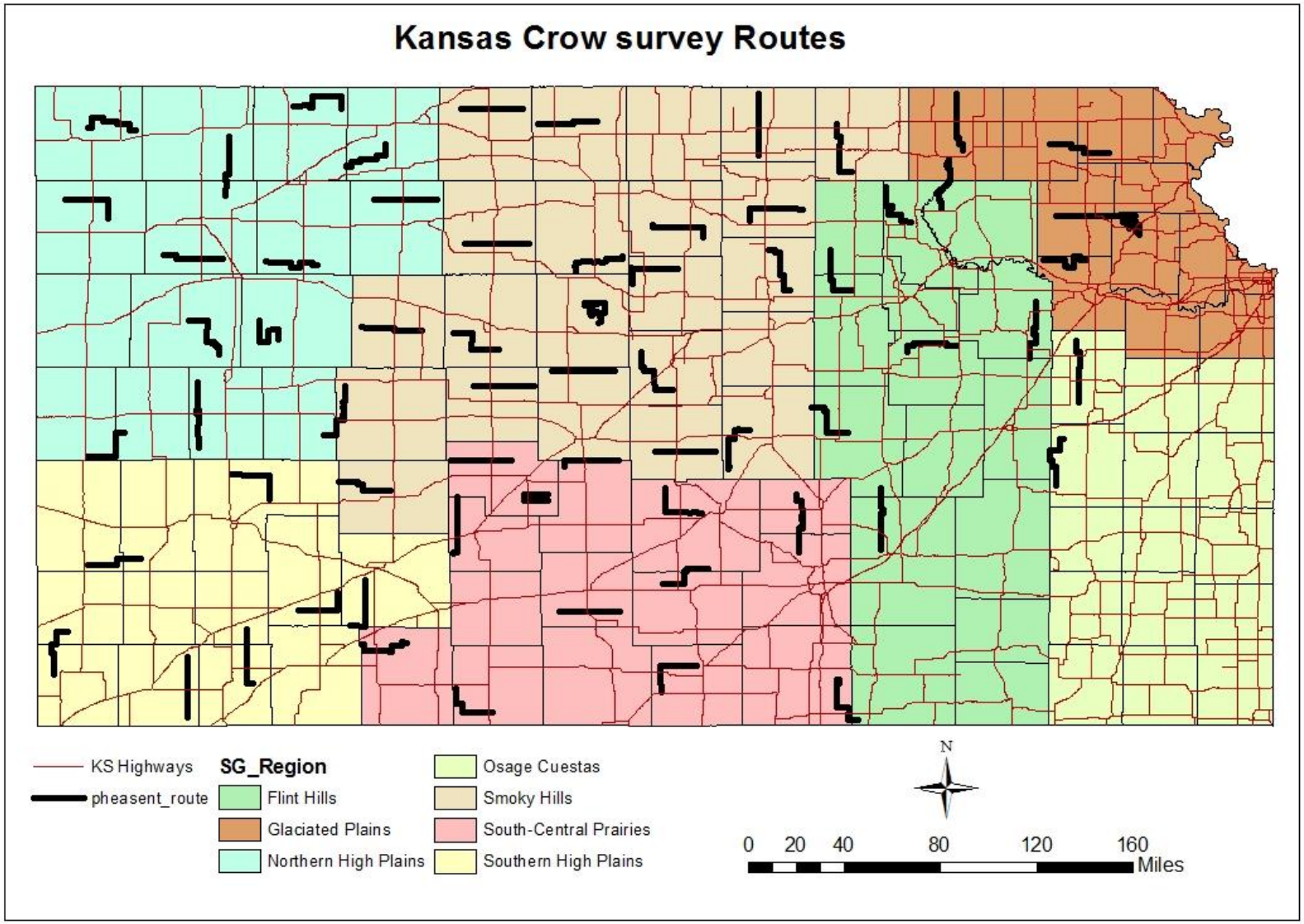


Figure 2. Current pheasant crow survey routes and management region boundaries.

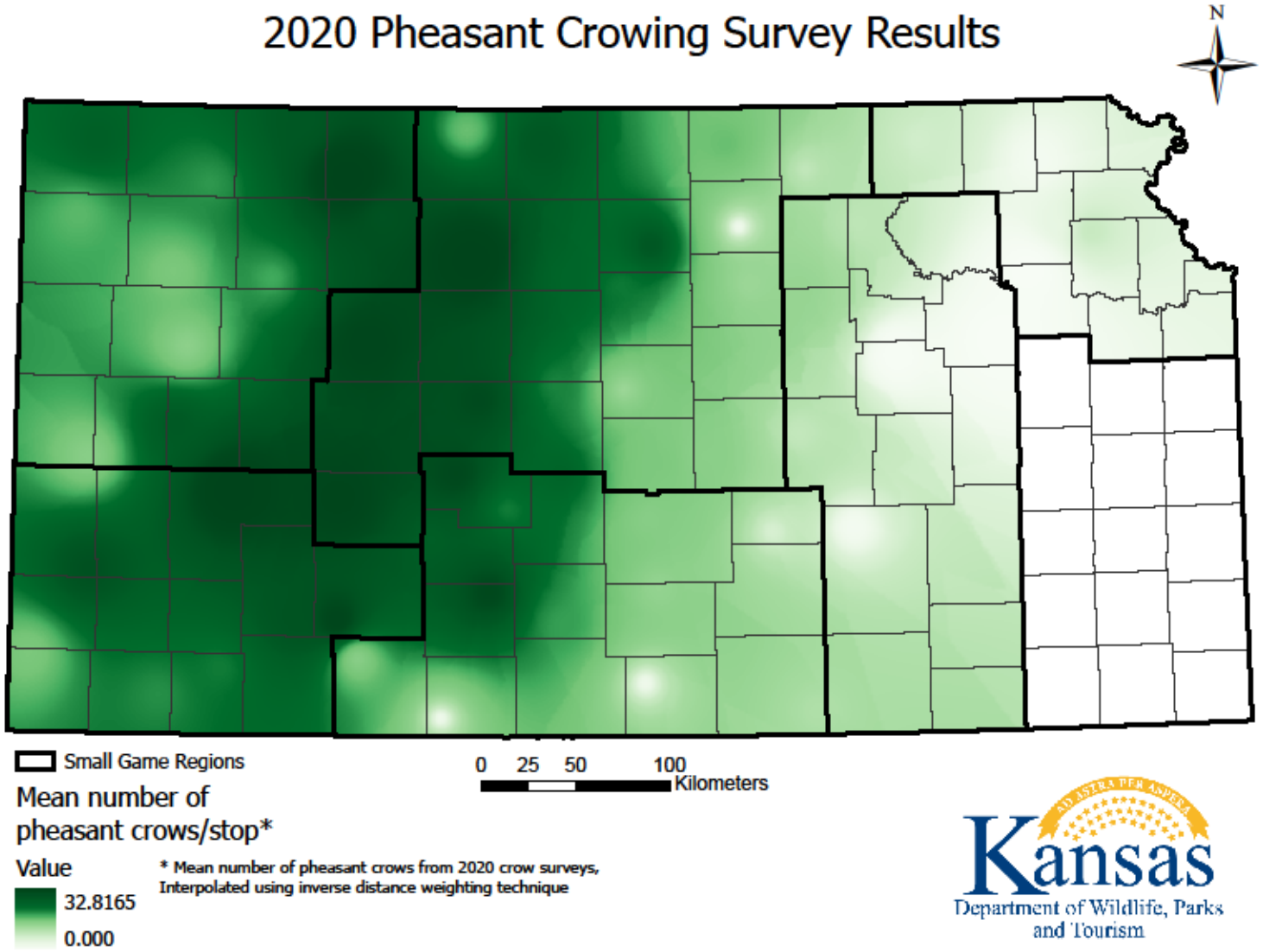


Figure 3. Pheasant breeding population index (crows per station) interpolated from route-specific indices across pheasant range in Kansas, using Inverse Distance Weighting technique, 2020.

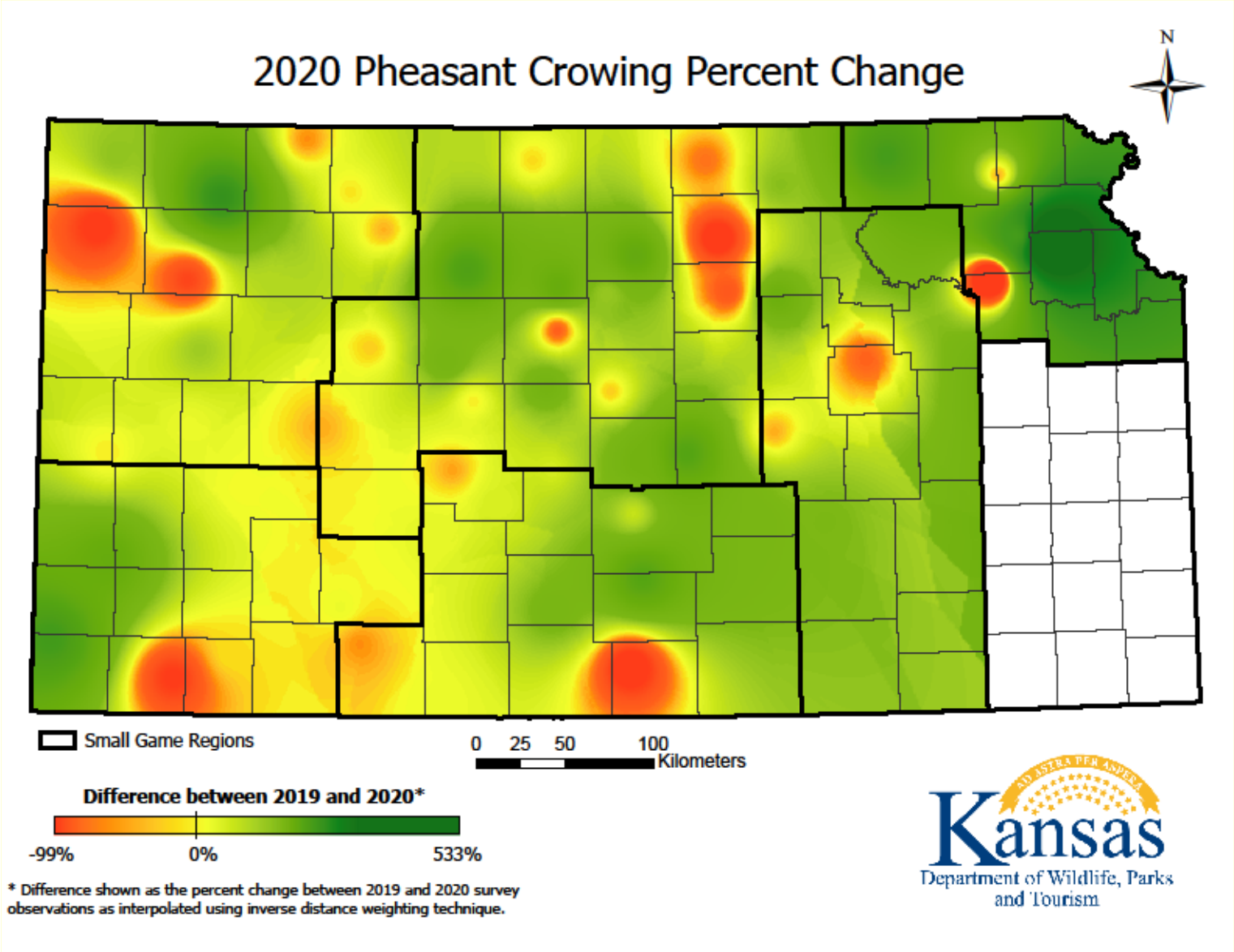


Figure 4. Percent change (2019 to 2020) in pheasant breeding index (crows per station) interpolated across pheasant range in Kansas.