# *PHEASANT CROWING SURVEY - 2015*

**PERFORMANCE REPORT**
**STATEWIDE WILDLIFE RESEARCH AND SURVEYS**

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## Kansas Department of Wildlife, Parks, & Tourism

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# *KANSAS PHEASANT CROWING SURVEY – 2015*
## Federal Aid in Wildlife Restoration Grant W-39-R-21

Prepared by: Jeff Prendergast and Eric Wiens

## INTRODUCTION

The Kansas Department of Wildlife, Parks, and Tourism (KDWPT) collects breeding population data for pheasant (*Phasianus colchicus*) by conducting crow counts throughout 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 to project hunter success and monitor population change through time.

## METHODS

The survey period was from April 25 through May 15. 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 2015 survey and comparisons to the 2014 data are presented in Table 1. Of the 65 established routes, 63 were assigned for 2015 (routes in Osage and Coffey counties are run only in even-numbered years) and 60 of the assigned routes were successfully completed. 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 significant differences.

Inverse Distance Weighting is a GIS mapping technique that can be used to interpolate data between known spatial 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. Inverse Distance Weighting was used by assigning the route-specific PCSI to the centroid of each route. Then all sampled routes were used to extrapolate data throughout Kansas' pheasant range (Figure 3). For comparison purposes the interpolated percent change of PCSI from 2014 to 2015 is also included (Figure 4).

## RESULTS

*Range-wide*
The 2015 PCSI was 8.79 crows per stop across all 60 surveyed routes. Among the 49 comparable routes (sampled both years), there was a significant increase (54%) in the statewide mean from 2014 ($P < 0.001$). Overall, the PCSI increased or remained the same on 41 of the 49 comparable routes while the PCSI decreased on the remaining 8 routes relative to 2014 (Table 1).

**Osage Cuestas:** Only sampled in even years. **Flint Hills:** All 7 routes were completed. The regional PCSI was 4.18, resulting in no significant change from 2014 ($P = 0.31$). **Glaciated Plains:** All 6 routes were completed. The regional PCSI was 1.31, resulting in no significant change from 2014 ($P = 0.1095$). **Northern High Plains:** There were 10 of 12 routes completed. The regional PCSI was 11.87, resulting in no significant change from 2014 ($P = 0.34$). **Smoky Hills:** All 20 routes were completed, resulting in a regional PCSI of 10.21, and a statistically significant increase of 47% ($P < 0.001$). **Southern High Plains:** 6 of the 7 survey routes were completed. The regional PCSI was 12.64, resulting in a statistically significant increase of 179% from 2014 ($P = 0.035$). **South-Central Prairies:** All 11 routes were completed. The regional PCSI was 9.00, resulting in a statistically significant increase of 58% from 2014 ($P = 0.06$)

## 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 can indicate breeding population potential.

Initially, 2014 appeared as though it might be another poor reproductive season for pheasants with drought conditions persisting into May. Although later then desirable, precipitation that fell in late spring and early summer over portions of western KS created favorable conditions for brood rearing and renesting hens, and as a result, there was an increase in reproductive success. This success has been reflected in a statistically significant PCSI increase over parts of the western and central portion of the state. The majority of the areas surveyed in the eastern half of the state witnessed an apparent increase as well, although statistically insignificant. Among the comparable values there was a statistically significant statewide increase of 54% for the 2015 PCSI.

Overall, the spring PCSI in Kansas went from the highest recorded value in 2011, to a precipitous decline through 2014. Fortunately, the 2015 PCSI showed a significant improvement (Figure 1). Extreme drought plagued the primary KS pheasant range from 2011- 2014, causing severe population declines. However, drought conditions have improved throughout much of the state, allowing for increases in the reproductive output of the Kansas pheasant population. Due to the extreme population decline, multiple breeding seasons will be necessary to recover the population. Optimal breeding conditions for pheasants are near average precipitation and temperatures, while extreme climatic events such as flooding, hail, or drought generally cause declines. Drought events are part of western Kansas' historical climate, and will likely happen in the future, causing natural fluctuations in pheasant populations through time. Managing for good habitat, such as properly managed Conservation Reserve Program (CRP), is the best tool that wildlife managers and wildlife enthusiasts have for long-term population management.

Kansas still supports a viable population of pheasants across the range. With improved weather and adequate habitat, the remaining stock will repopulate the range. We have observed the beginning of this recovery with the improved conditions in 2014. Spring rains provided adequate nesting and brooding cover over much of the primary Pheasant range in 2015, but conditions from late-June through August will dictate survival. Fall pheasant populations are highly dependent on production and recruitment of young of the year. Because pheasant have high reproductive output, they can rebound relatively rapidly, given good conditions. Brood survey data will be collected in late July and August, and summarized in early September. Predicting the fall population will be much more accurate once this data is available.

Table 1. Regional changes in pheasant crow counts in Kansas, 2014-2015.

**Flint Hills**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Butler-Marion | 1.00 | 1.64 | 64 |
| Cowley-Sumner | 8.73 | 11.55 | 32 |
| Dickinson-Clay | 10.36 | 9.70 | -6 |
| McPherson-Marion | 2.09 | 3.40 | 63 |
| Morris | 1.00 | 0.91 | -9 |
| Riley | 2.45 | 2.09 | -15 |
| Wabaunsee | 0.09 | 0.00 | -100 |
| **Region Mean** | **3.68** | **4.18** | **14** |

**Glaciated Plains**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Brown-Nemaha | 1.18 | 1.36 | 15 |
| Jackson-Jefferson | 0.82 | 1.45 | 78 |
| Marshall** | 3.73 | 2.45 | -34 |
| Perry WA | 1.27 | 2.09 | 64 |
| Shawnee | 0.30 | 0.33 | 11 |
| Tuttle Creek WA** | 3.00 | 1.91 | -36 |
| **Region Mean** | **0.89** | **1.31** | **47** |

**Northern High Plains**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Cheyenne** | NA | 18.5 | NA |
| Decatur** | NA | 19.67 | NA |
| Gove SW** | 4.50 | 4.60 | 2 |
| Graham | 10.64 | 21.91 | 106 |
| Logan SE | 1.45 | 2.36 | 62 |
| Norton | 12.73 | 7.91 | -38 |
| Rawlins-Thomas | 9.91 | 9.45 | -5 |
| Scott** | 2.64 | NA | NA |
| Sheridan** | 10.27 | 11.30 | 10 |
| Sherman** | 5.91 | NA | NA |
| Thomas | 8.18 | 17.73 | 117 |
| Wichita-Greeley** | 1.27 | 4.82 | 279 |
| **Region Mean** | **8.58** | **11.87** | **38** |

**Southern High Plains**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Finney | 3.40 | 12.00 | 253 |
| Ford | 9.38 | 25.64 | 173 |
| Gray** | 4.91 | 4.36 | -11 |
| Kearny-Hamilton** | 0.40 | NA | NA |
| Morton-Stanton | 0.36 | 0.36 | 0 |
| Seward-Haskell | 3.55 | 10.73 | 203 |
| Stevens | 6.00 | 14.45 | 141 |
| **Region Mean** | **4.54** | **12.64** | **179** |

**Smoky Hills**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Barton | 12.64 | 17.18 | 36 |
| Cloud | 3.40 | 3.73 | 10 |
| Ellis | 6.36 | 10.09 | 59 |
| Ellsworth | 2.60 | 3.36 | 29 |
| Hodgeman | 8.00 | 10.64 | 33 |
| Lincoln | 2.27 | 15.00 | 560 |
| McPherson** | 6.45 | 8.64 | 34 |
| Mitchell | 13.40 | 14.50 | 8 |
| Ness-Lane | 1.56 | 3.82 | 145 |
| Osborne | 12.73 | 19.09 | 50 |
| Ottawa | 8.64 | 10.00 | 16 |
| Phillips | 3.27 | 5.00 | 53 |
| Republic | 14.27 | 16.82 | 18 |
| Rice | 7.36 | 8.45 | 15 |
| Rooks | 5.36 | 12.64 | 136 |
| Rush** | NA | 26.73 | NA |
| Smith | 9.82 | 9.82 | 0 |
| Trego | 2.45 | 8.45 | 244 |
| Washington | 3.91 | 4.09 | 5 |
| Wilson WA | 7.27 | 11.09 | 53 |
| **Region Mean** | **6.96** | **10.21** | **47** |

**South-Central Prairies**

| Route | 2014 C/S | 2015 C/S | % Δ |
|---|---|---|---|
| Clark | 1.09 | 2.91 | 167 |
| Comanche | 0.36 | 1.18 | 225 |
| Edwards** | 3.45 | 5.45 | 58 |
| Harper | 3.00 | 5.38 | 79 |
| Kingman-Reno | 6.27 | 6.10 | -3 |
| Pawnee | 6.90 | 8.90 | 29 |
| Pawnee (Irrig.) | 9.91 | 24.22 | 144 |
| Pratt | 5.80 | 7.63 | 31 |
| Reno | 13.00 | 12.18 | -6 |
| Sedgwick-Harvey | 1.09 | 2.27 | 108 |
| Stafford-Barton | 11.89 | 19.27 | 62 |
| **Region Mean** | **5.93** | **9.00** | **52** |
| **Statewide** | **5.70** | **8.79** | **54** |

*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 1. Pheasant crow survey routes and observers in Kansas, 2015.

| Route | Observer | Route | Observer |
|---|---|---|---|
| Barton | Gene Schneweis | Norton | Blake Klema |
| Brown-Nemaha | Tyler Warner | *Osage*** | *Matt Peek* |
| Butler-Marion | Charles Cope | Osborne | Toby Marlier |
| Cheyenne | Kurt Meier | Ottawa | Vickie Cikanek~ |
| Clark | Jon Zuercher | Pawnee | Charlie Swank |
| Cloud | Luke Kramer | Pawnee (Irrig) | Tom Bidrowski |
| *Coffey*** | *Robert Culbertson* | Perry WA | Hunter Bailie |
| Comanche | Matt Hanvey | Phillips | Brad Odle |
| Cowley-Sumner | Kurt Grimm | Pratt | Charlie Swank |
| Decatur | Daniel Howard | Rawlins-Thomas | Wes Sowards |
| Dickinson-Clay | Clint Thornton | Reno | Kyle McDonald |
| Edwards | Charlie Swank~ | Republic | Rob Unruh |
| Ellis | Mike Nyhoff | Rice | Steven Adams |
| Ellsworth | Matt Smith | Riley | Corey Alderson |
| Finney | Daryl Fisher | Rooks | Michael Zajic |
| Ford | Aaron Baugh | Rush | Jason Wagner~ |
| Gove SW | Owen Johnson~ | Scott** | Brent Clark |
| Graham | Alex Lyon | Sedgwick-Harvey | Charles Cope |
| Gray | Manuel Torres~ | Seward-Haskell | Jeff Sutton |
| Harper | Craig Curtis | Shawnee | Brad Rueschhoff |
| Hodgeman | Aaron Baugh | Sheridan | Wes Sowards |
| Jackson-Jefferson | Tyler Warner | Sherman** | Mike Hopper |
| Kearny-Hamilton** | Brent Clark | Smith | Brad Odle |
| Kingman-Reno | Kyle McDonald | Stafford-Barton | Charlie Swank |
| Lincoln | Viki Cikanek | Stevens | Kraig Schultz |
| Logan SE | Randy Rodgers | Thomas | Kurt Meier |
| Marshall | Megan Smith~ | Trego | Kent Hensley |
| McPherson | Kyle McDonald~ | Tuttle Creek WA | Zack Cordes~ |
| McPherson-Marion | Jeff Rue | Wabaunsee | Brad Rueschhoff |
| Mitchell | Chris Lecuyer | Washington | Megan Smith |
| Morris | Brent Konen | Wichita-Greeley | Anna Walkowiak-Esch~ |
| Morton-Stanton | Kraig Schultz | Wilson WA | Scott Thommason |
| Ness-Lane | Randy Rodgers | | |

Note: ~ new observer for route, * New route for 2015,** Route Not Completed ; Osage and Coffee only run on even years

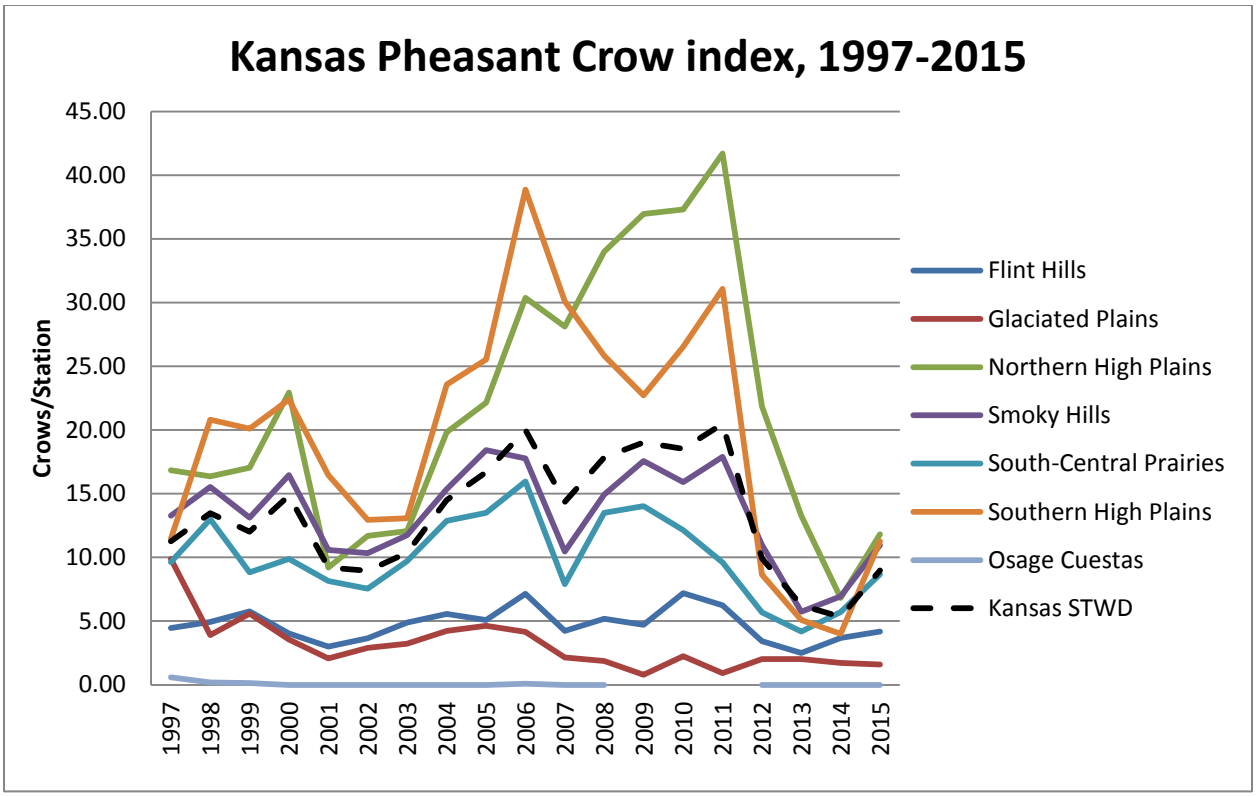


Figure 1. Regional trends for pheasant crow survey index in Kansas, 1997-2015.

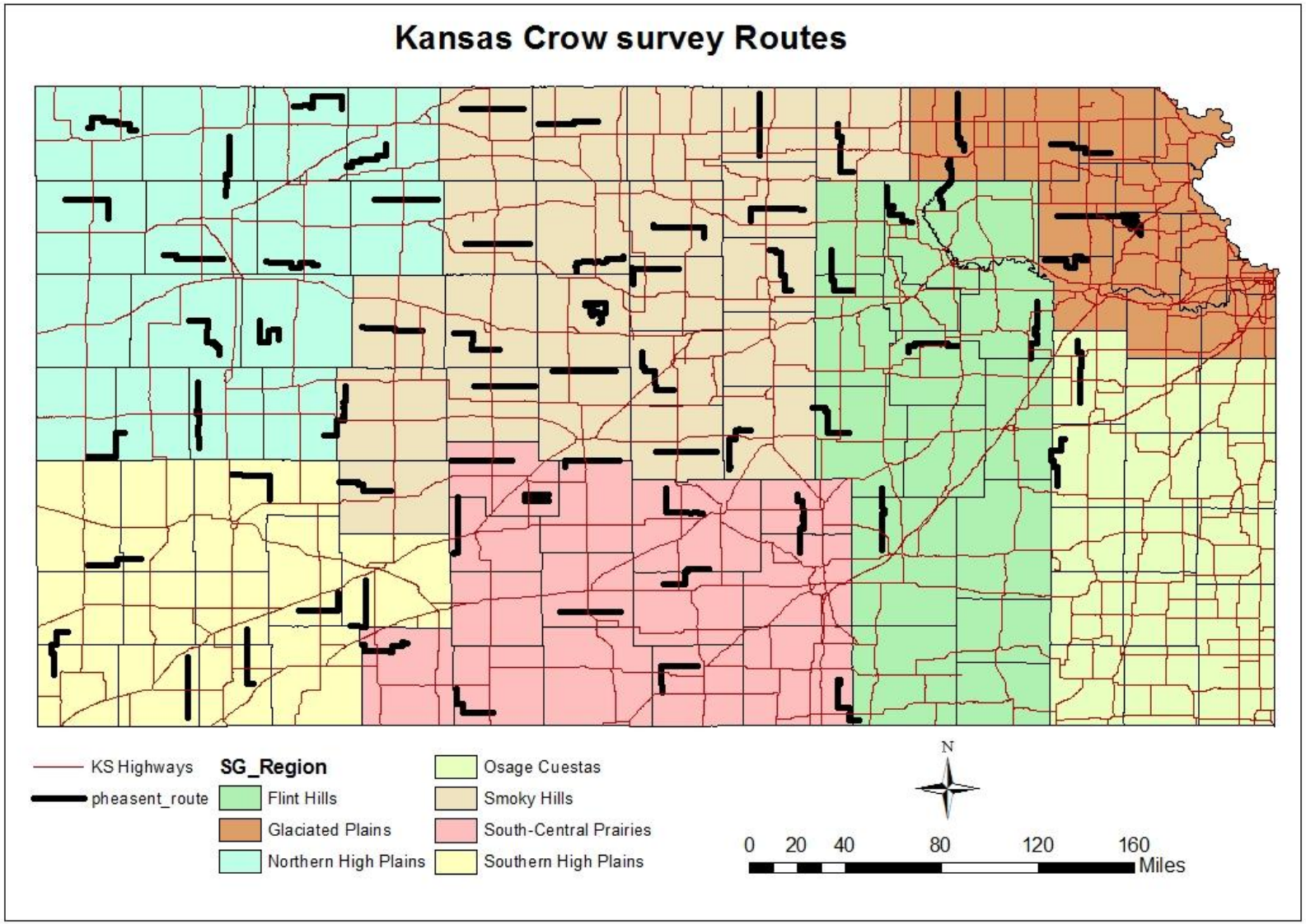


Figure 2. Pheasant crow survey routes and management region boundaries, 2015.

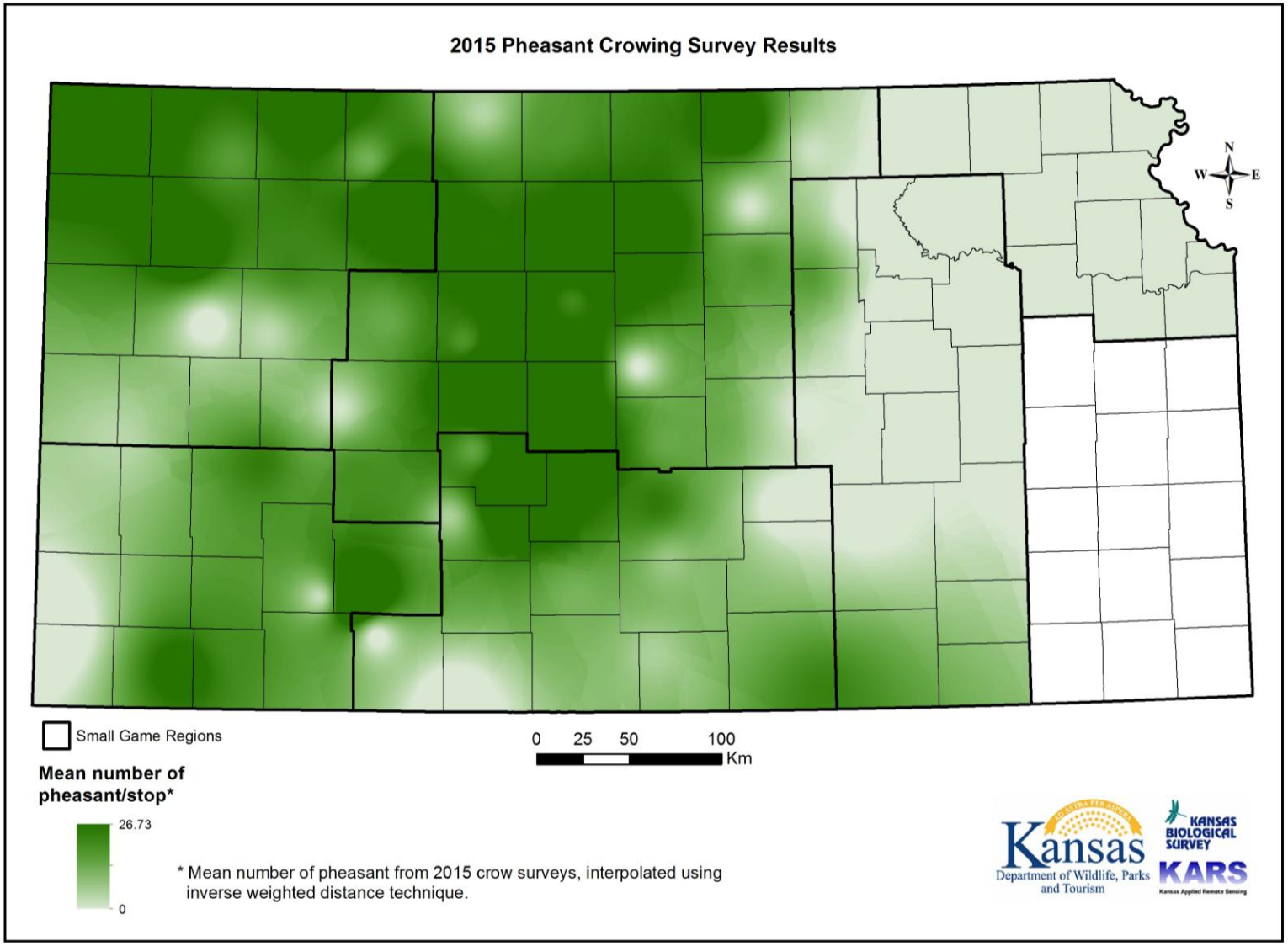


Figure 3. Pheasant breeding population index (crows per station) interpolated from route-specific indices across pheasant range in Kansas, using Inverse Distance Weighting technique, 2015.

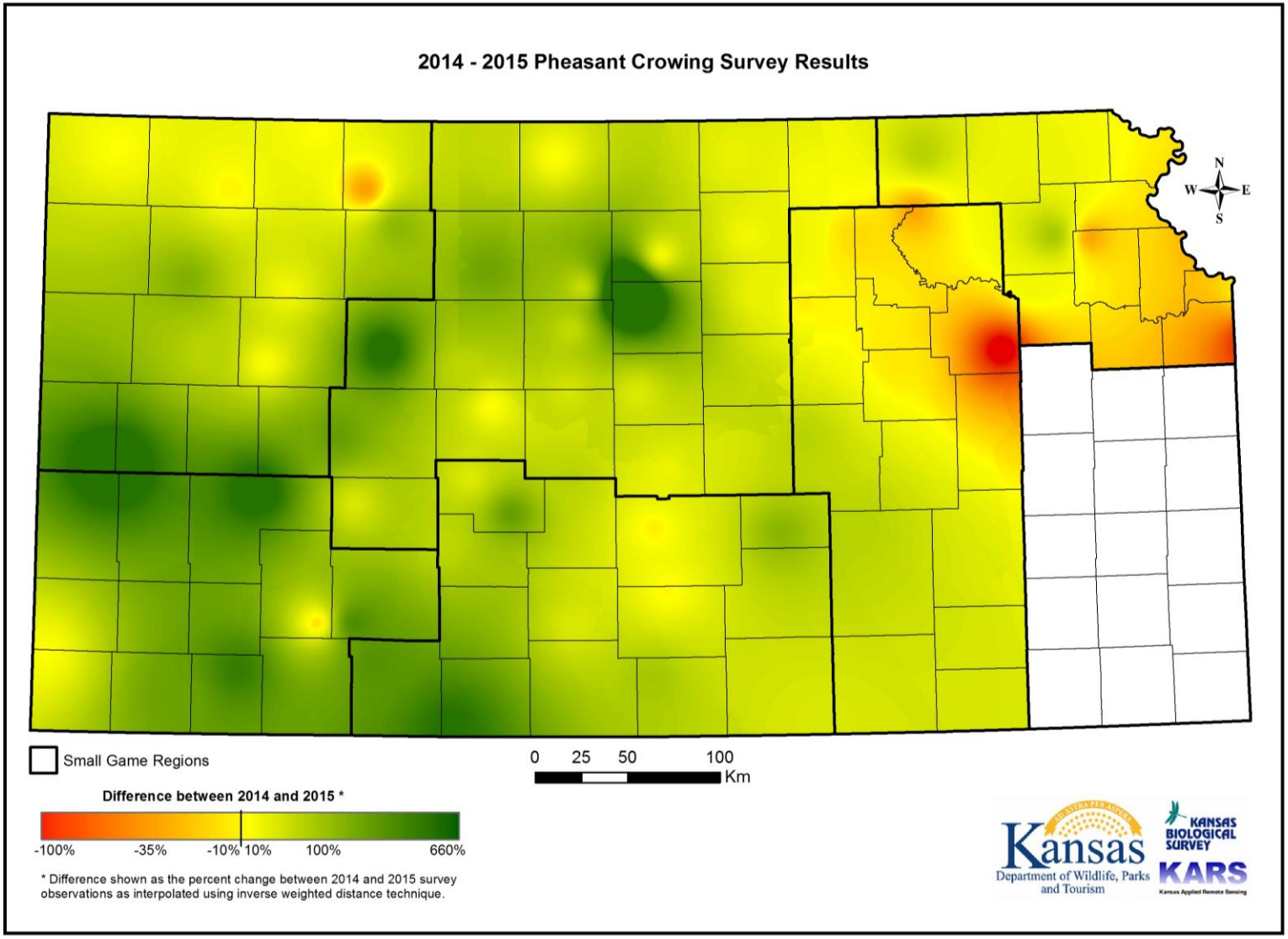


Figure 4. Percent change (2014 to 2015) in pheasant breeding index (crows per station) interpolated across pheasant range in Kansas.