QUAIL, PHEASANT, & TURKEY BROOD SURVEY – 2024

Performance Report

A Contribution in Part of Pittman-Robertson
Federal Aid in Wildlife Restoration
Grant W-39-R-31

KANSAS DEPARTMENT OF WILDLIFE, PARKS, and TOURISM

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September 2024

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QUAIL, PHEASANT, AND TURKEY BROOD SURVEY RESULTS – 2024

Prepared by Jeff Prendergast, Small Game Specialist

INTRODUCTION

The Kansas Department of Wildlife, Parks, and Tourism (KDWPT) collects reproductive data for quail (*Colinus virginianus and Callipepla squamata*), ring-necked pheasant (*Phasianus colchicus*), and wild turkey (*Meleagris gallopavo*) statewide. Northern bobwhites provide nearly all the quail data; however, scaled quail can be found in extreme southwestern Kansas and observations are included in quail estimates (generally < 1% data). Summer brood surveys were initiated in 1986 focusing on pheasant and quail. Turkey data were not collected and reported until 2006 and rabbit and jackrabbits were added in 2024. These summer brood surveys are used to forecast upcoming hunting seasons and to provide consistent monitoring of these important game species. Prairie chickens (greater and lesser; *Tympanuchus* spp.), though recorded opportunistically, cannot be easily assessed using the same methods because they generally do not associate with roads like quail, pheasants, and turkeys.

METHODS

Dates for the 2024 summer brood survey were from July 20 – August 31 (6 weeks). Survey protocol and methodology changed in 2012 to establish permanent brood routes averaging 35 miles (29-49 miles) in 74 randomly selected counties in Kansas (urban counties were removed from the original selection pool). Since the original selection, routes have been added to fill voids where staff has allowed, bringing the current number of routes to 78. Routes were positioned within each county to be representative of the average land cover (rangeland, crop, CRP, etc.) for that county. If public land (e.g., Wildlife Areas) occurred in the county, we attempted to place the route through or adjacent to the property. Routes were sampled 4 times beginning at sunrise, driving the route at a maximum of 25 mph until the entire route was sampled. The 6-week sampling period was separated into 2, 3-week periods where at least 2 samples occurred in each 3-week period. Additionally, observers were asked to have at least one sample completed on a morning with wet vegetation (dew or after a rain the evening/night before). This sampling protocol provides a more stringent standardization of collected data. Indices are reported on a per mile basis (e.g., pheasant/mile, etc.). If a quail or pheasant brood was detected, observers attempted to flush the brood to get the most accurate count of chicks possible. Dogs are permitted to be used to aid in locating chicks. Age of chicks was visually estimated based on aging criteria and recorded in weeks.

Data Analysis

The indices to upland game bird densities were calculated as the mean number of birds observed per mile for each species along routes. Given that observations are recorded on permanently established routes, samples are not independent and thus a paired-sample t-test is used to make inter-annual comparisons. A two-tailed test with an alpha level of 0.10 was used to identify significant differences between years (current vs. previous year). Data was standardized by

reporting counts per mile (e.g., pheasants/mile) for routes and regions. Ratio data (chicks/hen and chicks/brood) can help indicate population productivity, but sample sizes per route are generally limited; as such, ratio data are pooled across each Small Game Region (Figure 1). In considering the brood to hen ratios, broods that are observed without hens are removed to remove bias from the % of hens that successfully hatched broods. While many factors influence these ratios, the broods/hen index is generally an indicator of nest success, while chicks/brood is an indicator of brood survival after hatching. Quail ratio data was reported per adult (male and female) because males also will incubate nests and brood young. Turkey Management Regions (Figure 2) differ from Small Game Regions and data were reported accordingly.

Spatial comparisons were made using an ARC GIS Inverse Weighted Distance technique, which interpolates data across a landscape between known points. Inverse Distance Weighting was used per species by assigning the route-specific index to the centroid of the county sampled. This provides a unique map showing probable densities which are spatially relative. This provides a statewide estimate of upland bird densities but does not account for localized populations and habitats.

RESULTS

Participants sampled all 78 established routes between July 20 and August 31. There were 3 routes that were not able to be completed the 4 runs during the survey period (Table1). Results are summarized by Kansas Small Game Regions (Figure 1) or Turkey Regions accordingly (Figure 2).

Pheasants

For 2024, there was a significant increase in the statewide roadside index of pheasants (108%) compared to 2023. There were statistically significant increases in the Northern High Plains, and Southern High Plains, while the Smoky Hills and South Central Prairies also saw some improvement. (Table 2). Pheasants per mile was highest in the Southern High Plains, with the highest index in Stevens County (Table 2). No pheasants were detected in the Glaciated plains regions this year with, while Flint Hills region only had pheasants detected on 1 route. No pheasants were detected in the Osage Cuestas of southeastern Kansas.

Statewide Production indices were similar but slightly reduced this year (Table 3). However, the High plains regions had very good measures of production. The chicks/hen and chicks per brood remained high after increases last year (Table 3). There were no broods observed in the Glaciated Plains region. Pheasant hatch peaked statewide in late May into early June with peak hatch being a little more spread out then we have seen historically (Figure 3).

Quail

There was a significant increase in the statewide roadside index of quail (42%) compared to 2023. There were Statistically significant increases in the Southern High Plains (125%) and the Northern High Plains (17%) a non-significant, yet large apparent increase also occurred in the Flint Hills (74%). The remaining regions all saw small non-significant changes (Table 4). As is common with quail, many regional patterns were obscured by large offsetting changes on routes within the regions. Quail densities were greatest in the Southern High Plains and Flint Hills

regions, with the highest index recorded in Morton County (Table 4). Scaled quail make up a small number of observations and were only recorded on Hamilton and Morton County routes this year.

Statewide all measures of production were improved this year, with chicks per adult seeing the greatest increase. The Northern High Plains saw the greatest improvement after very few chicks were observed last year (Table 5). Quail hatch peaked in late June with production dropping off but continuing through July (Figure 5).

Turkey

The statewide roadside index of turkey remained similar to 2023. There was a significant regional increase in the southcentral region (184%). The remaining regions all had small non-significant changes from 2023 (Table 6). The Southeast region had the highest regional turkey index with the Northeast being a close second. (Table 6). Jackson county had the highest roadside index to turkeys this year (Table 6).

Statewide turkey production saw consistent improvements across all measures this year (Table 7). Production was up across all regions except the southwest (Table 7). Turkey broods saw hatches throughout May (Figure 7). The highest turkey densities will generally be found in northeastern Kansas (Figure 8).

DISCUSSION

Above average summer rainfall across the high plains in 2023 was too late to have major impacts on populations last year. However, it greatly improved habitat conditions coming into 2024. Rainfall across the high plains in spring and early summer allowed upland birds to capitalize on these improved habitat conditions and make major improvements this year. This was paired with abundant arthropod resources, led by an apparent record grasshopper emergence, providing ample resources for chicks. All this combined for excellent nesting and brooding conditions across the high plains that increased production supported by large broods and high nest survival. While precipitation was better in the central regions it was not as timely, and drought recovery was not as good. As such the central regions saw more stable to slight improvements this year. There were a few periods of prolonged extreme heat late in the summer that have impacted some fall crops, but given the abundance of insects and habitat conditions, this was not expected to have dramatic effects on chick survival. Despite much improved precipitation there were 98 counties in the state this year that registered D2 or greater on the drought severity index, triggering the release of Emergency use of CRP for forage. So far, the emergency use has not seemed as pervasive but emergency use is ongoing and the full extent of this impact won't be realized until later this year.

Pheasants are an important resource to Kansas. Within the last decade, estimated annual harvests have been trending down with the expiration of CRP fields and return of this habitat to traditional agricultural practices. Despite overall roadside index remaining low in 2023 harvest rates for pheasants were improved over the last few years, likely due better brood conditions in the high plains supporting better production last year. With some minimal regional increases last year and much improved habitat conditions there was optimism for improvements this year. The

statewide estimate was much improved driven largely by increases across the high plains of western Kansas. With roadside densities that are greatly improved we expect that harvest success will increase compared to 2023 and total harvest should be much improved. The Southern and Northern high Plains both saw large increases and have similar regional estimates this year. Smoky Hills remained stable after declines last year. While the improvements will result in better hunting conditions then we have had in a number of years, we were starting at depressed, so large improvements don't always result in high densities. The best opportunities will be in the Northern and Southern High Plains this year with some areas of high densities existing in both the Smoky Hills and South-Central Prairies.

Kansas continues to have one of the strongest quail populations in the country. Recent years have seen improved densities across many of the Great Plains states, including Kansas. This boom was caused by habitat changes associated with recovery from the extreme and expansive drought in the early 2010's. While the benefits of these habitat changes have largely waned, Kansas has largely maintained these higher densities. Spring densities have remained high based on spring whistle surveys. The recent drought conditions and subsequent precipitation have again created conditions that have allowed populations to see large increases in some regions. Quail have again seen improvements across a wide region extending from the Rolling Plains of Texas up into Southern Kansas. This created increased production across most of the southern regions of our state. The best increases occurred in the Southern High Plains and Flint Hills which will have the highest regional densities this year (Figure 6). Based on roadside survey estimates, we expect hunters' success rates to increase across much of the state this year.

After stable numbers last year, we saw small increases this year during the roadside estimates for turkeys driven largely by the increases in the Southcentral. There were no significant differences in the any of the other regional estimates though. After several consecutive years of declining estimates, these the improved production is promising. However, it is not enough to yet offset the trend that we have seen in recent years with our turkeys struggling to recruit young into the population. Hunting opportunity has become much more restricted as populations have declined for turkeys and there is no fall season in 2024. The southeast region had the highest roadside estimate this year (Figure 8).

Rabbits and Jackrabbits were added to the survey for the first time in 2024 in order to provide standardized data collection that was otherwise lacking. Jackrabbits have become less common in the eastern regions through time and there were no detections throughout the Flint Hills, Glaciated Plains, or Osage Cuestas. The distribution of jackrabbit is primarily held within the Western regions with the highest densities in the Southern High Plains (Figure 10). Cottontail Rabbits can be found across the state. Cottontails exist in high density across the state where the appropriate habitat exists. Cottontails have a more even distribution in eastern regions where the habitat availability is more consistent across the landscape. (Figure 9).

Table 1. Upland game bird brood routes and observers in Kansas, 2024.

Route	Observer	Replicates	Route	Observer	Replicates
Allen	Justin Harbit	4	Logan	Leonard Hopper	4
Atchison	Tim Urban	4	Marion	Jeff Rue	4
Barber	Jake George	4	Marshall	Megan Smith	4
Barton	Jeff Prendergast	4	Meade	Aaron Baugh	4
Bourbon	Justin Harbit	4	Miami	Andy Friesen	5
Brown	Tyler Warner	4	Mitchell	Connor Rolen	4
Butler	Tyler Burt	4	Montgomery	Ryan Lies	4
Cherokee	David Jenkins	4	Morris	Brent Konen	4
Cheyenne	Abby McGuire	4	Morton	Kraig Schultz	4
Cloud	Matt Farmer	3	Neosho	Logan Martin	4
Coffey	Matt Peek	4	Ness	Andy Nelson	4
Comanche	Matt Hanvey	4	Norton	Eric Wiens	4
Cowley	Kurt Grimm	4	Osage	Levi Jaster	4
Decatur	Daniel Howard	4	Osborne	Chris Lecuyer	4
Dickinson	Clint Thornton	4	Pawnee	Kevin Wood	4
Doniphan	Jesse Morland	4	Phillips	Eric Wiens	4
Elk	Viki Cikanek	4	Pottawatomie	Ben Couchman	4
Ellis	Luke Kramer	4	Pratt	Wes Sowards	4
Finney	Jared King	4	Rawlins	Kevin Klag	4
Ford	Jeff Sutton	4	Reno	Keith Murrow	5
Franklin	Ryan Tewllman	4	Republic	Rob Unruh	4
Geary	Corey Alderson	4	Rice	Steve Adams	4
Gove	Matt Schmidt	4	Rooks	Cale Hedges	4
Graham	Jake Brooke	4	Rush	Jason Wagner	4
Gray	Jared King	4	Russell	James Svaty	4
Greeley	Kurt Meier	4	Saline	Pat Riese	4
Greenwood	Justin Jones	2	Scott	Kurt Meier	4
Hamilton	Kurt Meier	4	Seward	Jason Vajnar	4
Harvey	Charlie Cope	4	Sheridan	Kevin Klag	4
Haskell	Kelly Lazar	6	Sherman	Abby McGuire	4
Hodgeman	Dan Haneke	4	Smith	Kirk Andrews	4
Jackson	Tyler Warner	4	Stafford	Kyle Abrahamson	4
Jefferson	Brad Rueschhoff	4	Stanton	Kraig Schultz	4
Jewell	Brandon Tritch	4	Stevens	Kraig Schultz	4
Kearney	Zerick Kuecker	4	Thomas	Jared Ireland	4
Kingman	Troy Smith	3	Trego	Kent Hensley	4
Kiowa	Kyle Abrahamson	4	Wabaunsee	Darin Porter	4
Labette	Rob Roggin	4	Wallace	Abby McGuire	4
Lane	Angie Reisch	2	Wilson	Cassie Wells	4

Table 2. Annual regional changes in mean pheasants per mile (P/M), 2024.

Route	2023 P/M	2024 P/M	% Δ
	Flint Hills		
Butler	0.01	0.00	0
Cowley	0.00	0.00	0
Dickinson	0.54	0.26	-51
Elk	0.00	0.00	NE
Geary	0.00	0.00	NE
Greenwood	0.00	0.00	NE
Marion	0.08	0.00	-100
Morris	0.01	0.00	-100
Pottawatomie	0.00	0.00	NE
Wabaunsee	0.00	0.00	0
Region	**0.06**	**0.03**	**-58**
	Glaciated Plains		
Atchison	0.00	0.00	NE
Brown	0.00	0.00	NE
Doniphan	0.00	0.00	0
Jackson	0.00	0.00	0
Jefferson	0.00	0.00	0
Marshall	0.03	0.00	-100
Region	**0.00**	**0.00**	**-100**
	Smoky Hills		
Barton	0.05	0.17	243
Cloud	0.03	0.33	1067
Ellis	0.03	0.18	575
Hodgeman	0.13	0.24	94
Jewell	0.19	0.28	44
Mitchell	0.16	0.03	-82
Ness	0.06	0.02	-63
Osborne	0.00	0.11	NE
Phillips	0.13	0.08	-39
Republic	0.01	0.06	700
Rice	0.39	0.39	-2
Rooks	0.38	0.12	-67
Rush	0.36	0.38	4
Russell	0.07	0.09	40
Saline	0.00	0.00	0
Smith	0.16	0.02	-90
Trego	0.05	0.19	243
Region	**0.13**	**0.16**	**22**

Route	2023 P/M	2024 P/M	% Δ
	Northern High Plains		
Cheyenne	0.27	0.88	223
Decatur	0.23	0.38	65
Gove[a]	0.17	0.16	-5
Graham	0.16	0.20	29
Greeley	0.82	1.03	26
Lane	0.10	0.04	-55
Logan	0.07	0.18	167
Norton	0.00	0.21	NE
Rawlins	0.14	0.58	305
Scott	0.14	1.01	600
Sheridan	0.02	0.17	633
Sherman	0.10	0.20	108
Thomas	0.13	0.00	-100
Wallace	0.03	0.11	220
Region	**0.17**	**0.37**	**117***
	South-Central Prairies		
Barber	0.00	0.07	NE
Comanche	0.00	0.01	NE
Harvey	0.00	0.04	NE
Kingman	0.03	0.14	400
Kiowa	0.26	0.16	-41
Pawnee	0.16	0.71	350
Pratt	0.21	0.16	-24
Reno	0.02	0.01	-73
Stafford	0.02	0.13	567
Region	**0.08**	**0.16**	**104**
	Southern High Plains		
Finney	0.01	0.18	2400
Ford	0.01	0.08	1200
Gray	0.00	0.07	NE
Hamilton	0.01	0.87	6000
Haskell	0.09	0.05	-44
Kearny	0.10	0.21	123
Meade	0.06	0.01	-90
Morton	0.06	0.85	1425
Seward	0.04	0.20	420
Stanton	0.01	0.07	900
Stevens	0.33	1.69	415
Region	**0.06**	**0.39**	**511***
Statewide	**0.10**	**0.21**	**108***

* = Significant difference ($p < 0.1$)

**The Osage Cuestas region is outside of the pheasant range and is removed for analysis.

Table 3. Annual regional changes in pheasant chicks per hen (C/H), chicks per brood (C/B), and broods per hen (B/H), 2024.

Region	2023C/H	2024C/H	%Δ	2023 C/B	2024 C/B	%Δ	2023 B/H	2024 B/H	%Δ
Flint Hills	8.0	4.7	-42	7.2	4.7	-35	0.8	1.0	29
Glaciated Plains	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Northern High Plains	11.3	10.9	-3	5.9	5.6	-5	0.5	0.7	48
Osage Cuestas	0.0	0.0	0	0.0	0.0	0	0.0	0.0	0
Smoky Hills	5.9	5.6	-7	4.6	5.2	14	0.7	0.6	-5
South-Central Prairies	11.1	4.1	-63	6.5	4.8	-26	0.8	0.6	-25
Southern High Plains	4.5	6.7	49	3.4	4.6	38	0.6	0.8	45
Statewide	7.4	7.0	-4	5.2	5.1	-3	0.8	0.7	-10

Table 4. Annual regional changes in mean quail per mile (Q/M), 2024.

Route	2023 Q/M	2024 Q/M	% Δ
	Flint Hills		
Butler	0.29	0.68	133
Cowley	0.23	0.16	-29
Dickinson	0.09	0.16	69
Elk	0.06	0.44	667
Geary	0.05	0.10	114
Greenwood	0.21	0.28	35
Marion	0.03	0.26	825
Morris	0.15	0.04	-70
Pottawatomie	0.04	0.01	-67
Wabaunsee	0.12	0.06	-53
Region	**0.13**	**0.22**	**74**
	Glaciated Plains		
Atchison	0.05	0.04	-14
Brown	0.04	0.13	260
Doniphan	0.27	0.04	-84
Jackson	0.05	0.24	350
Jefferson	0.03	0.02	-50
Marshall	0.11	0.01	-87
Region	**0.09**	**0.08**	**-11**
	Northern High Plains		
Cheyenne	0.00	0.00	NE
Decatur	0.02	0.28	1167
Gove	0.00	0.00	NE
Graham	0.02	0.33	1367
Greeley	0.00	0.00	NE
Lane	0.02	0.00	-100
Logan	0.00	0.00	NE
Norton	0.07	0.13	89
Rawlins	0.00	0.00	NE
Scott	0.00	0.01	NE
Sheridan	0.00	0.23	NE
Sherman	0.00	0.00	NE
Thomas	0.00	0.00	NE
Wallace	0.03	0.00	-100
Region	**0.01**	**0.01**	**17***
	South-Central Prairies		
Barber	0.32	0.53	66
Comanche	0.14	0.14	0
Harvey	0.06	0.00	-100
Kingman	0.20	0.24	18
Kiowa	0.28	0.19	-31
Pawnee	0.02	0.06	167
Pratt	0.23	0.03	-88
Reno	0.12	0.09	-29
Stafford	0.08	0.04	-50
Region	**0.16**	**0.15**	**-10**
	Smoky Hills		
Barton	0.04	0.23	450
Cloud	0.13	0.18	41
Ellis	0.03	0.18	600
Hodgeman	0.03	0.35	920
Jewell	0.17	0.07	-58
Mitchell	0.29	0.09	-70
Ness	0.02	0.01	-67
Osborne	0.01	0.01	0
Phillips	0.05	0.05	0
Republic	0.08	0.06	-20
Rice	0.25	0.17	-31
Rooks	0.16	0.01	-96
Rush	0.06	0.16	188
Russell	0.07	0.08	9
Saline	0.04	0.02	-60
Smith	0.38	0.10	-75
Trego	0.00	0.14	NE
Region	**0.11**	**0.11**	**5**
	Southern High Plains		
Finney	0.04	0.14	280
Ford	0.01	0.03	150
Gray	0.02	0.11	400
Hamilton	0.54	0.66	21
Haskell	0.00	0.00	0
Kearny	0.01	0.00	-100
Meade	0.11	0.29	169
Morton	0.10	0.72	587
Seward	0.00	0.03	NE
Stanton	0.00	0.14	NE
Stevens	0.21	0.25	21
Region	**0.10**	**0.22**	**125***
	Osage Cuestas		
Allen	0.01	0.03	100
Bourbon	0.05	0.10	88
Cherokee	0.03	0.06	100
Coffey	0.58	0.09	-85
Franklin	0.01	0.00	-100
Labette	0.00	0.01	NE
Miami	0.01	0.00	-100
Montgomery	0.13	0.34	170
Neosho	0.07	0.24	243
Osage	0.06	0.07	25
Wilson	0.04	0.15	250
Region	**0.09**	**0.10**	**9**
Statewide	**0.09**	**0.13**	**42***

*Values are significant at a $P < 0.10$.

NA = Data Not availiable

NE = Not estimable

Table 5. Annual regional changes in quail chick per adult (C/A), chicks per brood (C/B), and broods/adult, 2024.

Region	2023 C/A	2024 C/A	%Δ	2023 C/B	2024 C/B	%Δ	2023 B/A	2024 B/A	%Δ
Flint Hills	1.0	1.9	86	8.6	8.6	0	0.07	0.21	182
Glaciated Plains	0.8	1.0	25	8.3	8.3	0	0.10	0.09	-6
Northern High Plains	0.2	15.3	7017	3.0	13.6	352	0.00	0.50	NE
Osage Cuestas	1.8	1.5	-18	7.3	7.5	3	0.21	0.17	-19
Smoky Hills	1.8	2.2	23	8.5	8.6	1	0.11	0.12	10
South-Central Prairies	1.0	2.3	132	9.9	11.0	11	0.06	0.07	16
Southern High Plains	1.0	5.6	447	8.8	10.6	21	0.06	0.22	267
Statewide	1.2	2.6	114	8.5	9.6	13	0.09	0.09	0

Table 6. Annual regional changes in mean turkey per mile (T/M), 2024

Route	2023 T/M	2024 T/M	[a]% Δ	Route	2023 T/M	2024 T/M	% Δ
	Northeast				Northcentral		
Atchison	0.29	0.00	-100	Barton	0.00	0.05	NE
Brown	0.03	0.06	100	Cloud	0.27	0.06	-79
Dickinson	0.06	0.01	-88	Ellis	0.45	0.09	-79
Doniphan	0.12	0.00	-100	Jewell	0.52	0.28	-47
Franklin	0.17	0.17	0	Mitchell	0.00	0.17	0
Geary	0.24	0.41	69	Osborne	0.40	0.40	0
Jackson	0.30	0.93	204	Phillips	0.05	0.01	-86
Jefferson	0.44	0.19	-57	Republic	0.67	0.17	-75
Marshall	0.15	0.32	114	Rooks	0.03	0.00	-100
Morris	0.74	0.41	-44	Rush	0.13	0.27	111
Osage	0.15	0.41	171	Russell	0.20	0.01	-94
Pottawatomie	0.37	0.25	-33	Saline	0.15	0.31	112
Wabaunsee	0.01	0.01	100	Smith	0.48	0.52	9
Region	**0.24**	**0.24**	**3**	**Region**	**0.26**	**0.18**	**-30**
	Northwest				Southcentral		
Cheyenne	0.07	0.49	600	Barber	0.01	0.07	900
Decatur	0.00	0.07	NE	Comanche	0.00	0.00	0
Graham	0.00	0.00	0	Harvey	0.20	0.33	62
Norton	0.03	0.05	75	Kingman	0.04	0.14	275
Rawlins	0.09	0.10	8	Kiowa	0.00	0.16	NE
Sheridan	0.00	0.00	0	Meade	0.00	0.00	0
Sherman	0.00	0.00	0	Pawnee	0.06	0.00	-100
Thomas	0.00	0.00	0	Pratt	0.00	0.09	0
Region	**0.02**	**0.09**	**267**	Reno	0.22	0.71	220
	Southwest			Rice	0.05	0.36	0
Finney	0.04	0.06	-100	Stafford	0.23	0.44	91
Ford	0.00	0.00	0	**Region**	**0.07**	**0.21**	**184***
Gove[a]	0.05	0.00	-100		Southeast		
Gray	0.00	0.00	0	Allen	0.05	0.05	0
Greeley	0.00	0.00	0	Bourbon	0.40	0.01	-97
Hamilton	0.00	0.00	0	Butler	0.09	0.89	900
Haskell	0.00	0.00	0	Cherokee	0.00	0.00	0
Hodgeman	0.00	0.00	0	Coffey	0.06	0.04	-29
Kearny	0.00	0.00	0	Cowley	0.16	0.17	5
Lane	0.00	0.00	0	Elk	0.28	0.30	7
Logan	0.05	0.05	17	Greenwood	0.39	0.80	103
Morton	0.00	0.00	0	Labette	0.04	0.28	600
Ness	0.00	0.00	0	Marion	0.01	0.18	1200
Scott	0.00	0.00	0	Miami	0.23	0.55	137
Seward	0.00	0.00	0	Montgomery	0.04	0.03	-25
Stanton	0.00	0.00	0	Neosho	0.08	0.03	-60
Stevens	0.00	0.00	0	Wilson	0.08	0.13	64
Trego	0.01	0.00	-100	**Region**	**0.14**	**0.25**	**81**
Wallace	0.08	0.06	-27				
Region	**0.01**	**0.01**	**-25**	**Statewide**	**0.12**	**0.16**	**27**

*Values are significant at a $P < 0.10$.

NA = Data Not Available

NE = Not estimable

Table 7. Annual regional changes in turkey poults per hen (P/H), poults per brood (P/B), and broods per hen (B/H), 2024.

Region	2023 P/H	2024 P/H	%Δ	2023 P/B	2024 P/B	%Δ	2023 B/H	2024 B/H	%Δ
Northcentral	1.3	2.1	64	5.5	5.7	5	0.21	0.36	71
Northeast	0.8	1.6	103	4.1	6.3	54	0.18	0.25	39
Northwest	0.5	3.0	450	3.0	4.3	44	0.18	0.62	238
Southcentral	2.0	3.3	66	6.0	5.9	-2	0.30	0.53	77
Southeast	1.6	1.5	-8	4.5	4.6	1	0.37	0.33	-9
Southwest	3.0	0.9	-71	4.5	3.5	NE	0.33	0.25	-25
Statewide	1.2	1.9	65	4.7	5.5	15	0.23	0.35	50

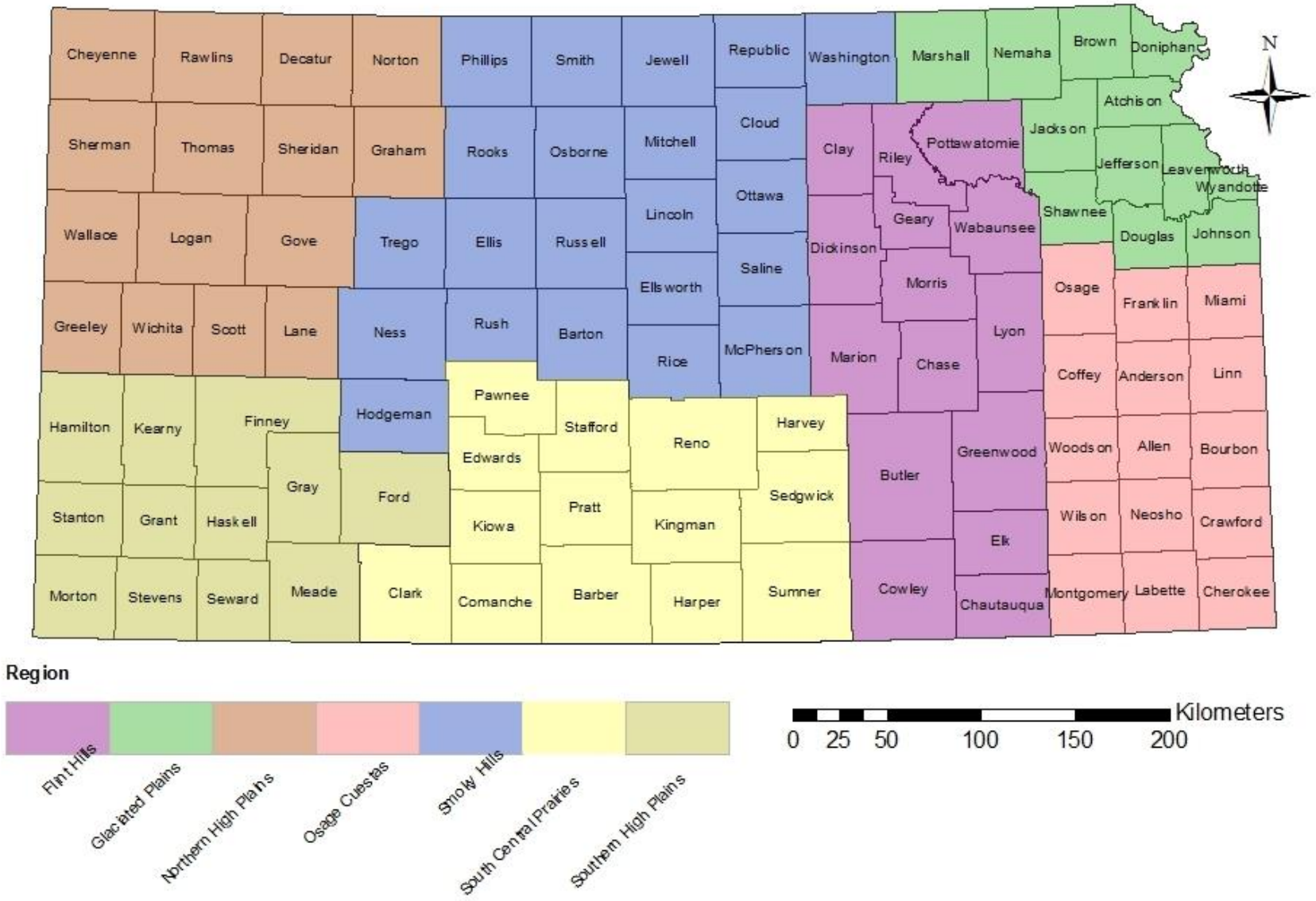

Figure 1. Kansas Small Game Regions.

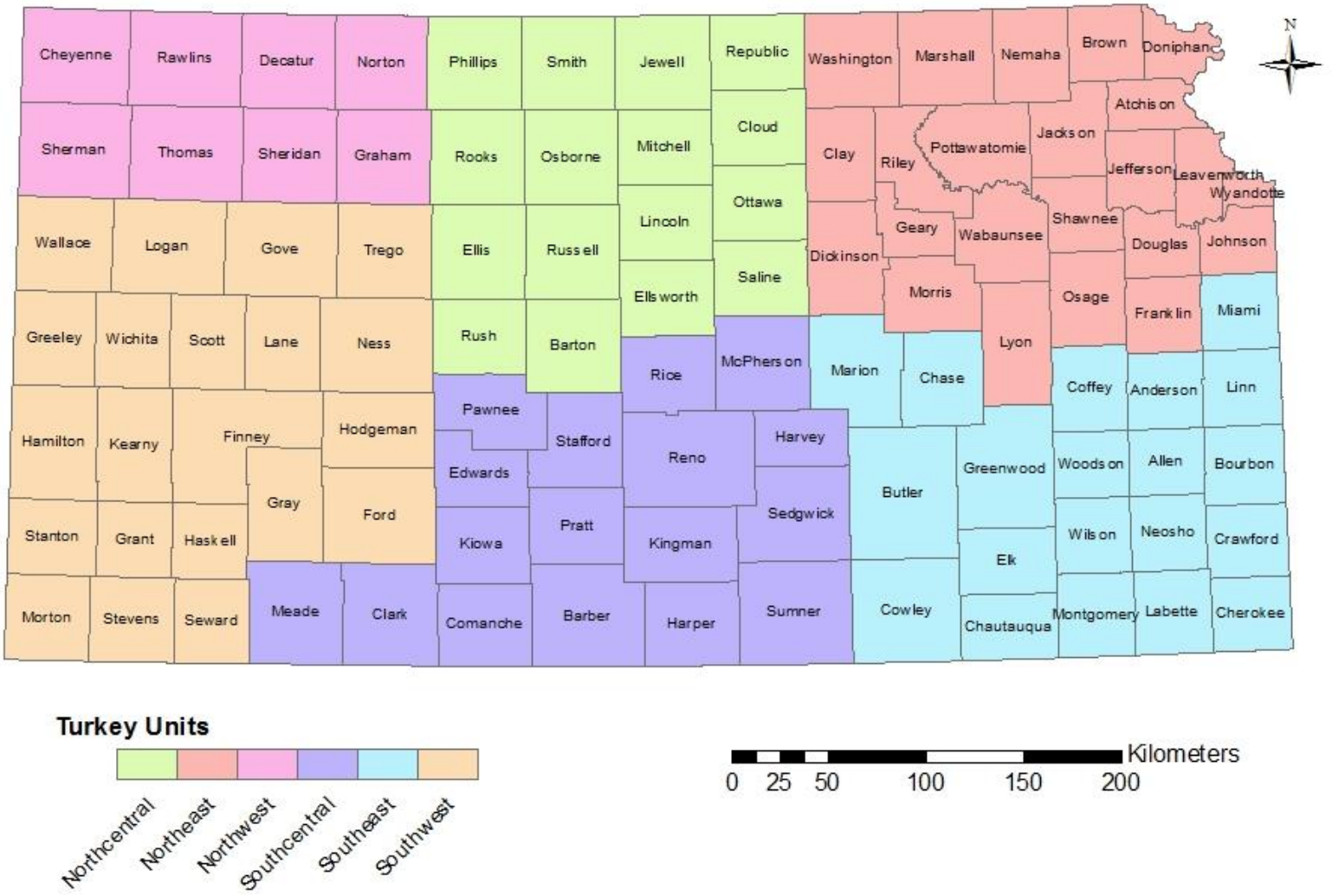

Figure 2. Kansas Turkey Management Regions.

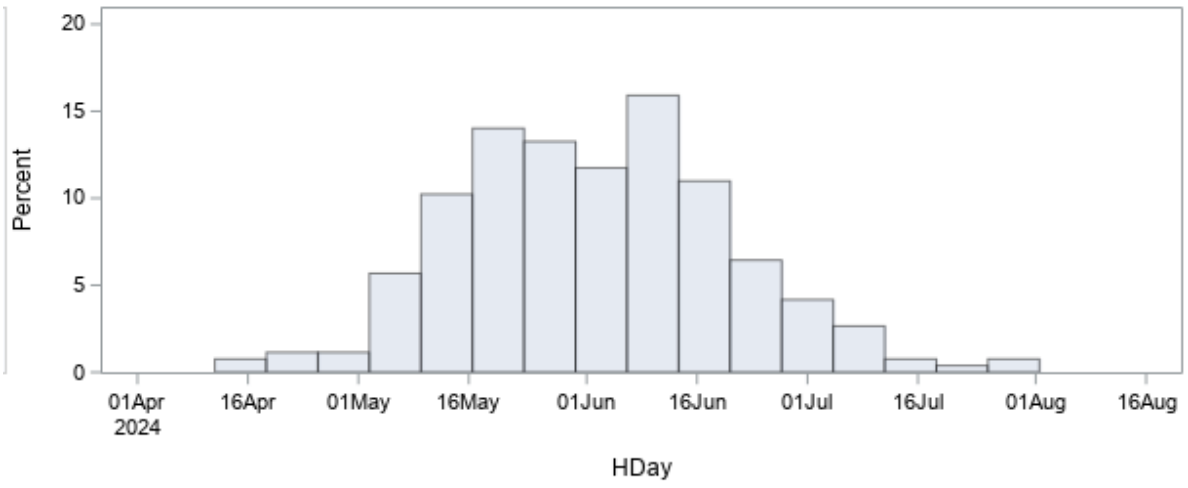

Figure 3. Weekly hatch dates of pheasant broods estimated from age at detection.

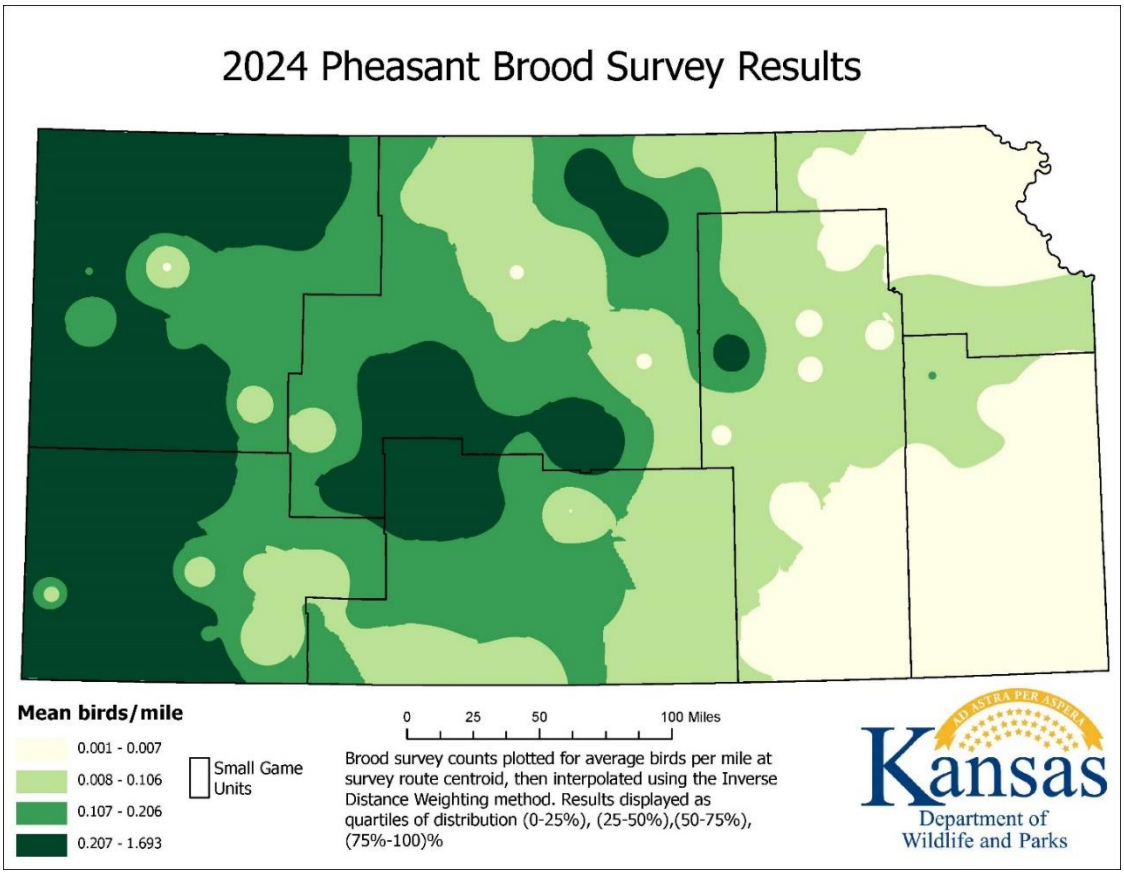

Figure 4. Relative pheasant densities estimated from brood survey routes in Kansas, 2024.

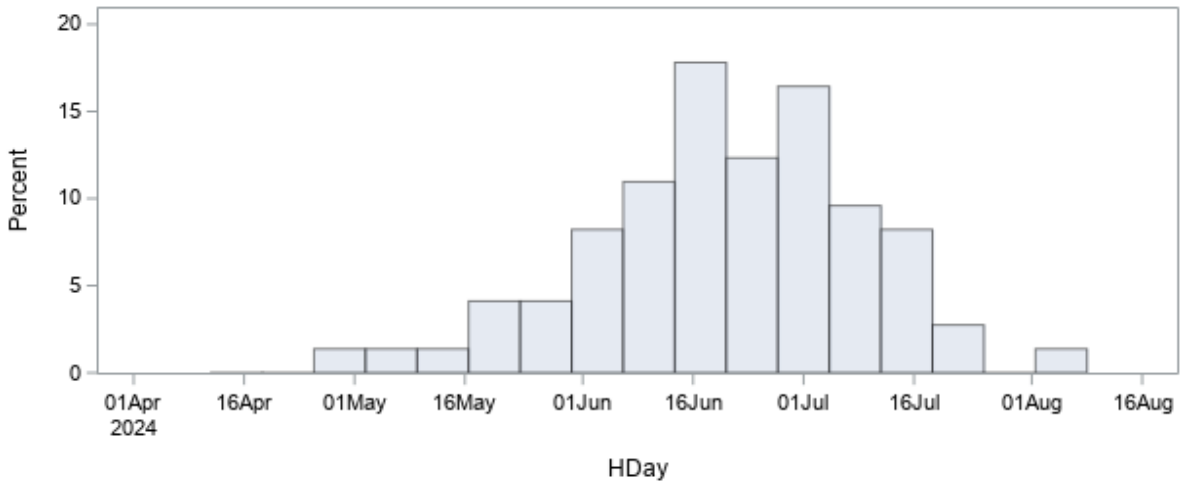

Figure 5. Weekly hatch dates of quail broods estimated from age at detection.

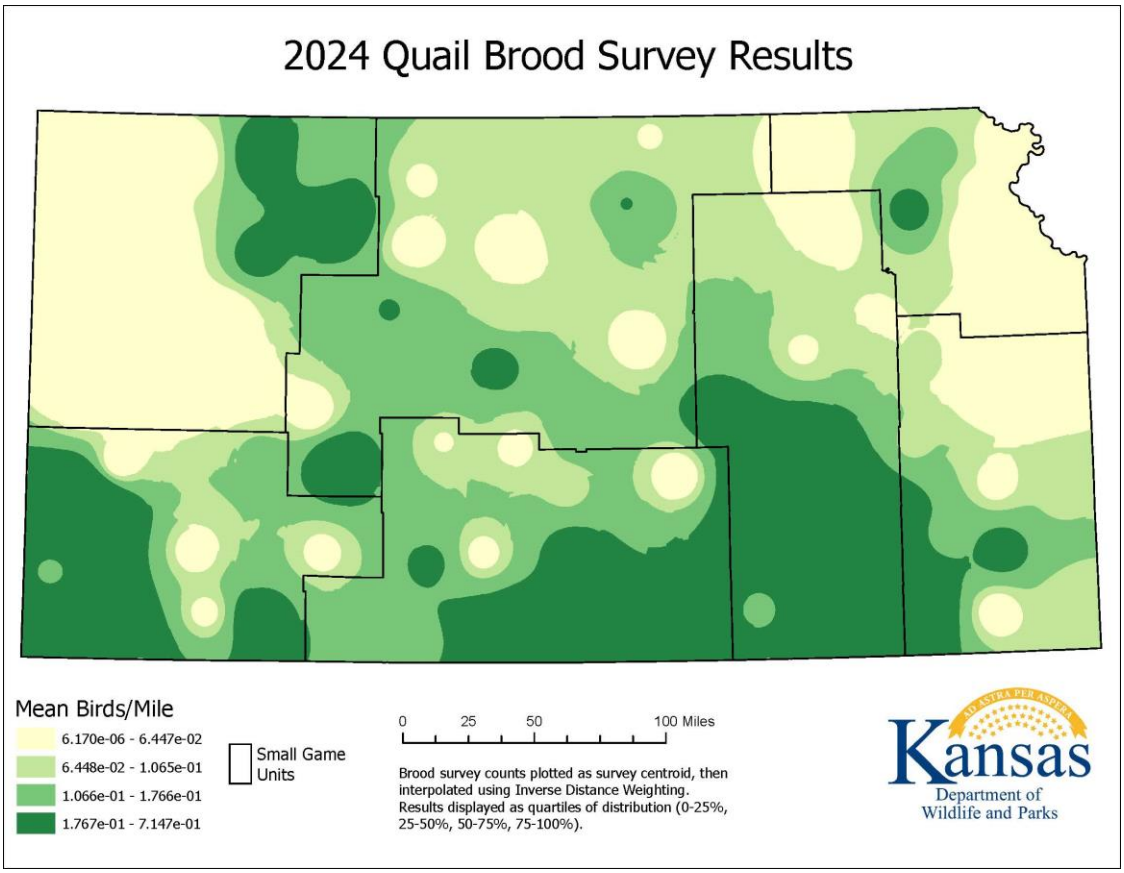

Figure 6. Relative quail densities estimated from brood survey routes in Kansas, 2024.

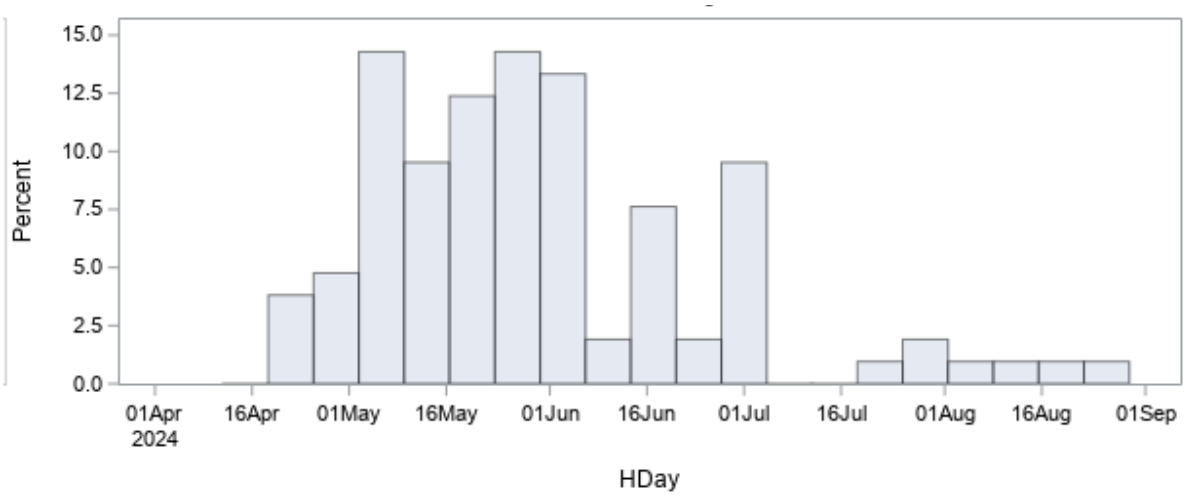

Figure 7. Weekly hatch dates of turkey broods estimated from age at detection.

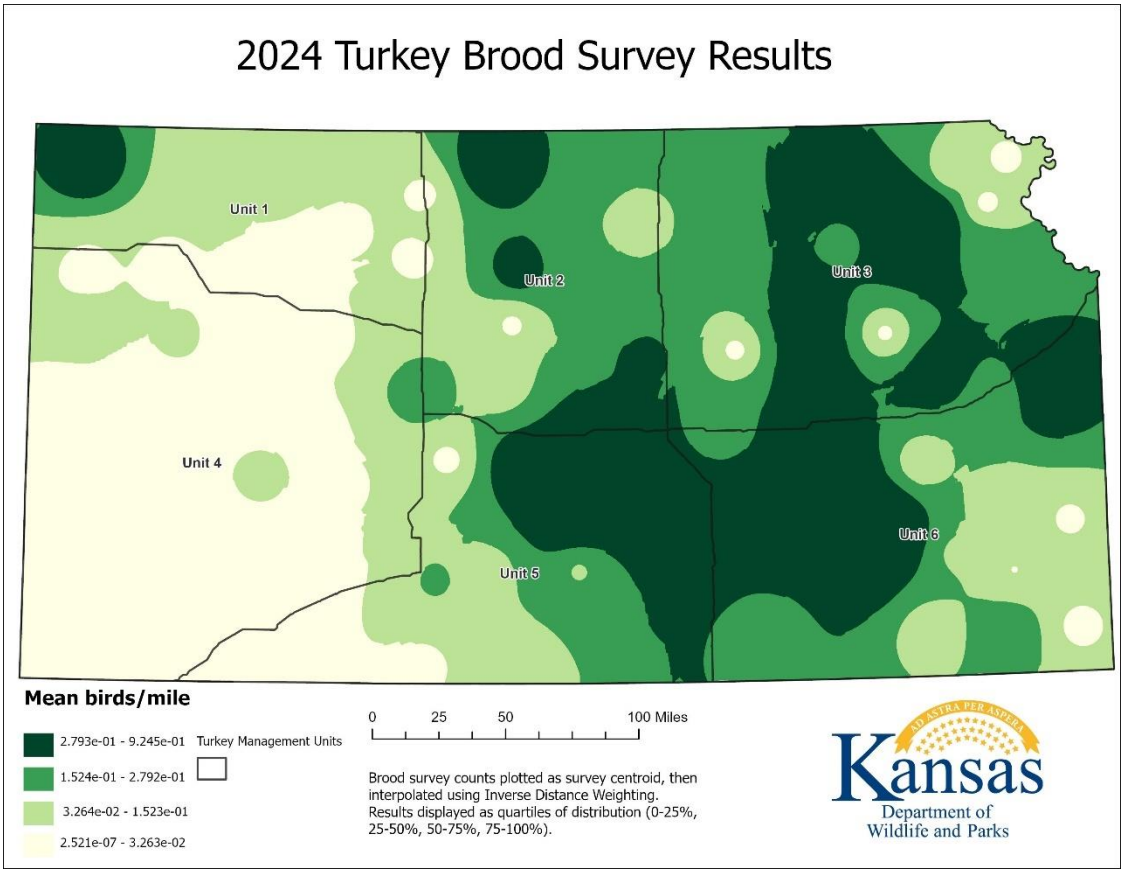

Figure 8. Relative turkey densities estimated from brood survey routes in Kansas, 2024.

Table 8. Regional comparision of Cottontail per mile (C/M), 2024.

Route	2024 C/M
Flint Hills	
Butler	0.06
Cowley	0.10
Dickinson	0.01
Elk	0.07
Geary	0.09
Greenwood	0.03
Marion	0.05
Morris	0.01
Pottawatomie	0.02
Wabaunsee	0.11
Region	**0.06**
Glaciated Plains	
Atchison	0.03
Brown	0.00
Doniphan	0.00
Jackson	0.10
Jefferson	0.07
Marshall	0.06
Region	**0.04**
Osage Cuestas	
Allen	0.03
Bourbon	0.08
Cherokee	0.04
Coffey	0.05
Franklin	0.01
Labette	0.02
Miami	0.07
Montgomery	0.05
Neosho	0.07
Osage	0.17
Wilson	0.23
Region	**0.07**

Route	2024 C/M
Smoky Hills	
Barton	0.12
Cloud	0.01
Ellis	0.05
Hodgeman	0.01
Jewell	0.09
Mitchell	0.05
Ness	0.12
Osborne	0.05
Phillips	0.02
Republic	0.00
Rice	0.06
Rooks	0.06
Rush	0.04
Russell	0.03
Saline	0.03
Smith	0.05
Trego	0.09
Region	**0.05**
Southern High Plains	
Finney	0.01
Ford	0.00
Gray	0.01
Hamilton	0.05
Haskell	0.02
Kearny	0.00
Meade	0.02
Morton	0.10
Seward	0.05
Stanton	0.00
Stevens	0.14
Region	**0.04**

Route	2024 C/M
South-Central Prairies	
Barber	0.09
Comanche	0.01
Harvey	0.01
Kingman	0.04
Kiowa	0.04
Pawnee	0.01
Pratt	0.00
Reno	0.05
Stafford	0.07
Region	0.04
Northern High Plains	
Cheyenne	0.02
Decatur	0.00
Gove	0.13
Graham	0.00
Greeley	0.06
Lane	0.00
Logan	0.01
Norton	0.09
Rawlins	0.05
Scott	0.09
Sheridan	0.02
Sherman	0.01
Thomas	0.01
Wallace	0.00
Region	**0.04**

Statewide 0.05

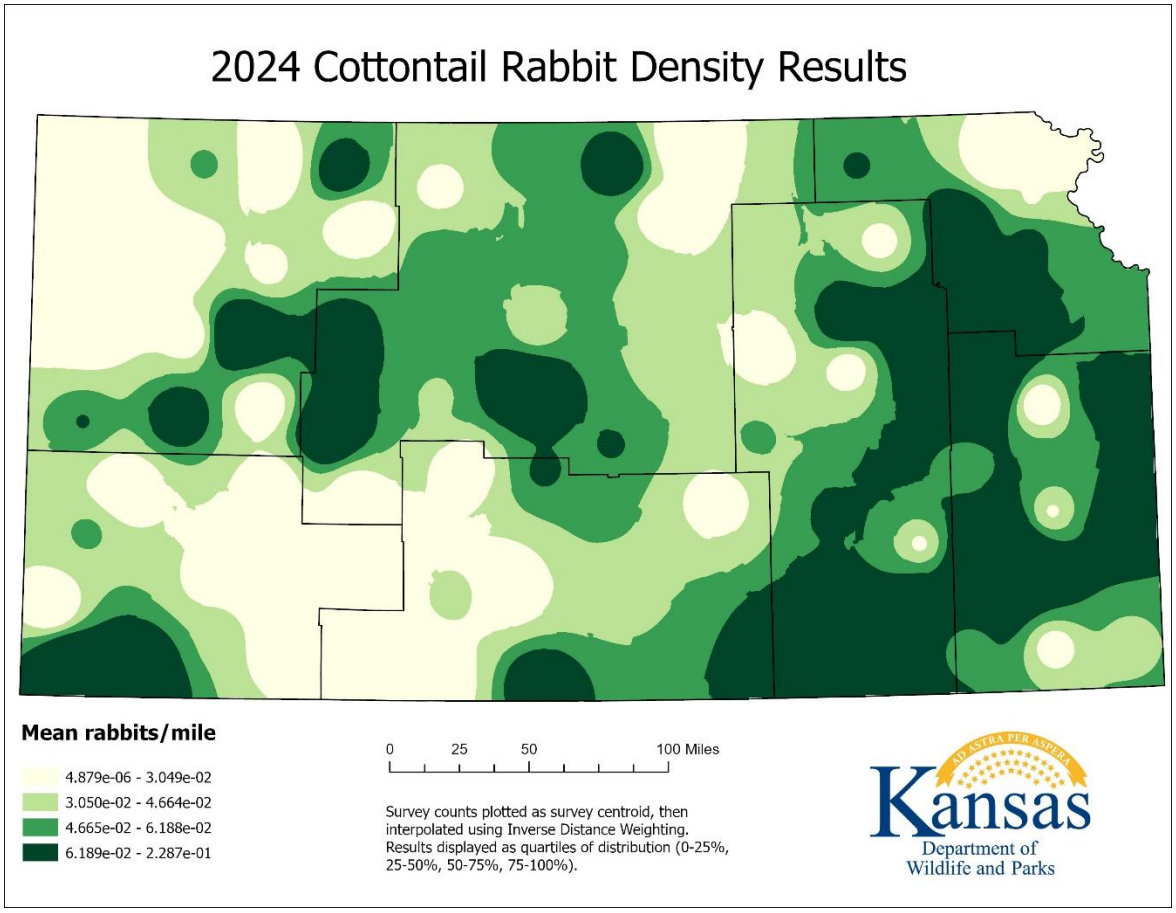

Figure 9. Relative Cottontail densities estimated from brood survey routes in Kansas, 2024.

Table 9. Regional comparision of jackrabbit per mile (J/M), 2024.

Route	2024 J/M
Flint Hills	
Butler	0.00
Cowley	0.00
Dickinson	0.00
Elk	0.00
Geary	0.00
Greenwood	0.00
Marion	0.00
Morris	0.00
Pottawatomie	0.00
Wabaunsee	0.00
Region	**0.00**
Glaciated Plains	
Atchison	0.00
Brown	0.00
Doniphan	0.00
Jackson	0.00
Jefferson	0.00
Marshall	0.00
Region	**0.00**
Osage Cuestas	
Allen	0.00
Bourbon	0.00
Cherokee	0.00
Coffey	0.00
Franklin	0.00
Labette	0.00
Miami	0.00
Montgomery	0.00
Neosho	0.00
Osage	0.00
Wilson	0.00
Region	**0.00**
Smoky Hills	
Barton	0.01
Cloud	0.01
Ellis	0.00
Hodgeman	0.00
Jewell	0.02
Mitchell	0.02
Ness	0.01
Osborne	0.00
Phillips	0.01
Republic	0.00
Rice	0.00
Rooks	0.01
Rush	0.00
Russell	0.00
Saline	0.00
Smith	0.00
Trego	0.02
Region	**0.01**
Southern High Plains	
Finney	0.01
Ford	0.00
Gray	0.01
Hamilton	0.06
Haskell	0.02
Kearny	0.00
Meade	0.06
Morton	0.03
Seward	0.15
Stanton	0.04
Stevens	0.01
Region	**0.04**
South-Central Prairies	
Barber	0.03
Comanche	0.04
Harvey	0.00
Kingman	0.00
Kiowa	0.09
Pawnee	0.01
Pratt	0.04
Reno	0.01
Stafford	0.00
Region	**0.02**
Northern High Plains	
Cheyenne	0.02
Decatur	0.01
Gove	0.00
Graham	0.00
Greeley	0.05
Lane	0.00
Logan	0.00
Norton	0.00
Rawlins	0.00
Scott	0.01
Sheridan	0.00
Sherman	0.04
Thomas	0.00
Wallace	0.01
Region	**0.01**

Statewide 0.01

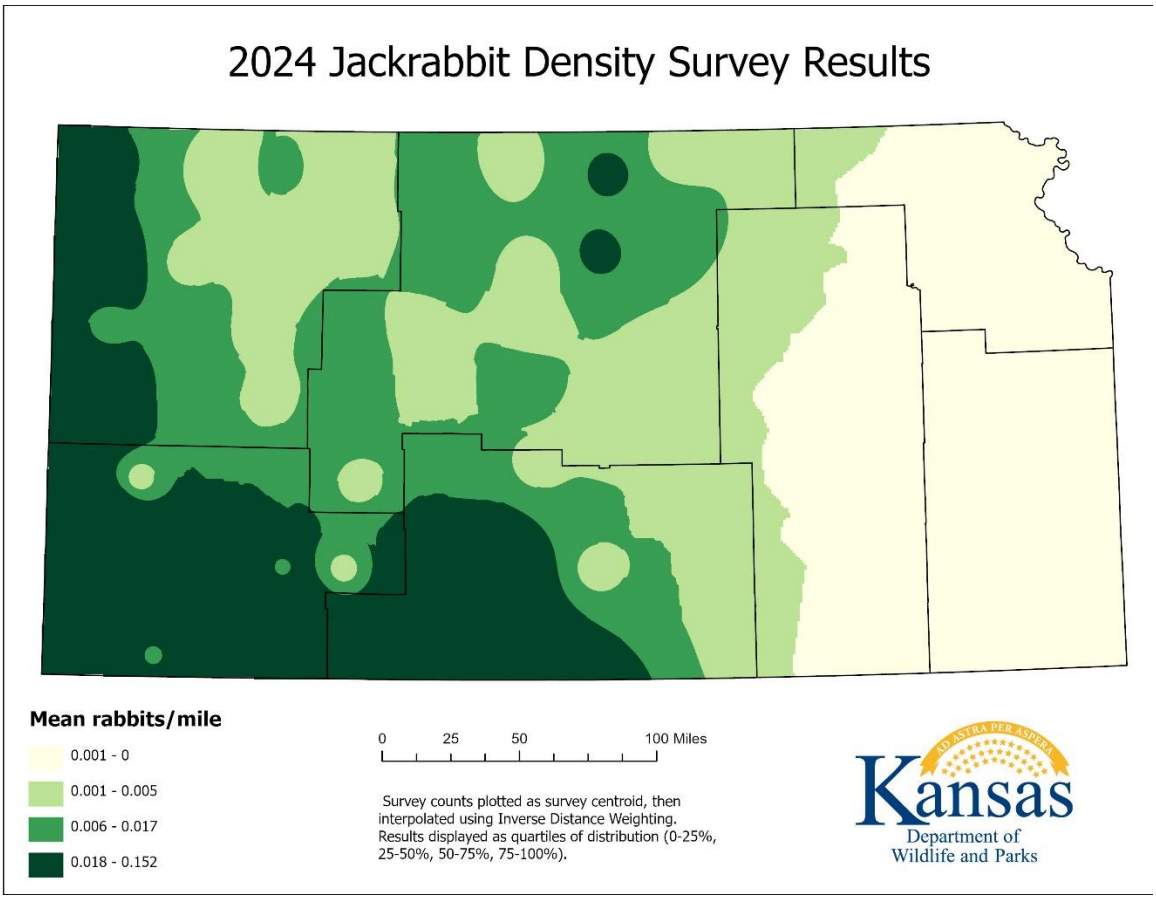

Figure 10. Relative Jackrabbit densities estimated from brood survey routes in Kansas, 2024

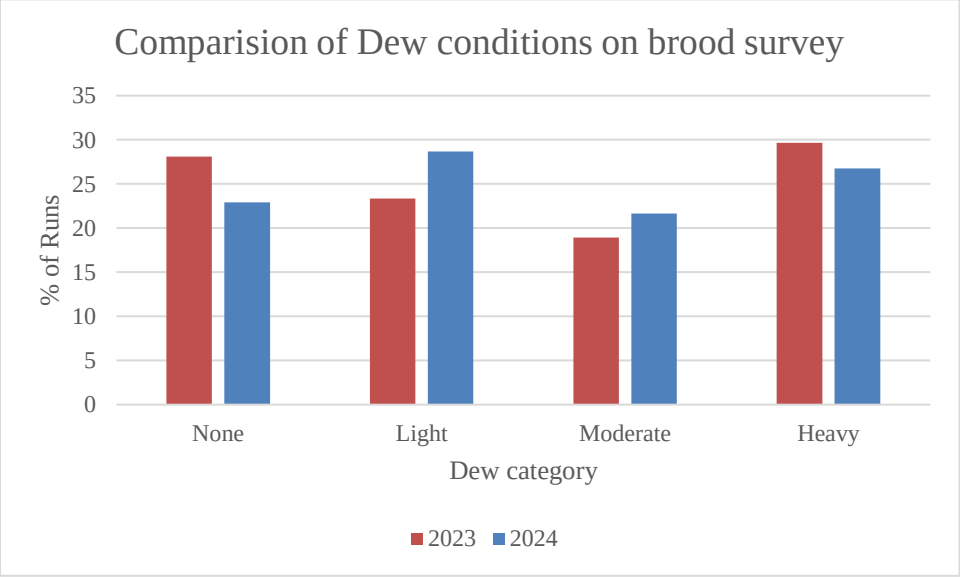

Figure 11. Interannual Comparison of Dew conditions during brood surveys. The presence of dew is one of the largest factors impacting detectability during survey.