

QUAIL, PHEASANT, & TURKEY BROOD SURVEY - 2011

Performance Report

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QUAIL, PHEASANT, AND TURKEY BROOD SURVEY RESULTS – 2011

Prepared by David Dahlgren, 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, in extreme southwestern Kansas scaled quail do provide some (< 1%) of the data. Summer brood surveys were initiated in 1986 focusing on pheasant and quail. Turkey data was not collected and reported until 2006. 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 hunted within designated seasons, are not included in summer brood surveys due to their late summer habitat use patterns not coinciding with observation protocol (i.e., generally use of roadways is limited).

METHODS

Dates for the 2011 Summer Brood Survey were from July 17 through August 27. This survey consisted of opportunistic monitoring during this period. Observers (KDWPT biologists, law enforcement, and other personnel) were instructed to record all quail, pheasants, and turkeys observed and the number of days spent traveling non-pavement roads on a weekly basis for 6 consecutive weeks during their regular work duties. A day spent in city boundaries or on paved roads was not considered an observation day. They recorded number of males, females, females with young, young, distinct broods, distinct brood size, and approximate age of brood based on size class (used photographs of known age chicks for all species). When a brood was detected, observers attempted to flush the entire brood by walking around the brood location. These tallies were then divided by observer-days to generate an index (*variable/observer-day*) for each class. Additionally, young per adult female ratios were included. Data are summarized by species-specific survey regions within Kansas (Figure 1), and statewide.

In 2011 weather during the survey period was extremely hot and dry compared to previous years, being the second hottest summer on record. This may have precluded some broods using open cover for this year's brood survey, likely underestimating indices.

Data Analysis

For reporting purposes summary statistics were used based on *variable/observer-day*. Histograms were used to assess hatching chronology for each species (based on estimated age of

young). A Wilcoxon Rank-Sum Test (same as Mann-Whitney U-test) was used to compare the distribution of each index year to year for the six week survey period. A one-tailed test with an alpha level of $P \leq 0.10$ was used to assess difference between the current and previous year.

Young:adult female ratio data can be used to assess productivity within regions and populations. While numbers per observer-day may represent abundance, young:adult female ratios represent reproductive success. All adult females with or without young are included in the ratio data. For quail, all adults (males and females) were used for ratio data because male quail are known to incubate nests and care for young.

RESULTS

Quail

In 2011 KDWPT personnel provided 2100 observer-days within the six week survey period (Table 1). This was up compared to 2010, where 1800 observer-days were provided. In 2011 a total of 757 quail were observed, down considerably from 2010 when 1747 quail were detected (Table 1). Indices and statistical comparisons are included in Tables 1 – 2. Notably, no broods were detected in the Glaciated Plains Region. Quail hatch peaked the 1st week of July (Figure 2). Most quail indices declined from the previous year (Table 2). Young:adult female ratios indicated mixed results across regions (Table 2).

Pheasant

In 2011 KDWPT personnel provided 1573 observer-days within the six week survey period (Table 3). This was up compared to 2010, where 1180 observer-days were provided. In 2011 a total of 1993 pheasants were detected, down significantly from 2010 when 3924 pheasants were observed. Indices and statistical comparisons are included in Tables 3 – 4. Pheasant hatch peaked the last week of June (Figure 3). Notably, no pheasants were observed in the Glaciated Plains region (northeast Kansas) during the entire survey period. Young:adult female ratios were down across all regions, though Northern High Plains and Smoky Hills fared better than other regions. Additionally, Southern High Plains declined significantly in pheasants/observer-day and young:adult female ratio (Table 3 and 4). Peak hatch date was later than normal this year.

Turkey

In 2011 KDWPT personnel provided 2142 observer-days within the six week survey period (Table 5). This was up compared to 2010, where 1795 observer-days were provided. In 2011 a total of 3322 turkeys were observed, down from 2010, when 4411 turkeys were detected. Indices and statistical comparisons are included in Tables 5 – 6. Turkey hatch peaked the 3rd week of June in 2011 (Figure 4). Most turkey indices across all regions were declining from 2010 to 2011, except in the Osage Cuestas and Northern and Southern High Plains (Table 6). Notably, the Southern High Plains increased in all indices except brood size (Table 6). Peak hatch date was later than normal this year.

DISCUSSION

Severe drought in south-western, south-central, and south-eastern Kansas occurred from fall 2010 through the 2011 breeding season, negatively impacting vegetation conditions across much of the state. Drier conditions in south-eastern Kansas (where conditions are usually too wet) provided good nesting opportunities, though drought and heat in July and August may have hurt chick survival. Moreover, for most of the state habitat conditions during nesting and early brood-rearing periods were not favorable to upland game production. This was particularly the case for the southern ½ of the state. However, some areas may have fared better than others given localized conditions.

Kansas experienced the 2nd hottest summer on record during this survey period. All upland game seek heavy cover during these conditions, making them less susceptible to detection by KDWPT personnel. The severe conditions likely underestimated most indices for all 3 species. However, young:adult ratios may provide more reliable information in these circumstances. Though overall indices may have been underestimated, the young:adult ratios still imply a significant drop in upland game populations this year.

While the north-central and north-western areas of Kansas had better vegetation conditions due to more precipitation, the data shows a significant decline from previous years in these areas. Late summer thunderstorms brought multiple hail events across these areas. While most hail events are usually localized, multiple storms increased the likelihood of impact to more area.

North-eastern Kansas (Glaciated Plains) had extremely low numbers of upland game observed this year, including no pheasants seen during the survey period. The declines in this part of the state seem to continue from the previous few years. Weather has not been favorable to upland game survival and production in this area and habitat continues to be degraded.

Quail

Statewide (combined across regions), nearly all quail indices declined in 2011 compared to 2010 (Table 2). Long term trends indicate continued decline from previous years (Figure 5). Note that quail are notoriously hard to survey with roadside methodology, especially during severe weather conditions, which may underestimate these indices. While many of the indices declined across the state, the average brood size and young:adult were on par or increased in the Northern High Plains, South-Central Prairies, Smoky Hills, and Osage Cuestas (Tables 1 and 2). In these areas mid to late summer precipitation may have sustained quail production. Anecdotal reports from landowners and biologists are indicating some fair to good quail production in these regions. Notably, very few quail were seen in the Southern High Plains and no detection of chicks occurred.

Pheasant

Statewide, nearly all indices declined for pheasant in 2011 compared to 2010 (Table 3). Long term trends indicate a severe drop in 2011, and the lowest since the beginning of this survey in 1986 (Figure 6). Even young:adult female ratios and brood size indicate severe declines (Tables

3 and 4). Most notably, not a single pheasant was detected in the Glaciated Plains during the survey period. Almost as extreme is the decline in the Southern High Plains, where only 7 broods were observed during this survey (0.05/Obs-Day), with an average of 1.75 chicks/brood (Table 4). The Northern High Plains and the Smoky Hills fared much better than other regions, with at least some production reported (Tables 3 - 4). In these areas production was down significantly from recent years when populations had been at all time highs since brood data collection began in 1986.

Turkey

Turkey declines occurred in the Flint Hills, Glaciated Plains, Smoky Hills, South-Central Prairies, while maintaining or increasing in the Osage Cuestas, Northern High Plains, and Southern High Plains (Tables 5-6). Long term trends indicate a severe drop in 2011 on a statewide scale (Figure 7). Interestingly, young:adult female ratios increased in the Flint Hills and Osage Cuestas, indicating a possible increase in production in those areas (Table 5). Conditions for turkey production were good in this part of the state.

SUMMARY

2011 will be a down year for upland game in Kansas, with declining numbers across nearly all regions and species. South-western and north-eastern Kansas are seeing some of the most extreme declines, largely due to weather. Extreme weather conditions are taking their toll on upland game in these areas, and throughout the state.

Pheasant populations in western Kansas rely heavily on winter wheat growth for nesting habitat. In many areas of this primary range, wheat growth was not conducive to nest survival. North-western and north-central Kansas, while still declining, had some reproduction, and fared much better than the other regions. In much of western Kansas we had extremely good carry-over from last year into this year's breeding season. That carry-over adult population will provide much of the hunting opportunity in western Kansas this year, especially the south-west.

Quail populations will likely be spotty across the Smoky Hill, South-Central Prairie, and Osage Cuestas regions, with some local areas having good populations. Much of the rest of the state, especially north-eastern and south-western will have very limited opportunity for quail this coming fall.

It is important to note that detection probabilities for all upland bird species were likely much lower during this brood survey compared to previous years because of the record high temperatures in late July and August. It has been the experience of field personnel that upland birds seek out heavy cover during high temperature events and become less detectable. This likely underestimated 2011 indices and exaggerated statistical relationships (i.e., declines are likely not as extreme, and increases are more extreme than suggested by the data) when comparing 2011 to 2010 data.

Table 1. Quail summary statistics by small game region, 2010-2011.

	Total field days		Total Birds		Adult Males		Adult Females		Young		Adult w/ Young		Broods	
	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011	2010	2011
Flint Hills	324	391	313	58	73	16	62	16	178	26	33	5	25	4
Glaciated Plains	235	209	204	21	47	13	35	8	122	0	18	0	16	0
Northern High Plains	74	121	67	48	13	13	9	3	45	32	6	0	5	4
Osage Cuestas	443	586	325	180	108	46	92	31	125	103	33	14	26	11
Smoky Hills	371	432	585	206	119	46	103	33	363	127	54	11	44	18
South Central Prairies	112	233	183	232	32	34	32	32	119	166	20	26	18	28
Southern High Plains	132	162	84	12	51	7	19	5	25	0	2	0	5	0
Statewide	1691	2134	1761	757	443	175	352	128	977	454	166	56	139	65

Table 2. Change in quail indices, 2010-2011.

Small Game Regions	Year	Birds/ Obs-day	Male/ Obs-day	Female/ Obs-day	Young/ Obs-day	Broods/ Obs-day	Brood Size	Y:A Ratio
Flint Hills	2010	1.00	0.23	0.19	0.58	0.08	8.34	1.42
	2011	0.16	0.05	0.05	0.08	0.01	6.50	3.32
	% Change	-84	-77	-76	-86	-87	-22	134
Glaciated Plains	2010	0.86	0.20	0.15	0.51	0.07	7.36	1.79
	2011	0.10	0.06	0.04	0.00	0.00	0.00	NA
	% Change	-88	-68	-76	-100	-100	-100	NA
Northern High Plains	2010	0.78	0.16	0.11	0.51	0.06	9.50	5.04
	2011	0.39	0.14	0.03	0.40	0.03	8.33	7.00
	% Change	-50	-12	-76	-22	-42	-12	39
Osage Cuestas	2010	0.75	0.24	0.21	0.29	0.06	7.20	0.75
	2011	0.31	0.08	0.05	0.17	0.02	9.42	2.32
	% Change	-59	-65	-75	-42	-71	31	208
Smoky Hills	2010	1.42	0.28	0.24	0.89	0.11	8.37	1.85
	2011	0.43	0.12	0.07	0.31	0.04	6.97	1.83
	% Change	-70	-59	-71	-65	-66	-17	-1
South-Central Prairies	2010	1.64	0.27	0.29	1.08	0.17	6.79	2.53
	2011	0.99	0.15	0.14	0.70	0.12	6.21	2.86
	% Change	-40	-45	-53	-35	-28	-9	13
Southern High Plains	2010	0.62	0.38	0.15	0.19	0.04	4.58	6.67
	2011	0.05	0.03	0.18	0.00	0.00	NA	NA
	% Change	-93	-91	16	-100	-100	-100	NA
Statewide	2010	1.01	0.25	0.19	0.58	0.08	7.62	2.09
	2011	0.35	0.09	0.06	0.24	0.03	7.32	2.71
	% Change	-65	-63	-71	-59	-62	-4	30

Bolded values are statistically significant relationships for one-tailed Ttests at $P \leq 0.10$

Table 3. Pheasant summary statistics by small game region, 2010-2011.

	Total Field Days		Total Birds		Adult Males		Adult Females		Young		Adult Female w/ Young		Broods	
	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>
Flint Hills	292	399	60	12	11	2	9	2	40	8	7	1	8	3
Glaciated Plains	254	206	39	0	7	0	7	0	25	0	2	0	5	0
Northern High Plains	78	135	1201	803	65	112	121	113	1015	578	93	81	157	116
Smoky Hills	345	436	1810	927	171	106	234	158	1405	663	186	118	259	152
South Central Prairies	125	240	345	151	44	31	43	41	258	79	33	23	47	29
Southern High Plains	149	157	562	100	87	35	112	49	363	16	64	3	120	9
Statewide	1243	1573	4017	1993	385	286	526	363	3106	1344	385	226	596	309

Table 4. Change in pheasant indices, 2010-2011.

Small Game Regions	Year	Birds/ Obs-day	Male/ Obs-day	Female/ Obs-day	Young/ Obs-day	Broods/ Obs-day	Brood Size	Y:AF Ratio
Flint Hills	2010	0.22	0.04	0.03	0.15	0.03	5.00	5.00
	2011	0.03	0.01	0.01	0.03	0.01	2.67	3.00
	% Change	-86	-82	-84	-78	-72	-47	-40
Glaciated Plains	2010	0.15	0.03	0.03	0.09	0.02	5.00	4.17
	2011	0.00	0.00	0.00	0.00	0.00	0.00	NA
	% Change	-100	-100	-100	-100	-100	-100	NA
Northern High Plains	2010	11.23	0.62	1.13	9.48	1.48	6.04	9.43
	2011	5.17	0.73	0.71	3.73	0.74	5.20	6.25
	% Change	-54	18	-37	-61	-50	-14	-34
Smoky Hills	2010	4.45	0.42	0.57	3.45	0.63	5.72	6.18
	2011	1.83	0.21	0.31	1.30	0.30	4.51	4.18
	% Change	-59	-50	-45	-62	-53	-21	-32
South- Central Prairies	2010	2.45	0.32	0.30	1.82	0.32	5.67	6.25
	2011	0.56	0.12	0.15	0.29	0.11	2.69	1.86
	% Change	-77	-64	-49	-84	-67	-53	-70
Southern High Plains	2010	3.57	0.55	0.72	2.30	0.76	3.62	3.17
	2011	0.58	0.21	0.28	0.09	0.05	1.75	0.75
	% Change	-84	-62	-61	-96	-93	-52	-76
Statewide	2010	3.68	0.33	0.46	2.88	0.54	5.19	5.73
	2011	1.36	0.23	0.24	0.97	0.20	3.63	3.41
	% Change	-63	-31	-47	-66	-63	-30	-40

Bolded values are statistically significant relationships for one-tailed Ttests at $P \leq 0.10$

Table 5. Turkey summary statistics by small game region, 2010-2011.

	Total Field Days		Total Birds		Adult Males		Adult Females		Young		Adult Female w/ Young		Broods	
	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>	<u>2010</u>	<u>2011</u>
Flint Hills	290	401	604	181	94	36	142	36	368	109	90	22	90	24
Glaciated Plains	246	210	537	138	115	33	131	38	291	67	76	23	78	19
Northern High Plains	79	141	361	805	118	210	60	243	183	352	35	95	35	96
Osage Cuestas	458	576	788	870	153	131	267	284	368	455	86	131	84	133
Smoky Hills	389	416	1185	688	275	138	263	157	647	393	151	85	147	85
South Central Prairies	103	234	677	527	221	191	86	109	370	227	55	81	54	66
Southern High Plains	123	164	14	113	0	10	5	85	9	18	4	15	4	14
Statewide	1688	2142	4166	3322	976	749	954	952	2236	1621	497	452	492	437

Table 6. Change in turkey indices, 2010-2011.

Small Game Regions	Year	Birds/ Obs-day	Male/ Obs-day	Female/ Obs-day	Young/ Obs-day	Broods/ Obs-day	Brood Size	Y:AF Ratio
Flint Hills	2010	2.07	0.32	0.48	1.26	0.31	4.78	2.62
	2011	0.46	0.09	0.09	0.27	0.06	4.65	3.91
	% Change	-78	-73	-80	-78	-80	-3	49
Glaciated Plains	2010	2.17	0.46	0.53	1.18	0.32	4.50	1.97
	2011	0.65	0.16	0.18	0.31	0.09	0.00	1.63
	% Change	-70	-66	-66	-74	-71	0	-17
Northern High Plains	2010	4.98	1.72	0.79	2.46	0.47	4.29	2.94
	2011	5.40	1.58	1.66	2.16	0.58	6.03	1.54
	% Change	8	-8	109	-12	21	41	-48
Osage Cuestas	2010	1.71	0.33	0.58	0.80	0.18	5.54	1.39
	2011	1.57	0.25	0.50	0.83	0.23	3.99	1.66
	% Change	-8	-25	-15	4	28	-28	20
Smoky Hills	2010	2.83	0.64	0.63	1.56	0.35	4.88	2.53
	2011	1.57	0.31	0.36	0.90	0.19	5.92	2.65
	% Change	-45	-52	-43	-42	-46	21	5
South-Central Prairies	2010	6.55	2.21	0.80	3.55	0.52	6.69	4.74
	2011	2.19	0.82	0.43	0.94	0.26	4.66	2.46
	% Change	-67	-63	-46	-74	-49	-30	-48
Southern High Plains	2010	0.10	0.00	0.04	0.07	0.03	2.17	2.17
	2011	0.64	0.07	0.48	0.12	0.08	1.33	0.34
	% Change	522	100	1178	84	166	-38	-84
Statewide	2010	2.92	0.81	0.55	1.55	0.31	5.00	2.66
	2011	1.78	0.49	0.53	0.80	0.21	4.71	2.21
	% Change	-39	-40	-4	-48	-32	-6	-17

Bolded values are statistically significant relationships for one-tailed Ttests at $P \leq 0.10$

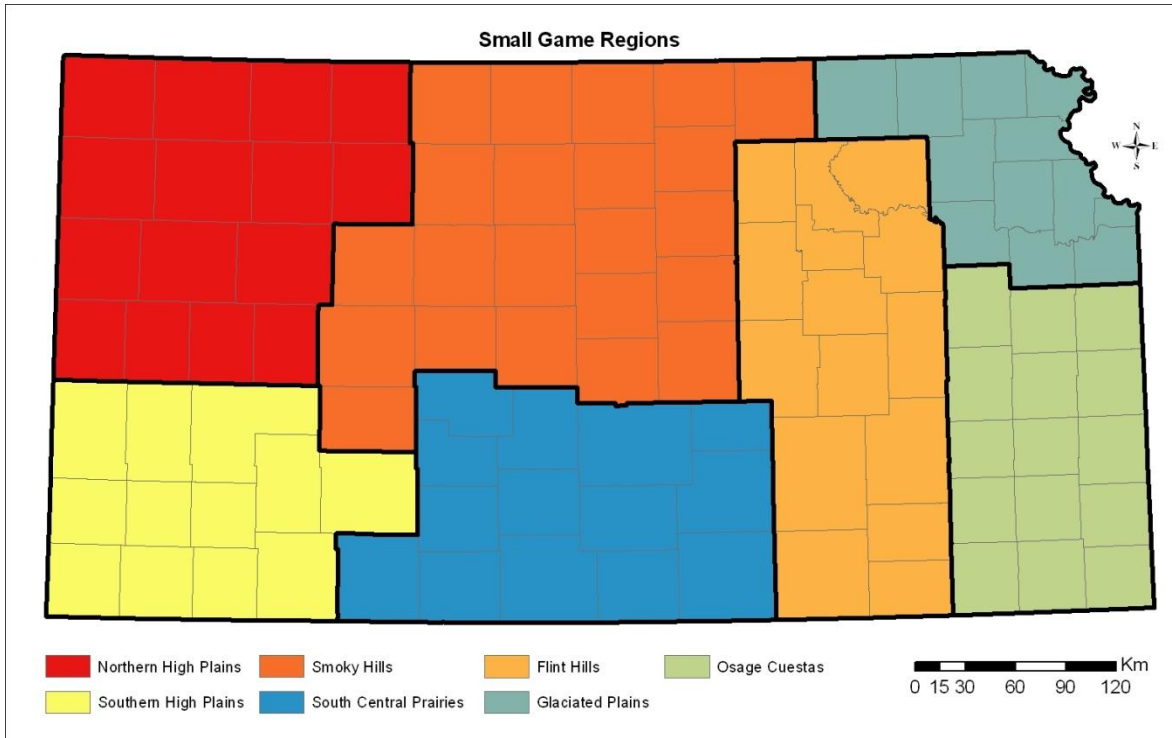


Figure 1. Kansas Small Game Regions, 2011.

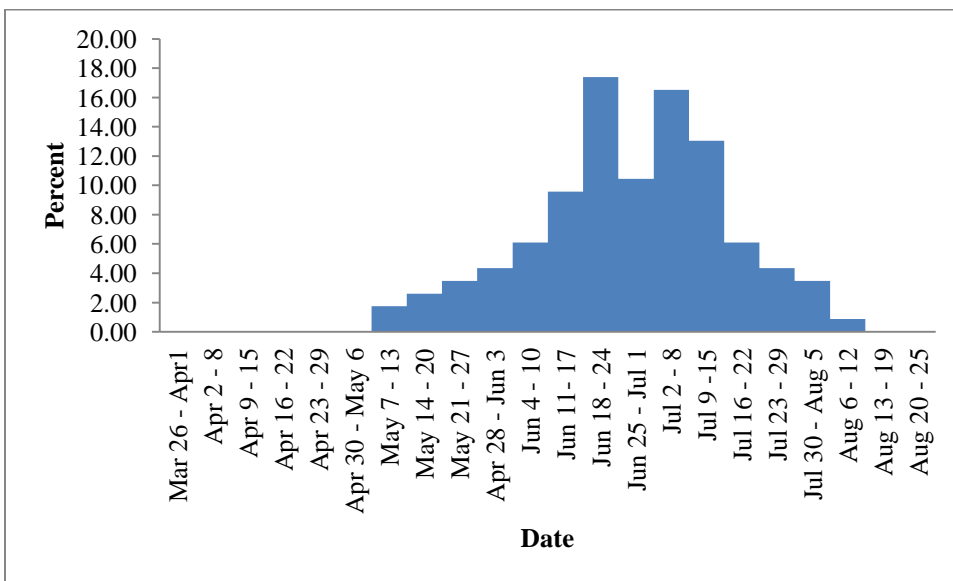


Figure 2. Quail hatch date frequency statewide, 2011.

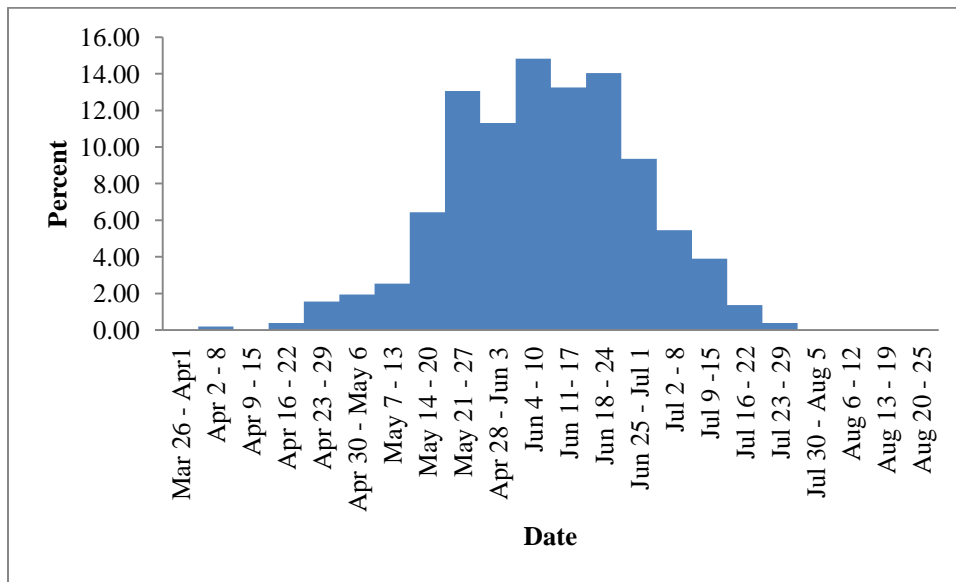


Figure 3. Pheasant hatch date frequency statewide, 2011.

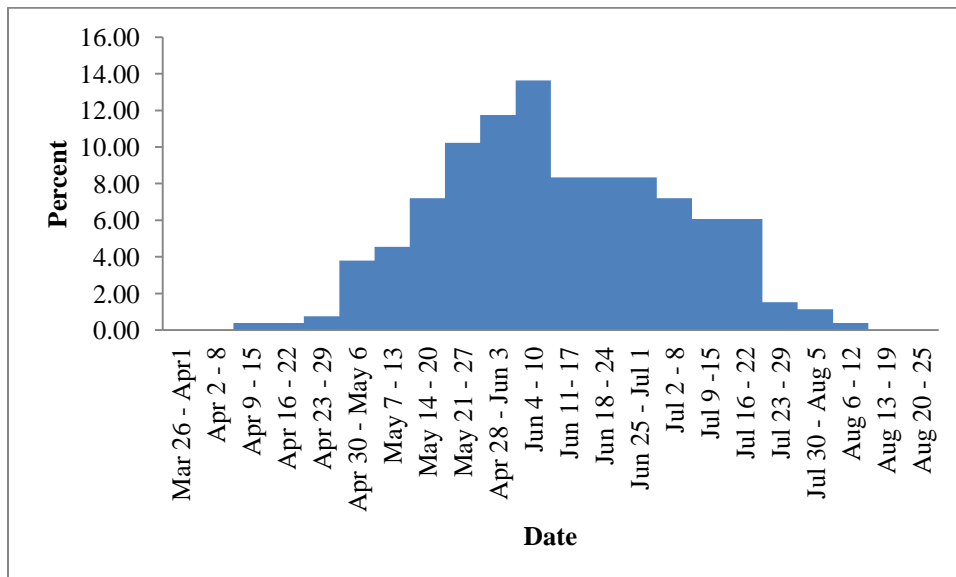


Figure 4. Turkey hatch date frequency statewide, 2011.

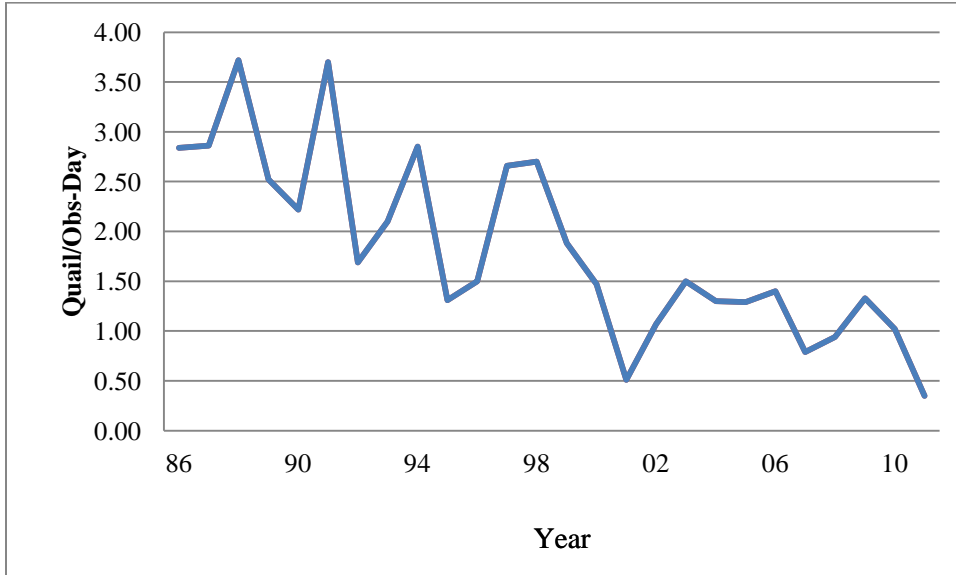


Figure 5. Quail/Observer-Day statewide long term trend, 1986-2011.

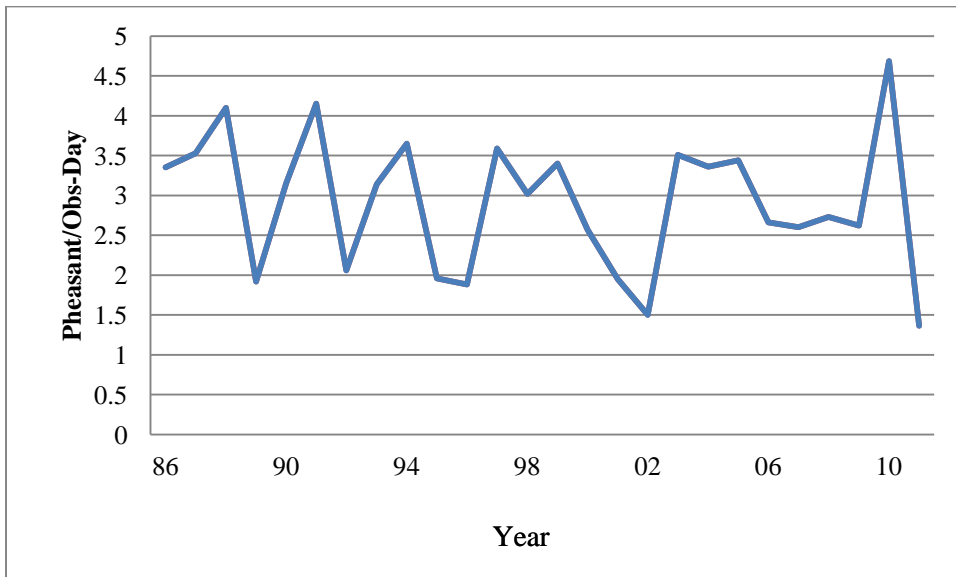


Figure 6. Pheasant/Observer-Day statewide long term trend, 1986-2011.

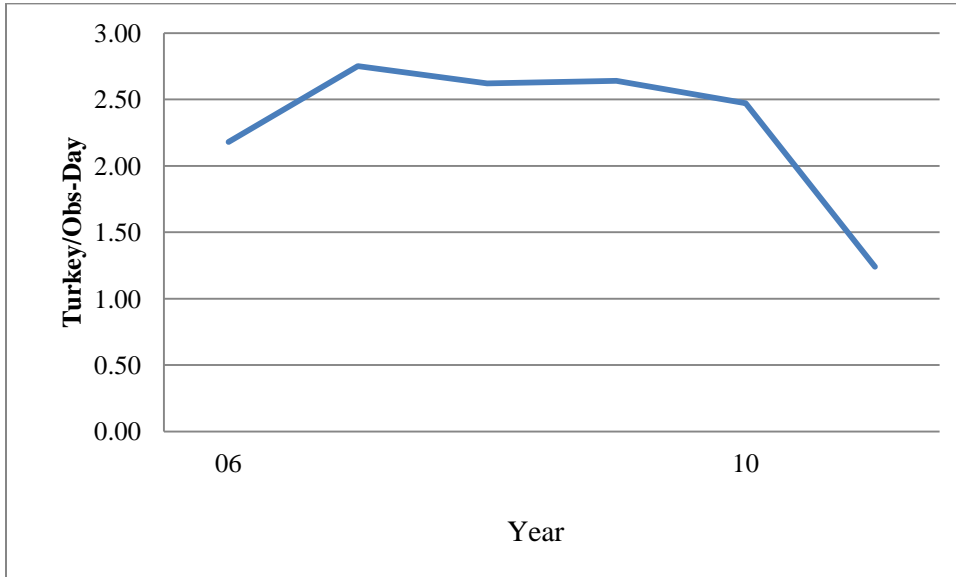


Figure 7. Turkey/Observer-Day statewide long term trend, 2006-2011.