



Prairie Chicken Hunter Activity 2017

Prepared by: Kansas Department of Wildlife, Parks, and Tourism

Date: June 30, 2020

Executive Summary

The Kansas Department of Wildlife, Parks, and Tourism conducts an online survey of greater prairie chicken (*Tympanuchus cupido*) hunters each year to estimate number of hunters, days hunted, and harvest. In 2017, 1,113 hunters were estimated to have gone afield a total of 8,083 days to hunt prairie chickens. An estimated 1,466 prairie chickens were harvested during an open prairie chicken season, with a hunter success rate of 40.3%.

Introduction

Kansas has two species of prairie grouse: the greater prairie chicken (*Tympanuchus cupido*) and lesser prairie chicken (*T. pallidicinctus*). Although both species are present in Kansas, the greater prairie chicken is more abundant than its slightly smaller relative and has a larger range across Kansas. The greater prairie chicken predominately utilizes tallgrass and mixed-grass prairie in eastern and northern Kansas, with large populations in the Flint Hills and Smoky Hills. Lesser prairie chickens are primarily found in mixed-grass and sand sagebrush prairies in southwestern Kansas, but their range is expanding into west-central Kansas.

Two distinct units are designated for hunting greater prairie chickens in Kansas: an east and southwest unit (see Figure 1). In the east unit, hunters can take prairie chickens during an early season, which runs from September 15 through October 15, and a regular season, which extends from the third Saturday of November through January 31. The southwest unit remains closed to hunting of prairie chickens, as the lesser prairie chicken is designated a threatened species by the U.S Fish and Wildlife Service. Hunters can harvest greater prairie chickens during an open season and must adhere to a two-bird daily bag limit and an eight-bird possession limit.

The Kansas Department of Wildlife, Parks, and Tourism (KDWPT) conducts a survey following the completion of greater prairie chicken hunting seasons to obtain biological and social data needed for informed management. Based on data from the survey, KDWPT estimates harvest and hunter activity for greater prairie chickens in Kansas.

Methods

A random sample of hunter names from the 2017-2018 season was obtained from the KDWPT database of resident and non-resident permit purchasers. The \$2.50 prairie chicken stamp allows KDWPT to identify all potential prairie chicken hunters during the season. As hunters were surveyed via email, only hunters with a valid email address were considered for inclusion in the online survey. Providing an email address is optional, thus not all hunters purchasing a prairie chicken stamp could be randomly surveyed by email. However, most hunters use email, with 85% of hunters voluntarily providing an email address. From the available pool of hunters, approximately 30% were chosen to receive the survey. After the prairie chicken season ended, selected recipients were sent an email containing a link to the online survey.

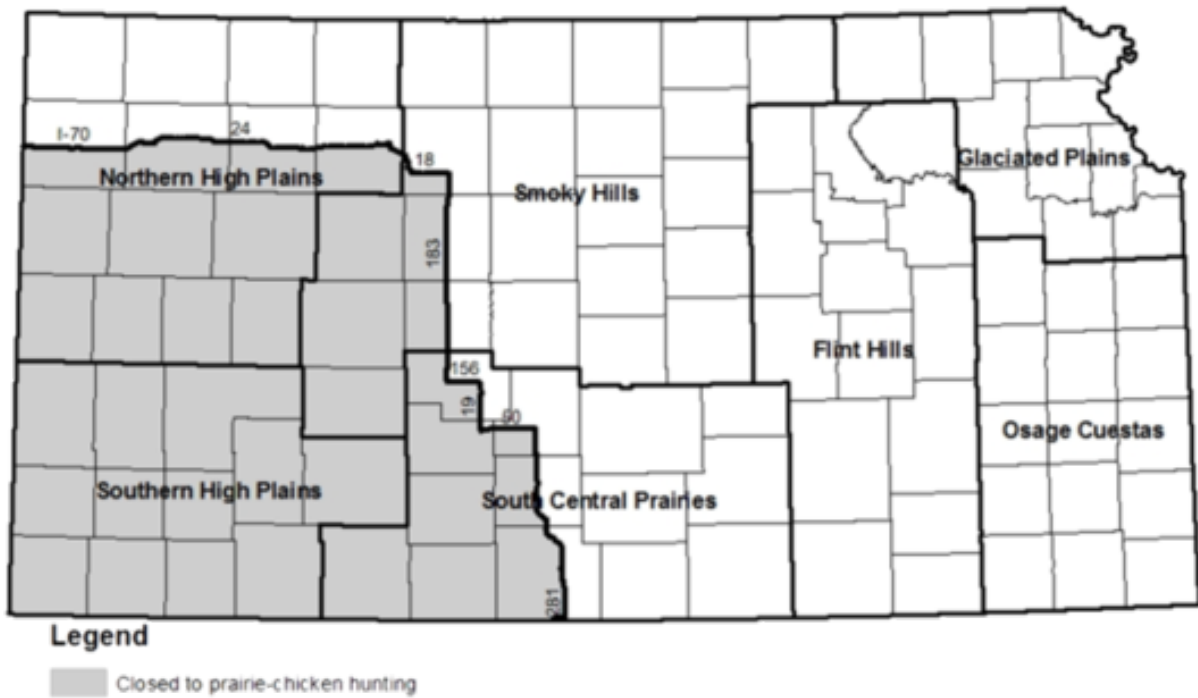


Figure 1: Map of small game management regions and unit closed to prairie chicken hunting in Kansas.

When recipients did not respond to the initial survey request, they received follow up requests one and two weeks apart.

The harvest survey was designed to be concise, with questions limited to days hunted and primary county of hunting of upland gamebirds, days spent hunting prairie chickens during the early and regular season in each county utilized, and the number prairie chickens harvested by county and season. Depending on respondents' answers, a maximum of 27 questions were asked, with questions consisting of multiple choice, open-ended, and clickable maps. The 2017-2018 survey contained four special topic questions pertaining to proposed changes to season dates of prairie chicken hunting.

All survey summarization and statistical analysis was completed using the statistical program R. To estimate harvest and activity statistics, a result weight (total permits/usable survey responses) was used to extrapolate the raw numbers reported by hunters. Harvest and hunter activity statistics were compiled based on small game management regions (Figure 1) and at the statewide level.

Results

Licenses sold and survey responses

Hunters purchased a total of 4,919 prairie chicken stamps in Kansas for the 2017-2018 prairie

chicken season, of which 31.96% ($n=1,572$) were residents of Kansas and 68.04% ($n= 3,347$) were non-residents.

A sample of 1,495 hunters (30.39%) purchasing the prairie chicken stamp were randomly selected to receive the Kansas Prairie Chicken Hunter Activity Survey. The Department obtained a 46.69% response rate, consisting of 698 responses with usable data for estimation of prairie chicken harvest and hunter activity during the 2017-2018 season. Respondents took NA minutes on average to complete the survey.

Of the survey respondents, 87.68% ($n=612$) reported hunting upland game birds, excluding turkeys, and 12.32% ($n=86$) did not hunt any upland game bird during the 2017-2018 season. Of the hunters that reported hunting upland gamebirds, including prairie chicken, quail, and pheasant, 25.98% ($n=159$) specifically hunted for prairie chickens.

Upland hunters numbers across Kansas

Prairie chicken hunters used the small game management units to varying degrees (Table 1). The primary region both resident and non-resident hunters utilized was the Smoky Hills. Forty-nine percent of hunters utilized the Smoky Hills region for hunting upland gamebirds, including pheasants, quail, and prairie chicken. Although 33% of active hunters utilized the Northern High Plains, Southern High Plains, and South Central Prairies for hunting of upland gamebirds, portions of these regions are closed to prairie chicken hunting (see Figure 1).

Days spent hunting upland birds

Upland gamebird hunters reported hunting from 1 to 45 days during an open prairie chicken season and hunted an average of 6 days. Mean number of days spent hunting by active hunters was similar across management regions (Table 2).

Prairie chicken hunters across Kansas

Similar numbers of non-resident and resident hunters targeted prairie chickens (Table 3, residents: 50.94%, non-residents 49.06%). Among active hunters, Kansas residents appeared more interested in targetting prairie chickens than non-residents, with 45% of resident hunters specifically hunting prairie chickens compared to 18% of non-resident hunters. Hunters targetted prairie chickens for an average of 7 days, but resident hunters generally spent more days hunting prairie chickens than non-residents (Table 3).

Hunter participation by prairie chicken season

Of the two seasons available to hunt prairie chickens (early, regular), the majority of hunters targetting prairie chickens participated in the regular season (78.62%). A smaller proportion of hunters participated in the early season (47.8%). Although participation in the early season was moderately high, a limited number of hunters did all of their prairie chicken hunting during the early season (19.5%). A higher proportion of hunters targetting prairie chickens did all of their hunting during the regular season (50.31%). Additionally, hunters utilized both seasons to a limited degree (28.3%). In general, Kansas residents hunted more days during the early and regular seasons than non-residents (Table 4).

Prairie chicken harvests across Kansas

An estimated 1466 prairie chickens were harvested statewide. Active hunters, both those specifically targetting and opportunistically harvesting prairie chickens, averaged 1.14 birds

and had a success rate of 40.28%. Resident hunters harvested more prairie chickens than non-resident hunters, 60.1 versus 39.9% of total harvest, but had similar average harvests (Table 5). For estimated prairie chicken harvests by season in each county see Table 6.

Table 1: Prairie chicken hunter activity in Kansas, 2017-2018.

Statistic	Flint Hills	Glaciated Plains	Northern High Plains	Osage Cuestas	Smoky Hills	South Central Prairies	Southern High Plains	Statewide
Resident								
Est Sample Size ¹	52	10	17	11	96	11	5	206
Active Upland Hunters ^{1,4}	46 (88.5)	9 (90.0)	15 (88.2)	10 (90.9)	84 (87.5)	10 (90.9)	4 (80.0)	180 (87.4)
Est Inactive Upland Hunters ^{1,2,4}	6 (11.5)	1 (10.0)	2 (11.8)	1 (9.1)	12 (12.5)	1 (9.1)	1 (20.0)	26 (12.6)
Specifically Pursued Chickens ^{3,4}	32 (69.6)	3 (33.3)	6 (40.0)	4 (40.0)	33 (39.3)	2 (20.0)	1 (25.0)	81 (45.0)
Non-resident								
Est Sample Size ¹	27	6	87	10	314	29	15	492
Active Upland Hunters ^{1,4}	24 (88.9)	5 (83.3)	77 (88.5)	9 (90.0)	277 (88.2)	26 (89.7)	13 (86.7)	432 (87.8)
Est Inactive Upland Hunters ^{1,2,4}	3 (11.1)	1 (16.7)	10 (11.5)	1 (10.0)	37 (11.8)	3 (10.3)	2 (13.3)	60 (12.2)
Specifically Pursued Chickens ^{3,4}	8 (33.3)	2 (40.0)	5 (6.5)	2 (22.2)	60 (21.7)	0 (0.0)	1 (7.7)	78 (18.1)
Overall								
Est Sample Size ¹	80	16	105	23	410	41	20	698
Active Upland Hunters ^{1,4}	70 (87.5)	14 (87.5)	92 (87.6)	20 (87.0)	361 (88.0)	36 (87.8)	18 (90.0)	612 (87.7)
Est Inactive Upland Hunters ^{1,2,4}	10 (12.5)	2 (12.5)	13 (12.4)	3 (13.0)	49 (12.0)	5 (12.2)	2 (10.0)	86 (12.3)
Specifically Pursued Chickens ^{3,4}	40 (57.1)	5 (35.7)	11 (12.0)	6 (30.0)	93 (25.8)	2 (5.6)	2 (11.1)	159 (26.0)

Note:

Some active hunters did not specify the primary region they hunted and are therefore only included in the statewide total. Additionally, statewide and overall totals may not equal sums of regional totals because of rounding errors.

¹ Because inactive hunters did not hunt in a specific region, region-specific counts are estimates using proportional methods.

² Denominator is the region sample size.

³ Denominator is the number of active hunters for the region.

⁴ Numbers in parentheses represent percentages.

Table 2: Average number of days hunted by upland gamebird hunters within small game management units, 2017-2018.

Statistic	Flint Hills	Glaciated Plains	Northern High Plains	Osage Cuestas	Smoky Hills	South Central Prairies	Southern High Plains	Statewide
Resident								
Sample Size	45	9	15	10	82	10	4	175
Mean (SD)	8.89 (9.13)	13.67 (13.28)	9.4 (9.49)	6.3 (5.29)	9.15 (8.01)	8.5 (4.17)	10 (3.37)	9.15 (8.39)
Median	6	10	6	4.5	5.5	9	8.5	6
Min, Max	1, 40	1, 45	1, 31	1, 15	1, 35	1, 14	8, 15	1, 45
95% CI	6.15, 11.63	3.46, 23.88	4.14, 14.66	2.52, 10.08	7.39, 10.91	5.52, 11.48	4.64, 15.36	7.9, 10.4
Non-resident								
Sample Size	23	5	74	9	268	25	13	417
Mean (SD)	3.48 (2.09)	4.6 (3.51)	4.92 (4.21)	6.11 (5.51)	5 (4.35)	3.6 (1.85)	4.08 (4.13)	4.81 (4.14)
Median	3	5	4	5	4	3	3	4
Min, Max	1, 10	1, 10	1, 28	2, 20	1, 45	1, 8	1, 17	1, 45
95% CI	2.58, 4.38	0.24, 8.96	3.94, 5.9	1.87, 10.35	4.48, 5.52	2.84, 4.36	1.58, 6.58	4.41, 5.21
Overall								
Sample Size	68	14	89	19	350	35	17	592
Mean (SD)	7.06 (7.93)	10.43 (11.51)	5.67 (5.65)	6.21 (5.24)	5.97 (5.7)	5 (3.47)	5.47 (4.65)	6.09 (6.06)
Median	4	7.5	4	5	4	4	4	4
Min, Max	1, 40	1, 45	1, 31	1, 20	1, 45	1, 14	1, 17	1, 45
95% CI	5.14, 8.98	3.78, 17.08	4.48, 6.86	3.68, 8.74	5.37, 6.57	3.81, 6.19	3.08, 7.86	5.6, 6.58

Note:

Although hunters may have hunted gamebirds in multiple units, total days hunted by individual hunters only appear in the primary region of use, regardless of whether all hunting occurred in that region. Additionally, some active hunters might not have specified the primary region they hunted or the number of days hunted during an open prairie chicken season and therefore are not included in table. Thus sample size may differ from that reported in Table 1.

Table 3: Number of active hunters targetting prairie chickens and average number of days hunted within small game management units by residency status, 2017-2018.

Statistic	Flint Hills	Glaciated Plains	Northern High Plains	Osage Cuestas	Smoky Hills	Statewide
Resident						
Survey Responses	50	7	6	4	33	81
Estimated Hunters	352	49	42	28	233	571
Avg Days Hunted (SD)	4.68 (6.52)	6.43 (7.35)	9.67 (12.31)	8 (6.22)	7 (9.75)	7.41 (9.13)
95% CI	2.83, 6.53	-0.37, 13.23	-3.25, 22.59	-1.9, 17.9	3.54, 10.46	5.39, 9.43
Non-resident						
Survey Responses	12	4	6	2	62	77
Estimated Hunters	85	28	42	14	437	543
Avg Days Hunted (SD)	3.58 (3.82)	3 (2.45)	9.67 (14.58)	5 (1.41)	6.84 (7.63)	7.1 (8.26)
95% CI	1.15, 6.01	-0.9, 6.9	-5.63, 24.97	-7.67, 17.67	4.9, 8.78	5.23, 8.97
Overall						
Survey Responses	62	11	12	6	95	158
Estimated Hunters	437	78	85	42	669	1113
Avg Days Hunted (SD)	4.47 (6.08)	5.18 (6.1)	9.67 (12.87)	7 (5.1)	6.89 (8.37)	7.26 (8.69)
95% CI	2.93, 6.01	1.08, 9.28	1.49, 17.85	1.65, 12.35	5.18, 8.6	5.89, 8.63

Note:

Some hunters might have utilized multiple small game management units while pursuing prairie chickens. Hunters counted in each management unit utilized, however hunters included only once in statewide totals. Thus, statewide totals may not be equivalent to that across management units.

Table 4: Number of active upland gamebird hunters targeting prairie chicken in the early and regular prairie chicken seasons.

Statistic	Flint Hills	Glaciated Plains	Northern High Plains	Osage Cuestas	Smoky Hills	Statewide
Early						
<i>Resident</i>						
Sampled Hunters (%)	27 (3.9)	3 (0.4)	3 (0.4)	2 (0.3)	22 (3.2)	48 (6.9)
Est Total Hunters	190	21	21	14	155	338
Avg Days Hunted (SD)	2.74 (2.89)	3 (1.73)	2.33 (1.53)	5 (0)	3.32 (2.5)	3.6 (3.03)
95% CI	1.6, 3.88	-1.3, 7.3	-1.47, 6.13	5, 5	2.21, 4.43	2.72, 4.48
Est Days Hunted	521	63	49	70	514	1219
<i>Non-resident</i>						
Sampled Hunters (%)	4 (0.6)	2 (0.3)	3 (0.4)	1 (0.1)	23 (3.3)	28 (4.0)
Est Total Hunters	28	14	21	7	162	197
Avg Days Hunted (SD)	2.75 (0.96)	2 (1.41)	4.33 (5.77)	2 (-)	4.13 (3.51)	4.46 (3.45)
95% CI	1.22, 4.28	-10.67, 14.67	-10, 18.66	-, -	2.61, 5.65	3.12, 5.8
Est Days Hunted	78	28	92	14	669	881
<i>Overall</i>						
Sampled Hunters (%)	31 (4.4)	5 (0.7)	6 (0.9)	3 (0.4)	45 (6.4)	76 (10.9)
Est Total Hunters	218	35	42	21	317	536
Avg Days Hunted (SD)	2.74 (2.71)	2.6 (1.52)	3.33 (3.93)	4 (1.73)	3.73 (3.05)	3.92 (3.19)
95% CI	1.75, 3.73	0.71, 4.49	-0.79, 7.45	-0.3, 8.3	2.81, 4.65	3.19, 4.65
Est Days Hunted	599	92	141	85	1184	2100
Regular						
<i>Resident</i>						
Sampled Hunters (%)	36 (5.2)	6 (0.9)	4 (0.6)	3 (0.4)	22 (3.2)	60 (8.6)
Est Total Hunters	254	42	28	21	155	423
Avg Days Hunted (SD)	4.44 (5.22)	6 (6.07)	12.75 (13.15)	7.33 (7.09)	7.18 (10.79)	7.12 (8.78)
95% CI	2.67, 6.21	-0.37, 12.37	-8.17, 33.67	-10.28, 24.94	2.4, 11.96	4.85, 9.39
Est Days Hunted	1128	254	359	155	1113	3009
<i>Non-resident</i>						
Sampled Hunters (%)	9 (1.3)	3 (0.4)	5 (0.7)	2 (0.3)	51 (7.3)	65 (9.3)
Est Total Hunters	63	21	35	14	359	458
Avg Days Hunted (SD)	3.56 (3.17)	2.67 (1.53)	9 (11.31)	4 (2.83)	6.45 (6.16)	6.49 (6.59)
95% CI	1.12, 6	-1.13, 6.47	-5.04, 23.04	-21.43, 29.43	4.72, 8.18	4.86, 8.12
Est Days Hunted	226	56	317	56	2319	2974
<i>Overall</i>						
Sampled Hunters (%)	45 (6.4)	9 (1.3)	9 (1.3)	5 (0.7)	73 (10.5)	125 (17.9)
Est Total Hunters	317	63	63	35	514	881
Avg Days Hunted (SD)	4.27 (4.86)	4.89 (5.13)	10.67 (11.52)	6 (5.52)	6.67 (7.77)	6.79 (7.69)
95% CI	2.81, 5.73	0.95, 8.83	1.81, 19.53	-0.85, 12.85	4.86, 8.48	5.43, 8.15
Est Days Hunted	1353	310	677	211	3432	5983

Note:

Table 5: Number of prairie chickens harvest by active hunters within the small game management units by residency status.

Statistic	Flint Hills	Glaciated Plains	Northern High Plains	Osage Cuestas	Smoky Hills	Statewide
Resident						
Total Harvest (%) ¹	47 (22.6)	6 (2.9)	4 (1.9)	8 (3.8)	58 (27.9)	125 (60.1)
Avg Harvest (SD)	2.35 (2.46)	2 (1.73)	1.33 (0.58)	4 (1.41)	2.9 (2.2)	1.45 (2.38)
95% CI	1.2, 3.5	-2.3, 6.3	-0.11, 2.77	-8.67, 16.67	1.87, 3.93	0.71, 2.19
Est Harvest ²	331	42	28	56	409	881
Est Successful Hunters ^{2,3}	141	21	21	14	141	296
Non-resident						
Total Harvest (%) ¹	7 (3.4)	-	16 (7.7)	-	60 (28.8)	83 (39.9)
Avg Harvest (SD)	3.5 (0.71)	-	2.29 (2.56)	-	1.76 (1.13)	0.86 (1.36)
95% CI	-2.88, 9.88	-	-0.08, 4.66	-	1.37, 2.15	0.44, 1.28
Est Harvest ²	49	-	113	-	423	585
Est Successful Hunters ^{2,3}	14	-	49	-	240	303
Overall						
Total Harvest (%) ¹	54 (26)	6 (2.9)	20 (9.6)	8 (3.8)	118 (56.7)	208 (100)
Avg Harvest (SD)	2.45 (2.36)	2 (1.73)	2 (2.16)	4 (1.41)	2.19 (1.68)	1.14 (1.93)
95% CI	1.4, 3.5	-2.3, 6.3	0.45, 3.55	-8.67, 16.67	1.73, 2.65	0.72, 1.56
Est Harvest ²	381	42	141	56	832	1466
Est Successful Hunters ^{2,3}	155	21	70	14	381	599

Note:

When small game management unit for harvest was unknown, harvest only included in statewide total.

¹ Proportion calculated using overall statewide harvests.

² Estimates calculated using a result weight (number of permits purchased divided by usable survey responses).

³ Successful hunters were those that harvested at least 1 prairie chicken during an open season.

Table 6: Estimated number of prairie chicken stamp buyers targetting prairie chickens in each county, the estimated effort expended by hunters, and the estimated prairie chicken harvests by prairie chicken stamp buyers targetting or oppuntistically hunting prairie chickens during the 2017-2018 early and regular season.

County	Early Season			Regular Season		
	Estimated Hunters	Estimated Days Hunted	Estimated Harvest	Estimated Hunters	Estimated Days Hunted	Estimated Harvest
Atchison	0	0	0	7	7	0
Barton	7	7	0	21	42	0
Butler	7	7	0	56	127	7
Chase	56	127	56	14	49	7
Cheyenne	21	99	14	28	282	14
Clay	14	28	0	21	42	7
Cloud	21	35	14	35	78	0
Coffey	7	35	21	7	42	0
Decatur	0	0	0	7	70	21
Dickinson	7	28	0	7	169	0
Elk	7	7	0	0	0	0
Ellis	0	0	0	0	0	7
Ellsworth	14	35	70	35	226	0
Geary	21	21	0	7	21	0
Graham	14	14	0	14	85	21
Greenwood	21	28	0	56	197	78
Jackson	21	49	7	21	183	0
Jewell	7	14	0	14	28	7
Lincoln	113	289	63	127	733	49
Linn	0	0	0	0	0	0
Lyon	7	7	0	35	85	28
Marion	0	0	0	35	99	7
Marshall	14	28	0	35	113	0
McPherson	0	0	0	7	14	0
Mitchell	42	92	28	78	381	70
Morris	7	7	0	14	56	0
Nemaha	7	14	28	7	7	0
Norton	7	7	0	21	183	0
Osage	14	49	21	28	169	14
Osborne	99	289	21	141	705	49
Ottawa	21	42	0	28	78	0

Table 6: Estimated number of prairie chicken stamp buyers targetting prairie chickens in each county, the estimated effort expended by hunters, and the estimated prairie chicken harvests by prairie chicken stamp buyers targetting or oppuntistically hunting prairie chickens during the 2017-2018 early and regular season. (*continued*)

County	Estimated Hunters	Estimated Days Hunted	Estimated Harvest	Estimated Hunters	Estimated Days Hunted	Estimated Harvest
Phillips	0	0	0	7	28	0
Pottawatomie	28	63	28	21	56	0
Rawlins	7	21	28	14	42	14
Rice	0	0	0	14	42	0
Riley	35	99	7	28	169	21
Rooks	14	14	0	7	49	14
Rush	0	0	0	14	35	0
Russell	70	176	63	113	479	49
Saline	28	56	28	35	99	14
Sheridan	0	0	0	7	14	0
Sherman	0	0	0	0	0	14
Smith	14	134	0	21	204	14
Unknown	0	0	0	0	0	0
Wabaunsee	63	176	42	63	282	14
Washington	0	0	0	35	211	0

Note:

Estimates calculated using a result weight (number of permits purchased divided by usable survey responses).