SUMMARY OF THE 2016-17 KDWPT BI-WEEKLY WATERFOWL SURVEY

PERFORMANCE REPORT
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SUMMARY OF THE 2016-17 KDWPT BI-WEEKLY WATERFOWL SURVEY

BACKGROUND

Kansas Department of Wildlife, Parks and Tourism (KDWPT) has conducted coordinated, statewide waterfowl surveys since 1959. A variety of methods, survey schedules, areas surveyed, and birds species counted have been used. Initially, surveys were conducted weekly at a few of the major waterfowl/wetland areas in the state, with most beginning in August or September and continuing through April or May. Weekly counts were reduced to one count every two weeks as a cost saving measure in 1974. In 1978 the number of counts were further reduced to twice monthly, September through March (14 counts), and have continued on the same schedule since that time. The number of areas surveyed has varied from a low of 19 in 1976-77 to a high of 41 areas currently surveyed. During its history, 69 different areas have been surveyed. In 2013, the number of species counted was limited to 37 waterfowl species as well as coots and sandhill cranes. In addition, the percent of survey area covered in ice was added to the survey as a means to record an important habitat/weather variable that can greatly affect waterfowl counts.

These counts provide important data used in the evaluation of long term trends in waterfowl abundance, distribution, and migration chronology across Kansas. They assist in evaluating management activities and aid in regulation development such as the waterfowl season setting process.

METHODS

KDPWT's Bi-weekly Waterfowl Survey (BWS) counts are conducted twice a month from September 1st through March 31st at areas of significant waterfowl concentration on public lands and waters in Kansas (Figure 1). In addition to waterfowl counts, percent of survey area covered in ice for each area and survey period was documented. The timing objective is to produce two surveys a month (one early/one late). A list of suggested survey dates was

provided for survey observers (Table 1). If timing conflicts occurred, counters were encouraged to complete the survey as close to the survey date as possible. As each survey location is unique, the means of estimating waterfowl abundance varies by survey locations. Because of the importance of the information collected in this survey in determining long term trends, counters are encouraged to maintain consistent field practices and coverage. In analysis below, comparisons of the 2016 observations were made to the 2011 through 2015 averages.

RESULTS

In 2016-17, 529 surveys were conducted at 40 of 41 BWS survey areas (Figure 2 and Table 2). Ninety-two percent of the possible 574 surveys were completed. This is a 32.3% increase in total number of counts compared to the 2011-15 average (400 counts). The total 2016-17 counts were 2,687,386 ducks, 4,375,751 geese, 263 swans, 236,508 coots and 15,604 sandhill cranes for a total for 7,315,512 birds counted (Table 3 and Figure 3). In 2016-17, Kansas experienced a mild fall with no significant freezes until mid-December and mild temperatures from mid-January through March. This is likely to have affected migration chronology and waterfowl distribution as it reduced the amount of ice coverage and duration for many portions of the state compared to past years (Figure 4).

DUCKS

The total number of ducks counted in 2016-17 (Figure 5) was 10.4% greater than the 2011-15 average. For the first third of the survey year, migration was similar to past years. The warm, late fall slightly delayed peak migration, with a first significant freeze in mid-December that corresponded to highest duck counts. The mild January temperatures allowed for the earlier return of spring migrants. Kansas duck zones are based off habitat types and migration chronology. As such we see variations among zones in waterfowl counts (Figures 6). The Low Plains Late Zone is the largest duck hunting zone (46.7% of Kansas land area) and contains 22 of 40 survey locations, and 54.3% of counts in 2016-17. The Low Plains Late Zone accounted for 41.7% of all ducks counted in 2016-17. In comparison, the High Plains Zone (29.1% of Kansas land area) accounted for 2.9% of all ducks counted, the Early Zone (9.1% Kansas land area)

accounted for 25.9% of all ducks counted, and the Southeast Zone (15.1% of Kansas land area) accounted for 29.6% of all ducks counted in 2016-17 (Figure 7). Figures 8 through 11 depicts by zone, the 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average counts for total duck count and average percent ice cover by each survey period. Mallards were the most common duck species (Figure 12) comprising 57.0% of all ducks counted, which is greater than the 2011-15 average where they accounted for 50.7% of the total ducks counted (Figure 13). The High Plains zone accounted for 1.9% of all mallards counted, whereas the Early Zone was 23.5%, Late Zone was 42.3%, and Southeast Zone was 32.3%. Table 4 provides statewide duck species accounts by survey period.

GEESE

In the 2016-17 survey year, geese arrived later and departed earlier compared to the 2011-15 average (Figure 14). Light geese were the most numerous geese (3,663,003) accounting for 83.7% of all geese counted in 2016-17 (Figure 15). This is 13.6% greater than their 2011-15 average. Canada geese (475,130) accounted for 10.9% total geese counted in 2016-17, which was 47.2% below the 2011-15 average. Greater white-fronted geese (207,587) accounted for 4.7% of total geese counted in 2016-17, which was 4.7% greater than the 2011-15 average. Figure 16 demonstrates the timing of migration of geese through Kansas. White-fronted geese are typically the first geese to arrive in early November and peak in late-November; the Canada geese peak in December; and we see a double peak for light geese. Figures 17 through 19 depicts 2016-17 KDWPT Bi-weekly Waterfowl Survey goose counts, the 2011-15 average by species, and the average percent ice cover for each survey period. Table 5 provides statewide goose species accounts by survey period.

SWANS, COOTS, AND SANDHILL CRANES

A total of 263 swans were counted in 2016-17 (Figure 20), which included 56 tundra swans, 32 trumpeter swans and 175 undifferentiated swans. This was an increase of 87.9% from the 2011-15 average. A total of 236,508 coots were counted which was an increase of 61.9 % from the 2011-15 average (Figure 21). A total of 15,604 sandhill cranes were counted which was a

decrease of 45.8% from the 2011-15 average. The 2016-17 total bird count was 7,315,512 which was 2.2% increase from the 2011-15 average (Figure 22).

ACKNOWLEDGMENTS

We would like to thank KDWPT staff, US Fish & Wildlife Service staff and volunteers listed in Table 2 for conducting the 2016-17 waterfowl counts.

Figure 1. Map of Kansas duck zones and 2016-17 Bi-weekly Waterfowl Survey counts locations.

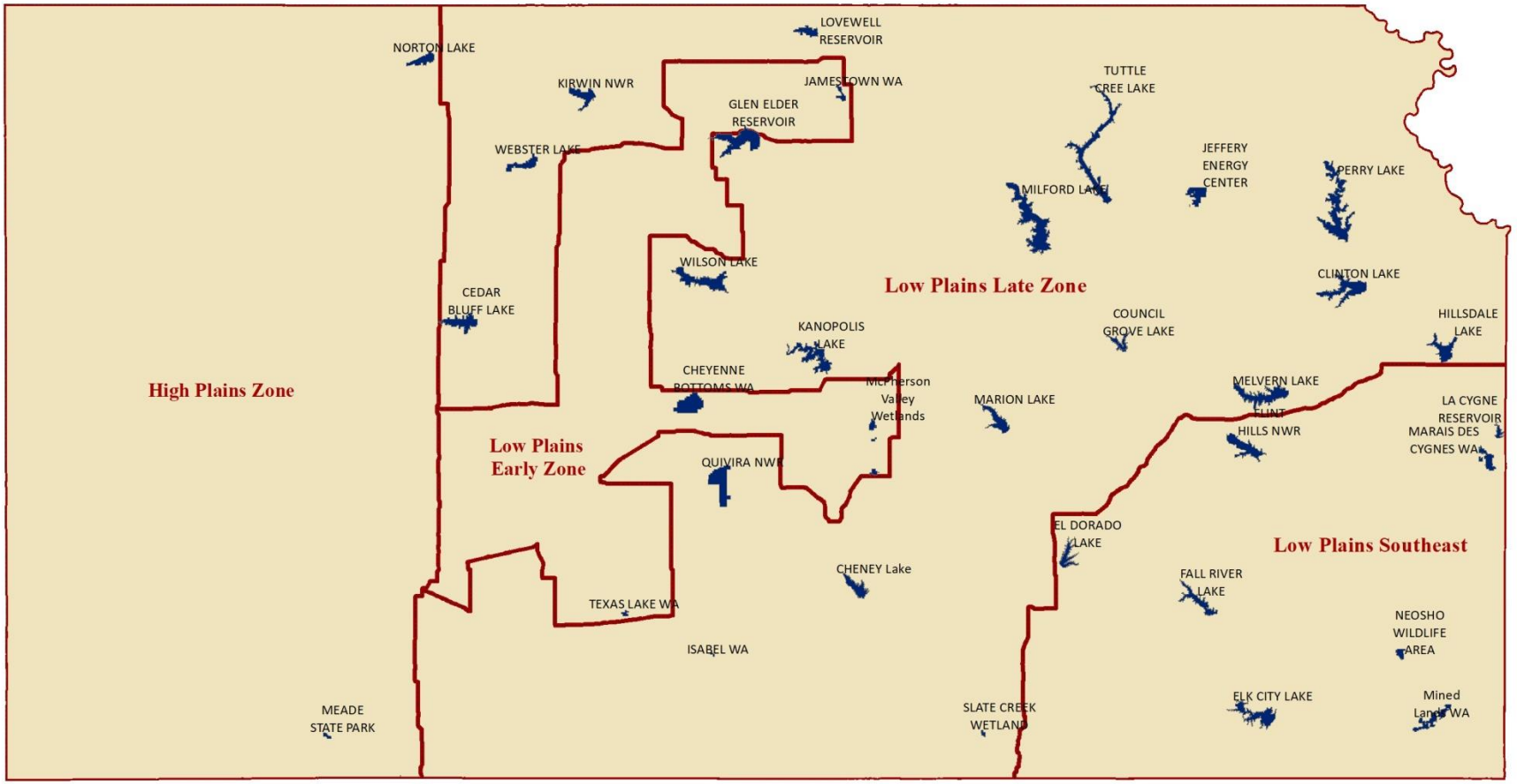

Table 1. KDWPT 2016-17 Bi-weekly Waterfowl Survey Dates

Survey Period	Suggested Survey Date
Sep 1-15	Thursday, September 8, 2016
Sep 16-30	Thursday, September 22, 2016
Oct 1-15	Thursday, October 06, 2016
Oct 16-31	Thursday, October 20, 2016
Nov 1-15	Thursday, November 10, 2016
Nov 16-30	Wednesday, November 23, 2016
Dec 1-15	Thursday, December 08, 2016
Dec 16-31	Thursday, December 22, 2016
Jan 1-15	Thursday, January 05, 2017
Jan 16-31	Thursday, January 19, 2017
Feb 1-15	Thursday, February 09, 2017
Feb 16-28	Thursday, February 23, 2017
Mar 1-15	Thursday, March 09, 2017
Mar 16-31	Thursday, March 23, 2017

Figure 2. Number of 2016-17 KDWPT Bi-weekly Waterfowl Survey counts completed by survey period (41 surveys are possible for each survey period) and average number of completed surveys from 2011-15.

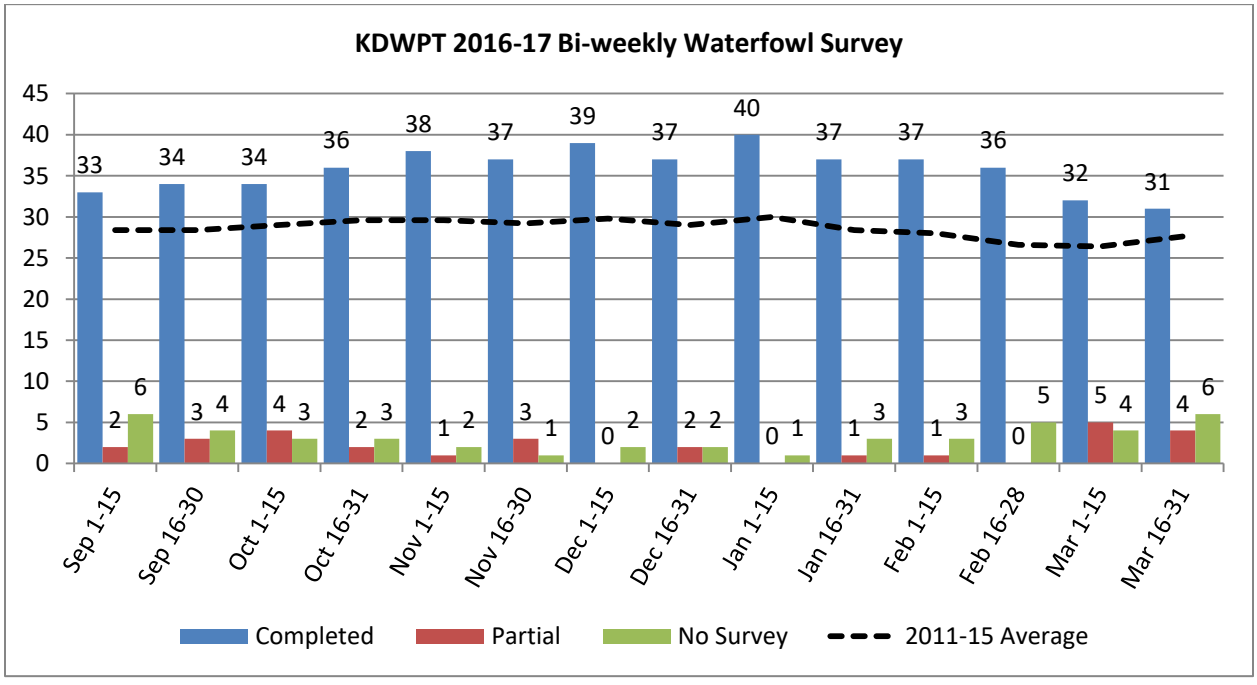

Table 2. List of 2016-17 KDWPT Bi-weekly Waterfowl Survey locations by zones and number of surveys (14 surveys are possible for each location)

Survey Location (# of survey locations)	**Observer** (% of total completed surveys)	**Number of Surveys Conducted** (Completion Rate)
Early Zone (6)	(18.7%)	**84** (100.0%)
Cheyenne Bottoms	Karl Grover, Gene Schneweis, Kim Schneweis	14
Herron Playa	Aaron Baugh	14
Jamestown WA	Matt Farmer	14
McPherson Wetlands	Jason Black	14
Stein Playa	Aaron Baugh	14
Texas Lake WA	Todd Gatton	14
High Plains (4)	(10.4%)	**54** (96.4%)
Lake McKinney	Kurtis Meier	13
Meade SFL	Jon Zuercher	13
Norton Reservoir	Luke Winge	14
Wild Turkey Playa	Aaron Baugh	14
Late Zone (22)	(54.3%)	**287** (93.2%)
Benedictine Bottoms	Kirk Thompson	14
Cedar Bluff Reservoir	Kent Hensley	14
Cheney Reservoir	Chris Becker	0
Clinton Reservoir	Justin Hamilton & Scott Purdon	13
Council Grove Reservoir	Brent Konen	14
Glen Elder Reservoir	Toby Marlier	14
Hillsdale Reservoir	Eric Kilburg	14
Isabel Wetlands	Todd Gatton	13
Jeffrey Energy Center	Bryon Brown	14
Kanopolis/ Smoky Hills	Scott Thomasson	14
Kirwin NWR	Mike Nelson, Brad Krohn, Tony Ifland	12
Lovewell Reservoir	Rob Unruh	14
Marion Reservoir	Scott Amos	14
Melvern Reservoir	Cody Miller	14
Milford Reservoir	Kristen Kloft, Nick Sanchez	14
Perry Reservoir	A. Page, C. Ridenour	14
Quivira NWR	R.Laubhan/B. Jones	14
Slate Creek WA	Kurt Grimm	14
Tuttle Creek Reservoir	Nathan Henry	9
Webster Reservoir	Michael Zajic	14
Wichita	Charles Cope	13
Wilson Reservoir	Scott Thomasson	14
Southeast Zone (9)	(19.8%)	**104** (82.5%)
El Dorado Reservoir	Jeff Rue	11
Elk City Reservoir	Ryan Lies	14
Fall River Reservoir	Ben Stultz	14
Flint Hills NWR	Tim Menard, Lyle Hancock	13
LaCygne Lake	Jacob Coulter, Falls	3
Marais des Cygnes WA	Jacob Coulter	13
Mined Land WA	David Shanholtzer	9
Neosho WA	Monte Manbeck	14
Wolf Creek/Coffee Co.	Rich Schultheis	13
Total (41)		**529** (92.1%)

Table 3. 2016-17 KDWPT Bi-weekly Waterfowl Survey count for all ducks and geese, percent of total count, and average percent ice cover for each survey period.

Survey Period	Total Ducks	% of Total Duck Count	Total Geese	% of Total Goose Count	Total Waterfowl	Total Bird	Average % Ice
Sep 1-15	47,865	2%	2,878	1%	50,743	53,238	0%
Sep 16-30	58,282	2%	5,412	1%	63,694	70,103	0%
Oct 1-15	50,745	2%	3,111	1%	53,856	90,737	0%
Oct 16-31	112,854	4%	15,658	2%	128,512	189,064	0%
Nov 1-15	185,028	7%	42,954	3%	227,982	285,802	0%
Nov 16-30	217,184	8%	219,249	6%	436,443	453,669	3%
Dec 1-15	255,578	10%	443,945	10%	699,531	705,932	35%
Dec 16-31	409,058	15%	815,708	17%	1,224,879	1,227,081	77%
Jan 1-15	250,822	9%	451,180	10%	702,052	705,915	66%
Jan 16-31	308,861	11%	869,849	17%	1,178,740	1,180,484	25%
Feb 1-15	253,992	9%	1,001,647	18%	1,255,641	1,261,109	11%
Feb 16-28	222,987	8%	429,295	9%	652,307	664,540	0%
Mar 1-15	176,169	7%	59,645	3%	235,839	252,611	1%
Mar 16-31	137,961	5%	15,220	2%	153,181	175,227	0%
Yearly Total	**2,687,386**		**4,375,751**		**7,063,400**	**7,315,512**	

Figure 3. 2016-17 KDWPT Bi-weekly Waterfowl Survey count for all ducks and geese and statewide average percent ice cover for each survey period.

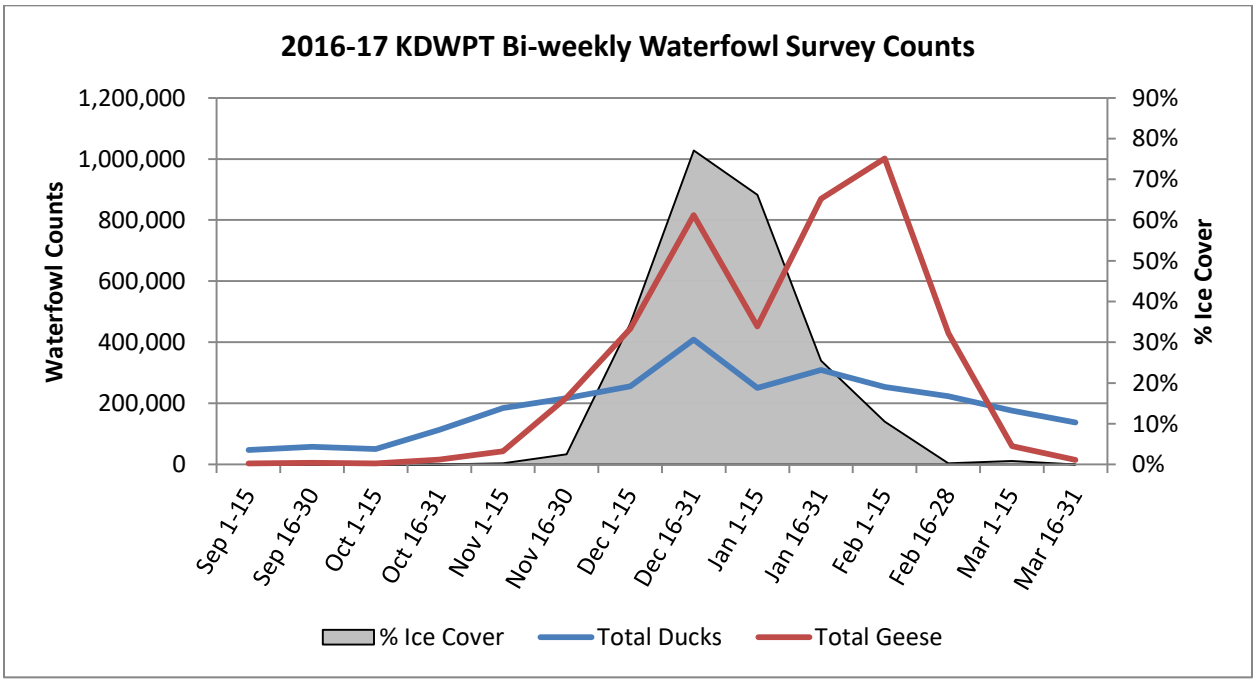

Figure 4. 2016-17 KDWPT Bi-weekly Waterfowl Survey statewide average percent ice cover for each survey period.

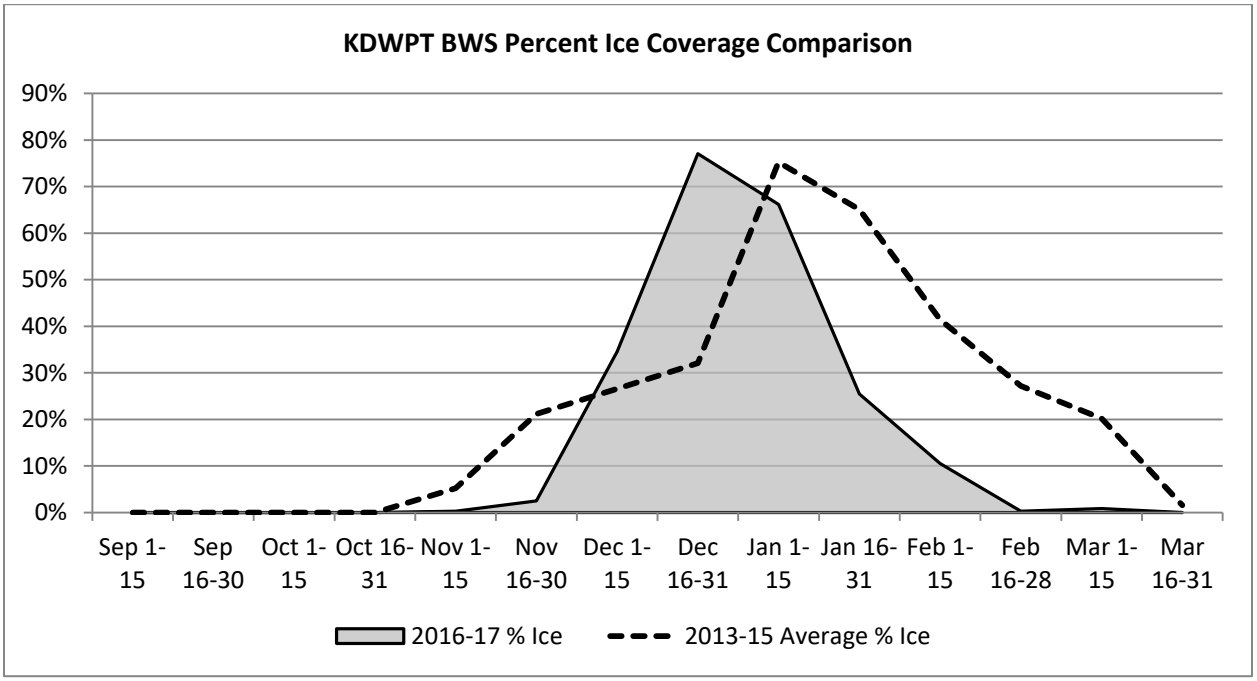

Figure 5. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average count for all ducks, statewide average percent ice cover, and percent of total ducks counted for all zones combined for each survey period.

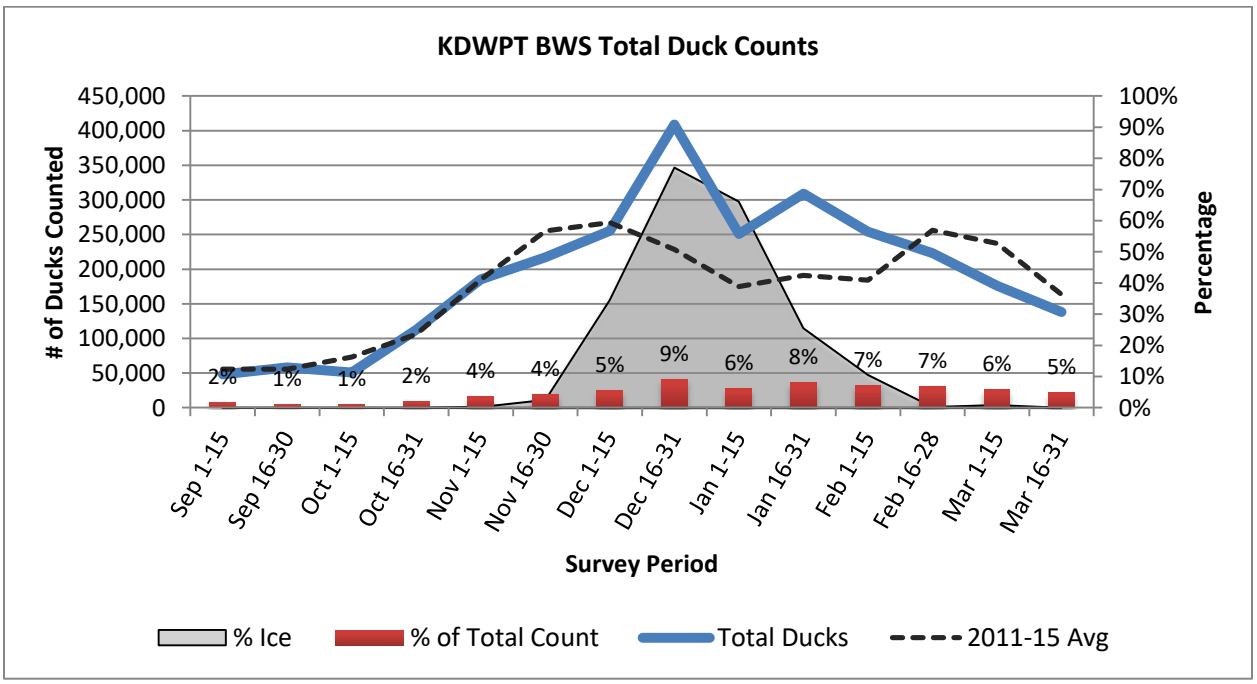

Figure 6. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts for all ducks for each survey period by Kansas duck hunting zone.

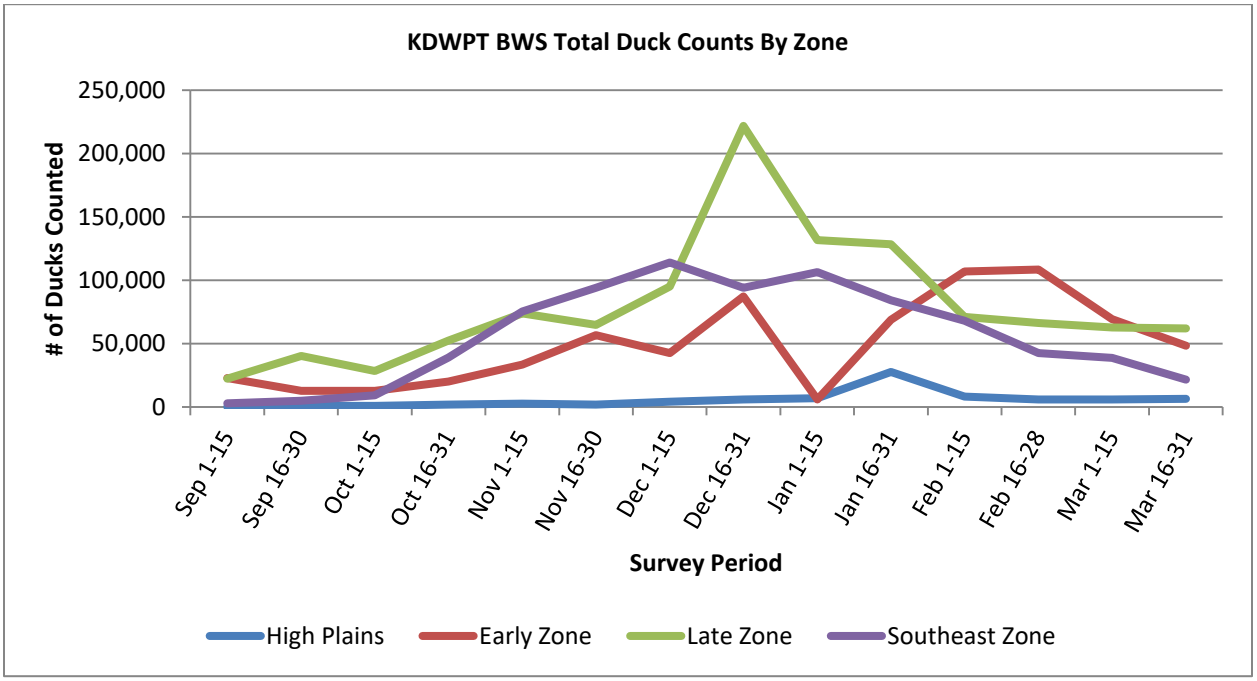

Figure 7. Percent of total 2016-17 KDWPT Bi-weekly Waterfowl Survey counts for all ducks for each survey period by Kansas duck hunting zone.

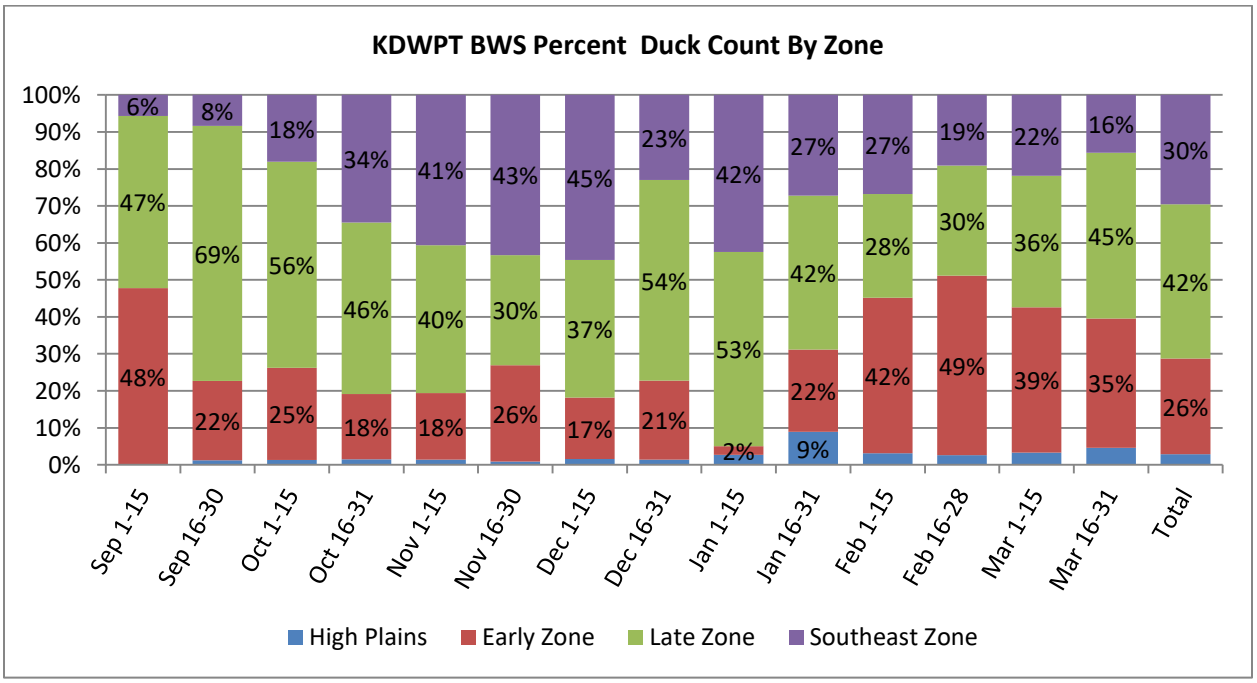

Figure 8. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average counts for total duck count and average percent ice cover by each survey period for the High Plains Zone.

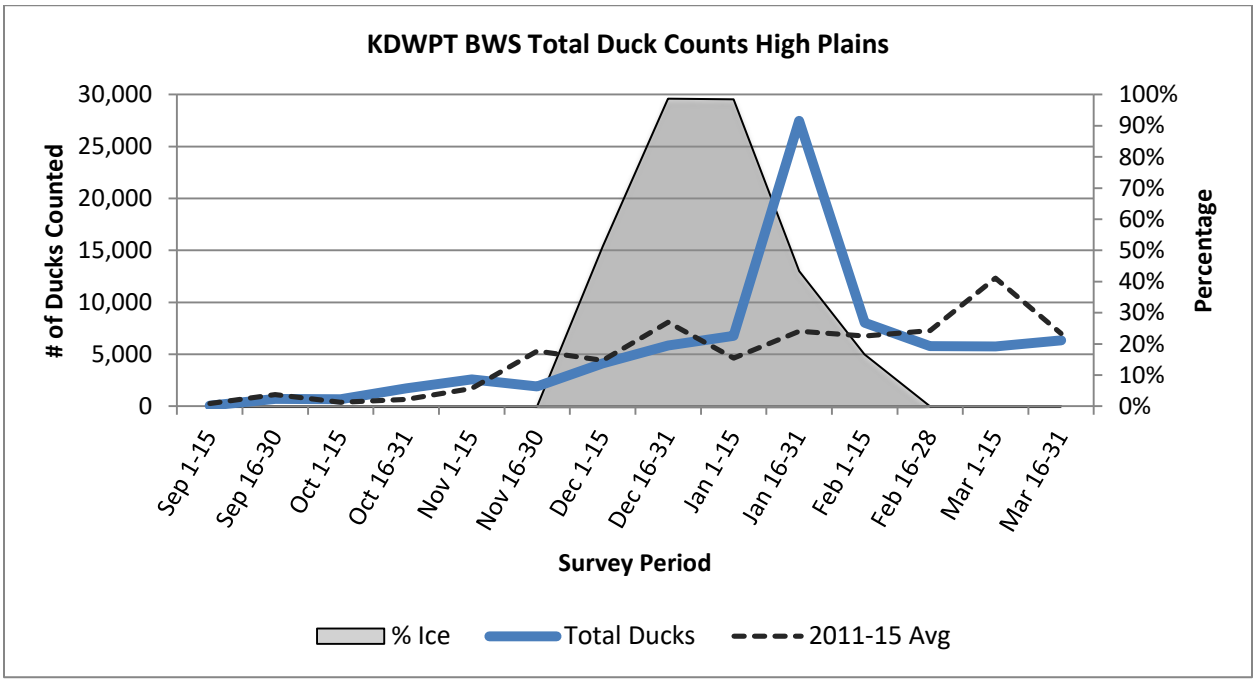

Figure 9. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average counts for total duck count and average percent ice cover by each survey period for the Early Zone.

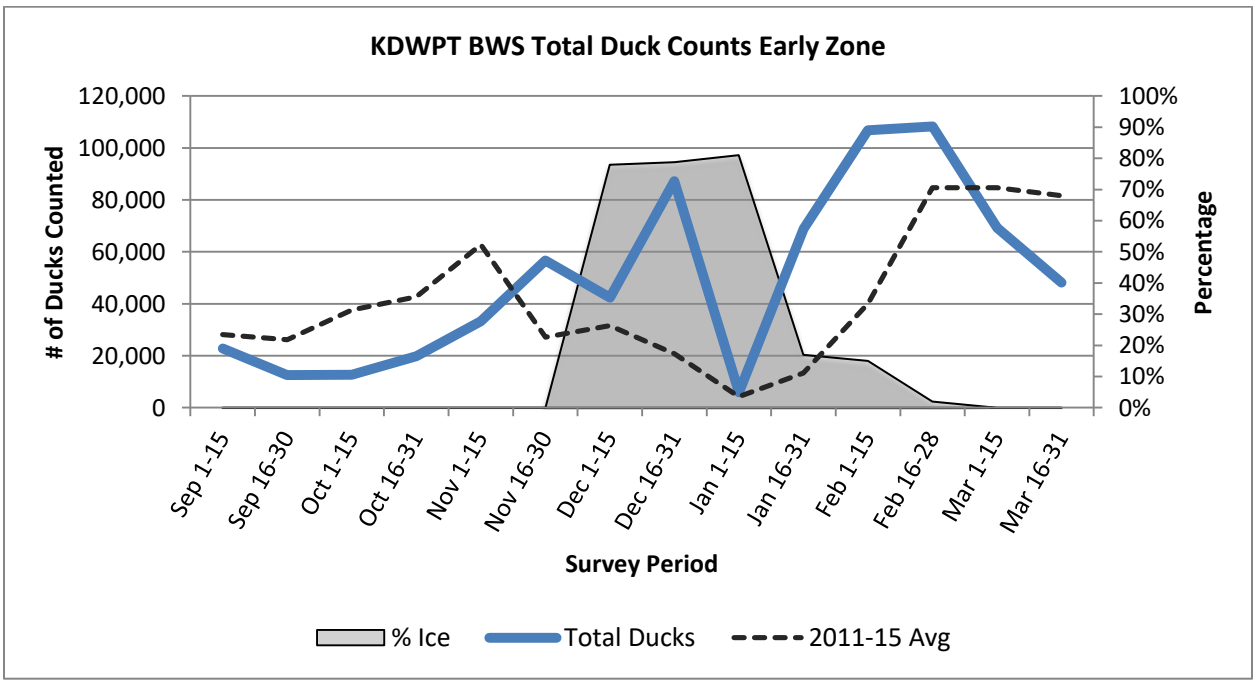

Figure 10. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average counts for total duck count and average percent ice cover by each survey period for the Late Zone.

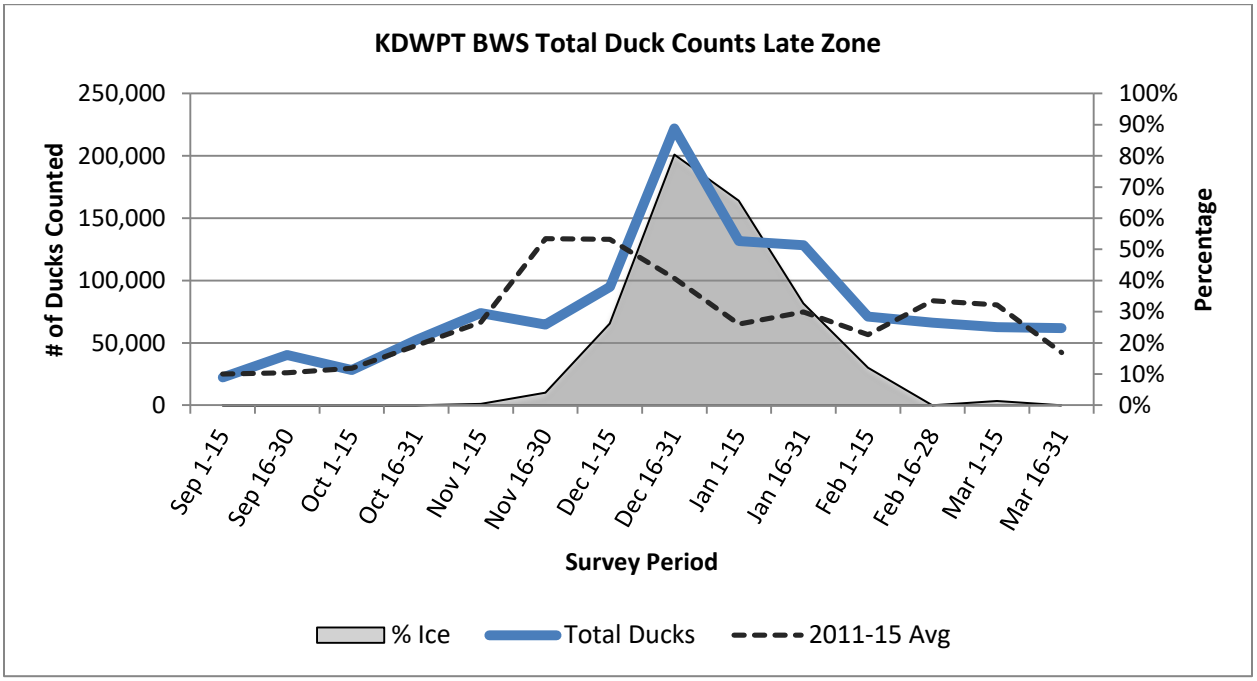

Figure 11. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-15 average counts for total duck count and average percent ice cover by each survey period for the Southeast Zone.

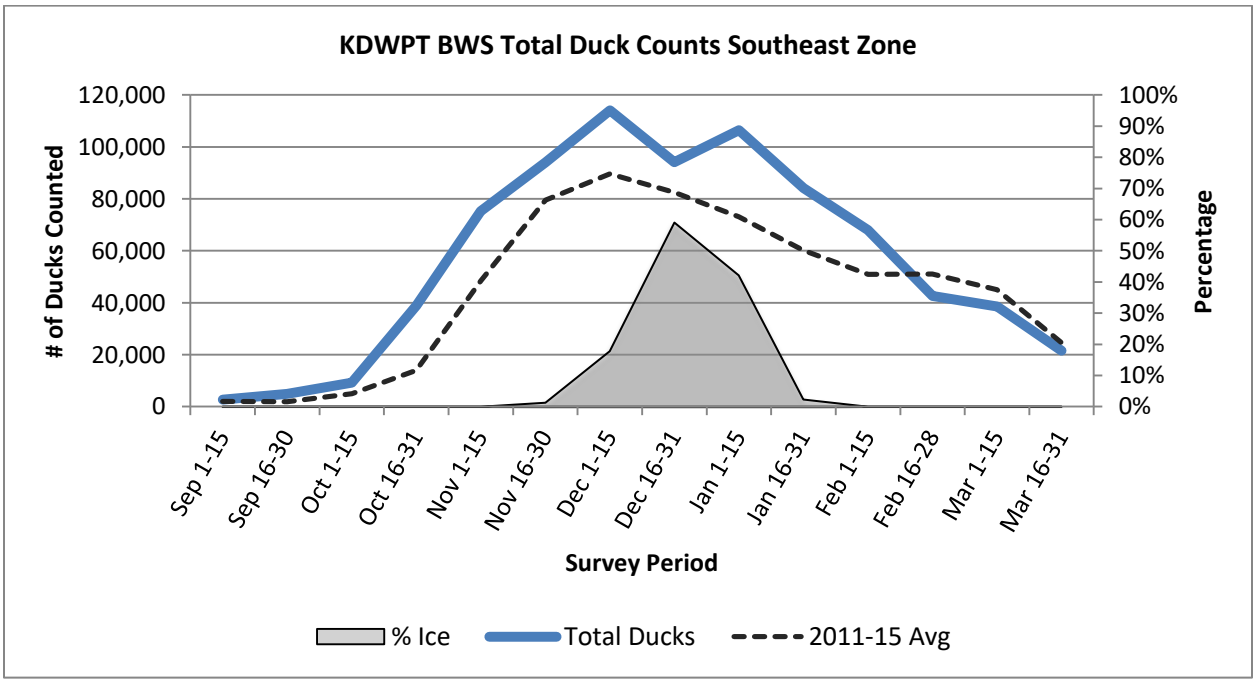

Figure 12. 2016-17 KDWPT Bi-weekly Waterfowl Survey duck species composition.

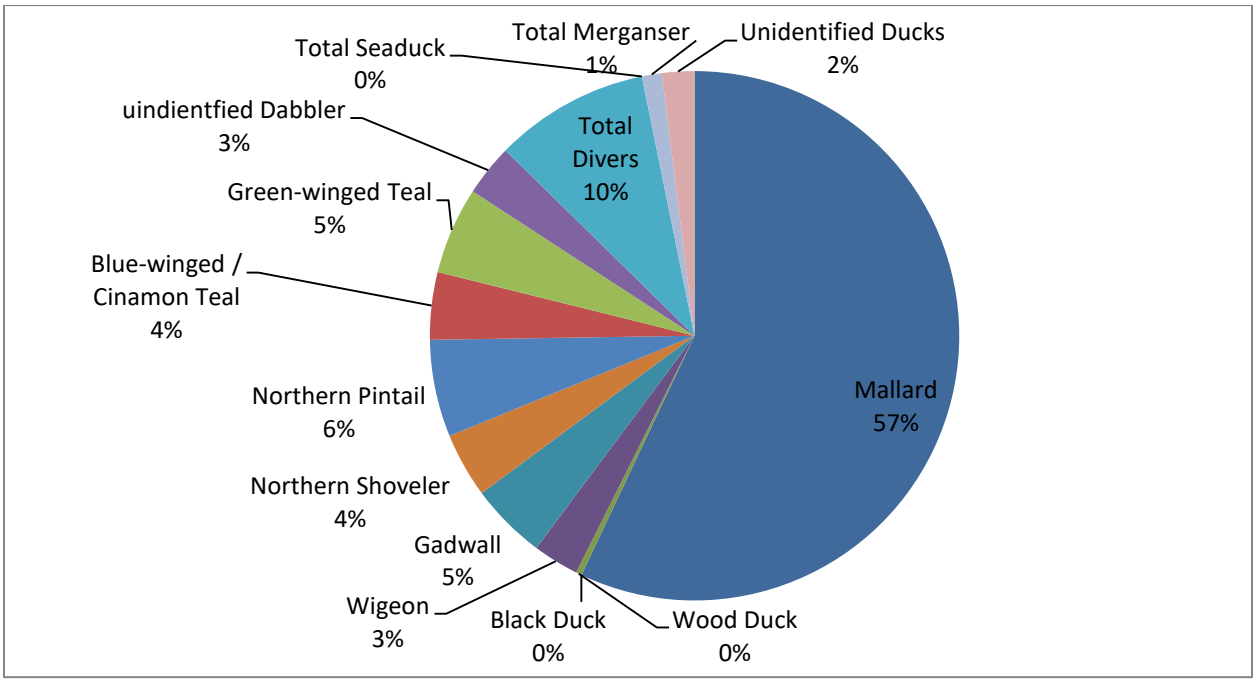

Figure 13. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-14 average counts for mallards, all other ducks combined, for each survey period.

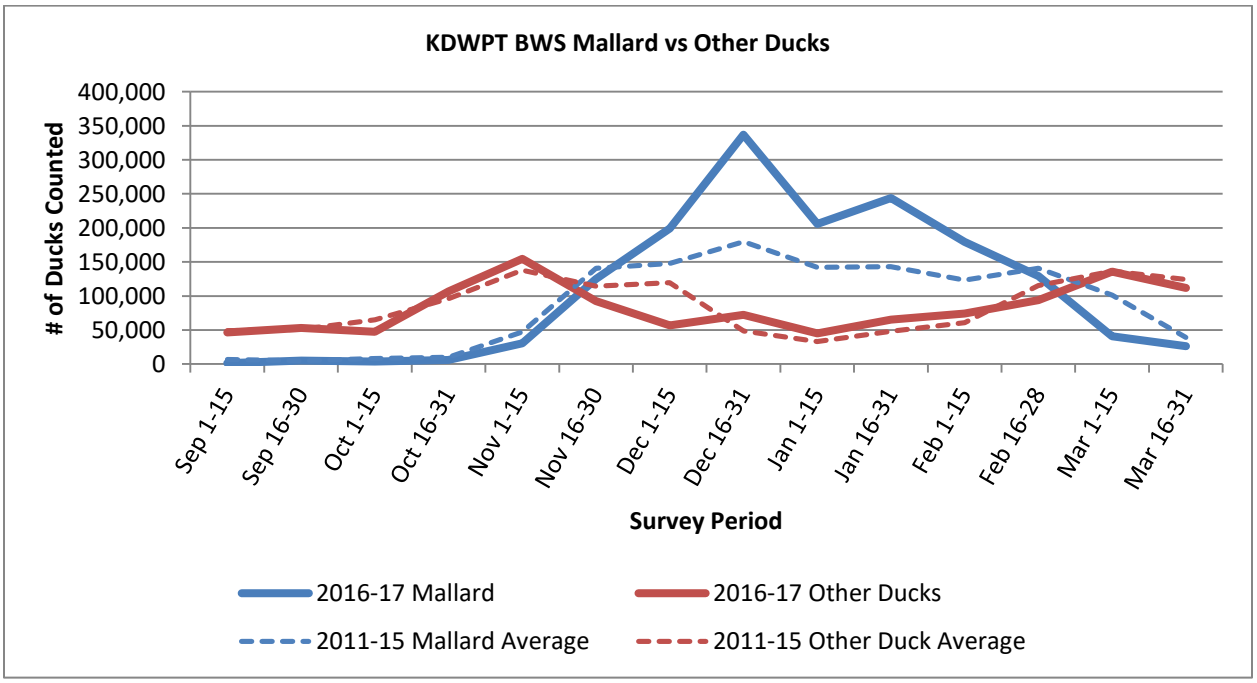

Table 4. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts by duck species for each survey period.

Species	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-30	Dec 1-15	Dec 16-31	Jan 1-15	Jan 16-31	Feb 1-15	Feb 16-28	Mar 1-15	Mar 16-31	Total	*% of total count*
Mallard	1,264	5,142	3,520	6,245	30,456	124,806	199,026	336,972	205,868	243,786	179,668	129,144	40,587	26,113	1,532,597	57.0 %
Black Duck	0	0	0	0	0	0	0	0	0	3	0	1	20	0	24	0.0%
Wood Duck	1,176	3,049	1,767	1,006	735	299	136	58	10	74	66	100	286	759	9,521	0.4%
Wigeon	0	203	1,089	5,643	13,350	7,075	2,367	10,426	5,232	1,733	3,593	9,011	8,392	7,436	75,550	2.8%
Gadwall	72	1,325	2,794	13,252	26,188	16,247	8,052	4,945	1,864	4,178	4,562	8,207	21,757	12,234	125,677	4.7%
Northern Shoveler	1,001	2,102	2,324	5,349	20,400	9,512	6,572	710	596	3,037	2,722	10,405	19,771	21,838	106,339	4.0%
Northern Pintail	1,325	5,831	6,083	12,761	15,039	13,423	8,242	3,341	2,971	10,351	22,737	28,900	19,429	8,895	159,328	5.9%
Blue-winged Teal	22,167	17,971	14,930	16,322	4,427	1,283	0	0	0	0	20	310	11,087	22,099	110,616	4.1%
Green-winged Teal	2,061	2,678	6,306	13,952	23,933	25,299	8,722	3,826	1,624	2,635	5,211	7,734	23,004	15,896	142,881	5.3%
unidentified Dabbler	17,880	17,543	8,751	10,064	15,142	1,139	1,513	2,240	454	4,372	2,001	700	776	2,179	84,754	3.2%
Total Dabblers	**46,946**	**55,844**	**47,564**	**84,594**	**149,670**	**199,083**	**234,630**	**362,518**	**218,619**	**270,169**	**220,580**	**194,512**	**145,109**	**117,449**	**2,347,287**	**87.3 %**
Ruddy Duck	95	216	1,225	7,067	9,907	1,968	666	840	16	17	210	1,081	4,741	3,737	31,786	1.2%
Canvasback	0	25	0	22	671	516	149	98	362	473	165	798	1,178	263	4,720	0.2%
Redhead	814	755	1,690	17,862	13,044	6,094	5,006	6,525	307	963	4,111	9,171	5,437	6,520	78,299	2.9%
Ring-necked duck	0	25	154	958	7,539	4,194	3,208	5,581	1,187	1,268	1,727	5,008	3,819	3,878	38,546	1.4%
Scaup	0	0	4	13	631	946	1,042	1,534	750	2,136	1,894	900	1,283	1,169	12,302	0.5%
Bufflehead	0	0	1	0	406	499	1,067	1,753	165	347	727	1,421	1,397	1,078	8,861	0.3%
Goldeneye	0	0	0	0	120	821	5,284	16,627	9,354	9,880	8,936	5,021	2,470	487	59,000	2.2%
unidentified Diver	0	0	56	110	1,470	904	1,125	2,362	3,026	2,799	7,797	465	445	360	20,919	0.8%
Total Divers	**909**	**1,021**	**3,130**	**26,032**	**33,788**	**15,942**	**17,547**	**35,320**	**15,167**	**17,883**	**25,567**	**23,865**	**20,770**	**17,492**	**254,433**	**9.5%**

Table 4 (continued)**.** 2016-17 KDWPT Bi-weekly Waterfowl Survey counts by duck species for each survey period.

Species	Sep 1-15	Sep 16-30	Oct 1-15	Oct 16-31	Nov 1-15	Nov 16-30	Dec 1-15	Dec 16-31	Jan 1-15	Jan 16-31	Feb 1-15	Feb 16-28	Mar 1-15	Mar 16-31	Total	*% of total count*
Black Scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Surf Scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Unidentified Scoter	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.0%
Total Sea duck	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0**	**0**	**0**	**0**	**0**	**0**	**2**	**0.0%**
Hooded Merganser	0	0	0	0	22	77	568	597	434	421	158	124	210	164	2,775	0.1%
Common Merganser	0	0	0	0	24	175	225	3,628	11,305	6,824	5,594	1,192	754	114	29,835	1.1%
Unidentified Merganser	0	0	1	0	1	0	0	0	0	0	0	0	2	2	6	0.0%
Total Merganser	**0**	**0**	**1**	**0**	**47**	**252**	**793**	**4,225**	**11,739**	**7,245**	**5,752**	**1,316**	**966**	**280**	**32,616**	**1.2%**
Unidentified Ducks	10	1,525	50	2,228	1,523	1,907	2,608	6,993	5,297	13,564	2,093	3,294	9,324	2,740	53,156	2.0%
Total Ducks	**47,865**	**58,282**	**50,745**	**112,854**	**185,028**	**217,184**	**255,578**	**409,058**	**250,822**	**308,861**	**253,992**	**222,987**	**176,169**	**137,961**	**2,687,386**	
% of total count	*1.8%*	*2.2%*	*1.9%*	*4.2%*	*6.9%*	*8.1%*	*9.5%*	*15.2%*	*9.3%*	*11.5%*	*9.5%*	*8.3%*	*6.6%*	*5.1%*		

Figure 14. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts and 2011-14 average counts for geese, statewide average percent ice cover, and percent of total geese counted for each survey period.

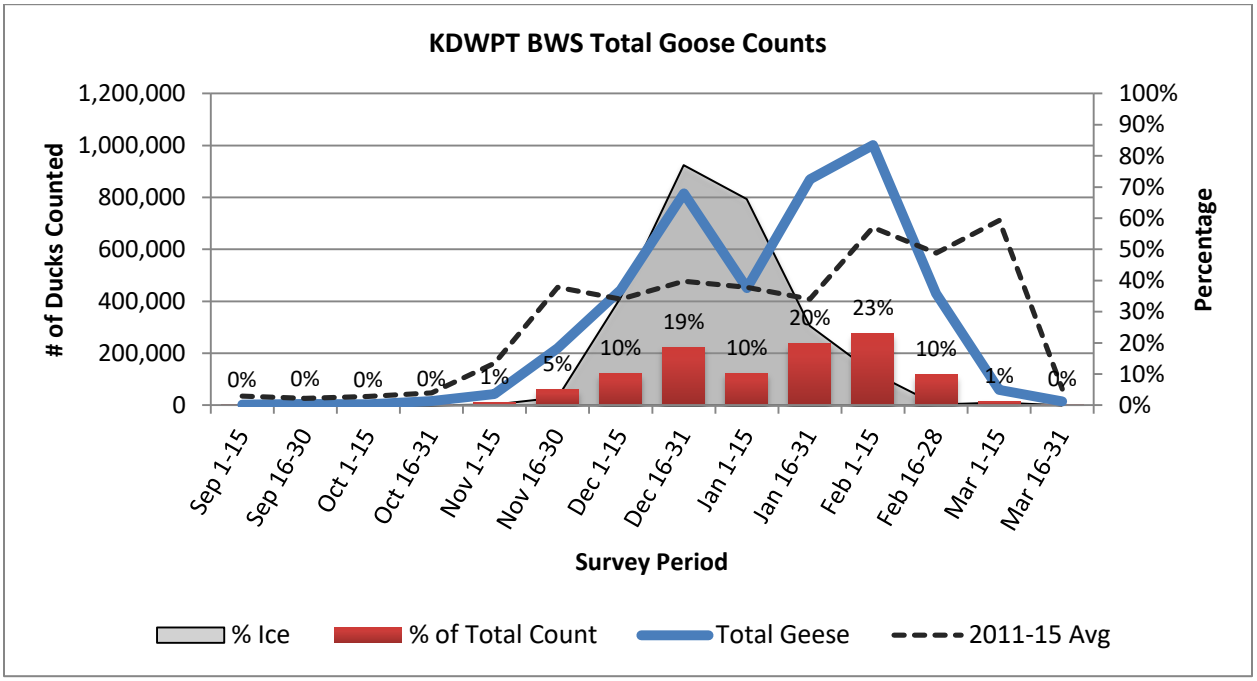

Figure 15. 2016-17 KDWPT Bi-weekly Waterfowl Survey goose counts composition

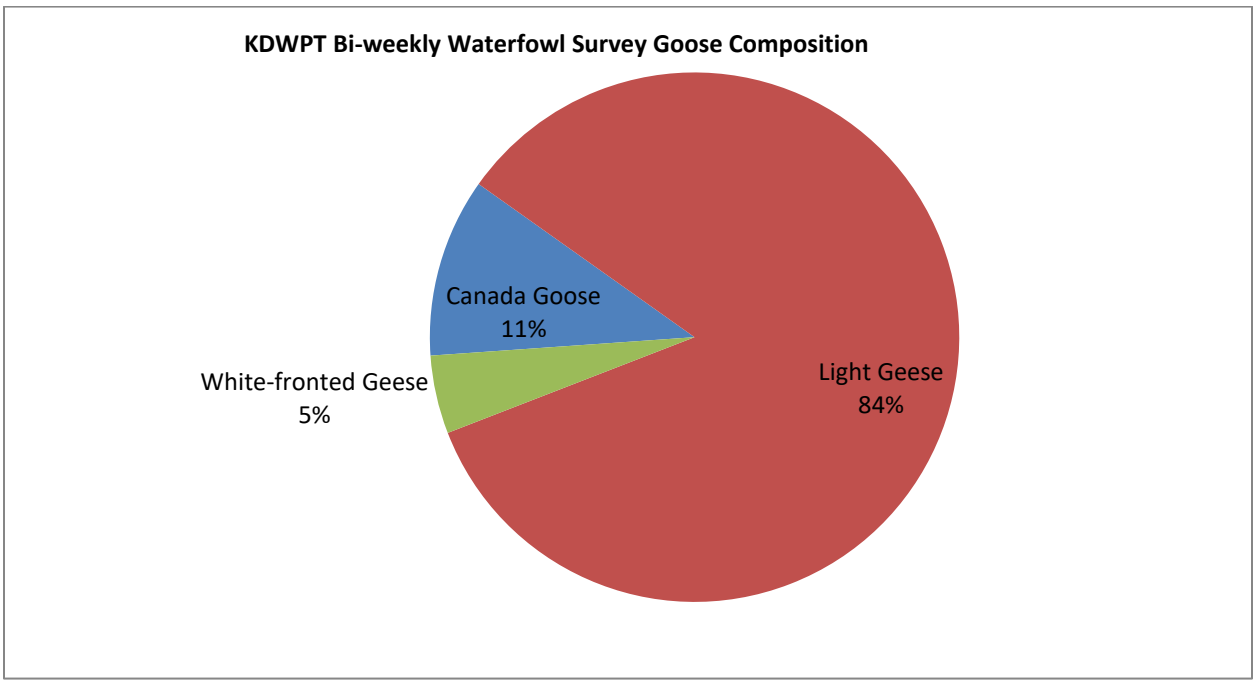

Figure 16. 2016-17 KDWPT Bi-weekly Waterfowl Survey goose counts statewide average percent ice cover, and percent of total geese counted for each survey period.

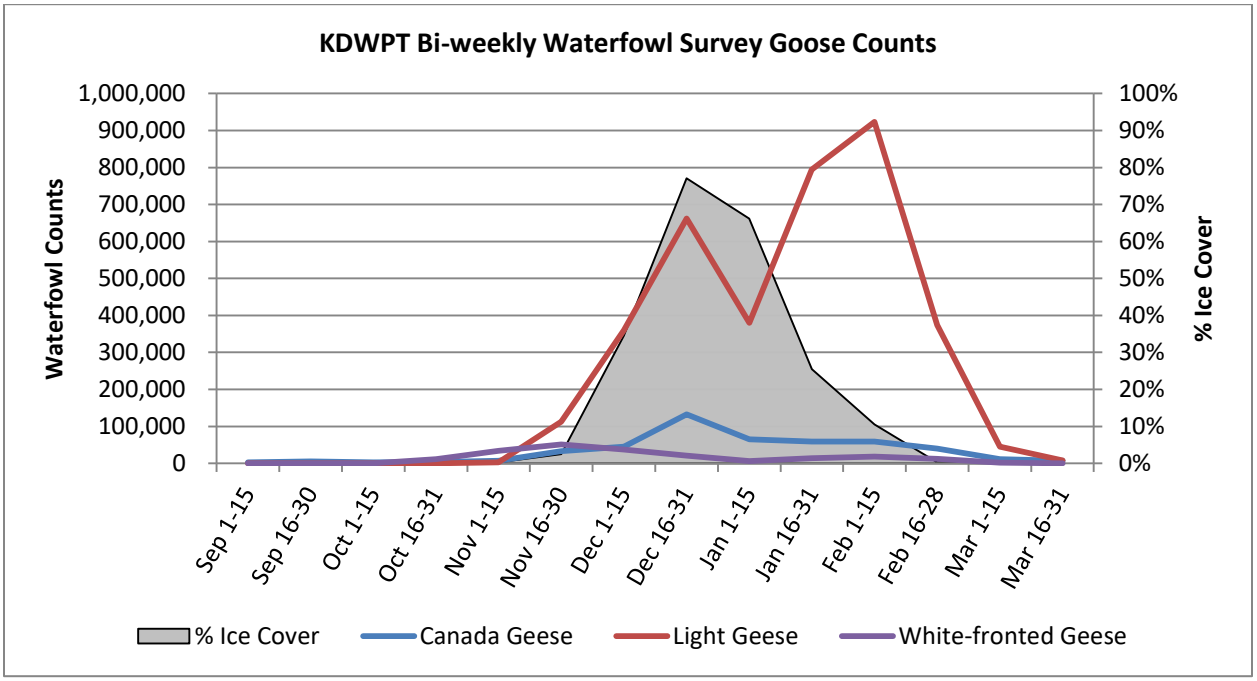

Figure 17. 2016-17 KDWPT Bi-weekly Waterfowl Survey light goose counts and 2011-15 average counts for light geese and average percent ice cover by each survey period.

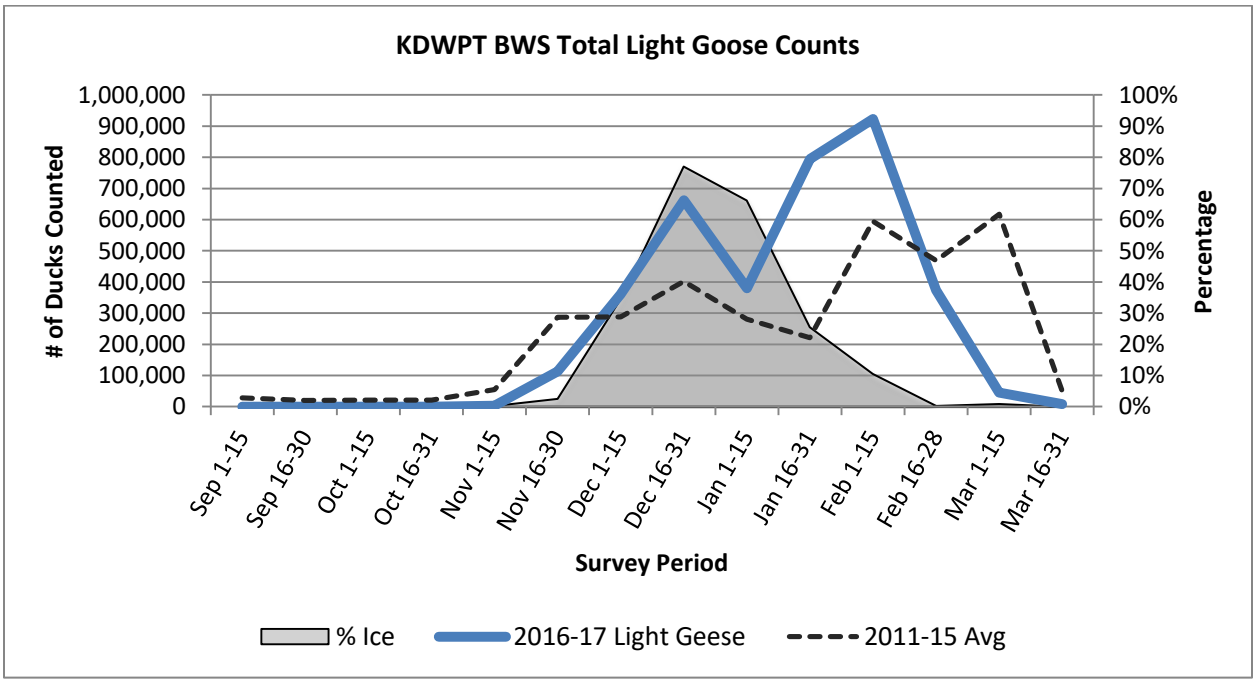

Figure 18. 2016-17 KDWPT Bi-weekly Waterfowl Survey Canada goose counts and 2011-15 average counts for Canada geese and average percent ice cover by each survey period.

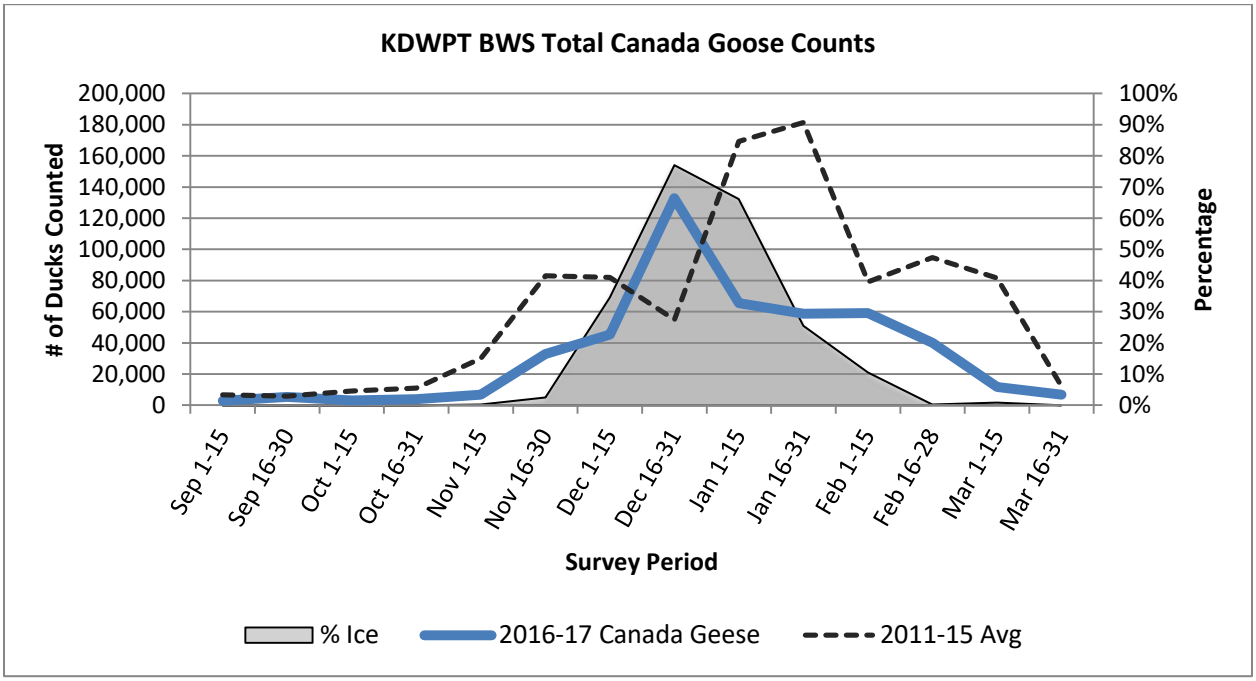

Figure 19. 2016-17 KDWPT Bi-weekly Waterfowl Survey white-fronted goose counts and 2011-15 average counts for white-fronted geese and average percent ice cover by each survey period.

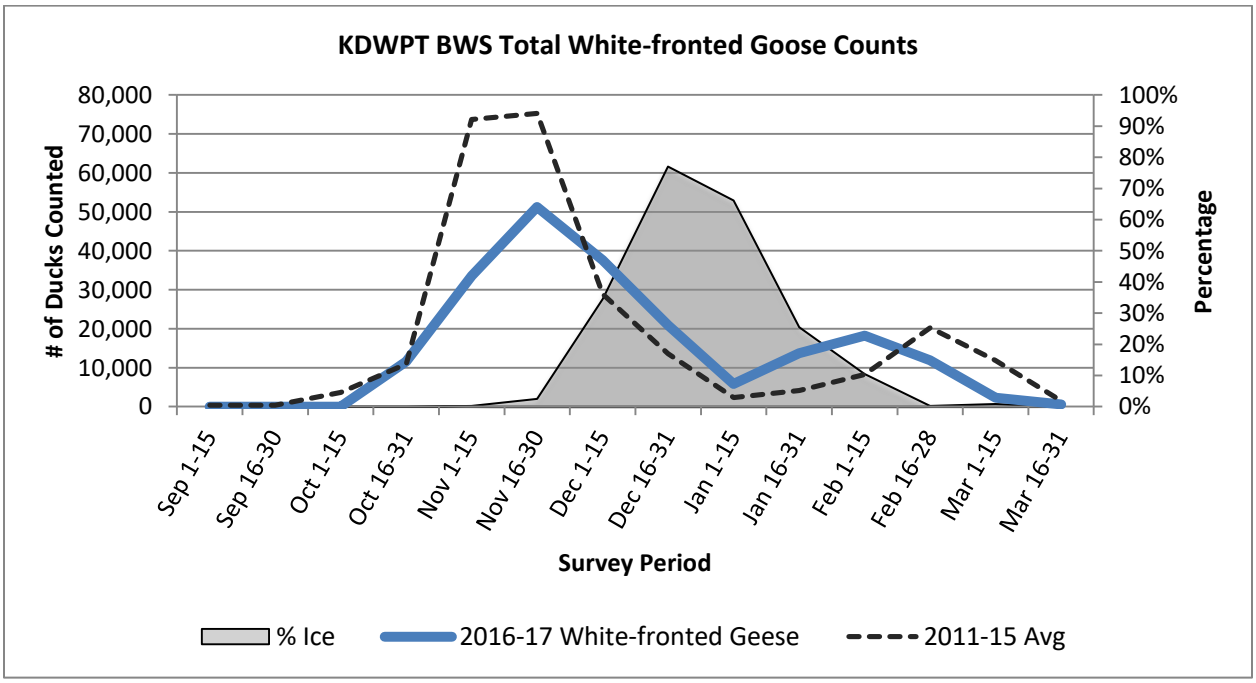

Table 5. 2016-17 KDWPT Bi-weekly Waterfowl Survey counts by goose species for each survey period.

Survey Period	**Canada Goose**	*% of Weekly Count*	*% of Total Canada Goose Counts*	**Light Geese**	*% of Weekly Count*	*% of total Light Goose Counts*	**White-fronted Geese**	*% of Weekly Counts*	*% of White-fronted Total Goose Counts*	**Total Geese**	*% of Total Goose Counts*	*Average % Ice*
Sep 1-15	2,871	*100%*	*1%*	0	*0%*	*0%*	7	*0%*	*0%*	2,878	*0%*	0%
Sep 16-30	5,379	*99%*	*1%*	1	*0%*	*0%*	32	*1%*	*0%*	5,412	*0%*	0%
Oct 1-15	3,078	*99%*	*1%*	0	*0%*	*0%*	33	*1%*	*0%*	3,111	*0%*	0%
Oct 16-31	3,987	*25%*	*1%*	61	*0%*	*0%*	11,610	*74%*	*6%*	15,658	*0%*	0%
Nov 1-15	6,850	*16%*	*1%*	2,520	*6%*	*0%*	33,584	*78%*	*16%*	42,954	*1%*	0%
Nov 16-30	32,930	*15%*	*7%*	113,093	*52%*	*3%*	51,226	*23%*	*25%*	219,249	*5%*	3%
Dec 1-15	45,299	*10%*	*10%*	360,419	*81%*	*10%*	37,577	*8%*	*18%*	443,945	*10%*	35%
Dec 16-31	132,849	*16%*	*28%*	661,953	*81%*	*18%*	20,890	*3%*	*10%*	815,708	*19%*	77%
Jan 1-15	65,409	*14%*	*14%*	379,943	*84%*	*10%*	5,828	*1%*	*3%*	451,180	*10%*	66%
Jan 16-31	58,738	*7%*	*12%*	794,406	*91%*	*22%*	13,705	*2%*	*7%*	869,849	*20%*	25%
Feb 1-15	59,190	*6%*	*12%*	923,419	*92%*	*25%*	18,238	*2%*	*9%*	1,001,647	*23%*	11%
Feb 16-28	40,081	*9%*	*8%*	373,931	*87%*	*10%*	11,943	*3%*	*6%*	429,295	*10%*	0%
Mar 1-15	11,731	*20%*	*2%*	45,453	*76%*	*1%*	2,336	*4%*	*1%*	59,645	*1%*	1%
Mar 16-31	6,738	*44%*	*1%*	7,804	*51%*	*0%*	578	*4%*	*0%*	15,220	*0%*	0%
Yearly Total	**475,130**	***11%***		**3,663,003**	***83.7%***		**207,587**	***5%***		**4,375,751**		

Figure 20. 2016-17 KDWPT Bi-weekly Waterfowl Survey swan counts and 2011-15 average counts for swans and average percent ice cover by each survey period.

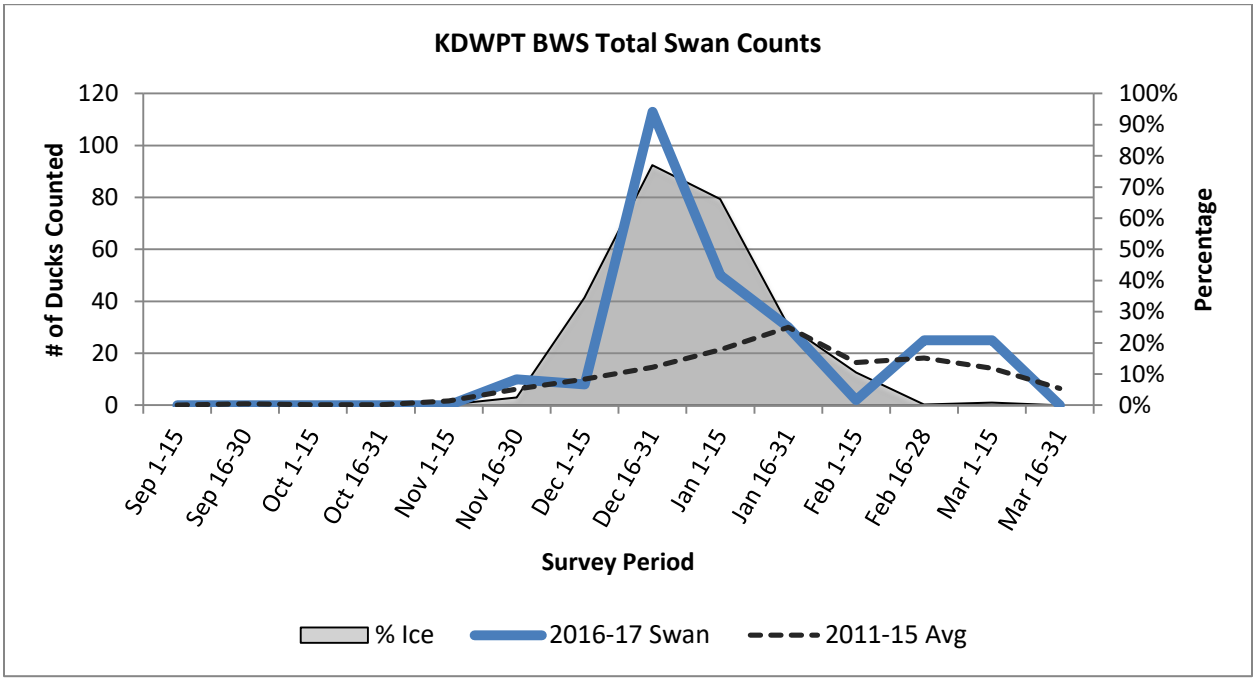

Figure 21. 2016-17 KDWPT Bi-weekly Waterfowl Survey coot counts and 2011-15 average counts for coots and average percent ice cover by each survey period.

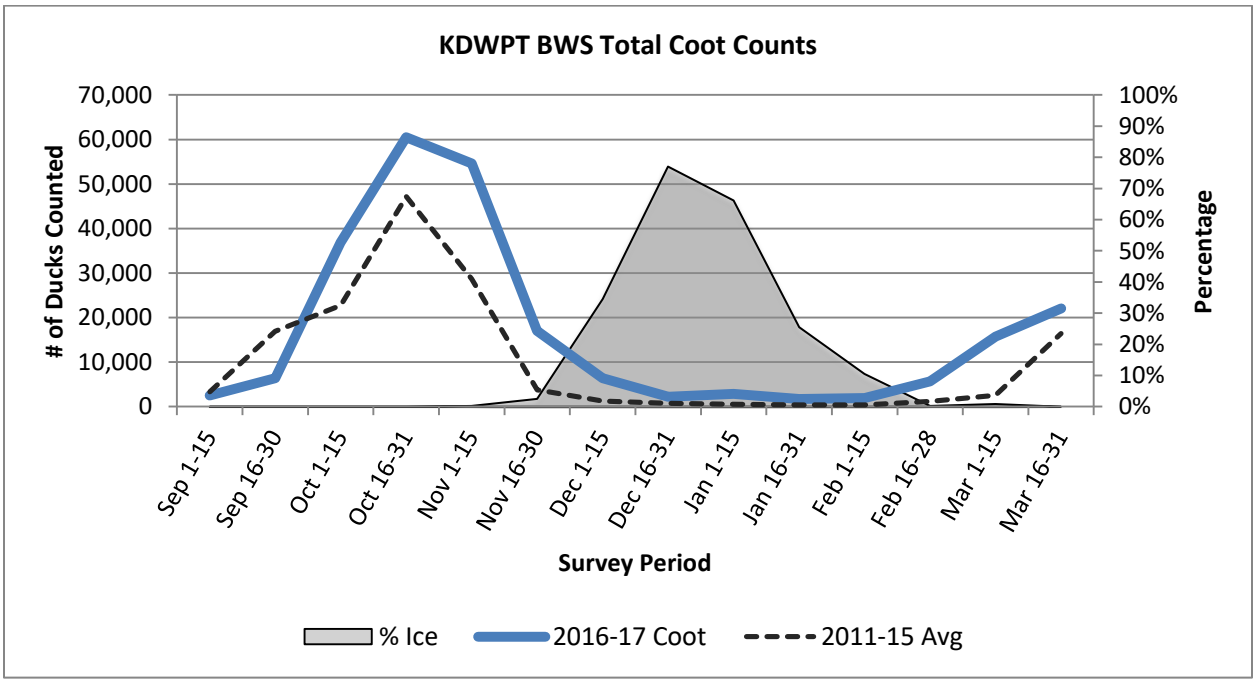

Figure 22. 2016-17 KDWPT Bi-weekly Waterfowl Survey sandhill crane counts and 2011-15 average counts for sandhill crane and average percent ice cover by each survey period.