

2014 - JCR Evaluation Form

SPECIES: White tailed Deer
 HERD: WD706 - BLACK HILLS
 HUNT AREAS: 1-6

PERIOD: 6/1/2014 - 5/31/2015
 PREPARED BY: JOE SANDRINI

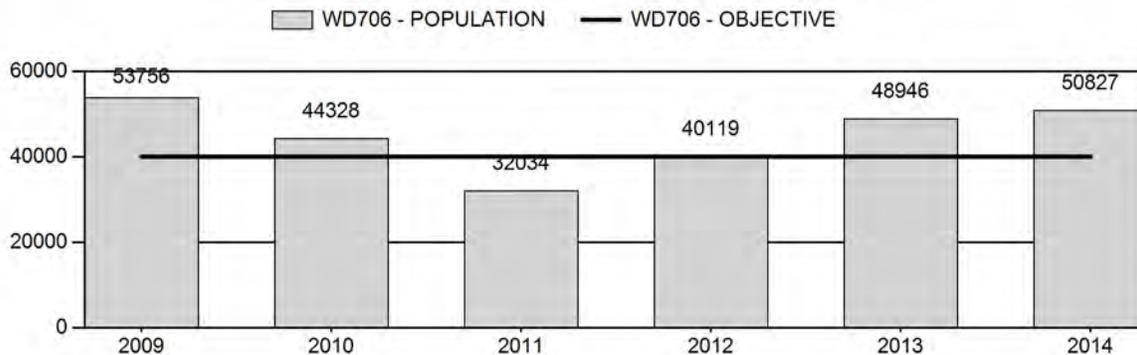
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	43,837	50,827	55,128
Harvest:	4,181	4,143	5,885
Hunters:	7,418	6,616	8,640
Hunter Success:	56%	63%	68 %
Active Licenses:	7,816	7,030	9,700
Active License Success:	53%	59%	61 %
Recreation Days:	31,224	30,305	40,000
Days Per Animal:	7.5	7.3	6.8
Males per 100 Females	26	32	
Juveniles per 100 Females	67	79	

Population Objective (± 20%) : 40000 (32000 - 48000)
 Management Strategy: Recreational
 Percent population is above (+) or below (-) objective: 27%
 Number of years population has been + or - objective in recent trend: 2
 Model Date: 02/18/2014

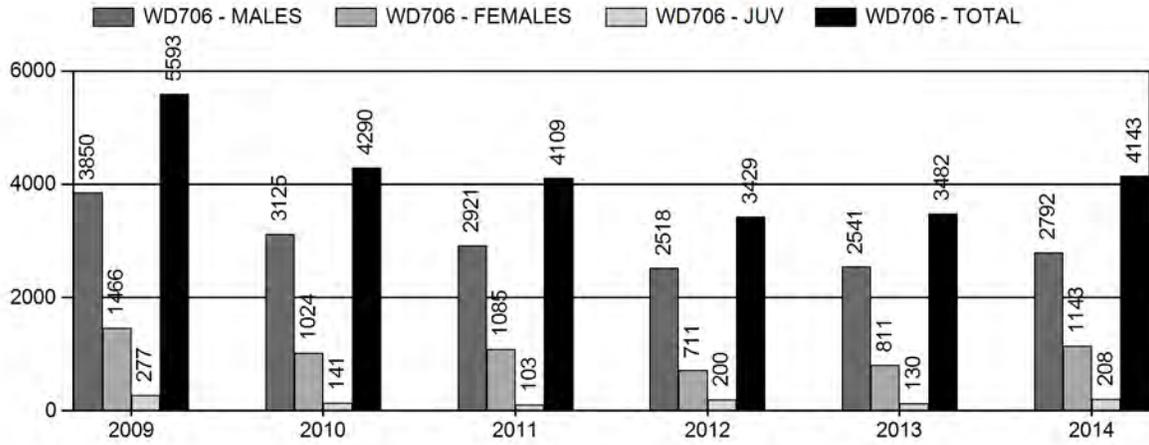
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3.9%	29.6%
Males ≥ 1 year old:	31.5%	5.0%
Juveniles (< 1 year old):	0.9%	1.1%
Total:	8.2%	10.5%
Proposed change in post-season population:	+ 18.7%	+8.5%

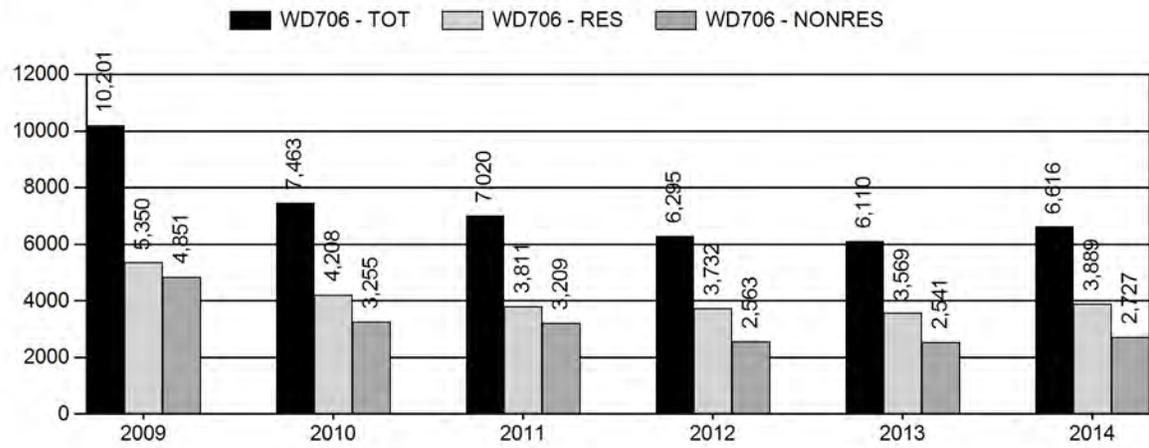
Population Size - Postseason



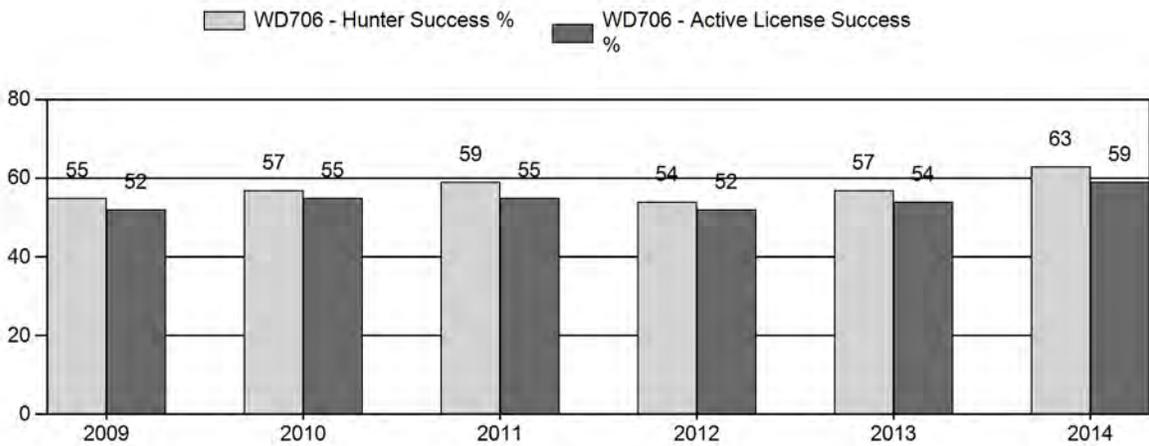
Harvest



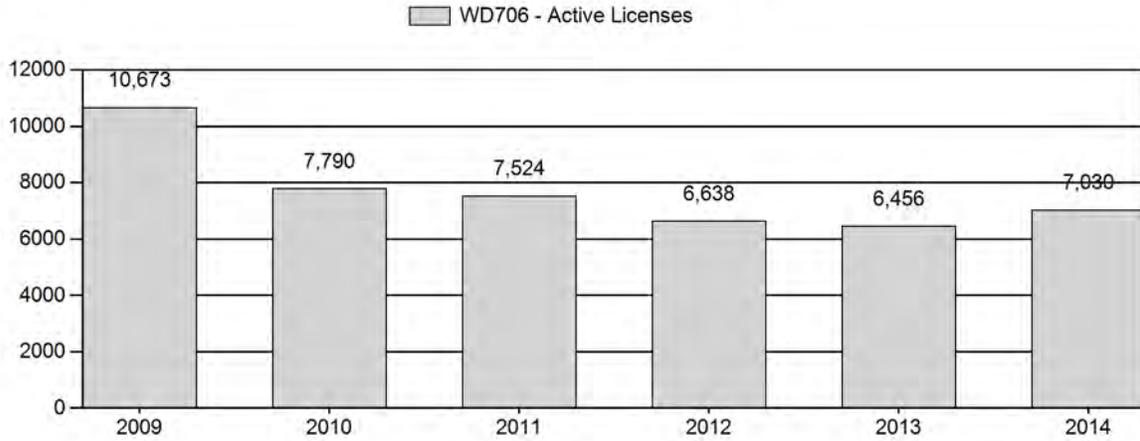
Number of Hunters



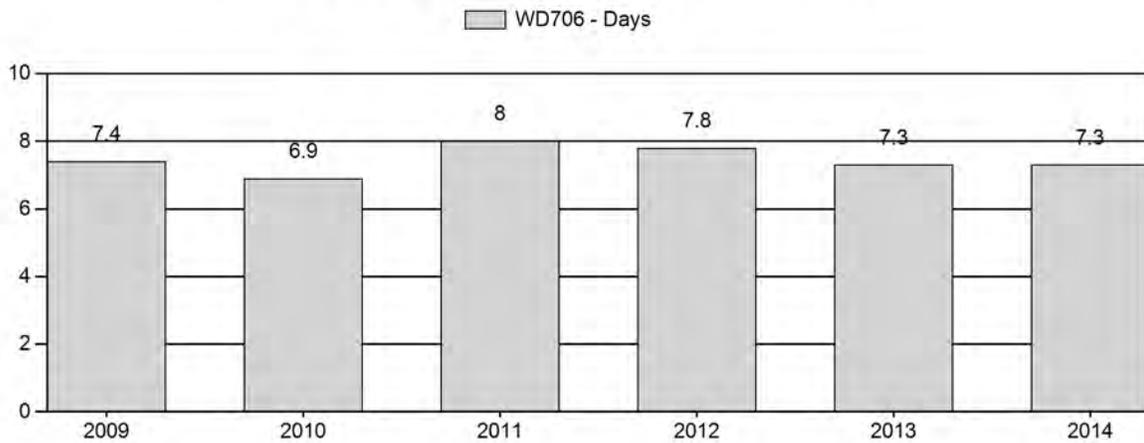
Harvest Success



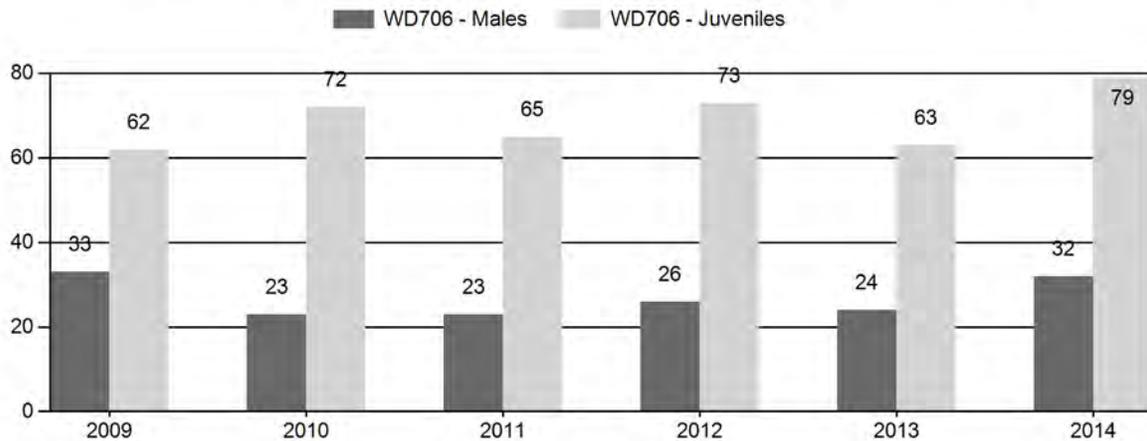
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for White tailed Deer Herd WD706 - BLACK HILLS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	59,908	131	224	355	17%	1,079	51%	672	32%	2,106	1,260	12	21	33	± 0	62	± 0	47
2010	49,047	93	232	325	12%	1,407	51%	1,016	37%	2,748	1,536	7	16	23	± 0	72	± 0	59
2011	36,554	48	149	197	12%	856	53%	559	35%	1,612	1,278	6	17	23	± 0	65	± 0	53
2012	43,891	93	143	236	13%	919	50%	675	37%	1,830	1,590	10	16	26	± 0	73	± 0	58
2013	52,709	163	153	316	13%	1,303	53%	827	34%	2,446	1,232	13	12	24	± 0	63	± 0	51
2014	55,385	111	198	309	15%	980	47%	778	38%	2,067	1,894	11	20	32	± 0	79	± 0	60

**2015 HUNTING SEASONS
BLACK HILLS WHITE-TAILED DEER HERD (WD706)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
1		Nov. 1	Nov. 30		General	Antlered white-tailed deer off private land; any white-tailed deer on private land
1, 2, 3	8	Nov. 1	Nov. 30	2000		Doe or fawn white-tailed deer valid on private land
2		Nov. 1	Nov. 30		General	Antlered deer off private land; any deer on private land
2	6	Nov. 1	Nov. 30	250	Limited quota	Doe or fawn valid on private land
3		Nov. 1	Nov. 30		General	Antlered deer off private land; any deer on private land
4		Nov. 1	Nov. 20		General	Antlered deer off private land; any deer on private land, except the lands of the State of Wyoming's Ranch A property shall be closed
4	6	Nov. 1	Nov. 20	200	Limited quota	Doe or fawn valid on private land
5		Nov. 1	Nov. 20		General	Antlered deer off private land; any deer on private land
5	6	Nov. 1	Nov. 20	50	Limited quota	Doe or fawn
6		Nov. 1	Nov. 20		General	Antlered deer off private land; any deer on private land
Archery		Sep. 1	Sep. 30			Refer to license type and limitations in Section 2

Region A Nonresident Quota: 3,500

SUMMARY OF CHANGES IN LICENSE NUMBER¹

Hunt Area	License Type	Quota change from 2014
1,2,3	8	+800
2	6	See MD751
Herd Unit Totals	8	+800
	Region A	See MD751

¹ Type 6 and Region A quota changes for Hunt Areas 1-6 are captured in the MD751 JCR

Management Evaluation

Current Management Objective: 40,000

Management Strategy: Recreational

2014 Postseason Population Estimate: ~ 50,800

2015 Proposed Postseason Population Estimate: ~ 55,100

2014 Hunter Satisfaction: 75% Satisfied, 16% Neutral, 9% Dissatisfied

HERD UNIT ISSUES: The management objective of the Black Hills White-Tailed Deer Herd Unit was set in 1983 for an estimated post-season population of 40,000 white-tailed deer. The herd is managed under the recreational management strategy. It is apparent the current objective is not commensurate with newer population estimates relative to landowner and hunter desires. Thus, the management objective and strategy are currently under review, and a proposed new objective of 55,000 will be taken out for public comment during the spring of 2015.

Over the years, modeling this population has been extremely difficult and frustrating. This is due to substantial interstate movement of deer, wide fluctuations in observed fawn:doe ratios, large changes in doe harvest, regular outbreaks of epizootic hemorrhagic disease virus (EHDV), increased predation in recent years, a high level of vehicle-deer collisions, the apparent low productivity of this herd compared to other white-tailed deer herds, severe weather events, and low and irregular visibility of bucks during classifications. Consequently, the population model is thought to be of low quality and estimates produced by the model should be viewed cautiously. Because of this, and the fact that much of the herd unit is comprised of private property, management of this herd has been based heavily on perceptions of deer numbers relative to landowner tolerance.

The Black Hills White-Tailed Deer Herd unit is primarily located within Crook and Weston Counties in northeastern Wyoming and encompasses about 3,140 mi² of occupied habitat. Seasonal range maps for this herd were updated in 2004, and currently 335 mi² are delineated as crucial winter range. Dominant land uses in the herd unit include livestock grazing and forage crop production. Most forested lands are actively managed for timber production and harvest. There is some extraction of minerals, primarily bentonite and oil. The majority of white-tailed deer are found in the eastern two-thirds of this herd unit and within the Belle Fourche River drainage where habitat is favorable.

Approximately 79% of the land within this herd unit is privately owned. The largest blocks of accessible public land are found on the Black Hills National Forest in Hunt Areas (HA) 2 and 4, Thunder Basin National Grasslands in HA 6, and BLM lands in HA 1. Due to the late timing of deer hunting season in the Black Hills relative to other areas in Wyoming, and the potential to harvest a whitetail on public land, this herd unit is extremely popular with resident hunters. Its proximity to the upper Midwestern United States and availability of sympatric mule deer hunted concurrently also make it very popular with non-residents. Access fees for hunting are very common on private land, and many holdings have been leased to outfitters. Consequently, accessible public lands are subject to very heavy hunting pressure, probably the highest in the State. Due to limited access for hunters on private land, keeping the growth of this herd in check is difficult when habitat and weather conditions are favorable.

Whitetails are the most numerous deer species in HA's 2 and 4, whereas more equal proportions or greater numbers of mule deer occupy HA's 1, 3, 5, and 6 depending upon habitat type. A high proportion of white-tailed deer in the herd unit reside on private land. This results in their management being strongly influenced by landowner sentiments. Field personnel report white-tailed deer numbers are now growing close to local tolerance. A survey of about 450 Black Hills landowners at the end of 2014 revealed about half of the respondents (52%) having whitetails on their property believed their numbers to be "about right;" while just over a third (35%) reported their numbers to be "too low;" and only 13% felt whitetail numbers were "too high." Over the past four years, many landowners and the hunting public have expressed the desire to see more deer, and now those longings are beginning to be addressed as this population has begun to rebound.

WEATHER: Drought conditions, which were generally persistent throughout the Black Hills between 2000 and 2006, began to moderate some in 2007. Between 2007 and 2011, annual temperatures were generally near or below the previous 30-year average and annual precipitation each year was at or above average (<http://www.ncdc.noaa.gov/cag/time-series/us>). Notably, 2010 was colder and wetter than both the 30-year and 100-year averages; and the winter of 2010-11 was severe. Since the late 1890's, only five other winters were as cold and snowy.

Drought returned to the Black Hills in 2012, with above normal summer temperatures and little rainfall during the growing season. Forage production that year was very poor, and the dry conditions led to several large wildfires in the southern half of the herd unit. The warm and dry conditions that beset the area in April of 2012 continued through the 2012-13 winter (<http://www.ncdc.noaa.gov/cag/time-series/us>). April of 2013 finally saw a break in this pattern when temperatures dropped well below normal for the entire month and good precipitation was again received. Through the remainder of the growing season, temperatures were slightly above average and precipitation well above normal. This resulted in excellent forage growth. In early October, 2013 winter storm Atlas blanketed the Black Hills with anywhere from about a foot of wet heavy snow near Newcastle, to three feet on the Bearlodge, and over five feet near Cement Ridge. No large scale die-offs of white-tailed deer were witnessed from this storm, but some white-tailed deer mortalities on the National Forest south of I-90 were discovered. This storm also displaced a large number of white-tailed deer from higher elevations on the BHNF to lower elevation private lands. The remainder of the fall and the 2013-14 winter brought very close to average temperatures and snowfall, which resulted in continuous snow cover over much of the Black Hills until late May, and elevated spring run-off. Spring weather was similar to the previous year with temperatures just below normal and about 20% more precipitation than average. This was followed by a summer with close to average temperatures and precipitation about 25% above normal, resulting in a second year in a row of excellent forage production and ultimately improved fawn production. To date, the 2014-15 winter has been mild with below normal snowfall in most locations.

Based upon weather and habitat conditions over the past five years, it is likely white-tailed deer entered the winter in fair condition most years, except bio-year 2012. More normal winter temperatures and precipitation punctuated by some severe winter and spring weather have increased stress on white-tailed deer compared to the previous decade, as did the drought of 2012. This weather pattern resulted in fluctuations in observed fawn:doe ratios and inconsistent,

annual recruitment of fawns in to the adult population. However, with favorable conditions the past two years, productivity and survival have increased.

HABITAT: Ponderosa pine (*Pinus ponderosa*) is the dominant overstory species on forested lands. Quaking aspen (*Populus tremuloides*), paper birch (*Betula papyrifera*), and bur oak (*Quercus macrocarpa*) stands are also present. Many areas dominated by deciduous trees are in late successional stages. Important shrubs include Saskatoon serviceberry (*Amelanchier alnifolia*), Oregon grape (*Berberis repens*), common chokecherry (*Prunus virginiana*), and wild spiraea (*Spiraea betulifolia*). Non-timbered lands in this portion of the herd unit are used to produce agricultural crops such as winter wheat (*Triticum aestivum*), alfalfa hay (*Medicago sativa*), or mixed-grass hay. White-tailed deer in the western one-third of the herd unit are limited mainly to riparian habitats and associated agricultural ground. Outside of these riparian corridors habitat in this portion of the herd unit is dominated by sagebrush steppe and grasslands with scattered ponderosa pine covered hills.

FIELD DATA: Preseason age and sex classifications are conducted in this herd unit during the second half of October each year along standardized routes. Most of these routes have been used for over 40 years. In 2013, classifications were not conducted along the routes due to difficult travel conditions created by winter storm Atlas. Instead, ground based classifications were conducted in areas where personnel could meet required sample sizes. Standard route classifications were resumed in 2014.

During the past three decades, fawn production and survival (based upon preseason classification counts) has been well below that observed in most white-tailed deer herds, and at times fluctuated dramatically. The underlying cause is thought to be related to nutritional condition of does (pers. Comm. SDGF&P). However, over the last 10-years observed fawn:doe ratios have trended towards improvement, likely a result of vegetative responses to fire enhancing forage conditions. Further, observed fawn:doe ratios during this timeframe did not fluctuate as drastically as during the previous decade and a half. On the other hand, observed preseason buck:doe ratios over the past ten years have been generally stable ($\text{mean}_{(04-14)} = 27:100$; $\text{SD} = 4.0$), but have shown a slight, overall decline. Stability in the buck:doe ratio the past few years is thought to be the result of substantial reductions in buck hunting pressure while this population declined and non-hunting mortality increased. For example, 2010-11 over-winter mortality was significant given weather conditions and the 2011 observed yearling buck:doe ratio of 6:100. Overall, this herd's observed, preseason buck:doe ratios are at the lower end of the Department's recreational management criteria. It should be noted, however, that classifications are made outside the rut, and because whitetails are secretive, we have always modeled this herd's preseason buck:doe ratio about 30% above observed values. This corrective factor was determined from historical modeling efforts with POP-II and the inflation in buck:doe ratios needed to get those models to run given harvest levels of bucks. Additionally, there have been occasional years when observed buck ratios inexplicably jumped about the same amount (something attributed to intermittently enhanced sightability).

HARVEST DATA: In the Black Hills, deer management entails regulating both mule deer and whitetail harvest under a single, General License season structure, across a variety of habitats and habitat conditions, and with serious deference given to landowner desires. Historical analysis of harvest information suggests hunter number has the greatest impact on buck harvest.

Therefore, buck harvest has been regulated by altering non-resident hunter participation via changes in the Region A quota, while resident buck hunter participation can only be limited by shortening the season – notably by inclusion or removal of the Thanksgiving Day weekend and the days following in November (due to the large influx of hunters during this period when buck deer are highly vulnerable to harvest). With more conservative hunting season structures in place between 2010 and 2013, harvest of both antlered and antlerless whitetails dropped. In 2014, as this herd began to recover, doe/fawn license issuance was increased and buck harvest climbed some even though General License seasons and Region A license issuance remained limited. As a result, the total harvest in 2014 was about 8% above that of 2013. Between 2009 and 2013, harvest success was fairly consistent before increasing in 2014, while hunter effort climbed significantly between 2010 and 2011 when it peaked before declining. Overall, harvest statistics generally support population model assertions that this population peaked in 2006, declined substantially into 2011, and is now beginning to rebound. However, there is some disparity relative to bio-year 2010, as the model indicates that year to be the population nadir, while harvest statistics and field observations suggest bio-year 2011 was when the population hit its low point.

Hunting seasons between 2010 and 2014 reduced harvest of whitetail bucks on average about 30% from that experienced during the traditional November season the preceding four years. Comparing these time periods, resident harvest of white-tailed bucks dropped about 20%, while non-resident harvest of white-tailed bucks dropped closer to 40%. During this same time, harvest of mule deer bucks declined more precipitously (see MD751). Despite these trends, preseason whitetail buck:doe ratios held fairly stable and deer hunter satisfaction essentially remained unchanged between 2011 and 2013, with about 68% of hunters of both deer species reporting they were either satisfied or very satisfied with their Black Hills deer hunt, and only around 15% indicating they were either dissatisfied or very dissatisfied – regardless of species. Notably, satisfaction measures improved in 2014 with 75% of both mule deer and white-tailed deer hunters reporting they were satisfied with their Black Hills deer hunt, and only 10% reporting negative satisfaction – again regardless of species. It can be inferred from the inherent correlation between harvest success and hunter satisfaction that the increases in deer hunter success rates in the Black Hills during 2013 and 2014 influenced increases in hunter satisfaction both years.

POPULATION: As noted above, population modeling of this herd has always been difficult and fraught with problems. In 2014, the spreadsheet model for this herd was reconstructed and re-initiated after correcting errors detected in the previous model and experimenting with models of various construction. The present model was set to solve only on years for which field data were available (1993-2014), but used to project 2015 populations.

Of the final three competing spreadsheet models, the Semi-Constant Juvenile / Semi-Constant Adult survival (SCJ SCA) model was selected to estimate the population. While the Constant Juvenile / Constant Adult survival (CJ CA) model will function with this herd's observed data set, it produces an essentially stable population of about 83,000 deer since 1993, which does not dovetail with field observations or harvest statistics. The AICc of this model is about double that of the competing models and it most poorly fits observed data. On the other hand, the Time Sensitive Juvenile / Constant Adult survival model (TSJ CA) yielded the lowest AICc value and best fit. However, this model was rejected because in order to get it to function, juvenile survival rates had to be allowed to vary down to 0.25, a value the model constrained itself to in 5 out of

22 years. Additionally, this model was not correlated well with trend data or harvest statistics. Alternatively, the SCJ SCA model is 75% correlated with preseason trend counts (Figure 1), and the trends it produces are generally congruent with field personnel and landowner observations. However, it does indicate a substantial decline in the population in 2009 that was not actually realized until after the 2010/11 winter. Further, changes in the preseason population estimates produced by the SCJ SCA model are not correlated with changes in hunter effort, while the TSJ CA model exhibits a slight inverse correlation. With regards to changes in hunter success, the SCJ SCA model is best correlated (67%) while the TSJ CA model is more poorly correlated (37%) with these estimates. Finally, the SCJ SCA model estimates 29% to 59% (mean = 38%) of the bucks have been harvested from the preseason population each year since 1993, while the TSJ CA model exhibits about half as much variation in the estimated percentage of bucks harvested annually, and estimates a mean buck harvest percentage value of 28% (something more tenable). Therefore, due to the variety of factors identified, we consider the chosen model to be of poor quality, but better than the competing models.

According to the current spreadsheet model, this population grew 154% between 2001 and 2007. The population then declined 50% to its nadir in 2010 (22% below current objective), before rebounding nearly 62% through 2014. This projected peak, subsequent decline, and rebound in the population reflects overall field observations. However, as previously noted, by all accounts this population dropped steadily from 2007 through 2010, before dipping significantly in 2011 – a trend shown one year antecedent in the model’s projections. If population estimates produced by the spreadsheet model are close to accurate, then our current objective is well below landowner and hunter desires. This is evident as about one-third of landowners and many hunters have noted white-tailed deer numbers are presently below what they would like to see.

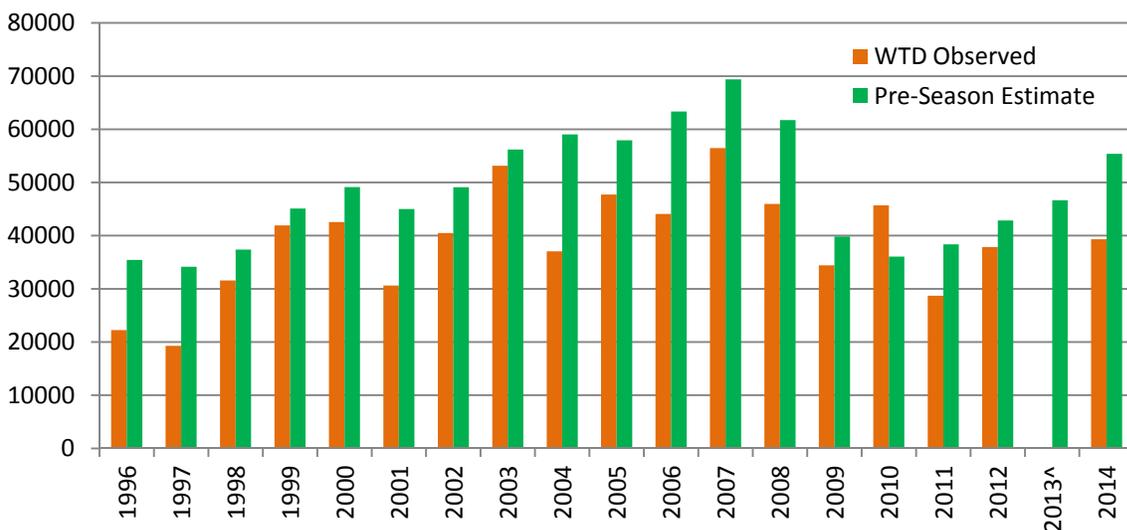


Figure 1. 1996-2014 white-tailed deer, estimated preseason population and trend count data, increased by a factor of 10. ^ trend count not completed 2013.

Beginning in 2002, hunting seasons in this herd unit were structured to retard growth, something with which we were only mildly successful. Population growth was reversed in 2007, but this directional change was due primarily to increased non-hunting mortality rather than enhanced harvest. Reductions in survival rates being most ostensibly attributed to increased over-winter

mortality caused by late spring blizzards in 2008 & 2009 and an unusually severe winter in bio-year 2010, along with EHDV outbreaks between 2008 and 2013 - all of which acted to increase annual mortality in all sex and age classes of deer. Between 2007 and 2010, evidence also suggests the mountain lion population in the Black Hills reached historically high levels. As a result, elevated harvest, weather conditions, disease and increased predation acted in concert to reduce this population substantially. In response, hunting seasons have been conservative since 2010, allowing this herd to increase the past three years. This trend in season structure has been reversed for 2015 in order to begin to temper herd growth once again.

MANAGEMENT SUMMARY: Changes to the 2015 white-tailed deer hunting season in the Black Hills were designed to allow more liberal harvest of bucks and increased take of antlerless white-tailed deer. Changes included moving the closing date back to the traditional November 30th closing date (from November 21st) in Hunt Areas 1, 2, and 3 while retaining the traditional November 20th closing date in HA's 4, 5, & 6. Although, mule deer hunting will be closed on November 20th in hunt area 1 (see MD751). Whitetail buck numbers are improving, and based upon classification data and population estimates there should be a good cohort of 1, 2 and even some 3 year-old bucks available for hunters in 2015, but reduced numbers of 4 & 5 year-old bucks. As such, it seems prudent to liberalize buck harvest, something that also attracts more hunters into the area, many of whom also harvest does. White-tailed doe harvest needs to be encouraged now as we must begin to slow the growth of this population. It is projected the 27% increase in Region A license issuance and 30-day season north of Interstate Highway 90 will increase buck harvest about 30% above the levels witnessed with more conservative hunting season structures the past several years. Even with this increase in buck harvest, the preseason buck:doe ratio should at minimum remain stable, if not increase some.

In order to help limit herd growth and allow landowners to be proactive in curbing increases in whitetail numbers, issuance of Type 8 doe/fawn white-tailed deer licenses valid on private land in HA's 1, 2, & 3 has been increased 67% for 2015 - this following a 50% increase in 2014. Issuance of Type 6 doe/fawn licenses in HA 2, which are valid for both mule deer and white-tailed deer on private lands, have also been increased from 50 to 250, while similar license types in HA 4 and HA 5 have been increased from 150 to 200 and 25 to 50, respectively. The ten Type 6 licenses valid and HA 6 & 9 issued in 2014 have been eliminated.

The 2015 hunting season is expected to yield an estimated 2015 postseason population of about 55,120 white-tailed deer, which represents an 8% increase in the current post-season population. These projections assume over-winter survival will be good and summer losses to EHDV minimal. Provided the change in population is reached, this herd would be 38% above objective, but hopefully get us close to a number of deer most hunters and landowners would like to see, and near the value of a revised objective.

INPUT
 Species: White-Tail Deer
 Sandrini
 Black Hills 706
 Herd Unit & No.:
 Model date: 02/18/15

MODELS SUMMARY			
	Fit	Relative AICc	Notes
CJ,CA	389	398	
SCJ,SCA	146	203	
TSJ,CA	50	172	

Clear form

Check best model to create report

CJ,CA Model
 SCJ,SCA
 TSJ,CA Model

Year	Pre-Rifle Pop Est		Trend Count	Pre-Archery Season Population (year i)			Pre-Rifle Season Population (year i)			Predicted Posthunt Population (year i)			Objective
	Field Est	Field SE		Juveniles	Total Males	Females	Juveniles	Total Males	Females	Juveniles	Total Males	Females	
1993				11831	6802	18302	11831	6802	18302	11116	3071	14721	40000
1994				10805	6264	16764	10805	6264	16764	10710	3213	16212	40000
1995				9640	6403	18352	9640	6403	18352	9561	3739	17721	40000
1996	2225			9647	6506	19293	9647	6506	19293	9605	4180	18934	40000
1997	1930			6748	6958	20433	6748	6958	20433	6724	4384	19955	40000
1998	3158			10993	6090	20313	10993	6090	20313	10951	3791	19956	40000
1999	4194			14137	8108	22851	14137	8108	22851	14103	6522	22621	40000
2000	4256			13018	10750	25375	13018	10750	25375	12951	7064	24746	40000
2001	3061			7556	10624	26844	7556	10624	26844	7443	7274	25962	40000
2002	4050			14334	8857	25923	14334	8857	25923	14261	5437	25428	40000
2003	5314			18624	9641	27925	18624	9641	27925	18392	5559	26928	40000
2004	3705			17222	11139	30680	17222	11139	30680	17067	7252	29644	40000
2005	4773			17143	11873	28929	17143	11873	28929	16949	7705	27513	40000
2006	4408			20140	12551	30654	20140	12551	30654	19690	8227	28913	40000
2007	5647			22420	14050	32925	22420	14050	32925	22225	6839	30872	40000
2008	4597			19454	11420	30846	19454	11420	30846	19245	6839	28496	40000
2009	3441			11878	8897	19072	11878	8897	19072	11573	4662	17459	40000
2010	4571			12694	5800	17580	12694	5800	17580	12539	2362	16453	40000
2011	2870			12621	6414	19327	12621	6414	19327	12508	3201	18134	40000
2012	3785			15173	7017	20658	15173	7017	20658	14953	4247	19876	40000
2013				14678	8862	23127	14678	8862	23127	14535	6067	22235	40000
2014	3932			19926	10359	25100	19926	10359	25100	19697	7287	23843	40000
2015				19994	13263	28344	19994	13263	28344	19620	9254	26254	40000
2016													40000
2017													40000
2018													40000
2019													40000
2020													40000
2021													40000
2022													40000
2023													40000
2024													40000
2025													40000

Survival and Initial Population Estimates

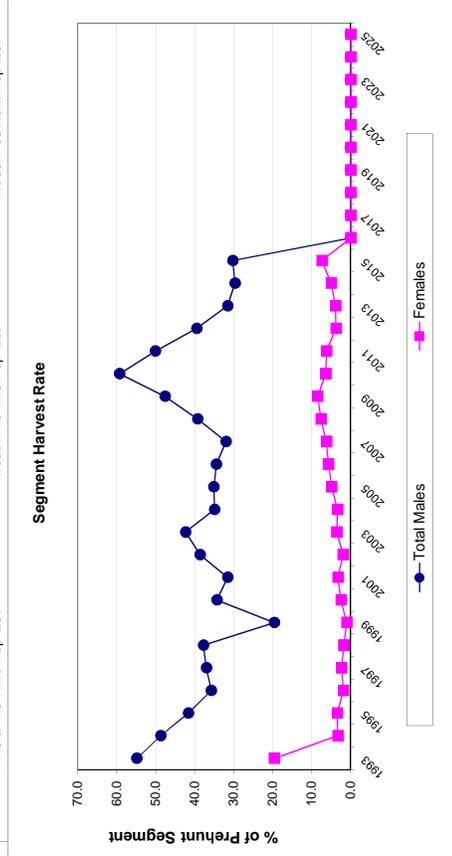
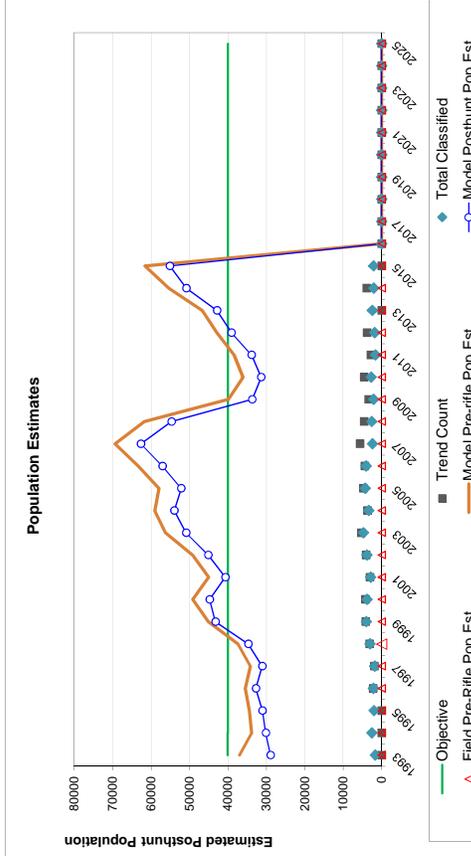
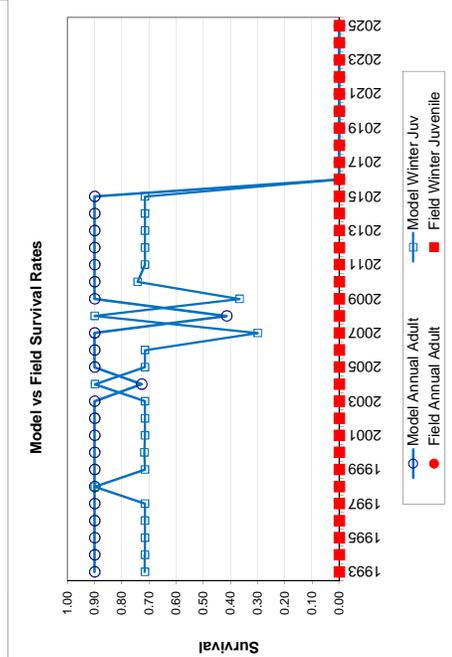
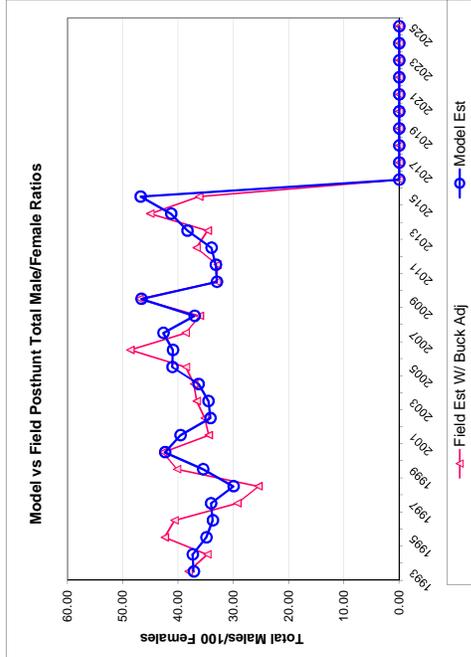
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	SE	Field Est	SE
1993	0.72		0.90	
1994	0.72		0.90	
1995	0.72		0.90	
1996	0.72		0.90	
1997	0.72		0.90	
1998	0.90		0.90	
1999	0.72		0.90	
2000	0.72		0.90	
2001	0.72		0.90	
2002	0.72		0.90	
2003	0.72		0.90	
2004	0.90		0.73	
2005	0.72		0.90	
2006	0.72		0.90	
2007	0.30		0.90	
2008	0.90		0.41	
2009	0.37		0.90	
2010	0.74		0.90	
2011	0.72		0.90	
2012	0.72		0.90	
2013	0.72		0.90	
2014	0.72		0.90	
2015	0.72		0.90	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Juvenile Survival =	0.715
Adult Survival =	0.900
Initial Total Male Pop/10,000 =	0.680
Initial Female Pop/10,000 =	1.830

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Buck Adjustment Factor	70%

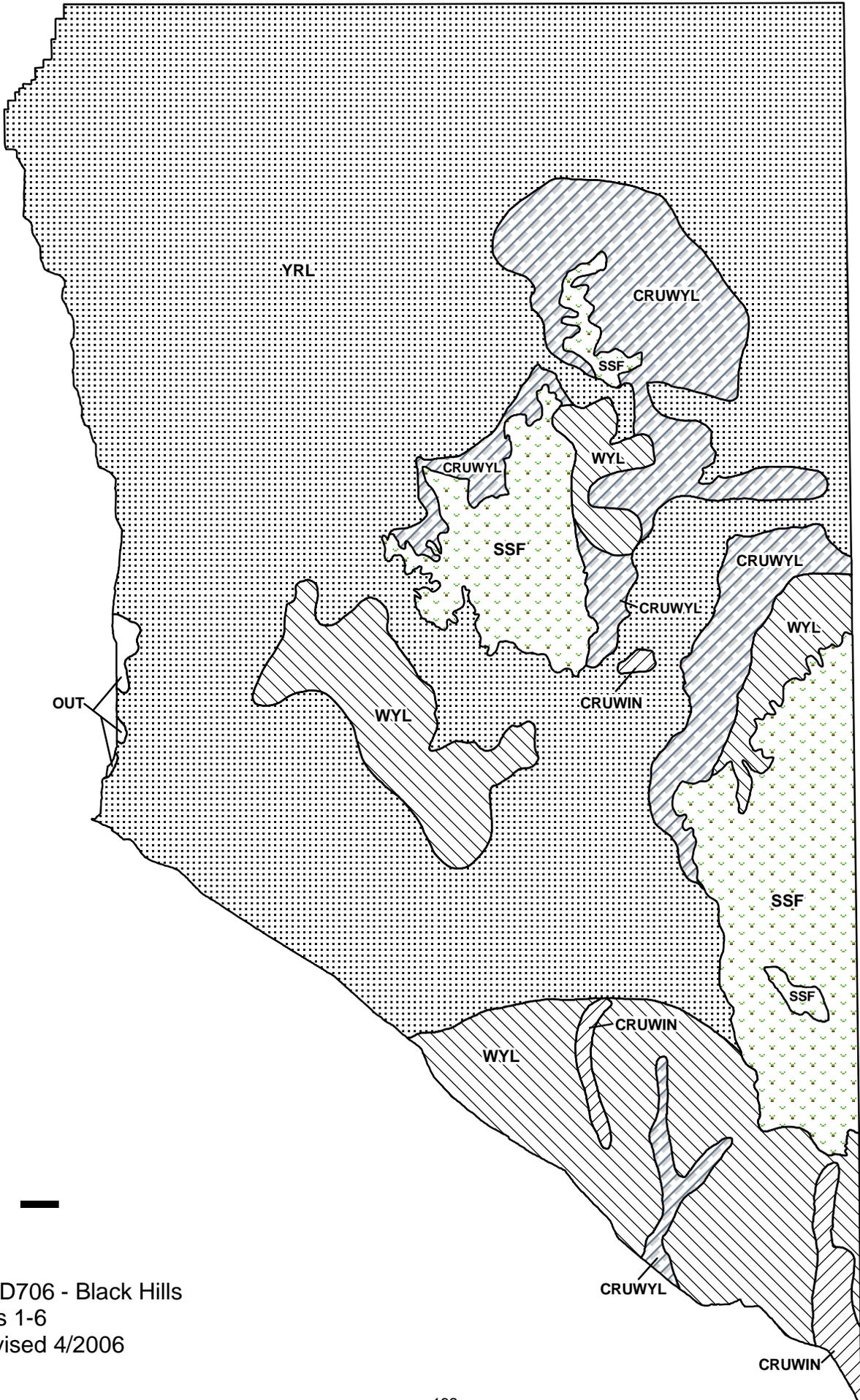
Year	Juvenile/Female Ratio			Total Male/Female Ratio			Total Harvest (Rifle+Archery)					
	Derived Est	Field Est	Field SE	Derived Est	Field est w/ buck Adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		64.64	3.46	37.17	38.13	1.95	650	3392	3256	7298	54.9	19.6
1994		64.45	2.78	37.37	34.72	1.49	86	2774	502	3362	48.7	3.3
1995		52.53	2.69	34.89	42.42	1.86	72	2422	574	3068	41.6	3.4
1996		50.00	2.49	33.72	40.68	1.74	38	2115	327	2480	35.8	1.9
1997		33.03	1.92	34.05	29.29	1.44	22	2340	435	2797	37.0	2.3
1998		54.12	2.17	29.98	25.48	1.09	38	2090	324	2452	37.8	1.8
1999		61.87	2.18	35.48	40.20	1.31	31	1442	209	1682	19.6	1.0
2000		51.30	1.92	42.36	42.73	1.36	61	3351	572	3984	34.3	2.5
2001		28.15	1.38	39.58	34.47	1.26	103	3046	802	3951	31.5	3.3
2002		55.30	2.00	34.17	35.20	1.20	67	3109	450	3626	38.6	1.9
2003		66.69	2.12	34.52	36.65	1.14	211	3711	907	4829	42.3	3.6
2004		56.14	2.17	36.31	37.14	1.33	141	3534	941	4616	34.9	3.4
2005		59.26	2.02	41.04	38.60	1.22	176	3789	1287	5252	35.1	4.9
2006		65.70	2.31	40.95	48.65	1.50	227	3931	1583	5741	34.5	5.7
2007		68.09	3.04	42.67	38.66	1.67	177	4882	1866	6125	32.0	6.2
2008		63.07	2.73	37.02	36.10	1.51	190	4074	2136	6400	39.2	7.6
2009		62.28	3.06	46.65	47.00	2.01	277	3850	1466	5593	47.6	8.5
2010		72.21	2.97	32.99	33.00	1.42	141	3125	1024	4290	59.3	6.4
2011		65.30	3.55	33.19	32.88	1.82	103	2921	1085	4109	50.1	6.2
2012		73.45	3.72	33.97	36.69	1.87	200	2518	711	3429	39.5	3.8
2013		63.47	2.82	38.32	34.65	1.52	130	2541	811	3482	31.5	3.9
2014		79.39	3.81	41.27	45.04	2.06	208	2792	1143	4143	29.6	5.0
2015		70.54	3.32	46.79	36.20	1.70	340	3645	1900	5885	30.2	7.4
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



Comments:

END



WTD706 - Black Hills
 HAs 1-6
 Revised 4/2006

2014 - JCR Evaluation Form

SPECIES: White tailed Deer

PERIOD: 6/1/2014 - 5/31/2015

HERD: WD707 - CENTRAL

HUNT AREAS: 7-14, 21-22, 34, 65-67, 88-89

PREPARED BY: WILLOW HIBBS

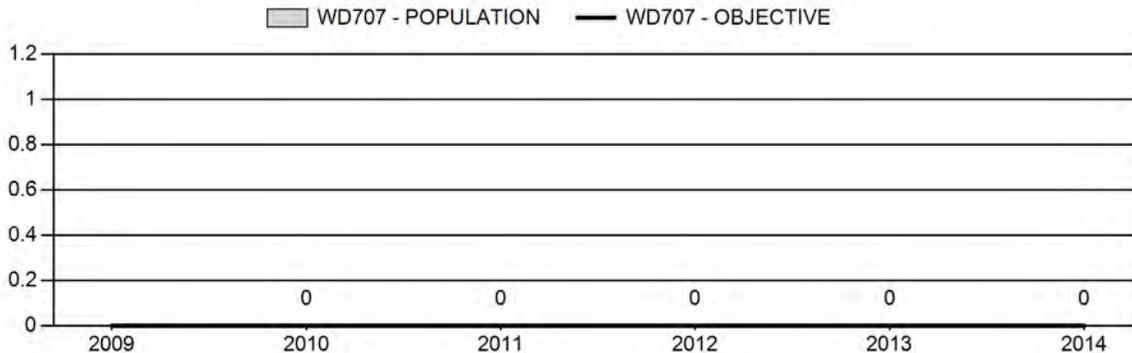
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	0	N/A	N/A
Harvest:	1,377	783	425
Hunters:	2,890	1,921	1,000
Hunter Success:	48%	41%	42%
Active Licenses:	3,299	2,214	1,200
Active License Success:	42%	35%	35%
Recreation Days:	13,767	10,238	5,000
Days Per Animal:	10.0	13.1	11.8
Males per 100 Females	35	35	
Juveniles per 100 Females	62	80	

Population Objective (\pm 20%) :	0 (0 - 0)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

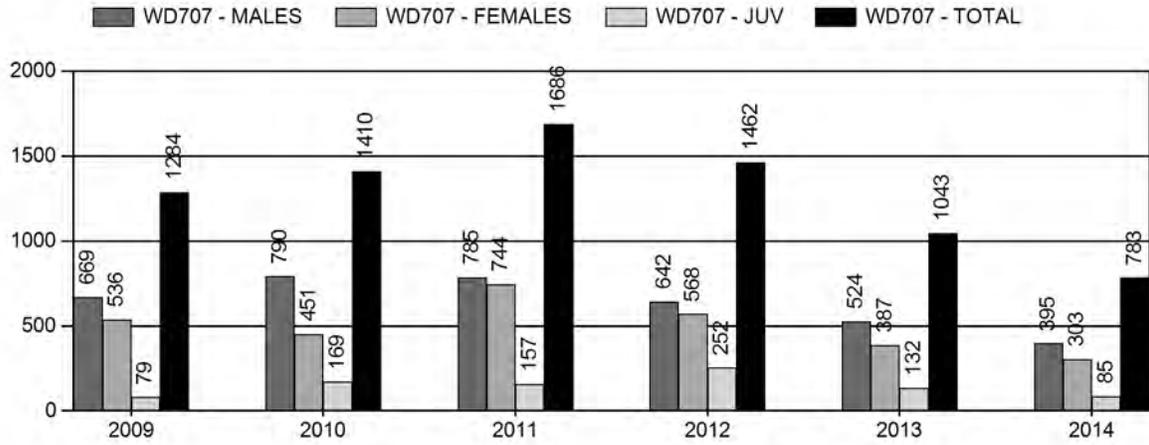
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	0%	0%
Males \geq 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%
Total:	0%	0%
Proposed change in post-season population:	0%	0%

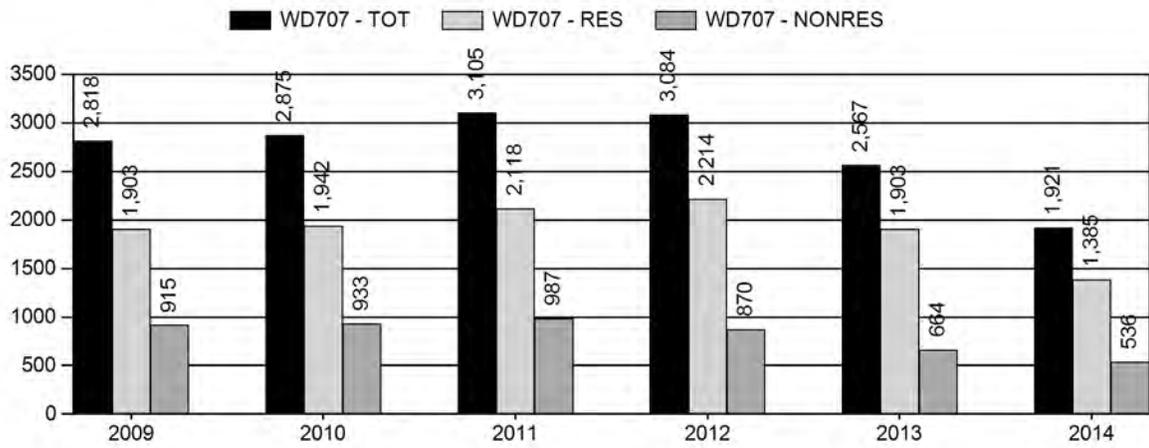
Population Size - Postseason



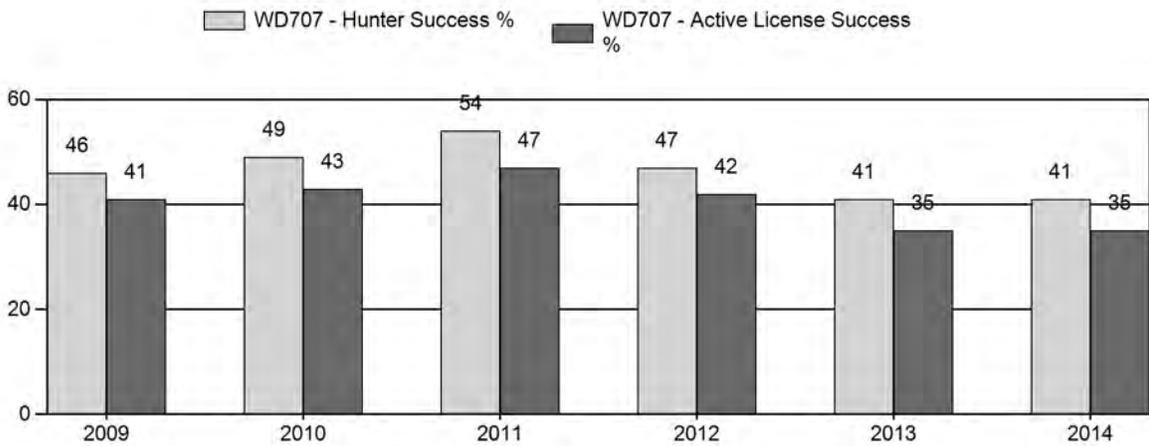
Harvest



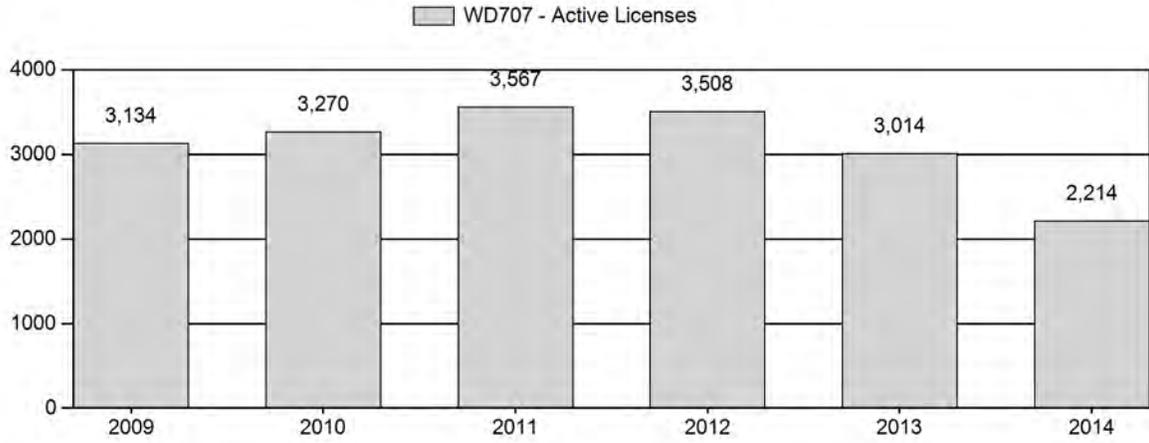
Number of Hunters



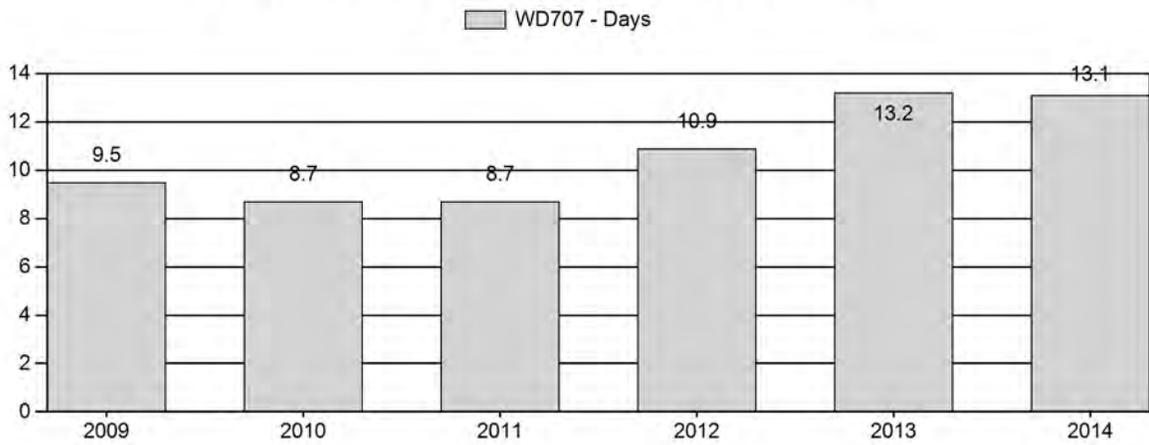
Harvest Success



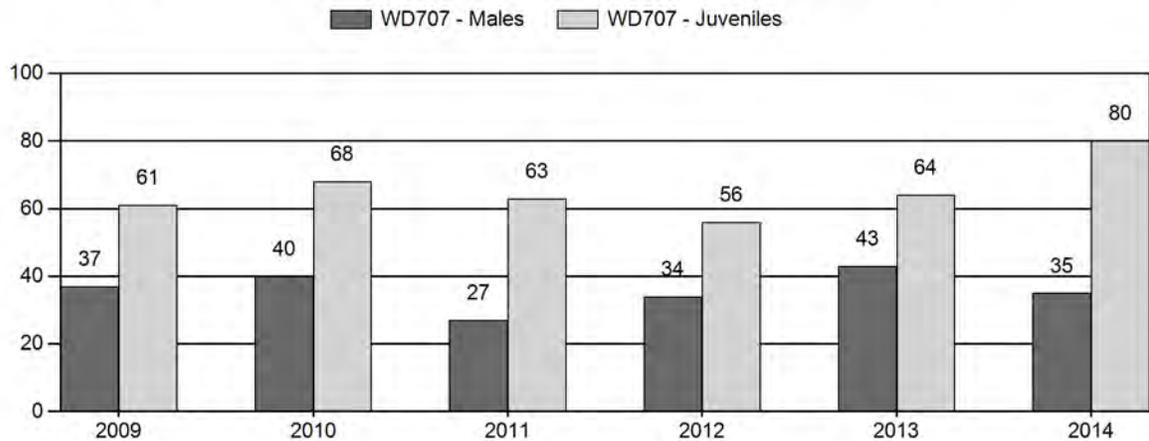
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for White tailed Deer Herd WD707 - CENTRAL

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	0	49	108	157	19%	430	51%	261	31%	848	0	11	25	37	± 0	61	± 0	44
2010	0	60	87	147	19%	372	48%	253	33%	772	0	16	23	40	± 0	68	± 0	49
2011	0	45	81	126	14%	467	53%	292	33%	885	0	10	17	27	± 0	63	± 0	49
2012	0	54	76	130	18%	381	53%	212	29%	723	0	14	20	34	± 0	56	± 0	41
2013	0	19	61	80	21%	188	48%	121	31%	389	0	10	32	43	± 0	64	± 0	45
2014	0	11	24	35	16%	100	47%	80	37%	215	0	11	24	35	± 0	80	± 0	59

**2015 HUNTING SEASONS
CENTRAL WHITE-TAILED DEER (WD707)**

Hunt Area	Type	Date of Seasons		Quota	License	Limitations
		Opens	Closes			
10,11,12 13,14	3	Oct. 1	Nov. 30	300	Limited quota	Any white-tailed deer
	8	Oct. 1	Nov. 30	300	Limited quota	Doe or fawn white-tailed deer
		Oct. 16	Nov. 30		General	Any white-tailed deer
22	3	Oct. 1	Nov. 30	50	Limited quota	Any white-tailed deer
	8	Oct. 1	Nov. 30	25	Limited quota	Doe or fawn white-tailed deer
34	3	Oct. 15	Nov. 30	25	Limited quota	Any white-tailed deer
	8	Oct. 15	Nov. 30	25	Limited quota	Doe or fawn white-tailed deer
65, 66	3	Oct. 15	Nov. 30	200	Limited quota	Any white-tailed deer
	8	Oct. 15	Nov. 30	100		Doe or fawn white-tailed deer
88,89	3	Oct. 15	Nov. 30	25	Limited quota	Any white-tailed deer, also valid in Area 66
88,89	8	Oct. 15	Nov. 30	25	Limited quota	Doe or fawn white-tailed deer, also valid in Area 66
Archery						Refer to license type and limitations in Section 2

Note: The above season limitations are restricted to only those lines in the Chapter 6 Regulation that directly affect white-tailed deer hunting. Additional general and limited quota seasons occur in hunt areas 7-14, 22, 34, 65-67, 88, and 89 but are not captured here.

Hunt Area	License Type	Quota Change from 2014
10, 11, 12, 13, 14	3	-100
34	8	-25
65, 66, 88, 89	3	-300
	8	-400
65, 66	3	+200
	8	+100
88, 89, 66	3	+25
	8	+25
Herd Unit Total	3	-175
	8	-300

Management Evaluation

Current Management Objective: ≥ 20 bucks:100 does postseason

Management Strategy: Recreational

2013 Postseason Population Estimate: NA

2014 Proposed Postseason Population Estimate: NA

2014 Hunter Satisfaction: 55% Satisfied, 20% Neutral, 25% Dissatisfied

The Central White-tailed Deer Herd Unit has a postseason management objective of ≥ 20 bucks per 100 does. No population model exists for this herd unit, as this is not a well-defined or closed population. Managers are unable to obtain adequate classifications over this large herd unit as it is not a budget priority for helicopter surveys and there is poor sightability of white-tailed deer in cottonwood riparian habitats. Access to perform ground surveys is inconsistent and highly variable from year to year as most white-tailed deer inhabit private lands.

Herd Unit Issues

White-tailed deer densities in this herd are highest along major cottonwood riparian communities of the Cheyenne River and North Platte River drainages and on irrigated hay fields in the La Prele Creek, La Bonte Creek, and Casper Creek drainages. Most white-tailed deer habitats in this herd unit are on private lands. Landowners typically have a low tolerance for white-tailed deer, and access to hunt them is generally good. Periodic disease outbreaks (i.e. hemorrhagic diseases, adenovirus, Asian louse, Chronic Wasting Disease) are known to occur within this herd, and can contribute to population declines in localized areas when environmental conditions are suitable. Female harvest in this herd is typically insufficient to curtail population growth as many Type 8 licenses typically remain unsold each year. Epizootic Hemorrhagic Disease (EHD) often regulates this population given the lack of female harvest.

Weather

In addition to EHD outbreaks, white-tailed deer likely experienced increased mortality in recent years due to the harsh winter conditions of 2010-2011 and the 2012 drought. Such weather conditions were also not conducive to good fawn productivity/survival over this time frame. Conditions improved in 2013 with adequate precipitation throughout the growing season and moderate winter conditions. Weather conditions throughout 2014 produced above average precipitation, especially during the growing season, which resulted in excellent forage production throughout the herd unit. Improved forage, coupled with low competition for resources due to low white-tailed deer densities, yielded good fawn production and excellent body condition of white-tailed deer going into winter. The 2014-2015 winter has been moderate to date with several sub-zero cold snaps and precipitation events occurring earlier in the season, and warmer conditions with mild precipitation realized later in the season. Following more substantial precipitation events earlier in the year, warm conditions often occurred in between cold snaps which allowed for a high degree of mobility and access to forage throughout the winter. Therefore, winter survival should be normal over this bio-year.

Habitat

This herd unit has no established habitat transects that measure growth and/or utilization on shrub species that are preferred browse of white-tailed deer. However, browse quality and availability was relatively high along riparian corridors as substantial moisture was received in 2014. Anecdotal observations from field personnel noted above-average moisture conditions resulting in good browse and herbaceous forb conditions throughout the herd unit. Many landowners also reported improved conditions for irrigation of hay fields during the 2014 growing season.

Field Data

Fawn production is typically good for this herd, with ratios ranging in the 60-70s per 100 does. Observed fawn ratios were above average in 2014 at 80 per 100 does. Still, this herd appeared to be at a low point due to disease outbreak, harsh winters in 2010 and 2011, and the severe drought of 2012. This herd unit will require several more years of improved fawn production and survival before managers can expect any significant increase in population size.

Buck ratios for the Central White-tailed Deer Herd historically average in the mid 30s per 100 does, but occasionally swell into the 40s or drop into the 20s. In 2014 the observed buck ratio was 35 per 100 does. Observed ratios may vary from year to year due to differing levels of effort or success in sampling white-tailed deer during post-season classification surveys. Buck ratios vary widely across the large variety of habitats in this herd unit as well. Additionally, white-

tailed deer can be difficult to classify on private lands and in riparian cover, particularly bucks that may be solitary and elusive. Still, observed buck ratios have always met management objectives for this herd by remaining at or above 20 bucks per 100 does. However, postseason classification ratios in this herd should be viewed with caution as sample sizes are typically small and are not well stratified throughout the herd unit.

Harvest Data

License success in this herd unit is typically in the 40-50th percentile, and was 41 percent in 2014. License issuance varies greatly between the many hunt areas contained within the herd unit. Hunters can typically take white-tailed deer on general licenses and also purchase additional limited quota licenses valid for any white-tailed deer or doe/fawn white-tailed deer. In recent years, reductions in limited quota white-tailed deer licenses have been made due to low deer densities, declining hunter success, and few complaints regarding damage on private lands.

White-tailed deer hunting opportunity peaked in 2011 with a total of over 3,100 hunters afield. Since then license issuance has been gradually reduced, as the population, and hunting access, have decreased. From 2011-2013, harvest success declined 24%, while hunter effort increased 52%. Hunter comments in 2013 also reflect reduced access resulting from declining numbers of white-tailed deer in the herd unit. Many phone calls were received by Casper Region personnel from hunters seeking access for white-tailed deer hunting, as landowners with fewer deer turned hunters away. Additional comments were received via harvest surveys from hunters expressing their dissatisfaction as opportunity to hunt white-tails on private lands was low. Observations from field personnel, landowners, harvest statistics, and hunter comments all indicate this herd has declined considerably. Only 55% of hunters reported being “very satisfied” or “satisfied” with their hunt. Consequently, license issuance will be further reduced within this herd unit for 2015.

Population

Currently there is no population model that accurately represents this herd. Therefore, management is based on maintaining postseason buck ratios with a goal of ≥ 20 bucks per 100 does. While field data indicates that buck ratios exceed this goal, this population has experienced significant declines in the past 5 years. However, field personnel believe that this population has the potential to rebound rapidly in the near future.

Management Summary

Traditional season dates in this herd vary from one hunt area to the next. Generally, white-tailed deer seasons run concurrently with October mule deer seasons, and are extended into November

to maximize hunter opportunity and harvest. The 2015 season includes 600 Type 3 licenses, 475 Type 8 licenses, and additional opportunities to harvest white-tailed deer on General, Type 1, and Type 6 licenses. Type 3 and Type 8 licenses were reduced by 175 and 300 respectively, to address a decrease in access to white-tailed deer throughout the herd unit. Goals for 2015 are to maintain buck ratios, improve hunter opportunity, afford landowners the opportunity to address agricultural damage on private lands if necessary, and generally allow for population increase.

If we attain the projected harvest of 725 with fawn production/survival similar to the five-year average, buck ratios should be maintained above 20 per 100 does.

**Central White-tailed Deer Herd Unit
(WD707)
Revised May 12, 2010
Hunt Areas 7-15, 21, 22, 34, 65-67, 88, 89**

