2014 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2014 - 5/31/2015

HERD: MD319 - POWDER RIVER

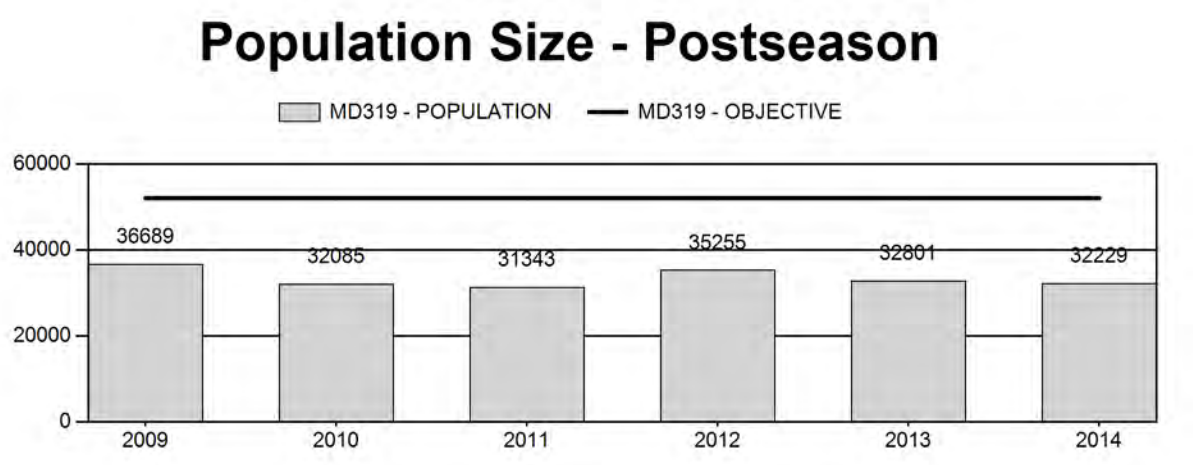
HUNT AREAS: 17-18, 23, 26
PREPARED BY: ERIKA PECKHAM

	2009 - 2013 Average	2014	2015 Proposed
Population:	33,635	32,229	29,113
Harvest:	2,703	2,782	2,840
Hunters:	4,040	3,932	4,000
Hunter Success:	67%	71%	71%
Active Licenses:	4,204	4,145	4,250
Active License Success:	64%	67%	67%
Recreation Days:	16,017	16,130	16,500
Days Per Animal:	5.9	5.8	5.8
Males per 100 Females	38	45	
Juveniles per 100 Females	68	88	

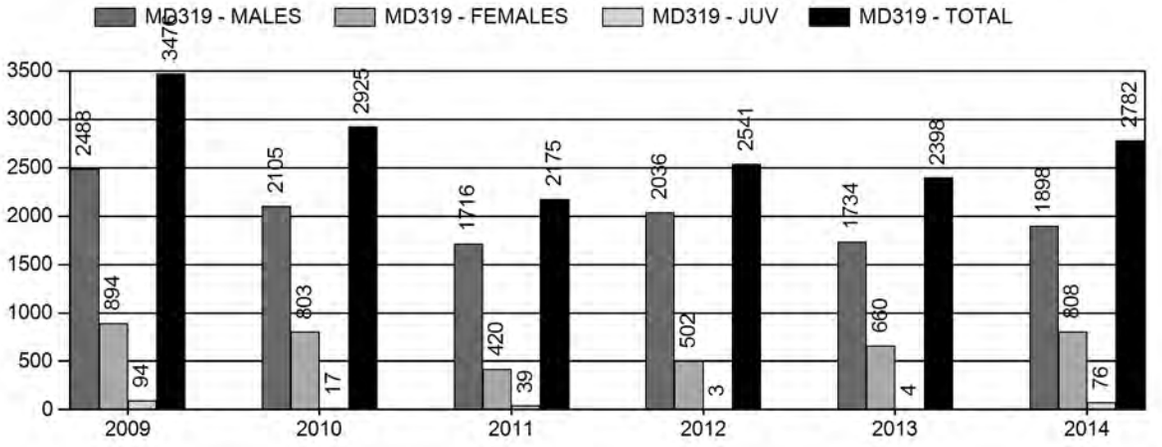
Population Objective (± 20%) :	52000 (41600 - 62400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-38.0%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/25/2015

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

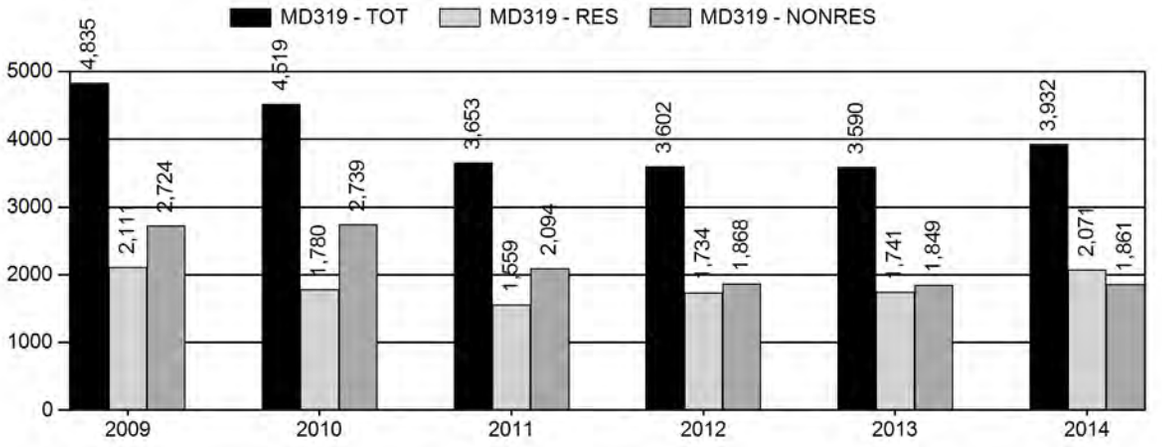
	JCR Year	Proposed
Females ≥ 1 year old:	5.4%	6.8%
Males ≥ 1 year old:	24.6%	29.6%
Juveniles (< 1 year old):	0%	0%
Total:	7.6%	8.8%
Proposed change in post-season population:	-8.3%	-9.7%



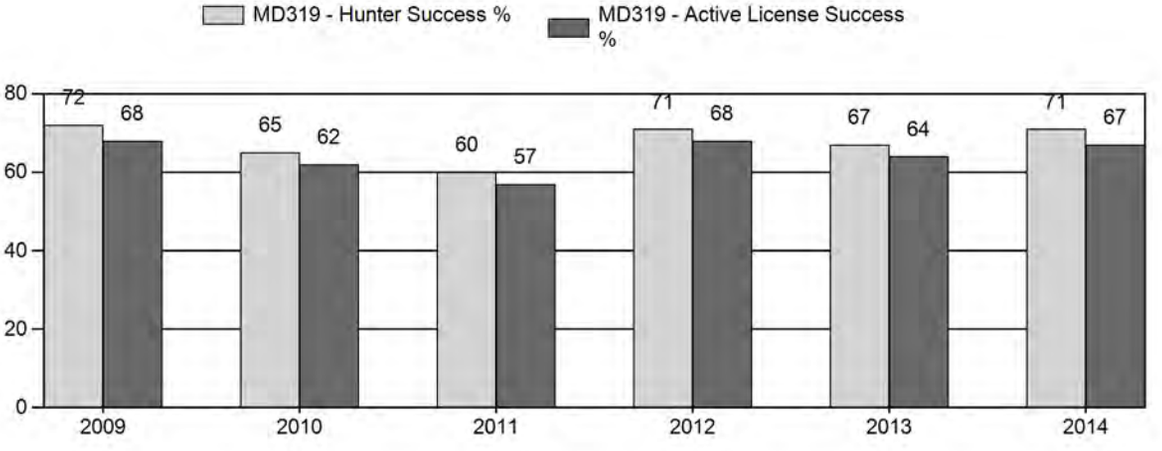
Harvest



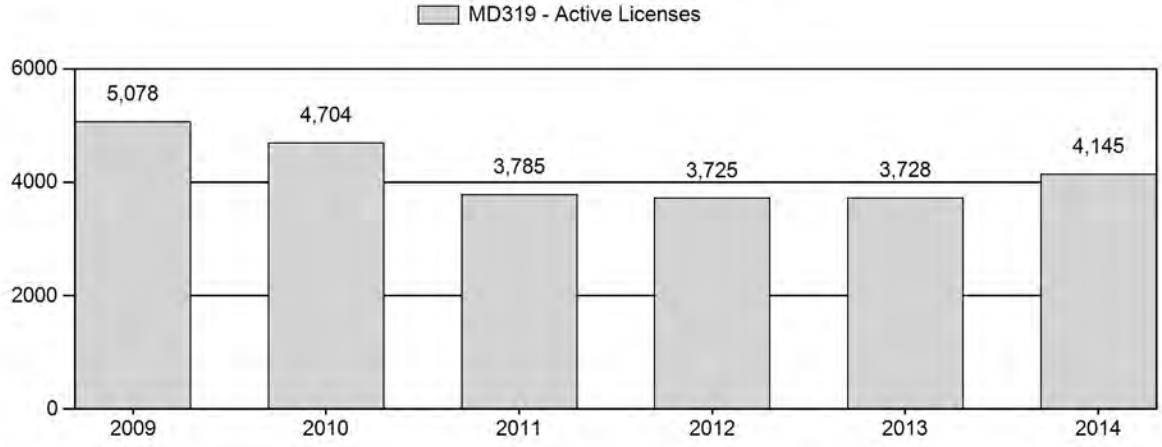
Number of Hunters



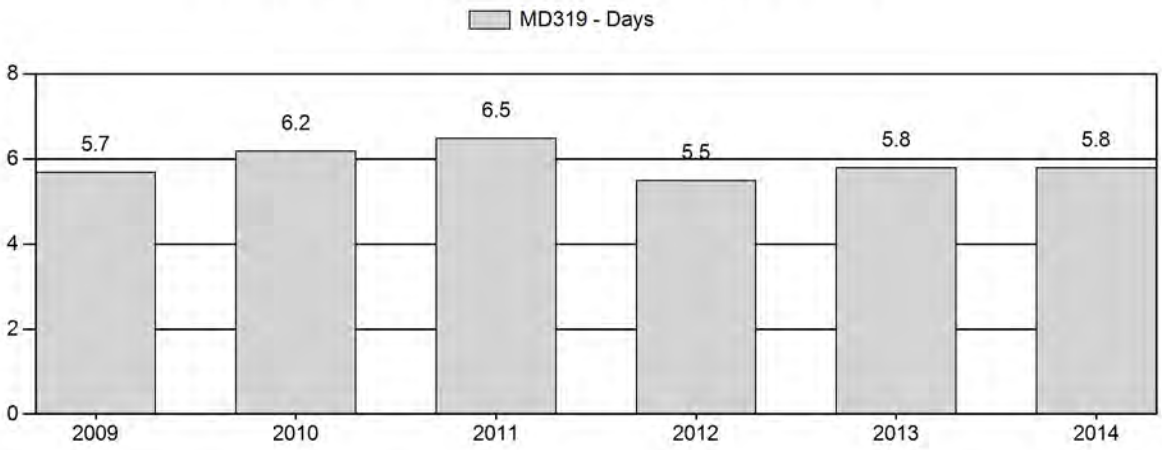
Harvest Success



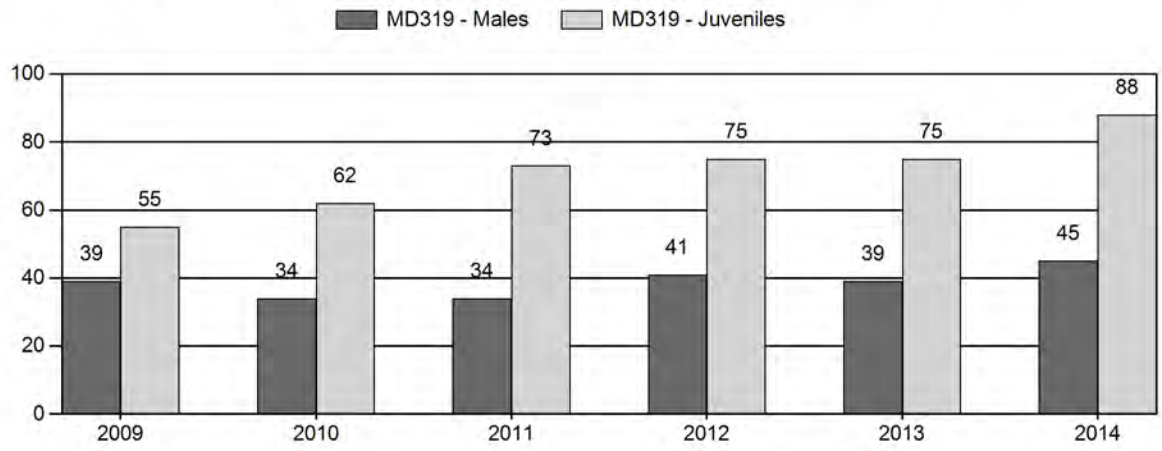
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD319 - POWDER RIVER

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	36,689	103	0	0	0	415	518	20%	1,336	52%	736	28%	2,590	920	8	31	39	± 2	55	± 3	40
2010	32,085	91	0	0	0	364	455	17%	1,348	51%	832	32%	2,635	1,494	7	27	34	± 2	62	± 3	46
2011	31,343	110	0	0	0	241	351	16%	1,040	48%	755	35%	2,146	1,645	11	23	34	± 3	73	± 4	54
2012	35,255	260	0	0	0	332	592	19%	1,459	46%	1,088	35%	3,139	1,785	18	23	41	± 2	75	± 4	53
2013	32,801	168	0	0	0	488	656	18%	1,665	47%	1,247	35%	3,568	1,594	10	29	39	± 2	75	± 3	54
2014	32,229	230	0	0	0	534	764	19%	1,714	43%	1,508	38%	3,986	1,556	13	31	45	± 2	88	± 4	61

2015 HUNTING SEASONS
POWDER RIVER MULE DEER HERD (MD319)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
17		Oct. 1	Oct. 20		General	Antlered mule deer or any white-tailed deer
18		Oct. 1	Oct. 20		General	Antlered mule deer or any white-tailed deer
23		Oct. 1	Oct. 14		General	Antlered deer off private land, any deer on private land
26		Oct. 1	Oct. 14		General	Antlered deer off private land, any deer on private land
23,26	6	Oct. 1	Dec. 15	1,900	Limited quota	Doe or fawn valid on private land
Archery		Sep. 1		Sep. 30		Refer to Section 4 of this Chapter

Region C Quota 2,100

Hunt Area	Type	Quota change from 2014
23,26	**6**	**+200**
Herd Unit Total	**6**	**+200**

Management Evaluation

Current Postseason Population Management Objective: 52,000
Management Strategy: Recreational
2014 Postseason Population Estimate: ~32,200
2015 Proposed Postseason Population Estimate: ~29,100

Herd Unit Issues

The postseason population objective for the Powder River Mule Deer Herd is 52,000 mule deer. The management strategy is recreational management. The objective and management strategy were last revised in 1989 and are slated to be reviewed in 2015.

Issues associated with this herd include hunter access to private land and trying to balance private and public land use. Nearly all landowners charge access fees or outfit for buck hunting, and tend to cater to non-resident hunters, which results in nonresidents encompassing the majority of the hunters in this herd unit. New GPS technologies are helping hunters find smaller pieces of unmarked public lands, but at the same time this new accessibility has increased complaints of trespass and congestion by neighboring landowners.

Extensive coal bed methane development has occurred in the herd unit and has resulted in a network of roads and other development associated with the infrastructure required to support coal bed methane extraction. This development has tapered off substantially and in certain areas wells are being plugged and abandoned. Proper reclamation will be integral in keeping the habitat intact going into the future.

A continuing issue with portions of this herd unit is that the population is well below objective. The 2014 post-season population estimate was about 32,200, which is only slightly lower than the preceding 5-year average of 33,600. Since around 2008 the population has experienced a declining trend in numbers and poor fawn recruitment, likely influenced by weather factors. This has been especially true in Hunt Areas 17 and 18.

Weather

Weather throughout 2013 and into 2014 was optimal for rangeland conditions in this area. There were a few isolated hailstorms that afflicted this unit; however nothing that was very widespread. The growing season commenced with plentiful rainfall and ideal conditions to produce ample forage. The winter of 2013-2014 was moderate with not much for snow accumulation, or prolonged snow cover. The winter of 2014-15 was mild with minimal snow and frequent above average temperatures. The Palmer Drought Index indicates that throughout 2014, the conditions in the Powder River drainage were “moderately moist”. During the majority of these two winters, the ground was open, with minimal snowpack. Conditions regarding both drought and severity of winters were optimal for production and survival.

Habitat

Overall, the growing season of 2014 was very productive. Moisture was received at critical points throughout the growing season, which allowed for excellent rangeland conditions in some areas. Additionally, cooler than normal temperatures throughout the summer permitted prolonged green and growth. The body condition of the animals going into the winter appeared to be very good. Given the moderate winter of 2014-2015, the deer continue to be in good condition. There is a Wyoming big sagebrush habitat transect located within this herd unit. The utilization is typically very light on this transect. In the fall of 2014, the transect survey showed

the average leader growth to be 6.4 cm, which is lower than anticipated, given the favorable conditions that were experienced in the 2014 growing season. The 10 year average leader growth for this transect is ~6 cm, so it was still slightly above the average.

Field Data

Although all hunt areas have experienced a decline, it appears that Areas 17 and 18 were impacted greater than 23 and 26. In 2009 there was a sharp drop in the fawn:doe ratio to 55. This drop in fawn numbers was probably due to heavy snows in early 2009 followed by a very cold and wet spring. In 2010, there was continued poor fawn recruitment with observations indicating 62 fawns per 100 does. In addition to two years of poor fawn recruitment, a drought was experienced in 2012. Beginning in 2011, there was an improvement and fawn production increased into the 70's. This trend has continued into 2014 with this year experiencing the highest fawn ratio on record at 88 fawns per 100 does.

Over the past several years, the buck ratio has remained fairly constant. The 6 year average was 39 bucks per 100 does, which ranged anywhere from 34-45, and exceeded the recreational management strategy of 20-29 bucks per 100 does.

As this is a predominantly private land area, postseason landowner surveys are also considered. In 2014 the survey was fairly split with 43% of respondents stating that deer were below desired levels and 48% stating that they were at desired levels. Only 9% of respondents felt that there were more deer than desired. Also noteworthy is that there is still somewhat of a disparity in views depending on which portion of the herd unit is being polled. Hunt Areas 23 and 26 lie west of the Powder River. The majority feel that deer numbers are where they would like see them (62%). However 65% of people in Hunt Areas 17 and 18 feel that deer are below objective. This is likely a reflection of the poor conditions which led to extremely low fawn ratios in 2009 and 2010 in Hunt areas 17 and 18.

Harvest Data

The harvest survey indicated that in 2014 there were around 2,800 animals harvested in this herd unit. Buck harvest increased from ~1,700 to ~1,900 despite a slight reduction in the Region C quota. In Areas 23 and 26 the Type 6 limited quota licenses were increased from 1,700 to 1,900 licenses for 2015, still valid only on private land. Comments have been received from landowners and hunters that licenses sold out in 2014 and they were unable to achieve desired harvest on private lands, primarily for white-tailed deer. It is anticipated that the majority of the harvest with these licenses will be white-tailed deer. Hunter success in this herd unit has averaged 67% over the preceding 5 years, with 2014 having an overall success rate of 71%.

It was estimated that 80% of hunters were either very satisfied or satisfied. As Game and Fish personnel talk to hunters they advise people to obtain private access in this portion of the state as there is limited public land. Hunters that hunt on private land usually enjoy a high success rate, which is typically correlated to satisfaction. However, it should be noted that in speaking to people on public lands, many people were disappointed with the lack of animals.

Population

This herd is estimated at ~32,200 mule deer which is around 38% below objective. The "Time Specific Juvenile – Constant Adult Mortality Rate" (TSJ-CA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model had the lowest AIC value (131) and seemed to represent what has been occurring on the ground (fair model). The model aligns well with the observed buck ratios, further strengthening its selection as a good fit. There is no independent population estimate for this herd. The model indicates that in 2006 the population was at objective, but started to decline thereafter. This model appears to fairly consistently track with field observations and management data.

Management Summary

Antlerless harvest has been maintained in Hunt Areas 23 and 26. In recent years, there have been no Type 6 licenses available in Hunt Areas 17 and 18 due to very depressed deer numbers as a partial result of poor fawn production. The post season buck ratio exceeds the parameters of a "Recreational" management strategy. Private landowners typically allow access based on the number of hunters that can be accommodated. In years of suppressed deer numbers, the harvest on private lands has likely been proportional. If we attain the projected harvest of 2,840 deer and experience similar fawn recruitment as seen the last few years, it is anticipated that the population will still decline slightly. Based on the population model we predict a 2015 post-season population of about 29,100.

We maintained the nonresident Region C deer quota at 2,100 licenses for the 2015 season. Region C contains Hunt Areas 17, 18, 23 and 26 of the Powder River Herd, and 19, 20, 29 and 31 of the Pumpkin Buttes Herd. After several years of decline in these areas, 2014 experienced an increase in the fawn ratio in these two herds. It appears that the herd has stabilized and may begin to trend upward if favorable conditions persist.

INPUT	
Species:	Deer
Biologist:	Erika Peckham
Herd Unit & No.:	Powder River MD
Model date:	02/25/15

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	Constant Juvenile & Adult Survival	232	241	☐ CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	106	132	☐ SCJ,SCA Mod	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	5	131	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				17690	12637	34611	64938	17407	8827	31955	58189	52000
1994				18823	12387	30890	62099	18792	9420	30360	58572	52000
1995				21200	11294	28046	60540	21196	8045	27596	56838	52000
1996				18203	12950	28591	59744	18168	10177	28175	56520	52000
1997				12072	12346	26745	51162	12072	9198	26664	47934	52000
1998				16176	11081	25054	52311	16176	7985	25043	49204	52000
1999				15264	9623	23270	48156	15259	6260	23203	44722	52000
2000				13436	10277	23831	47545	13429	6618	23592	43638	52000
2001				10619	11337	24916	46873	10604	7696	24667	42967	52000
2002				11257	10538	24114	45908	11247	7007	23820	42074	52000
2003				16046	10147	23598	49791	16032	6476	23219	45727	52000
2004				13859	11805	25200	50864	13803	8240	24531	46574	52000
2005				17143	10358	23390	50891	17084	7501	22609	47194	52000
2006				16188	13688	25775	55651	16162	9979	24838	50980	52000
2007				14349	11452	23339	49141	14301	8603	22156	45060	52000
2008				14400	11131	21973	47504	14329	8373	20813	43516	52000
2009				10555	10003	19955	40513	10452	7266	18972	36689	52000
2010				10131	7903	17268	35302	10113	5588	16384	32085	52000
2011				11070	7014	15651	33735	11027	5126	15189	31343	52000
2012				12223	8889	16939	38050	12220	6649	16387	35255	52000
2013				10925	8362	16152	35439	10921	6455	15426	32801	52000
2014				12489	7812	14989	35289	12405	5724	14100	32229	52000
2015				11416	7060	13761	32237	11317	4970	12826	29113	52000
2016												52000
2017												52000
2018												52000
2019												52000
2020												52000
2021												52000
2022												52000
2023												52000
2024												52000
2025												52000

Survival and Initial Population Estimates

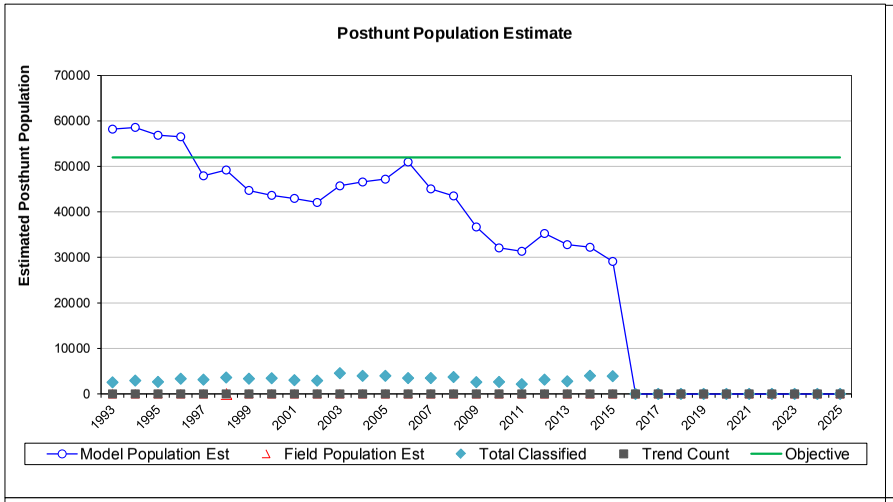
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.61			0.80		
1994	0.40			0.80		
1995	0.61			0.80		
1996	0.46			0.80		
1997	0.62			0.80		
1998	0.40			0.80		
1999	0.69			0.80		
2000	0.90			0.80		
2001	0.83			0.80		
2002	0.81			0.80		
2003	0.83			0.80		
2004	0.55			0.80		
2005	0.90			0.80		
2006	0.43			0.80		
2007	0.59			0.80		
2008	0.46			0.80		
2009	0.40			0.80		
2010	0.50			0.80		
2011	0.87			0.80		
2012	0.50			0.80		
2013	0.48			0.80		
2014	0.40			0.80		
2015	0.40			0.80		
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

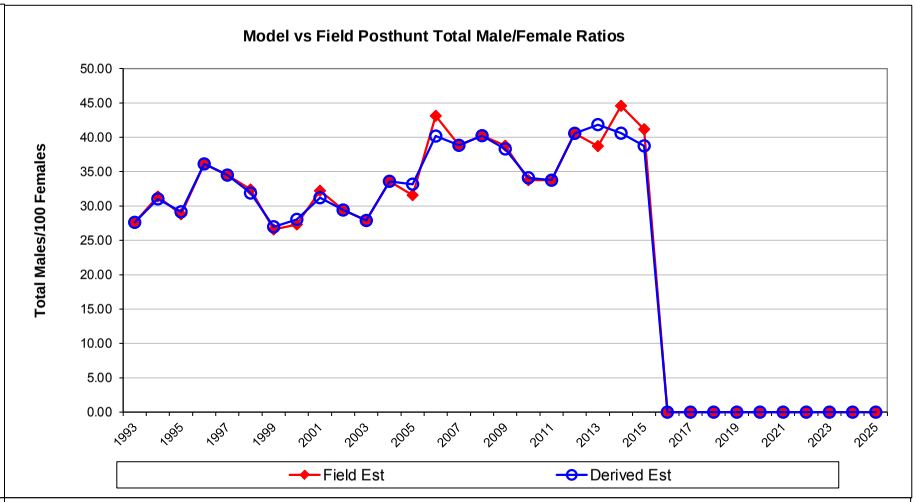
Parameters:	Optim cells
Adult Survival =	0.800
Initial Total Male Pop/10,000 =	0.883
Initial Female Pop/10,000 =	3.196

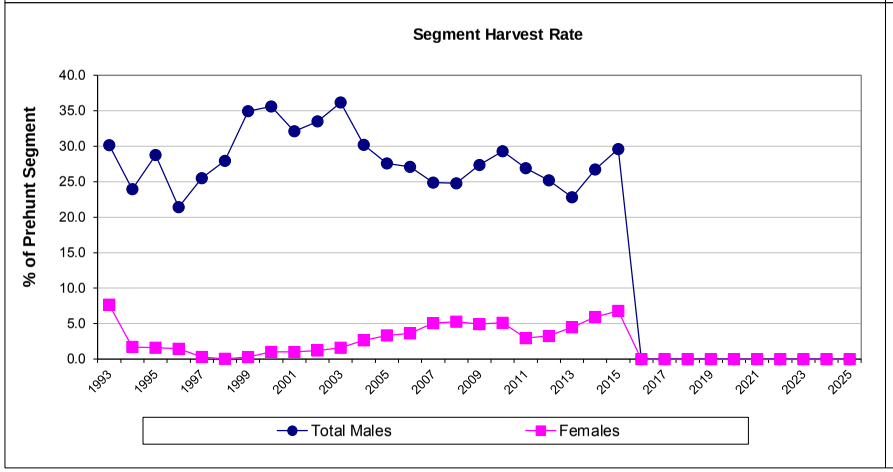
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

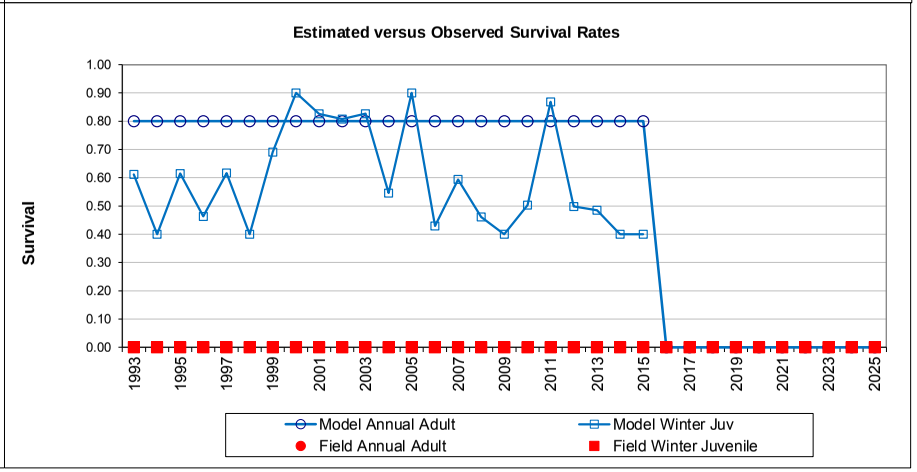
Year	Classification Counts: Juvenile/Female Ratio			Classification Counts: Total Male/Female Ratio			Classification Counts				Harvest: Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		54.47	2.45	27.62	27.63	1.59	257	3464	2414	6135	30.2	7.7
1994		61.90	2.57	31.03	31.38	1.65	28	2697	482	3207	24.0	1.7
1995		76.81	3.25	29.15	28.79	1.70	3	2954	409	3366	28.8	1.6
1996		64.48	2.52	36.12	36.12	1.72	32	2521	378	2931	21.4	1.5
1997		45.27	1.94	34.49	34.50	1.63	0	2862	73	2935	25.5	0.3
1998		64.59	2.41	31.88	32.40	1.53	0	2815	10	2825	27.9	0.0
1999		65.77	2.50	26.98	26.58	1.39	4	3057	61	3122	34.9	0.3
2000		56.92	2.18	28.05	27.31	1.36	7	3327	218	3552	35.6	1.0
2001		42.99	1.89	31.20	32.21	1.57	14	3310	227	3551	32.1	1.0
2002		47.22	2.05	29.41	29.42	1.52	9	3210	267	3486	33.5	1.2
2003		69.04	2.25	27.89	27.89	1.24	13	3337	344	3694	36.2	1.6
2004		56.27	2.05	33.59	33.59	1.47	51	3241	608	3900	30.2	2.7
2005		75.56	2.63	33.18	31.58	1.47	54	2597	710	3361	27.6	3.3
2006		65.07	2.53	40.18	43.12	1.92	23	3372	852	4247	27.1	3.6
2007		64.55	2.49	38.83	38.83	1.77	44	2590	1076	3710	24.9	5.1
2008		68.85	2.56	40.23	40.23	1.78	65	2507	1054	3626	24.8	5.3
2009		55.09	2.53	38.30	38.77	2.01	94	2488	894	3476	27.4	4.9
2010		61.72	2.72	34.10	33.75	1.83	17	2105	803	2925	29.3	5.1
2011		72.60	3.47	33.75	33.75	2.08	39	1716	420	2175	26.9	3.0
2012		74.57	2.99	40.58	40.58	1.98	3	2036	502	2541	25.2	3.3
2013		70.79	3.02	41.84	38.72	2.01	4	1734	660	2398	22.8	4.5
2014		87.98	3.11	40.59	44.57	1.94	76	1898	808	2782	26.7	5.9
2015		88.24	3.13	38.75	41.18	1.85	90	1900	850	2840	29.6	6.8
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



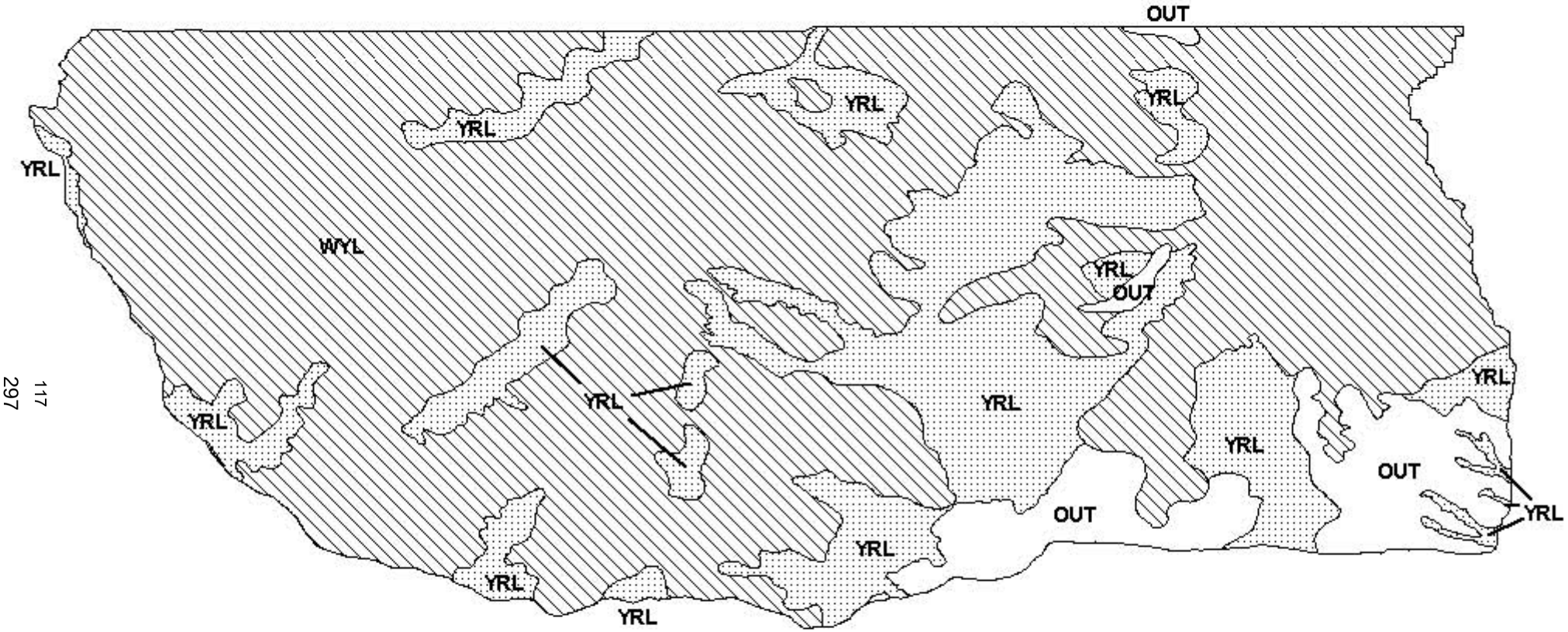






Comments:

END



Mule Deer (MD319) - Powder River
HA 17, 18, 23, 26
Revised - 3/87

2014 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2014 - 5/31/2015

HERD: MD320 - PUMPKIN BUTTES

HUNT AREAS: 19-20, 29, 31
PREPARED BY: DAN THIELE

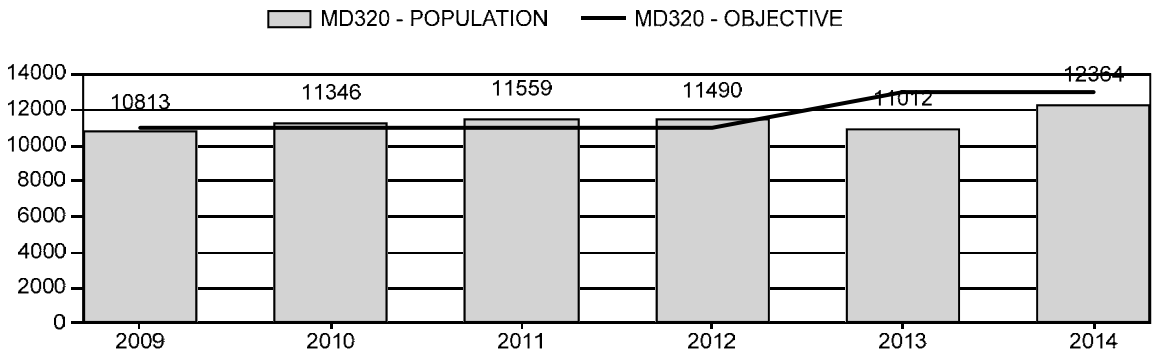
	2009 - 2013 Average	2014	2015 Proposed
Population:	11,244	12,364	12,319
Harvest:	675	647	630
Hunters:	1,034	1,011	1,000
Hunter Success:	65%	64%	63 %
Active Licenses:	1,060	1,027	1,025
Active License Success:	64%	63%	61 %
Recreation Days:	3,880	3,846	3,800
Days Per Animal:	5.7	5.9	6.0
Males per 100 Females	43	38	
Juveniles per 100 Females	63	85	

Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-4.9%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/20/2015

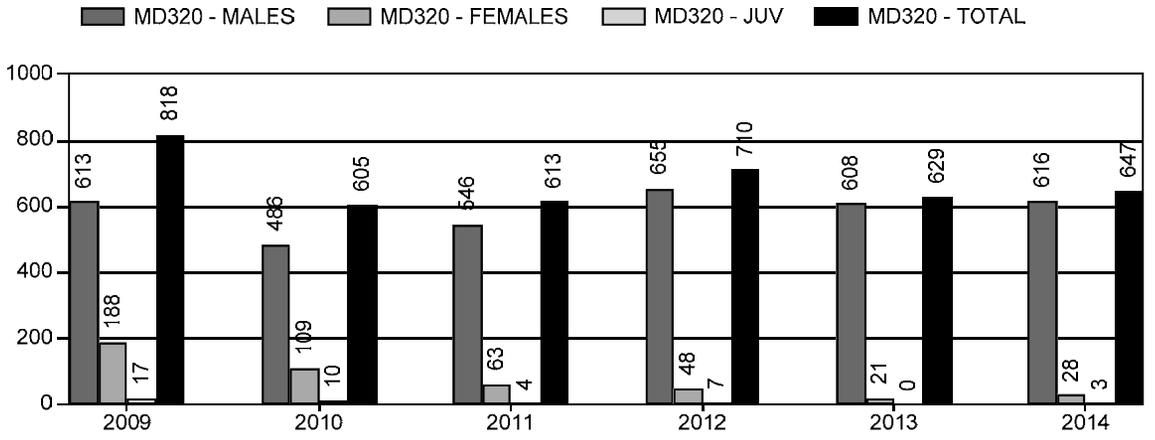
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	28%	25%
Juveniles (< 1 year old):	0%	0%
Total:	5%	5%
Proposed change in post-season population:	+12%	0%

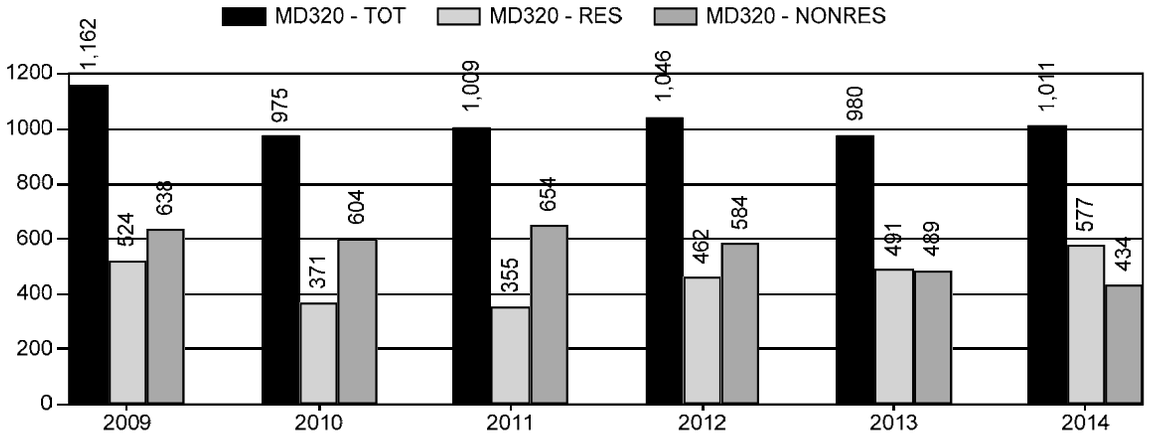
Population Size - Postseason



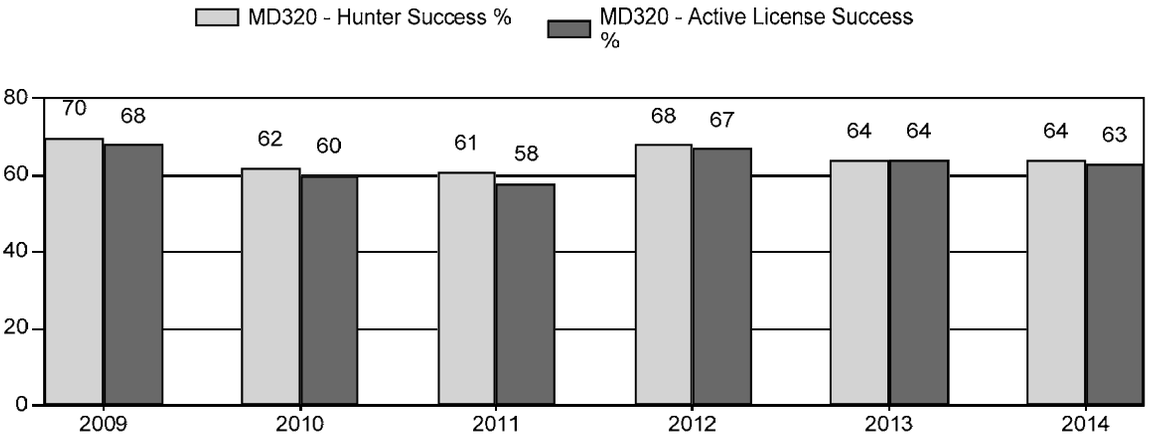
Harvest



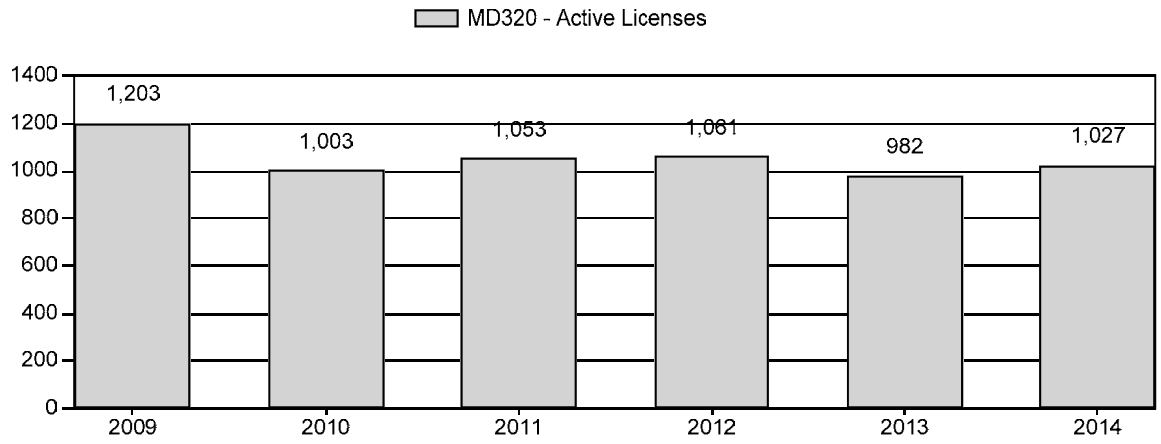
Number of Hunters



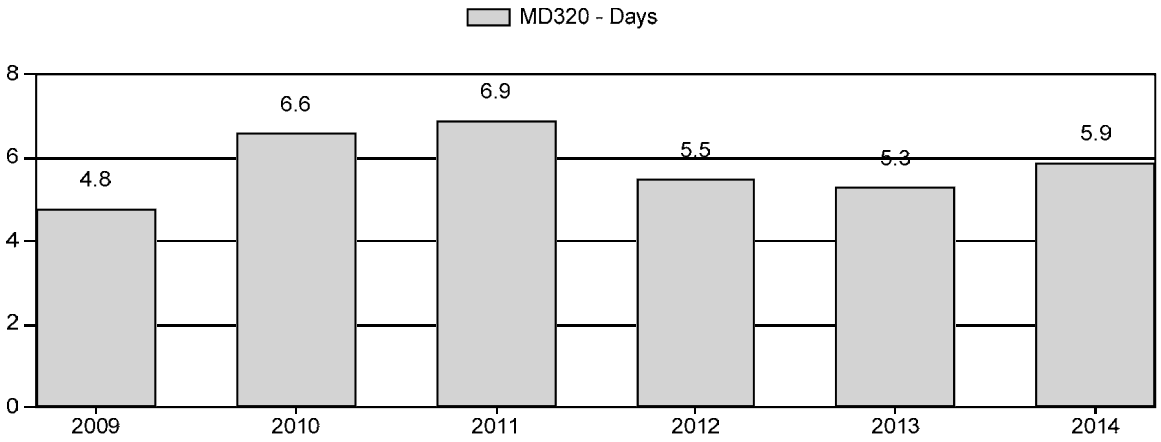
Harvest Success



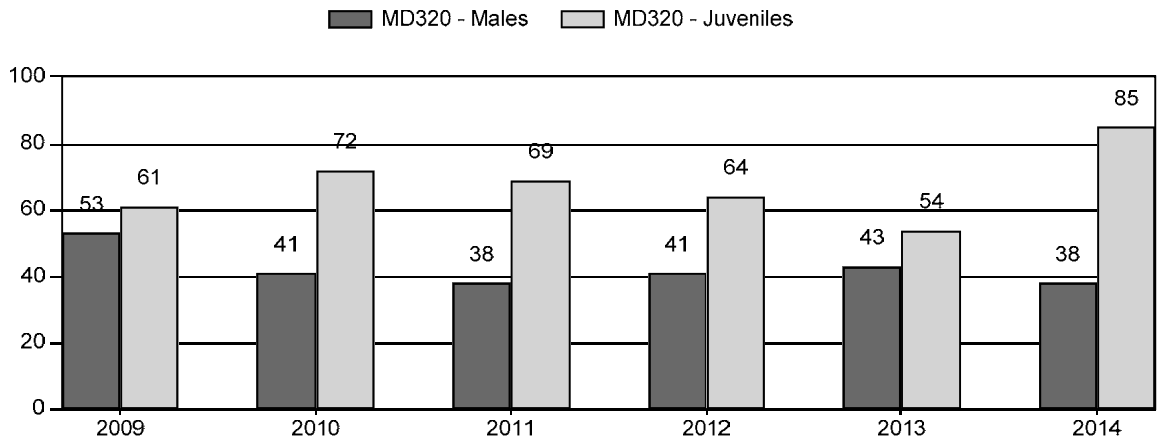
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD320 - PUMPKIN BUTTES

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	10,813	111	0	0	0	269	380	25%	715	47%	433	28%	1,528	1,250	16	38	53	± 4	61	± 4	40
2010	11,346	75	0	0	0	198	273	19%	659	47%	477	34%	1,409	1,493	11	30	41	± 4	72	± 5	51
2011	11,559	76	0	0	0	225	301	18%	795	48%	545	33%	1,641	1,362	10	28	38	± 3	69	± 5	50
2012	11,490	119	0	0	0	182	301	20%	732	49%	470	31%	1,503	1,234	16	25	41	± 3	64	± 5	45
2013	11,012	96	222	105	4	556	420	22%	977	51%	525	27%	1,922	979	10	33	43	± 3	54	± 3	38
2014	12,364	81	182	58	3	0	324	17%	849	45%	721	38%	1,894	1,942	10	29	38	± 3	85	± 5	61

2015 HUNTING SEASONS
PUMPKIN BUTTES MULE DEER HERD (MD320)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
19		Oct. 1	Oct. 20		General	Antlered mule deer
20		Oct. 1	Oct. 20		General	Antlered mule deer
19, 20	6	Oct. 1	Oct. 20	25	Limited quota	Doe or fawn valid on private land
29		Oct. 1	Oct. 14		General	Antlered deer off private land; any deer on private land
31		Oct. 1	Oct. 10		General	Antlered deer
Archery		Sep. 1	Sep. 30			Refer to Section 3 of this Chapter
Region C				2,100		

Hunt Area	Type	Quota change from 2014
19, 20, 29, 31		No change
Herd Unit Total		
	Region C	No change

Management Evaluation
Current Postseason Population Management Objective: 13,000
Management Strategy: Private Lands
2014 Postseason Population Estimate: ~12,350
2015 Proposed Postseason Population Estimate: ~12,300

Herd Unit Issues

The Pumpkin Buttes Mule Deer Herd Unit post-season population objective was reviewed in 2013 and revised from 11,000 to 13,000 deer. The management strategy was changed from recreational to private lands management.

This herd unit is largely private land with limited areas of accessible public lands. Limiting hunting on public lands to antlered deer helps maintain hunting recreation for those unable or unwilling to access private lands.

Coalbed methane gas development has slowed after 10 years of intense development in Areas 19 and 20 and the northeast portion of Area 29. Interest in deep oil is increasing at this time.

Publicly accessible BLM and state lands in the northern portions of Areas 19 and 29 are particularly problematic as intensive development activity reduced quality hunting opportunity. In recent years these lands attracted fewer hunters.

Weather

Weather in the area of the Pumpkin Buttes Herd Unit during 2014 was favorable after 2013 was very dry though the most of the year. Fall moisture in 2013 provided mule deer a nutritional boost followed by a relatively mild winter. Precipitation in 2014 was above normal with abundant precipitation in June and August. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed "moderately moist" conditions for January 2014 and progressed to "very moist" in August and September. August precipitation was 250% of normal. Winter weather conditions were relatively mild with interspersed periods of very warm temperatures.

Habitat

There are two Wyoming big sagebrush transects in this herd unit. Production measured in October 2014 averaged 22 mm per leader at Indian Creek compared to 8 mm per leader in 2013 and a 10 year average of 47 mm. The Schoonover transect averaged 21mm in 2014 compared to 14 mm in 2013 and a 10 year average of 27 mm. Utilization during the 2014-15 winter was light (less than 5% of leaders browsed) as mule deer and pronghorn were dispersed over winter/yearlong range. Winter conditions were normal so above average mortality was not observed. Complete shrub monitoring results are available in the appendix, Shrub Monitoring Report for the Sheridan Region.

Field Data

Classifications following the hunting season resulted in a fawn ratio of 85:100 and a buck ratio of 38:100. The fawn ratio easily exceeded those observed the past five years and was the highest observed since 1987. Fawn production and survival was excellent due to the abundant 2013 fall moisture, mild winter weather and excellent spring 2014 moisture. The yearling buck ratio (10:100) matched that of 2011 and 2013 and indicates fawn recruitment has been lower three of the last six years. The buck ratio decreased to 38:100, matching the lowest buck ratio for the six year period. At the hunt area scale, ratios ranged from 29:100 to 46:100. Buck ratios have been about 40:100 the last five years with ratios exceeding the special management threshold four of the last six years due to the private land status of this herd unit and the conservative hunting philosophy of outfitters who lease private land hunting rights. Classifications have included antler classifications the last two years. In 2014, Class I bucks comprised 75% of the adult buck classification while Class II bucks made up 24% and Class III bucks 1%. Hunters were highly satisfied with the 2014 hunting season with 75% expressing satisfaction with their hunt.

Harvest Data

The 2014 harvest survey reported slight increases in harvest and hunter numbers from 2013. The increase in harvest occurred even though the nonresident region quota was reduced 5% in 2014 and hunter success was stable. An 18% increase in resident hunters contributed to the higher harvest and resulted in resident hunters accounting for more than one-half (57%) of the hunters. Very limited antlerless deer harvest is occurring with that segment of the population comprising

less than 10% of the harvest the last three years. Field checks indicated that 89% of the buck harvest was adult bucks, reflective of the high buck ratio and private land hunting. The antler classification for field checked bucks was 50% Class I bucks, 48% Class II bucks and 2% Class III bucks. This varies from the postseason classification, likely due to the predominance of private land and hunter selection for larger bucks. Hunter success was unchanged from 2013 and comparable to the five year average (65%). Likewise, hunter effort showed a slight increase but remained comparable to the five year average. Mule deer numbers remain depressed as evidenced by the landowner survey responses. The postseason landowner survey shows a strong indication that landowners believe the population has decreased since 2005. In 2005, 38% of responding landowners thought deer numbers were too low compared to 2013 when 64% reported deer numbers too low. In 2014, 51% of landowners thought numbers were too low and 49% thought numbers were about right.

Population

This population is estimated at about 12,350 mule deer, 5% below the revised population objective. The population estimate was generated with the newly adopted EXCEL spreadsheet model. No independent population estimates have been collected for this herd. The Semi-Constant Juvenile/Semi-Constant Adult model (SCJ/SCA) was chosen over the Constant Juvenile/Constant Adult model (CJ/CA) even though it had a higher AIC value (133 vs. 104). This model produced fawn survival estimates within the range of parameters selected while the CJ/CA model selected the lowest possible survival rate allowed. The model predicts a relatively stable population over the last 10 years which seems to contradict what harvest data and landowner perceptions suggest. A 10% increase in the 2014 population is estimated as a result of the high fawn ratio. Antlerless harvest has been minimal but the fawn ratio has failed to meet the 66:100 required for population growth in three of the last six years. The significant differences in the three models leads to some uncertainty in the credibility of the model. Additionally, independent survival estimates are lacking for this herd so the user manual suggested starting values are applied. Therefore, this model is considered a fair model.

Management Summary

The nonresident Region C license quota has been reduced 600 licenses (22%) over the past three hunting seasons. The Region C quota was over-subscribed in the draw resulting in the regular draw applicants with zero points having drawing odds of 82%. These adjustments reversed trends in decreasing hunter success and increasing hunter effort. Nonresident hunters harvest proportionally more bucks and are more successful than resident hunters. In this herd unit, nonresident hunters harvested 329 bucks with 78% hunter success compared to the resident hunter harvest of 287 bucks and 54% hunter success. In the Powder River Herd Unit which comprises the remainder of Region C, nonresident hunters harvested 1,148 bucks with 86% hunter success versus resident hunters harvesting 750 bucks with 58% hunter success. Hunter success and hunter effort remain favorable as these data are influenced by private land outfitted hunters. Public land hunters typically have lower hunter success.

Hunting seasons within the Pumpkin Buttes Herd Unit are very conservative with minimal antlerless harvest occurring (<1%) so harvest strategies are not limiting the growth of this herd. Fawn ratios averaged 63:100 for the five year average indicating that low fawn production has limited herd growth. Although hunter statistics and buck ratios are favorable, landowners desire

more deer based on the landowner survey. The conservative hunting season combined with favorable weather and habitat conditions hold potential that 2015 will result in a favorable fawn ratio. Hunting seasons are identical to 2014 with no change in the region quota. This population is expected to remain stable in 2015.

INPUT	
Species:	Mule Deer
Biologist:	Dan Thiele
Herd Unit & No.:	Pumpkin Buttes
Model date:	02/20/15

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	Constant Juvenile & Adult Survival	95	104	☐ CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	121	133	☑ SCJ,SCA Mod	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	14	140	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				3794	2290	7084	13167	3740	1376	6651	11767	11000
1994				4219	2626	6956	13801	4197	1884	6779	12861	11000
1995				4530	2836	6855	14221	4503	1953	6563	13020	11000
1996				4810	2987	6772	14568	4810	2444	6712	13966	11000
1997				4148	3484	6988	14620	4132	2752	6903	13787	11000
1998				5127	3528	6937	15592	5113	2619	6847	14579	11000
1999				4799	3721	7192	15712	4795	2562	7050	14407	11000
2000				3744	3577	7260	14581	3738	2515	7164	13417	11000
2001				2482	3213	7029	12724	2471	2344	6877	11691	11000
2002				2766	2683	6404	11854	2748	1864	6232	10844	11000
2003				4422	2374	5960	12757	4380	1524	5849	11753	11000
2004				3203	2597	6147	11947	3179	1865	5954	10998	11000
2005				4540	2508	5864	12912	4494	1786	5595	11875	11000
2006				3750	2847	5974	12571	3746	2094	5649	11490	11000
2007				3363	2870	5788	12022	3348	2196	5546	11090	11000
2008				3856	2831	5582	12269	3827	2161	5297	11285	11000
2009				3239	2950	5524	11713	3220	2276	5317	10813	11000
2010				3800	2857	5355	12012	3789	2323	5235	11346	11000
2011				3701	3071	5461	12233	3696	2470	5392	11559	11000
2012				3545	3163	5562	12271	3537	2443	5509	11490	11000
2013				3002	3092	5610	11704	3002	2423	5587	11012	13000
2014				4655	2912	5509	13076	4652	2234	5478	12364	13000
2015				3822	3263	5926	13012	3817	2603	5899	12319	13000
2016												13000
2017												13000
2018												13000
2019												13000
2020												13000
2021												13000
2022												13000
2023												13000
2024												13000
2025												13000

Survival and Initial Population Estimates

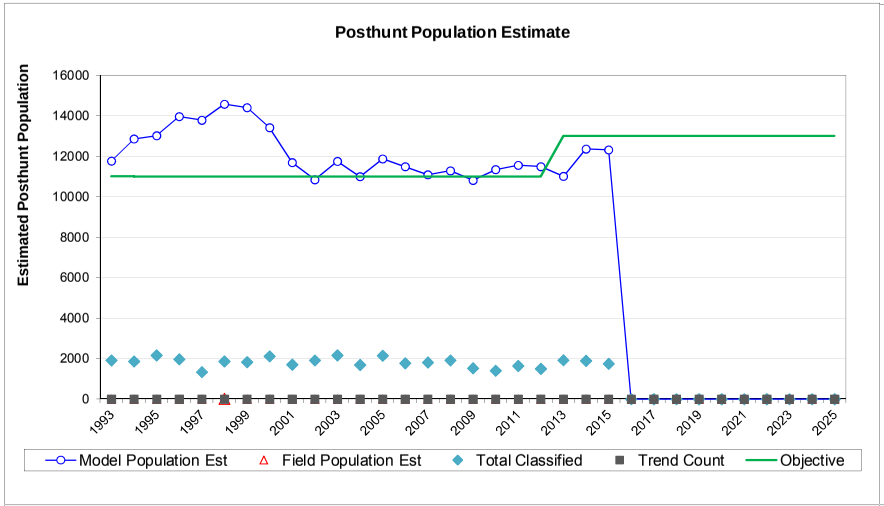
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.80			0.82		
1994	0.61			0.82		
1995	0.61			0.82		
1996	0.61			0.82		
1997	0.61			0.82		
1998	0.61			0.82		
1999	0.61			0.82		
2000	0.61			0.82		
2001	0.61			0.82		
2002	0.61			0.82		
2003	0.61			0.82		
2004	0.61			0.82		
2005	0.61			0.82		
2006	0.61			0.82		
2007	0.61			0.82		
2008	0.61			0.82		
2009	0.61			0.82		
2010	0.61			0.82		
2011	0.61			0.82		
2012	0.61			0.82		
2013	0.61			0.82		
2014	0.61			0.82		
2015	0.61			0.82		
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

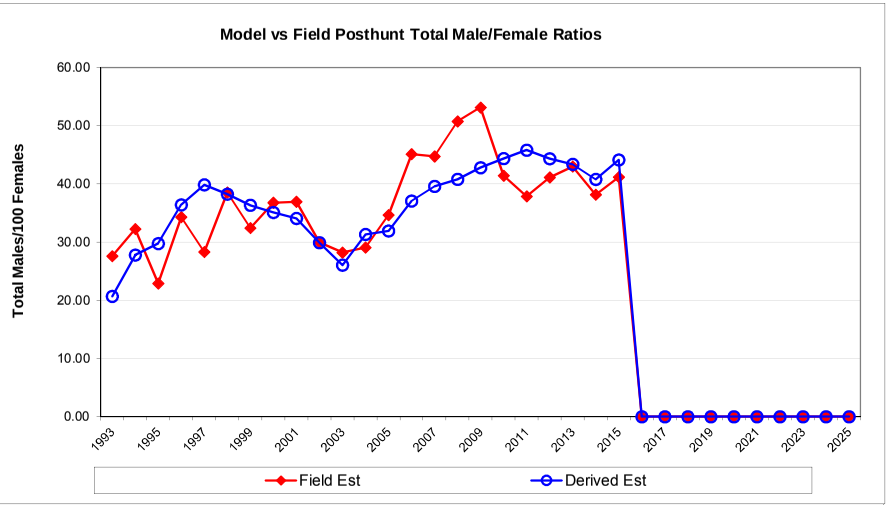
Parameters:	Optim cells
Juvenile Survival =	0.614
Adult Survival =	0.821
Initial Total Male Pop/10,000 =	0.138
Initial Female Pop/10,000 =	0.665

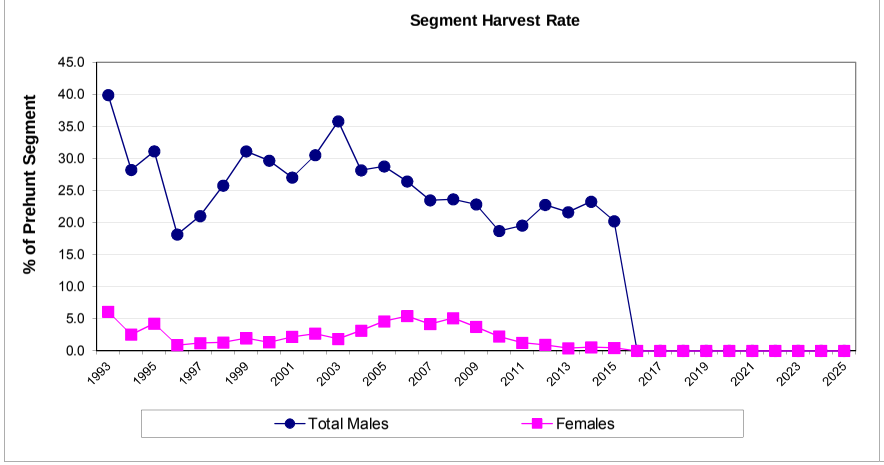
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

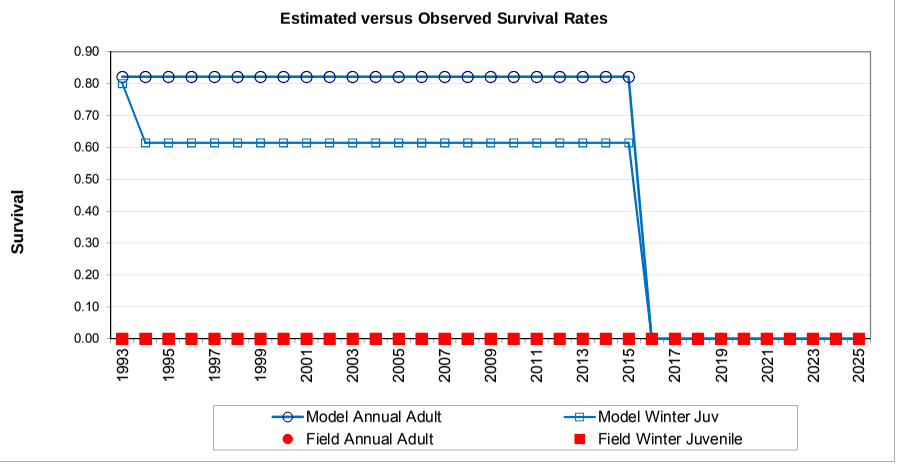
	Classification Counts										Harvest	
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		56.23	2.90	20.69	27.59	1.84	49	831	393	1273	39.9	6.1
1994		61.91	3.23	27.79	32.26	2.11	20	674	161	855	28.2	2.5
1995		68.61	3.20	29.76	22.90	1.58	24	803	265	1092	31.1	4.3
1996		71.65	3.59	36.42	34.31	2.20	0	493	54	547	18.2	0.9
1997		59.86	3.67	39.86	28.31	2.26	14	666	77	757	21.0	1.2
1998		74.69	3.86	38.25	38.54	2.47	12	827	82	921	25.8	1.3
1999		68.02	3.54	36.35	32.42	2.17	4	1053	129	1186	31.1	2.0
2000		52.18	2.66	35.11	36.78	2.12	5	965	88	1058	29.7	1.3
2001		35.93	2.22	34.09	36.94	2.26	10	790	139	939	27.0	2.2
2002		44.10	2.40	29.91	29.95	1.88	16	745	157	918	30.5	2.7
2003		74.88	3.50	26.06	28.21	1.84	38	773	101	912	35.8	1.9
2004		53.39	2.97	31.33	29.06	2.01	22	665	176	863	28.2	3.1
2005		80.32	3.80	31.93	34.67	2.16	42	656	245	943	28.8	4.6
2006		66.31	3.62	37.08	45.12	2.79	4	684	295	983	26.4	5.4
2007		60.36	3.31	39.59	44.73	2.71	14	613	220	847	23.5	4.2
2008		72.24	3.80	40.80	50.75	2.98	27	609	259	895	23.7	5.1
2009		60.56	3.69	42.79	53.15	3.37	17	613	188	818	22.9	3.7
2010		72.38	4.35	44.37	41.43	2.98	10	486	109	605	18.7	2.2
2011		68.55	3.81	45.81	37.86	2.56	4	546	63	613	19.6	1.3
2012		64.21	3.80	44.34	41.12	2.82	7	655	48	710	22.8	0.9
2013		53.74	2.91	43.38	42.99	2.51	0	608	21	629	21.6	0.4
2014		84.92	4.30	40.79	38.16	2.49	3	616	28	647	23.3	0.6
2015		64.71	3.54	44.13	41.18	2.62	5	600	25	630	20.2	0.5
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



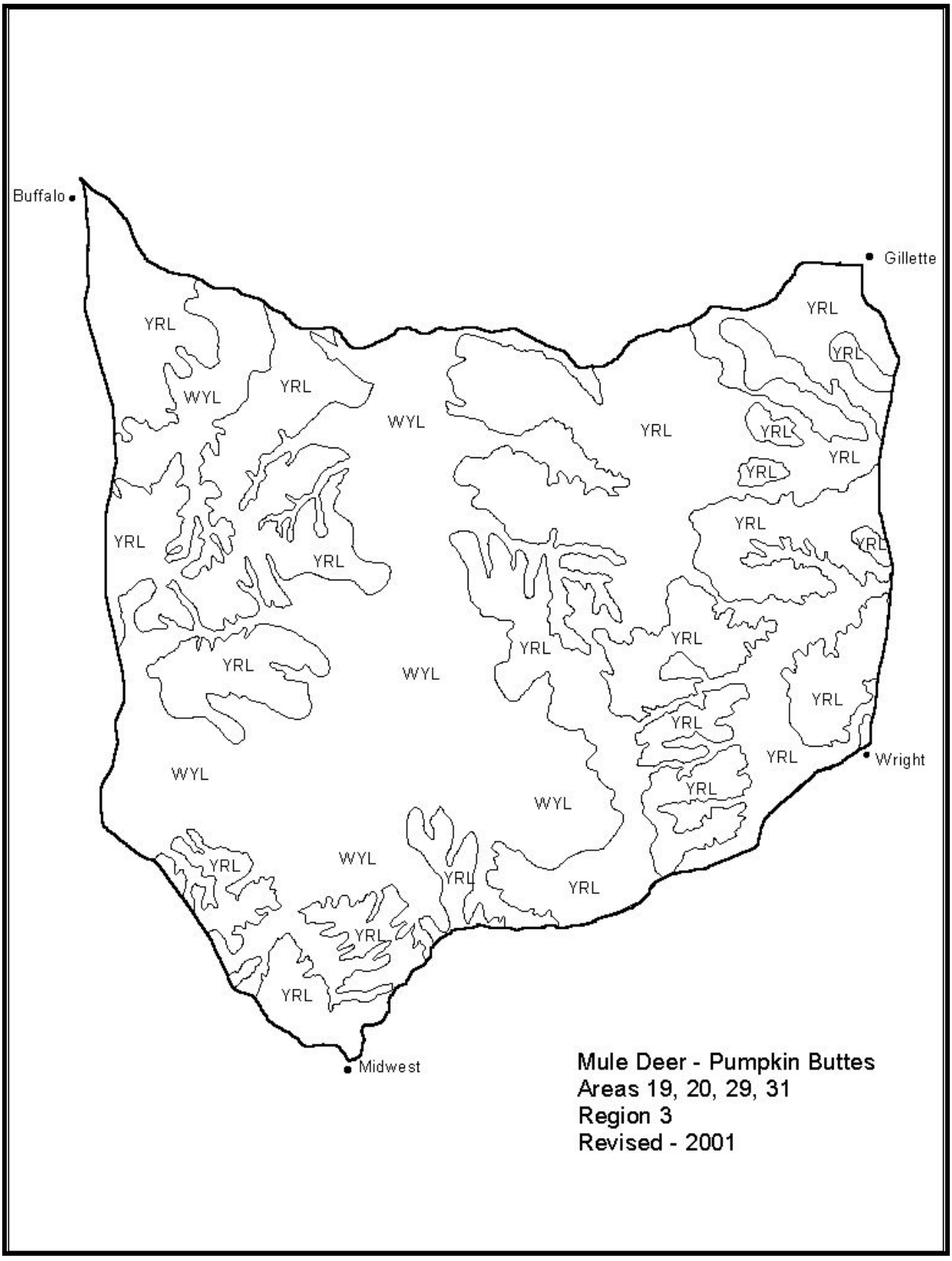






Comments:

END


Buffalo
Gillette
Wright
Midwest
YRL
WYL
Mule Deer - Pumpkin Buttes
Areas 19, 20, 29, 31
Region 3
Revised - 2001

2014 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2014 - 5/31/2015

HERD: MD321 - NORTH BIGHORN

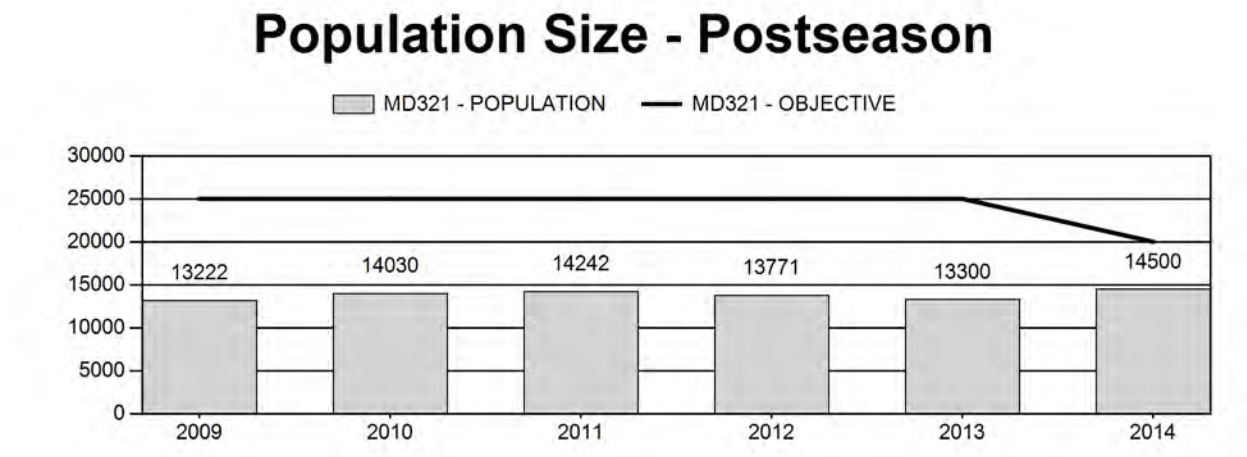
HUNT AREAS: 24-25, 27-28, 50-53
PREPARED BY: TIM THOMAS

	2009 - 2013 Average	2014	2015 Proposed
Population:	13,713	14,500	13,100
Harvest:	1,743	1,433	1,420
Hunters:	3,813	3,439	3,400
Hunter Success:	46%	42%	42%
Active Licenses:	4,047	3,541	3,500
Active License Success:	43%	40%	41%
Recreation Days:	19,186	17,189	16,000
Days Per Animal:	11.0	12.0	11.3
Males per 100 Females	32	32	
Juveniles per 100 Females	73	82	

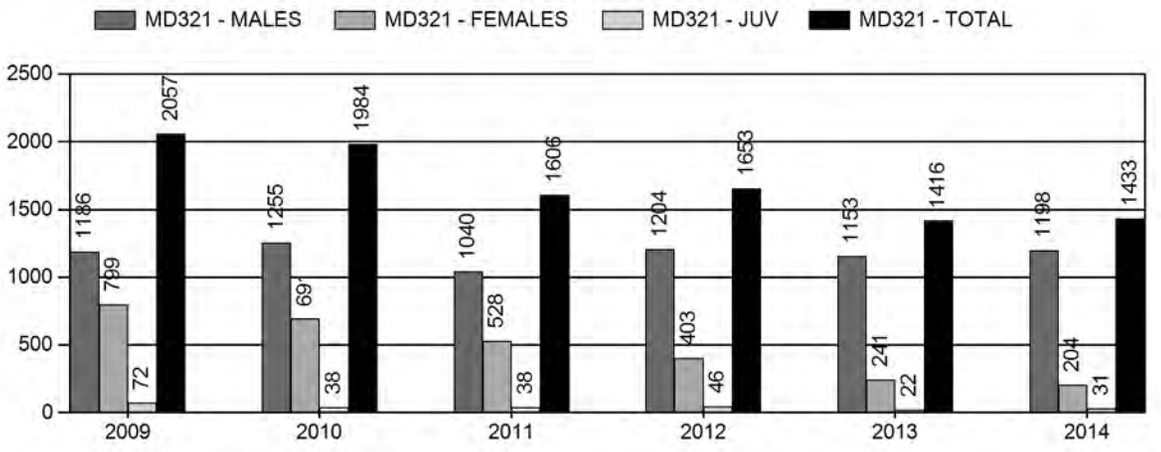
Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-27.5%
Number of years population has been + or - objective in recent trend:	9
Model Date:	02/24/2015

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

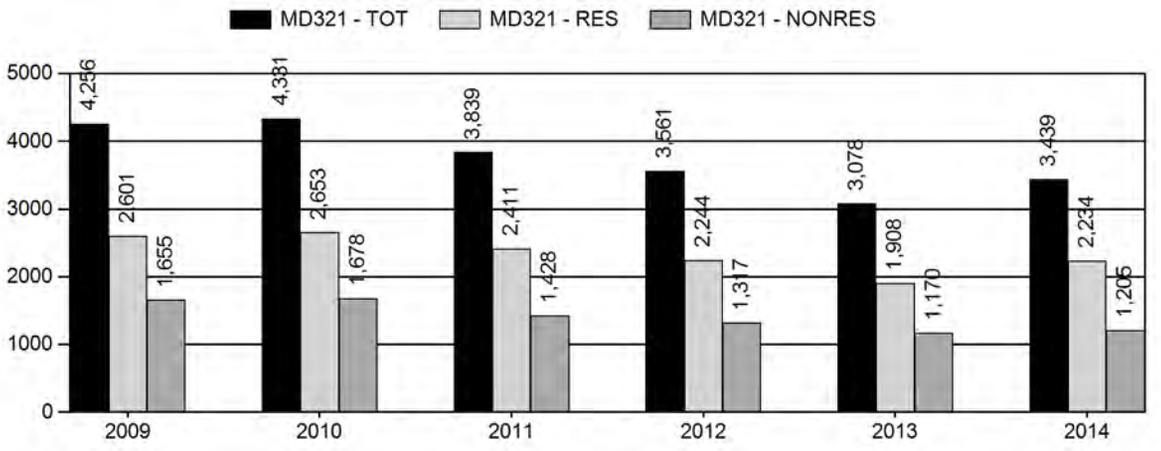
	JCR Year	Proposed
Females ≥ 1 year old:	4%	3%
Males ≥ 1 year old:	41%	39%
Juveniles (< 1 year old):	1%	1%
Total:	10%	10%
Proposed change in post-season population:	-2%	-9%



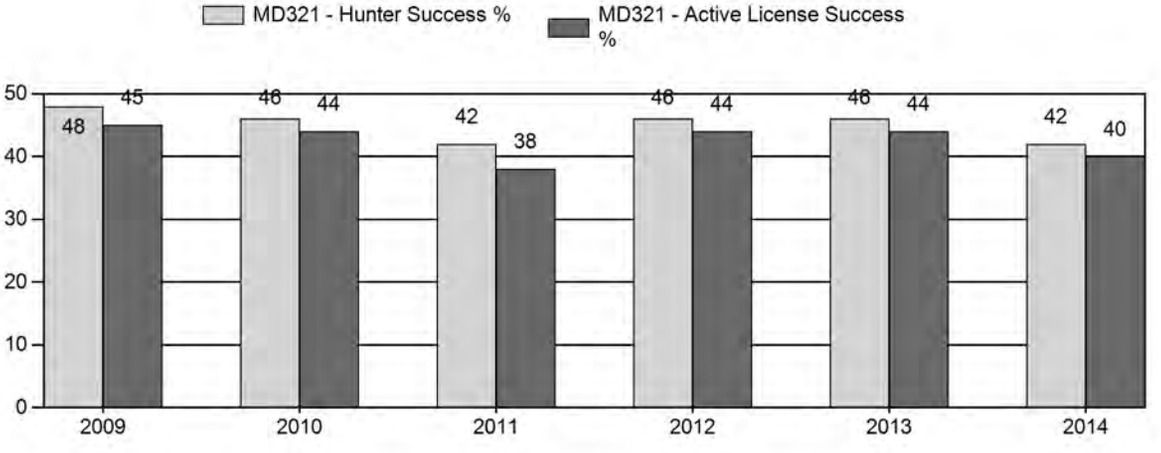
Harvest



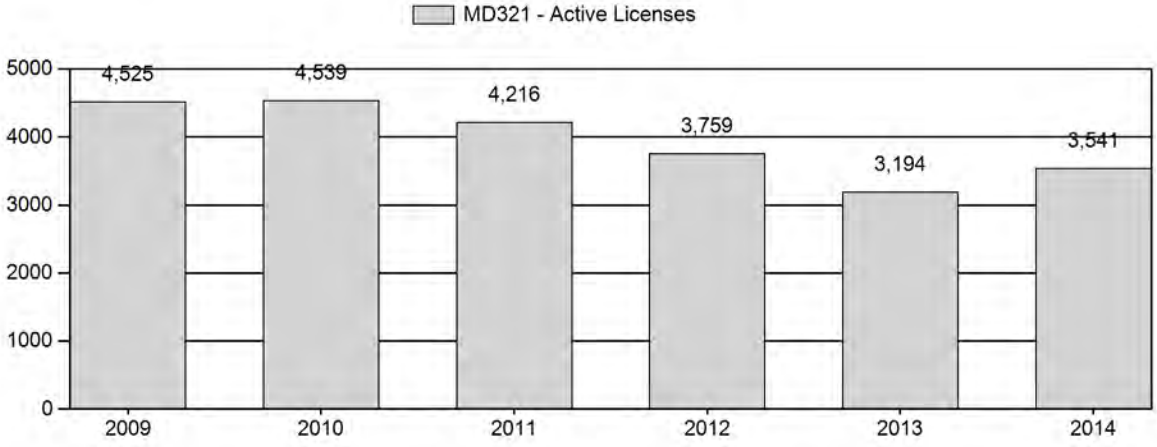
Number of Hunters



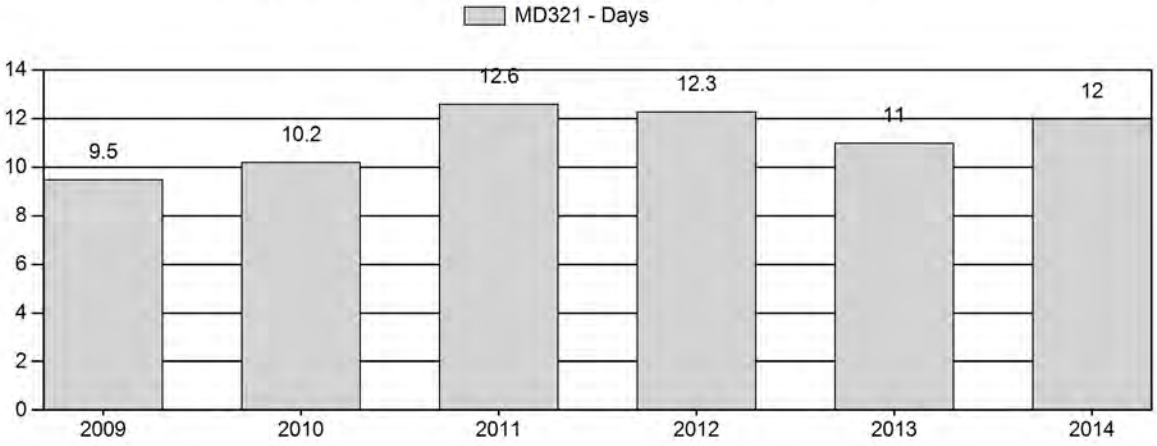
Harvest Success



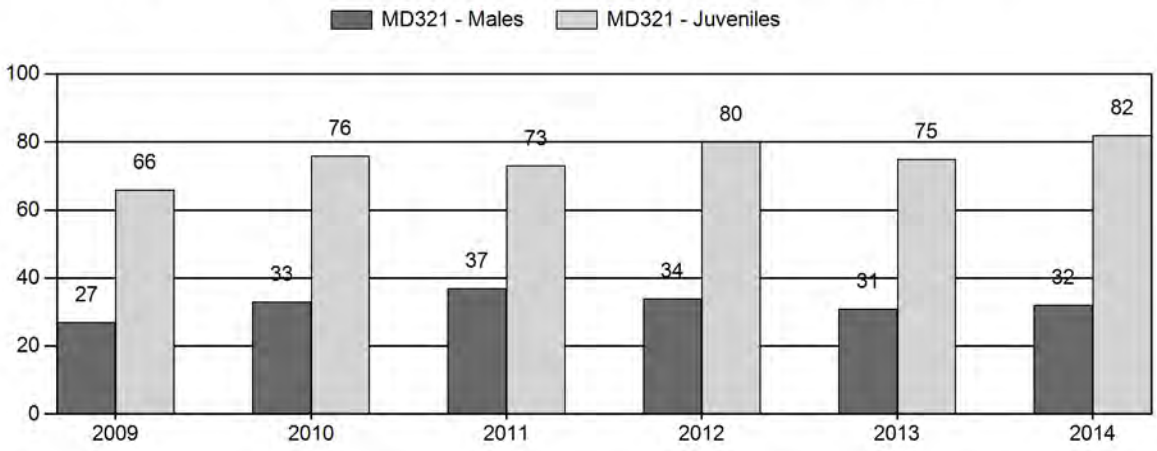
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD321 - NORTH BIGHORN

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	13,222	117	0	0	0	204	321	14%	1,204	52%	792	34%	2,317	1,289	10	17	27	± 2	66	± 4	52
2010	14,030	136	0	0	0	226	362	16%	1,099	48%	838	36%	2,299	1,672	12	21	33	± 2	76	± 4	57
2011	14,242	133	0	0	0	226	359	18%	962	47%	705	35%	2,026	1,588	14	23	37	± 3	73	± 4	53
2012	13,771	118	0	0	0	135	253	16%	749	47%	596	37%	1,598	1,886	16	18	34	± 3	80	± 5	59
2013	13,300	128	0	0	0	240	318	15%	1,012	49%	754	36%	2,084	1,409	13	19	31	± 2	75	± 4	57
2014	14,500	91	0	0	0	187	278	15%	878	47%	718	38%	1,874	1,834	10	21	32	± 3	82	± 5	62

2015 HUNTING SEASONS
NORTH BIGHORN MULE DEER HERD (MD321)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
24		Oct. 15	Oct. 31		General	Antlered mule deer or any white-tailed deer
	6	Sep. 1	Dec. 15	400	Limited quota	Doe or fawn valid on private land
25		Oct. 15	Oct. 24		General	Antlered mule deer or any white-tailed deer
27		Oct. 15	Oct. 31		General	Any deer
28		Oct. 15	Oct. 24		General	Antlered mule deer or any white-tailed deer
50		Oct. 15	Oct. 24		General	Antlered deer
51		Oct. 15	Oct. 24		General	Antlered deer
	6	Oct. 15	Nov. 30	75	Limited quota	Doe or fawn valid within one (1) mile of Shell Creek
52		Oct. 15	Oct. 24		General	Antlered deer
	6	Oct. 15	Nov. 30	25	Limited quota	Doe or fawn valid within one-half (1/2) mile of irrigated land
53		Oct. 15	Oct. 31		General	Antlered deer
Archery		Sep. 1	Sep. 30			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
51	6	+ 25
52	6	+ 25
Herd Unit Total	**6**	**+ 50**
Region Y		**- 200**
Region R		**No Change**

Management Evaluation
Current Postseason Population Management Objective: 20,000
Management Strategy: Recreational
2014 Postseason Population Estimate: ~ 14,500
2015 Proposed Postseason Population Estimate: ~ 13,100

Herd Unit Issues

The management objective for the North Bighorn Mule Deer Herd Unit is a post-season population objective of 20,000 mule deer and the management strategy is recreational management. The objective and management strategy were last revised in 2014.

This mule deer herd has been below the management objective for many years, despite limited doe harvest and relatively conservative seasons. There are other factors limiting this herd from reaching the desired management objective, which likely include, but are not limited to, habitat issues and competition from other ungulates for preferred forage.

Weather

The spring and summer of 2014 were generally warm and wet, resulting in good conditions for forage production throughout the region. The winter of 2014-15 was highly variable, with relatively open conditions into early November, cold and snowy conditions from early November through January, then periods of warm weather alternating with colder temperatures and snow. Several thaw/freeze cycles during parts of the winter resulted in hard, crusted snow that was difficult for animals to paw through to access forage. Overall, adults entered the winter in good condition and likely survived the winter well. Fawns likely saw about average over-winter survival.

Habitat

We do not have an established habitat transect in this herd unit. Most deer in this herd unit migrate to higher elevations in the Bighorn Mountains during the spring. Deer return to the foothills of the Bighorn Mountains in the fall and spend the winter at lower elevations, often on private lands, especially on the eastside of the Bighorn Mountains.

Field Data

During November and December, field personnel classified mule deer in this herd unit using both aerial (helicopter – Hunt Areas 50-53) and ground (Hunt Areas 24 and 27) techniques. Hunt Areas 25 and 28 are not surveyed as deer migrate out of these areas during October. We classified a total of 1,874 mule deer, above the sample desired at the 80% confidence level (n=1,834). We observed 82 fawns:100 does, an increase from 75:100 observed in 2013. Fawn production, based on observed doe to fawn ratios, has been good the past 5 years (73-82 fawns:100 does; mean = 77 fawns:100 does), which should help this population increase towards objective.

The observed buck to doe ratio continues to be in the 30s (32 bucks:100 does), but a lot of these bucks appear to be young aged animals. Mature bucks (i.e. 5+ years old) seem to be lacking in this population, resulting in smaller antlered animals generally available for harvest. Habitat

quality and quantity also plays a role in antler development. Even though the management strategy for this herd unit is recreational hunting, hunters - both resident and non-resident - have consistently requested better quality (i.e. larger antlered) deer in this herd unit. We plan to collect teeth for age analysis and antler size data during the next 2-3 hunting seasons to better understand the age structure and antler class dynamics of this herd unit.

Deer hunters in this herd unit were generally satisfied with their hunt, according to the hunter satisfaction survey attached to the harvest survey. Of 959 hunters who responded to the satisfaction survey, the majority (66%) were satisfied or very satisfied, while only 15% indicated they were dissatisfied or very dissatisfied. The balance of responses were neutral. Statewide, this herd unit ranked 9th out of 37 herd units for satisfaction, with an average statewide satisfaction of 60% (range=44%-81%).

Non-resident hunters (n=315) were generally more satisfied (71%) than resident hunters (n=644; 66%). Hunter satisfaction was similar between the east side (Hunt Areas 24, 25, 27, and 28) and the west side (Hunt Areas 50-53) of the Bighorn Mountains. Hunt Areas 27, 28 and 52 had the lowest satisfaction rate (54%, 56%, and 61% respectively) while Hunt Areas 24, 50, and 51 had the highest rates of satisfaction (77%, 66%, and 71% respectively). Deer usually migrate early from Hunt Area 28, resulting in limited opportunities during October. Access to private lands could be a reason for low satisfaction in Hunt Areas 27 and 52.

Overall, hunter satisfaction was lower during the 2014 hunting season compared to the 2013 season, which was a surprise to managers. Weather conditions in general were more conducive to hunting during the 2014 season. Hunter satisfaction increased in some hunt areas on the east side of this herd unit and decreased in some hunt areas on the west side. This is likely a function of deer not migrating between hunt areas due to mild weather conditions prior to and during the 2014 season.

Harvest

In 2014, hunters harvested an estimated 1,433 mule deer, similar to 2013 but still 24% below the previous 10 year (2004-2013) average harvest. Doe harvest decreased 15% while buck harvest increased 4%. The decline in doe harvest was mostly a result of reduced licenses for antlerless harvest and reduced access to private lands for mule deer doe harvest (i.e. landowners reducing access due to perceived decrease in mule deer numbers). Doe harvest will likely decline still further as all hunt areas on the west side of this herd unit are proposed to go to “antlered deer” on general licenses for the 2015 season.

Hunter success was 42%, below the success rates for 2013 (46%) and the previous 10 year average (47%). This was likely a function of increased demand as hunter numbers increased 12% in 2014 compared to 2013. Also, conditions were generally warm and dry during much of the hunting season, with deer scattered and little to no snow for tracking. Hunters spent about 12.0 days hunting per deer harvested, up slightly from 2013 and the 10 year average of 10.5 days/harvest. The decrease in hunter success and increase in hunter effort were likely part of the normal variation in annual hunter statistics and not likely reflective of a significant decrease in the population.

Hunt Area 24 saw the highest harvest (n=401 mule deer; 28%) for both buck (n=294; 25%) and antlerless (n=107; 46%) mule deer. Hunt Area 52 saw the lowest harvest (n=65 mule deer; 4.5%). Hunt Area 51 had the highest success rate (64%) and the lowest effort rate (5.8 days/animal). Hunt Area 28 had the lowest success rate (29%) and highest days hunted per animal harvest (17.1 days/animal).

Population

The 2014 post-season population estimate was about 14,500 mule deer with the population relatively stable. This population likely peaked in recent years around 2006 and has decreased since then. Hunters and field personnel have noticed a decline in this deer population over the past several years.

We use spreadsheet simulation models for population estimations. Model parameters and input follow the "User's Guide: Spreadsheet Model for Ungulate Population data" (Morrison 2012). Classification and harvest data are the only empirical data available for mule deer population simulation for this herd unit.

The "Time-Specific Juvenile – Constant Adult Survival Rate" (TSJ,CA) spreadsheet model was chosen to estimate the postseason population estimate of this herd. This simulation model had the second highest relative Akaike information criterion (AIC) value of all the models (101 compared to 99 or 105), and had the lowest fit (4 compared to 61 or 96). This model was selected because it appeared to reasonably simulate the perceived population dynamics of this herd unit. Since we do not have an independent population estimate or survival data for this herd, we consider this simulation model to be of "fair" quality.

The Constant Juvenile, Constant Adult (CJ,CA) model has a similar relative AIC value as the TSJ,CA model, but models the population significantly higher than thought by managers. The Semi-Constant Juvenile, Semi-Constant Adult (SCJ,SCA) model had the lowest relative AIC value, but we do not have any year specific survival rates for this, or surrounding, herd units to use to properly adjust the model parameters.

Management Summary

Hunting on public land, primarily the Bighorn National Forest, has generally been conservative. Hunting on private land has generally been more liberal, often designed to address damage complaints to cultivated crops. Hunting seasons traditionally run during the last two weeks of October, opening on October 15 and closing on different dates, depending on the hunt area and year. Season length is generally 10-17 days.

An archery pre-season occurs the entire month of September for any deer. Archery hunting can play a significant role in the herd unit. For example, 41% of the harvest in Hunt Area 25 was from archery hunters. Over all, archery hunting accounted for 15% of the total 2014 harvest (14% of buck harvest, 20% of doe harvest).

We maintained Area 24 Type 6 (doe/fawn deer) license numbers for 2015. These licenses are valid only on private land. In 2014, about 63% of the harvest on this license type was white-tailed deer. This license does allow some landowners to address localized problems of higher than desired mule deer numbers.

We reduced the General license season in Hunt Areas 25 and 28 to a 10-day season, similar to most other hunt areas in the Bighorn Mountains. This was in response to hunter comments to attempt to improve buck quality. Most nonresident hunters are done hunting by October 24 so this will likely mostly affect resident hunters. These two hunt areas tend to have the lower satisfaction levels than other hunt areas in this herd unit.

We restricted General license hunters to "antlered" deer in Hunt Areas 51 and 52, similar to most adjoining hunt areas. We increased Hunt Area 51 Type 6 licenses for 2015 to address damage issues on agricultural croplands. Hunt Area 52 Type 6 licenses were added for 2015 for the same reason.

We estimate a harvest of about 1,400 mule deer in 2015. With average recruitment and the proposed harvest, we estimate a 2015 post-season population of about 13,100 mule deer, still well below the management objective.

We maintained the nonresident Region R deer quota at 750 licenses for the 2015 season. Region R contains Hunt Areas 50-53 from the North Bighorn Herd Unit and the Paint Rock Herd Unit (Hunt Areas 41, 46 and 47). This quota is set by Cody Region personnel. Hunters on the west side harvest ~36% of the harvest for this herd unit. Hunt Areas 50-53 accounted for 43% of the total mule deer harvest in Region R (Hunt Areas 41, 46, 47, 50-53).

We reduced the nonresident Region Y deer quota from 2,000 to 1,800 licenses for 2015. Region Y contains Hunt Areas 24, 25, 27, 28 of the North Bighorn Herd Unit and the Upper Powder River Herd Unit (Hunt Areas 30, 32, 33, 163 and 169). This reduction was intended to reduce buck harvest in an effort to boost buck numbers and quality in these hunt areas. Nonresident hunters tend to harvest bucks more often than residents and are generally more successful than resident hunters. In the North Bighorn Herd Unit, resident success was 30% compared to nonresident success of 63%. Resident hunters harvested 556 bucks compared to 642 bucks harvested by nonresidents. In the Upper Powder River Herd Unit, resident success was 50% while nonresident success was 69%. Nonresident hunters harvested over twice as many buck mule deer as resident hunters (521 to 243 respectively).

Hunters on the eastside harvest about 64% of the mule deer in this herd unit. Hunt Areas 24, 25, 27 and 28 account for 50% of the total mule deer harvest in Region Y.

INPUT	
Species:	Mule Deer
Biologist:	Timothy P Thomas
Herd Unit & No.:	North Bighorn
Model date:	02/24/15

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	Constant Juvenile & Adult Survival	96	105	☐ CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	61	99	☐ SCJ,SCA Mod	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	4	101	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				10668	6684	17870	35222	10583	4005	15878	30466	25000
1994				8925	6131	15631	30686	8873	3827	14329	27029	25000
1995				7983	5184	13587	26754	7917	3428	12677	24021	25000
1996				7381	4486	11887	23753	7358	2510	11275	21143	25000
1997				6842	3559	10572	20973	6831	2341	10383	19555	25000
1998				7206	4269	10704	22179	7192	2565	10588	20344	25000
1999				7883	4684	11104	23671	7876	2775	10978	21629	25000
2000				6196	4226	10790	21212	6187	2314	10612	19113	25000
2001				6712	4271	10910	21893	6688	2826	10608	20122	25000
2002				6387	3599	9826	19812	6335	2290	9558	18183	25000
2003				7143	3992	9807	20942	7119	2497	9638	19254	25000
2004				6990	3675	9390	20055	6972	1914	9076	17962	25000
2005				7173	4669	10400	22242	7138	2852	9959	19949	25000
2006				8252	5494	11181	24927	8216	3610	10680	22505	25000
2007				6496	4532	10189	21217	6467	3004	9462	18932	25000
2008				5679	3697	8865	18240	5634	2417	8086	16136	25000
2009				4579	3182	7719	15480	4499	1878	6840	13217	25000
2010				5180	3527	7498	16205	5138	2147	6738	14023	25000
2011				4996	3667	7340	16002	4954	2523	6760	14236	25000
2012				5183	3503	6894	15580	5133	2179	6450	13762	25000
2013				4828	3294	6712	14834	4804	2026	6447	13277	25000
2014				5576	3464	7002	16042	5542	2146	6777	14465	20000
2015				4799	3103	6809	14710	4777	1783	6589	13148	20000
2016												20000
2017												20000
2018												20000
2019												20000
2020												20000
2021												20000
2022												20000
2023												20000
2024												20000
2025												20000

Survival and Initial Population Estimates

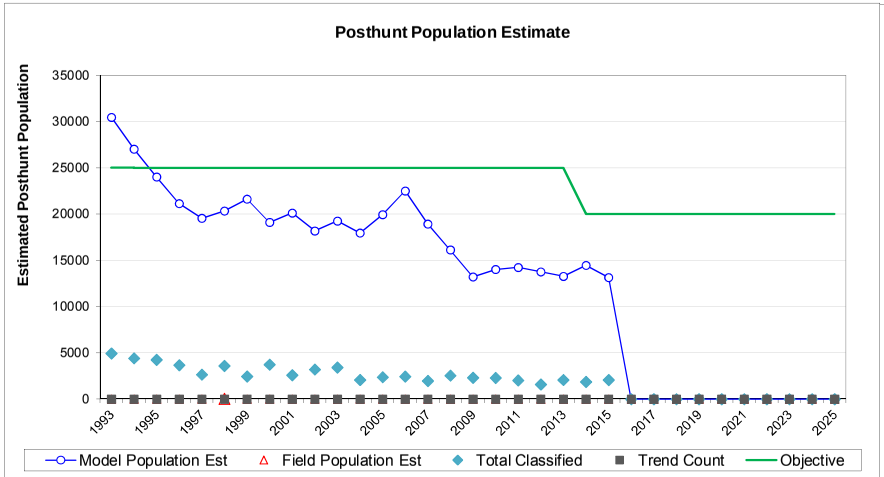
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.55			0.80		
1994	0.48			0.80		
1995	0.44			0.80		
1996	0.42			0.80		
1997	0.70			0.80		
1998	0.73			0.80		
1999	0.51			0.80		
2000	0.78			0.80		
2001	0.40			0.80		
2002	0.68			0.80		
2003	0.47			0.80		
2004	0.90			0.80		
2005	0.90			0.80		
2006	0.40			0.80		
2007	0.40			0.80		
2008	0.44			0.80		
2009	0.90			0.80		
2010	0.76			0.80		
2011	0.60			0.80		
2012	0.60			0.80		
2013	0.77			0.80		
2014	0.50			0.80		
2015	0.60			0.80		
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

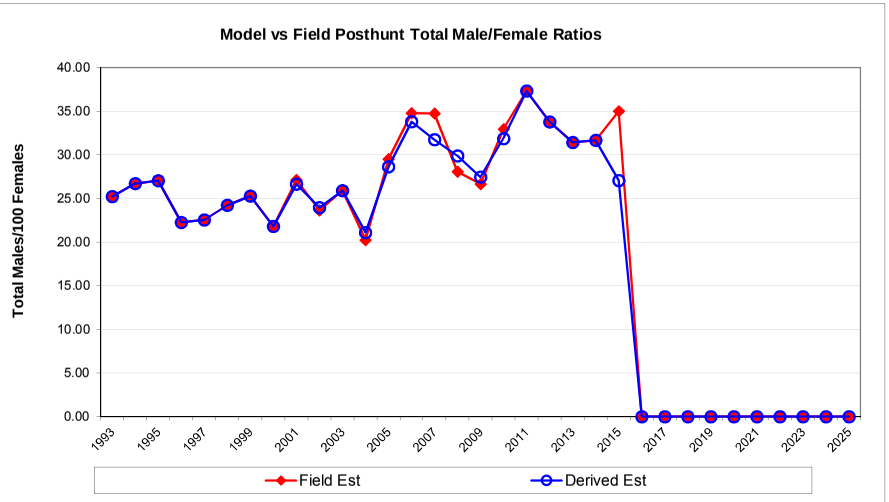
Parameters:	Optim cells
Adult Survival =	0.800
Initial Total Male Pop/10,000 =	0.400
Initial Female Pop/10,000 =	1.588

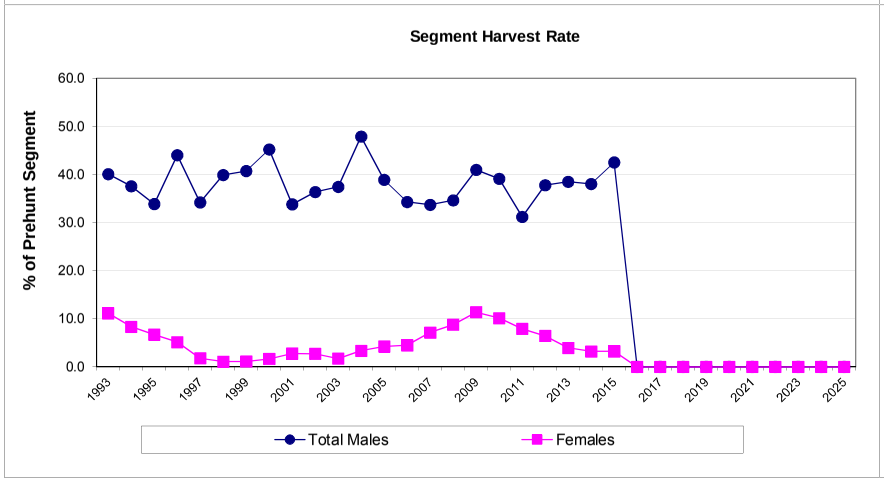
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

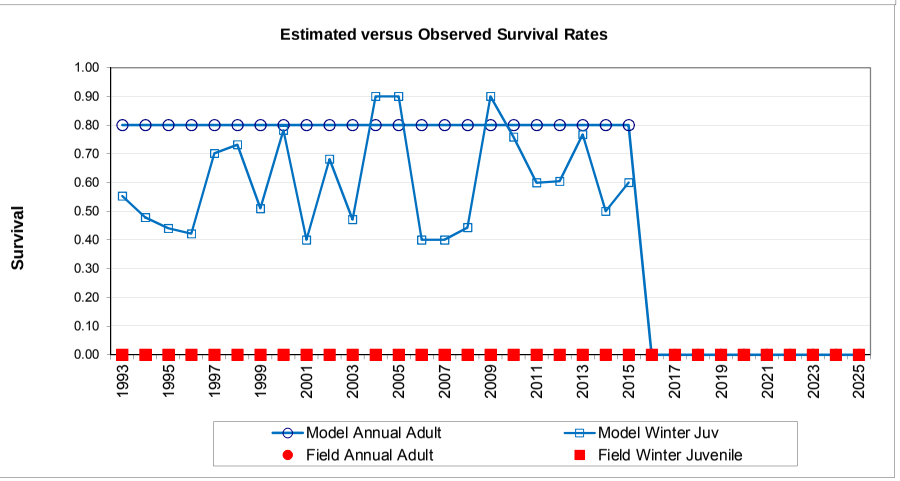
Year	Classification Counts: Juvenile/Female Ratio			Classification Counts: Total Male/Female Ratio			Classification Counts				Harvest: Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		66.65	2.08	25.22	25.22	1.11	77	2436	1811	4324	40.1	11.1
1994		61.92	2.07	26.71	26.71	1.20	47	2094	1184	3325	37.6	8.3
1995		62.45	2.13	27.04	27.04	1.24	60	1597	828	2485	33.9	6.7
1996		65.26	2.34	22.26	22.26	1.18	21	1796	556	2373	44.0	5.1
1997		65.79	2.79	22.55	22.55	1.40	10	1107	172	1289	34.2	1.8
1998		67.93	2.47	24.23	24.23	1.27	13	1549	106	1668	39.9	1.1
1999		71.74	3.15	25.28	25.28	1.60	7	1735	114	1856	40.7	1.1
2000		58.31	2.11	21.81	21.81	1.13	8	1738	162	1908	45.2	1.7
2001		63.05	2.75	26.64	27.13	1.59	22	1313	275	1610	33.8	2.8
2002		66.27	2.56	23.96	23.65	1.32	48	1190	243	1481	36.4	2.7
2003		73.86	2.74	25.90	25.90	1.38	22	1359	154	1535	37.5	1.7
2004		76.82	3.58	21.09	20.25	1.52	16	1601	285	1902	47.9	3.3
2005		71.67	3.23	28.64	29.52	1.80	32	1652	401	2085	38.9	4.2
2006		76.93	3.44	33.80	34.78	2.02	33	1713	456	2202	34.3	4.5
2007		68.35	3.44	31.75	34.74	2.19	27	1389	661	2077	33.7	7.1
2008		69.67	3.03	29.89	28.07	1.67	41	1164	708	1913	34.6	8.8
2009		65.78	3.01	27.45	26.66	1.67	72	1186	799	2057	41.0	11.4
2010		76.25	3.50	31.86	32.94	2.00	38	1255	691	1984	39.1	10.1
2011		73.28	3.63	37.32	37.32	2.31	38	1040	528	1606	31.2	7.9
2012		79.57	4.37	33.78	33.78	2.46	46	1204	403	1653	37.8	6.4
2013		74.51	3.58	31.42	31.42	2.02	22	1153	241	1416	38.5	3.9
2014		81.78	4.11	31.67	31.66	2.18	31	1198	204	1433	38.0	3.2
2015		72.50	3.54	27.06	35.00	2.17	20	1200	200	1420	42.5	3.2
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES









Comments:

END

Deer Control within the Cities of Buffalo and Sherian

Higher deer numbers within and adjacent to the Cites of Buffalo and Sheridan have resulted in numerous conflicts, including damage to landscaping, deer-vehicle collisions, and deer-dog interactions. As a result of these various conflicts, the Cities of Buffalo and Sheridan initiated deer reduction programs in 2009 (Buffalo) and 2011 (Sheridan). Below is a summary of these efforts. Complete reports in compliance with their respective Chapter 56 permit are on file at the Cheyenne Office.

Buffalo

The City of Buffalo conducted deer removed from within the city limits from 2009 - 20013. They were issued a Chapter 56 Permit for 2014 but did not take any deer. A summary of the Buffalo program is provided in Table 1.

Table 1. City of Buffalo Deer Reduction Program Summary, 2009-2013.

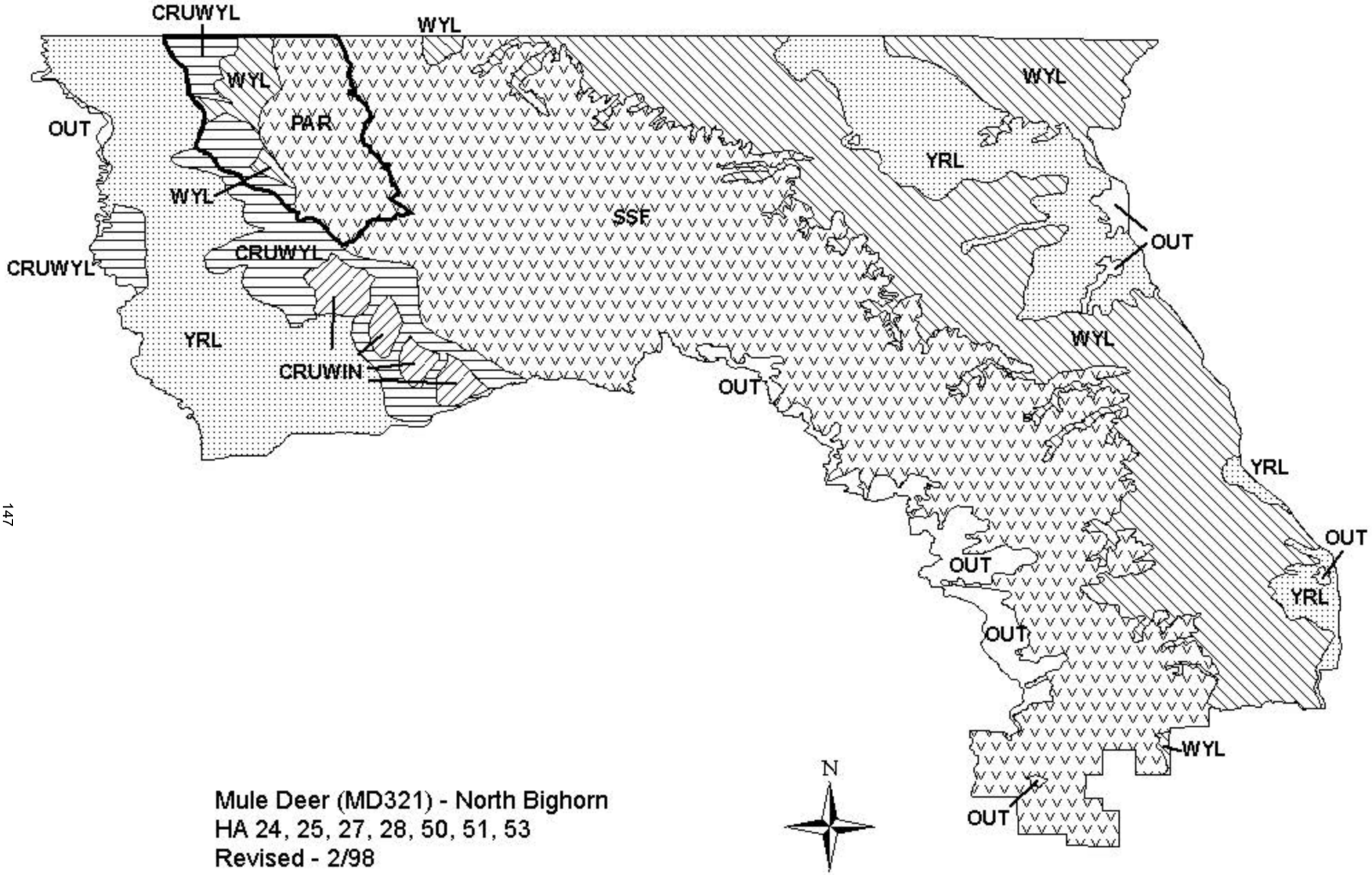
	2009	2010	2011	2012	2013
No Deer Permited	50	75	100	75	75
No. of Days	2	5	4	5	1
Mule Deer	16	16	35	10	0
White-tailed Deer	34	59	26	51	6
Total	**50**	**75**	**61**	**61**	**6**
CWD Positive	0	3 WTD	0	0	0

Sheridan

This was the fourth year the City of Sheridan removed deer from within the city limits. Officers try to target areas where they receive complaints about deer-human conflicts. All deer are tested for CWD and no deer have tested positive to date. All deer were donated whole to individuals in 2014. A summary of the Sheridan program is provided in Table 2.

Table 2. City of Sheridan Deer Reduction Program Summary, 2011-2014.

	2011	2012	2013	2014
No Deer Permited	100	100	100	100
Mule Deer	51	42	5	17
White-tailed Deer	49	39	28	22
Total	**100**	**81**	**33**	**39**
CWD Positive	0	0	0	0



Mule Deer (MD321) - North Bighorn
HA 24, 25, 27, 28, 50, 51, 53
Revised - 2/98

2014 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2014 - 5/31/2015

HERD: MD322 - UPPER POWDER RIVER

HUNT AREAS: 30, 32-33, 163, 169
PREPARED BY: DAN THIELE

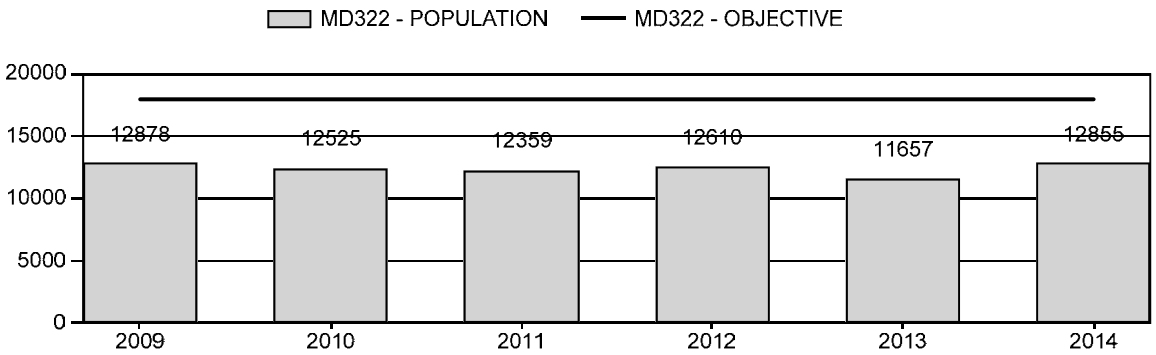
	2009 - 2013 Average	2014	2015 Proposed
Population:	12,406	12,855	12,992
Harvest:	954	929	675
Hunters:	1,558	1,545	1,300
Hunter Success:	61%	60%	52 %
Active Licenses:	1,621	1,567	1,325
Active License Success:	59%	59%	51 %
Recreation Days:	6,188	6,671	4,750
Days Per Animal:	6.5	7.2	7.0
Males per 100 Females	34	43	
Juveniles per 100 Females	65	90	

Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-28.6%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/20/2015

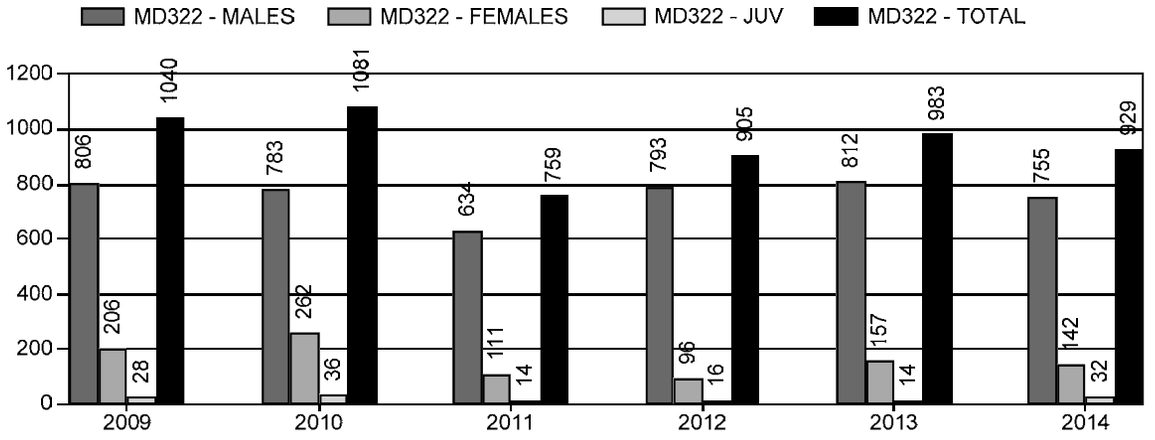
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	3%	1%
Males ≥ 1 year old:	31%	23%
Juveniles (< 1 year old):	0%	0%
Total:	7%	5%
Proposed change in post-season population:	+10%	+1%

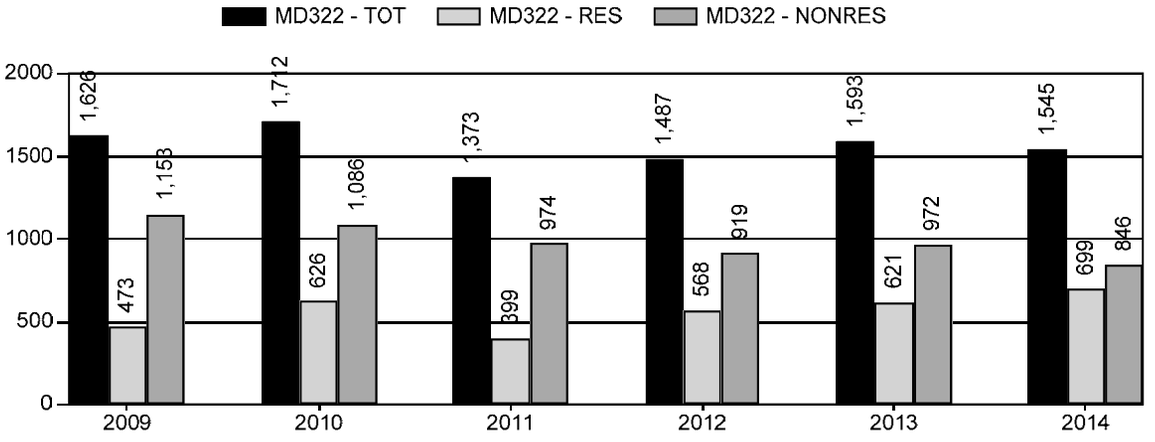
Population Size - Postseason



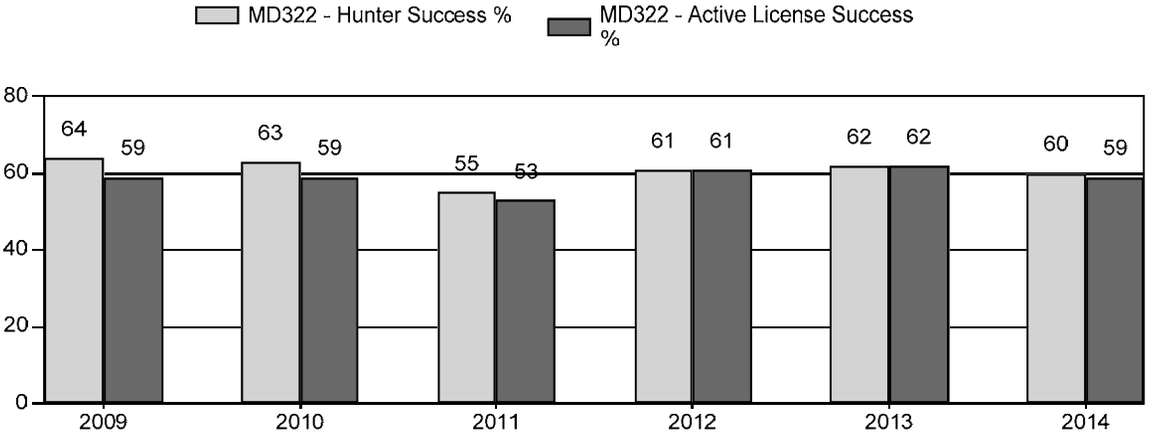
Harvest



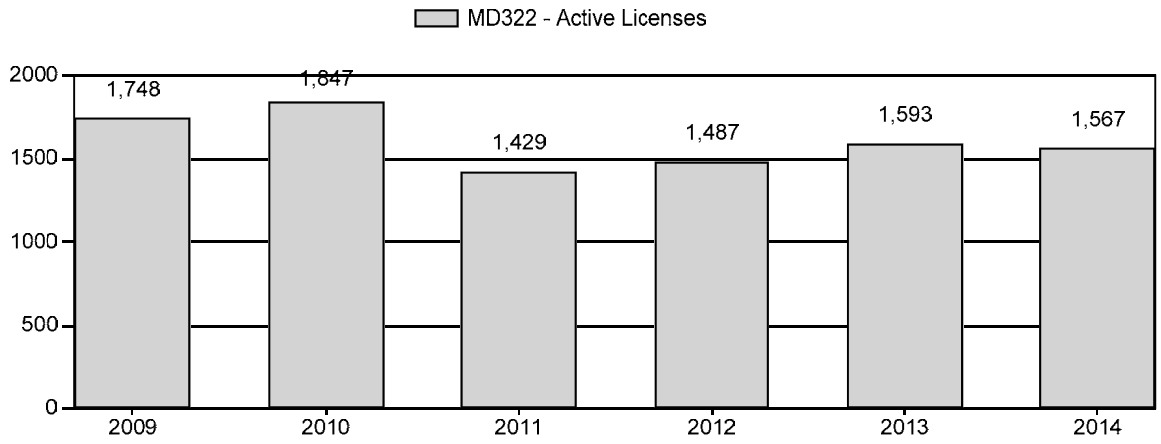
Number of Hunters



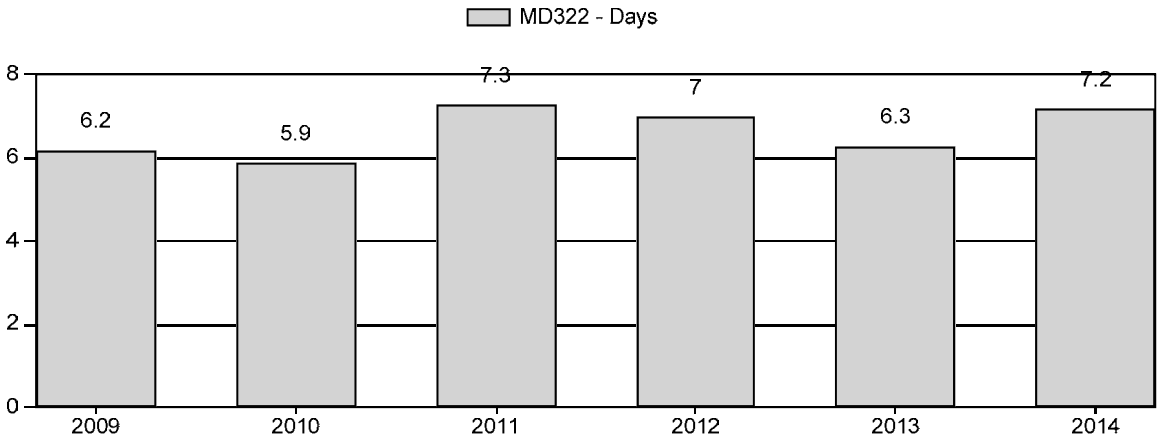
Harvest Success



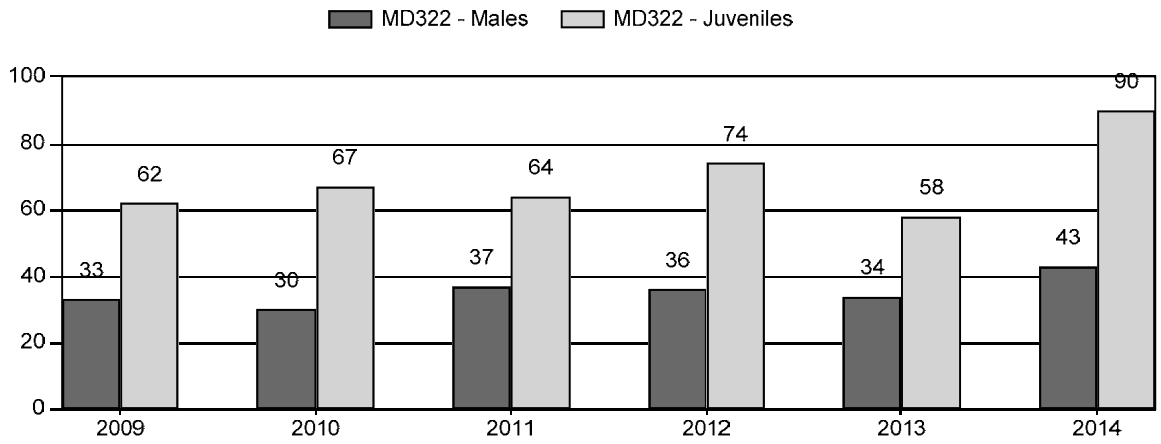
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD322 - UPPER POWDER RIVER

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	12,878	127	0	0	0	165	292	17%	880	51%	542	32%	1,714	1,170	14	19	33	± 3	62	± 4	46
2010	12,525	115	0	0	0	196	311	15%	1,047	51%	697	34%	2,055	1,279	11	19	30	± 2	67	± 4	51
2011	12,359	138	0	0	0	246	384	18%	1,049	50%	675	32%	2,108	1,218	13	23	37	± 3	64	± 4	47
2012	12,610	134	0	0	0	188	322	17%	897	48%	662	35%	1,881	1,522	15	21	36	± 3	74	± 4	54
2013	11,657	135	534	138	1	0	349	18%	1,013	52%	586	30%	1,948	1,046	13	21	34	± 3	58	± 4	43
2014	12,855	150	580	130	7	0	363	19%	840	43%	755	39%	1,958	2,177	18	25	43	± 3	90	± 5	63

2015 HUNTING SEASONS
UPPER POWDER RIVER MULE DEER HERD (MD322)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
30		Oct. 15	Oct. 31		General	Antlered deer off private land, any deer on private land
32		Oct. 15	Oct. 31		General	Antlered deer
33		Oct. 15	Oct. 31		General	Antlered deer off private land, any deer on private land
	6	Oct. 15	Oct. 31	25	Limited quota	Doe or fawn deer valid on private land
163, 169		Oct. 15	Oct. 21		General	Antlered deer
Archery		Sept. 1	Sept. 30			Refer to Section 3 of this Chapter
Region Y	Quota			1,800		

Hunt Area	Type	Quota change from 2014
33	6	**-25**
Herd Unit Total	**6**	**-25**
Region Y Quota		**-200**

Management Evaluation
Current Postseason Population Management Objective: 18,000
Management Strategy: Special
2014 Postseason Population Estimate: ~12,850
2015 Proposed Postseason Population Estimate: ~13,000

Herd Unit Issues

The Upper Powder River Mule Deer Herd Unit objective and management strategy was reviewed in 2013. No change was made to the post-season population objective of 18,000 deer, however, the management strategy was changed from recreational to special management. In 2014, this herd was selected as the Sheridan Region's Mule Deer Initiative herd.

This herd unit has excellent deer habitat extending from sagebrush grasslands in the east to mountain grasslands and mixed conifer habitats to the west. In the last 10 years, white-tailed deer numbers have greatly increased creating potential competition issues with mule deer in riparian areas and associated cropland. Accessible public lands are limited in the north but more

prevalent to the south with these lands receiving heavy hunting pressure. Areas 163 and 169 contain relatively large areas of accessible public lands and are managed with more conservative hunting seasons. Outfitted and trespass fee hunting of private lands limit hunter access resulting in nonresidents comprising a slight majority of the hunters in this herd unit. Hunters have found more flexibility in accessing scattered public lands by using GPS map technology

Another factor influencing this population is mortality attributed to mountain lion predation. Most mountain lion habitat and harvest in mountain lion Hunt Area 15 corresponds to this deer herd unit. Area 15 lion harvest reached a record high 31 lions in 2008-09. Harvest remained high the following two hunting seasons (2010-11 harvest 29 lions and 2011-12 harvest 30 lions). Since then harvest has decreased with 16 lions harvested in 2012-13, 15 lions in 2013-14 and the current season's harvest at 20 lions as of March 31, 2015.

Weather

Weather in the area of the Upper Powder River Herd Unit during 2014 was favorable after 2013 was very dry throughout most of the year. Fall moisture in 2013 provided mule deer a nutritional boost followed by a relatively mild winter. Precipitation in 2014 was above normal with abundant precipitation in June and August. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed "moderately moist" conditions for January 2014 and progressed to "very moist" in August and September. August precipitation was 250% of normal. Winter weather conditions were relatively mild with interspersed periods of very warm temperatures.

Habitat

There is one Wyoming big sagebrush habitat transect and one curl-leaf mountain mahogany transect in this herd unit. Sagebrush production measured in September 2014 averaged 36 mm per leader compared to 36 mm per leader in 2013 and the 10 year average of 28 mm per leader. Mountain mahogany production near Outlaw Cave averaged 29 mm per leader in 2014 compared to 4 mm per leader in 2013 and the 10 year average of 22 mm per leader. Utilization during the 2014-15 winter was light (less than 5% of leaders browsed) due to low mule deer numbers and an open winter. Complete shrub monitoring results are available in the appendix, Shrub Monitoring Report for the Sheridan Region.

Field Data

Classifications completed following the hunting season resulted in herd ratios of 90 fawns per 100 does and 43 bucks per 100 does. The fawn ratio was the highest of the six year period as well as the highest since 1990 when 80 fawns per 100 does were observed. Fawn production and survival was excellent due to the abundant 2013 fall moisture, mild winter weather and excellent spring 2014 moisture. Buck ratios remain solid with ratios of $\geq$30 per 100 in all six years, supporting the change in management strategy to special management. Classifications have included antler classifications the last two years. In 2014, Class I bucks comprised 81% of the adult buck classification while Class II bucks made up 18% and Class III bucks 1%. High ratios are influenced by the herds rugged topography and conservative hunting strategies on private land. Hunters were generally satisfied with their hunting experience as 62% responded positively to the hunter satisfaction survey. This compares to 70% in 2013. Hunters in Area 163 recorded the lowest satisfaction (48%) which corresponds to 45% hunter success.

Harvest Data

The 2014 harvest survey reported a 5% decrease in total harvest and a 7% decrease in buck harvest under an unchanged nonresident Region Y quota. The Region Y quota sold out in the draw. Nonresident hunters comprised 55% of the hunters. Hunter numbers and hunter success decreased from 2013 possibly due to unseasonably warm dry weather during the hunting season. Hunter effort likewise responded by increasing from 6.3 to 7.2 days per animal harvested. Hunter success was comparable to the five year average while hunter effort (7.2 days per animal) was well above the five year average of 6.5 days per animal. Field checks indicated that 83% of the buck harvest was adult bucks, reflective of the high buck ratio and private land hunting. The antler classification for field checked bucks was 76% Class I bucks, 22% Class II bucks and 2% Class III bucks, very similar to the postseason classification. Antlerless deer harvest comprised 19% of the total harvest with general license harvest accounting for 90% of the doe/fawn harvest.

The postseason landowner survey reflects the trend of decreasing deer numbers but has somewhat stabilized the last five years with a majority of landowners desiring more deer. In 2014, 67% of responding landowners wanted more deer, while 26% were satisfied with the population. Only three landowners wanted fewer deer. Fifty doe/fawn licenses were available in 2014 to address an Area 33 landowner's concern of too many deer on irrigated hay meadows.

Population

This population is estimated at about 12,850 mule deer, approximately 30% below the population objective. The estimate was generated with the EXCEL spreadsheet model. No independent population estimates have been collected. The Semi-Constant Juvenile/Semi-Constant Adult model (SCJ/SCA) was chosen over the Constant Juvenile/Constant Adult model (CJ/CA) even though it has a slightly higher AIC value (90 vs. 83). This model selected fawn survival estimates within the range of parameters while the CJ/CA model selected the lowest survival rates allowed. The model indicates this population has decreased from 1998 through 2013 but increased 10% in 2014 due to the high fawn ratio of 90 fawns per 100 does. The last year this population was estimated to be at objective was in 2000. The population appears to have stabilized the last five years. The model provides reasonable results that correspond well with management data and field observations. However, because independent survival estimates are lacking for this herd, this model is considered a fair model.

Management Summary

Fawn ratios have exceeded the identified threshold of 66 fawns per 100 does in only three of the last six years limiting the growth potential of this herd. The prevalence of drought since the late 1990's combined with aging shrubs are considered major factors in the low productivity of this herd. High mountain lion numbers have likely influence deer numbers in some areas of the herd. Additionally, extremely high white-tail deer numbers may be competing with the more productive segments of the mule deer herd, those occurring in and adjacent to riparian corridors with irrigated alfalfa meadows. And elk numbers remain above objective in the corresponding herd unit.

Seasons have been adjusted to limit antlerless harvest in recent years with general license any deer hunting allowed in three of the five hunt areas and only 50 doe/fawn licenses available to address crop depredation complaints in Hunt Area 33. The postseason buck ratio remains adequate but is influenced by private land areas that are hunted more conservatively.

The nonresident Region Y license quota was reduced 9% in 2012 to 2,000 licenses. These adjustments reversed trends in decreasing hunter success and increasing hunter effort. Nonresident hunters harvest proportionally more bucks and are more successful than resident hunters. In this herd unit, nonresident hunters harvested 521 bucks with 69% hunter success compared to the resident hunter harvest of 234 bucks and 50% hunter success. In the North Bighorn Herd Unit which comprises the remainder of Region Y, nonresident hunters harvested 642 bucks with 63% hunter success versus resident hunters harvesting 556 bucks with 30% hunter success. Public land hunters, which include most resident hunters, have lower hunter success.

As part of the Mule Deer Initiative effort, two public meetings were held in Kaycee and a landowner survey and hunter survey have been conducted. Primary concerns voiced by hunters and landowners are the lack of mule deer, continued antlerless deer seasons and lack of "mature" bucks even though the buck ratio meets the special management threshold. Primary causes identified by landowners included mountain lion predation, over harvest, vehicle collisions and drought. Hunters identified overharvest, habitat and drought. Landowners supported limiting hunter numbers whereas hunters were more evenly divided on the issue. Many hunters recommended antler point restrictions even though that option was not presented to them. A management plan will be completed in this year.

Although the population remains well below objective, hunter success and hunter satisfaction has equaled or exceeded 60%, the buck ratio is high and harvest field checks show antler Class II and III deer comprise about 25% of the adult buck harvest; hunters and landowners have concerns with the deer population, buck quality and hunting seasons. To address these concerns, season recommendations for 2015 included limiting general license antlerless harvest to private lands in Areas 30 and 33, antlered deer harvest in Areas 32, 163 and 169 and a 10% reduction in the nonresident quota (-200 licenses). These changes will reduce hunter numbers as well as limit antlerless harvest to those ranches that have concerns with deer depredation issues. Given the mild 2014-15 winter, the high 2014 fawn cohort should result in an improved yearling age class for 2015. Mountain lion hunting seasons remain extremely liberal with a yearlong season and reduced price licenses offered. Additionally, liberal white-tailed deer and elk hunting seasons are designed to reduce those populations and limit potential competition issues. Efforts will be made to initiate additional habitat projects and address high vehicle caused mortality on I-25. Lastly, lab age of harvested adult bucks will be collected in 2015 to determine age structure of the buck harvest.

The hunting season adjustments will address public concerns with the on-going Mule Deer Initiative efforts and management of this herd. A 2015 population of 13,000 deer is predicted.

INPUT	
Species:	Mule Deer
Biologist:	Dan Thiele
Herd Unit & No.:	Upper Powder River
Model date:	02/20/15

☑ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	74	83	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	78	90	☑ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	11	137	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				6722	4554	13726	25002	6694	2868	12709	22271	18000
1994				5615	3997	11969	21581	5552	2905	11309	19766	18000
1995				6086	3997	10805	20888	6046	2940	10476	19462	18000
1996				7538	4171	10277	21986	7448	3082	10073	20603	18000
1997				7420	4701	10365	22487	7411	3387	10106	20904	18000
1998				7408	4938	10381	22726	7388	3855	10150	21393	18000
1999				7098	5310	10409	22817	7085	3835	10145	21065	18000
2000				5347	5204	10316	20867	5318	3481	10116	18915	18000
2001				4387	4394	9769	18550	4355	3218	9551	17124	18000
2002				5097	3896	9026	18019	5056	2783	8808	16648	18000
2003				5981	3751	8632	18365	5968	2763	8397	17129	18000
2004				4902	4005	8569	17477	4846	2898	8354	16097	18000
2005				5587	3782	8202	17570	5524	2894	7964	16382	18000
2006				4332	3980	8087	16399	4305	3064	7796	15165	18000
2007				3347	3757	7590	14694	3333	2654	7303	13290	18000
2008				4817	3136	6903	14856	4787	2230	6583	13600	18000
2009				4049	3224	6750	14022	4018	2337	6523	12878	18000
2010				4158	3082	6474	13714	4118	2221	6186	12525	18000
2011				3946	3018	6230	13194	3930	2321	6108	12359	18000
2012				4450	3044	6112	13605	4433	2171	6006	12610	18000
2013				3489	3071	6178	12738	3474	2178	6005	11657	18000
2014				5192	2793	5893	13877	5156	1962	5737	12855	18000
2015				4445	3116	6174	13735	4440	2401	6152	12992	18000
2016												18000
2017												18000
2018												18000
2019												18000
2020												18000
2021												18000
2022												18000
2023												18000
2024												18000
2025												18000

Survival and Initial Population Estimates

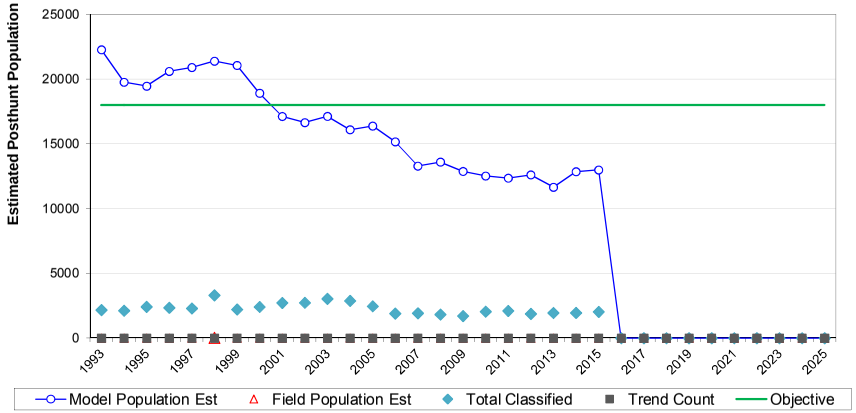
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.50			0.81		
1994	0.59			0.81		
1995	0.59			0.81		
1996	0.59			0.81		
1997	0.59			0.81		
1998	0.59			0.81		
1999	0.59			0.81		
2000	0.59			0.81		
2001	0.59			0.81		
2002	0.59			0.81		
2003	0.59			0.81		
2004	0.59			0.81		
2005	0.59			0.81		
2006	0.59			0.81		
2007	0.59			0.81		
2008	0.59			0.81		
2009	0.59			0.81		
2010	0.59			0.81		
2011	0.59			0.81		
2012	0.59			0.81		
2013	0.59			0.81		
2014	0.59			0.81		
2015	0.59			0.81		
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

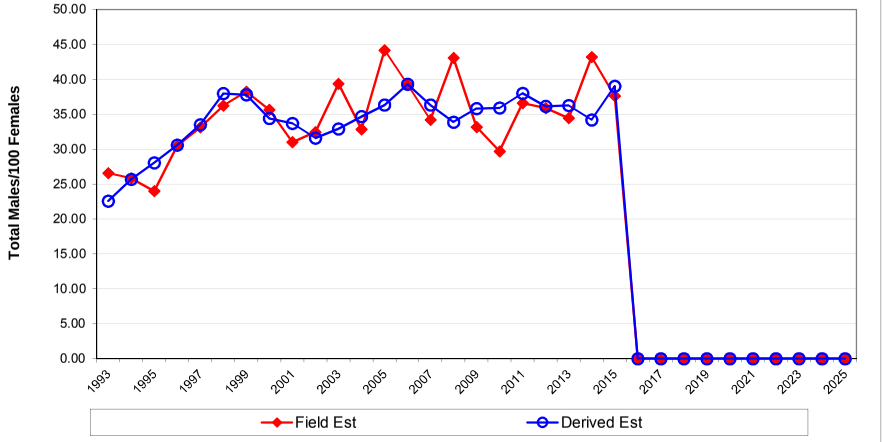
Parameters:	Optim cells
Juvenile Survival =	0.592
Adult Survival =	0.810
Initial Total Male Pop/10,000 =	0.287
Initial Female Pop/10,000 =	1.271

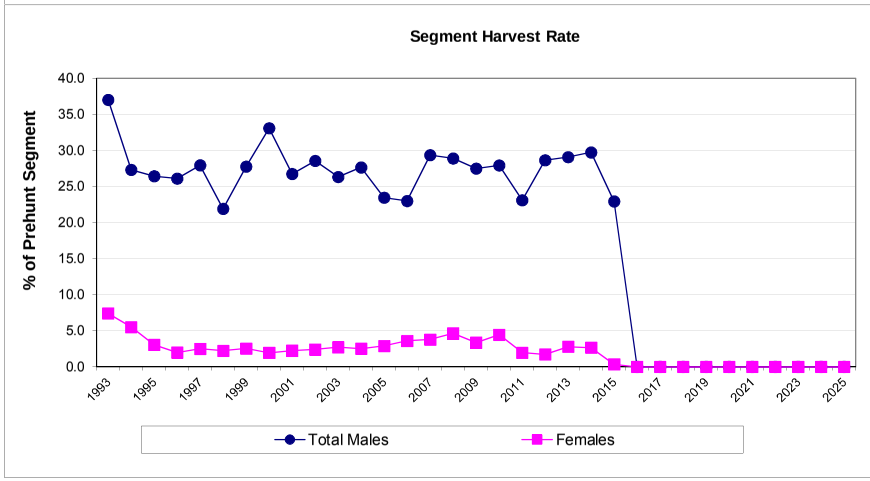
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

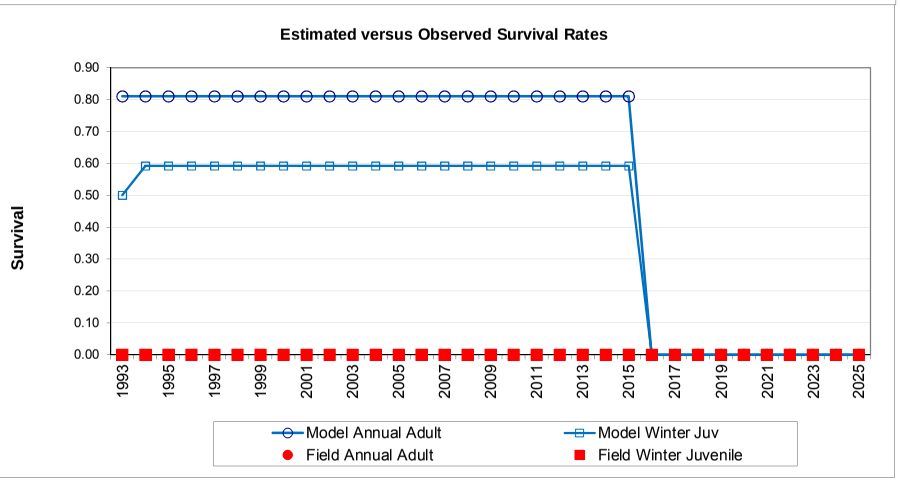
Year	Classification Counts: Juvenile/Female Ratio			Classification Counts: Total Male/Female Ratio			Harvest				Harvest: Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		52.67	2.57	22.57	26.58	1.66	25	1533	925	2483	37.0	7.4
1994		49.09	2.46	25.69	25.83	1.64	57	993	600	1650	27.3	5.5
1995		57.71	2.62	28.06	24.00	1.50	36	961	299	1296	26.4	3.0
1996		73.94	3.34	30.60	30.50	1.86	82	990	185	1257	26.1	2.0
1997		73.34	3.38	33.51	33.12	1.99	8	1195	236	1439	28.0	2.5
1998		72.79	2.82	37.98	36.24	1.77	18	984	210	1212	21.9	2.2
1999		69.83	3.34	37.80	38.25	2.23	12	1341	240	1593	27.8	2.5
2000		52.57	2.50	34.41	35.65	1.94	26	1566	182	1774	33.1	1.9
2001		45.60	2.07	33.70	31.02	1.62	29	1069	199	1297	26.8	2.2
2002		57.40	2.51	31.60	32.45	1.73	37	1012	198	1247	28.6	2.4
2003		71.07	2.90	32.91	39.38	1.95	12	898	214	1124	26.3	2.7
2004		58.01	2.46	34.69	32.85	1.70	51	1007	196	1254	27.7	2.5
2005		69.36	3.19	36.34	44.18	2.35	57	807	216	1080	23.5	2.9
2006		55.23	2.96	39.31	39.24	2.37	24	832	265	1121	23.0	3.6
2007		45.64	2.50	36.34	34.21	2.07	13	1003	261	1277	29.4	3.8
2008		72.73	3.85	33.88	43.09	2.70	27	824	291	1142	28.9	4.6
2009		61.59	3.36	35.83	33.18	2.24	28	806	206	1040	27.5	3.4
2010		66.57	3.25	35.91	29.70	1.92	36	783	262	1081	27.9	4.5
2011		64.35	3.18	38.00	36.61	2.18	14	634	111	759	23.1	2.0
2012		73.80	3.78	36.15	35.90	2.33	16	793	96	905	28.7	1.7
2013		57.85	3.00	36.27	34.45	2.14	14	812	157	983	29.1	2.8
2014		89.88	4.51	34.20	43.21	2.71	32	755	142	929	29.7	2.7
2015		72.16	3.58	39.02	37.63	2.31	5	650	20	675	22.9	0.4
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



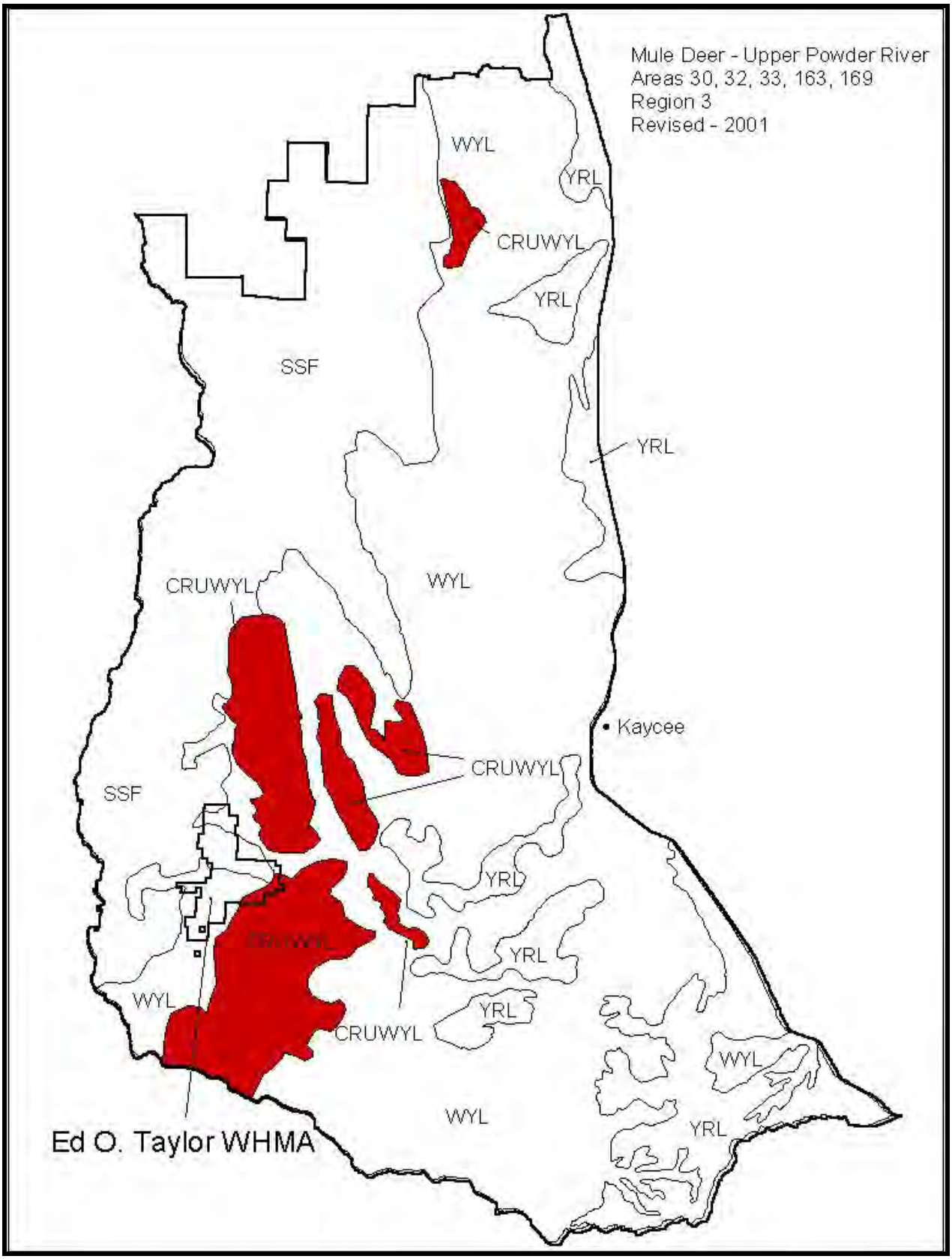






Comments:

END


Mule Deer - Upper Powder River
Areas 30, 32, 33, 163, 169
Region 3
Revised - 2001
WYL
YRL
CRUWYL
YRL
SSF
YRL
CRUWYL
WYL
Kaycee
CRUWYL
SSF
YRL
YRL
WYL
CRUWYL
YRL
WYL
YRL
Ed O. Taylor WHMA