

MULE DEER

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2016 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2016 - 5/31/2017

HERD: MD319 - POWDER RIVER

HUNT AREAS: 17-18, 23, 26

PREPARED BY: ERIKA PECKHAM

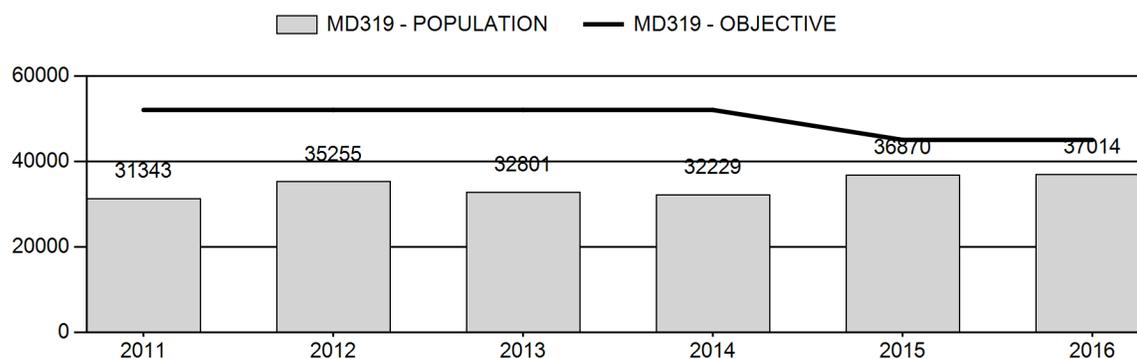
	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	33,700	37,014	37,348
Harvest:	2,556	2,827	2,885
Hunters:	3,736	4,042	4,050
Hunter Success:	68%	70%	71 %
Active Licenses:	3,898	4,181	4,200
Active License Success:	66%	68%	69 %
Recreation Days:	14,549	14,736	14,500
Days Per Animal:	5.7	5.2	5.0
Males per 100 Females	42	51	
Juveniles per 100 Females	79	62	

Population Objective (± 20%) :	45000 (36000 - 54000)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-17.7%
Number of years population has been + or - objective in recent trend:	9
Model Date:	2/27/2017

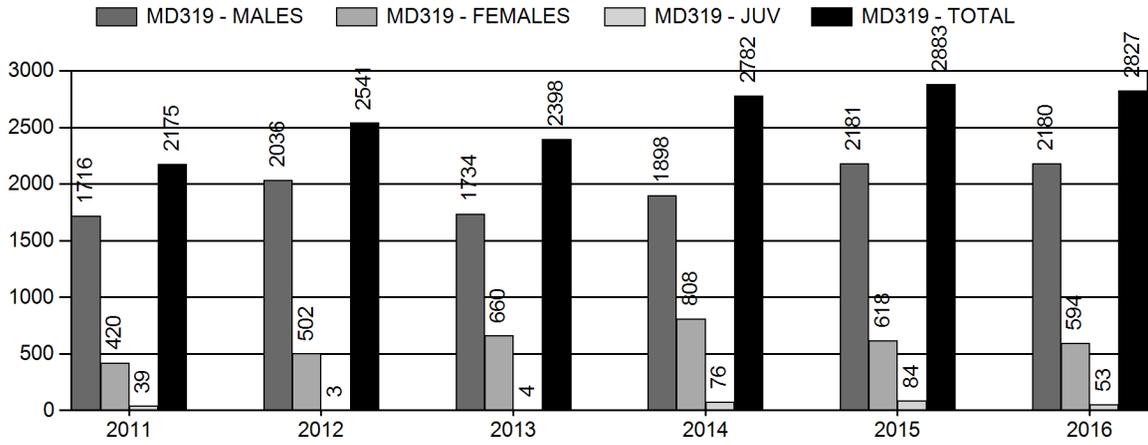
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3%	3.7%
Males ≥ 1 year old:	21.3%	22.4%
Total:	7.2%	7.1%
Proposed change in post-season population:	3.2%	.9%

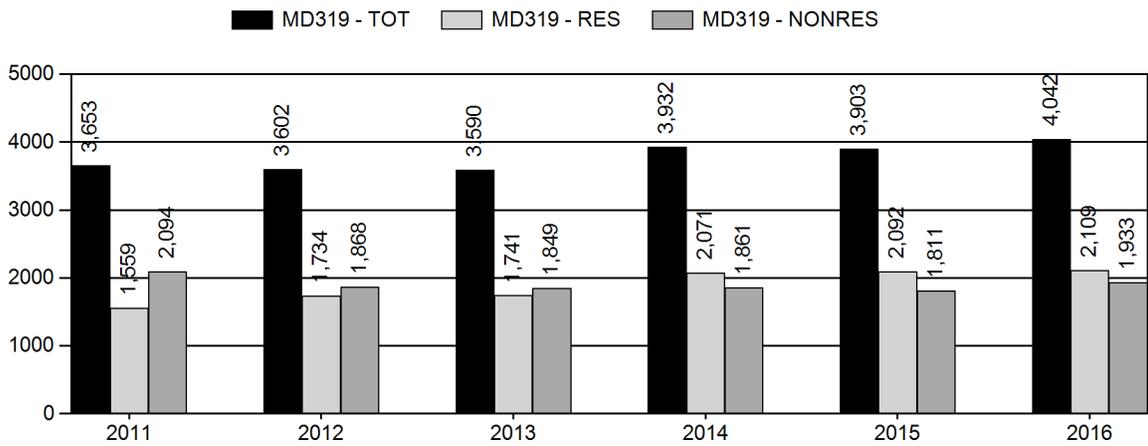
Population Size - Postseason



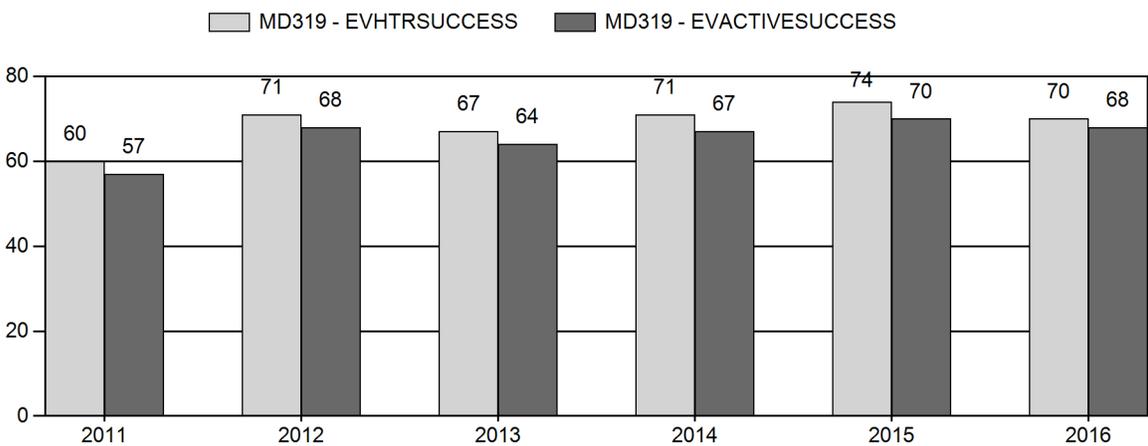
Harvest



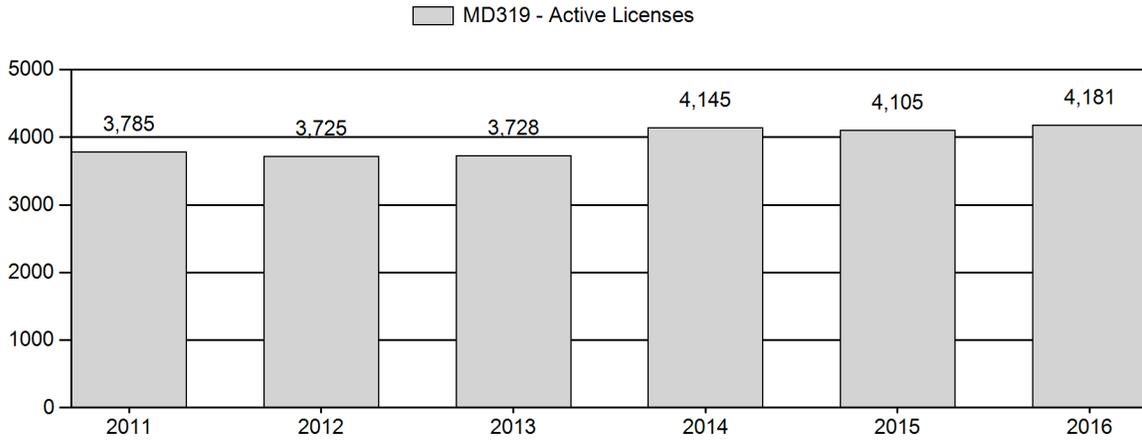
Number of Active Licenses



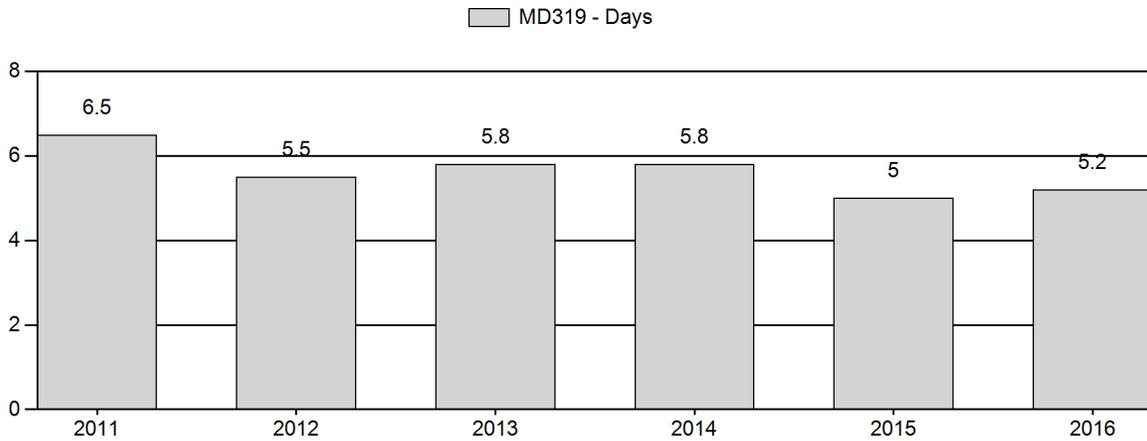
Harvest Success



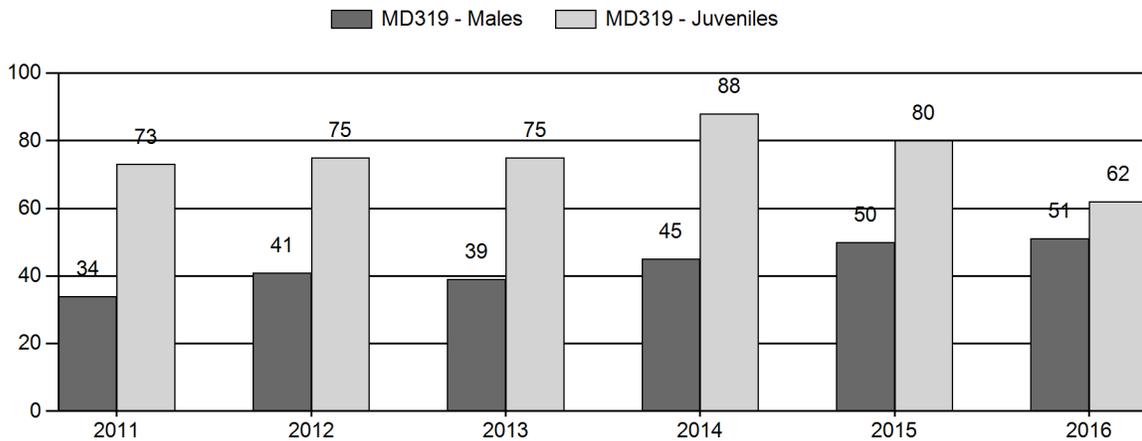
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Mule Deer Herd MD319 - POWDER RIVER

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs		Males to 100 Females				Young to		
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%	Cls	Obj	Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	36,870	185	0	0	0	435	620	22%	1,234	43%	987	35%	2,841	2,056	15	35	50	± 3	80	± 4	53
2016	37,348	235	196	91	0	209	731	24%	1,447	47%	891	29%	3,069	2,059	16	34	51	± 3	62	± 3	41

**2017 HUNTING SEASONS
POWDER RIVER MULE DEER HERD (MD319)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
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	2,000	Limited quota	Doe or fawn valid on private land

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
17, 18, 23, 26	Sep. 1	Sep. 30

Region	Deer Hunt Areas	Quota
C	17-19, 23, 26, 29, 31	2200

SUMMARY OF CHANGES IN LICENSE NUMBERS

Hunt Area	Type	Quota change from 2016
Herd Unit Total		No Changes
Region C Quota		No Changes

Management Evaluation

Current Postseason Population Management Objective: 45,000

Management Strategy: Private Lands

2016 Postseason Population Estimate: ~37,000

2017 Proposed Postseason Population Estimate: ~37,300

2016 Hunter Satisfaction: 84% Satisfied, 11% Neutral, 5% Dissatisfied

Herd Unit Issues

The postseason population objective for the Powder River Mule Deer Herd is 45,000 mule deer. The management strategy is private lands management. The objective and management strategy were last reviewed and updated in 2015.

Issues associated with this herd include difficult 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. This results in nonresidents comprising the majority of the hunters in this herd unit. Most of the public land hunters utilize GPS technologies which help them to find smaller pieces of unmarked public lands; however, this accessibility has increased the complaints of trespass and congestion by neighboring landowners. On a given day most pieces of public land are being utilized by hunters.

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.

For various reasons, this herd has been well below objective for several years. The 2016 post-season population estimate was about 37,000, which is still below the objective of 45,000. Around 2008 the population experienced a declining trend in numbers and poor fawn recruitment, likely influenced by weather factors. This was especially true in Hunt Areas 17 and 18. Fawn ratios in 2014 and 2015 were markedly improved in these areas, however then fell in 2016.

Weather

Weather throughout 2016 and into 2017 was not ideal for optimal rangeland conditions in this area. Drought conditions were experienced in much of this herd unit. The winter of 2015-2016 was mild with not much for snow accumulation, or prolonged snow cover. In contrast, the winter of 2016-17 was severe with numerous snowstorms and frequent below average temperatures. During this winter snow cover was persistent. With the cold temperatures, icing conditions occurred, making access to the limited forage even more difficult. As a result, over winter survival could have been impacted. The Palmer Drought Index indicates that more than half of 2016 experienced “moderate” or “severe” drought conditions in the Powder River drainage. Additionally, looking at historic temperature information for December and January, records indicate that the 30-year mean low temperature for Gillette in December is 13.2F and 14.5F for January. In contrast, December of 2016 experienced a mean low temperature of 2.5 with January reported as 9.7. These are substantially lower than the 30-year average (<http://www.wrcc.dri.edu>).

Habitat

This herd unit contains open rangeland dominated by short-grass prairie and big sagebrush, dry land and irrigated crop lands. There is currently no formal habitat monitoring occurring in this herd unit. It should be noted that various stands of sagebrush in this area appeared to be stressed with overall low vigor. It is unknown for certain what may be the cause of this but is speculated that it may be related to the previous prolonged drought as stressed appearing sagebrush has been noted throughout the general area. This has been noted primarily east of the Powder River. These areas are being monitored to see if die-off is imminent or if the plants were stressed and will potentially rebound. Habitat monitoring is planned for 2017 in Deer Area 18.

Field Data

Although all hunt areas have experienced a decline in the recent past, it appears that Areas 17 and 18 were impacted greater than 23 and 26. In 2009 and continuing into 2010 there was a sharp drop in the fawn:doe ratio to 55 and 62 respectively. Beginning in 2011, there was an improvement and fawn production increased into the 70's. 2014 had the highest fawn ratio on record for this herd at 88. This upward trend of fawn ratios continued into 2015, but then dropped back down to 62:100 in 2016, which is somewhat lower than anticipated.

Over the past several years, the buck ratio has remained fairly high, but constant. The preceding 5 year average was 42 bucks per 100 does, which ranged anywhere from 34-50. The 2016 bucks ratio of 51:100 is the highest on record for this herd.

As this is a predominantly private land area, postseason landowner surveys are also considered. In 2016 the survey was fairly split with 44% of respondents stating that deer were below desired levels and 46% stating that they were at desired levels. Only 10% of respondents felt that there were more deer than desired. This is fairly similar to perceptions in 2015. There is still a difference of opinion in landowners located west of the Powder River versus the landowners located on the east side of the Powder River. The landowners in Hunt Areas 23 and 26 are fairly split, however the majority of them (50%) feel that the deer are at objective. There is still a fairly high percentage (34%) of respondents that feel that the deer are below objective. Concerning Hunt Areas 17 and 18, 100% of respondents feel that deer are at or below objective, with the majority (72%) stating that they were below where they would like to see them.

Harvest Data

The harvest survey indicated that in 2016 there were around 2,800 animals harvested in this herd unit. Buck harvest was almost unchanged despite a slight increase in Region C licenses. No changes were made to the Type 6 license valid in Areas 23 and 26. The majority of these licenses were used in Area 23. It is anticipated that the majority of the harvest with these licenses will continue to be white-tailed deer. Hunter success in this herd unit has averaged 69% over the preceding 5 years, with 2016 experiencing an overall success rate of 70%. Days per harvest rarely deviates from 5-6 days in this herd and 2016 was no exception, with hunters averaging 5.2 days to harvest a deer.

Hunter satisfaction was reported as 84% indicating that they were “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. It seemed that in 2016 the comments received from public lands hunters were improved from the recent past; with more people indicating that they were pleased with what they saw for deer.

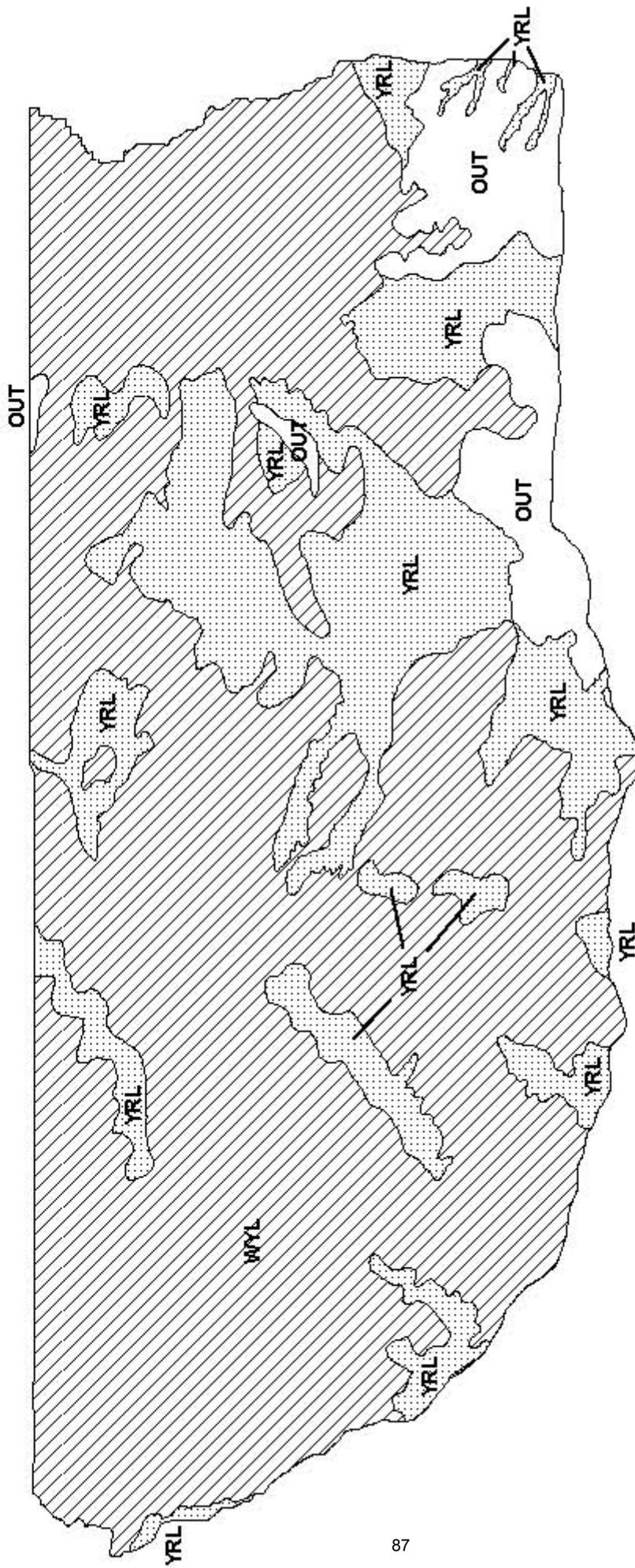
Population

This herd is estimated at ~37,000 mule deer which is around 22% below objective. The “Semi-Constant Juvenile –Semi-Constant Adult Mortality Rate” (SCJ-SCA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model had the lowest AIC value (125) and seemed to represent what has been occurring on the ground (fair model). There is no independent population estimate for this herd. The model indicates that in 2008 the population peaked and began a sharp decline thereafter and began an ascent in 2011. 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. Private landowners typically allow access based on the number of hunters that can be accommodated for the harvest they believe is appropriate for their ranch. If we attain the projected harvest of 2,885 deer and experience similar fawn recruitment as seen the last few years, it is anticipated that the population will slightly increase. Based on the population model we predict a 2017 post-season population of about 37,300.

Region C contains Hunt Areas 17, 18, 23 and 26 of the Powder River Herd, and 19, 29 and 31 of the Pumpkin Buttes Herd. After several years of decline in these areas, beginning in 2014 there was an increase in the fawn ratio in these two herds. It appears that the herd has begun to trend upward and if favorable conditions persist, will continue to move toward the population objective. Although things will potentially still be trending upwards, due to the harsh winter conditions at the onset of winter, it was not felt that an increase in the Region C quota of 2,200 was warranted.



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

2016 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2016 - 5/31/2017

HERD: MD320 - PUMPKIN BUTTES

HUNT AREAS: 19, 29, 31

PREPARED BY: DAN THIELE

	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	12,043	13,065	13,200
Harvest:	644	651	680
Hunters:	995	1,044	1,050
Hunter Success:	65%	62%	65%
Active Licenses:	1,012	1,055	1,075
Active License Success:	64%	62%	63%
Recreation Days:	3,770	4,293	4,000
Days Per Animal:	5.9	6.6	5.9
Males per 100 Females	41	45	
Juveniles per 100 Females	68	66	

Population Objective (± 20%) : 13000 (10400 - 15600)

Management Strategy: Private Land

Percent population is above (+) or below (-) objective: 0%

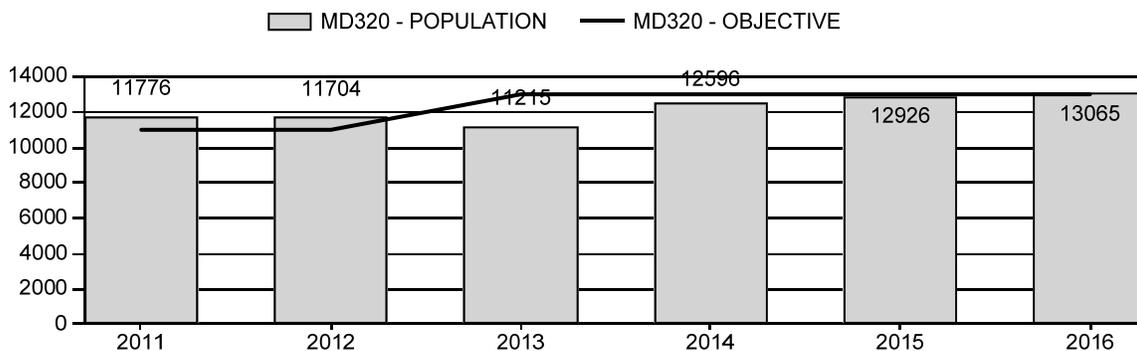
Number of years population has been + or - objective in recent trend: 0

Model Date: 2/21/2017

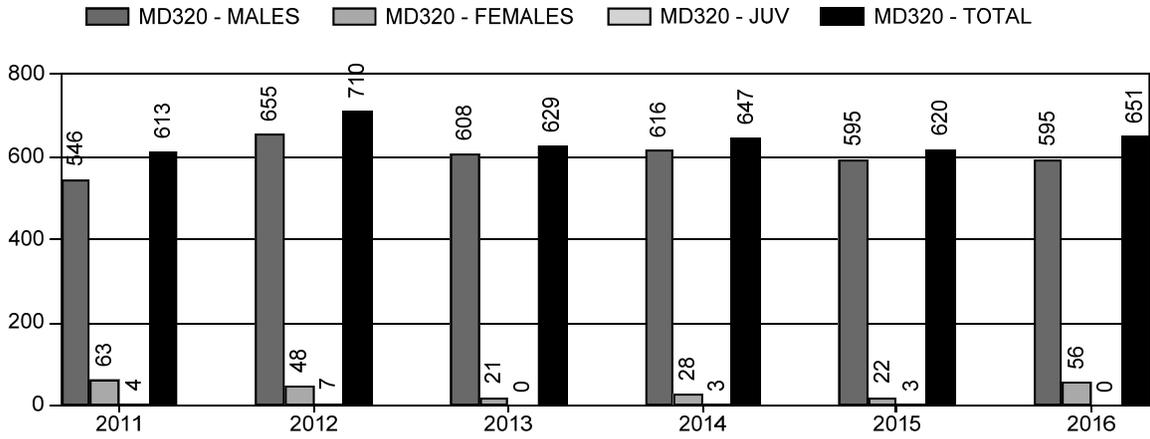
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1%	0%
Males ≥ 1 year old:	19%	20%
Total:	5%	6%
Proposed change in post-season population:	+1%	+1%

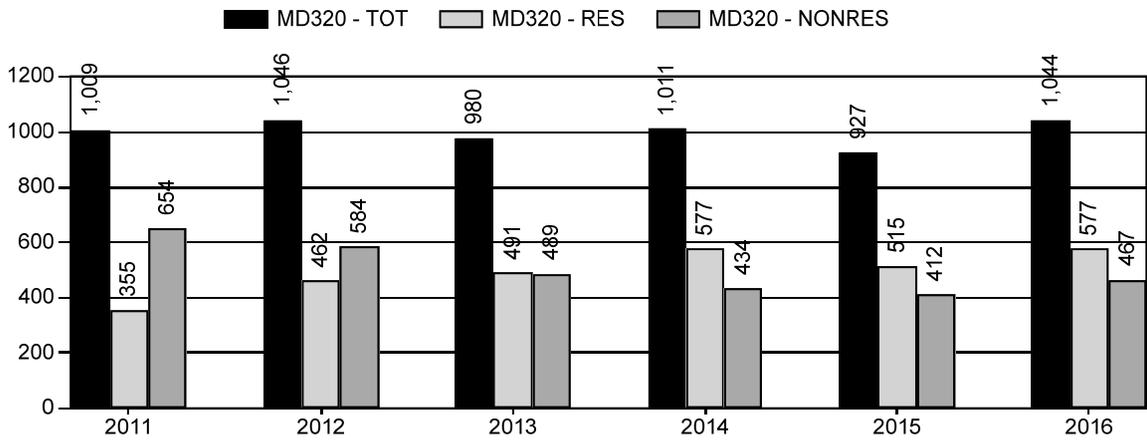
Population Size - Postseason



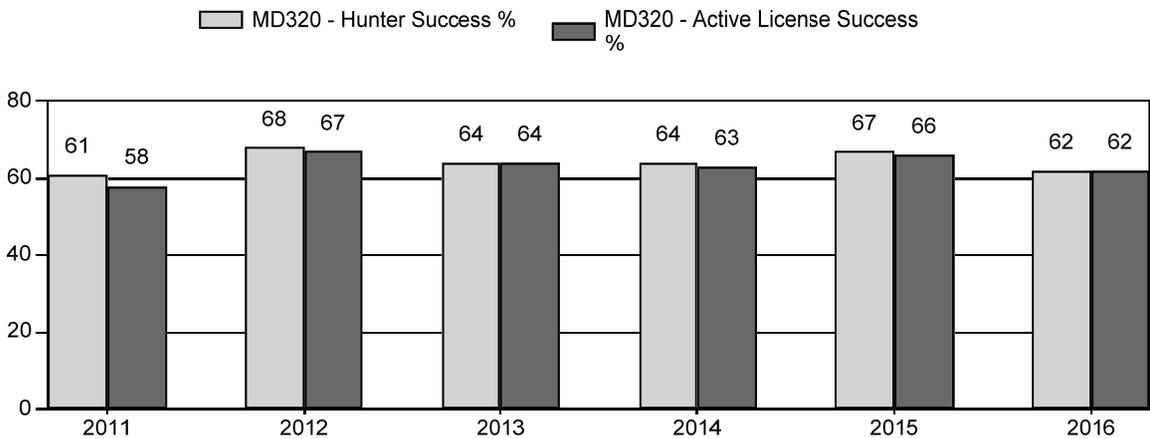
Harvest



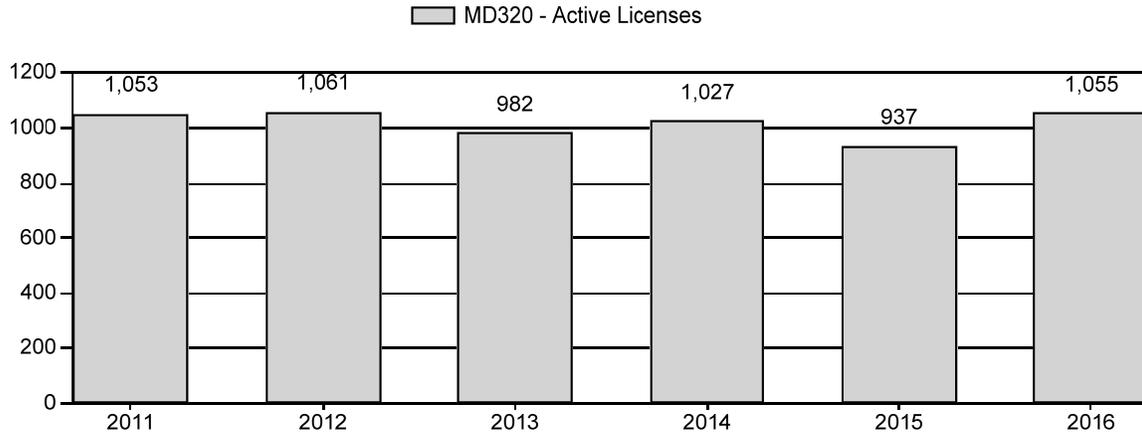
Number of Active Licenses



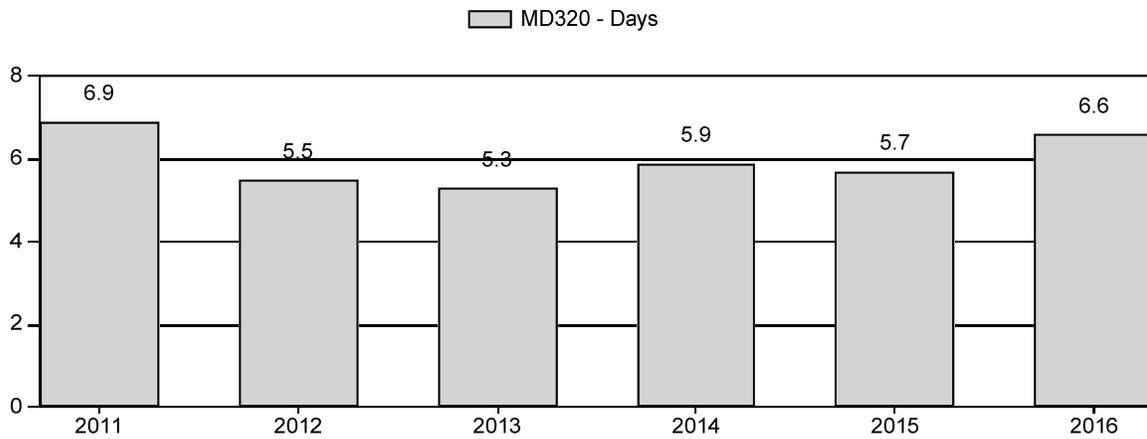
Harvest Success



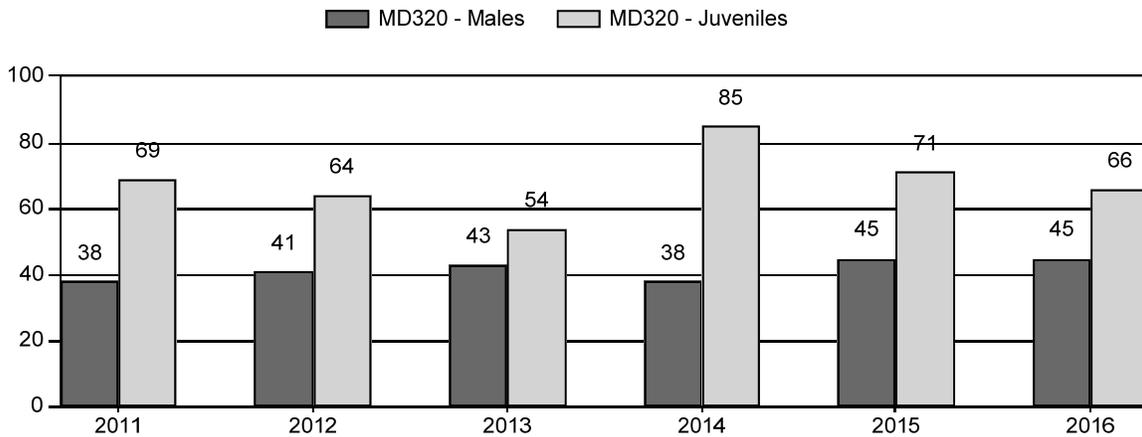
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Mule Deer Herd MD320 - PUMPKIN BUTTES

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot		Males to 100 Females			Young to			
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Cls	Obj	YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	11,776	76	0	0	0	225	301	18%	795	48%	545	33%	1,641	1,362	10	28	38	± 3	69	± 5	50
2012	11,704	119	0	0	0	182	301	20%	732	49%	470	31%	1,503	1,234	16	25	41	± 3	64	± 5	45
2013	11,215	96	201	121	2	0	420	22%	977	51%	525	27%	1,922	979	10	33	43	± 3	54	± 3	38
2014	12,596	81	182	58	3	0	324	17%	849	45%	721	38%	1,894	1,942	10	29	38	± 3	85	± 5	61
2015	12,926	139	180	62	6	23	410	21%	903	46%	642	33%	1,955	1,521	15	30	45	± 3	71	± 4	49
2016	13,065	160	204	88	8	0	460	21%	1,027	47%	677	31%	2,164	1,365	16	29	45	± 3	66	± 4	46

**2017 HUNTING SEASONS
PUMPKIN BUTTES MULE DEER HERD (MD320)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
19		Oct. 1	Oct. 20		General	Antlered mule deer
19	6	Oct. 1	Oct. 20	50	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

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
19, 29, 31	Sep. 1	Sep. 30

Region	Deer Hunt Areas	Quota
C	17-19, 23, 26, 29, 31	2200

SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2016
19		No change
29		No change
31		No change
Herd Unit Total		No change
Region C		No change

Management Evaluation

Current Postseason Population Management Objective: 13,000

Management Strategy: Private Lands

2016 Postseason Population Estimate: ~13,050

2017 Proposed Postseason Population Estimate: ~13,200

2016 Hunter Satisfaction: 75% Satisfied, 16% Neutral, 9% Dissatisfied

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.

In 2016, Hunt Area 20 was incorporated into Hunt Area 19 to simplify the deer hunt area map and more closely match the antelope Hunt Area 23 boundary.

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 opportunity for those unable or unwilling to access private lands.

Coalbed methane gas development has slowed after more than 10 years of intense development in Area 19 and the northeast portion of Area 29. Interest in deep oil has also decreased with plunging energy prices. As methane wells are plugged and abandoned, the BLM is working to remove infrastructure and eliminate and reclaim well pads and unneeded roads.

Weather

Weather in the area of the Pumpkin Buttes Herd Unit during 2016 was less favorable than the previous two years with average precipitation and slightly warmer temperatures. April precipitation was 74% above normal but spring precipitation (April-June) was only 81% of normal. The Palmer Drought Index (PDI) for Climate Division 5 (Powder, Little Missouri and Tongue drainages) recorded “moderate drought” conditions for June 2016 but progressed to “severe drought” through July and August before improving to “moderate drought” for the remainder of the calendar year and through March 2017. The PDI improved to mid-range in April due to above normal March (+44%) and April (+145%) precipitation. Winter weather was more severe with above normal December precipitation combined with average temperatures eight degrees colder than normal. Cold weather continued through January with temperatures averaging six degrees below normal before more favorable weather returned in February.

Habitat

There are two Wyoming big sagebrush habitat transect in this herd unit. Production was not measured in 2016. Timely 2016 precipitation provided for average shrub growth and good herbaceous forage production. With the exception of colder weather in December and January, winter conditions were normal so above average deer mortality was not observed. Utilization during the 2016-17 winter was perceived to be light (less than 5% of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range.

Field Data

The postseason classification survey resulted in 2,164 deer classified achieving an adequate sample and yielding a fawn ratio of 66:100 and a buck ratio of 45:100. The fawn ratio was well below the 85:100 recorded in 2014 and slightly below the five year average of 68:100 due to below normal spring precipitation. A high yearling buck ratio (16:100) resulted from the high 2015 fawn ratio and excellent overwinter survival thereby contributing to the highest buck ratio of the six year period. At the hunt area scale, ratios ranged from 32:100 in Hunt Area 31 to 49:100 in Hunt Area 19. Buck ratios have exceeded 40:100 four of the last six years due to the private land status of this herd unit and the conservative hunting philosophy of outfitters and landowners. Classifications have included antler classifications the last four years. In 2016, Class I bucks comprised 68% of the adult buck classification while Class II bucks made up 29% and Class III bucks 3%.

The annual landowner survey results show landowners continue to desire a higher deer population. Although 30% are satisfied with current numbers, 61% prefer an increase in numbers. Landowners in all three hunt areas show a strong preference for an increase in deer numbers. 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 2016 when 61% reported deer numbers too low.

Harvest Data

The 2016 harvest survey reported a slight increase (5%) in harvest and a 13 percent increase in hunter numbers from 2015. The increase in harvest was due to an increase in antlerless harvest influenced by an increase in Area 19 Type 6 licenses. Buck harvest was unchanged. Hunter numbers were the second highest of the six year period due in part to a 100 license increase in the 2016 Region C quota. It is interesting to note that resident hunter numbers increased over the six year period and exceeded nonresident hunter numbers the last four years. Traditionally, this private land herd unit has favored nonresident hunters. Very limited antlerless deer harvest is occurring with that cohort of the population comprising less than 10% of the harvest each of the last five years. Field checks indicated that 92% 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 64% Class I bucks, 33% Class II bucks and 3% Class III bucks. This closely reflects the postseason classification and again reflects the herd unit's high buck ratios resulting from restrictive access to private land and hunters selecting for larger bucks. Hunter and active license success decreased to the second lowest level of the six year period while hunter effort increased 0.9 days per animal harvested to the second highest level of the six year period. This was due to lower resident and nonresident general license hunter success.

Hunters were highly satisfied with the 2016 hunting season with 75% expressing satisfaction with their hunt.

Population

This population is estimated at about 13,050 mule deer, placing this herd at objective. The population estimate was generated with the EXCEL spreadsheet model. No independent population or survival 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 (134 vs. 105). 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 from 2003 to 2013 followed by a 16% increase the last three years primarily due to the high 2014 fawn ratio combined with conservative antlerless harvest and mild winters. The fawn ratio has averaged 74:100 the last three years, equaling or exceeding the threshold of 66:100 required for population stability. The significant difference 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

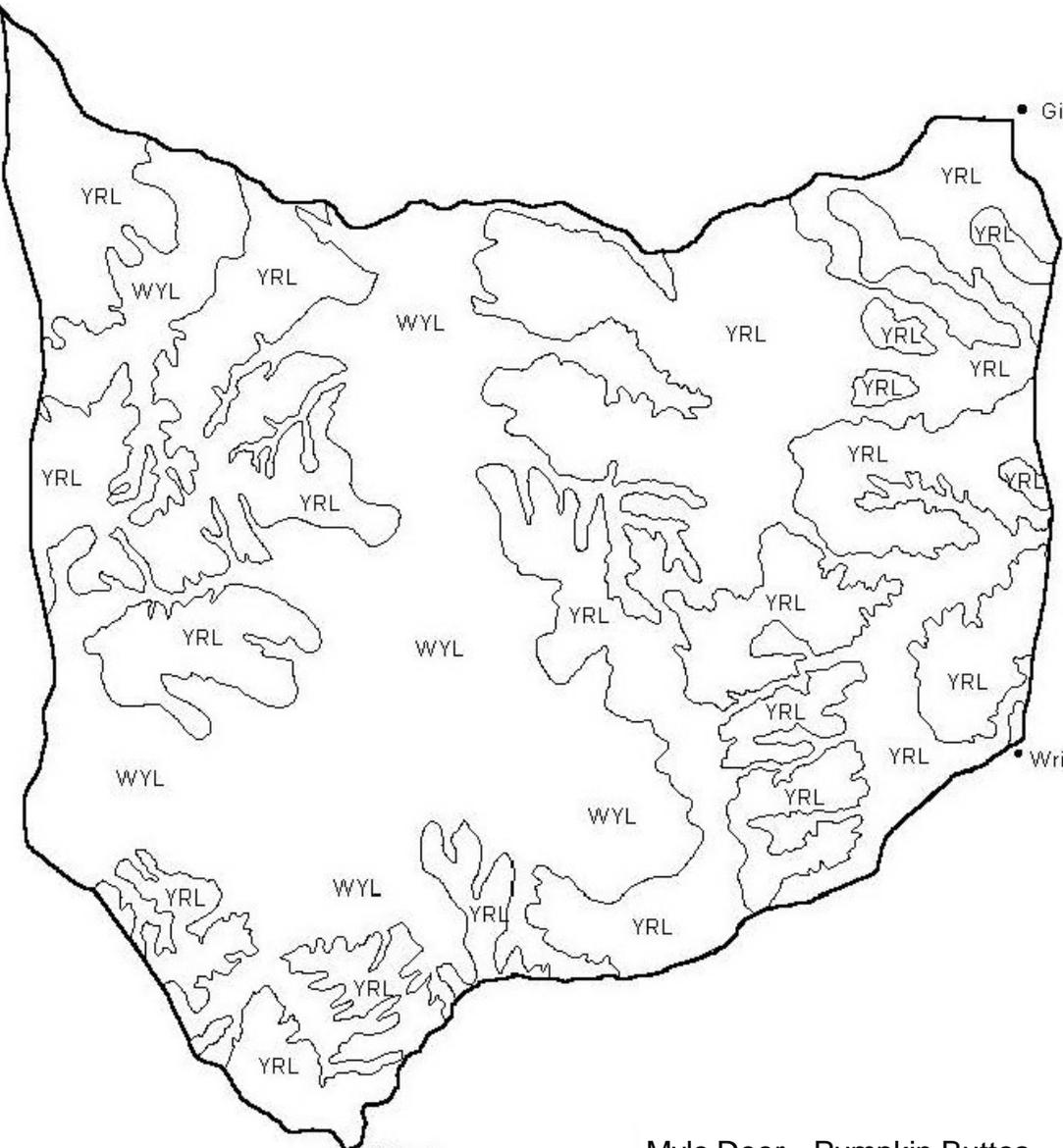
In recent years, hunting demographics have changed with resident hunters now comprising the majority of the hunters. However, nonresident hunters continue to harvest a majority of the deer so adjusting the nonresident region quota continues to influence the harvest. The nonresident Region C license quota was increased 100 licenses in 2016 but was over-subscribed in the regular draw resulting in applicants with zero points having drawing odds of 45%. Special Draw applicants experienced 100% draw odds. 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.

The population is estimated to be at objective. Landowner survey results suggest a strong majority of landowners prefer to manage for higher deer numbers. Based on harvest trends, significantly higher deer populations have existed in the past and shrub surveys suggest higher deer numbers are compatible with the supporting habitat. Damage complaints are almost nonexistent at this time. If environmental conditions provide for increased deer numbers, the objective may have to be adjusted upward during the next herd unit review. The private lands management strategy is appropriate for this herd given that most private lands are outfitted resulting in high buck ratios.

Hunting seasons within the Pumpkin Buttes Herd Unit continue to be very conservative with minimal antlerless harvest occurring (<10%) so harvest strategies are not limiting the growth of this herd. Fawn ratios averaged 68:100 for the five year average indicating that low fawn production is the primary factor restricting herd growth. Weather is considered to be the most significant factor influencing fawn ratios. This was highlighted in 2014 when abundant fall 2013 precipitation combined with mild winter weather and above normal spring precipitation produced a fawn ratio of 85:100, the highest fawn ratio observed since 1987. Although hunter statistics and buck ratios are favorable, landowners desire more deer based on the landowner survey. Favorable weather and habitat conditions hold potential that 2017 will result in a high fawn ratio and continued herd growth. The 2017 hunting seasons are unchanged including the nonresident Region C quota of 2,200 licenses. The population is expected to increase slightly in 2017.

Buffalo •

• Gillette



• Wright

• Midwest

Mule Deer - Pumpkin Buttes
Areas 19, 29, 31
Region SN
Revised - 2001

2016 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2016 - 5/31/2017

HERD: MD321 - NORTH BIGHORN

HUNT AREAS: 24-25, 27-28, 50-53

PREPARED BY: TIM THOMAS

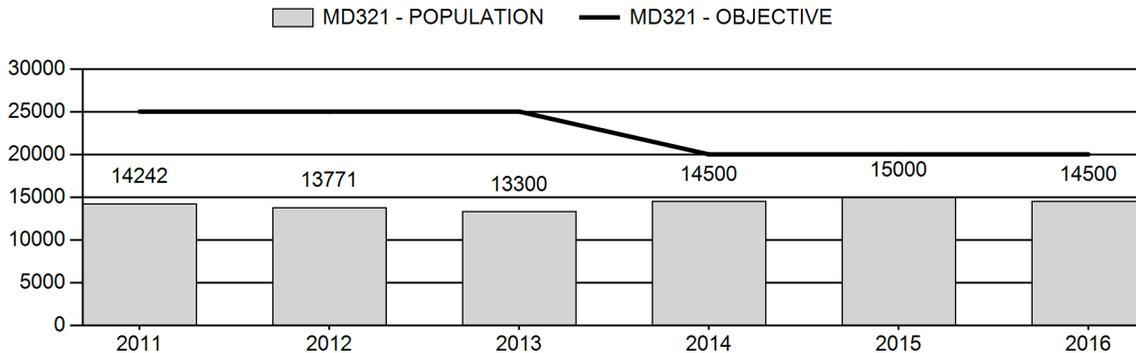
	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	14,163	14,500	14,400
Harvest:	1,524	1,374	1,425
Hunters:	3,509	3,359	3,400
Hunter Success:	43%	41%	42 %
Active Licenses:	3,684	3,456	3,500
Active License Success:	41%	40%	41 %
Recreation Days:	18,256	15,636	16,250
Days Per Animal:	12.0	11.4	11.4
Males per 100 Females	33	30	
Juveniles per 100 Females	78	74	

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:	10
Model Date:	3/1/2017

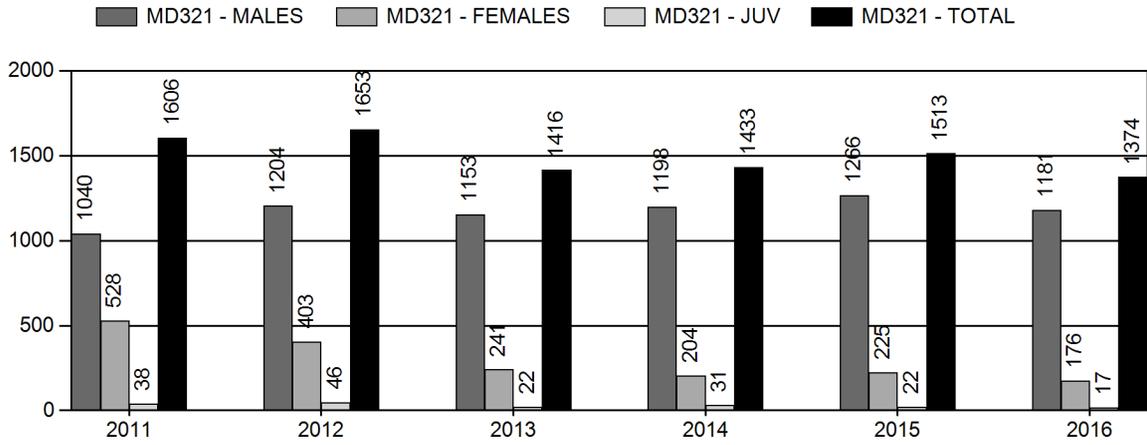
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3%	3%
Males ≥ 1 year old:	37%	38%
Total:	9%	9%
Proposed change in post-season population:	-3%	0%

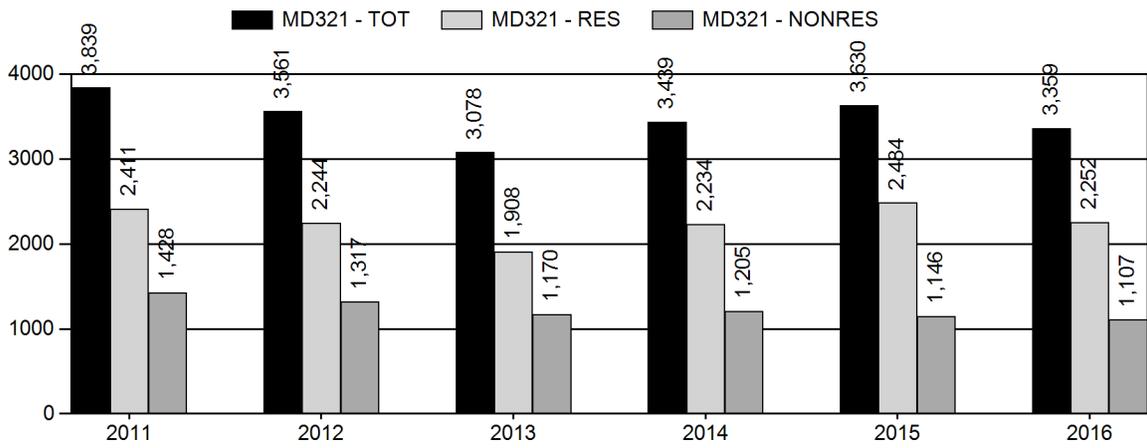
Population Size - Postseason



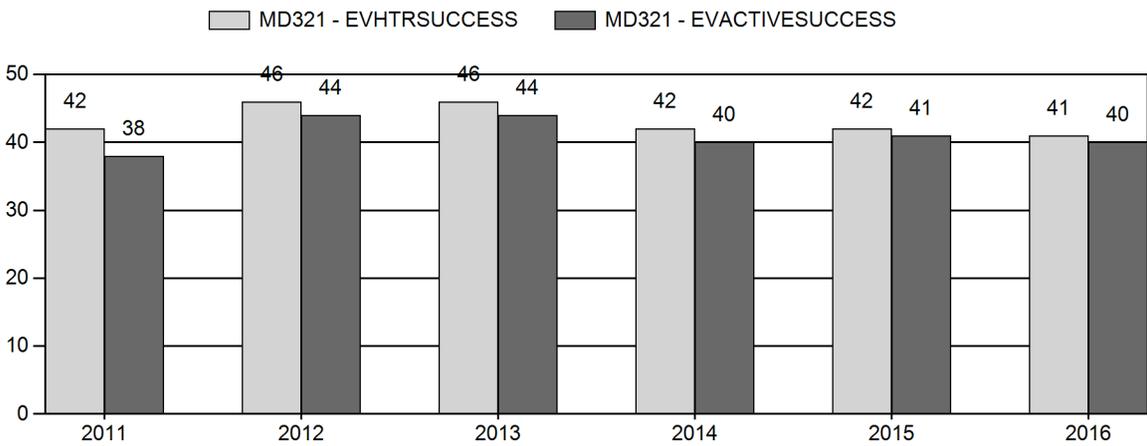
Harvest



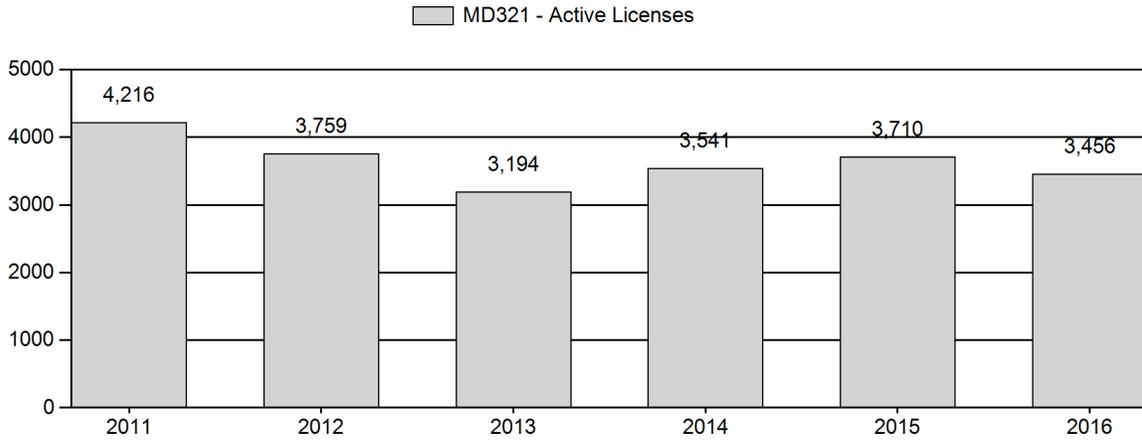
Number of Active Licenses



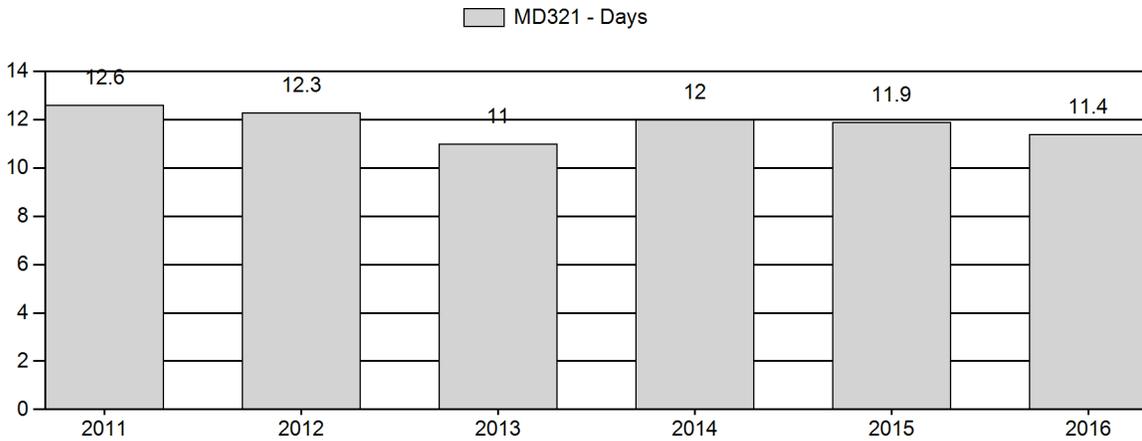
Harvest Success



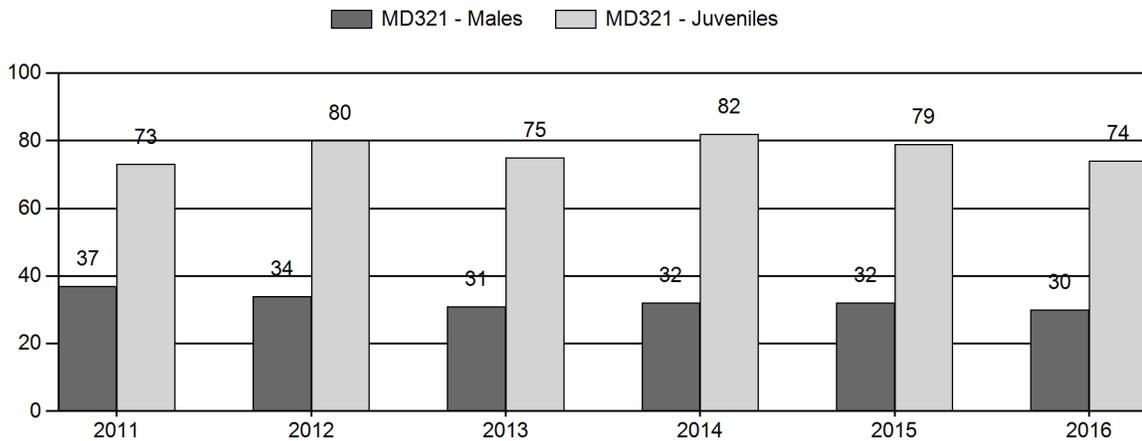
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Mule Deer Herd MD321 - NORTH BIGHORN

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females				Young to		
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	190	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	15,000	155	138	36	2	34	365	15%	1,130	47%	894	37%	2,389	1,734	14	19	32	± 2	79	± 4	60
2016	14,500	116	38	28	4	132	318	15%	1,044	49%	771	36%	2,133	1,544	11	19	30	± 2	74	± 4	57

**2017 HUNTING SEASONS
NORTH BIGHORN MULE DEER HERD (MD321)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
24		Oct. 15	Oct. 31		General	Antlered mule deer or any white-tailed deer
	6	Sep. 1	Dec. 15	200	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	Antlered mule deer or any white-tailed 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
	7	Sep. 1	Nov. 30	200	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 on or within one-half (1/2) mile of irrigated land
53		Oct. 15	Oct. 31		General	Antlered deer

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
24, 25, 27, 28, 50, 51, 52, 53	Sep. 1	Sep. 30

Region	Deer Hunt Areas	Quotas
R	41, 46, 47, 50-53	750
Y	24, 25, 27, 28, 30, 32, 33, 163, 169	1,800

Hunt Area	Type	Quota change from 2016
24	6	-100
51	6	- 25
51	7	+200
Herd Unit Total	6	- 125
	7	+200
Region Y		No Change
Region R		No Change

Management Evaluation

Current Postseason Population Management Objective: 20,000

Management Strategy: Recreational

2016 Postseason Population Estimate: ~ 14,500

2017 Proposed Postseason Population Estimate: ~ 14,400

2016 Hunter Satisfaction: 70% Satisfied; 16% Neutral; 14% Dissatisfied

Herd Unit Issues

The North Bighorn Mule Deer Herd Unit is located in north central Wyoming. It covers the northern portion of the Bighorn Mountains and associated foothills. Management is shared between the Sheridan and Cody Regions, with the Sheridan wildlife biologist having reporting responsibility.

The North Bighorn Mule Deer Herd Unit is managed for a post-season population objective of 20,000 mule deer with a recreational management strategy. The objective and management strategy for this herd 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. We do not think predation is a significant limiting factor most years, although we recognize predation is a contributing factor to mule deer mortality.

Weather

Temperature and precipitation data referenced in this section were collected at the Burgess Junction (#481220), Shell (#488124) and Sheridan Airport (#488155) weather stations located within this herd unit. These data were reported by the Western Region Climate Center on their website (www.wrcc.dri.edu).

The spring 2016 was relatively warm and wet, resulting in a good start for forage production in the Bighorn Mountains. Starting in May, precipitation was below average for the summer, with temperatures near or above normal. The fall of 2016 was generally warm and wet. Precipitation was significantly above normal (September) or near normal (October – November), with temperatures slightly (September) to well (October-November) above normal. Temperatures were well below average in December and January, moderating in February. Precipitation was above normal to normal during December and January. There were several significant snow events during April. Deer appeared to have entered the winter in good condition. Increased fall and winter precipitation, combined with prolonged periods of below average temperatures likely increased over-winter fawn mortalities.

Habitat

We do not have established habitat transects in this herd unit. Most deer in this herd unit migrate to higher elevations in the Bighorn Mountains during the spring and spend summer on Forest Service lands. 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 east side of the Bighorn Mountains.

Field Data

During November and December, field personnel classified mule deer in this herd unit using both aerial (helicopter; Areas 50-53) and ground (Areas 24 and 27) survey techniques. Due to inclement weather, classification effort was below normal in Area 53 this year. Hunt Areas 25 and 28 are not surveyed as deer migrate out of these areas during October and are not present during the survey period. We classified a total of 2,133 mule deer, which is above the desired sample at the 80% confidence level (n=1,544). We observed 74 fawns:100 does, a decrease from 79:100 observed in 2015 and the lowest observed fawn to doe ratio since 2011 (73:100). Fawn production, based on observed doe to fawn ratios, has been good the past 5 years (74-82 fawns:100 does; mean = 78 fawns:100 does), which should have helped this population increase towards objective.

The observed buck to doe ratio continues to be in the 30s (30 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 portions of 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, some hunters - both resident and non-resident - have consistently requested better quality (i.e. larger antlered) deer in this herd unit. Starting in 2015, we collected antler measurements and teeth for age analysis. This is an effort to correlate antler development with age in this herd unit.

Preliminary analysis suggests we are harvesting younger bucks (i.e. 2-3 years old) in the North Bighorn Herd Unit compared to other hunt areas of the state (Fig. 1) where teeth were collected. This could be a function of relatively large younger age cohorts due to increased fawn production and recruitment the past couple of years. Also, data may be biased towards young animals as some hunters did not want a tooth pulled from older deer that they planned to mount. That generally wasn't a concern with younger deer and thus that segment may be represented at a greater level than actually occurred in the harvest.

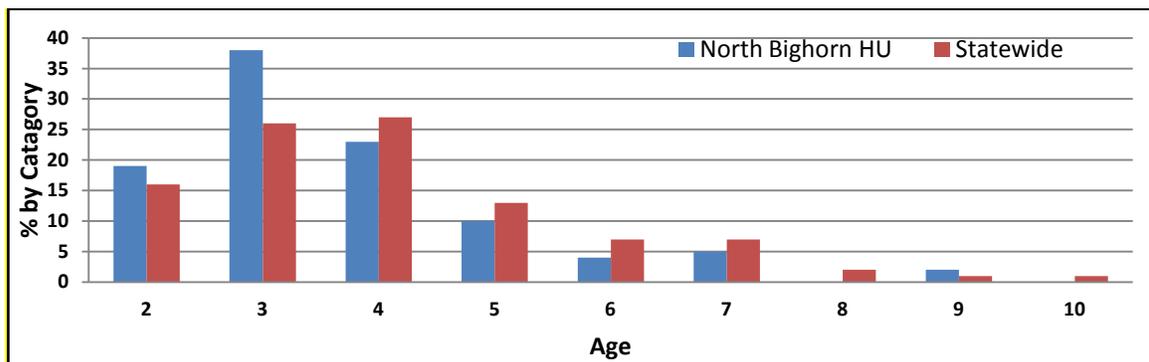


Figure 1. Age of harvested mule deer bucks, by percentage, from the North Bighorn Mule Deer Herd Unit compared to statewide tooth age data. Deer were harvested during 2016 hunting season. Yearling harvest is excluded as managers don't consistently collect teeth or record yearlings during field checks.

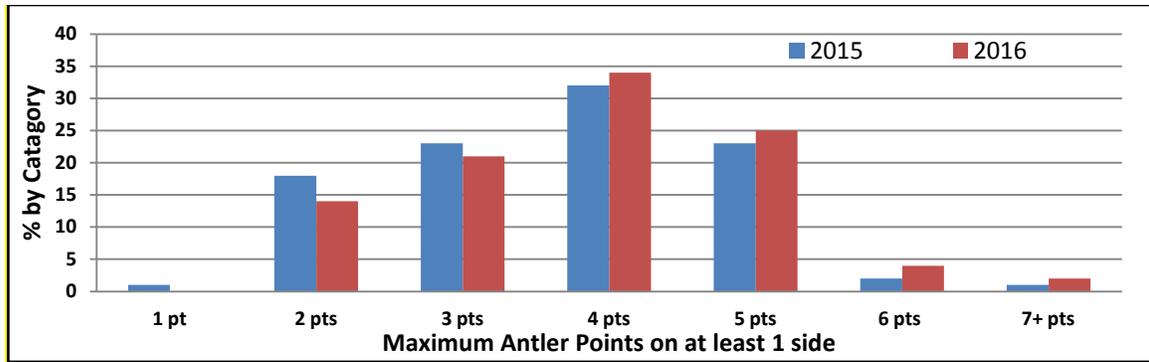


Figure 2. Antler point development of mule deer bucks, by percentage, from the North Bighorn Mule Deer Herd Unit during the 2015 and 2016 hunting seasons. Deer were categorized by largest number of antler points on one side. Yearling bucks are excluded due to inconsistency of data collection.

Hunters appear to select for deer with at least 3 points on one side. In 2015, 81% of harvest of deer >1 year of age had at least 3 antler points. In 2016, 86% of deer >1 year of age had at least 3 antler points. Only deer with both age and antler measurements were included in this analysis so older aged deer where a tooth was not extracted may be under represented.

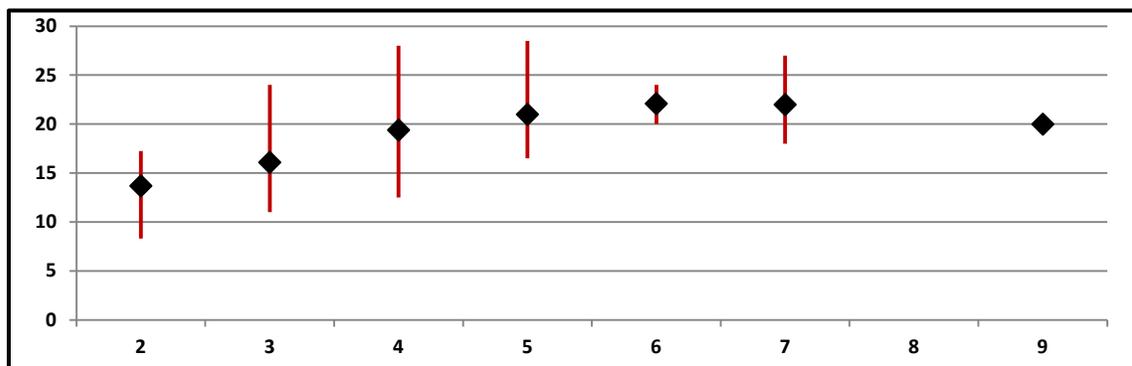


Figure 3. Average mule deer antler width, with maximum and minimum width, by age class for deer harvested from the North Bighorn Herd Unit during the 2016 hunting season.

Antler width development by age class is about what would be expected from harvested mule deer in the North Bighorn Herd Unit (Fig. 3). As animals get older, antler width tends to increase, leveling off around 6-7 years old, and dropping off for older aged animals (i.e. 8+ years). There is a lot of variation within cohorts as would be expected.

Deer hunters in this herd unit were generally satisfied with their hunt, according to the hunter satisfaction survey attached to the harvest survey. Of 965 hunters who responded to the satisfaction survey, the majority (70%) were satisfied or very satisfied, while only 14% indicated they were dissatisfied or very dissatisfied. The balance of responses were neutral. Statewide, this herd unit ranked 17th out of 37 herd units for satisfaction, down one place from 2015, with an average statewide satisfaction of 70% (range=54%-90%).

Non-resident hunters (n=319) were generally more satisfied (75%) than resident hunters (n=646; 67%). Hunter satisfaction was higher on the east side (69%; Hunt Areas 24, 25, 27, and 28) than the west side (60%; Hunt Areas 50-53) of the Bighorn Mountains. Hunt Areas 53, 28 and 52 had the lowest satisfaction rates (43%, 64%, and 65% respectively) while Hunt Areas 51, 24 and 25

had the highest satisfaction rates (80%, 74% and 71% respectively). Deer usually migrate early from Hunt Area 28, resulting in limited opportunities during October.

Overall, hunter satisfaction in 2016 was similar to the 2015 hunting 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. Hunt Area 25 satisfaction increased, likely a function of good archery hunting and deer not migrating until late October. Private lands hunt areas (Areas 24 and 27) saw decreased satisfaction levels, likely a function of difficult access to private lands.

Harvest

In 2016, hunters harvested an estimated 1,374 mule deer, a 9% decrease from the 2015 harvest and 23% below the previous 10 year (2006-2015) average harvest. Harvest consisted of an estimated 1,181 bucks (86%), 176 does (13%), and 17 fawns (1%). Buck harvest declined about 7% while doe harvest declined 22%, to its lowest level since 2003. Doe harvest declined in response to fewer doe/fawn licenses, restricting harvest on general license to bucks only, and restricting archery harvest to bucks only on general licenses. Environmental conditions were generally wet, with snow or rain during much of the hunting season, likely also contributing to the decreased harvest.

Hunter success was 41%, similar to 2015 but down slightly from previous years. Hunters spent about 11.4 days hunting per deer harvested, a slight decline from 2015 and similar to the 10 year average of 11.2 days/harvest.

In 2016, approximately 1/4 of the hunting pressure and 1/3 of the harvest occurred in west side hunt areas (Hunt Areas 50-53) while ~3/4 of hunting pressure and 2/3 of the harvest occurred in east side hunt areas (Hunt Areas 24, 25, 27, & 28).

Hunt Area 24 saw the highest total harvest (n=509 mule deer; 37%), as well as for both buck (n=386; 47%) and antlerless (n=114; 65%) mule deer. Hunt Area 52 saw the lowest deer harvest (n=50 mule deer; 4%). Hunt Area 51 had the highest success rate (64%) and Hunt Area 28 had the lowest success rate (20%). Hunt Area 51 saw the lowest effort rate (6.6 days/animal), while Hunt Area 25 had the highest effort rate (17.1 days/animal). These harvest statistics are similar to those from the 2015 season.

Population

The 2016 post-season population estimate is about 14,500 mule deer. This population likely peaked in recent years around 2006 and then decreased and stabilized just under 15,000 deer

Hunters and field personnel have noticed a decline in this deer population over the past decade. The population stabilized and has started to increase with improved fawn production and mild environmental conditions the past 2 years.

We use a spreadsheet simulation model for population estimations in this herd unit. 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 of this herd. This simulation model had the lowest relative Akaike information criterion (AIC) value of all the models (93 compared to 102 or 107), and had the lowest fit (4 compared to 66 or 98). 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.

Management Summary

Hunting strategies on public land in this herd unit, primarily the Bighorn National Forest, have generally been conservative. Hunting strategies on private lands in this herd have generally been more liberal, often designed to address damage complaints to cultivated crops. Several larger ranches outfit for mule deer, which generally results in limited harvest. Hunting seasons in this herd unit 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 long.

An archery pre-season occurs the entire month of September. General license holders can only hunt for the sex of deer specified in the hunting regulations. Archery hunting can play a significant role in the herd unit. For example, 51% of the harvest (n=123) in Hunt Area 25 was from archery hunters. Over all, archery hunting accounted for 17% of the total 2016 harvest (19% of buck harvest, 5% of doe/fawn harvest). Statewide in 2016, archery hunters harvested an estimated 5% of the mule deer harvest.

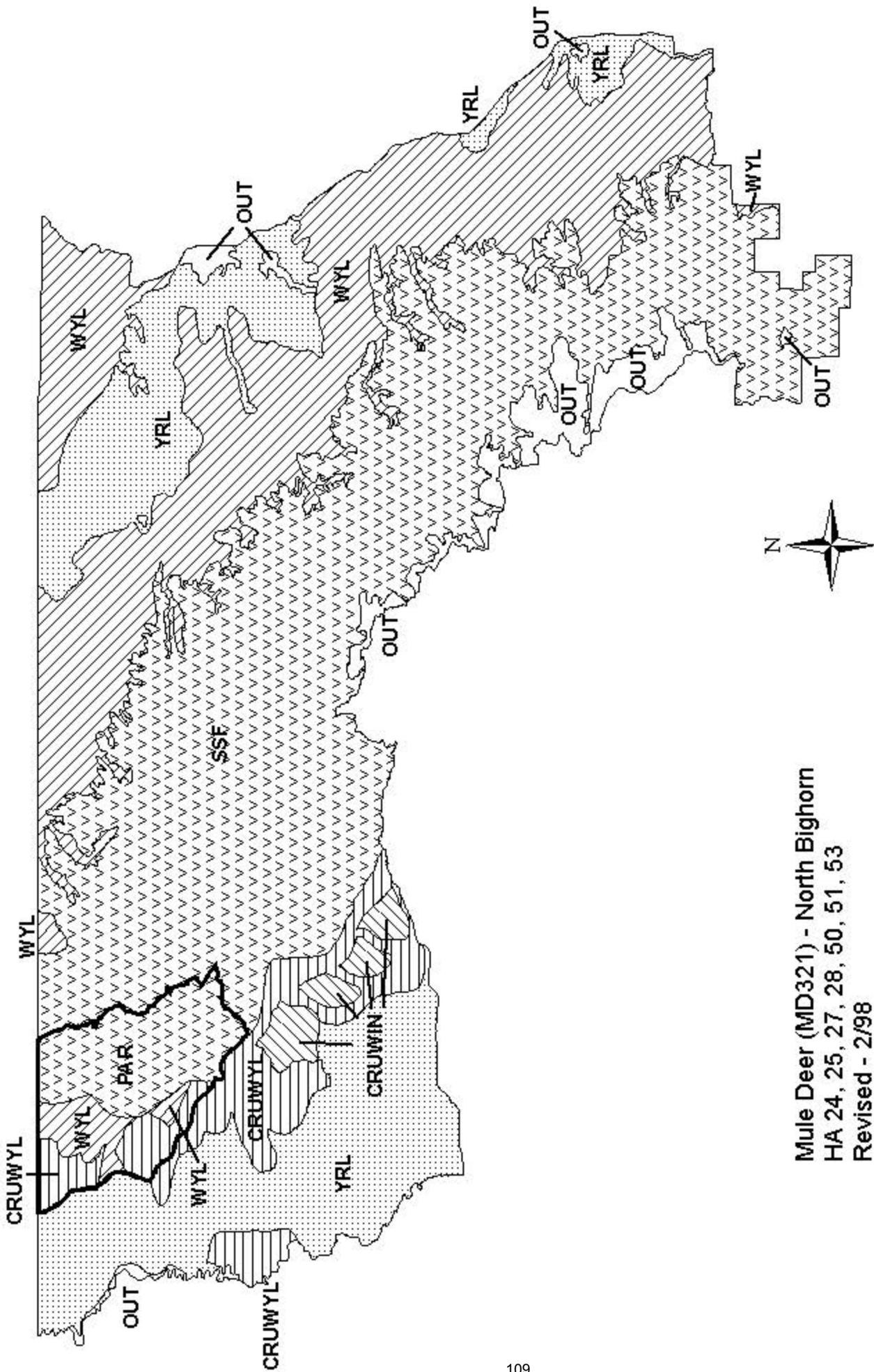
We decreased Area 24 Type 6 (doe/fawn deer) license numbers by 100 for the 2017 season. These licenses are valid only on private land. In 2016, 50% of the harvest on this license type was mule deer. This license does allow some landowners to address localized problems of higher than desired mule deer numbers.

We decreased Hunt Area 51 Type 6 licenses and created an Area 51 Type 7 license for the 2017 season to address damage issues on agricultural croplands.

We estimate a harvest of about 1,425 mule deer for 2017. With below average recruitment due to severe weather conditions this year, and similar proposed harvest, we estimate a 2016 post-season population of about 14,400 mule deer, below the management objective but stable.

We maintained the nonresident Region R deer quota at 750 licenses for the 2017 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. Hunt Areas 50-53 accounted for 34% of the total mule deer harvest in Region R (Hunt Areas 41, 46, 47, 50-53) and 40% of the mule deer harvested by nonresident hunters.

We maintained the nonresident Region Y deer quota at 1,800 licenses for 2016. 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). Hunters in the North Bighorn portion of Region Y (Hunt Areas 24, 25, 27 and 28) accounted for 53% of the total mule deer harvest in Region Y during 2016 and 40% of the mule deer harvested by nonresident hunters.



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

2016 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2016 - 5/31/2017

HERD: MD322 - UPPER POWDER RIVER

HUNT AREAS: 30, 32-33, 163, 169

PREPARED BY: DAN THIELE

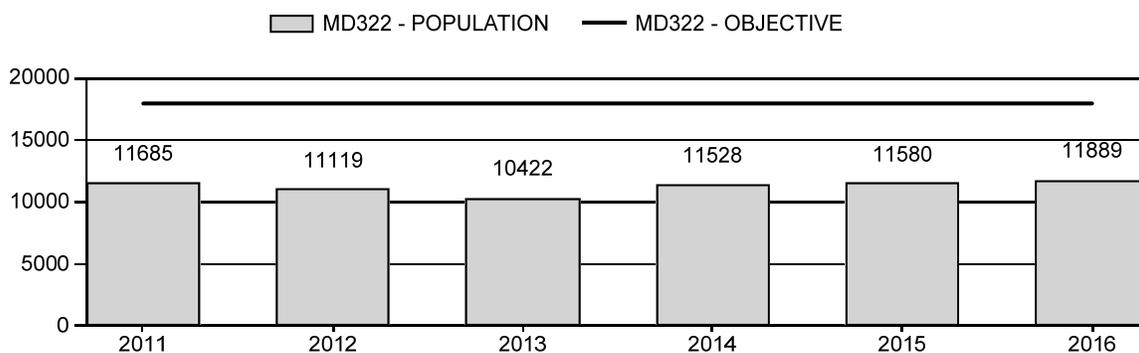
	<u>2011 - 2015 Average</u>	<u>2016</u>	<u>2017 Proposed</u>
Population:	11,267	11,889	12,300
Harvest:	867	848	805
Hunters:	1,471	1,398	1,375
Hunter Success:	59%	61%	59 %
Active Licenses:	1,490	1,409	1,400
Active License Success:	58%	60%	58 %
Recreation Days:	6,146	5,871	5,600
Days Per Animal:	7.1	6.9	7.0
Males per 100 Females	39	49	
Juveniles per 100 Females	70	72	

Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-34.0%
Number of years population has been + or - objective in recent trend:	15
Model Date:	2/21/2017

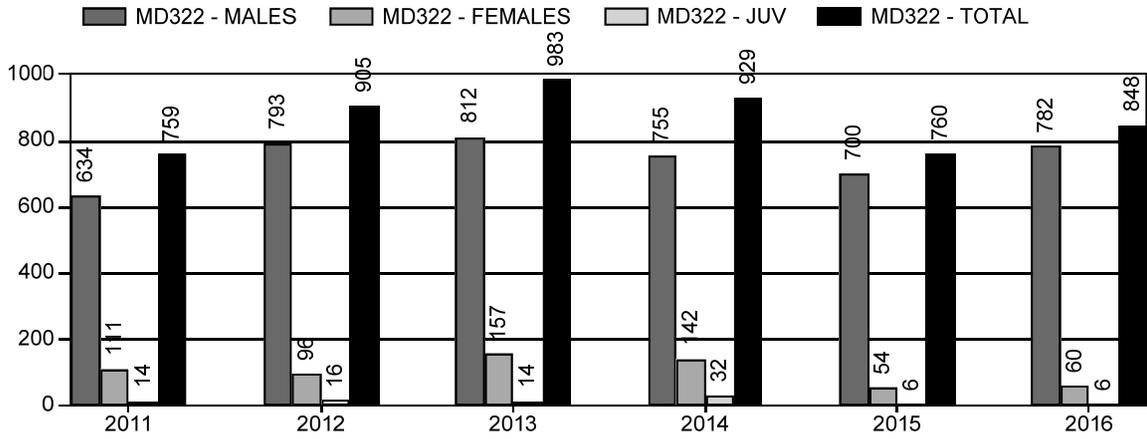
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	28%	26%
Total:	7%	7%
Proposed change in post-season population:	+3%	+3%

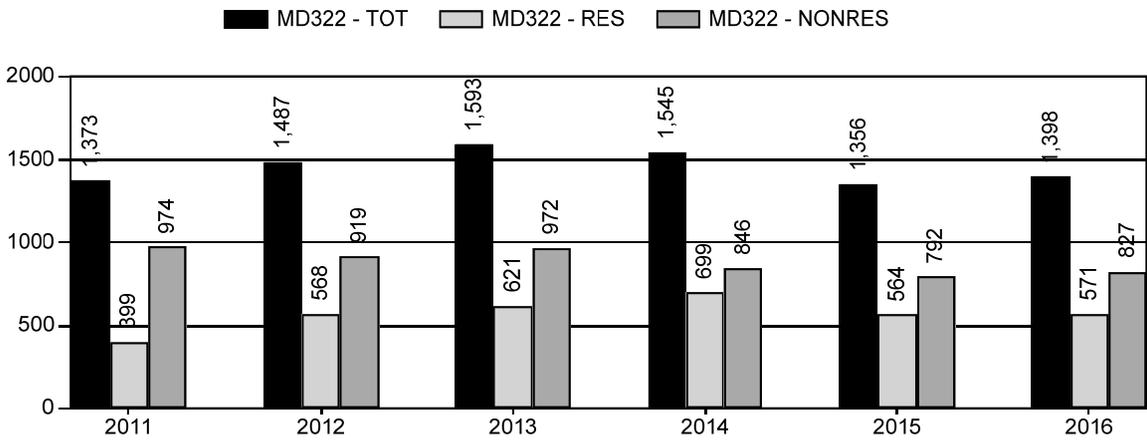
Population Size - Postseason



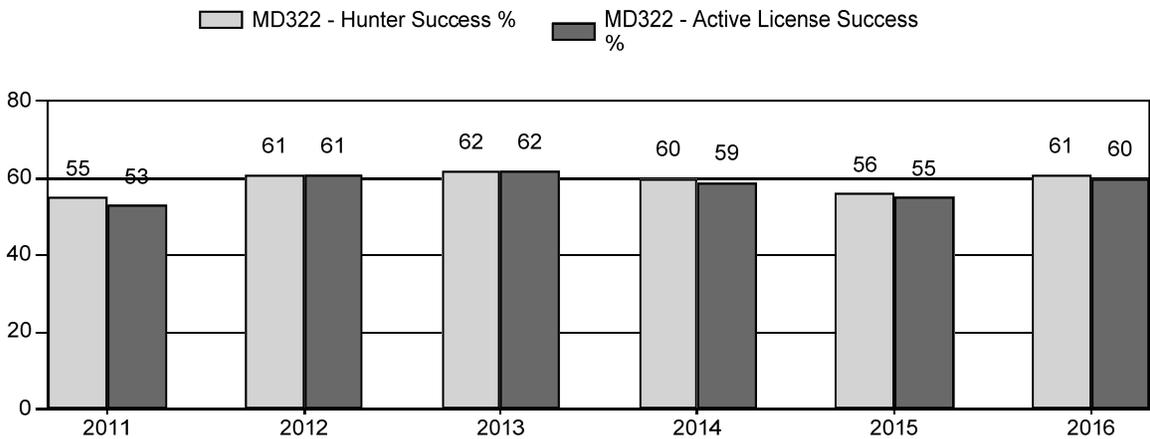
Harvest



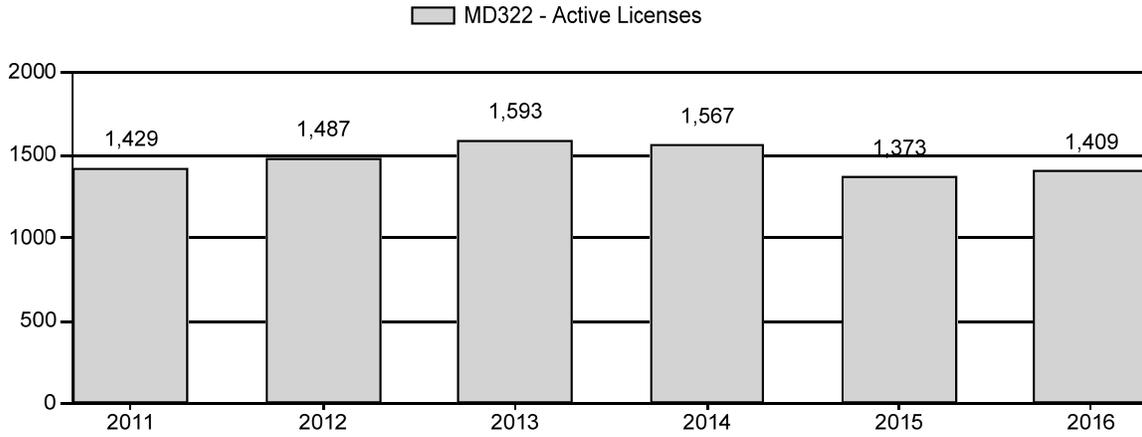
Number of Active Licenses



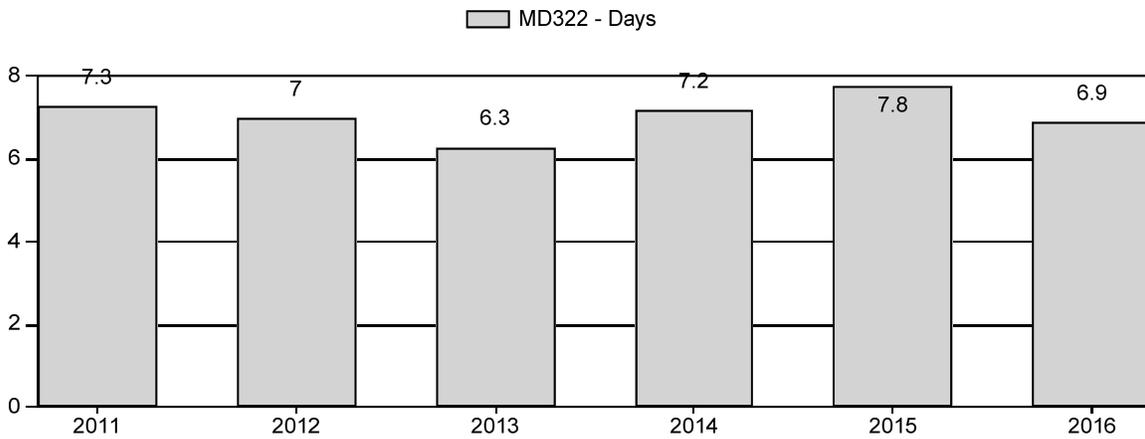
Harvest Success



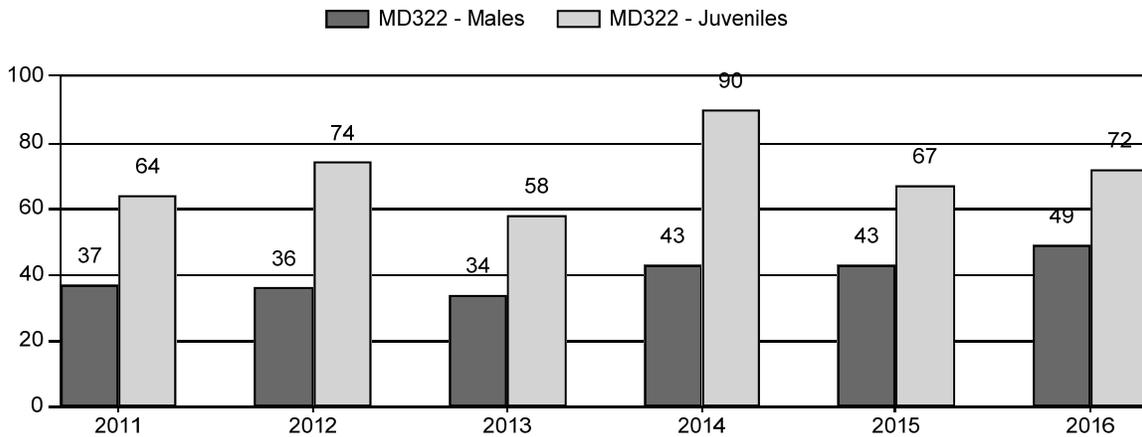
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Mule Deer Herd MD322 - UPPER POWDER RIVER

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2011	11,685	138	0	0	0	246	384	18%	1,049	50%	675	32%	2,108	1,218	13	23	37	± 3	64	± 4	47
2012	11,119	134	0	0	0	188	322	17%	897	48%	662	35%	1,881	1,522	15	21	36	± 3	74	± 4	54
2013	10,422	135	166	47	1	0	349	18%	1,013	52%	586	30%	1,948	1,046	13	21	34	± 2	58	± 3	43
2014	11,528	150	172	39	2	0	363	19%	840	43%	755	39%	1,958	2,177	18	25	43	± 3	90	± 5	63
2015	11,580	170	188	48	2	0	408	21%	940	47%	632	32%	1,980	1,369	18	25	43	± 3	67	± 4	47
2016	11,889	185	263	50	0	0	498	22%	1,021	45%	734	33%	2,253	1,562	18	31	49	± 3	72	± 4	48

2017 HUNTING SEASONS

UPPER POWDER RIVER MULE DEER HERD (MD322)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
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 valid on private land
163, 169		Oct. 15	Oct. 21		General	Antlered deer

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
30, 32, 33, 163, 169	Sep. 1	Sep. 30

Region	Deer Hunt Areas	Quota
Y	24, 25, 27, 28, 30, 32, 33, 163, 169	1,800

SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2017
Herd Unit Total		No Change
Region Y		No Change

Management Evaluation

Current Postseason Population Management Objective: 18,000

Management Strategy: Special

2016 Postseason Population Estimate: ~11,900

2017 Proposed Postseason Population Estimate: ~12,300

2016 Hunter Satisfaction: 69% Satisfied, 19% Neutral, 12% Dissatisfied

Herd Unit Issues

The Upper Powder River Mule Deer Herd Unit objective and management strategy were 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 15 years, white-tailed

deer and elk numbers have greatly increased creating potential competition issues with mule deer. 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 are finding 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) before significantly decreasing the next several years. From 2012-13 to 2016-17 harvest has ranged from 13 to 21 lions as harvested lion demographics suggest this population has been impacted by hunting.

Weather

Precipitation is reported by “water year” (October through September) as this range of dates most accurately captures the time frame when precipitation influences deer productivity (i.e. gestation, parturition and the first few months of life). Precipitation from October 2015 thru September 2016 was eight percent above the 30 year average (Figure 1). However, precipitation during the growing season (April thru June 2016) was slightly lower than the 30 year average while the growing season precipitation for high elevation SSF seasonal ranges (May - July 2016) was notably lower than the 30 year average, 5% and 38%, respectively. The majority of the precipitation came during the months of April and May and was followed by hot and dry summer weather, with the exception of September which was much wetter than average. The drier spring season resulted in the Palmer Drought Index (PDI) for Climate Division 5 (Powder, Little Missouri and Tongue drainages) recording “moderate drought” conditions for June 2016 but progressed to “severe drought” through July and August before improving to “moderate drought” for the remainder of the calendar year and through March 2017. The PDI improved to mid-range in April due to above average March (+44%) and April (+145) precipitation.

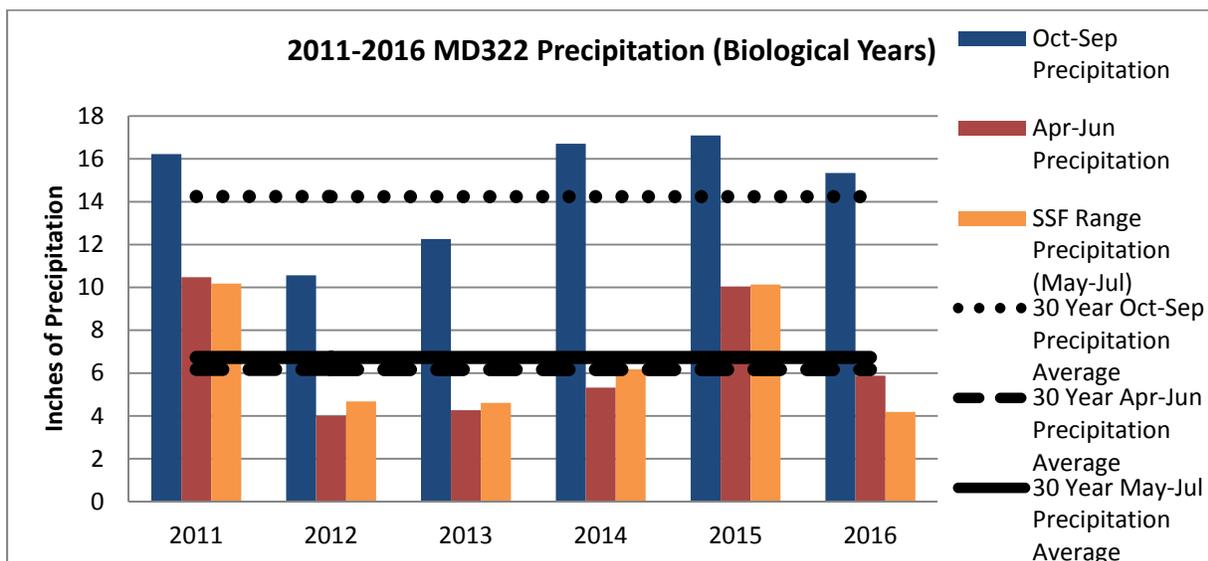


Figure 1. Water year precipitation and 30 year averages for MD322, 2011-2016.

Winter weather was more severe with above normal December precipitation combined with average temperatures eight degrees colder than normal. Cold weather continued through January with temperatures averaging six degrees below normal before more favorable weather returned in February. Snowtel sites for the southern Bighorn Mountains reported below normal snow moisture content through most of the winter before improving markedly through April resulting in May 1st readings at 137% of normal with Powder River Pass at 124%, Beartrap at 778%, Middle Powder at 112% and Grave Springs at 119%. As of May 1st, 2017, total precipitation reported at the four snowtel sites since October 1st was 91% of normal.

Habitat

Growing season precipitation was adequate in April and May 2017, but tapered off dramatically the remainder of the season. The exceptionally dry summer did not appear to have a significant impact on fawn production (72 fawns/100 does). Adequate precipitation occurred early in the growing season and likely contributed to ample forage during late gestation/parturition in most parts of the herd unit.

Two permanent shrub transects are measured in this herd unit. One transect is located in curl-leaf mountain mahogany habitat near Outlaw Cave and the other is located in Wyoming big sagebrush near Tisdale Mountain. Data was collected on leader growth, hedging class, age class, and percent utilization. Leader production measured in fall 2016 was 2.5 cm at Outlaw Cave, similar to the 10-year average while the hedging class score of 1.48 was slightly below the 10-year average. An age class score of 2.0 was also slightly below the 10-year average. Production measurements for the Tisdale Mountain sagebrush transect resulted in 3.4 cm of growth which was about average. The hedging class score of 1.55 was slightly below the 10-year average while the age class score of 2.19 was similar to the 10-year average. Shrub utilization measured in spring 2017 was 2.0% at Outlaw Cave and 3.6% at Tisdale Mountain indicating very light utilization.

During late spring/early summer eight riparian and eight upland rapid habitat assessments were completed in the herd unit. To date, it appears that shrub and rangeland habitats are adequately meeting the needs of mule deer. In contrast, very few of the riparian areas are adequate for mule deer. An additional 11 rapid habitat assessments are scheduled for this summer. When completed, the assessments will provide a snapshot of habitat quality available in this herd unit.

Field Data

Classifications completed following the hunting season totaled 2,253 deer, resulting in an adequate sample and herd ratios of 72 fawns per 100 does and 49 bucks per 100 does. The fawn ratio was well below the 90 fawns per 100 does in 2014 but above the 67 fawns per 100 does recorded in 2015. Mild winters and continued favorable spring precipitation four of the last five years has contributed to fawn ratios meeting or exceeding the threshold of 66 fawns per 100 does identified to maintain stable mule deer populations. High overwinter fawn survival resulted in another excellent yearling buck ratio of 18 per 100 which contributed to the highest buck ratio (49 per 100) of the six year period. Buck ratios remain high with ratios of ≥ 30 per 100 in all six years, supporting the change in management strategy to special management. Buck classifications have included antler classifications the last four years. In 2016, Class I bucks comprised 84% of the adult buck classification while Class II bucks made up 16% and Class III bucks 0%. High ratios are influenced by the herd unit's rugged topography and conservative hunting strategies on private land.

Harvest Data

The 2016 harvest survey reported a 12% increase in total harvest due to a 12% increase in buck harvest and a 10% increase in antlerless harvest. The increase occurred under an unchanged hunting season structure. Antlerless deer harvest accounted for 8% of the harvest reflective of the conservative season adjustments generated through the Mule Deer Initiative process. Hunter numbers did not change significantly thereby resulting in both hunter success and active license success increasing five percentage points. Nonresident hunters continue to comprise the bulk of the hunters accounting for 59% of the hunters this year. Hunters averaged 6.9 days per animal harvested, nearly one day per animal less than 2015. These data suggest hunters had good luck finding deer.

Hunters were generally satisfied with their hunting experience as 69% responded positively to the hunter satisfaction survey. At the hunt area scale, positive responses ranged from 59% in Area 169 to 71% in Area 33.

Field checks indicated that 86% 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, 21% Class II bucks and 3% Class III bucks, similar to the postseason classification.

Due to public concerns about a lack of quality bucks in this herd, incisors from field checked adult bucks were collected for the second year and aged by cementum annuli technique at the Wyoming Game and Fish Lab. Lab ages provide insight into the distribution of the age cohorts in the harvest as well as antler size compared to age. A total of 155 samples were submitted for analysis, however, hunt area and antler spread were not recorded for all samples. Harvested adult buck age averaged 4.5 years and ranged from 2.5 years to 7.5 years. Antler spread average and median were similar at 17.3 inches and 17.0 inches, respectively, with antler spread ranging from 6 inches to 27 inches. The 3.5 year and 4.5 year cohorts collectively comprised 47% of the sample while 2.5 year old bucks comprised 10% of the harvest. Bucks aged 5.5 years to 7.5 years comprised nearly one-third (32%) of the sample (Table 1). Average antler width increased with age up to 7.5 years. However, on average, bucks aged 4.5 to 7.5 years old do not grow very large antlers.

Table 1. Antler size by age cohort for adult bucks harvested in MD322 in 2016.

MD322	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
Number	15	44	41	27	12	7	0	0	0
Ave Spread (in)	12.3	15.1	17.7	19.6	22.1	21.7			
Median Spread (in)	13.0	15.5	17.5	19.0	22.4	22.0			
Min Spread (in)	6.0	10.5	11.5	14.0	16	19			
Max Spread (in)	16.0	20.0	25.0	26.5	27	26			

Comparing 2016 results with 2015 shows that average antler spread by age class was smaller in 2016, possibly due to the very dry late spring and summer weather (Figure 2). Furthermore, 2.5 year old bucks comprised a smaller percentage of the sample which is surprising given the extremely high 2014 fawn ratio (90:100) and favorable winter survival. This could also be due to an increasing buck ratio providing an increased number of bucks in the population. These

data reflect reasonable age structure of the harvest considering this herd is managed under a special management strategy.

A complete summary of this data is provided at the end of this report.

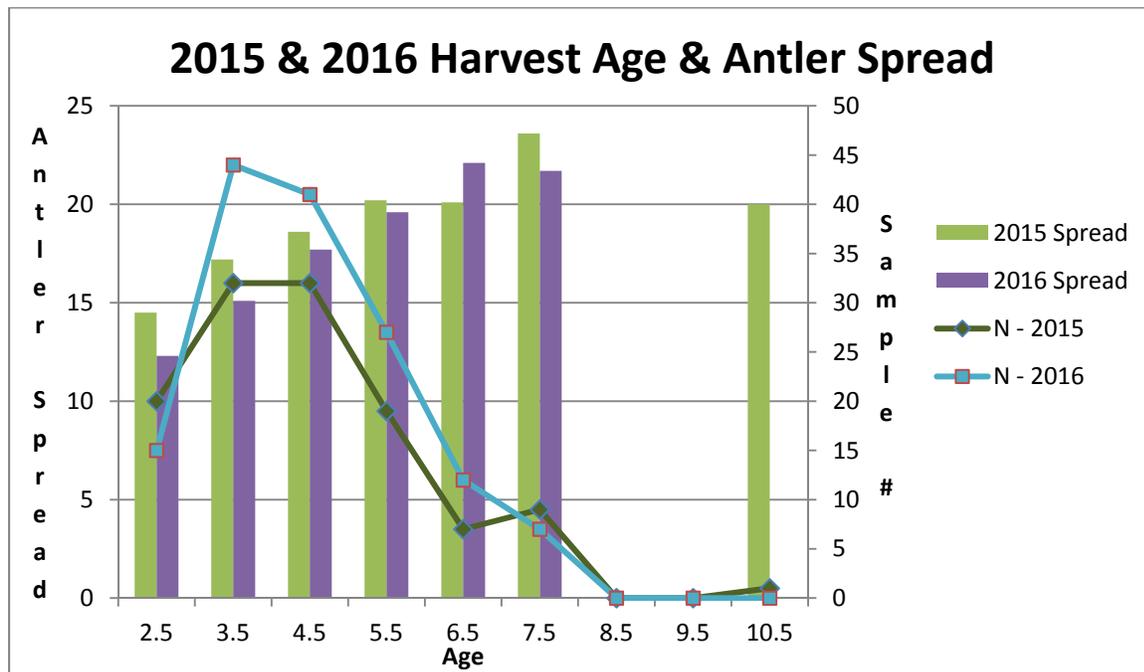


Figure 2. Average antler spread by age cohort for adult bucks harvested in 2015 and 2016.

The postseason landowner survey reflects the trend of decreasing deer numbers but has somewhat stabilized the last five years and in 2016 showed an increased number of landowners believe deer numbers are acceptable or too high. In 2016, 44% of responding landowners desire more deer, while 51% are satisfied with the population and 5% believe numbers are too high. Twenty-five doe/fawn licenses were available in 2016 to address an Area 33 landowner’s concern of too many deer on irrigated hay meadows.

Population

This population is estimated at about 11,900 mule deer, approximately 30% below the population objective. The estimate was generated with the EXCEL spreadsheet model. No independent population estimate has 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 (104 vs.102). 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 decreased from 1998 through 2013 then increased 15% through 2016 due to the higher fawn ratios and mild winters. The last year this population was estimated to be at objective was in 2000. 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 exceeded the identified threshold of 66 fawns per 100 does in four of the last six years enabling this herd to grow but at a sluggish four percent growth over the last three years, mostly influence by the high 2014 fawn ratio. 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 influenced 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. Elk numbers remain above objective in the corresponding herd unit where hunting seasons have been liberalized to increase harvest. In 2003, Chronic Wasting Disease (CWD) was discovered in this herd. Since then, the disease has been confirmed in three of the five hunt areas. After suspending testing of harvested deer in recent years, deer were tested at check stations in 2016 resulting in 75 mule deer tested. Five positive deer were identified for a 6.7% prevalence rate. This compares to a 1.4% prevalence rate on 1,295 deer tested in previous years suggesting CWD is becoming more common.

Season adjustments were implemented following Mule Deer Initiative meetings in 2015 that further limited general license antlerless deer harvest. As of 2015, only Hunt Areas 30 and 33 offer general license antlerless harvest but take is limited to private land. In addition, 25 Type 6 doe/fawn licenses are issued to address crop depredation complaints in Hunt Area 33. The postseason buck ratio remains more than 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 and an additional 10% in 2015 to 1,800 licenses. The 2012 adjustment reversed decreasing trends in hunter success and increasing hunter effort. The past two hunting seasons, general license hunter success equaled or exceeded 60% while hunter effort declined, suggesting the 2015 hunting season adjustments improved hunter's chances of success. In the 2016 regular license draw, nonresidents had a 57% chance of drawing a Region Y license with zero preference points. Nonresident hunters harvest proportionally more bucks and are more successful than resident hunters. In this herd unit, nonresident hunters harvested 570 bucks with 73% hunter success compared to the resident hunter harvest of 212 bucks and 42% hunter success. Public land hunters, which include most resident hunters, have lower hunter success.

As part of the Mule Deer Initiative effort, one public meeting was held in Kaycee in 2016 in conjunction with the season setting meeting. A MDI update was provided as well as results of the harvest age and antler spread measurements and a habitat project update. Habitat projects completed to date include 702 acres of cheat grass aerially sprayed on BLM lands east of Outlaw Cave in Area 163. In addition, 860 acres of curl-leaf mountain mahogany habitat was treated by removing encroaching conifers and 40 curl-leaf mountain mahogany plants were planted east of Outlaw Cave to test the survival rate of nursery grown seedlings. Two projects were completed on the Schiermiester Ranch in Area 33. Fourteen acres of dense silver sagebrush were treated with a Dixie harrow after which a mixture of native seed mixture of grasses and forbs were seeded. A second project involved the trial planting of 10 deciduous browse trees in mesic draws. If successful, additional plantings will occur in the future.

In response to concerns about lack of mature deer, managers collected incisors from adult bucks as well as antler measurements from harvested deer in 2015 and 2016. The hunter harvested deer tooth age data indicates that there is acceptable age distribution of the adult bucks for a herd

managed under the special management strategy. Although there are some larger buck deer harvested, on average antler width is average at best. Even though this herd has a very high buck ratio of over 40 bucks per 100 does and reasonable cohorts of age class 4.5 year to 6.5 year old bucks, antler size is average. The older age class bucks are typically harvested from ranches with conservative hunting practices. This may be the best that can be expected given the historic hunting pressure in this herd and the nutritional carrying capacity for this herd.

Although the population remains well below objective, hunter success and hunter satisfaction usually equal or exceed 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. Furthermore, hunters and landowners have concerns with the deer population, buck quality and hunting seasons. To address these concerns, the 2017 hunting season will again be conservative for both antlered and antlerless deer. Antlerless harvest is limited to private land to address crop depredation concerns. 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. Efforts continue to initiate additional habitat projects and address vehicle caused mortality on Interstate Highway 25.

Hunting seasons will address public concerns identified with the continuing Mule Deer Initiative efforts and management of this herd. A 2017 population of 12,300 deer is projected.

Upper Powder River Mule Deer Herd Unit (MD322)

Hunt Areas 30, 32, 33, 163, 169

2016 Harvest Age / Antler Size Report

Number of Teeth Lab Aged = 155

Age Range = 2.5 yrs to 7.5 yrs

Average Age = 4.5 yrs

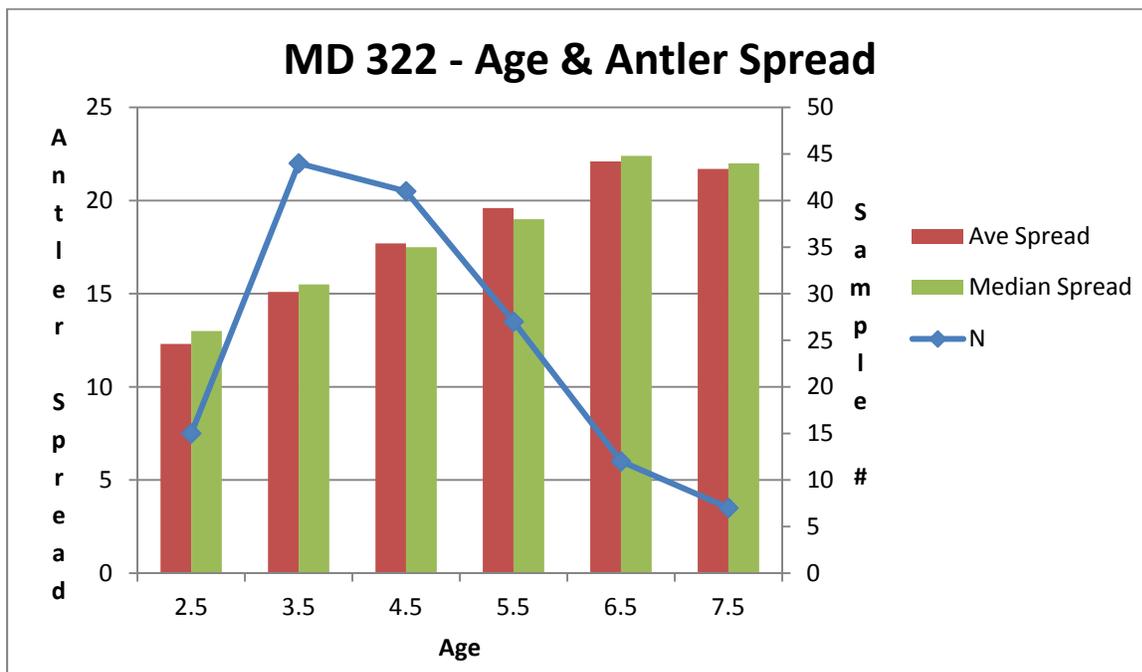
Median Age = 4.5 yrs

Ave Spread = 17.3"

Median Spread = 17.0"

Antler Spread Range = 6" to 27"

MD322	2.5	3.5	4.5	5.5	6.5	7.5	8.5	9.5	10.5
Number	15	44	41	27	12	7	0	0	0
Ave Spread	12.3	15.1	17.7	19.6	22.1	21.7			
Median Spread	13.0	15.5	17.5	19.0	22.4	22.0			
Min Spread	6.0	10.5	11.5	14.0	16.0	19.0			
Max Spread	16.0	20.0	25.0	26.5	27.0	26.0			



Hunt Area 30

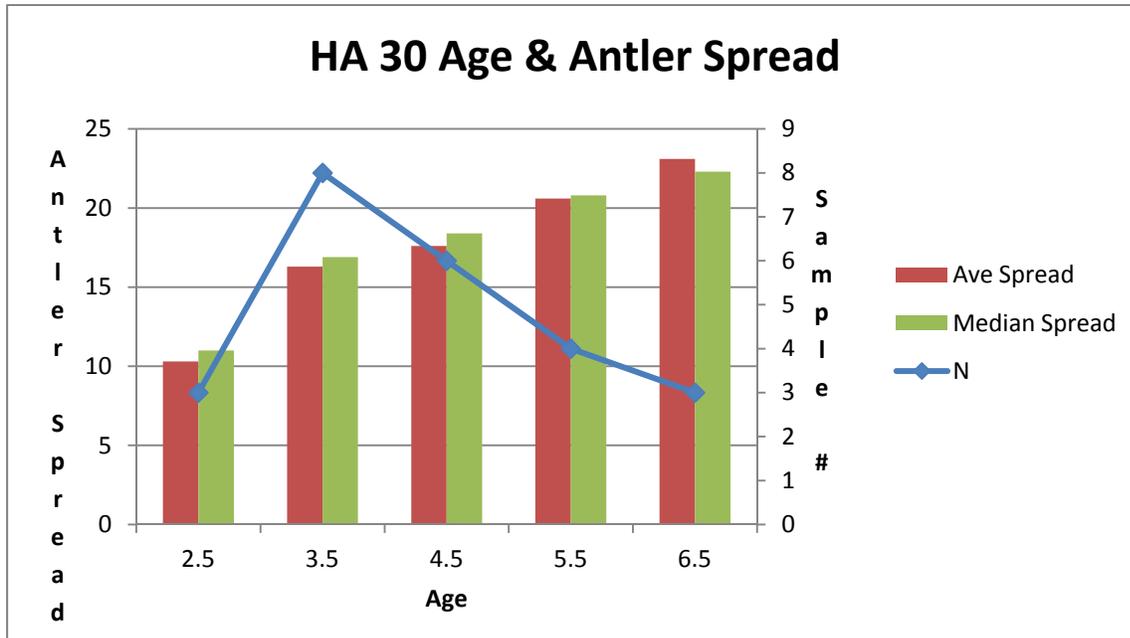
Number of Teeth Lab Aged = 28

Age Range = 2.5 yrs to 6.5 yrs

Average Age = 4.3 yrs

Median Age = 4.5 yrs

Antler Spread Range = 6.0" to 26.0"



Hunt Area 32

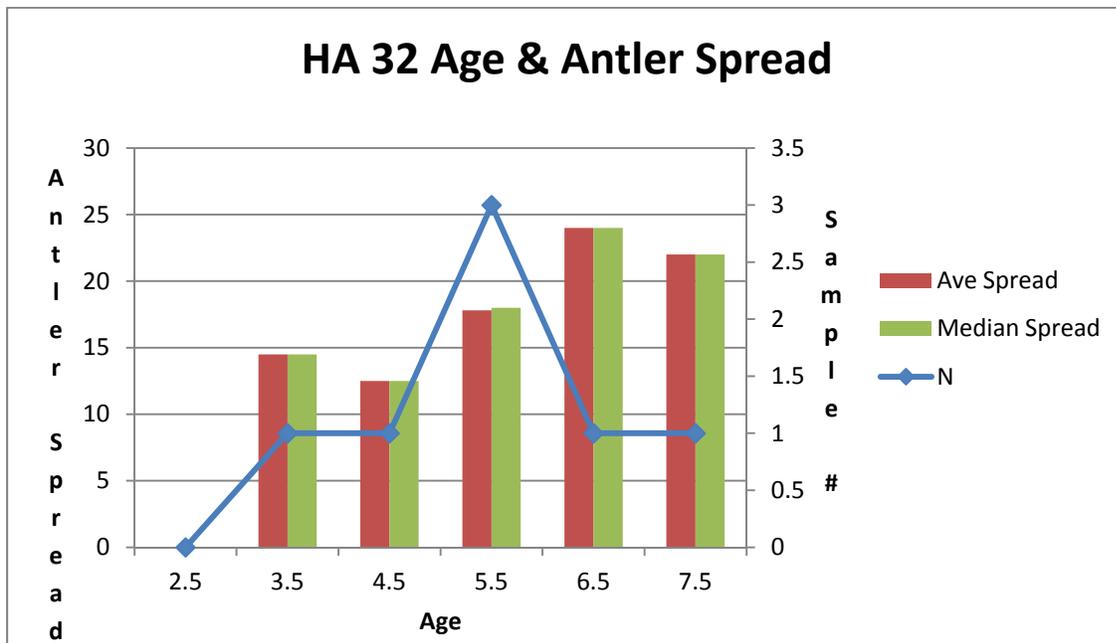
Number of Teeth Lab Aged = 7

Age Range = 3.5 yrs to 7.5 yrs

Average Age = 5.5 yrs

Median Age = 5.5 yrs

Antler Spread Range = 12.5" to 24.0"



Hunt Area 33

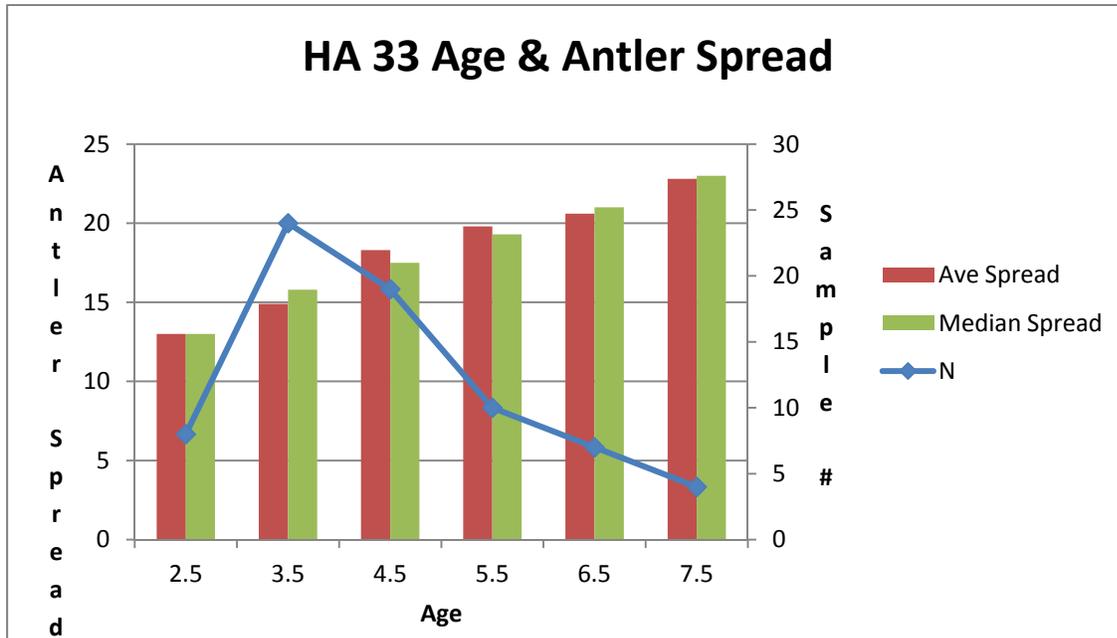
Number of Teeth Lab Aged = 74

Age Range = 2.5 yrs to 7.5 yrs

Average Age = 4.4 yrs

Median Age = 4.5 yrs

Antler Spread Range = 10.5" to 26.0"



Hunt Area 163

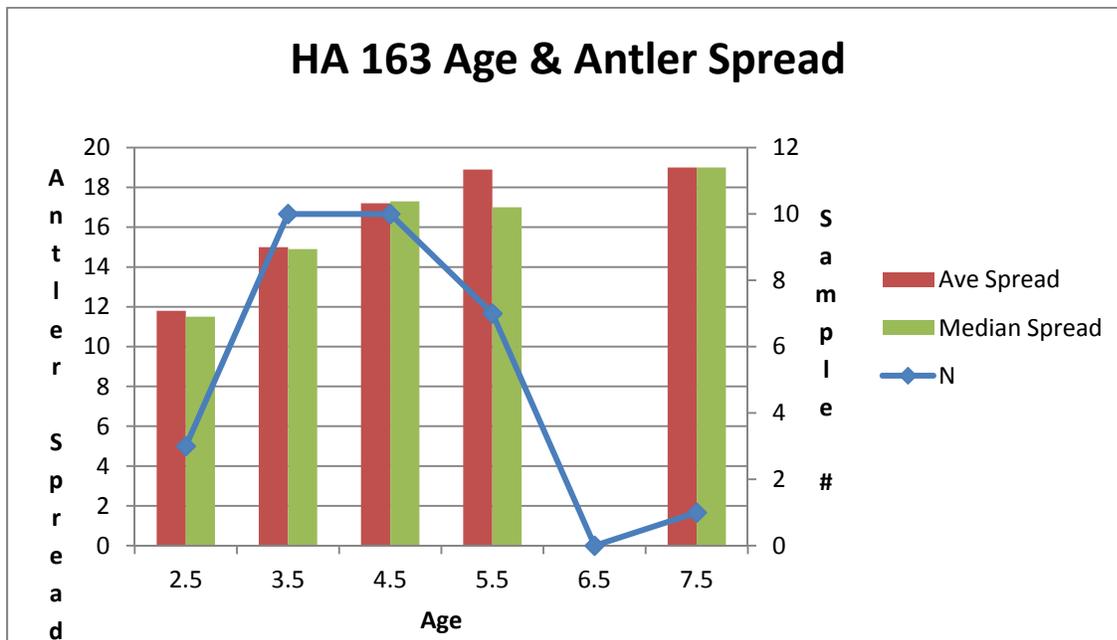
Number of Teeth Lab Aged = 35

Age Range = 2.5 yrs to 7.5 yrs

Average Age = 4.2 yrs

Median Age = 4.5 yrs

Antler Spread Range = 10.0" to 26.5"



Hunt Area 169

Number of Teeth Lab Aged = 10

Age Range = 2.5 yrs to 6.5 yrs

Average Age = 4.7 yrs

Median Age = 4.5 yrs

Antler Spread Range = 12.0" to 27.0"

