2016 - JCR Evaluation Form

SPECIES: Mule Deer

HERD: MD101 - TARGHEE

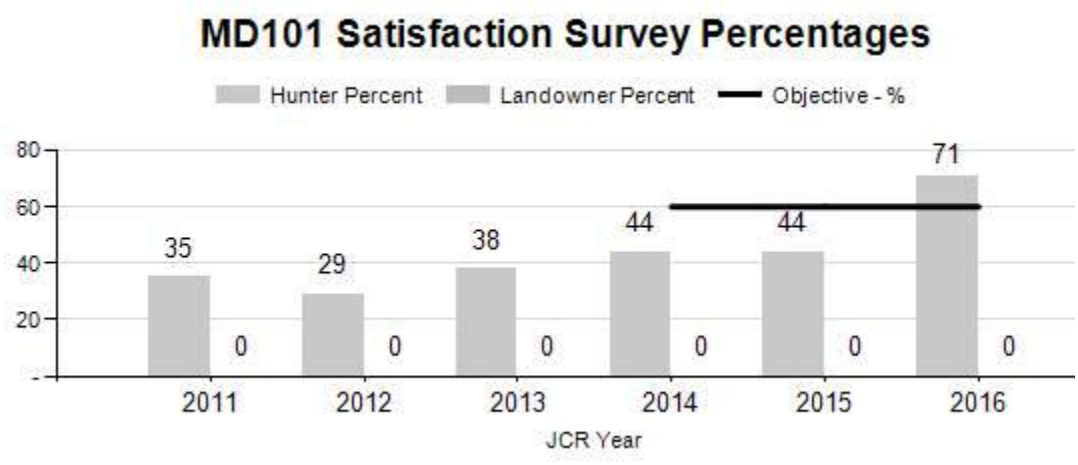
HUNT AREAS: 149, 900

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

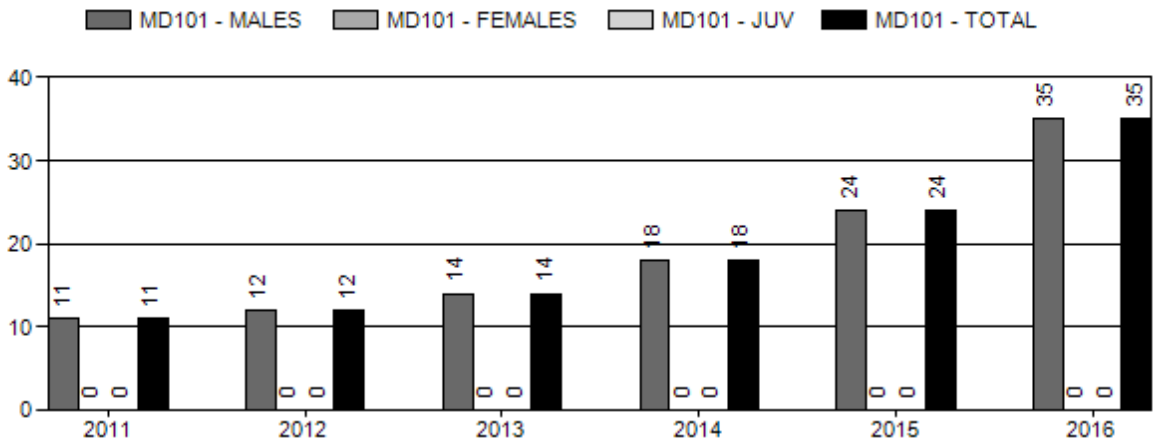
PREPARED BY: ALYSON COURTEMANCH

	2011 - 2015 Average	2016	2017 Proposed
Hunter Satisfaction Percent	39%	39%	75%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	16	35	40
Hunters:	83	101	100
Hunter Success:	19%	35%	40 %
Active Licenses:	83	101	100
Active License Success:	19%	35%	40 %
Recreation Days:	403	624	500
Days Per Animal:	25.2	17.8	12.5
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

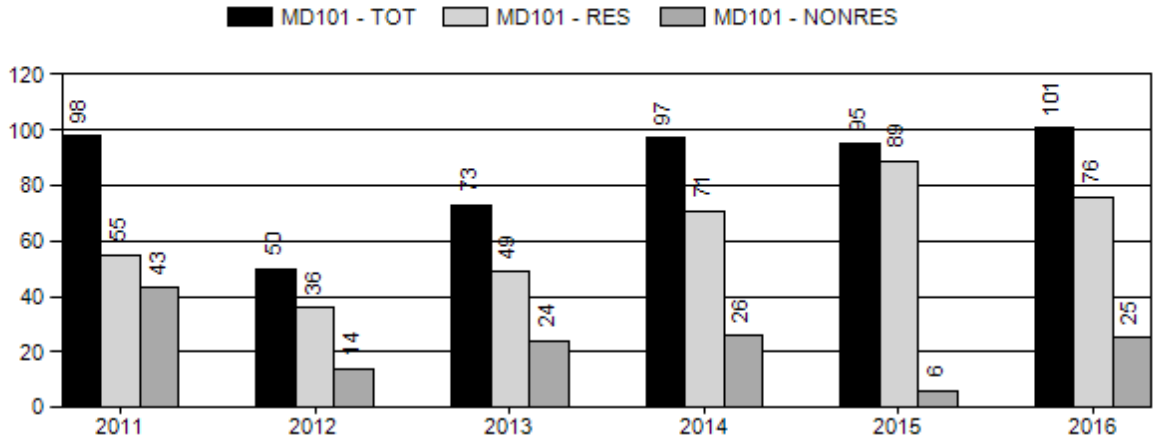
Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	1



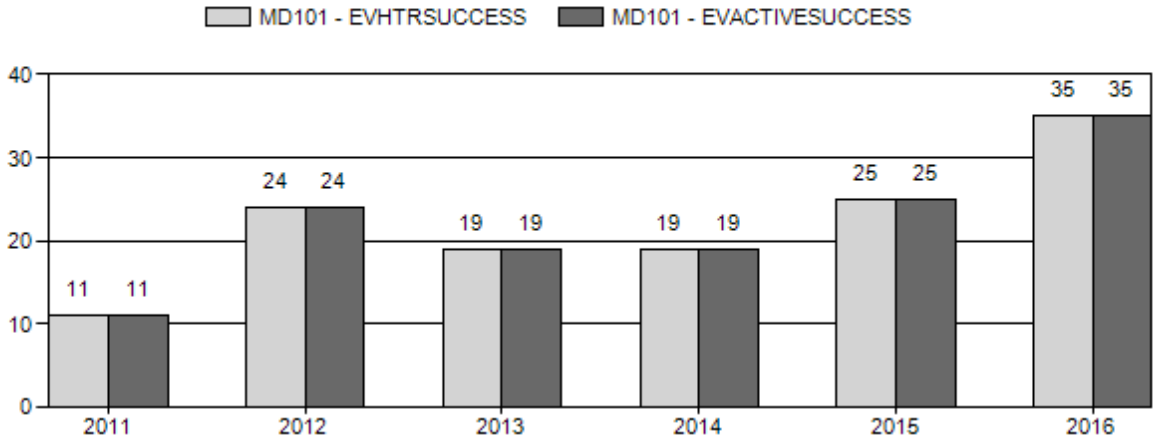
Harvest



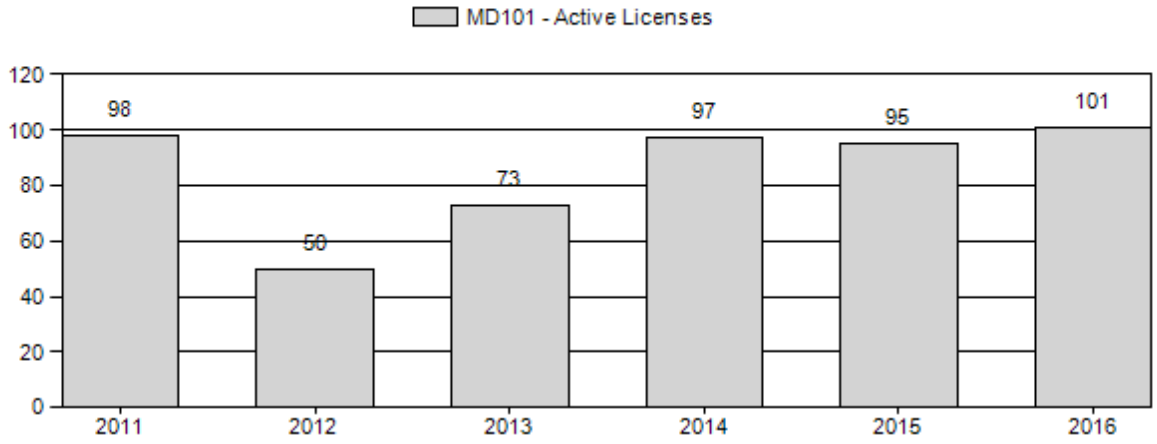
Number of Hunters



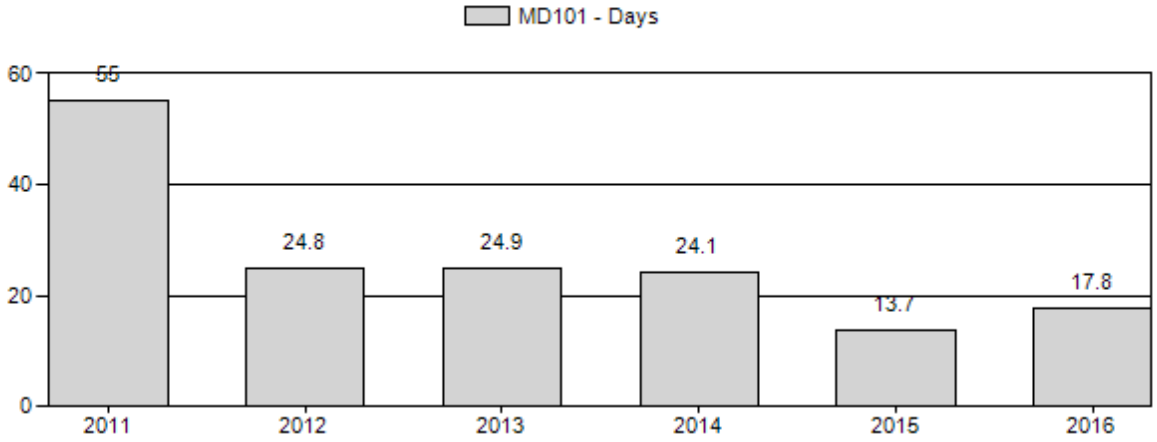
Harvest Success



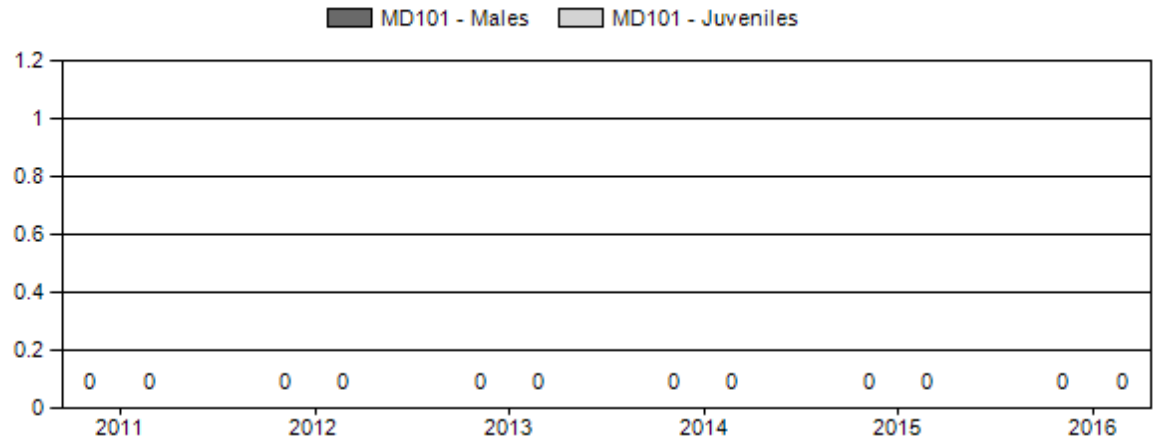
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2017 HUNTING SEASONS
TARGHEE MULE DEER HERD (MD101)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
149		Sep. 15	Oct. 6		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
	3	Sep. 15	Nov. 30	15	Limited quota	Any white-tailed deer
	8	Sep. 15	Nov. 30	50	Limited quota	Doe or fawn white-tailed deer
149	Archery	Sep. 1	Sep. 14			Refer to Section 2 of this Chapter

Region H Nonresident Quota: 600

Summary of 2017 License Changes

Hunt Area	License Type	Quota change from 2016
149	3	+15
Herd Unit Total	**3**	**+15**
	Region H	**-200**

Management Evaluation

Management Strategy: Recreational

Population Objective Type: Hunter Satisfaction

Primary Objective: Achieve a 3-year average of ≥ 60% of hunters indicating they are "satisfied" or "very satisfied" on the harvest survey.

Secondary Objective: Achieve a 3-year average of ≥ 15% harvest success.

The Wyoming Game and Fish Department (WGFD) proposed changing the objective for the Targhee Mule Deer Herd from a postseason population objective to a hunter satisfaction objective in 2014. The objective change was needed because the herd is rarely surveyed due to budget priorities elsewhere and spreadsheet models do not appear to adequately simulate observed population trends. In addition, the interstate nature of the herd poses additional

challenges to population surveys and management since the majority of the herd winters in Idaho. A hunter satisfaction objective was adopted in 2014 after public review, and included a primary and secondary objective (listed above). The region did not adopt a landowner satisfaction objective because the majority of the herd unit is located on public lands.

In 2016, 71% of hunters indicated they were "satisfied" or "very satisfied" with hunting in the Targhee Mule Deer Herd (n=28 respondents). The average satisfaction for the past 3 years is 53% (Fig. 1). Therefore, the herd is currently below its primary objective of ≥ 60% hunter satisfaction. However, it is promising to see that hunter satisfaction has been increasing and was 71% in 2016.

In 2016, 35% of hunters were successful in the Targhee Mule Deer Herd (Fig. 2). The 3-year average of hunter success is 26%. Therefore, the herd is meeting the secondary objective of an average of ≥ 15% harvest success over 3 years.

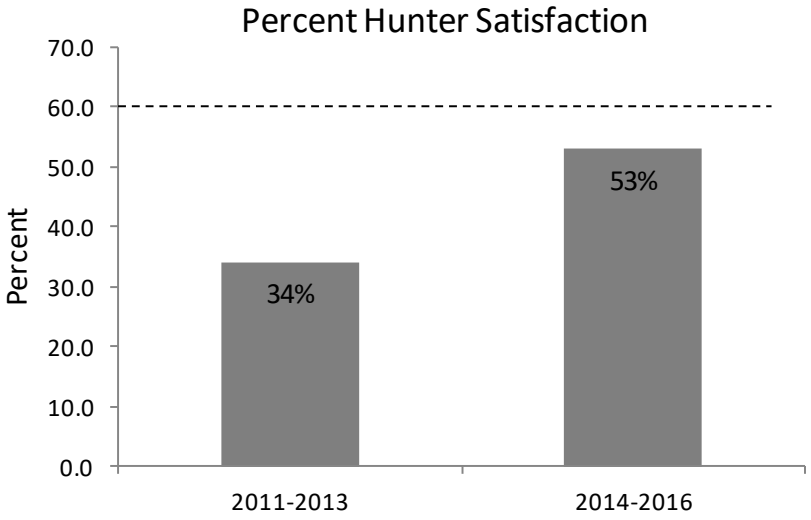


Fig. 1. Percent of hunters indicating they are "satisfied" or "very satisfied" with hunting in the Targhee Mule Deer Herd on WGFD's annual harvest survey, 2011-2016. Dashed line indicates the objective of ≥ 60%.

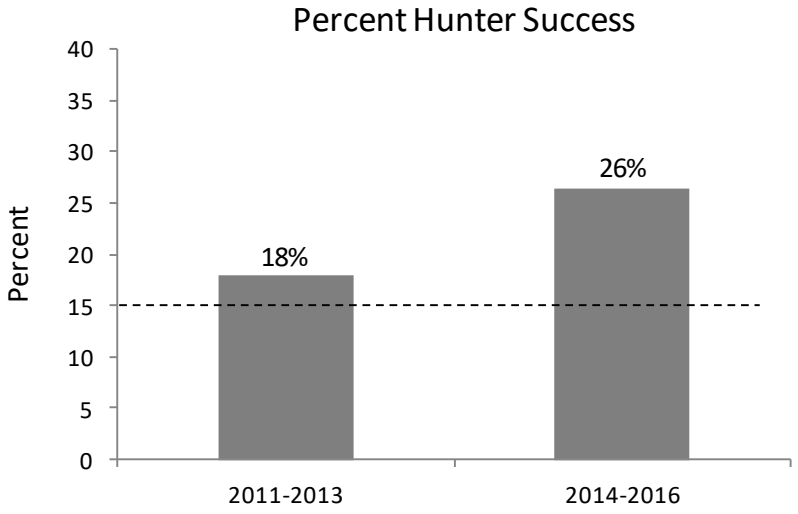


Fig. 2. Harvest success rates in the Targhee Mule Deer Herd for 2011-2016. Dashed line indicates the objective of ≥ 15% harvest success.

Herd Unit Issues

Post-season classification surveys are not flown in this herd due to budget constraints. However, mule deer were opportunistically recorded during an aerial survey of the Targhee bighorn sheep herd in March 2015. Fifteen mule deer were observed. Many of the historical winter ranges for the Targhee Herd have been converted to agriculture and residential development in Idaho. Winter ranges that remain are primarily low elevation mountain shrub and aspen communities in Wyoming and riparian areas in Idaho along the Teton River. Many of the mountain shrub and aspen communities along the state line are old and decadent and are being encroached by conifers. More restrictive hunting seasons have been implemented to allow this population to increase and increase hunter success. Beginning in 2015, a Type 8 doe/fawn white-tailed deer license was added to the hunt area due to several private landowners expressing interest in controlling white-tailed deer numbers. In 2017, a Type 3 any white-tailed deer license will also be added.

Weather

Summer 2016 was very dry. Precipitation in July was only 50% of average. September and October were rainy, resulting in a late-season flush of forage production. November was relatively warm and mild with no significant snowfall until early December. However, the region received significant snowfall and freeze/thaw events in late December through January, causing severe winter conditions. These conditions caused mule deer to concentrate at low elevations in high numbers. Idaho initiated emergency deer feeding in several areas. Several rain events and warmer temperatures in February resulted in slopes melting out in some areas on native winter ranges. At the time of the mid-winter survey in February 2017, winter snowpack was reported at

131% of average in the Snake River Basin. Due to these severe winter conditions, a relatively high over-winter deer mortality rate is expected this year. Please refer to the following web sites for specific weather station data. http://www.wrds.uwyo.edu/wrds/nrcs/snowprec/snowprec.html and http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html

Habitat

There are several historical vegetation transects in mule deer winter ranges, but they have not been monitored in the past 5 years. Several habitat improvement projects are being planned in this herd unit, including the Hill Creek Prescribed Burn, which is scheduled for completion in 2016. In addition, a habitat treatment in Teton Canyon is currently in the planning stages to improve mountain shrub and aspen communities for mule deer. The WGFD is assisting Caribou-Targhee National Forest (CTNF) with vegetation monitoring in aspen stands pre and post-treatment. Please refer to the 2016 Annual Report Strategic Habitat Plan Accomplishments for Jackson Region habitat improvement project summaries (https://wgfd.wyo.gov/Habitat/Habitat-Plans/Strategic-Habitat-Plan-Annual-Reports).

Field Data

No field data were collected in the Targhee Herd Unit during the 2016 biological year.

Harvest Data

Based on harvest statistics, the density of mule deer in the Targhee Herd continues to be a concern. However, there has been a promising trend in the last 2 years of increased hunter success in this herd unit. Although the secondary objective of an average of ≥ 15% harvest success over 3 years is being met, most hunters are not satisfied with their hunting experience (although hunter satisfaction rose to 71% in 2016). The average days to harvest was 17.8 in 2016, indicating that it is difficult for hunters to find deer. One hundred and one hunters participated in the mule deer hunt and 35 mule deer were harvested. In addition, 34 hunters reported hunting white-tailed deer on their general licenses. Seven white-tailed deer does were harvested on general licenses.

A new Type 8 white-tailed deer doe/fawn license was offered beginning in 2015 with 50 licenses. Thirty-two hunters utilized this license in 2016 to harvest 10 does (31% success). Since the majority of white-tailed deer occur on private land, access is likely a limiting factor for white-tailed deer harvest. Fifteen Type 3 licenses valid for any white-tailed deer will be offered in 2017 in addition to the Type 8 license.

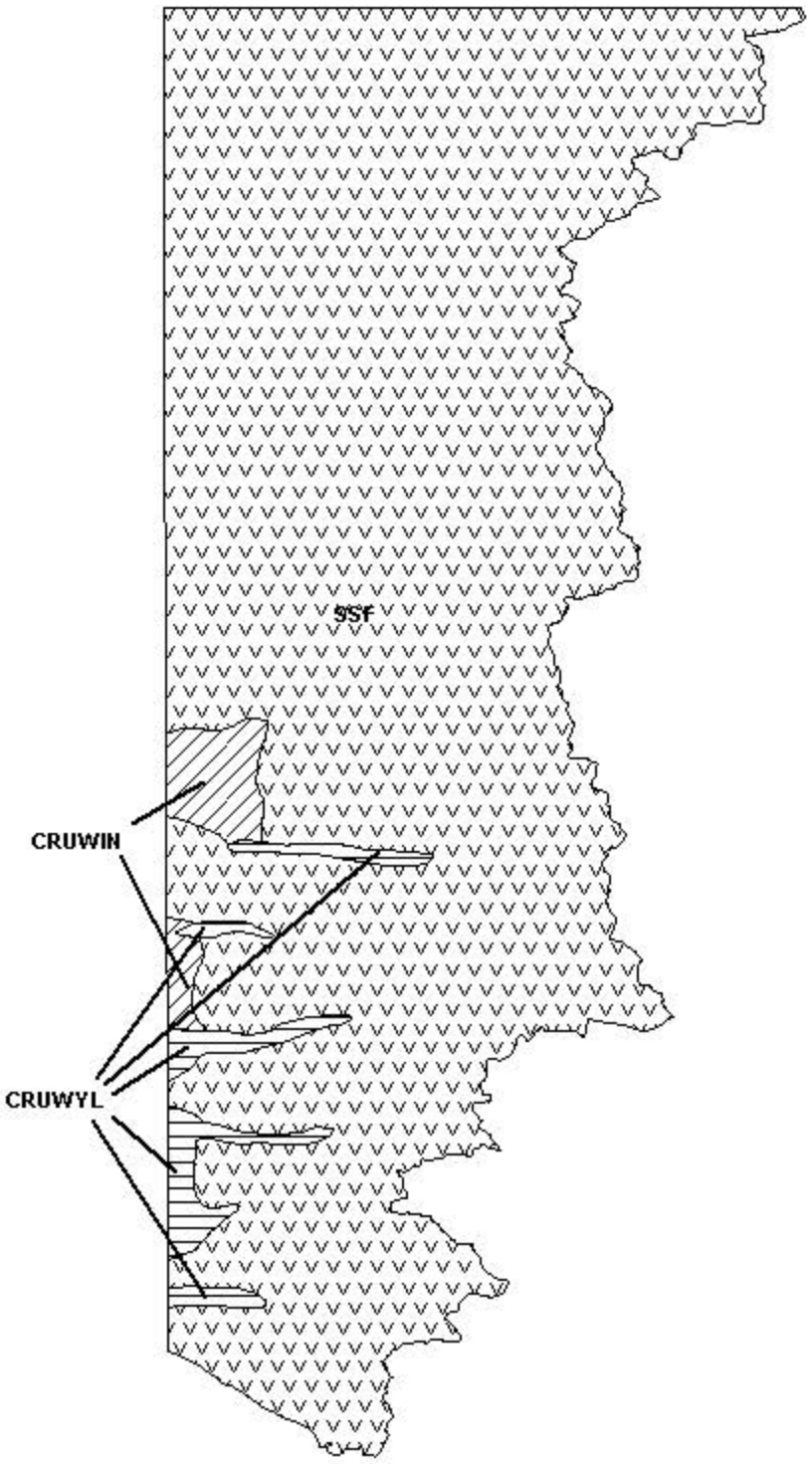
Population

This population likely declined following liberal hunting seasons in Idaho. Data are limited for this population and spreadsheet models do not simulate observed trends. Mule deer winter and transitional ranges in Wyoming are dominated by older age class shrubs and conifer-encroached aspen stands. Many mountain shrub communities are decadent, with plants reaching over 10 feet in height, well above a mule deer's browse zone.

Management Summary

Due to the "interstate" nature of this mule deer population, managing this herd is difficult. Observations of deer along the state line indicate this population remains at a low density even though hunting seasons are conservative. Antlered mule deer seasons will close on October 6 to coincide with hunt season closures in adjacent hunt areas east of Jackson.

Several private landowners have expressed interest in expanded white-tailed deer hunting opportunities in Hunt Area 149. Therefore, a new Type 8 license was offered beginning in 2015 for doe or fawn white-tailed deer with 50 licenses. Thirty-two hunters utilized this license in 2016 to harvest 10 deer (31% success). Fifteen Type 3 licenses valid for any white-tailed deer will be offered beginning in 2017. This is in response to a growing white-tailed deer population near private lands in the herd unit and requests by the public for additional license types. Since the majority of white-tailed deer occur on private land, access is likely a limiting factor for white-tailed deer harvest. White-tailed deer licenses will help maintain low densities to prevent competition with mule deer, reduce damage to private lands, and create additional deer hunting options in this area.



Mule Deer (MD101) - Targhee
HA 149
Revised - 7/87

2016 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2016 - 5/31/2017

HERD: MD131 - WYOMING RANGE

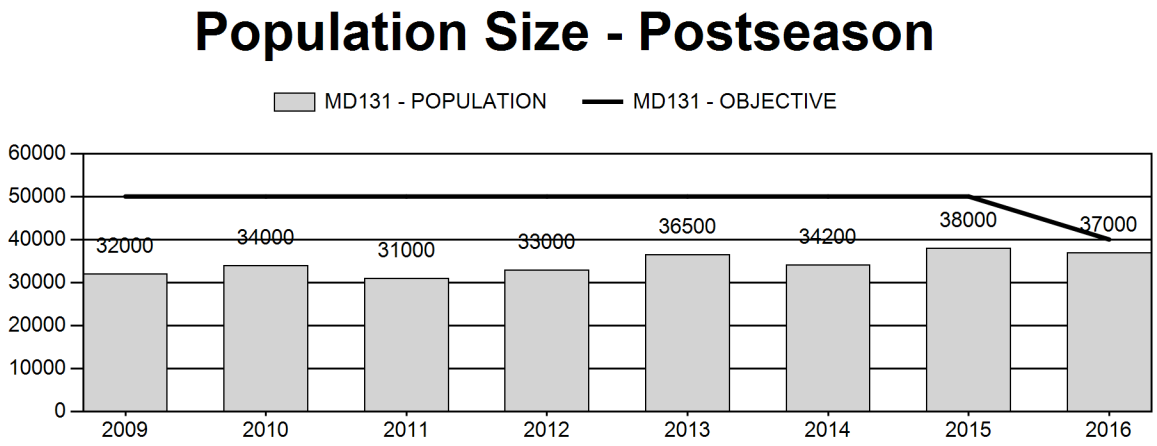
HUNT AREAS: 134-135, 143-145
PREPARED BY: GARY FRALICK

	2011 - 2015 Average	2016	2017 Proposed
Population:	34,540	37,000	23,000
Harvest:	2,429	3,457	1,100
Hunters:	5,716	6,544	5,200
Hunter Success:	42%	53%	21%
Active Licenses:	5,716	6,544	5,200
Active License Success:	42%	53%	21%
Recreation Days:	31,296	35,745	28,000
Days Per Animal:	12.9	10.3	25.5
Males per 100 Females	39	36	
Juveniles per 100 Females	67	58	

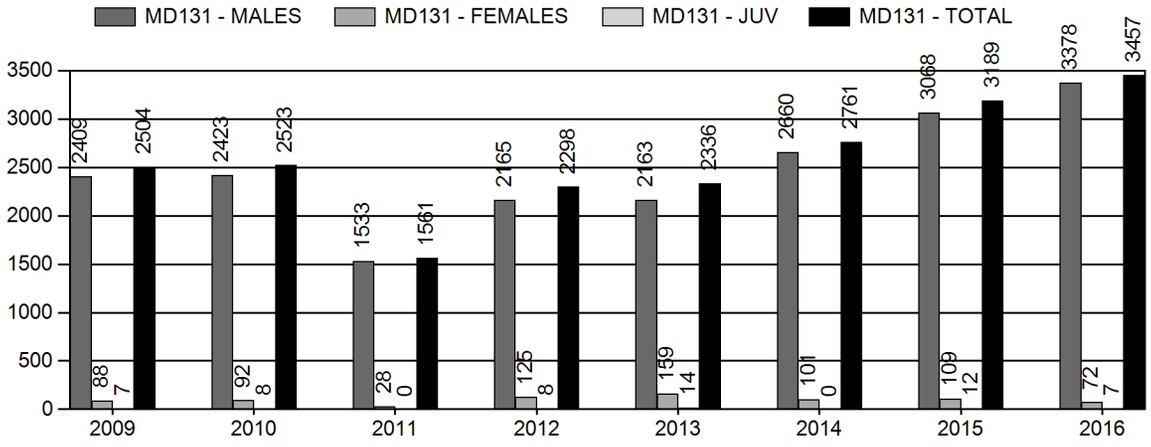
Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-7.5%
Number of years population has been + or - objective in recent trend:	0
Model Date:	02/20/2017

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

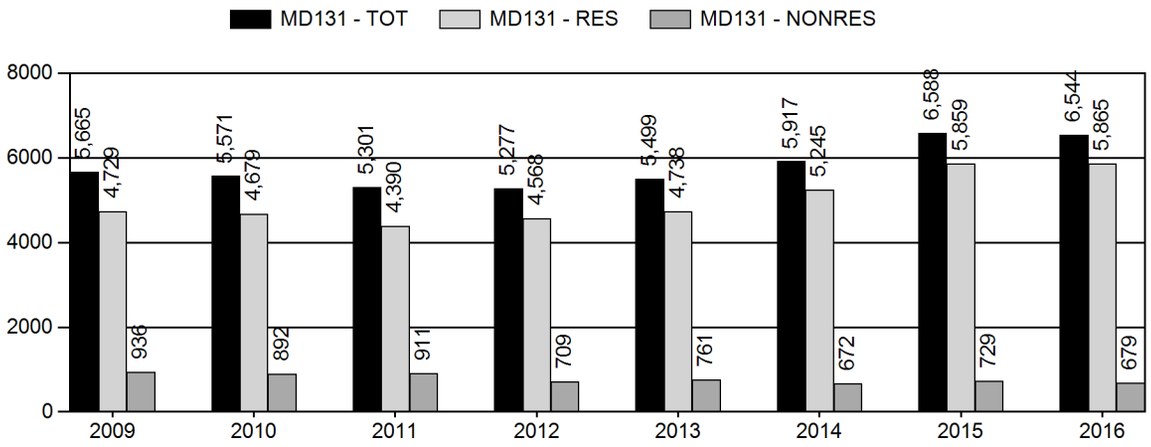
	JCR Year	Proposed
Females ≥ 1 year old:	6%	1%
Males ≥ 1 year old:	31%	37%
Total:	8%	9%
Proposed change in post-season population:	1%	-1%



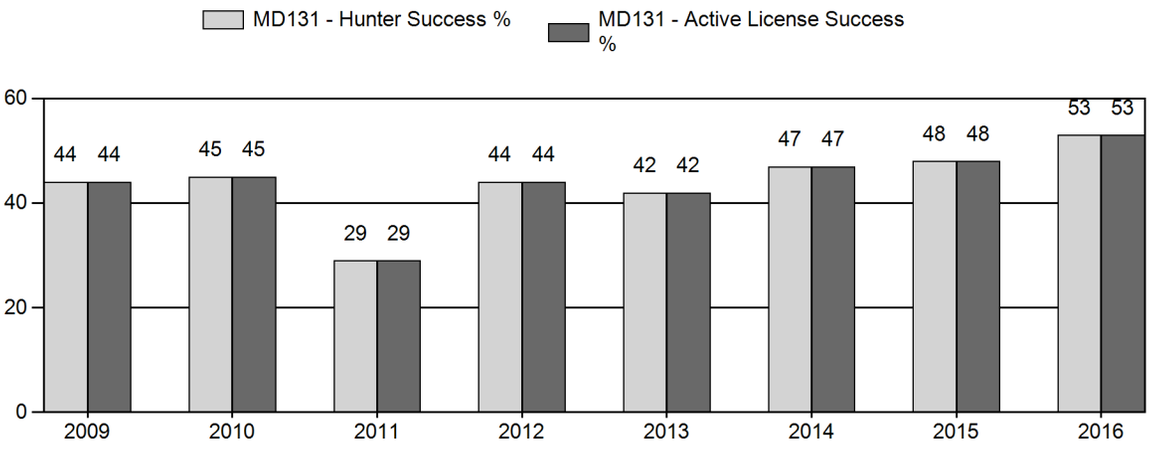
Harvest



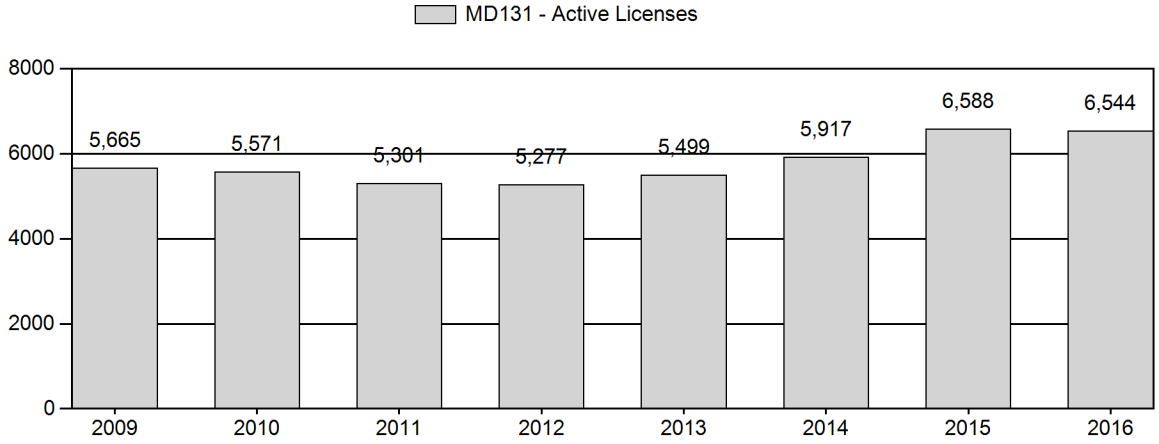
Number of Active Licenses



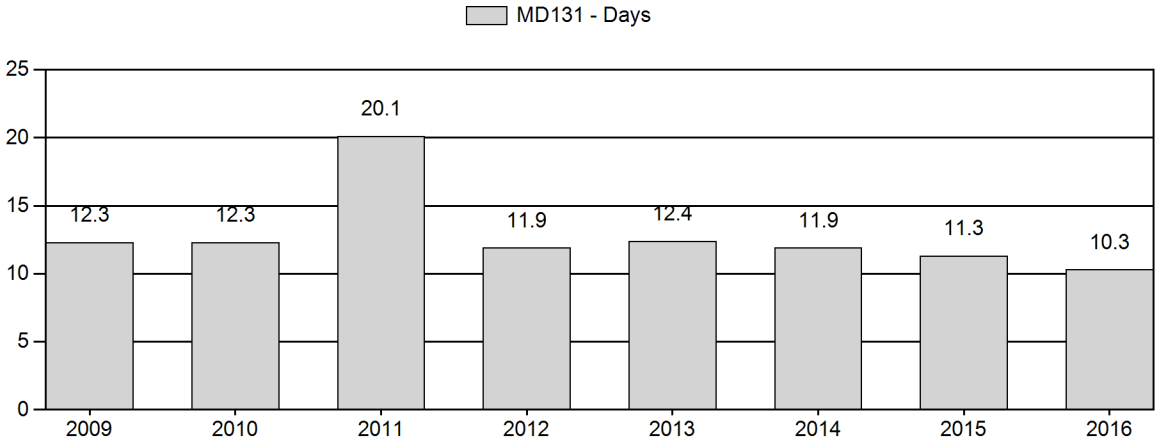
Harvest Success



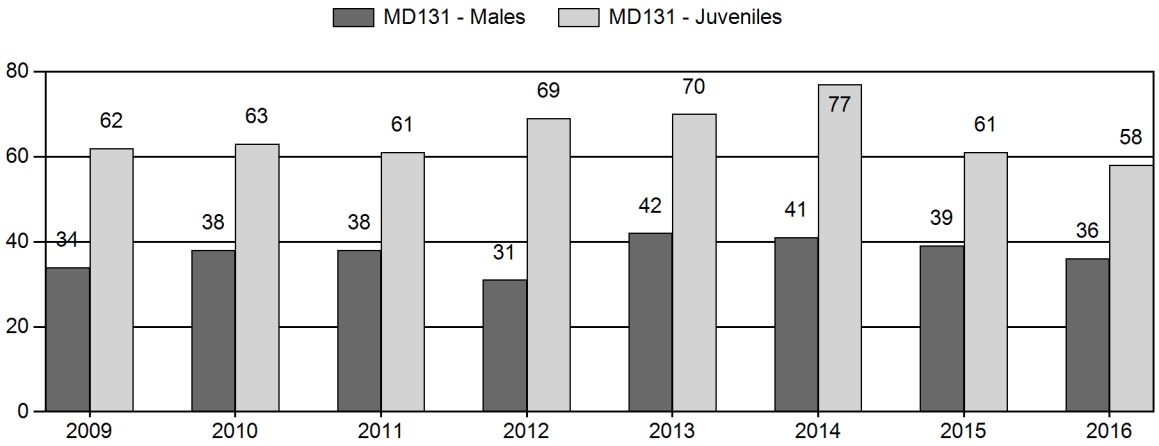
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for Mule Deer Herd MD131 - WYOMING RANGE

		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
2011	31,000	340	0	0	0	998	1,338	19%	3,563	50%	2173	31%	6266	1224	10	28	38	± 1	61	± 2	44
2012	33,000	251	0	0	0	439	690	15%	2,256	50%	1556	35%	4502	1325	11	19	31	± 2	69	± 3	53
2013	36,500	544	0	0	0	704	1,248	20%	2,948	47%	2065	33%	6259	1376	18	24	42	± 2	70	± 2	49
2014	34,200	582	627	428	274	0	1,313	19%	3,239	46%	2478	35%	7030	1232	18	23	41	± 2	77	± 2	54
2015	38,000	672	408	308	158	0	1,548	20%	3,830	50%	2,381	30%	7,857	1300	17	22	39	± 1	61	± 2	43
2016	37,000	533	420	303	107	0	1,363	18%	3,810	52%	2,220	30%	7,393	0	14	22	36	± 1	58	± 2	43

2017 HUNTING SEASONS
WYOMING RANGE MULE DEER HERD (MD131)

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
134		Oct. 1	Oct. 8		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
135		Oct. 1	Oct. 6		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
143		Sep. 15	Oct. 6		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
144		Sep. 15	Oct. 6		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
145		Sep.15	Oct. 6		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
145	3	Sep. 15	Nov. 15	50	Limited quota	Any white-tailed deer
145	3	Nov. 16	Jan. 31			Antlerless white-tailed deer
134, 135		Sep. 1	Sep. 30			Archery only – Refer to Section 2 of this Chapter
143, 144, 145		Sep. 1	Sep. 14			Archery only - Refer to Section 2 of this Chapter

REGION G NON-RESIDENT QUOTA - 400 LICENSES

SUMMARY OF PROPOSED CHANGES BY LICENSE NUMBER

Area	License Type	Change from 2016
134	General	Change closing date from Oct. 14 to Oct. 8
135	General	Change closing date from Oct. 14 to Oct. 6; Add antler point restriction: antlered deer three (3) points or more on either antler
143, 144, 145	General	Change closing date from Oct. 7 to Oct. 6; Add antler point restriction: antlered deer three (3) points or more on either antler
145	3	-10
145	3	Lengthen any white-tailed deer season opening date from Nov. 1 to Sep. 15
145	3	Shorten any white-tailed deer season closing date from Nov. 30 to Nov. 15
145	3	Lengthen antlerless white-tailed season from Dec. 1 – Jan. 31 to Nov. 16 to Jan. 31
	Region G	-200
Herd Unit Total	**3**	**-10**
Herd Unit Total	**Region G**	**-200**

Management Evaluation
Current Postseason Population Management Objective: 40,000
Management Strategy: Special
2016 Postseason Population Estimate: 37,000
2017 Proposed Postseason Population Estimate: 23,000

The management objective was revised in 2016. The current population objective for Wyoming Range mule deer herd is 40,000 deer, and the management strategy is special. The postseason 2016 population estimate was approximately 37,000 deer, while extreme winter losses may reduce deer numbers to approximately 23,000 deer postseason 2017.

Herd Unit Issues

Management strategies since 1993 emphasized hunting antlered deer in an effort to promote population growth. Antlered deer hunts occur in mid-September and early October throughout the herd unit. Hunt seasons close in the northern hunt areas prior to the onset of the annual fall migration in order to minimize vulnerability of bucks that migrate from subalpine summer

ranges to sagebrush winter ranges in the Upper Green River Basin. Sustained population growth has been difficult because of the frequency of high overwinter mortality every 3 years on crucial winter ranges, low vigor and productivity of important winter range browse, and reduced fawn survival and recruitment.

The Wyoming Range Mule Deer Project was launched in March 2013. The overall goal of this research project is to address important research and management needs indentified by the Wyoming Mule Deer Initiative and Wyoming Range Mule Deer Initiative. An important aspect of this research is to investigate the nutritional relationships between mule deer population dynamics, energy development and disturbance, habitat conditions, and climate to provide a mechanistic approach to monitoring and management of mule deer (Appendix A). A planned approach is to integrate data on nutritional condition, forage production and utilization, and population performance to understand factors regulating Wyoming Range mule deer and the ability of the current habitat to support mule deer. In addition, there is an opportunity to address secondary objectives including nutritional contributions of winter and summer ranges, factors affecting reproduction, identification of habitats of nutritional and reproductive importance to mule deer, timing and delineation of important migration routes, and direct assessment of the effects of energy development on nutrition and survival of mule deer (Monteith et al. 2012).

In March 2015 Phase II of the Wyoming Range Mule Deer Project was initiated. The Phase II segment of the project focused on measuring survival and cause-specific mortality of mule deer fawns to quantify the relative roles of habitat, nutrition, and predation on recruitment of young (Appendix A). Specific objectives of this project quantified the effects of predation and other mortality factors on survival of young mule deer, and provided a relative assessment of the effect of juvenile mortality on the annual population dynamic.

Weather

Precipitation

Overall precipitation from October 2015 through September 2016 was slightly above average when averaged across the entire herd unit (Figure 1). The general characteristics included a relatively dry winter followed by average spring precipitation. Fortunately, growing season (April through June) precipitation was above average which resulted in good vegetation production across all ranges.

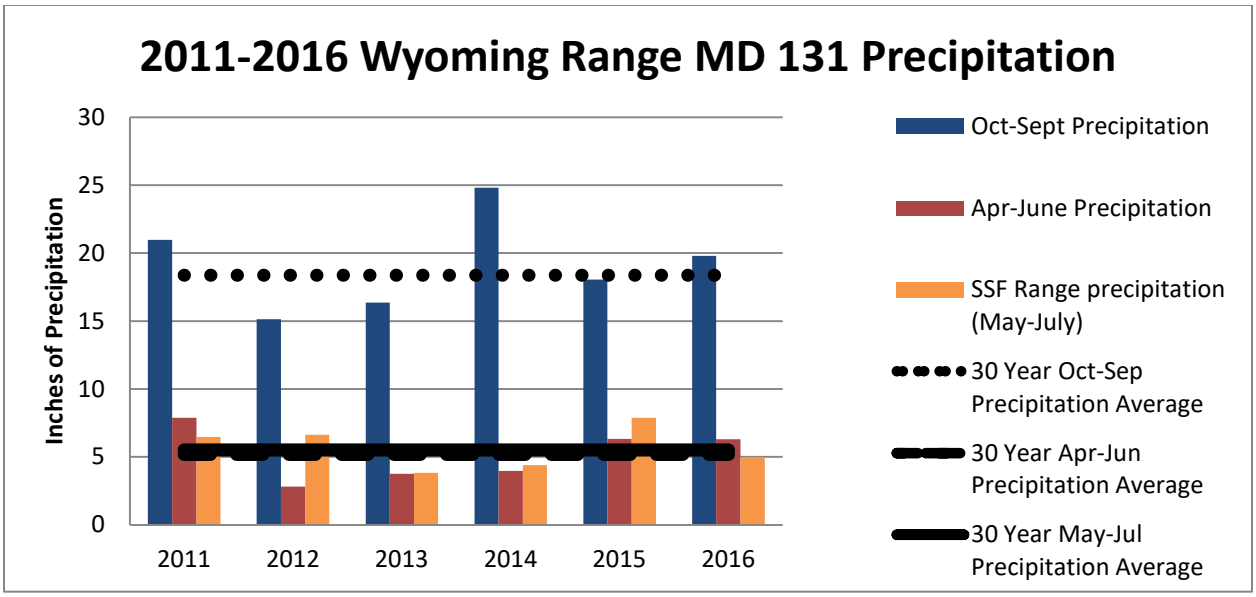


Figure 1. Precipitation levels at select sites in the Wyoming Range Mule Deer Herd, 2011-2016.

Winter Severity

The 2016-2017 winter has been extreme with below average temperatures and above average snow on winter ranges. Snow crusting has also resulted from temperature extremes creating difficult foraging conditions. Measured fawn mortality from change-in-ratio surveys was 86%, while known adult female mortality was approximately 40%. This extreme winter follows three winters of mild conditions resulting in good over-winter survival for fawns and adults. High elevation mountain ranges have received above average snow levels. The Snow Water Equivalent of the Upper Green River Basin has registered 192%, the Upper Bear River Basin has registered 169%, and the Lower Green River Basin has registered 161% compared to the 1981-2010 median as of February 27, 2017.

Habitat

Sagebrush and other shrubs produced good leader growth in 2016 which provided a good quantity of forage on winter ranges. However, many shrubs are under snow and largely unavailable on extreme winters. Current snow conditions do not indicate deer will leave winter ranges early, but weather in the next two months can significantly impact those conditions.

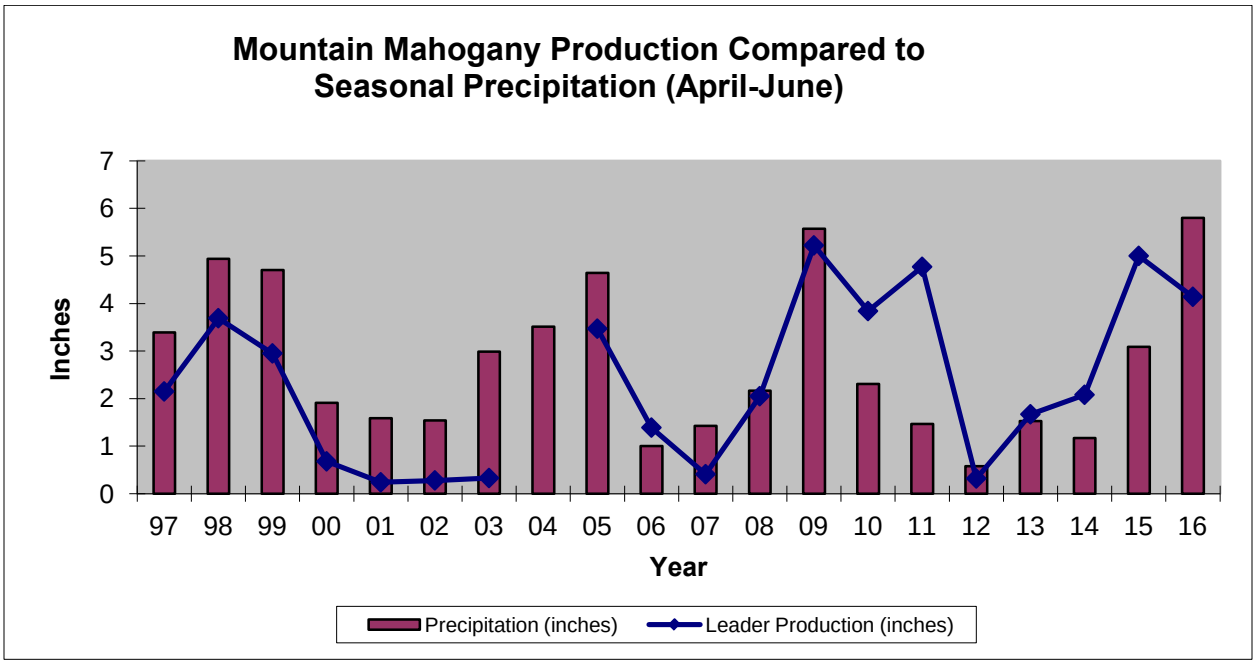
Significant Events

Habitat treatments were conducted as part of the Wyoming Range Mule Deer Habitat Project on BLM land in 2016 including: 3,348 acres of sagebrush mowing, 976 acres of aspen mechanical preparation for future burning, 683 acres of aspen prescribed burns, and 3,469 acres of cheatgrass treated. An additional project in LaBarge Creek modified 1.25 miles of fence of wildlife friendly. More information can be obtained by reading the Pinedale Region report in the

2016 Strategic Habitat Plan Annual Report. There were no significant wildfires in 2016 in this herd unit.

Habitat Monitoring

Winter Range Shrub transects were only monitored on four true mountain mahogany transects in 2016 by Department personnel. The quantity of precipitation was above average during the growing season (April through June) with an outstanding amount of moisture falling in May (4 inches) in parts of the herd unit near Big Piney. In the months following, however, the amount of precipitation dropped dramatically resulting in a hot and dry summer. True Mountain Mahogany production dropped slightly from last year, even with an increase in overall precipitation, likely due to the drop in moisture following May.



Other shrub species were monitored where the Department has implemented habitat treatments. In one such case (Three Buttes Dixie Harrow, 2014), production on Wyoming big sagebrush was almost 4 times greater in the treated area versus untreated areas in 2016. Many habitat treatments performed by the WGFD targeting shrub communities have the objective of establishing a younger age class of shrubs with additional benefits of increasing the productivity and vigor of plants that remain after treatment, such as the one mentioned above. With numerous obstacles that deer face on winter ranges, such as snow depth and extreme temperatures, increasing forage quality through habitat treatments is an objective of habitat managers to increase over-winter survival.

Rapid Habitat Assessments

In 2016, Department personnel initiated the Rapid Habitat Assessment methodology to survey important mule deer habitats. This method strives to capture large-scale habitat quality metrics to better understand how the habitat is providing for the current population of mule deer. The overall end result of this effort will be to provide a standardized habitat component to discussions about how mule deer objectives should or should not be adjusted based on the general concept of carrying capacity. In 2016, 4 Aspen (759 acres) and 1 Rangeland (101 acres) Rapid Habitat Assessments were completed throughout the herd unit by personnel in the Pinedale and Green River Regions.

Field Data

The Wyoming Range deer herd has been unable to sustain population growth for more than 3 consecutive years since the early 1990s. Normal to high over-winter mortality, in addition to other factors identified by research associated with the Wyoming Range Mule Deer Project continues to suppress this population's ability to sustain growth because of poor survival and recruitment of fawns.

Since the initiation of the Wyoming Range Mule Deer Project, radio-collared adult does have provided an index of two important metrics: adult survival and fetal rates (Appendix B). Phase II – the fawn survival component of the project, was implemented in 2015 to provide an assessment of annual fawn survival. During 2015 an important, but previously unknown, mortality factor was discovered in this deer herd. The disease, Adenovirus Hemorrhagic Disease (AHD) was determined to be responsible for killing radio-collared newborn fawns and un-collared fawns as old as 5 months old throughout the herd unit. Although the impact to the annual population dynamic is unknown at this time, it is suspected that AHD, in addition to predation and malnutrition, played an important role in the mortality of a substantial percentage of fawns born in 2015 and 2016.

Adult survival averaged 92% prior to the 2016-2017 winter (Appendix B). During 2013-2015, fetal rates have averaged 1.6 fetuses/doe. An on-going effort to monitor population dynamics with posthunt herd composition surveys provides an assessment of buck recruitment and fawn production and survival. During 2015 and 2016 fall recruitment 55% and 59% of the radio-collared fawns marked in June were recruited to winter range in November, respectively.

The primary issue affecting the population dynamic of the northern segment of the herd, is the general decline in productivity and survival of fawns prior to their arrival on, and subsequent departure from, the LaBarge/Big Piney winter ranges (Area 143). During the 5-year period from 1996-2000, an average of 82 fawns:100 does were observed on this winter range. During a subsequent 5-years period (2011-2015), the average fawn:100 does ratio was 62:100. In 2016, the proportion of fawns:does was the lowest since 1993 in Hunt Area 143. The 2016 doe:fawn ratio was 50 fawns:100 does. Body condition of pregnant does that arrive on winter ranges and depart in the spring is one of the primary determinants of fawn viability and survival.

Buck:doe ratios have met or exceeded the special management objective of 30-45 bucks:100 does in the posthunt population over the last 7 years. Moderate to high overwinter survival has ensured recruitment of 1.5+ year old bucks. Despite lower fawn survival and recruitment, buck ratios have met management goals of 30-45 bucks in the posthunt population. Since 2009 buck:does ratios have exceeded 40:100 in two of the last seven years. On the LaBarge winter ranges buck:doe ratios averaged 42 bucks:100 since 2010. The highest buck ratio achieved in at least 20 years was in 2013 when 46 bucks:100 does were observed on the LaBarge winter ranges. The buck:doe ratio was 36 bucks:100 does in 2016 (Appendix C).

On herd unit winter as well as summer ranges, low fawn recruitment is of concern, and is believed to be related to habitat conditions, nutritional condition of doe deer, effects of winter severity, predation, and because of the recent findings of the Phase II fawn survival component, the prevalence of disease. Poor browse production related to persistent drought, and an increase in decadent and over-mature forage plants on crucial winter ranges are factors that dictate over-winter deer survival during mild and open winters. Additional factors are the declining vigor, and an increase in dead and decadent aspen communities in parturition and summer ranges. The condition of aspen communities is believed to contribute to the declining neonatal fawn survival and recruitment.

The highest recorded loss of mule deer during winter in the Wyoming Range was recorded during the 2016-17 winter. Results of the Wyoming Range mule deer project indicate that 100% of all neonatal fawns radio-collared since May and June 2016 died (Appendix D). Approximately 55% of the fawns died from the time of collaring May/June 2016 to December 2016. The surviving research fawns died during the winter (Appendix D). Concurrently with the estimated fawn morality is adult female mortality associated with winter mortality. A preliminary estimate of adult female is approximately 40% of the radio-collared does 2+ years died during the recent winter (Appendix D).

An assessment of relative winter fawn mortality has been estimated in the Wyoming Range herd since 1986. A systematic survey of the proportion of adults to fawns to assess fawn mortality is initiated in December and April. The comparative change in the proportion of fawns:100 adults between the winter and spring provides a minimum estimate of the proportion of fawns lost over the winter. Since 1993 the highest years of minimum winter fawn mortality have occurred on average approximately every four years (Appendix E). The highest estimated fawn mortality occurred in 2011 and 2017, respectively.

Harvest

Hunting seasons since 1993 have been designed to allow 7-14 days of hunting in the southern areas (Areas 134,135) and 16-23 days of hunting in the northern areas (Areas 143-145). Antlered only hunting, and the near absence of antlerless harvest has failed to produce the sustained population increase since the late 1990s. Nonresident licenses were reduced to 600 licenses for Region G beginning in 2012. Observed buck:doe ratios totaled 42 bucks :100 does in 2013, which is the highest observed buck:doe ratio since 1991. A conservative management approach of closing hunting seasons prior to the annual fall migration in the northern hunt areas has ensured that trophy class bucks continue to be recruited into the posthunt population.

Hunter success increased from 48% in 2015 to 53% in 2016. A total of 3457 mule deer where harvested in 2016, while, in comparison 3189 deer were harvested in 2015. Hunter success and number of total deer harvested have attained levels not observed since the early 1990s and 2001 hunting seasons. During the 2014 and 2015 hunting seasons a total of 101 and 109 fawns were harvested, respectively. Doe harvest accounted for 4% and 3% of the total herd unit harvest during 2014 and 2015, respectively. In 2016, 72 does were harvested which accounted for only 2% of the herd unit's total harvest. Nonresident hunters harvested 13% of the total deer harvest in 2016. In nonresident Region G, nonresidents accounted for 11% of the total harvest in Areas 135, 143-145.

Population

The population trend has increased over the last 5 years, although only minimally. The "Time Sensitive Juvenile – Constant Adult Mortality Rate" (TSJ,CA) spreadsheet model was used to derive the post season population estimate. The TSJ,CA model showed the best overall fit compared to the suite of available models (Fit=1, Relative AICc=116). This model tracks observed buck:100 doe ratios extremely well.

Management Summary

The population remains below the objective, but is within the ± 20% threshold. The 2017 hunting season is designed to promote population growth and retain bucks in the posthunt population by closing hunt seasons prior to the onset of the fall migration. Extreme winter mortality was documented during the 2017 winter. Consequently, Nonresident Region G licenses were reduced from 600 to 400 licenses. The 2017 season in Hunt Areas 134 will allow 8 days of general season antlered deer hunting, with the added restriction that antlered deer with three points or more on either antler may be taken in Areas 134. The season in Hunt Area 135 will be shortened from October 14 to October 6, with the added restriction that antlered deer may be taken with three points or more on either antler. Hunt Areas 143-145 will close on October 6 in 2017, and offer hunters the opportunity to harvest antlered mule deer with three points or more on either antler may be taken.

In Area 145, a limited quota any white-tailed deer hunt will allow hunters to take any white-tailed deer during a portion of the November hunting season. The number of Type 3 licenses will decrease from 60 to 50 licenses, and the segment of the any white-tailed deer hunt will be shortened from November 1 – November 30 in 2016 to November 1 - November 15 for the 2017 hunt. Doe fawn white-tailed deer may be taken from November 16 – December 31. Public concerns have focused on a general lack of access to suitable hunting locations and fewer white-tailed deer being observed in those areas. Also, there has been a decrease in reported chronic damages to stored crops on private property by landowners in recent years thereby resulting in the proposed reduction in hunting opportunity for the Type 3 license.

The 2017 hunting seasons are projected to harvest approximately 1100 deer. The population is projected to decrease to approximately 23000 deer following the 2017 hunting season.

APPENDIX A

Nutritional carrying capacity and factors limiting population growth of mule deer in the Wyoming Range

Wyoming Cooperative Fish and Wildlife Research Unit
Wyoming Game and Fish Department
University of Wyoming
2013

PROJECT TITLE
Nutritional carrying capacity and factors limiting population growth of mule deer in the Wyoming Range

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DURATION: 1 July 2012 – 30 June 2016

INTRODUCTION

Concerns over population performance and factors limiting population growth have heightened in recent decades in response to near ubiquitous declines in the abundance of mule deer (*Odocoileus hemionus*) throughout much of the West. Factors responsible for such declines remain largely speculative and controversial (deVos et al. 2003); however, recent comprehensive research has identified habitat quality and winter severity as important factors that are currently limiting mule deer in the Intermountain West (Bishop et al. 2009, Hurley et al. 2011). In response to concerns of mule deer populations in Wyoming, in 2007, the Wyoming Game and Fish Commission adopted the *Wyoming Mule Deer Initiative* (MDI) with the intent to develop individual management plans or strategies for key herd units based on overarching goals and objectives. Separately, the Mule Deer Working Group (2007) recognized that the *"Success and implementation of these plans will depend upon our ability to identify limiting factors to mule deer populations and their habitats"*.

Of particular concern is the Wyoming Range mule deer herd in western-central Wyoming- one of the largest mule deer herds in the state and a premier destination for mule deer hunting in the country. The Wyoming Range mule deer population (MD131) has undergone dynamic changes in recent decades from a population high of >50,000 in the late 1980s, to a sustained population of ~30,000 during the last decade. Prior to the acceptance of the MDI, the Wyoming Range mule deer herd was a top priority for the development of a management plan according to the MDI. The first of the herd-specific management plans, the *Wyoming Range Mule Deer Initiative* (WRMDI), was finalized in 2011 following a collaborative public input process. The proposed research we describe here stems directly from research and management issues identified by the Mule Deer Working Group in the WRMDI, and we have proposed to conduct this research on Wyoming Range mule deer because of its priority status and controversy behind its population dynamics.

The marked decline of this deer population following the 1992-93 winter, and the near absence of any substantial recovery, has engaged the WGFD in controversy regarding management and herd unit objectives. Despite conservative harvest focused on the antlered portion of the population with limited to no harvest of females, the population has failed to recover to the herd unit objective of 50,000 animals. Given current population trends, severity of winters, and deteriorating range conditions, it has become apparent that

the habitat is not capable of supporting the current herd unit objective. Nevertheless, identifying the current capacity of the habitat to support mule deer in the Wyoming Range has been a persistent management challenge. Habitat conditions on both winter and summer range occupied by Wyoming Range mule deer have been deteriorating as a result of both drought and land-use practices. Declines in snowpack and rising spring temperatures have been pronounced in recent decades across much of the Rocky Mountains (Westerling et al. 2006, Pederson et al. 2011); both of which have a negative effect on forage quality and abundance, thereby influencing carrying capacity.

PRIMARY OBJECTIVE

The overall goal of this research project is to address important research and management needs indentified by the MDI and WRMDI. **Overall, we seek to investigate the nutritional relationships between mule deer population dynamics, energy development and disturbance, habitat conditions, and climate to provide a mechanistic approach to monitoring and management of mule deer.** Our approach is to mesh data on nutritional condition, forage production and utilization, and population performance to understand factors regulating Wyoming Range mule deer and the ability of the current habitat to support mule deer. In addition, we have the opportunity to address secondary objectives including nutritional contributions of winter and summer ranges, factors affecting reproduction, identification of habitats of nutritional and reproductive importance to mule deer, timing and delineation of important migration routes, and direct assessment of the effects of energy development on nutrition and survival of mule deer.

BENEFITS

The impetus behind this project follows from questions underlying the population dynamics of the Wyoming Range mule deer herd, and was formulated to meet multiple objectives outlined by the Mule Deer Working Group in the *Wyoming Mule Deer Initiative*, and the herd-unit specific *Wyoming Range Mule Deer Initiative* (WRMDI). Our proposed study will meet objectives under 5 of the 6 management issues identified in the WRMDI which was finalized in 2011, including but not limited to:

• Estimate the nutritional capacity of existing habitat available to mule deer in the Wyoming Range to evaluate whether revision of the current population objective of 50,000 wintering mule deer is warranted.

• Characterize existing habitat conditions with respect to population density by implementing a nutritionally based approach to estimating carrying capacity that could be applied to other herd units in Wyoming.

• Link habitat use with vital rates and nutritional processes will help identify vegetation communities and habitat treatments most beneficial for mule deer to enhance mule deer populations as wells as identifying effective mitigation strategies.

• Assess the nutritional capacity for survival and reproduction will help characterize the potential effects of predation on mule deer, as well as the benefits of predator control efforts already in place.

• Evaluate patterns of mule deer migration will delineate important mule deer migration corridors, and provide predictive models for timing of seasonal migration to identify critical migration periods.

• Evaluate the physiological effects of oil and gas development will help to quantify the direct and indirect effects of habitat loss and disturbance on mule deer in the Wyoming Range, as well as identifying habitat manipulations that are likely to be most effective in mitigating the effects of energy development.

• Results of this research project will be presented in public forums in conjunction with the public input process, and by way of other venues to inform the public and stakeholders of issues facing Wyoming Range mule deer as well as management strategies likely to be most beneficial to the mule deer population.

The Wyoming Range Mule Deer Project was initiated in March 2013. The overarching goal of the project is to investigate the nutritional relationships among habitat conditions, climate, and behavior to understand how these factors interact to regulate population dynamics, and ultimately, the capacity of the current range to support mule deer in western Wyoming. In March 2015, we completed data collection for Phase I and have now transitioned into Phase II of the project, which is aimed at unraveling the relative contributions of habitat, nutrition, and predation on survival of young mule deer—a study that is the first of it's kind in Wyoming. This update will report on some of our accomplishments and preliminary findings on Phase I of the project and will highlight the factors that most influenced fawn survival in our first year of research in cause-specific mortality. Given recent contributions to the project, we currently plan to continue this rigorous research through March 2018, which will yield 3 summers of data focused on survival of fawns. Ultimately, we hope to understand what factors regulate this iconic deer population, with robust data collected during key times for mule deer, including migration, summer reproduction, and overwinter survival.

Mule Deer Capture

We initiated our research in March 2013 with an initial capture of 70, female mule deer that were fitted with GPS radio-collars. Since the project's initiation, we have recaptured the same cohort of deer each December and March via helicopter net-gunning — the safest and most efficacious way to capture and recapture radio-collared deer. At each capture event, new deer are also fitted with GPS radio-collars to replace mortalities. By recapturing our study animals as they enter winter ranges in December and leave winter ranges in March, we are able to use field ultrasonography to track seasonal changes in nutritional condition (i.e., body fat; Fig. 1) and reproductive status. Fat measured in December yields insight into the contributions of summer range, the costs of reproduction, and the fat reserves an animal has to aid in winter survival. Measurements of fat in March reveal the nutritional contributions of winter range, and the fat reserves an animal has to aid in provisioning offspring. In addition, we use ultrasonography to assess pregnancy status and fetal rates each March.

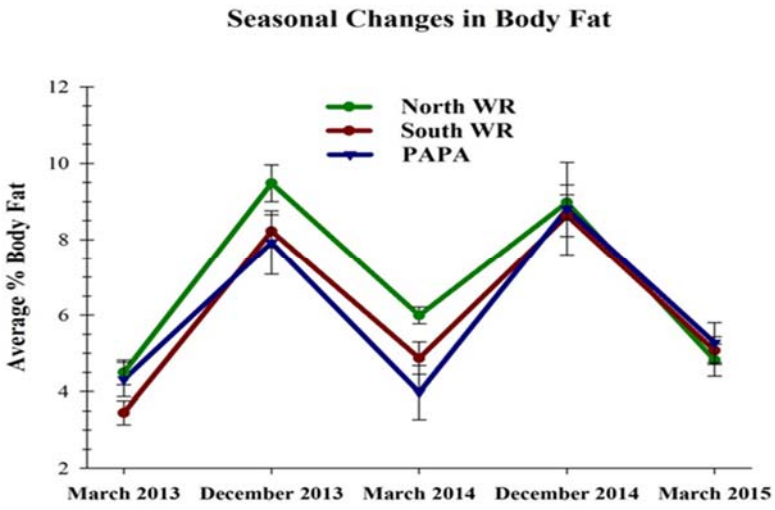


Figure 1. Seasonal changes in body fat for Wyoming Range deer that winter on northern and southern winter ranges (North WR and South WR, respectively) as well as Sublette deer that winter on the Pinedale Anticline (PAPA).

GPS radio-collars have yielded detailed data about the habitats that deer use throughout the year. This allow us to link the habitats animals experience in summer to nutritional condition and survival of fawns.

Reproduction

Pregnancy and fetal rates (number of young in utero) is typically high. That is, adult mule deer are rarely not pregnant, and most often, are carrying twins. The deer in the Wyoming Range fit this pattern. During our 3 years of monitoring thus far, pregnancy rates have consistently exceeded 95%, and fetal rates are about 1.7 fawns per female (Fig. 2). Therefore, reproductive rates are sufficiently high, and the key factor then, underpinning population dynamics that our work continues to explore is what determines survival and recruitment of young.

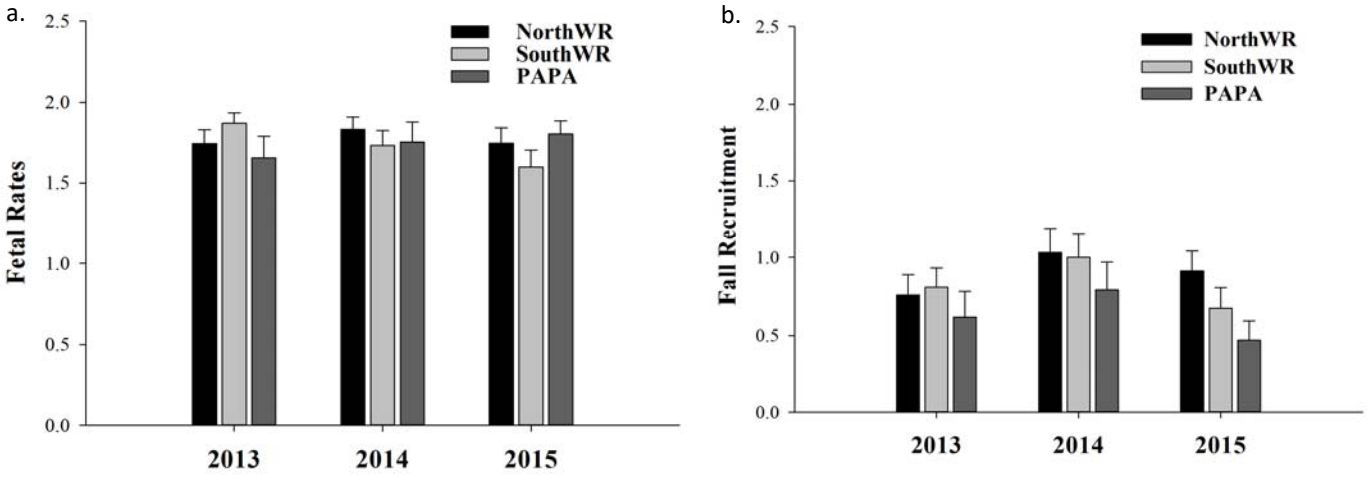


Figure 2: (a) Fetal rates (number of young in utero) and (b) recruitment rates (number of young at heel in December) for the north and south Wyoming Range deer herd and deer on the Pinedale Anticline Project Area during 2013–2015.

Producing and rearing young is energetically expensive, and comes at a cost to nutritional condition for female deer. The cost however, is mediated by environmental conditions and forage availability, as was evident in the apparent differences in nutritional condition of females in December for those that succeeded to rear 2 young in 2013 and 2014; costs of successful reproduction were much greater during the drought of 2013 as compared to the wet year of 2014 (Fig. 3).

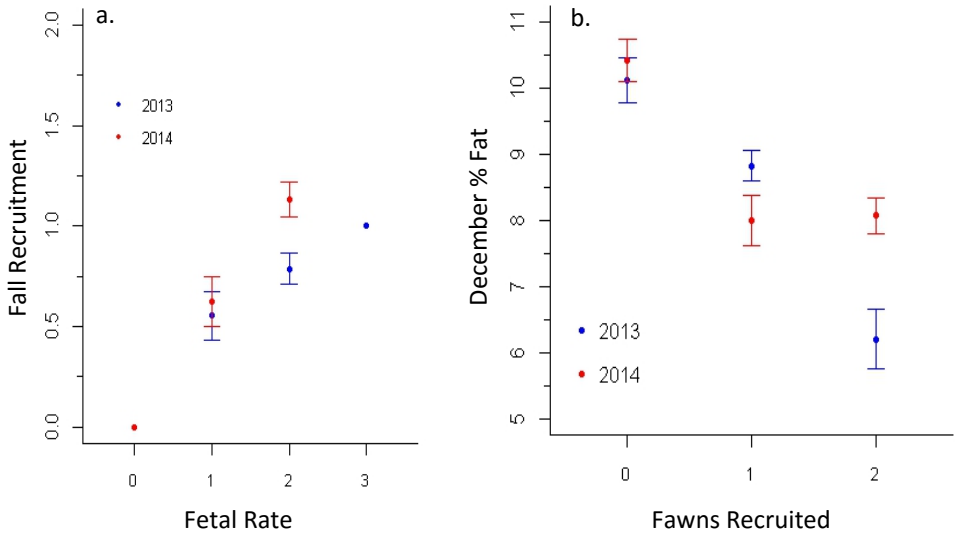


Figure 3: (a) Number of recruited young in December relative to number of fetuses in March, and (b) December % Fat relative to number of fawns recruited for adult female mule deer in the Wyoming Range herd during 2013 and 2014.

Fawn Survival

Fawn Collaring

In March 2015, we initiated Phase II with recapturing collared deer and deploying a vaginal implanted transmitter (VIT) in pregnant females. VITs were used to indicate where and when birth occurred (Fig. 4). Once birth events were identified, we then captured, radio-collared, and collected a suite physical data (e.g., body weight) of fawns born to our radio-collared females. We successfully collared 52 fawns in summer 2015 and have been continually monitoring their survival.

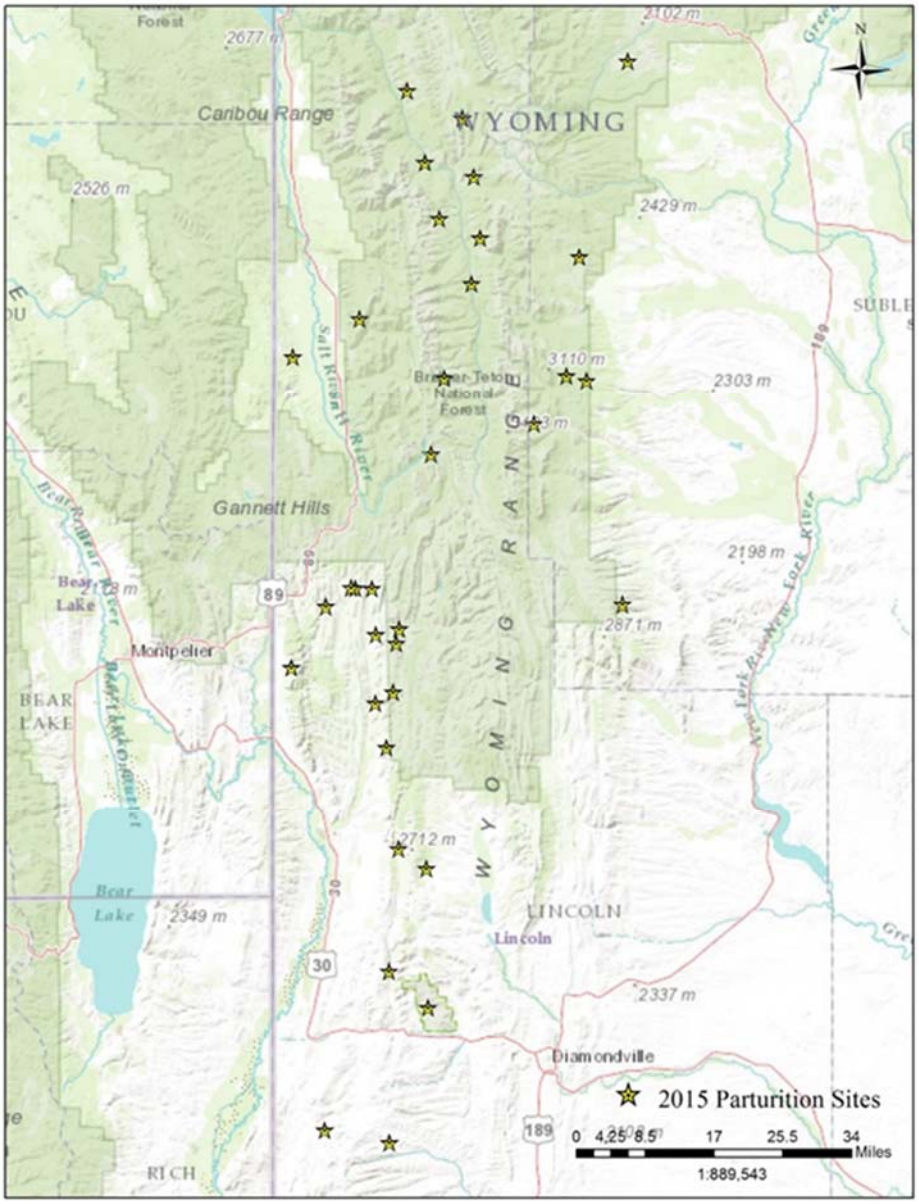


Figure 4. Locations of parturition sites (i.e., birth sites) of fawns radio-collared throughout summer 2015

In March 2016, we recaptured all radio-collared adults females and fit them with VITs to continue our efforts in monitoring fawn survival through summer 2016. Additionally, we recaptured some radio-collared fawns. This will provide us with the unique opportunity to monitor survival and habitat selection of yearlings; which is essential for understanding the contributions of that demographic to population growth.

Fawn Survival

Of the 52 fawns radio-collared during summer 2015, 22 had died (42%) by November. The causes of death were comprised mostly of predation, disease, injury by accident (trauma), and malnutrition. Disease was the cause of death for 36% of mortalities (Fig. 5). The most prevalent disease causing agent was adenovirus. Adenovirus is a viral disease that can cause internal hemorrhaging and pulmonary edema. Although adenovirus has been detected in mule deer populations before, it was not known to be prevalent in Wyoming until our research detected it. Further work is necessary to understand what this disease means for Wyoming Range deer.

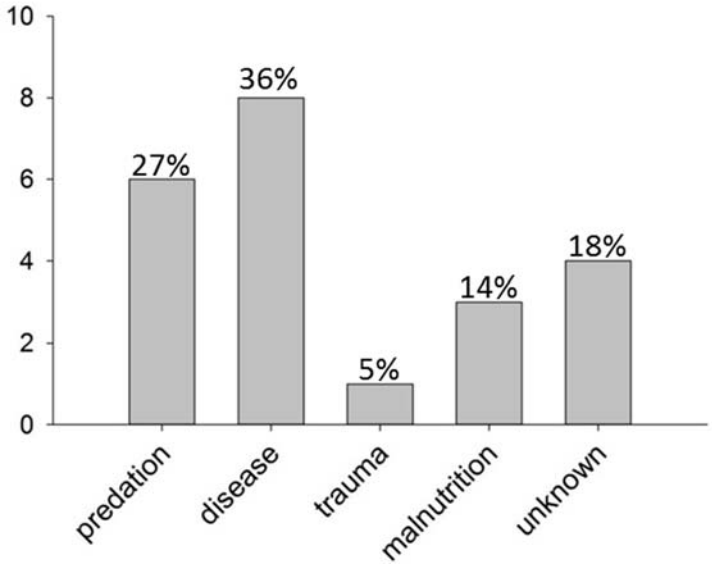


Figure 5. Locations of parturition sites (i.e., birth sites) of fawns radio-collared throughout summer 2015.

Predation was the second leading cause of death among fawns accounting for 27% of all mortalities. The species identified as being responsible for confirmed predations included black bears and coyotes. We used tracks, scat, and signs of behaviors characteristic of various predators to determine the species responsible. Of the predation mortalities where the species was identified, 40% were a result of black bear and 60% were coyote.

This is the typical condition of a fawn that died of adenovirus. Most were found fully intact and without any sign of predation or an obvious cause of death. Adenovirus was confirmed in these mortalities at the Wyoming State Veterinary Lab (WSVL). We are also currently working with the WSVL in developing an diagnostic test for detecting adenovirus in living animals in order to determine prevalence of the virus within the population.

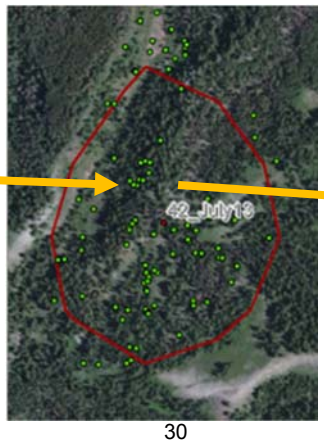
Predators

In collaboration with our efforts, the Wyoming Game and Fish Department (WGFD) fit 6 black bears with GPS radio-collars throughout our study area. Their capture efforts were focused in areas where black bear movements are likely to overlap home ranges of radio-collared deer. These data will be valuable in understanding how bear behavior during parturition affects fawn survival.

In summer 2016, WGFD will expand their predator monitoring efforts by establishing hair-snare traps throughout our study area. Hair-snare traps are a reliable way to determine densities of predators throughout the study area. With these data, we will be able to evaluate how predator density affects habitat selection of adult mule deer as well as survival of young. Bolstering our efforts in monitoring predator behavior and densities allows us to better understand how predators may influence fawn survival, and thus, population dynamics.

Summer Habitat and Maternal Condition

The condition of a female and the habitat conditions she experiences in the summer may be very important in predicting and understanding fawn survival – especially in understanding the influence of malnutrition and disease on fawn survival. Therefore, we are evaluating forage and habitat conditions within summer home ranges of collared deer. Specifically, we are measuring habitat structure and forage availability of known locations of use by collared females that gave birth to fawns. We will then couple these data with information on maternal condition (i.e., nutritional condition) and evaluate the influence on fawn survival.



The Wyoming Range Deer Project is the quintessential partnership, both in inception, development, operations, and funding. Without all the active partners, this work would not be possible. Funds have been provided by the Wyoming Game and Fish Department, Boone and Crockett Club, Muley Fanatic Foundation, Bureau of Land Management, Wyoming Wildlife and Natural Resource Trust, Knobloch Family Foundation, U.S. Geological Survey, National Science Foundation, Wyoming Governor's Big Game License Coalition, Animal Damage Management Board, Ridgeline Energy Atlantic Power, Bowhunters of Wyoming, and the Wyoming Outfitters and Guides Association. Special thanks to the Wyoming Game and Fish Department and Bureau of Land Management for assistance with logistics and fieldwork, and to the Cokeville Meadows National Wildlife Refuge and National Forest Service for assistance with housing.

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Appendix C. Wyoming Range Mule Deer Herd, posthunt herd composition data, 2010-2016.										
							Ratio:100 Females			
2010	Yrlng Males	Adult Males	Total Males	Does	Fawns	Total	Yrlng Males	Adult Males	Total Males	Fawns
HA134	85	127	212	658	379	1249	13	19	32	57
HA135	163	231	394	1055	622	2071	15	22	37	59
HA143	246	330	576	1411	959	2946	17	23	41	68
144/145	Survey conducted in February 2011					768				
TOTAL	494	688	1182	3124	1960	7034	16	22	38	63
2011										
HA134	27	164	191	653	415	1259	4	25	29	63
HA135	53	317	370	1017	675	2062	5	31	36	66
HA143	260	517	777	1893	1083	3753	14	27	41	57
144/145	Survey conducted in February 2012					752				
TOTAL	340	998	1338	3563	2173	7826	9	28	37	61
2012										
HA134	55	103	158	635	404	1197	9	16	25	64
HA135	80	159	239	822	647	1708	10	19	29	79
HA143	116	177	293	799	505	1597	14	22	37	63
144/145	Survey conducted in February 2013					764				
TOTAL	251	439	690	2256	1556	5266	11	19	30	69
2013										
HA134	99	175	274	660	496	1430	15	26	41	75
HA135	145	203	348	913	672	1933	16	22	38	74
HA143	300	326	626	1373	897	2896	22	24	46	65
144/145	Survey conducted in March 2014					805				
TOTAL	544	704	1248	2946	2065	7064	18	24	42	70
2014										
HA134	100	138	238	565	466	1269	18	24	42	82
HA135	191	322	513	1386	1128	3027	14	23	37	81
HA143	291	271	562	1288	884	2734	22	21	43	68
144/145	Survey conducted in February 2015					1005				
TOTAL	582	731	1313	3239	2478	8035	18	22	40	76
2015										
HA134	81	173	254	737	406	1397	11	23	34	55
HA135	176	302	478	1188	828	2494	15	25	40	70
HA143	415	399	814	2005	1147	3966	21	20	41	57
144/145	Survey conducted in February 2016					440				
TOTAL	672	874	1546	3930	2381	8297	17	22	39	60
2016										
HA134	95	190	285	774	489	1549	12	24	36	63
HA135	182	380	562	1605	1008	3175	11	24	35	63
HA143	256	260	516	1430	723	2669	18	18	36	50
144/145	Survey conducted in February 2017					517				
TOTAL	533	830	1363	3809	2220	7910	14	22	36	58

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Wyoming Range Mule Deer Project: A Brief Update on Population Trends Winter 2017

Winter ranges for mule deer in the Wyoming Range have experienced exceptional winter weather in 2017. With snowpack levels at ~200% of normal and numerous days of sub-zero weather, this winter has tested the resilience of wildlife populations in western Wyoming. Although winter conditions similar to 2017 occasionally occur, it has been many years since we have experienced conditions as severe. Performance of mule deer populations can be affected strongly by winter severity and population declines often occur immediately following severe winters—a trend that has been documented repeatedly throughout the western North America. Fortunately, severe winters do not lead to the demise of mule deer, and populations tend to have the propensity to bounce back. Our research at the University of Wyoming in collaboration with Wyoming Game and Fish Department has documented some interesting (and unfortunately, expected) trends in survival, recruitment, and pregnancy following severe winter conditions for Wyoming Range mule deer. Here, we briefly highlight some of our more marked trends observed in winter 2017 as of mid-March.

Survival—Adults

Before 2017, adult survival for Wyoming Range mule deer was relatively high with an annual survival rate of 92%, and age was the number one factor affecting overwinter survival. Conversely, the severe winter conditions of 2017 have led to only 75% of our marked animals surviving through mid-March. As was expected, adult mortality this winter affected old animals in particular (average age at mortality was 9.7 ± 0.62), with all mortalities being of individuals older than 6 years.

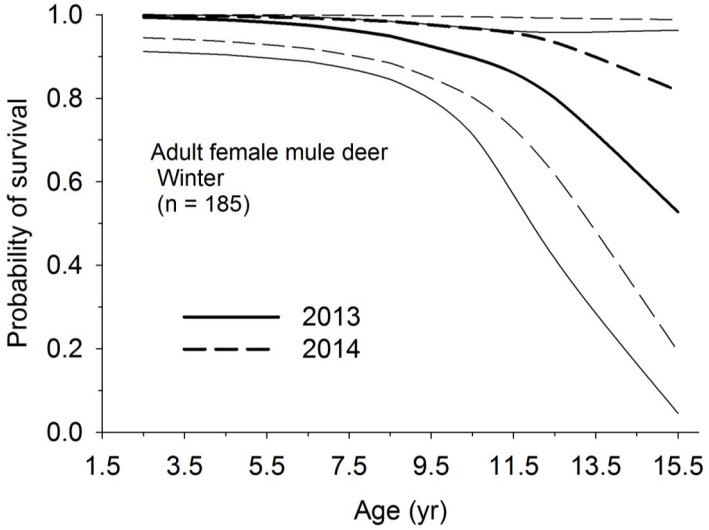

Figure 1: Probability of adult survival throughout the winters of 2013 and 2014. As age of the animal increased, the probability of survival decreased.

Survival—Fawns

Annual fawn survival for most mule deer populations is often lower than adult survival, and it is not uncommon for less than half of the fawns born in June to make it through their first year of life. In the first year of our research evaluating survival of fawns, 45% of fawns born in summer 2015 survived until June 2016; only 17% of annual mortalities occurred during winter. Unfortunately, survival of fawns born in summer 2016 tells a much different story. As of March 5, 2017, only one of the 70 fawns we tracked was still alive— **which equates to a 99% mortality of fawns.** Although fawns tend to be especially susceptible to the effects of winter severity, the winter of 2017 has resulted in an almost entire loss of the cohort of fawns born during the past summer.

We retrieved all remains of mortalities of collared fawns. Whole carcasses were submitted to the Wyoming State Veterinary Lab and WGFD Wildlife Health Laboratory for necropsy and to assess the influence of diseases such as adenovirus hemorrhagic disease (AHD) on winter mortalities.

Nutritional Condition

Nutritional condition, as measured by % body fat, is the currency mule deer use to finance reproduction and survival. Winter often serves as a bottleneck for food resources and a drop in % body fat is expected among animals on winter range. Despite seasonal fluctuations in nutritional condition, unlike many other ungulate species, mule deer still manage to successfully reproduce with relatively low body fat. Regardless, nutritional condition of mule deer in March 2017 was the worst we have seen since the initiation of our research in March 2013 with an average of 1.8% (± 0.25) body fat for deer on winter ranges near Big Piney (i.e., NorthWR) and 2.8% (± 0.30) body fat for deer on winter ranges near Cokeville and Evanston (i.e., SouthWR). Our research this following summer will help us understand the carryover effects of winter on reproduction and recruitment when conditions are severe and will allow us to address ecological questions that are still poorly understood.

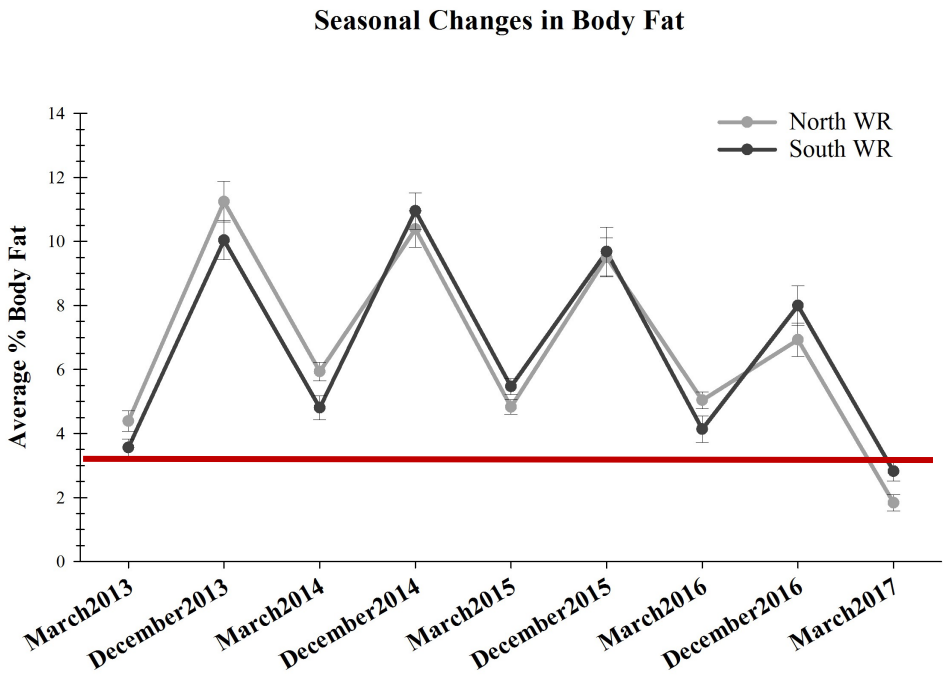

Figure 2: Seasonal changes in percent body fat of mule deer captured as they enter (in December) and leave (in March) winter ranges in the Wyoming Range. The red line marks the lowest average % body fat observed in mule deer of the Wyoming Range prior to March 2017. Note that March 2017 is the worst condition we have observed for the duration of our study.

Pregnancy and Fetal Growth

Pregnancy and fetal rates (number of fetuses per animal) among mule deer tends to be high among populations, and most adults are pregnant with twins. Since March 2013, fetal rates averaged about 1.7. Despite extremely poor nutritional condition of animals this March, fetal rates among winter ranges were 1.6 in 2017—comparable to the preceding 4 years. As also reported in other work, pregnancy rates among mule deer tend to vary little among years (regardless of weather conditions). Interestingly, average eye diameter of fetuses was lower in March 2017 (14.0 ± 0.18) than in previous years (15.3 ± 0.11). A lowered average in fetal eye diameter may indicate suppressed fetal growth coinciding with the significant decrease in % body fat of animals in March 2017. Our subsequent research this summer will help us better understand the ability of animals to successfully provision the resources needed for rearing young following severe winter conditions on winter ranges.

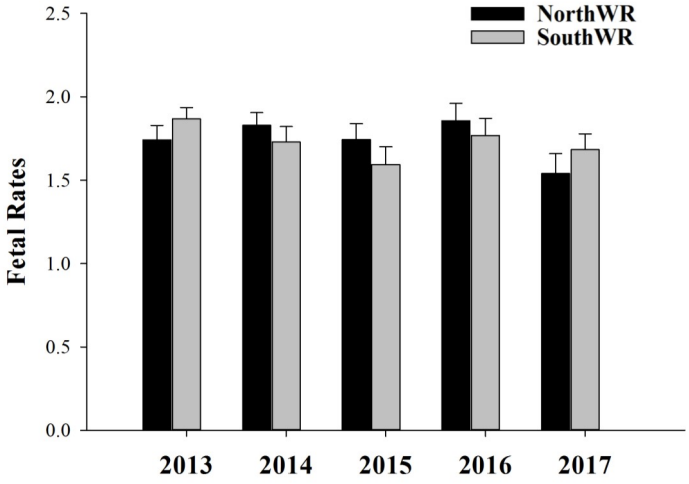

Figure 3: Fetal rates of Wyoming Range mule deer on NorthWR and SouthWR winter ranges. Although most animals had low % body fat in winter 2017, fetal rates in March 2017 did not significantly differ from previous years.

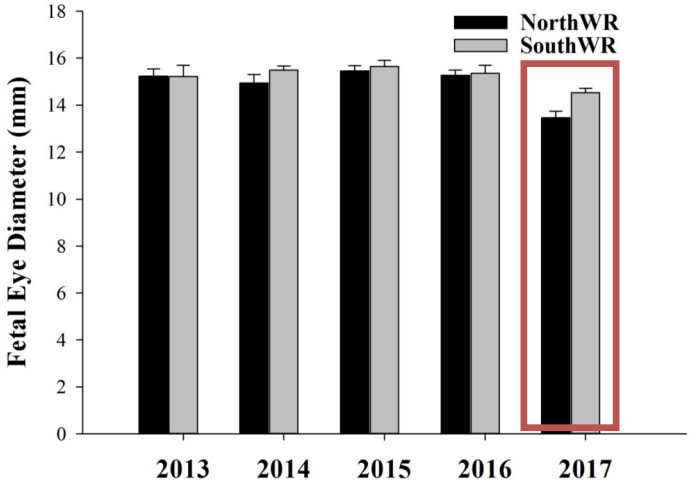

Figure 4: Fetal eye diameter of Wyoming Range mule deer on NorthWR and SouthWR winter ranges. Fetal eye diameter in 2017 (outlined in red) was lower than what was observed in previous years potentially indicating suppressed fetal growth over winter.

Future Research Efforts

Throughout summer 2017, we will continue our research efforts aimed at elucidating the relative influence of predation, climate, and habitat conditions on fawn survival in the Wyoming Range. The severe winter conditions of 2017 will provide us with a unique opportunity to evaluate how severe winter weather may influence the ability of females to subsequently rear young, and thus, provide valuable insight into the factors that regulate population growth and examine the prospects for recovery of this cherished herd.

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Photo: Mark Thonhoff

Appendix E. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2017.

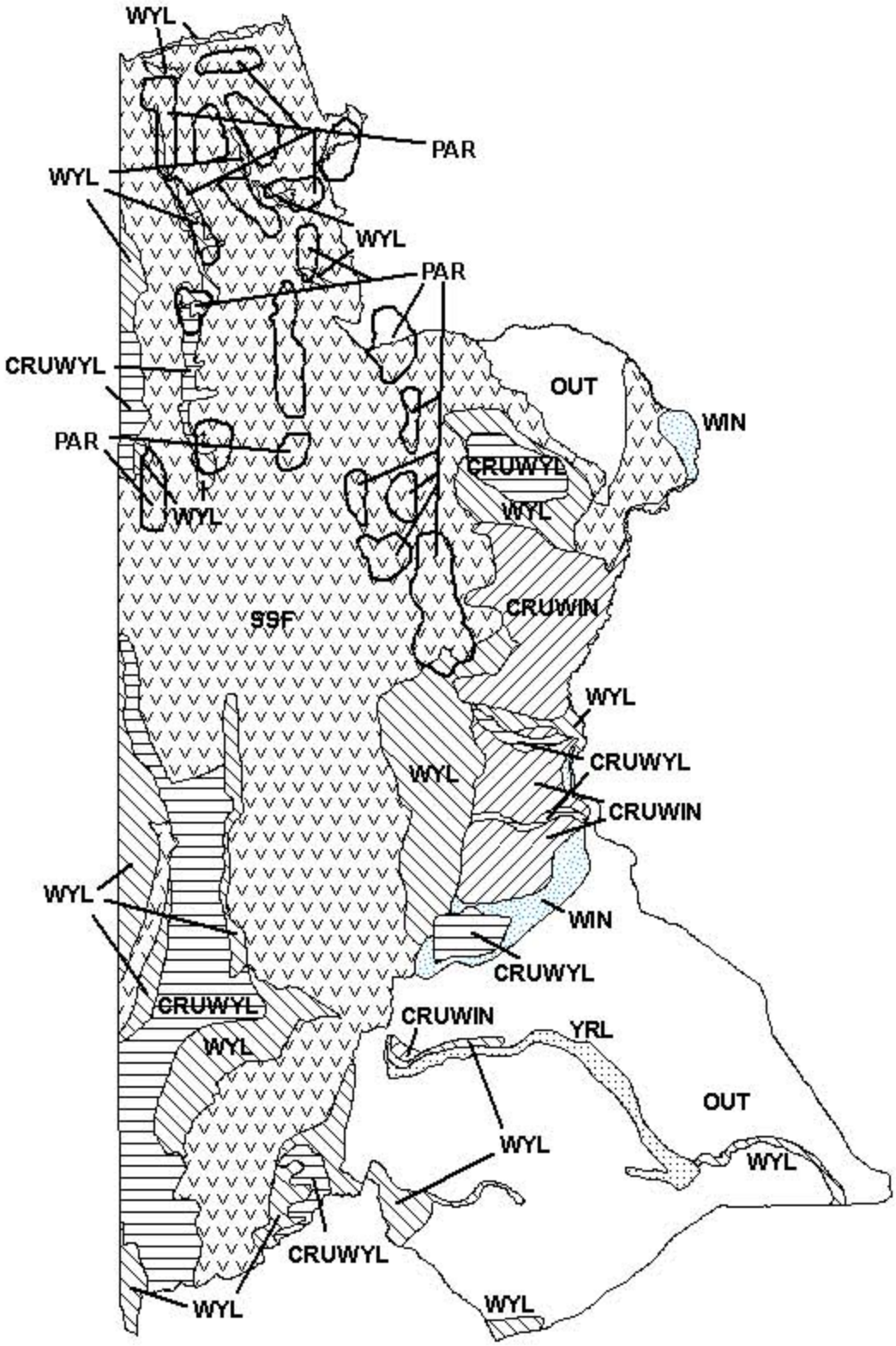
	No. Deer Classified				Change in Ratio		
	December		April		December	April	%
2016-17	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	Change
HA134	1059	489	344	27	46.1	7.8	-83.1
HA135	2167	1008	531	45	46.5	8.4	-82.0
HA143	1946	723	2142	113	37.1	5.3	-86.0
TOTAL	5172	2220	3017	185	42.9	6.1	-86.0
2015-16							
HA134	991	406	300	119	40.9	39.6	-3.2
HA135	1666	828	482	167	49.6	34.6	-30.2
HA143	2819	1147	1903	615	40.6	32.3	-20.4
TOTAL	5476	2381	2685	901	43.5	33.5	-25.7
2014-15							
HA134	803	466	103	76	58.0	73.7	+21.3
HA135	1899	1128	461	319	59.4	69.1	+14.0
HA143	1850	884	798	317	47.8	39.7	-16.9
TOTAL	1850	884	789	317	47.8	39.7	-16.9
2013-14							
HA134	934	496	121	53	53.1	Small Sample Size	Small Sample Size
HA135	1261	672	526	208	53.3	39.5	-25.8
HA143	1999	897	1431	486	44.8	33.9	-24.3
TOTAL	3260	1569	1957	694	48.1	35.5	-26.2
2012-13							
HA134	793	404	199	71	50.9	Small Sample Size	Small Sample Size
HA135	1061	647	254	95	60.9	37.4	-38.6
HA143	1092	505	1498	585	46.2	39.0	-15.6
TOTAL	2153	1152	1752	680	53.5	38.8	-27.4
2011-12							
HA134	844	415	NDR	NDR	49.2	No Data Reported	No Data Reported
HA135	1387	675	133	52	48.7	Small Sample Size	Small Sample Size
HA143	2670	1083	1046	375	40.6	35.8	-11.8
TOTAL	2670	1083	1046	375	40.6	35.8	-11.8
2010-11							
HA134	870	379	722	77	43.5	10.6	-75.6
HA135	1449	622	611	73	42.9	11.9	-72.2
HA143	1987	959	1069	227	48.2	21.2	-56.0
TOTAL	4306	1960	2402	377	45.5	15.6	-65.7
2009-10							
HA134	954	430	772	289	45.0	37.4	-16.8
HA135	1409	642	428	166	45.5	38.7	-14.9
HA143	2480	1177	1278	503	47.4	39.3	-17.0
TOTAL	4843	2249	2478	958	46.4	38.6	-16.8
2008-09							
HA134	856	403	622	238	47.0	38.3	-18.5
HA135	1561	731	207	76	46.8	36.7	-21.6
HA143	2140	870	1415	522	40.6	36.9	-9.1
TOTAL	4557	2004	2244	836	44.8	37.3	-16.7

Appendix E. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2017.

	No. Deer Classified				Change in Ratio		
	December		April		December	April	%
2007-08	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	Change
HA134	1225	736	787	171	60.0	21.7	-63.8
HA135	1198	657	565	137	54.8	24.2	-55.8
HA143	3122	1404	1315	525	44.9	39.9	-11.1
TOTAL	5545	2797	2667	833	50.4	31.2	-38.1
2006-07							
HA134	680	344	249	104	50.6	41.7	-17.6
HA135	844	462	444	191	54.7	43.0	-21.4
HA143	2253	1136	520	223	50.4	42.8	-15.1
TOTAL	3777	1942	1213	518	51.4	42.7	-16.9
2005-06							
HA134	732	442	391	174	60.4	44.5	-26.3
HA135	1075	644	435	157	59.9	36.1	-39.7
HA143	2279	1085	1177	413	47.6	35.1	-26.2
TOTAL	4086	2171	2003	744	53.1	37.1	-30.1
2004-05							
HA134	942	537	515	135	57.0	26.2	-54.0
HA135	854	534	790	232	62.5	29.4	-52.9
HA143	1750	893	1156	461	51.0	39.8	-21.9
TOTAL	3546	1964	2461	828	55.3	33.6	-39.2
2003-04							
HA134	760	457	146	21	60.1	14.4	-76.0
HA135	1148	625	587	149	54.4	25.3	-53.5
HA143	1490	788	880	195	52.8	22.1	-58.1
TOTAL	3398	1870	1613	365	55.0	22.6	-58.9
2002-03							
HA134	511	235	426	129	45.9	30.3	-33.9
HA135	1141	546	986	366	47.8	37.1	-22.4
HA143	1556	7767	1542	585	49.3	37.9	-23.1
TOTAL	3208	1548	2954	1080	48.2	36.6	-24.1
2001-02							
HA134	1051	478	468	59	45.5	12.6	-72.3
HA135	1535	704	902	174	45.8	19.3	-57.9
HA143	2453	1122	1456	474	45.7	32.5	-28.9
TOTAL	5039	2304	2826	707	45.7	25.0	-45.3
2000-01							
HA134	572	305	256	76	53.3	29.6	-44.4
HA135	821	490	873	375	59.7	42.9	-28.1
HA143	2244	1358	1529	811	60.5	53.0	-12.4
144/45	215	137	83	42	63.0	50.6	-20.0
TOTAL	3852	2290	2741	1304	59.4	47.5	-20.0

Appendix E. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2017.

	No. Deer Classified				Change in Ratio		
1999-00	December		April		December	April	% Change
	Adults		Fawns		Fawns	Juv:100 Adults	
HA135	936	460	559	242	49.1	43.3	-11.8
HA143	1570	934	1225	715	59.5	58.4	-00.1
TOTAL	3250	1816	1872	1009	55.6	53.6	-3.6
1998-99							
HA134	591	321	280	121	54.3	43.2	-20.4
HA135	908	513	416	178	56.5	42.7	-24.4
HA143	1921	1017	1224	540	52.9	44.1	-16.6
TOTAL	3420	1851	1920	839	54.1	43.7	-19.2
1997-98							
HA134	821	386	90	29	47.0	32.2	-31.5
HA135	1081	621	415	160	57.4	38.6	-32.8
HA143	1769	896	1528	648	50.7	32.4	-16.4
TOTAL	3671	1903	2033	837	51.8	41.2	-20.5
1996-97							
HA134	1092	570	217	25	72.6	11.5	-84.2
HA135	1601	867	231	82	75.7	35.5	-53.1
HA143	1221	791	1202	401	64.8	33.4	-48.5
TOTAL	3914	2228	1650	508	56.9	30.7	-46.0
1995-96							
HA134	431	228	334	106	54.2	31.7	-41.5
HA135	735	407	416	180	55.4	43.0	-22.4
HA143	1925	942	1369	483	48.9	35.3	-27.8
144/45	551	254	206	39	46.1	18.9	-59.0
TOTAL	3642	1831	2325	808	50.3	34.8	-30.8
1994-95							
HA134	1331	574	596	221	43.1	37.1	-13.9
HA135	434	245	489	219	56.5	44.8	-20.7
HA137	361	172	217	85	47.6	39.2	-17.6
HA143	1965	759	1189	514	38.6	43.2	+10.6
TOTAL	4742	2133	2491	1039	45.0	41.7	-7.3
1993-94							
HA134	564	202	318	88	35.8	27.7	-22.6
HA135	360	148	357	108	41.1	30.3	-26.3
HA137	229	64	254	79	27.9	31.1	+10.3
HA143	1165	395	957	301	33.9	31.5	-7.1
144/45	298	170	108	41	57.0	38.0	-33.3
TOTAL	2667	1002	1994	617	37.6	30.9	-17.8
1992-93							
HA134	1089	530	190	21	48.7	11.1	-77.2
HA135	470	253	92	16	53.8	17.4	-67.7
HA143	1924	548	1281	251	28.5	19.6	-31.2
144/45	515	174	193	24	33.8	12.4	-63.3
TOTAL	4586	1782	1756	312	38.9	17.8	-54.2



Mule Deer (MD131) - Wyoming Range
HA134, 135-137, 143-145, 147
Revised - 3/05