2015 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2015 - 5/31/2016

HERD: MD534 - GOSHEN RIM

HUNT AREAS: 15
PREPARED BY: MARTIN HICKS

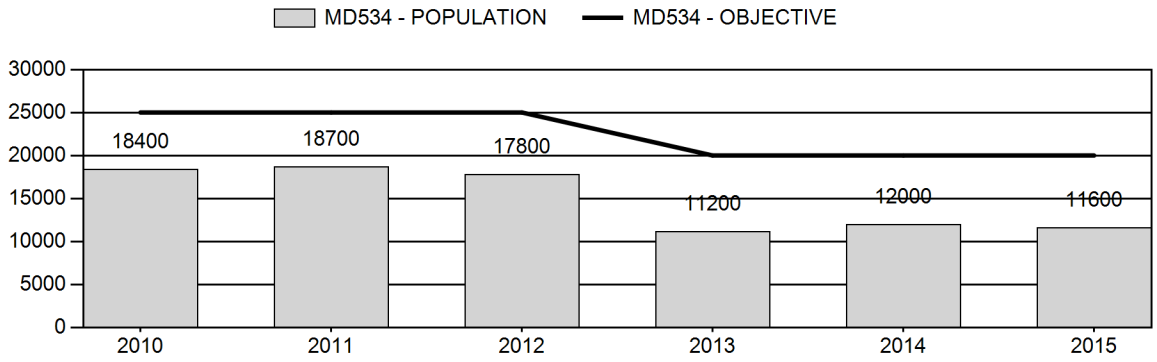
	2010 - 2014 Average	2015	2016 Proposed
Population:	15,620	11,600	12,300
Harvest:	809	924	905
Hunters:	1,677	1,651	1,650
Hunter Success:	48%	56%	55 %
Active Licenses:	1,747	1,742	1,740
Active License Success:	46%	53%	52 %
Recreation Days:	6,460	6,759	6,700
Days Per Animal:	8.0	7.3	7.4
Males per 100 Females	31	37	
Juveniles per 100 Females	64	64	

Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-42%
Number of years population has been + or - objective in recent trend:	5
Model Date:	02/18/2016

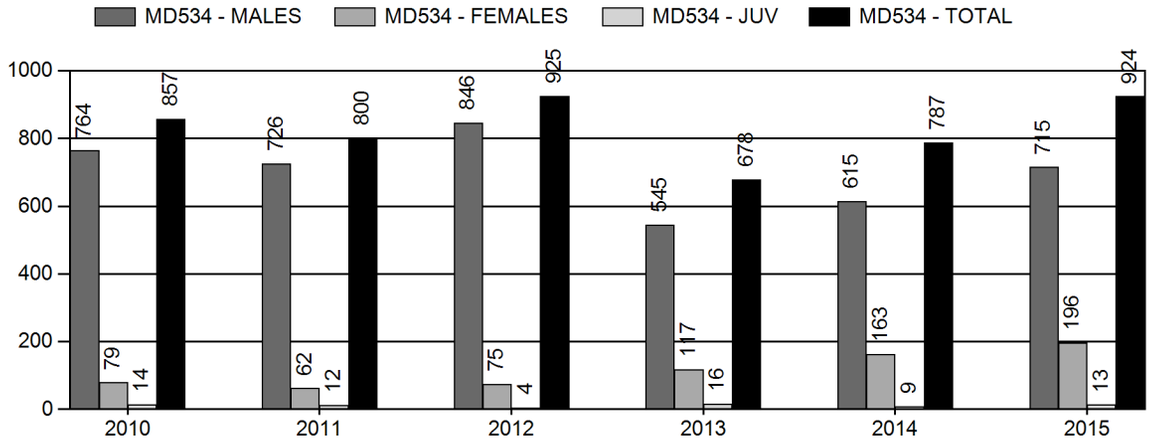
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	3.5%	3.4%
Males ≥ 1 year old:	29%	28%
Juveniles (< 1 year old):	.3%	.2%
Total:	7.3%	6.8%
Proposed change in post-season population:	-1%	+5%

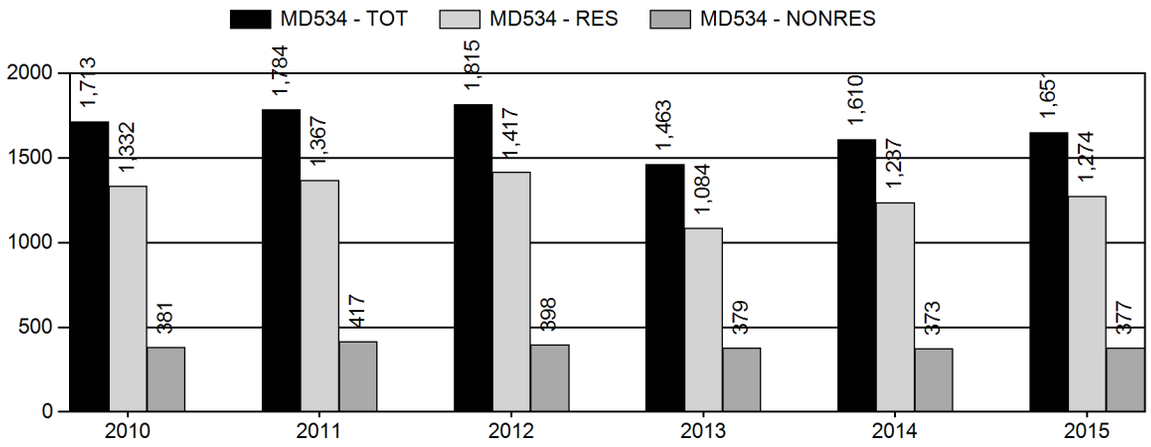
Population Size - Postseason



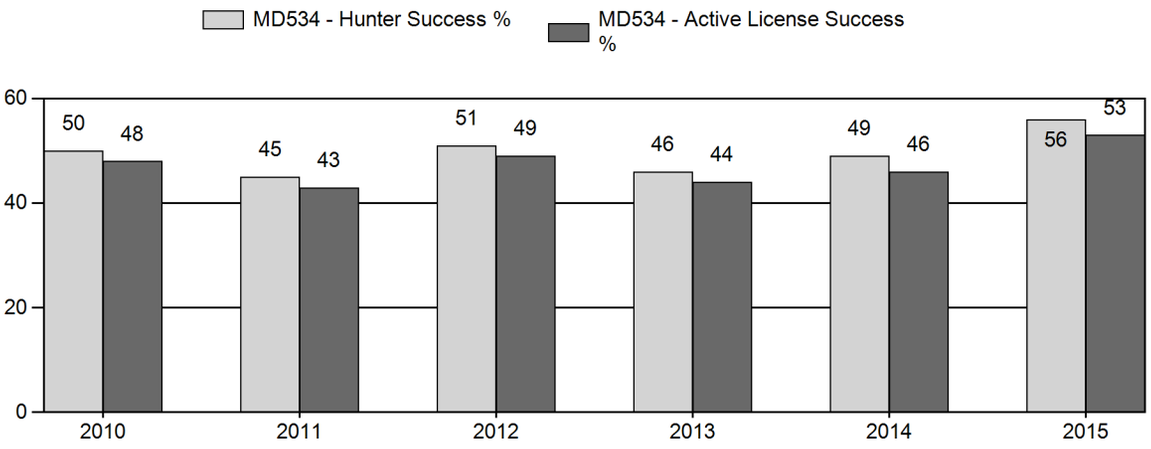
Harvest



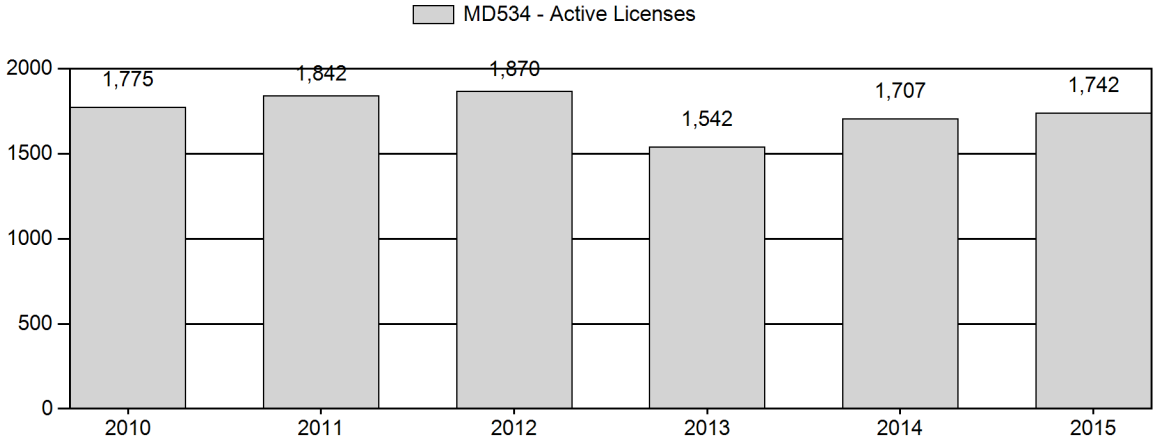
Number of Hunters



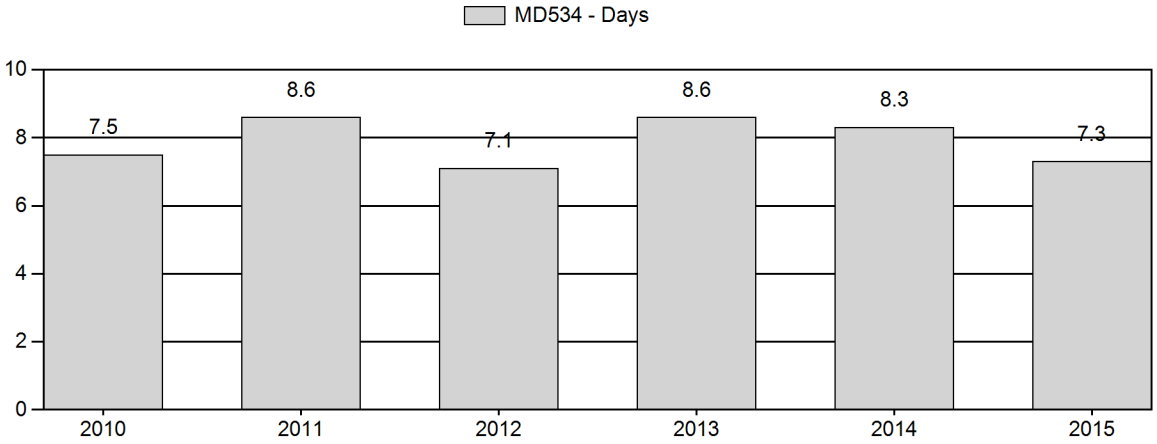
Harvest Success



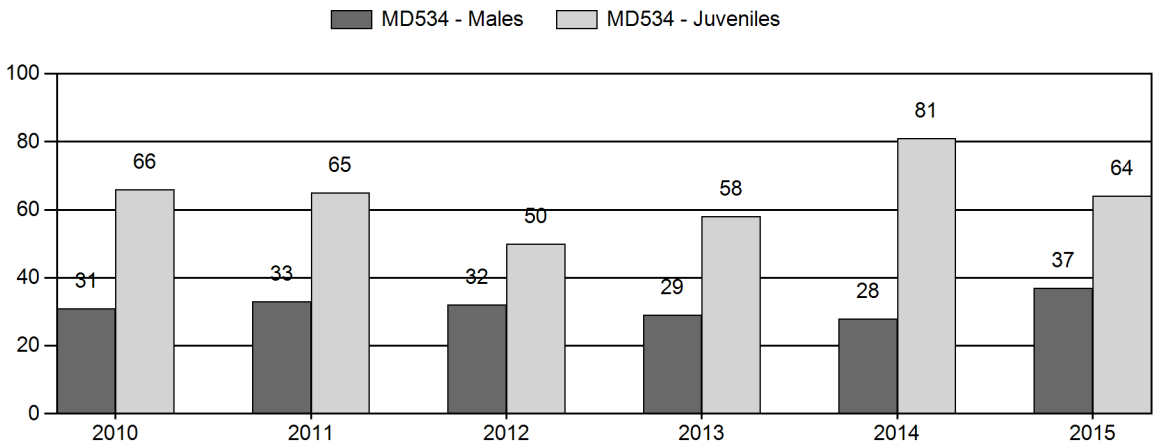
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD534 - GOSHEN RIM

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	18,400	80	0	0	0	125	205	16%	668	51%	440	34%	1,313	1,123	12	19	31	± 3	66	± 5	50
2011	18,700	116	0	0	0	226	342	17%	1,031	51%	665	33%	2,038	1,364	11	22	33	± 3	65	± 4	48
2012	17,800	121	0	0	0	192	313	18%	977	55%	487	27%	1,777	1,076	12	20	32	± 3	50	± 3	38
2013	11,200	39	128	172	21	88	224	15%	776	53%	451	31%	1,451	1,235	5	24	29	± 3	58	± 4	45
2014	12,000	93	53	67	23	7	243	13%	876	48%	706	39%	1,825	1,130	11	17	28	± 2	81	± 5	63
2015	11,600	181	144	64	19	13	421	18%	1,137	50%	726	32%	2,284	1,234	16	21	37	± 2	64	± 3	47

2016 HUNTING SEASONS
GOSHEN RIM MULE DEER HERD UNIT (MD534)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
15	Gen	Oct. 1	Oct. 14		General	Antlered mule deer or any white-tailed deer
15	6	Oct. 1	Dec. 31	350	Limited quota	Doe or fawn
Region T				400		

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
15	Sept. 1	Sept. 30	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
15	6	0

Management Evaluation
Current Management Objective: 20,000 (16,000-24,000)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~11,600
2016 Proposed Postseason Population Estimate: ~12,300
2015 Hunter Satisfaction: 70% Satisfied, 19% Neutral, 11% Dissatisfied

Herd Unit Issues
The management objective for the Goshen Rim Mule Deer Herd Unit was changed from 25,000 to 20,000 and Hunt Areas 15,16,55,57 were combined into Hunt Area 15 as a result of internal recommendations and public input during the 2013 herd objective review process. The management strategy is recreational management with a post-season buck ratio range of 20-29 bucks:100 does.

The 2015 post-season population estimate was approximately 11,600 mule deer with a stable population. Restricted access makes it difficult to manage this herd. Access is driven by isolated private land experiencing damage and small parcels of state, BLM lands, and private lands enrolled into the Department's PLPW program.

Without paying a trespass/trophy fee or hiring an outfitter, hunters have a difficult time harvesting a mature mule deer buck. Landowners and hunters would like to see an increase in mule deer, but without major habitat revitalization (for part of the year mule deer are dependent on irrigated and dryland agriculture fields) this herd unit will most likely remain around 12,000 mule deer. Buck ratios are anticipated to remain on the higher end of the recreational management strategy due to private land (92% of the occupied habitat). Public land hunters will

continue to have a difficult time finding a mature buck due to the majority of land being held in private ownership.

Major landscape changes have been occurring in the southern portion of the herd unit. Urban sprawl continues to increase north and east of Cheyenne as well as industrial (methane production) development in Laramie County. The USDA's Conservation Reserve Program (CRP) has experienced a decline in productivity and quality of perennial forage throughout the herd unit. The conversion of dryland (wheat fields) cropland to CRP in the past provided favorable fawning and winter cover for mule deer. These stands are now monotypic stands of unfavorable perennial grass (i.e. smooth brome and crested wheatgrass) and no legume component, providing little if any habitat benefits.

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were above average at all elevations throughout southeast Wyoming. No significant prolonged periods of extreme heat or cold temperatures were observed, or extreme or prolonged periods of snow loading in lower elevation winter ranges. Timing of precipitation and amounts received during key growth periods for cool season grasses and preferred transitional range and winter range shrub species was excellent. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Weather patterns most likely had a positive influence on all big game species. For specific meteorological information for the Goshen Rim herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs.

Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if the predominant species. This herd unit is comprised of a mix of native rangelands, CRP, dryland and irrigated croplands. Because of the availability of croplands throughout the herd unit, native rangeland habitat conditions are likely not as important to mule deer. Shrub habitats monitored in the past along the Goshen Rim have shown a high proportion of shrub in the decadent age class, with little to no natural regeneration occurring.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species.

In Summer 2015, population biologists and habitat managers began working together to modify habitat monitoring techniques utilized statewide and to improve overall consistency among the regions. Identification of key herd units per big game species, assessing habitats through landscape scale inventory methods versus monitoring a handful of permanent monitoring sites, assessing habitats in all seasonal ranges (summer, transition, winter), and development of

correlations to amounts of and timing of precipitation will help improve the overall value of data collected and result in our abilities to more strongly correlate management decisions for populations based off habitat conditions.

Field Data

This herd experienced a sharp decline in 2012 following the worst drought recorded since the 1930's and since then has been fluctuating around 12,000 mule deer. General licenses have focused harvest on the male segment of the population with little effort to remove females. There were 350 Type 6 licenses available for the 2015 season for some doe harvest opportunity and address damage situations. On average less than 1 percent of the female population is harvested. Chronic wasting disease is not as prevalent in this herd when compared to the Laramie Mountains Mule Deer and the South Converse Mule Deer Herd Units, but the long-term prevalence rate average of 11% is most likely impacting population performance to an unknown extent.

Fawn ratios in 2015 (64 fawns:100 does) significantly decreased compared to 2014 (81 fawns:100 bucks) to a level that is the same as the five-year average. This ratio is slightly below 66 fawns:100 bucks which is the level needed to increase a population (Unsworth et al. 1999). Above average fawn ratios in 2014 helped to bolster buck ratios in 2015 (37 bucks:100). Yearling buck ratios (16 yearling bucks:100 does) were well above the five-year average of 10 bucks:100 does. However, even with the spike in buck ratios, based on personnel and hunter observation's the buck ratios on accessible lands are more likely to remain on the lower end of the recreation management strategy.

In 2015, 32% of the field harvest data was comprised of yearling bucks, which was slightly higher than 2014 but with only half the sample size. The majority of yearling mule deer that are aged in the field typically come from public land where hunters are usually less selective, so the 32% is not surprising. Yearling buck harvest data in 2015 correlated well with post-season fawn ratios from 2014 (81 fawns:100 does) and 2015 post-season classifications (16 yearling bucks:100 does), supporting the validity in 2014 fawn ratios and 2015 yearling buck ratios. On public land the majority of mature male deer are typically 2-3+ years old, however on private land where access is controlled, the average age is usually 4-6+ years old. Based on field observations and field harvest data, public land hunters typically harvest younger deer, lending credibility to a lower buck:doe ratio on the limited amount of public lands.

Since 2012 antler class data has been collected from harvested mule deer, then in 2013 data was collected from classified mule deer to gauge buck quality. Antler class data is broken down into three classes: 1) Class I- $\leq$19", 2) Class II- 20-25", Class III- $\geq$26". Typically harvest class data is similar to classification class data (see tables from JCR). There was a 50% decrease in sample size for harvest antler data in 2015 compared to 2014; therefore any comparisons need to be interpreted with precaution. The sample size for post-season classifications was met in 2015 lending credibility to that data set. The percent of Class I bucks observed during post-season classifications was by far the majority of bucks (78%) observed in 2015, where in the past it is typically a more even split. The small sample size for field check data is most likely a factor in the disparities. The only similarities between field harvest and composition data was few Class III bucks were observed, both were around 10% of the respected data set. Based on these observations it appears there will be a significant increase in 2+ bucks for the 2016 season. The

hunter satisfaction rate of 70% was higher than the 2014 rate of 64%. This increase is most likely a result of an increase in success, harvest and a decrease in effort.

Harvest Data

Hunter success (56%) was higher than the five-year average of 48%, and hunter effort (7.3 days/harvest) decreased compared to the five-year average of 8.0 days per harvest. Access continues to be an issue in this herd unit with 92% of the occupied habitat consisting of private land. The only major access is the PLPW's Hunter Management Program on the Guernsey Guard Camp, walk-in areas, and the various Wildlife Habitat Management Areas. Access for the most part is driven by damage, which is the reason for the Type 6 licenses. Access for buck harvest is extremely difficult unless a hunter is willing to pay a trespass fee or hire an outfitter. Private land ratios inflate overall buck ratios to the higher end of the recreational management strategy. With that said, it is interesting that harvest data improved compared to the 5-year average. The number of hunters that went to the field was just slightly higher than last year and the five-year average. Weather conditions were similar to the 2014 season; except there was a major snowstorm event in 2014 that possibly resulted in the slight decline in hunter participation and perhaps affected hunter's ability to harvest a mule deer.

Population

The "Time-Specific Juvenile and Constant Adult Survival" (TSJ,CA) spreadsheet model was chosen to use for the post-season population estimate of this herd. The model has a slightly higher AIC value but did have the best fit compared to the other two models. Given the better fit of data and perceived population trend by personnel, landowners and hunters this seemed like the most plausible model. Juvenile survival ranges varied from a high of 90% to a low of 40% with an average of 60%. Hunters and landowners would like to see a continued increase in the population, however, given poor fawn production CWD, and poor shrub conditions an increase is not likely in the near future. This models ranks poor, the only data available is classification and harvest data.

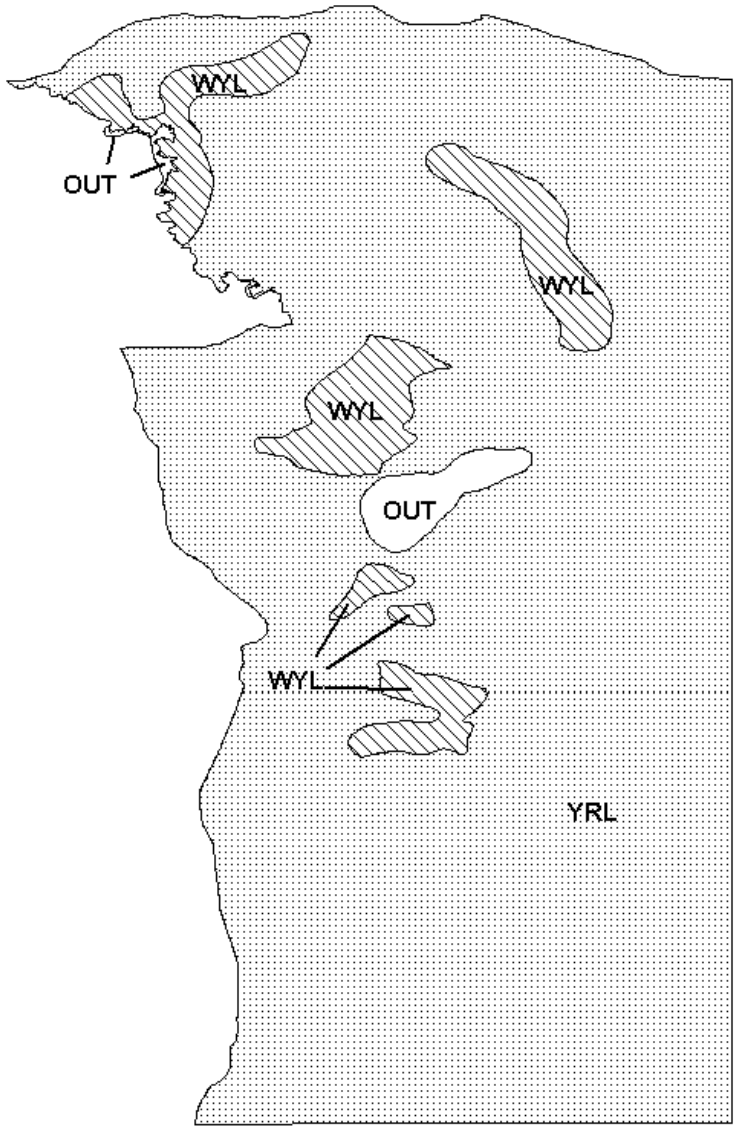
Management Summary

Hunting seasons in this herd unit have traditionally started on October 1 and run for 11 to 14 days for the general season with limited doe/fawn harvest opportunity running later. The same season structure in 2015 will remain the same for 2016; general season October 1-14 and 350 Type 6 licenses. Department personnel will work with landowners and hunters to distribute harvest as damage issues arise. The Region T licenses will remain at 400. In 2015 94% of the licenses were active, similar to the number of hunters that went to the field in 2014 when 500 Region T licenses were available. Based on license sales and available access opportunities the current number of Region T licenses seems adequate.

If we attain the projected harvest of 905 mule deer and observe normal fawn production the predicated mule deer population of 12,300 will continue to remain well below the objective of 20,000.

Literature cited:

Unsworth, JW, Pac DF, White GC, and Bartmann BC: Mule deer survival in Colorado, Montana, and Idaho. J. Wildl. Manage. 63(1):315-326, 1999



Mule Deer (MD534) - Goshen Rim
HA 15, 16, 55, 57
Revised - 97

2015 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2015 - 5/31/2016

HERD: MD537 - LARAMIE MOUNTAINS

HUNT AREAS: 59-60, 64
PREPARED BY: MARTIN HICKS

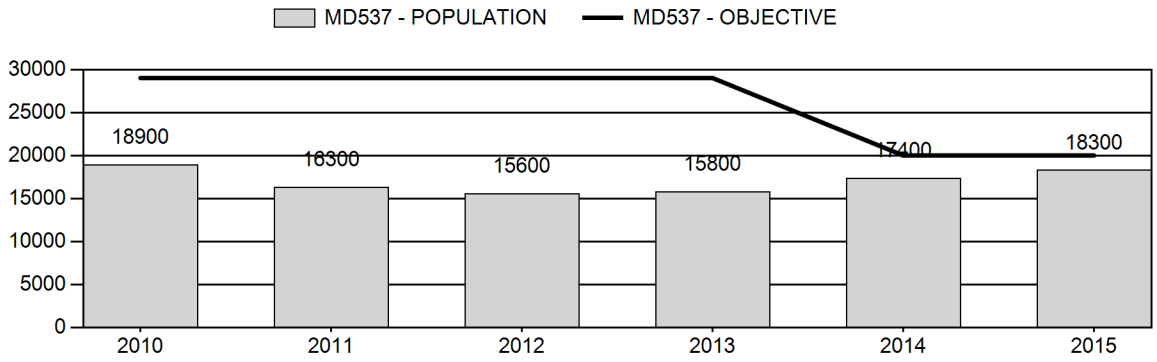
	2010 - 2014 Average	2015	2016 Proposed
Population:	16,800	18,300	18,200
Harvest:	1,093	1,065	1,000
Hunters:	2,068	1,839	1,840
Hunter Success:	53%	58%	54 %
Active Licenses:	2,143	1,879	1,880
Active License Success:	51%	57%	53 %
Recreation Days:	9,588	7,134	7,135
Days Per Animal:	8.8	6.7	7.1
Males per 100 Females	38	52	
Juveniles per 100 Females	64	73	

Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-8.5%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/18/2016

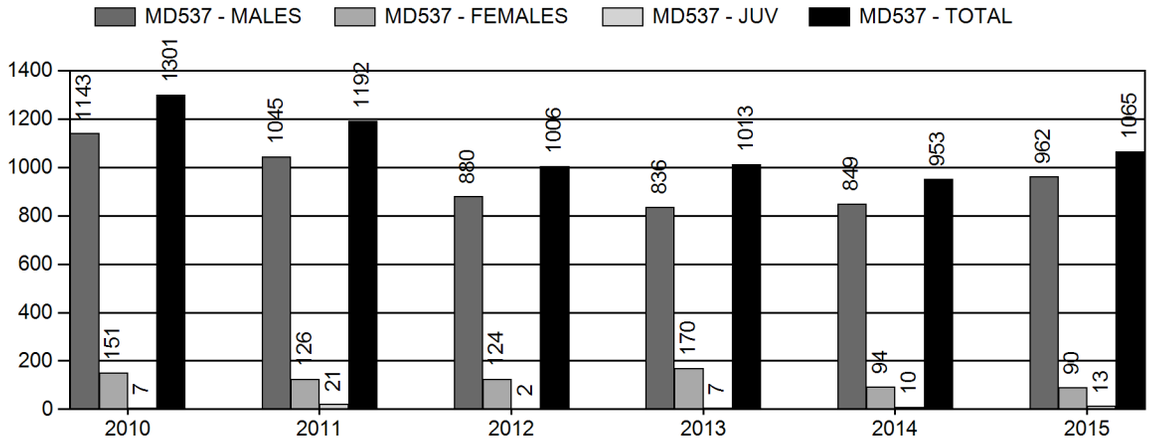
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	1.2%	1.1%
Males ≥ 1 year old:	22.5%	20.8%
Juveniles (< 1 year old):	.2%	.1%
Total:	5%	5%
Proposed change in post-season population:	-9%	-1%

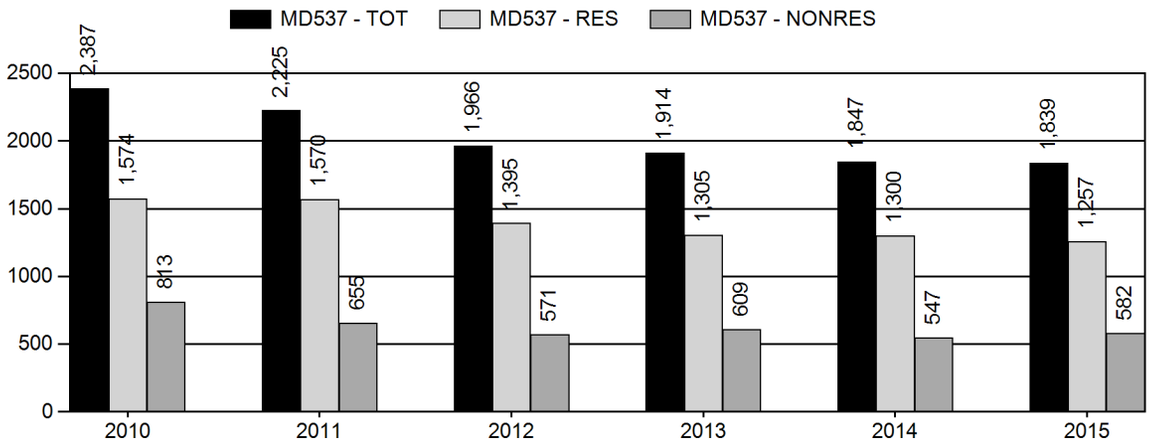
Population Size - Postseason



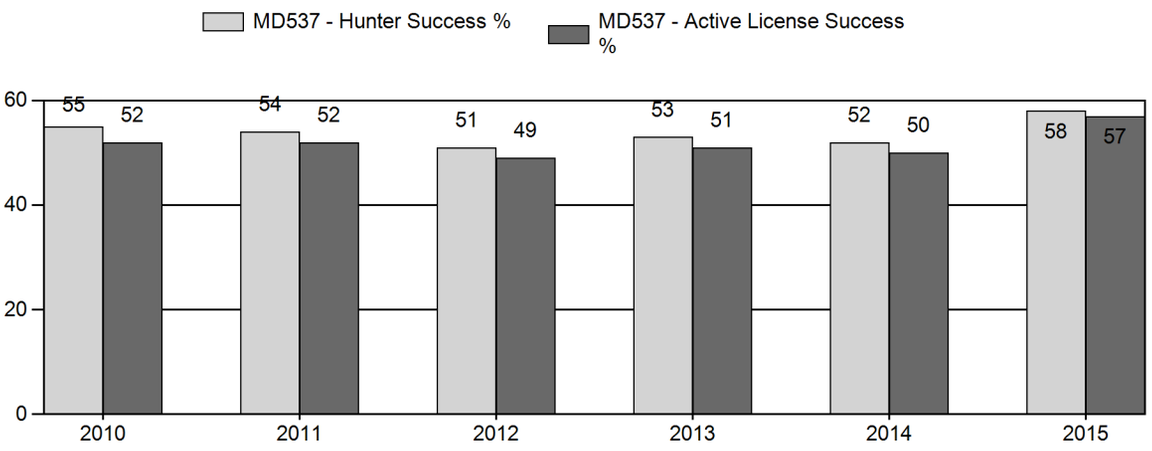
Harvest



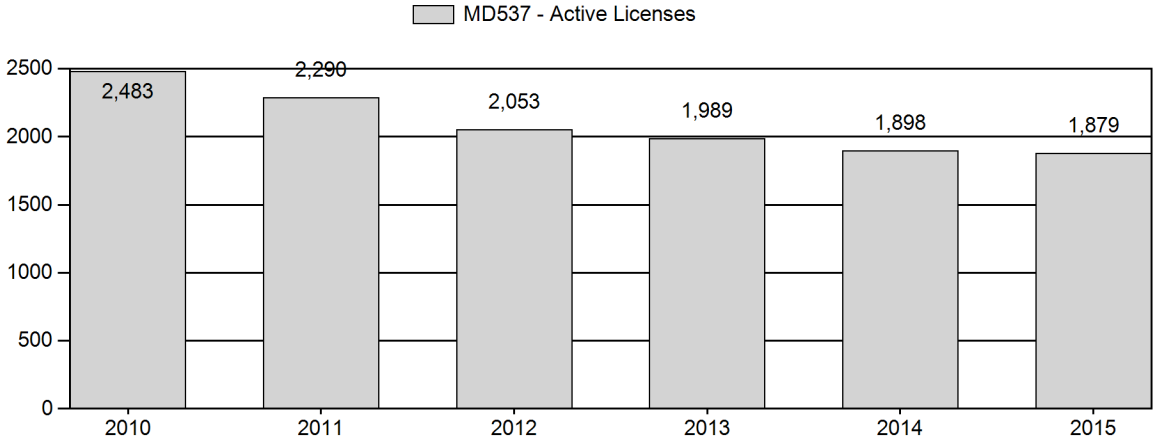
Number of Hunters



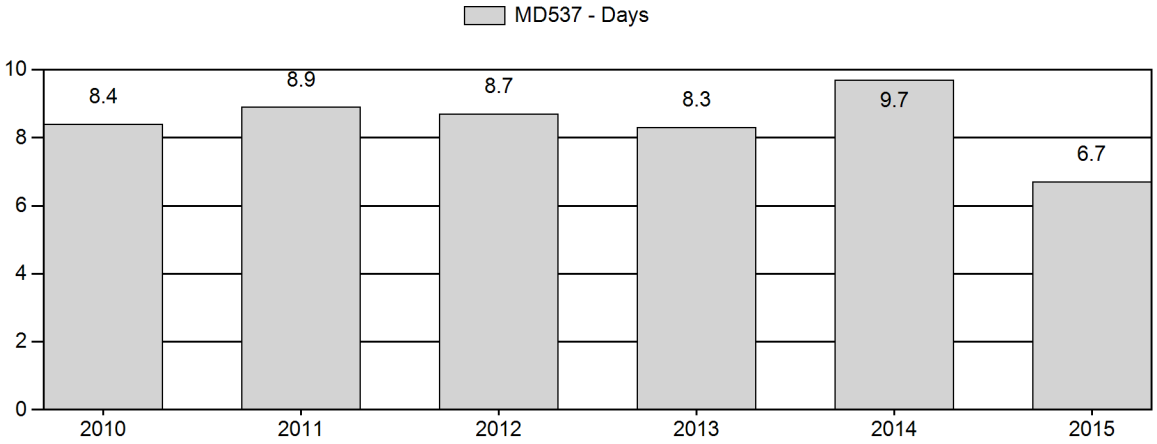
Harvest Success



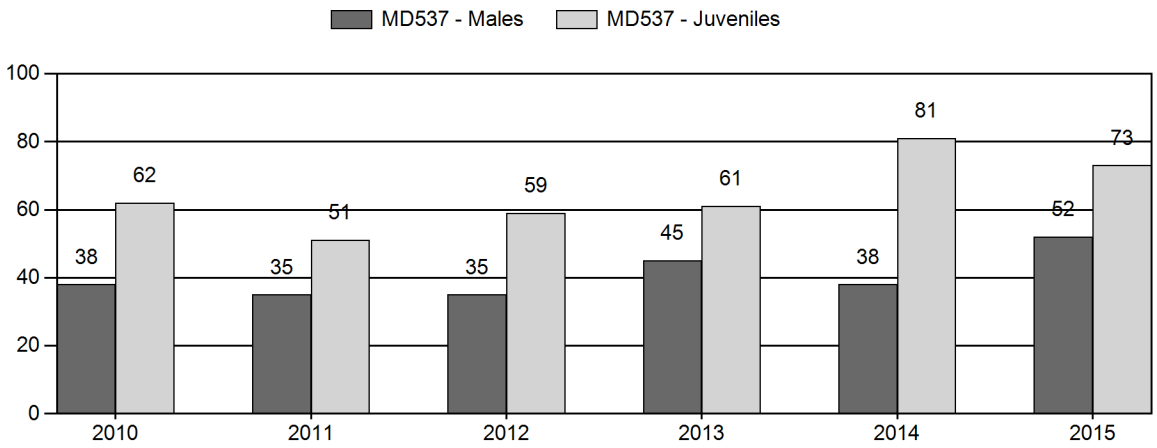
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD537 - LARAMIE MOUNTAINS

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	18,900	205	0	0	0	425	630	19%	1,639	50%	1,015	31%	3,284	1,202	13	26	38	± 2	62	± 3	45
2011	16,300	102	0	0	0	296	398	19%	1,122	54%	570	27%	2,090	1,263	9	26	35	± 2	51	± 3	38
2012	15,600	83	0	0	0	162	245	18%	699	51%	415	31%	1,359	1,218	12	23	35	± 3	59	± 5	44
2013	15,800	23	101	104	9	2	239	22%	528	48%	324	30%	1,091	1,161	4	41	45	± 4	61	± 5	42
2014	17,400	147	177	161	36	0	521	17%	1,384	46%	1,115	37%	3,020	1,135	11	27	38	± 2	81	± 4	59
2015	18,300	290	203	97	16	0	606	23%	1,164	44%	850	32%	2,620	1,304	25	27	52	± 3	73	± 4	48

2016 HUNTING SEASONS
LARAMIE MOUNTAINS MULE DEER HERD (MD537)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
59	Gen	Oct. 15	Oct. 25		General	Antlered mule deer or any white-tailed deer, except the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Research Center at Sybille shall be closed
59,64	6	Oct. 15	Oct. 31	100	Limited quota	Doe or fawn, valid on private land
59,64	6	Nov. 1	Dec. 31			Doe or fawn white-tailed deer
60	1	Oct. 20	Nov. 5	100	Limited quota	Antlered deer on national forest, any deer valid off national forest; All lands within Curt Gowdy State Park, archery only
60	1	Nov. 6	Nov. 30			Doe or fawn white-tailed deer valid off national fores; all lands within Curt Gowdy State Park, archery only
60	2	Oct. 20	Nov. 5	200	Limited quota	Any deer valid off national forest; all lands within Curt Gowdy State Park, archery only
60		Nov. 6	Nov. 30			Doe or fawn white-tailed deer valid off national forest; all lands within Curt Gowdy State Park, archery only
60	6	Oct. 20	Nov. 30	50	Limited quota	Doe or fawn; all lands within Curt Gowdy State Park, archery only
64	Gen	Oct. 15	Oct. 25		General	Antlered mule deer or any white-tailed deer, except the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Habitat Management Area and the Laramie Peak Wildlife Habitat Management Area north of the Tunnel Road (Albany County Rd 727), shall be closed
64	2	Oct. 15	Oct. 25	100	Limited quota	Antlered mule deer or any white-tailed deer
59,60,61,64, 65	J			900		

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
59,60,64	Sept. 1	Sept. 30	Refer to Section 2 of this Chapter

Summary of Change

Hunt Area	License Type	Quota Change from 2015
62,63,64	T6	0
60	T1	0
60	T2	0
60	T6	0
64	T2	0
59,60,61,64,65	Region J	0

Management Evaluation
Current Post-season Population Objective: 20,000 (16,000-24,000)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~18,300
2016 Proposed Postseason Population Estimate: ~18,200
2015 Hunter Satisfaction: 71% Satisfied, 16% Neutral, 13% Dissatisfied

Herd Unit Issues
The management objective for the Laramie Mountains Mule Deer Herd Unit was reviewed in 2014 and as a result of internal and public involvement the objective was decreased to 20,000 mule deer and Hunt Areas 59,62,63 were combined into Hunt Area 59 and Hunt Areas 64,73 were combined into Hunt Area 64. The recreational management strategy will remain in place with a post-season buck ratio range of 20-29 bucks:100 does.

The 2015 post-season population estimate was about 18,300 with the population fluctuating around 17,000. Chronic wasting disease (CWD) has been detected in this herd for well over two decades. The average prevalence rate since 1997 is 23%, contributing towards the suppression of this herd. Management strategy has been very conservative with little doe harvest to try and increase the herd. Approximately 50% of the herd unit is private lands which affects our ability to provide opportunity.

The Arapahoe wild fire in 2012 will have habitat effects for years to come. In some areas perennial vegetation is responding. In other places the ground appears sterile with little to no vegetation growth. Mule deer have been harvested in the burned areas since. Mule deer occupation in burned areas was also documented during the winter of 2013. In the long run this major fire will be a positive event for ungulate habitat. It will take time to see the major re-vegetation events. A major snowstorm event that dropped 2-3' of snow followed by 60+mph

winds in February, 2016 could possibly have had a negative impact on mule deer survival. Managers will know more this spring if there was a high mortality loss.

Landowners and sportsmen would like to see more mule deer. To address this desire the Type 6 license are proposed to stay at a conservative number.

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were above average at all elevations throughout southeast Wyoming. No significant prolonged periods of extreme heat or cold temperatures were observed, or extreme or prolonged periods of snow loading in lower elevation winter ranges. Timing of precipitation and amounts received during key growth periods for cool season grasses and preferred transitional range and winter range shrub species was excellent. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Weather patterns most likely had a positive influence on all big game species. For specific meteorological information for the Laramie Mountains herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs.

Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if the predominant species. In Summer 2015, Colorado State University natural resource program scientists worked cooperatively with WGFD and USFS personnel to map cheatgrass infestations via satellite imagery and on-the-ground vegetation sampling efforts. This data showing cheatgrass prevalence will be available for habitat managers to utilize in 2016. Future herbicide applications to control cheatgrass will likely be largely based off of this data. With recent completion of an Environmental Assessment by the USFS, options have expanded greatly to control cheatgrass, including aerial application of herbicides.

Areas burned by the Arapaho Wildfire of 2012 continue to rebound. Aspen regeneration has been excellent, and appears that in areas assessed that browsing is within acceptable limits that will allow for full recovery of aspen habitats in many places. Significant erosion occurred throughout burned areas in Spring 2015, associated with moisture events. Canada thistle, leafy spurge, and knapweed spp. are present throughout the burn in varying degrees and efforts need to be undertaken to map infestations and implement biological and chemical methods of control. A significant die-off of sagebrush and antelope bitterbrush did occur in portions of the Laramie Range due to a rapid freeze event that occurred in November 2014. The die-off was widespread, from the Front Range of Colorado to the Eastern Plains of Montana. The severity of the die-off

is unknown at this time, and whether or not the shrubs will recover. Affected shrubs did not show any significant signs of re-sprouting in Summer 2015.

A prescribed burn was completed on the Iron Mountain Ranch in late March 2015, impacting 2,500 acres of mixed mountain shrub habitats. Initial herbaceous and woody plant response following treatment was excellent, as expected with the above average precipitation that fell in Spring 2015. Previous prescribed burns completed within the Iron Mountain herd unit continue to outperform untreated habitats, particularly in shrub annual leader production. A second prescribed burn encompassing 1,700 acres of mixed conifer / aspen habitats was completed on the Mule Creek Ranch in September 2015. Monitoring of the site will occur in 2016 to measure aspen, mixed mountain shrub, and herbaceous response to treatment, as well as utilization levels by big game.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species.

In Summer 2015, population biologists and habitat managers began working together to modify habitat monitoring techniques utilized statewide and to improve overall consistency among the regions. Identification of key herd units per big game species, assessing habitats through landscape scale inventory methods versus monitoring a handful of permanent monitoring sites, assessing habitats in all seasonal ranges (summer, transition, winter), and development of correlations to amounts of and timing of precipitation will help improve the overall value of data collected and result in our abilities to more strongly correlate management decisions for populations based off habitat conditions.

Field Data

Fawn ratios of 73 fawns:100 does in 2015 were lower than 2014, which was the highest observed in over ten years (81 fawns:100 does), but were still well above the 5-year average (62 fawn:100 does) allowing for population growth. According to Unsworth et al. (1999) populations increase when fawn ratios are above 66 fawn: 100 does. Buck ratios of 52 bucks:100 does were the highest observed in 34 years, well above the recreational management strategy. The majority of the bucks are yearlings (25 yearling bucks:100 does) and 2 year olds. Finding a mature buck on public land is still difficult; very few were recorded in field harvest checks and 2015 classifications. The 2015 sample size was well above the adequate sample size, lending credibility to herd composition data.

Since 2012 antler class data has been collected from harvested mule deer and then starting in 2013 from classified mule deer to gauge buck quality. Antler class data is broken down into three classes: 1) Class I- $\leq$19", 2) Class II- 20-25", Class III- $\geq$26".

Yearling buck harvest in 2015 was similar to 2014 but the majority (48%) of the deer checked in the field were Class I bucks. It was expected that more yearling bucks would be harvested with the all time high yearling buck ratio, but it appears hunters were more selective for 2-3 year old deer, which is interesting since fawn production 2-3 years ago was average. It appears adult

survival was better than average from 2013-2015. This is somewhat plausible given improved habitat conditions as a result of spring moisture.

The majority of mule deer bucks harvested in 2015 were Class I bucks (75%), which is similar to 2012 and 2013. In 2014 the majority of bucks classified during field checks were class II. Mild winter conditions coupled with excellent forage conditions from 2012-2014 most likely contributed to above average survival for male mule deer in order to see a spike in Class II harvest. There are very few class III buck in the harvest and classification data. Lack of access, CWD and lower survival rates most likely contributed to fewer older age class bucks in the field. Based on harvest and classification data there will be a surplus number of bucks available for harvest opportunities in 2016.

Deer were in good condition going into the winter given premium habitat conditions in 2015. The average body score taken from 35 mule deer was 17 out of 20, similar to 2014. According to the 2015 satisfaction survey, 71% of the hunters were satisfied with their quality of hunt. This is significantly higher than 2014 (59%). Harvest statistics indicate that hunters had more success and it took fewer days to harvest a mule deer compared to the five-year average, which is a likely reason for the improved satisfaction level.

Harvest Data

Hunter success in 2015 (58%) was slightly higher than the five-year average of 53% and hunter effort of 6.7 days per harvest was significantly lower than the five-year average of 8.8 days per harvest. These data support an increasing trend in population, which also supports model simulations, personnel, landowner, and sportsmen observations, which is a shift in population trends that is welcomed by the hunting community. The boost in fawn production should help to offset the higher rate of adult mortality due to CWD.

Population

The "Time-Specific Juvenile and Constant Adult Survival" (TSJ,CA) spreadsheet model was chosen to use for the post-season population estimate of this herd. The AIC value was slightly higher but did have a better fit than the other two models. This model was chosen for the following reasons: 1) The model tracks juvenile variability in survival, which is more consistent with this herd unit based on the fluctuations in juvenile composition data, 2) There is a large number of years with classification and harvest data, indicative of the TSJ, CA model, 3) simulated population trends mimic perceived trends observed by local personnel, landowners and hunters. Adult survival was changed in years 2010-2013. Adult survival data from the South Converse Mule Deer Herd Unit CWD study was incorporated from those years since both herd units have high prevalence rates and the Laramie Mountains Herd Unit is adjacent to South Converse. This model is rated as fair to poor, there is not a abundance estimate but there is some survival data. There is not an annual population estimate with a standard error available to anchor the model to, but enough data to give the model a fair fit and results are biologically defensible. Adult survival was adjusted to .7-.8 instead of the recommended range of .7-.95 to account for chronic wasting disease prevalence rates in years that did not have adult survival data.

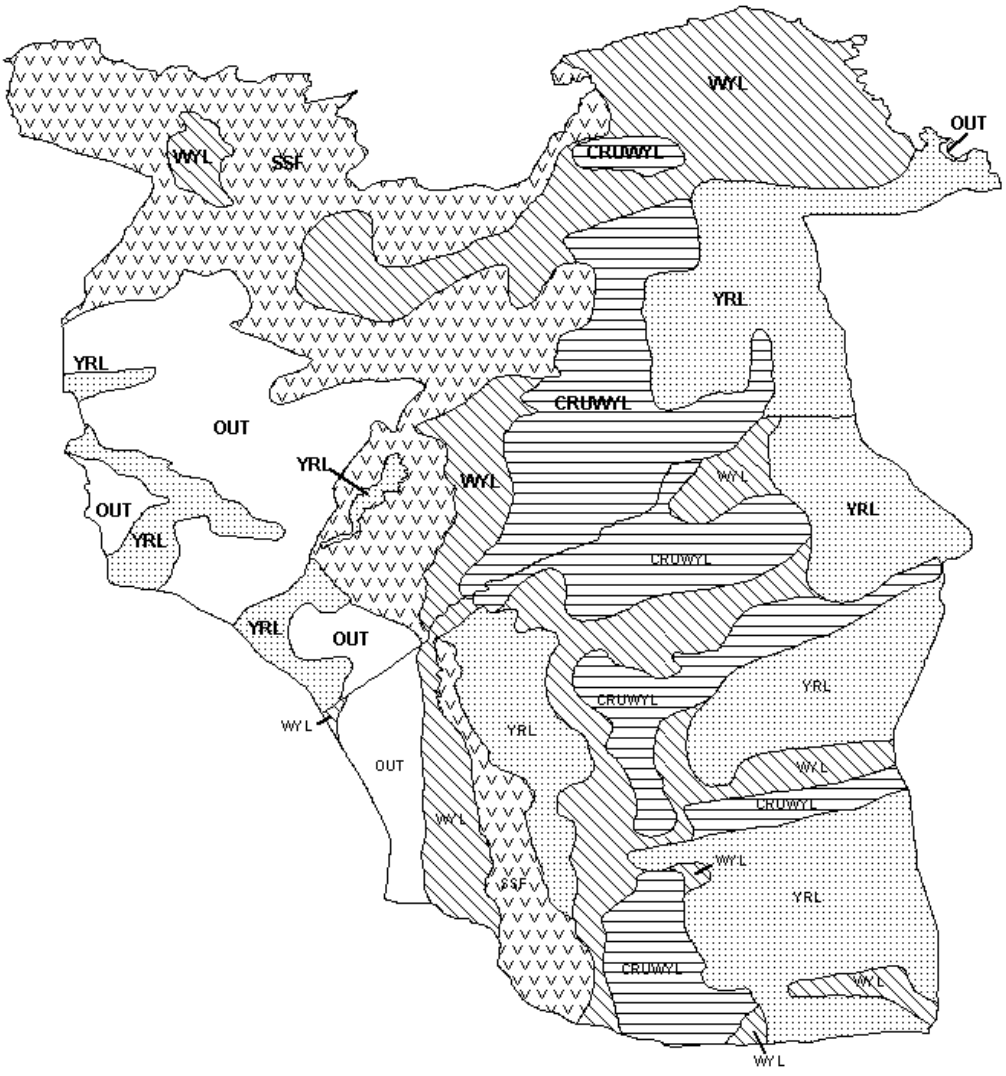
Management Summary

Hunting seasons in this herd unit have started on the 15th of October for the past 9 years have closed on October 25. Late doe/fawn seasons have been used to address damage situations in lower elevations on private land, but the public has overwhelmingly indicated they would like to see more mule deer, so Type 6 licenses have remained conservatively prescribed. The season structure for the general season and Type 6 licenses will remain the same as 2015. Hunt Area 60 remains a sought after license for hunters since it gives hunters a chance to hunt into November when bucks are more susceptible to harvest. Region J licenses will remain at 900 to address low deer densities, especially on public lands. Nonresident licenses continue to decrease over the past few years. The 900 Region J quota will be consistent with recent license sales (2012=949, 2013=779, 2014=822, 2015=819) and hopefully improve harvest statistics and reduce hunting pressure. Despite all time high buck ratios the general firearm season length will not increase. This mule deer herd along with mule deer herds across the state is well below desired levels for not only the population but available bucks. It is our goal that by improving the odds of younger bucks making it to 4-5 years old hunter satisfaction will improve.

If we attain the projected harvest of 1,000 mule deer, maintain average fawn recruitment, and take into account CWD prevalence rates the mule deer population will remain around 18,000 mule deer and fall within the post-season objective range of 16,000-24,000 mule deer.

Literature Cited:

Unsworth, JW, Pac DF, White GC, and Bartmann BC: Mule deer survival in Colorado, Montana, and Idaho. J. Wildl. Manage. 63(1):315-326, 1999



Mule Deer (MD537) - Laramie Mountains
HA 59, 60, 62-64, 73
Revised - 3/04

N

2015 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2015 - 5/31/2016

HERD: MD539 - SHEEP MOUNTAIN

HUNT AREAS: 61, 74-77
PREPARED BY: LEE KNOX

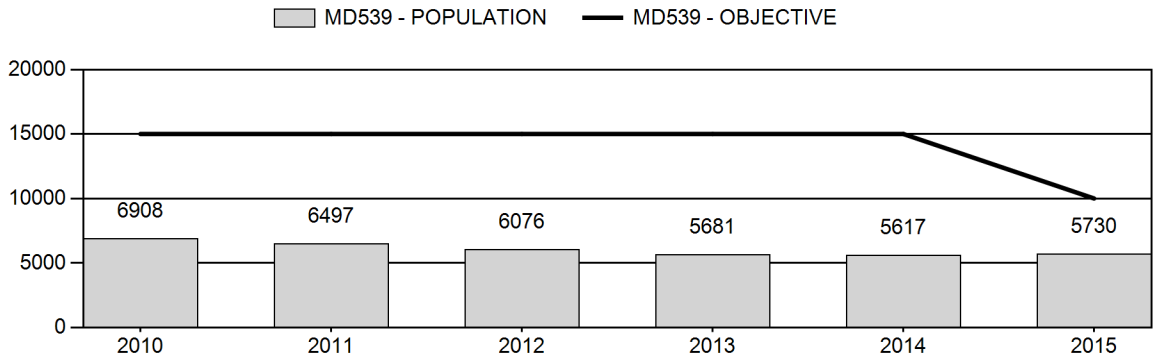
	2010 - 2014 Average	2015	2016 Proposed
Population:	6,156	5,730	6,100
Harvest:	330	368	350
Hunters:	1,532	1,367	1,200
Hunter Success:	22%	27%	29 %
Active Licenses:	1,532	1,367	1,200
Active License Success:	22%	27%	29 %
Recreation Days:	7,750	7,305	7,300
Days Per Animal:	23.5	19.9	20.9
Males per 100 Females	26	39	
Juveniles per 100 Females	57	65	

Population Objective (± 20%) :	10000 (8000 - 12000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-42.7%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/26/2016

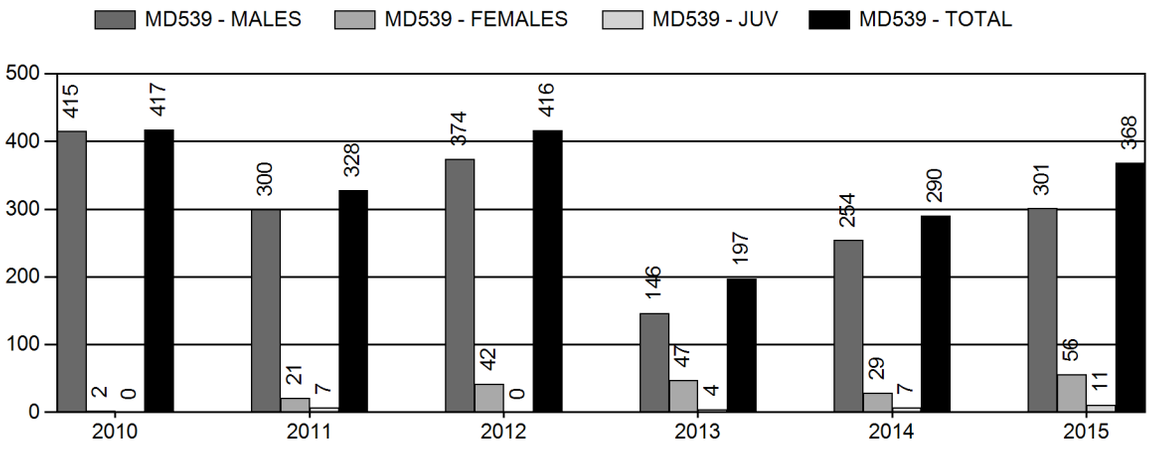
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	.1%	1%
Males ≥ 1 year old:	24%	24%
Juveniles (< 1 year old):	0%	0%
Total:	6%	6%
Proposed change in post-season population:	5%	5%

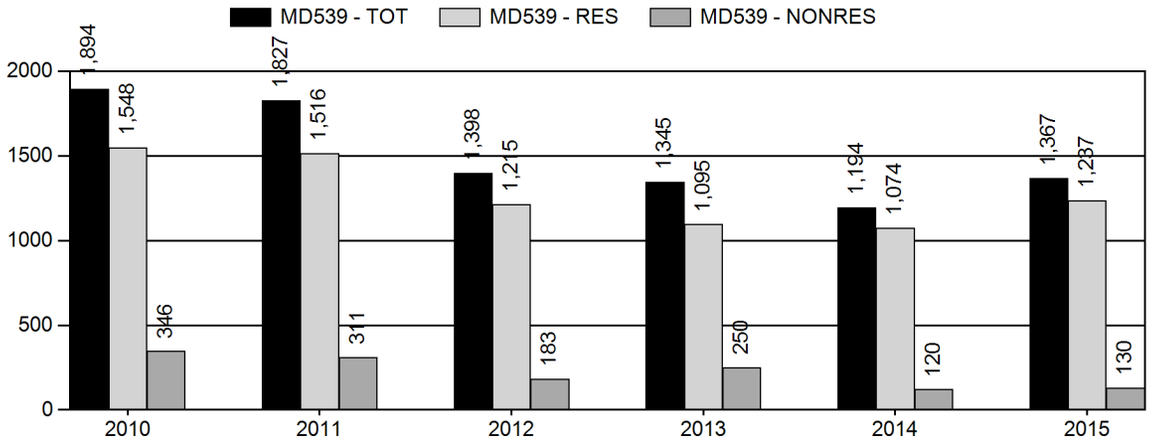
Population Size - Postseason



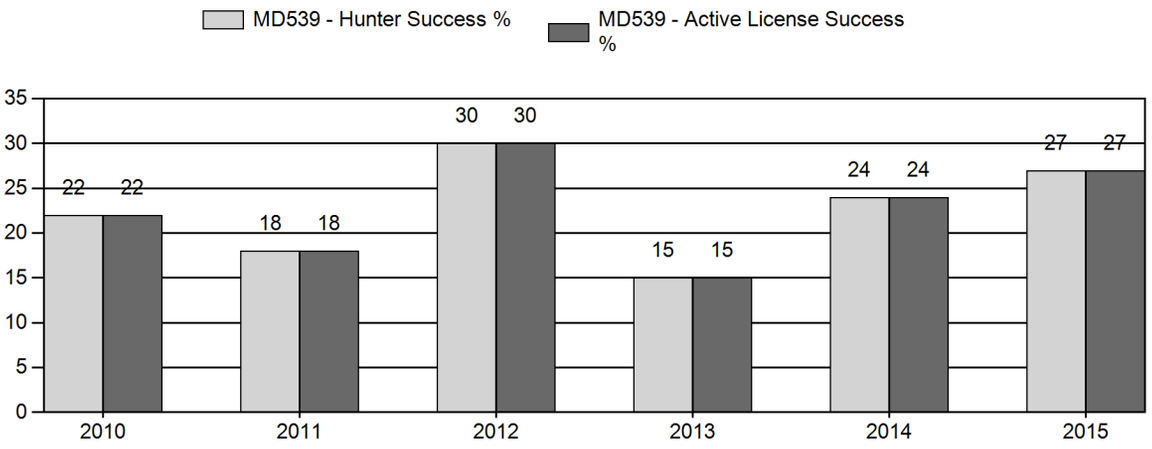
Harvest



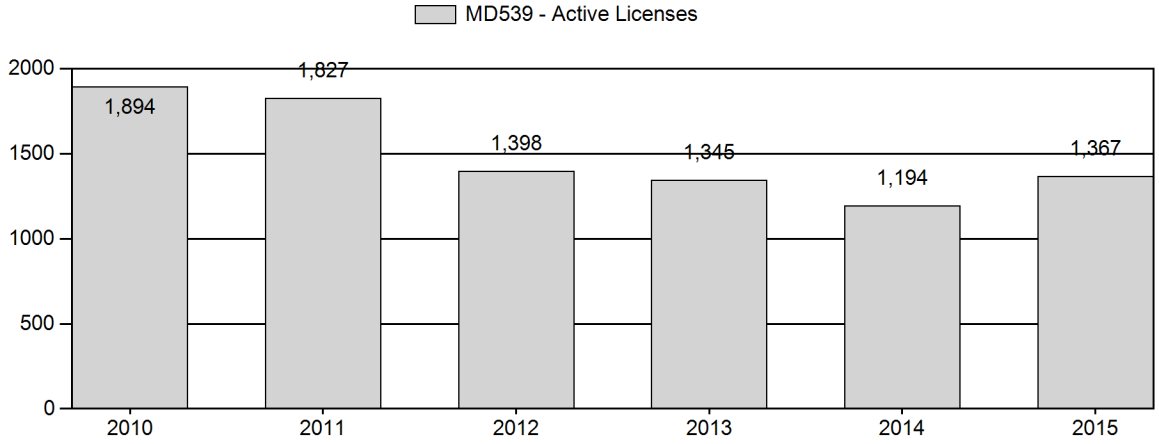
Number of Hunters



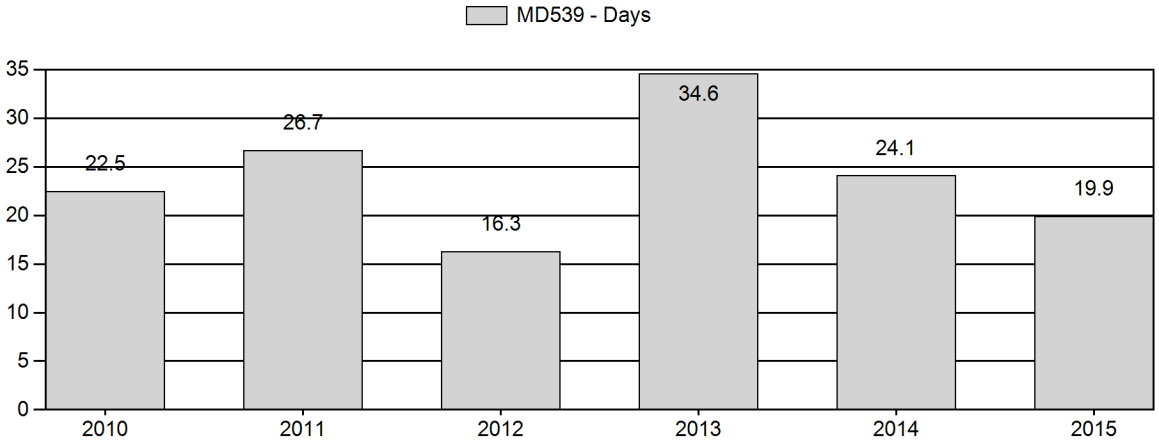
Harvest Success



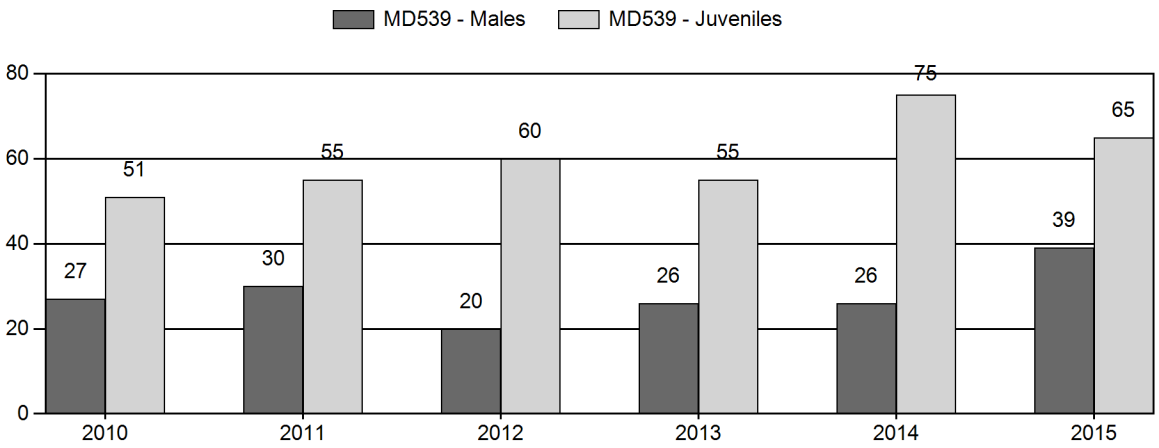
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD539 - SHEEP MOUNTAIN

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	6,908	63	0	0	0	63	126	15%	474	56%	243	29%	843	840	13	13	27	± 3	51	± 5	40
2011	6,497	48	0	0	0	98	146	16%	480	54%	263	30%	889	1,087	10	20	30	± 3	55	± 5	42
2012	6,076	33	0	0	0	52	85	11%	416	55%	249	33%	750	1,047	8	12	20	± 3	60	± 6	50
2013	5,681	82	47	42	16	1	188	14%	721	55%	395	30%	1,304	984	11	15	26	± 2	55	± 4	43
2014	5,617	31	23	14	8	0	76	13%	290	50%	218	37%	584	1,109	11	16	26	± 4	75	± 8	60
2015	5,730	83	56	47	21	0	207	19%	531	49%	347	32%	1,085	1,099	16	23	39	± 4	65	± 5	47

2016 HUNTING SEASONS
Sheep Mountain Mule Deer (MD539)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
61		Oct. 1	Oct. 7		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
74		Oct. 1	Oct. 7		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
75		Oct. 1	Oct. 7		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
76		Oct. 1	Oct. 7		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
77		Oct. 1	Oct. 7		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
61,74,75,76,77	Sep. 1	Sep. 30

Region D Nonresident Quota: 400

Management Evaluation
Current Postseason Population Management Objective: 10,000 (8,000-12,000)
Management Strategy: Recreational
2015 Postseason population Estimate: ~ 5,700
2016 Proposed Postseason Population Estimate: ~ 6,100
2015 Hunter Satisfaction: 64% Satisfied, 20% Neutral, 16% Dissatisfied

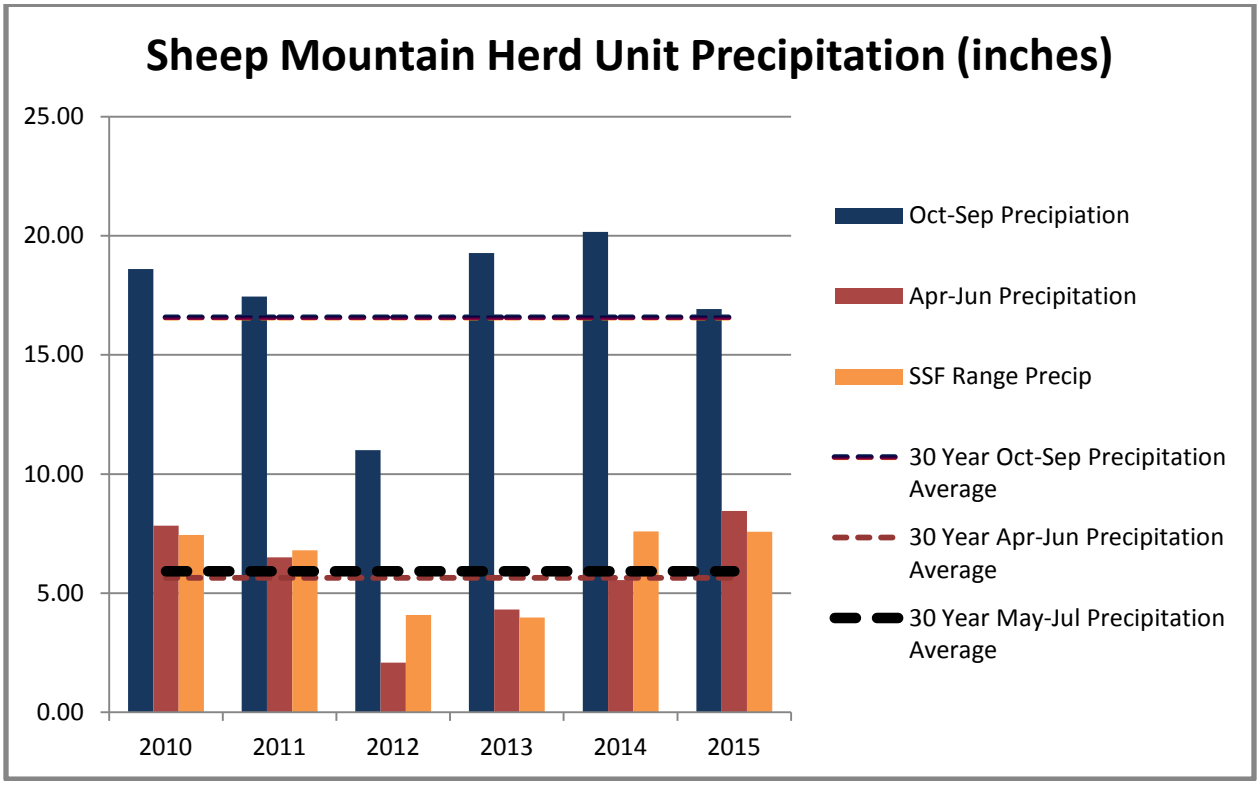
The management objective for the Sheep Mountain Mule Deer herd unit is a post-season population objective of 10,000 mule deer. The management strategy is recreational management

with guidelines to maintain a post hunt buck ratio of 20 to 29:100 does. The objective and management strategy was reviewed in the spring of 2015.

Herd Unit Issues

The Sheep Mountain herd unit encompasses hunt areas 61, 74, 75, 76 and 77. Landownership varies from mostly private lands with limited public access, to large portions of public lands. The 2015 post-season population estimate is approximately 5,700 with the population trending up after a decline from 7,500 in 2009. The Sheep Mountain herd unit historically has one of the lowest hunter success rates in the state. Most of the herd's summer range is in dense lodge pole or spruce forests that were once heavily logged in the 1960s and 1970s. There is a large scale forest die off from pine and spruce beetles, and though we think it will be beneficial, the effects are unknown. Winter and transition range is limited. In 2012 there was a large scale wildfire that is thought to be beneficial in the long run, but currently has caused displacement. Black bear and lion mortality limits were liberalized, and season lengths were increased. We finalized a three year predator removal project with the Albany County Predator Board focusing on key mule deer parturition areas in the Sheep Mountain herd unit to evaluate the effect of coyotes on fawn recruitment. We are currently beginning a mule deer initiative process with this herd unit. It has helped spark more discussions with the WGFD, federal agencies and non-government organizations that should turn into some good on the ground improvements that will be beneficial.

Precipitation

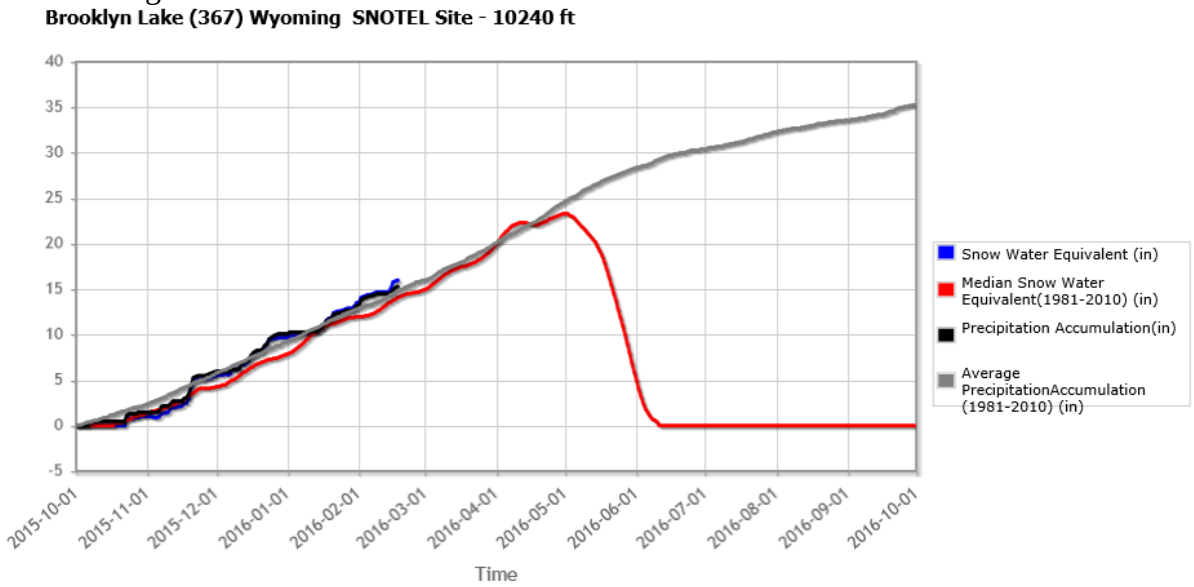


Parameter-Elevation Relationships on Independent Slopes Model (**PRISM**) utilized to estimate to estimate precipitation by calculating a climate-elevation regression for each Digital Elevation Model grid cell (*4 km resolution*).

Precipitation from October 2014 – September 2015 was slightly higher than the 30 year average. Precipitation during the growing season (April thru June 2015) across all seasonal ranges, and growing season precipitation in higher elevation spring/summer/fall ranges (May – July 2015) was notably higher than the 30 year average. As is consistent with most prominent mountain ranges in Wyoming, the majority of precipitation fell during the period outside of the primary growing season, likely in the form of snow, particularly at higher elevations. From August – October, conditions were very mild and dry.

Winter Severity

Winter 2015 - 2016, as of mid-February, has been fairly mild, with upper elevations in the Snowy Range near 100% of normal for snowpack, but lower elevations lacking in persistent snow through most of the winter.



Snotel Site within Sheep Mountain Herd Unit (October 2015 – February 2016)

Habitat

Growing season precipitation was above normal in 2015, resulting in excellent growth of grasses, forbs, and shrubs across all seasonal ranges. Exceptional fall precipitation in 2014 resulted in green-up of forages, allowing mule deer to enter winter in above-average body condition. High soil moisture levels from fall 2014 precipitation events and normal snowpack in winter 2015 likely positively impacted vegetation growth in spring 2015. However, despite favorable precipitation levels, many important shrub habitats continue to underperform due to maturity and decadence, caused by a lack of disturbance.

Deer fecal pellets were collected across several locations in winter 2015 to determine winter dietary preferences within the herd unit. In summary, fecal collections from unburned habitats were comprised of 90% - 95% shrubs, with big sagebrush leaf material being the major dietary

component. In areas burned by wildfire, diets were diverse and included 15% forbs, 13% grasses, and 72% shrubs.

No permanent vegetative transects were read this year within this herd unit, but considerable effort was spent assessing habitats with new "Rapid Habitat Assessment" methodologies developed by the Department. Landscape scale assessments were completed in the Red Mountain, Jelm Mountain, Woods Landing, Squirrel Creek wildfire affected areas, Sheep Mountain, Wick WHMA and in high elevations in the Rock Creek drainage of the Snowy Range. Habitat types assessed included aspen in known parturition habitats, mixed mountain shrubs in transitional and winter ranges, and riparian habitats / willow complexes in high elevations. The local game warden, biologist, wildlife supervisor, and statewide habitat biologist assisted with assessments. Forage production of cool season grasses and forbs was excellent, and signs of herbivory (wild or domestic) were minimal in sites assessed in July. Aspen regeneration post-Squirrel Creek wildfire is excellent, with many stands of aspens already 4' – 6' in height three years post-fire, and exhibiting very little sign of excessive herbivory by wildlife or livestock. Cheatgrass on south-facing aspects and areas of higher fire severity is concerning, especially on the southern-most portions of the burn area, above Woods Landing. Plans are in place to aerially treat 3,000 acres of cheatgrass with herbicide in late summer 2016. Habitat assessment data will be collected for a period of five years and reported in the objective review for this herd.

Field Data

We classified 1,100 deer within the herd unit, meeting the classification objective of 1,100 deer. Fawn ratios remain at the desired level even though we saw a decline from 75:100 does in 2014 to 65:100 does in 2015. We expect the decline is due to a high fawn crop and fawn survival in 2014 leading to a large yearling age class in 2015 diluting the fawn ratio. 2015 was the third year an antler point restriction was implemented. We saw a large jump in the buck: doe ratio from 26:100 2014 to 39:100 does currently. We saw a large increase in both juvenile and adult buck ratios, with the adult buck ratio being the highest in 20 years. The three year average puts us at the top end of recreational management at 30 bucks:100 does. We implemented a new ranking system in our classification in 2013 that places bucks into 3 classes based on antler spread: class I is 19 inches or less, class II is 20-25 inches, and class III is 26 inches or greater. Of the total number of bucks classified, class I made up 67%, class II was 23%, and class III was 10%, which is comparable to 2014. Total hunters increased from 1,200 in 2014 to 1,400, but over the last decade we have lost 1,000 resident hunters. Hunter effort decreased for the second year to 20 days, and hunter success increased for the second year to 27%, indicating hunters are finding more mature bucks. However 27% hunter success is still far below the state wide average of 71% and is the second lowest herd unit success rates in the state.

Harvest Data

2015 was the fourth year of a weeklong season, and the third year of an antler point restriction. Harvest had been on a steady decline from a high of 980 deer in 2004 to 190 deer in 2013. We saw an increase from 2014 to 2015 at 290 to 370 respectively. Youth and archery hunters harvested 70 does and fawns in 2015, less than 1% of the total female population but an increase from previous years. Even though the female harvest makes up 19% of the total harvest, it is less than 1% of the total female population and is not substantial enough to affect the population, but it is perceived poorly by the public. The 2015 season structure was mostly well received; hunters

and landowners perceived it as the Department is addressing their concerns with this herd unit. Overall public comments are that the herd is increasing.

Population

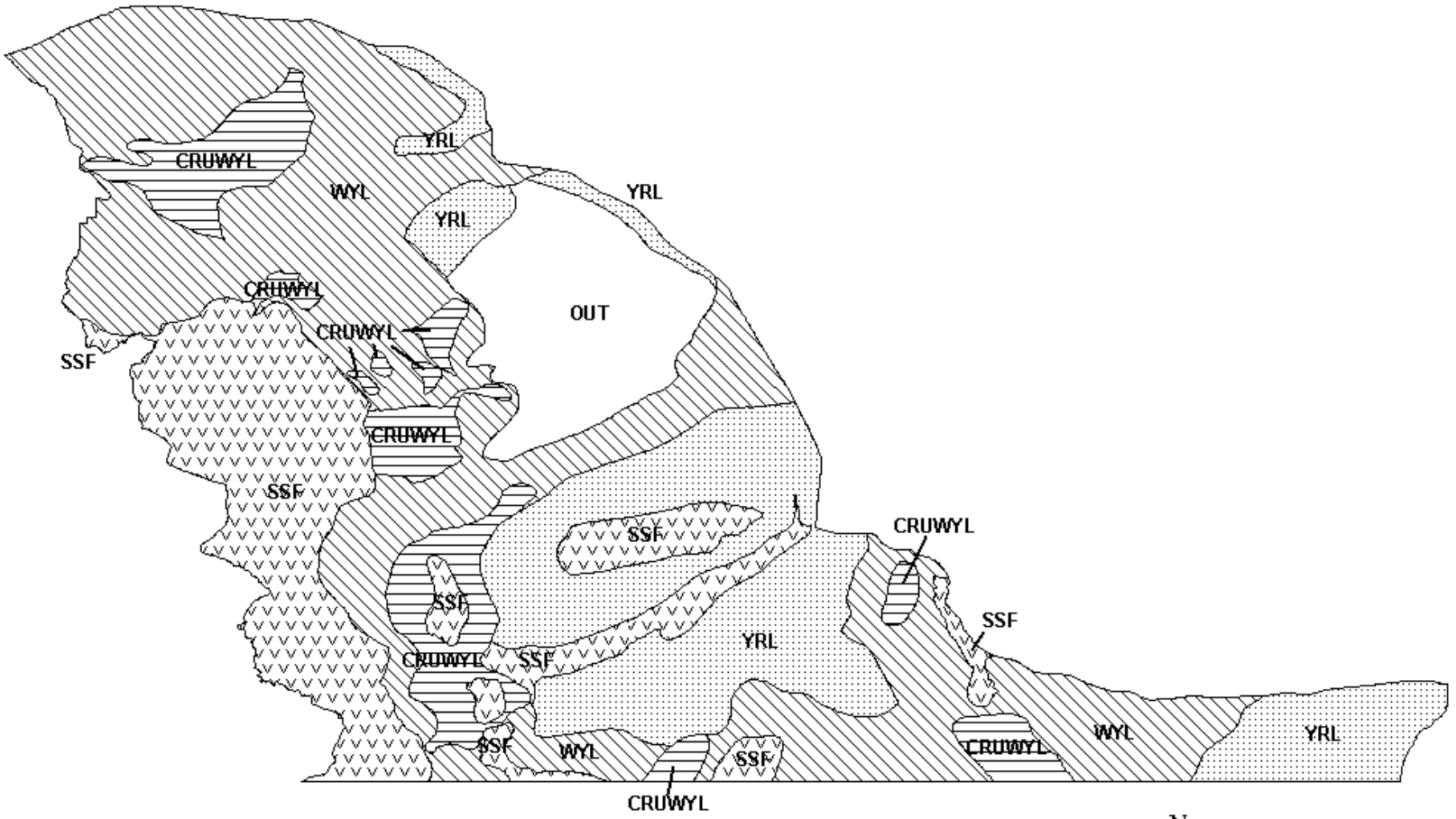
Time-Specific Juvenile & Constant Adult Survival (TSJ, CA) spreadsheet model was chosen for this Herd Unit. This model has the lowest AIC score of 159 and a fit of 71, and estimates the population at 5,700. This model is ranked as fair; there is 15-20 years of data; ratio data available for all years in model; juvenile and adult survival estimate with standard errors obtained from adjacent or other similar herds; model aligns fairly well. We were able to get several years of fawn and adult survival rates from radio collared studies in Colorado that took place near the Wyoming border. With this information the model provides a more believable estimate considering the classification samples and fawn ratios. Field staff, landowners, and hunters all agree the population is down but growing and the herd should be managed conservatively.

Management summary

If we attain the projected harvest of 350 deer, and have a fawn ratio of 66:100 does or higher, the herd should continue to grow. Using 66:100 (Unsworth 1999) does as our predicted fawn ratio, we estimate a 2015 post-season population of about 6,100. Even though our current buck ratio is at a 20 year high at 39:100 does, the 3 year average of 30:100 is still within recreational management. Considering that even with a record high buck ratio, hunter success in the herd unit was still the second lowest state. We are hesitant to make any changes based off two good years, and will remain status quo for the 2016 season with a 7 day season with a 3 point or better antler point restriction (APR). The APR is well perceived by the public and removing it at this time could hurt public relations. We do not believe at this time the APR is causing any negative impacts to the buck population which is shown by the percentages of class Is IIs and IIIs being more representative of a limited quota season structure than an APR. The nonresident quota for region D will remain at 400 licenses to address low deer populations in the region D herd units, and the change of 6 hunt areas from general to limited quota in the Platte Valley. This will maintain hunter opportunity that is in line with the current mule deer resource.

Bibliography

Unsworth, J.W., D.F. Pac, G.C. White, and R.M. Bartmann. 1999. Mule deer survival in Colorado, Idaho, and Montana. Journal of Wildlife Management 63:315-326.



Mule Deer (MD539) - Sheep Mountain
HA 61, 74-77
Revised - 8/88

APENDIX A

SHEEP MOUNTAIN OBJECTIVE REVIEW

SHEEP MOUNTAIN MULE DEER HERD UNIT

AND OBJECTIVE REVIEW

Prepared by: Lee Knox, Laramie Senior Wildlife Biologist

The herd unit concept is based on distinct populations and minimal interchange (≤10%) with neighboring populations. The Sheep Mountain Mule Deer Herd Unit (SMMDHU) occupies an estimated 2,500 square miles in southeastern Wyoming, ranging from the city of Cheyenne west to the Snowy Range divide, and from the Colorado/Wyoming state line north to Highway 287/30 and Interstate 80 (Figure 1). The herd unit encompasses hunt areas 61, 74, 75, 76 and 77. Landownership varies from private lands with limited public access to public lands easily accessible. The current Postseason Population Management Objective was last reviewed in 1987 when it was increased from 10,000 to 15,000 mule deer. The herd unit is managed under recreational guidelines which prescribe to maintain a ratio of 20 to 29 bucks:100 does.

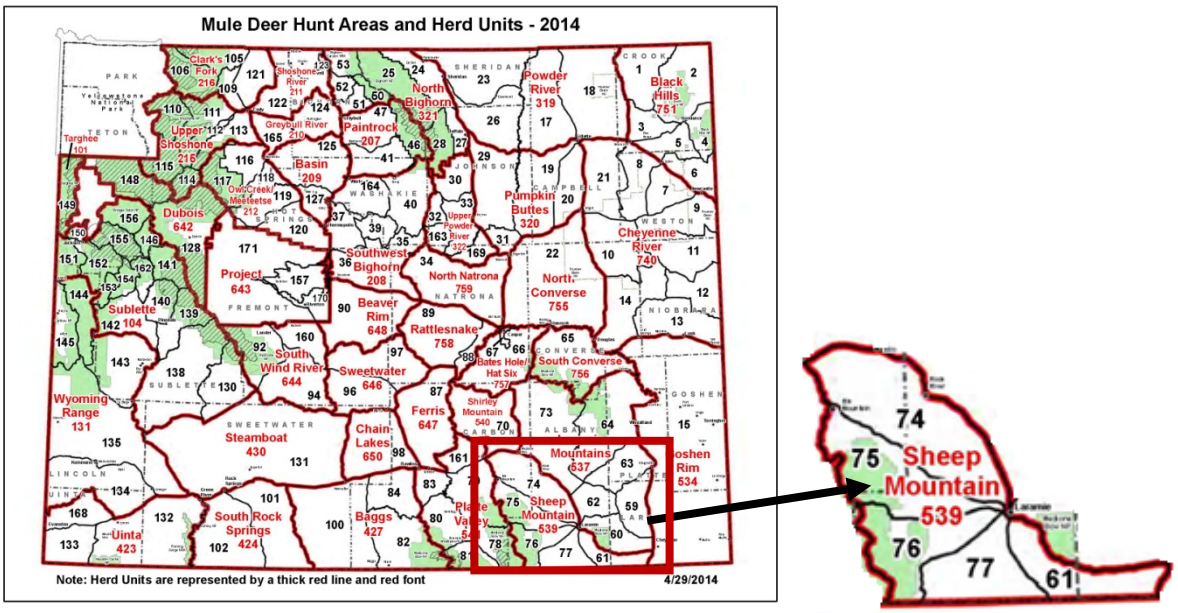


Figure1. 2014 Wyoming mule deer herd units. The Sheep Mountain Mule Deer Herd Unit is highlighted.

POPULATION OBJECTIVE REVIEW

The postseason population objective for this herd unit is currently 15,000 mule deer. The 2014 post-season population estimate was approximately 5,600 mule deer with the population stabilizing after a decline from 7,500 mule deer in 2009 (Figure 2). The postseason population objective is based upon both biological and social factors, including, but not limited to: winter range carrying capacity, hunter needs, landowner needs and tolerance, land status, and competition with other wild and domestic animals. The postseason population estimate is determined by modeling herd dynamics using harvest data and preseason herd classification data.

The SMMDHU population model has been further refined by addition of both adult female and juvenile survival data from research projects conducted in neighboring herds.

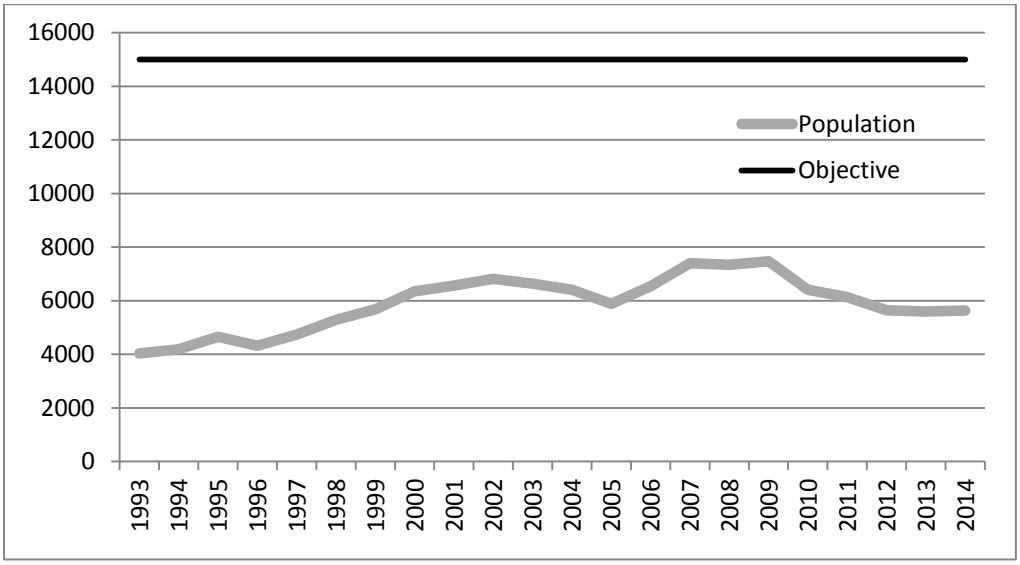


Figure 2. Population estimates and objective for the Sheep Mountain Mule Deer Herd Unit, 1993-2014.

CURRENT HERD UNIT MANAGEMENT STRATEGIES

Hunt areas 61, 74, 75, 76, and 77 are managed through a general season structure and recreational guidelines. Although landownership and habitats differ between hunt areas, the same season structure has been maintained due to the overall population size being below objective which requires a conservative management strategy across all hunt areas in the herd unit.

LANDOWNER AND PUBLIC INVOLVMENT

Surveys were mailed to 107 landowners that owned a minimum of 640 acres in the SMMDHU. Of the 107 letters mailed, 24 completed surveys were returned. At the postseason public meetings in Saratoga, Wheatland, Torrington, Laramie, and Cheyenne, questionnaires were provided to the public, similar to those mailed to the landowners. Only one questionnaire was returned.

Overall, 63% of the landowners that responded were dissatisfied with the current mule deer population (Figure 3). When asked why, 65% of dissatisfied landowners responded that there were too few mule deer, while 5% responded that there were too many mule deer (Figure 4).

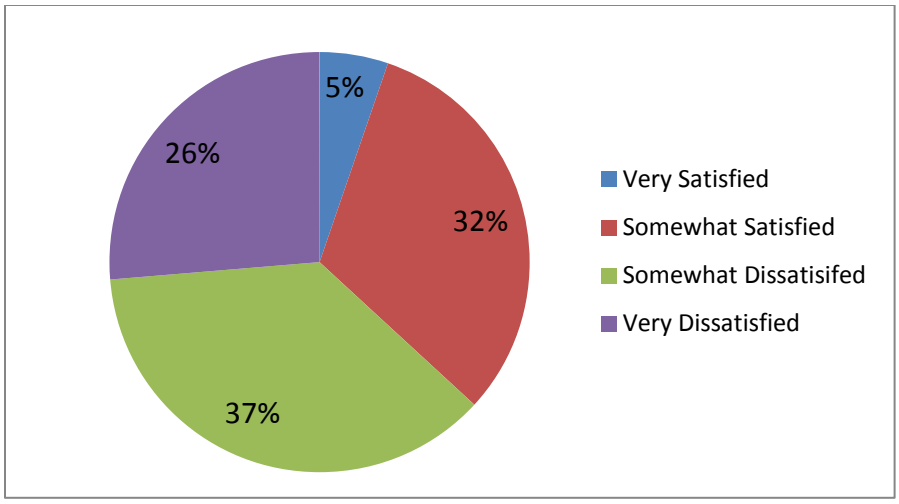


Figure 3. Current landowner satisfaction with the SMMDHU population.

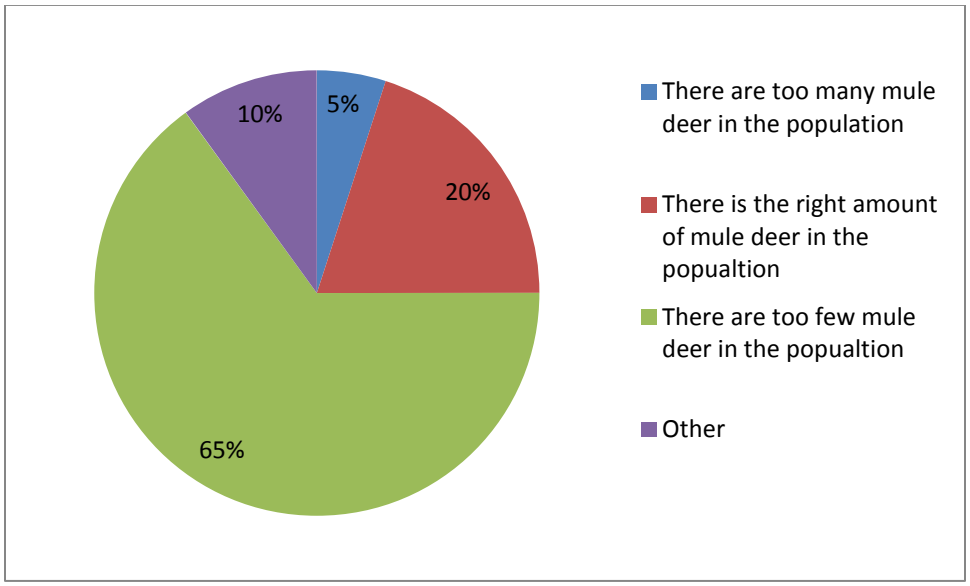


Figure 4. Landowner response as to why they were satisfied/dissatisfied. .

Sixty-seven percent of the landowners surveyed believed that the current population objective of 15,000 mule deer was correct (Figure 5). Only 16% believed it should be lowered. Historically, the population was estimated to be near 15,000 mule deer for only a short period in the early 1990s. Using the current model, the population estimate has not been over 8,000 mule deer at any time during the past 20 years (Figure 2).

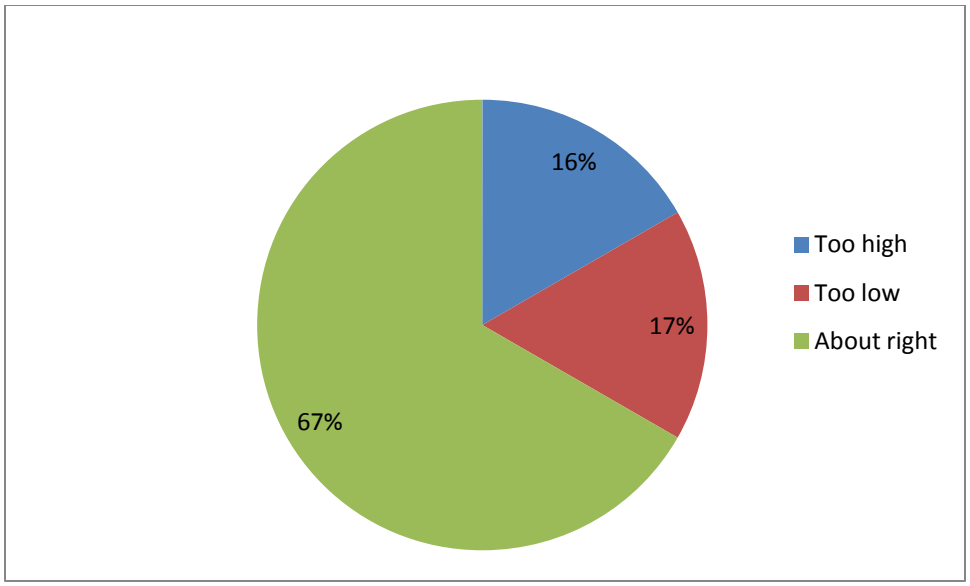


Figure 5. Landowner opinion of the current population objective of 15,000 mule deer.

Harvest has been on a steady decline from 984 mule deer in 2004 to 197 mule deer in 2013. The 2014 harvest saw a slight increase to 290 mule deer (Figure 6). Hunter success has declined precipitously since 2004 (Figure 7). Overall hunter numbers have declined by more than 1,000 over the last decade, indicating low satisfaction with the SMMDHU (Figure 6).

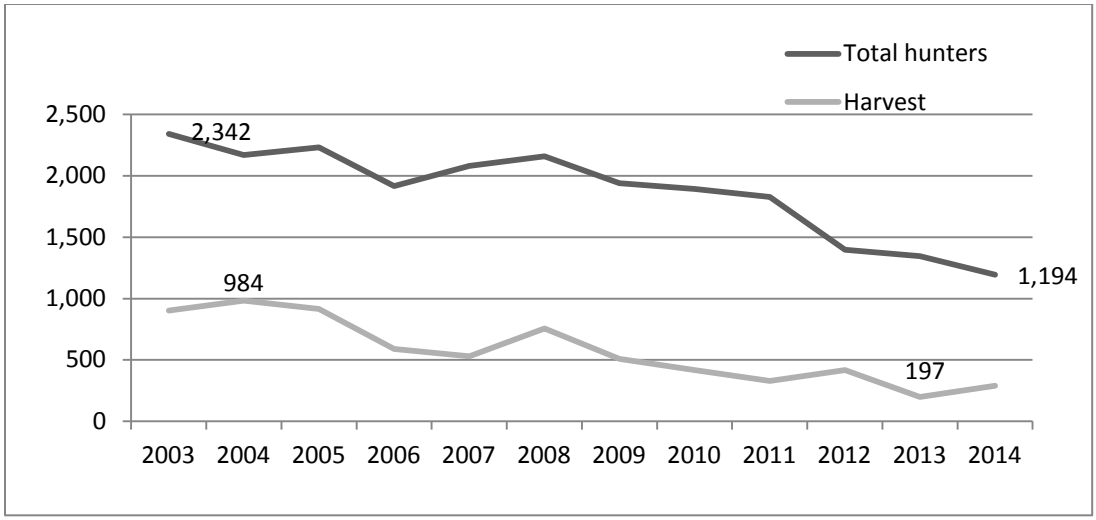


Figure 6. Number of hunters and mule deer harvested in the SMMDHU from 2003-2014.

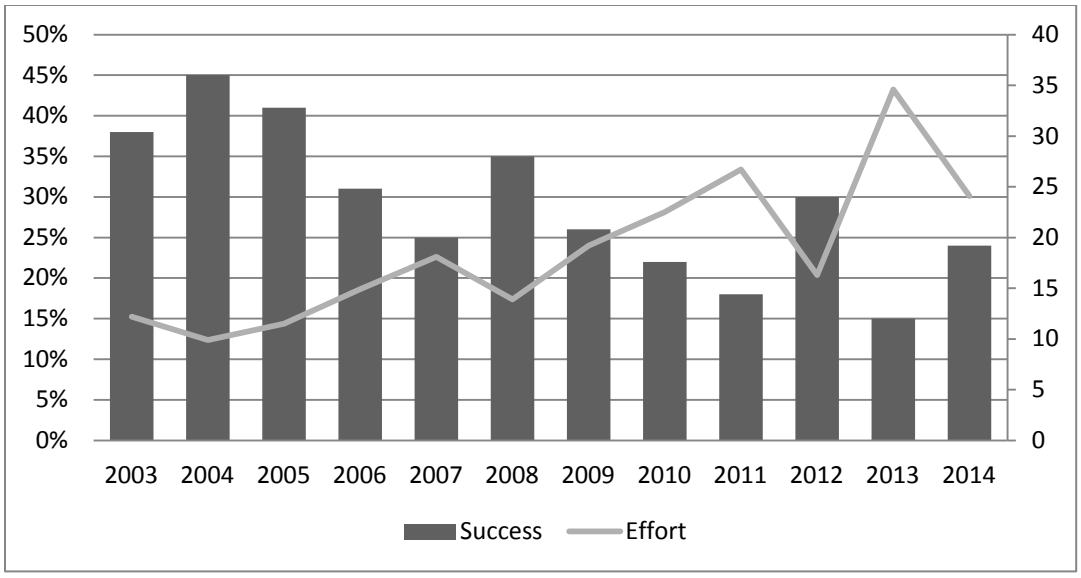


Figure 7. Hunter success and effort, measured as days per harvest, from 2003 to 2014.

RECOMMENDATION

Through the Wyoming Mule Deer Initiative process, public meetings, and landowner meetings, the current population objective and whether it should be lowered to an achievable level has been discussed with the public. The current population objective of 15,000 mule deer is unrealistic considering the current population model estimates and current habitat conditions. Public meetings were held in Wheatland, Laramie, Cheyenne, Saratoga, and Casper to propose a new objective of 10,000 mule deer. A total of 80 members of the public attended the meetings. We received five surveys back, all in favor of reducing the current population objective from 15,000 to 10,000 mule deer. A postseason population objective of 10,000 deer may still be difficult to obtain in five years, especially considering past population trends, but it is more palatable to the landowners and the public. If after five years, the population objective is not attained, this objective should be reviewed again.

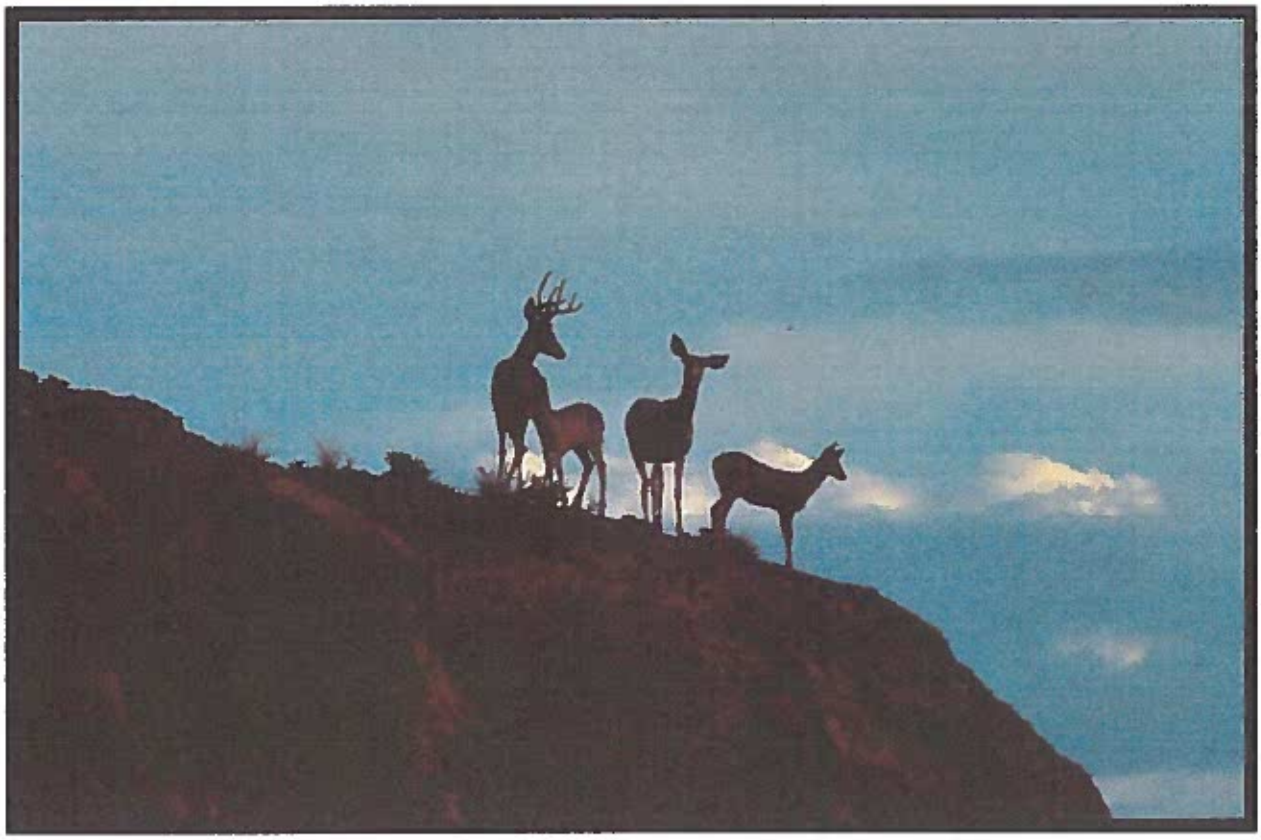
APENDIX B

ADMB SHEEP MOUNTAIN MULE DEER RECRUITMENT PROJECT

Sheep Mountain Mule Deer Recruitment Project

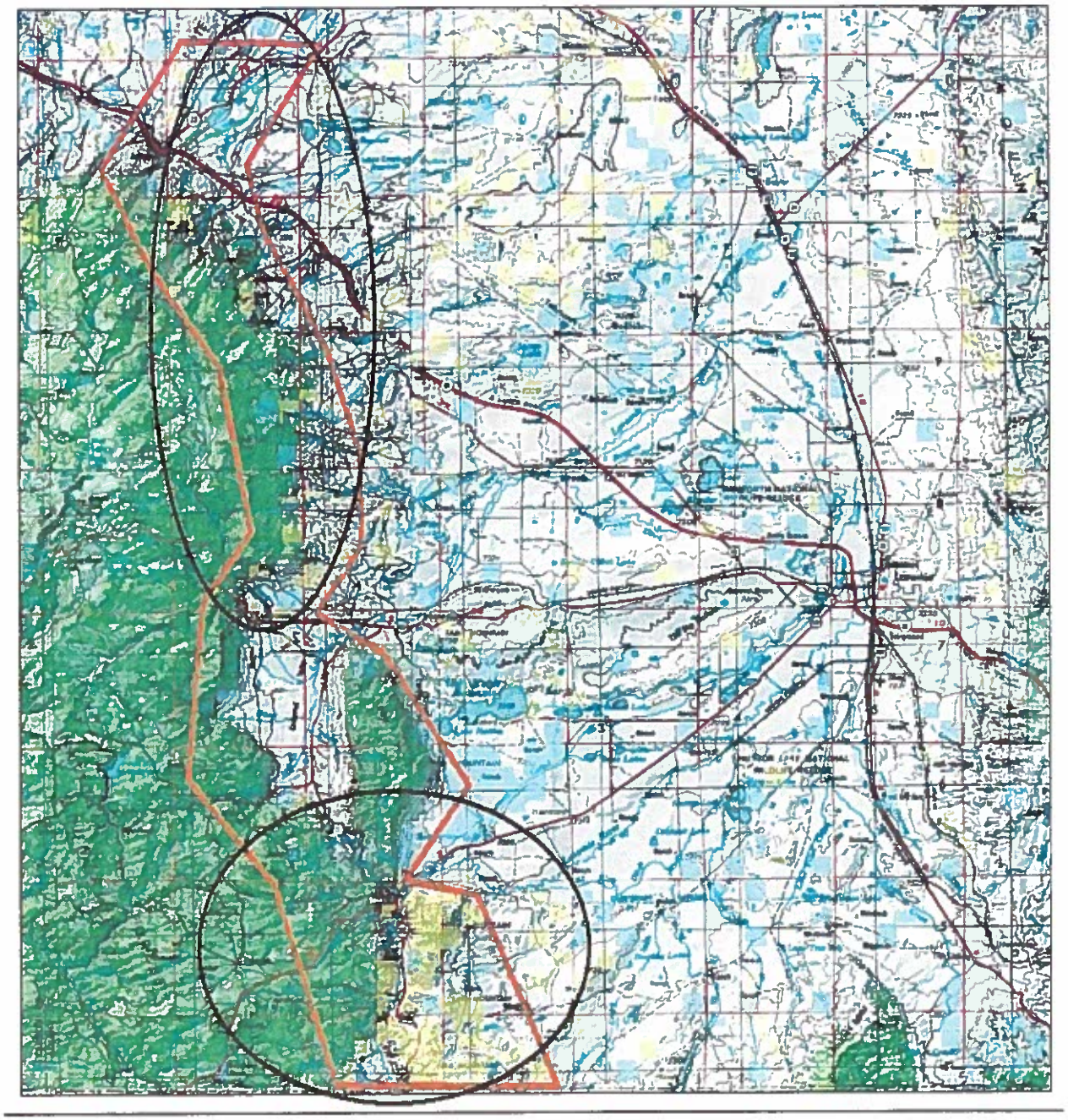
Albany County Predatory Management District (ACPMD), USDA/APHIS/Wildlife Services (WS'), Wyoming Game and Fish Department (WGFD)

01/01/2013-12/31/2015



The Sheep Mtn. Mule Deer Recruitment Project consisted of a 3 yr. (01/01/2013- 12/31/2015) cooperative effort aimed at the removal of coyotes (*Canis latrans*) within Wyoming Hunt Areas 61, 74, 75, 76, 77 and adjacent lands. These removal efforts were aimed at increasing the viability of the mule deer (*Odocoileus hemionus*) herd that fawn in these areas. These areas lay Easterly adjacent to the Medicine Bow National Forest (USFS) and run generally North and South. This area is mainly used for cow/calf production, recreation, and grass cattle ranching. It is interspersed by Private, Bureau of Land Management (BLM), United States Forest Service, and State of Wyoming lands.

The work to remove coyotes from the hunt areas and adjacent lands began on 01/01/2013 and continued until the end of calendar year 2015. Coyote removal efforts (ground/aerial hunting) continued throughout the project timeframe as funding, weather, recreational hunting use of lands, and time demanded by other WS'/ACPMD duties allowed.



Sheep Mtn. fawning areas (black circles) and initially proposed coyote removal areas (orange areas). Please notice that the removal areas were extended considerably on the following yearly GPS coyote removal maps.

01/01/2013-12/31/2013 (Year 1 of 3)

A total of 89 coyotes within 17 different agreements were removed from the project area. When GPS waypoints of coyotes taken within the project area could be obtained, they were plotted as GPS points (squares) on the following topographic map. Also, of the 89 coyotes, 24 were retrieved for comprehensive data collection.

Below is a series of operational, budget and coyote related to the data for year 1 of the project time period (01/01/2013-12/31/2013).

30.9 hrs.	*($6,573.00 ACPMD)**	Aerial hunting time only (fixed/rotor wing and assoc. costs).
96.0 hrs.	*($2,337.00 ACPMD, $51.62 WS')**	Ground work time only.
26.0 hrs.	*($1,342.12 WS')**	Administrative time only.
89		Coyotes removed from project area.
3		USDA/APHIS/WS personnel involved.

** (approximate costs incurred by ACPMD $8,910.00 and WS' $1,393.74)*

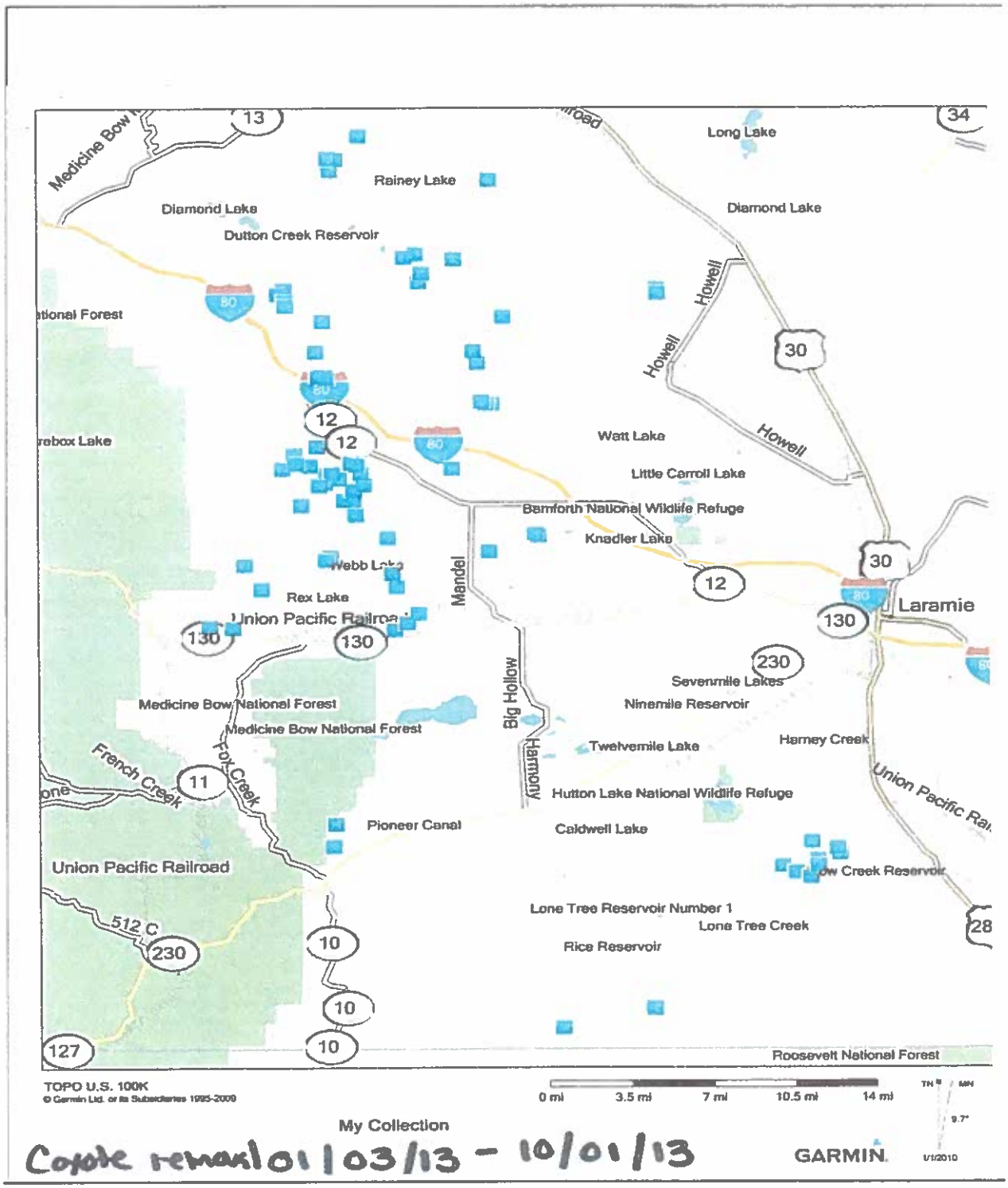
24 of 89 total (27%) coyotes taken verified for sampling and analysis below:

11	Adult male coyotes verified.
11	Adult female coyotes verified.*
1	Pup (female) coyote verified.
1	Pup (male) coyote verified.

* *1 adult female coyote showed evidence of 4 pups whelped.*

Stomach content occurrences on 24 verified coyotes.

10 Rodent	2 Empty	14 Pronghorn	3 Deer



Coyote removal map 01/01/2013-12/31/2013

Square indicates location on map where individual coyote was taken.

1/01/2014-12/31/2014 (Year 2 of 3)

A total of 116 coyotes and 1 den within 17 different agreements were removed from the project area. When GPS waypoints of coyotes taken within the project area could be obtained, they were plotted as GPS points (squares) on the following topographic map. Also, of the 116 coyotes, 29 were retrieved for comprehensive data collection.

Below is a series of operational, budget and coyote related to the data for year 2 of the project time period (01/01/2014-12/31/2014).

54.0 hrs.	*($13,446.00 ACPMD)**	Aerial hunting time only (fixed/rotor wing and assoc. costs).
138.0 hrs.	*($3,563.06 ACPMD, $200.72 WS')**	Ground work time only.
39.0 hrs.	*($1,957.02 WS')**	Administrative time only.
116/1 den		Coyotes removed from project area.
3		USDA/APHIS/WS personnel involved.

** (approximate costs incurred by ACPMD $17,009.08 and WS' $2,157.74)*

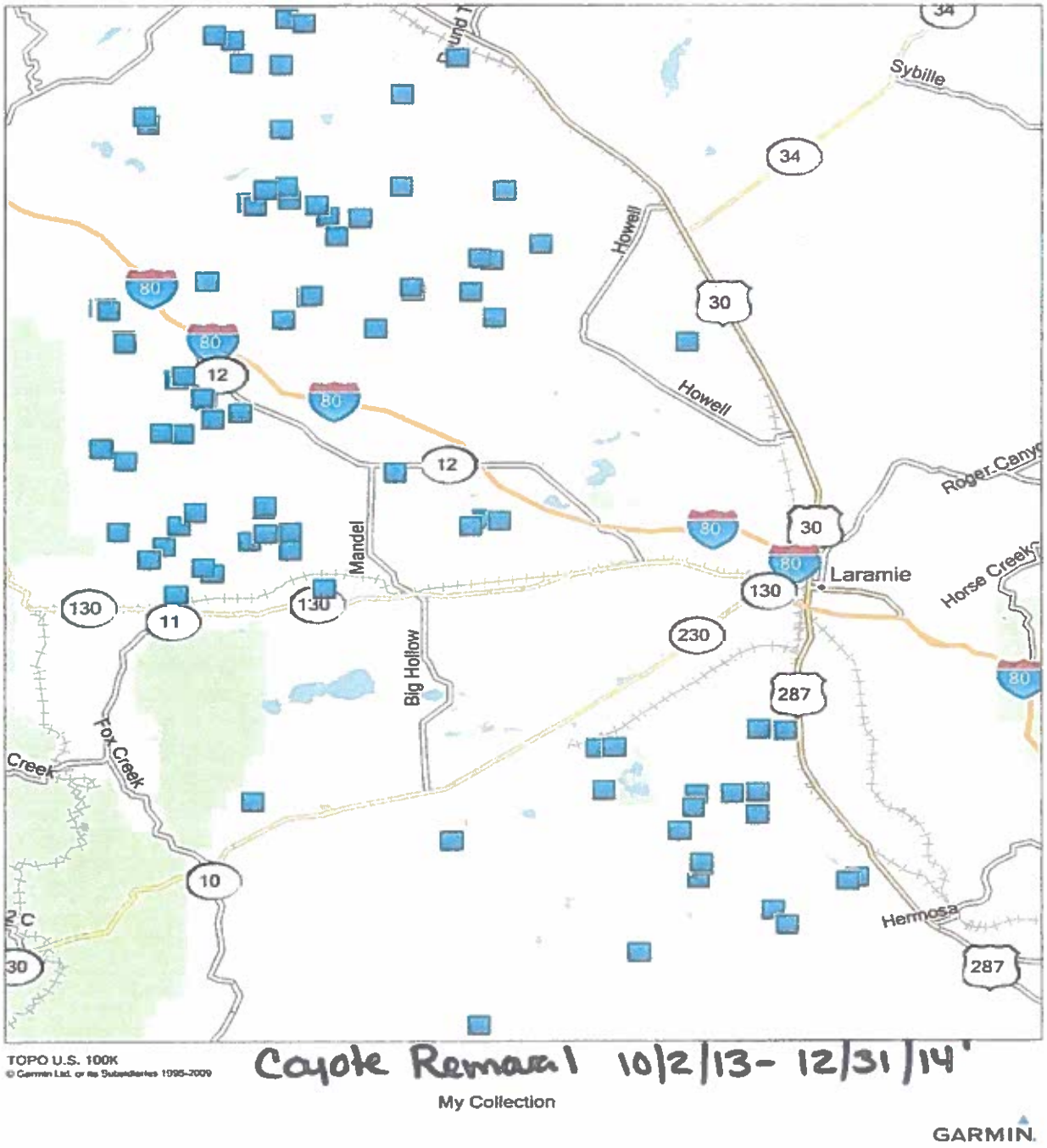
29 of 116 total (25%) coyotes taken verified for sampling and analysis below:

12	Adult male coyotes verified.*
13	Adult female coyotes verified.**
3	Pup (female) coyote verified.
1	Pup (male) coyote verified.

** 1 adult male exhibited signs of mange mite. **1 adult female showed evidence of 3 pups whelped. 1 adult female showed evidence of 6 pups whelped.*

Stomach content occurrences on 29 verified coyotes.

15 Rodent 3 Empty 14 Pronghorn 4 Deer 2 Bird



Coyote removal map 01/01/2014-12/31/2014

Square indicates location on map where individual coyote was removed.

01/01/2015-12/31/2015 (Year 3 of 3)

A total of 148 coyotes and 1 den within 16 different agreements were removed from the project area. When GPS waypoints of coyotes taken within the project area could be obtained, they were plotted as GPS points (dots) on the following topographic map. Also, of the 148 coyotes, 18 were retrieved for comprehensive data collection.

Below is a series of operational, budget and coyote related to the data for the 3rd and final year of the project time period (01/01/2015-12/31/2016).

55.0 hrs.	*($11,933.50 ACPMD)**	Aerial hunting time only (fixed/rotor wing and assoc. costs).
130.5 hrs.	*($4,296.50 ACPMD, $205.56 WS')**	Ground work time only.
24.5 hrs.	*($ 1,259.05WS')**	Administrative time only.
158/1 den		Coyotes removed from project area.
3		USDA/APHIS/WS personnel involved.

** (approximate costs incurred by ACPMD $16,230.00 and WS' $1,464.56)*

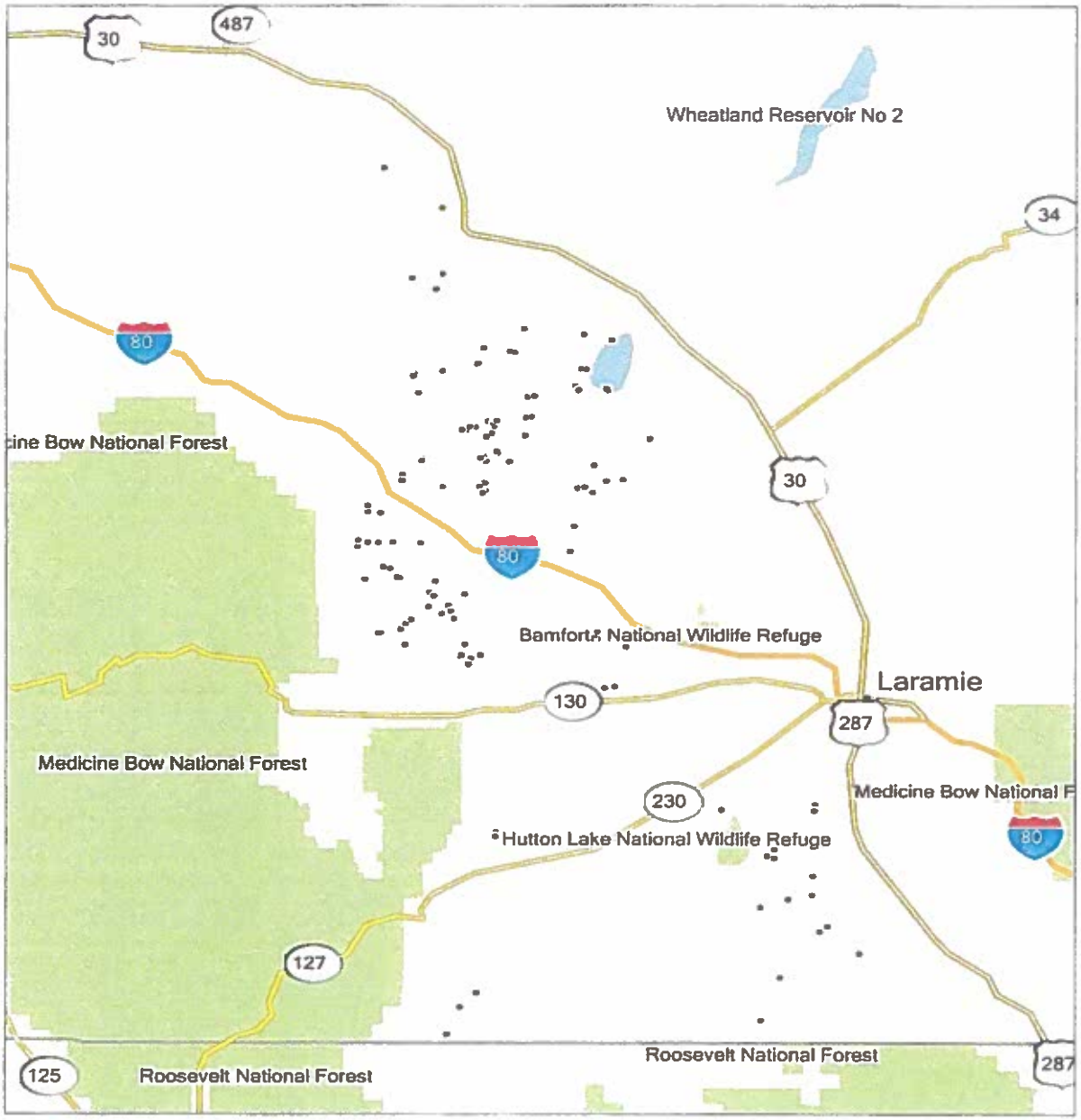
18 of 148 total (12%) coyotes taken verified for sampling and analysis below:

8	Adult male coyotes verified.
7	Adult female coyotes verified.**
1	Pup (female) coyote verified.
2	Pup (male) coyote verified.

*1 adult female exhibited signs of mange mite. **1 adult female contained 5 unborn pups.*

Stomach content occurrences on 18 verified coyotes.

8 Rodent 1 Empty 7 Pronghorn 1 Deer 1 grass 2 Livestock (cow)

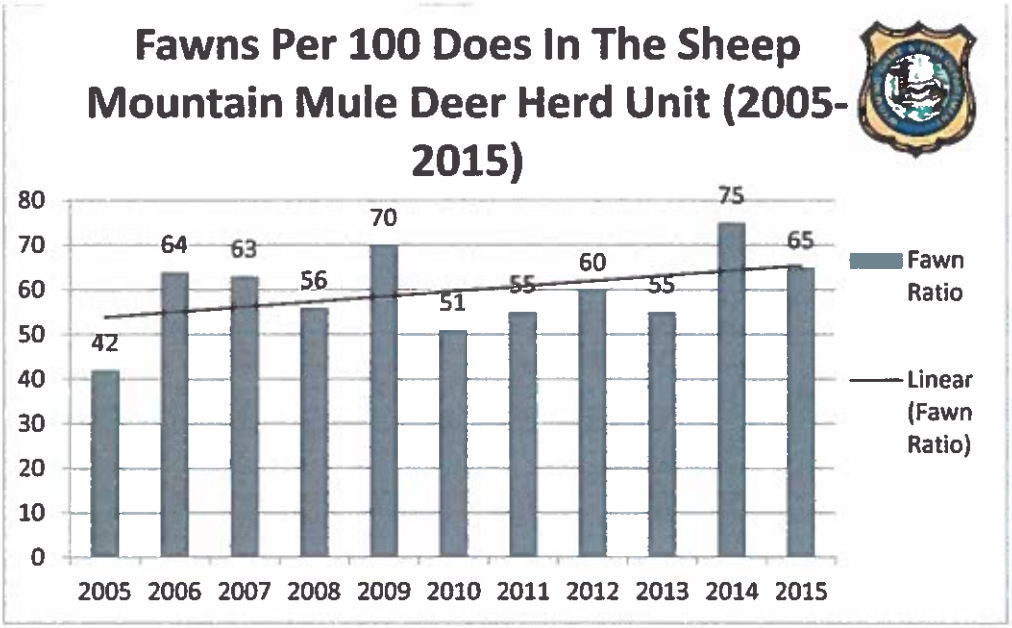


Coyote Removal map 01/01/2015-12/31/2015

Dot indicates location on map where individual coyote was removed.

WGFD Mule Deer Doe/Fawn Ratio Graph

(Provided by Lee Knox, WGFD Senior Biologist)



The Sheep Mountain Herd Unit encompasses Hunt Areas 61, 74, 75, 76 and 77. Fawn ratios have varied over the last 10 years but seem to be trending up. During the winters of 2007, 2009 and 2010 we experienced an increase in winter mortalities especially in younger age classes which may also have had an effect on fawn recruitment. The severe drought during the summer of 2012 was hard on wildlife and appears to have caused a poor fawn crop in 2013 as well. In 2014 and 2015 we saw an increase in the fawn crop possible due to the coyote removal project with the ADMB as well as good spring and fall habitat conditions. After the large successful fawn crop in 2014 we expected a slight decrease in fawn ratios in 2015 due to the abundance of yearling does in the population. Current fawn ratios indicate the herd is stable to increasing in population.

In conclusion of this 3 yr cooperative study, it is of opinion that the removal of coyotes, coupled with other favorable influencing conditions, can have a positive effect in the increase of mule deer fawn recruitment.

Special thanks to:

ACPMD Members, WGFD Lee Knox Senior Biologist, USDA/APHIS/WS Joel Modey (Wildlife Specialist) and Jerry Hyatt (WS Pilot), and Sky Aviation (Helicopter Services).

Please feel free to contact me if there are any questions or concerns.

Sincerely,

Craig Acres

USDA/APHIS/WS' Staff Biologist (ret.)
Cc: Files
01/11/2016

2015 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2015 - 5/31/2016

HERD: MD540 - SHIRLEY MOUNTAIN

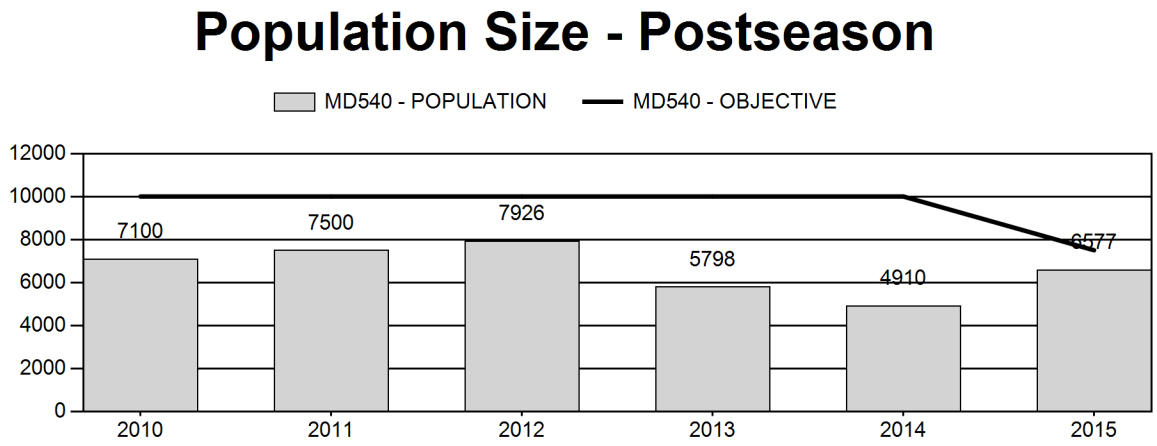
HUNT AREAS: 70
PREPARED BY: WILL SCHULTZ

	2010 - 2014 Average	2015	2016 Proposed
Population:	6,647	6,577	7,177
Harvest:	294	233	250
Hunters:	693	576	600
Hunter Success:	42%	40%	42 %
Active Licenses:	699	583	600
Active License Success:	42%	40%	42 %
Recreation Days:	2,793	2,590	2,600
Days Per Animal:	9.5	11.1	10.4
Males per 100 Females	30	42	
Juveniles per 100 Females	52	72	

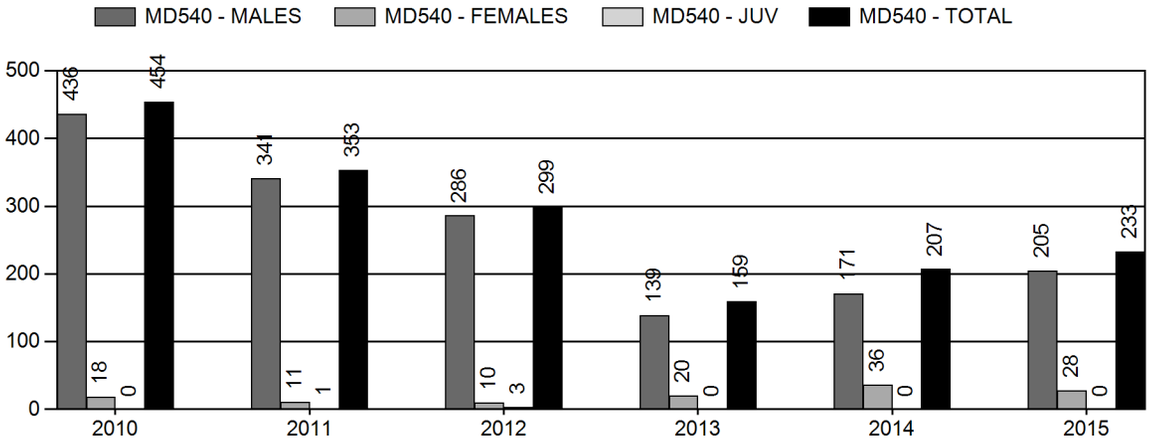
Population Objective (± 20%) :	7500 (6000 - 9000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-12.3%
Number of years population has been + or - objective in recent trend:	20
Model Date:	02/23/2016

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

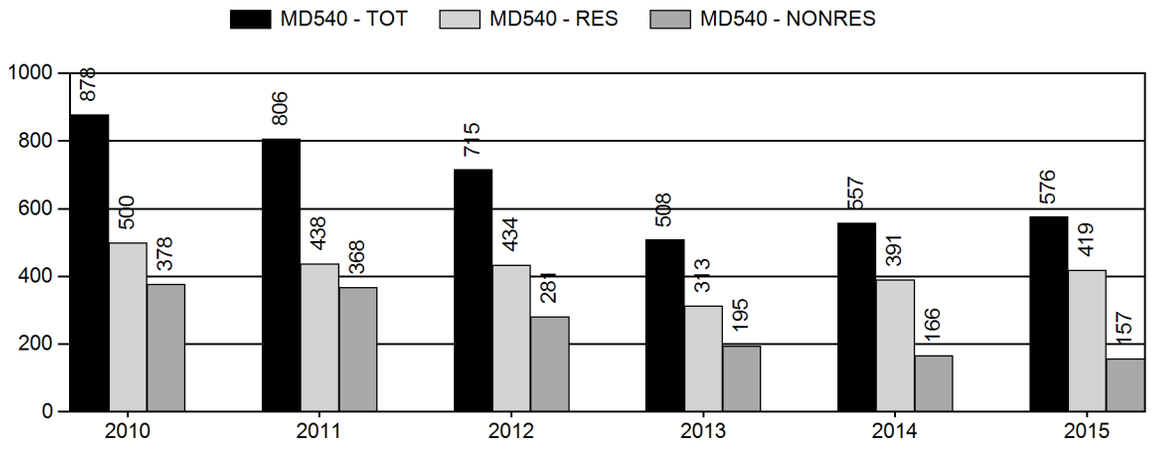
	JCR Year	Proposed
Females ≥ 1 year old:	1%	0.1%
Males ≥ 1 year old:	17%	13%
Juveniles (< 1 year old):	0%	0.0%
Total:	4%	3.0%
Proposed change in post-season population:	1%	8.0%



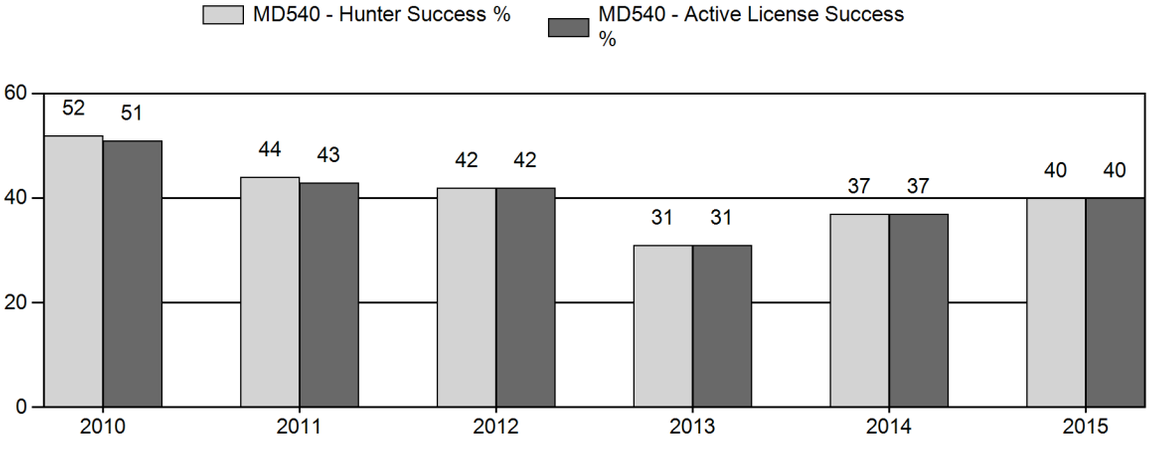
Harvest



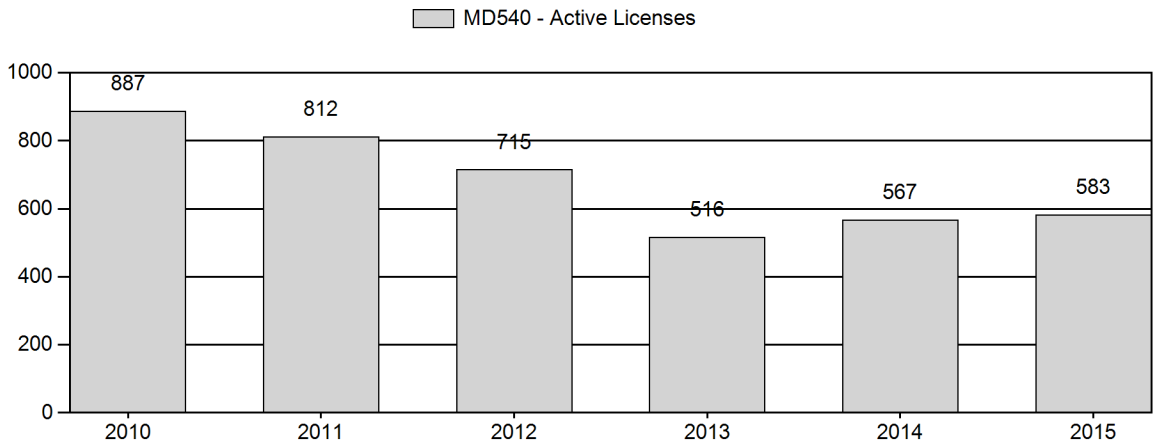
Number of Hunters



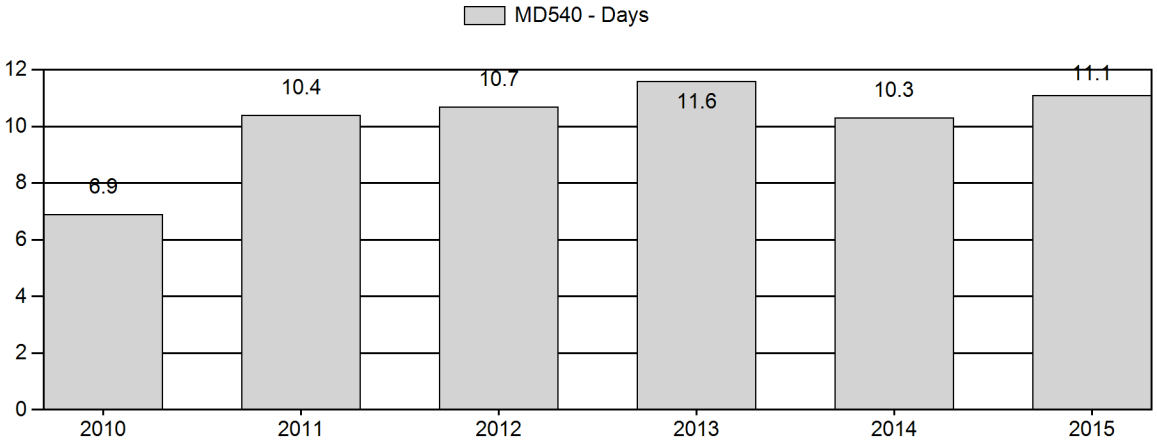
Harvest Success



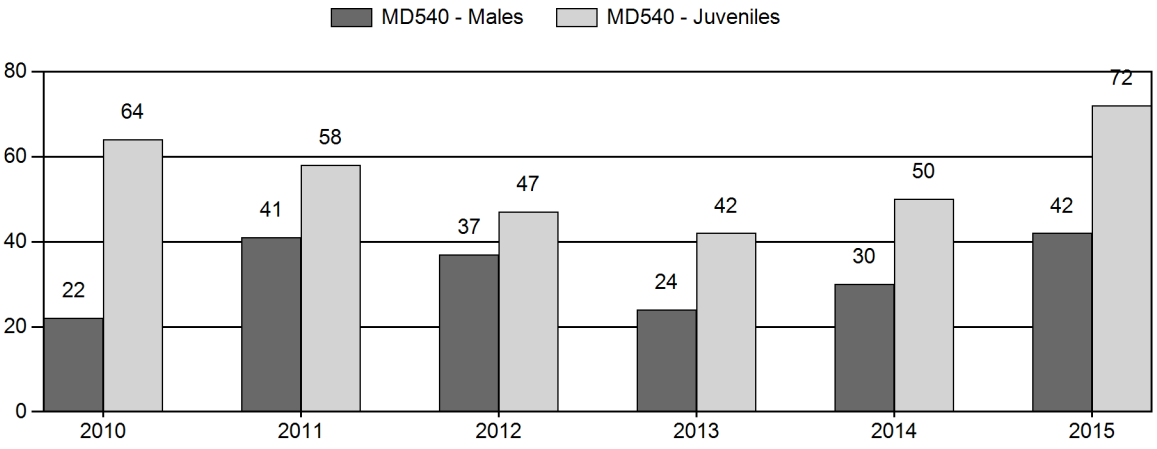
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD540 - SHIRLEY MOUNTAIN

		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
2010	7,100	24	0	0	0	18	42	12%	190	54%	122	34%	354	958	13	9	22	± 5	64	± 9	53
2011	7,500	29	0	0	0	37	66	20%	162	50%	94	29%	322	1,079	18	23	41	± 7	58	± 9	41
2012	7,926	16	0	0	0	39	55	20%	149	54%	70	26%	274	1,033	11	26	37	± 7	47	± 9	34
2013	5,798	26	0	0	0	32	58	14%	246	60%	103	25%	407	997	11	13	24	± 4	42	± 6	34
2014	4,910	20	21	9	1	0	51	17%	170	56%	85	28%	306	915	12	18	30	± 6	50	± 8	38
2015	6,577	27	18	12	1	0	58	20%	137	47%	99	34%	294	831	20	23	42	± 8	72	± 12	51

2016 HUNTING SEASONS
SHIRLEY MOUNTAIN MULE DEER (MD540)

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
70		Oct. 15	Oct. 21		General	Antlered mule deer three (3) points or more on either antler or any white-tailed deer
	6	Oct. 15	Nov. 30	25	Limited quota	Doe or fawn valid on private land
	Archery	Sep. 1	Sep. 30			Refer to license type and limitations in Section 3 of Chapter 6

Region D Nonresident Quota: 400

Hunt Area	License Type	Quota change from 2015
Herd Unit Total	**None**	**None**

Management Evaluation

Current Postseason Population Management Objective: 7,500 (6,000-9,000)
Management Strategy: Recreational
2015 Postseason Population Estimate: 6,600
2016 Proposed Postseason Population Estimate: 7,200
2015 Hunter Satisfaction: 56% Satisfied, 21% Neutral, 23% Dissatisfied

Mule deer in the Shirley Mountain herd unit are managed toward a population objective of 7,500. The population was estimated using a spreadsheet model developed in 2012 and updated in 2015. The herd unit is managed for recreational opportunity. The management objective was last reviewed in 2015 and reduced from 10,000 to 7,500 mule deer.

Herd Unit Issues

The Shirley Mountain herd unit is comprised of a mixture of habitat and landownership types. Hunter access to public lands containing mule deer habitat is considered good. Small groups of mule deer are considered nuisances and create damage in a localized area on the west side of Shirley Mountain, in the Lost Creek and Sage Creek drainages. Trends in mule deer numbers were in decline until this year; while interest from both

resident and nonresident hunters in this herd unit has remained high. Expansion of wind farms in the eastern and southern portions of this herd unit is eminent.

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were average, to slightly above average at all elevations throughout the herd unit. No significant prolonged periods of extreme heat or cold temperatures were observed or. The timing of precipitation and amounts received during key growth periods for cool season grasses and preferred transitional range and winter range shrub species was excellent. Weather patterns most likely had a positive influence on mule deer. Mild fall temperatures and lack of persistent snow allowed mule deer to stay longer in spring, summer, and fall ranges providing additional relief for winter ranges that have historically been over utilized. Snow accumulation began mid December and persisted in lower elevation winter ranges through February. For specific meteorological information for the Shirley Mountain herd unit the reviewer is referred to: http://www.ncdc.noaa.gov/cag/

Habitat

Positive trends in habitat conditions were observed in bio-year 2015 due to timely and adequate amounts of precipitation received in this herd unit. The limited number of habitat transects that have been established within this herd unit do not provide sufficient data to make reliable inferences about habitat quantity or quality. The vast majority of shrub habitats in this herd unit are in need of treatments which would result in improved nutritive content and increased production for shrubs.

Field Data

Postseason classifications were conducted from the ground in late November of 2015. A less than adequate sample size (n=294) was 4% lower than the 2014 sample size. Yearling buck ratios increased in 2015 by 40% to 20/100 does. This was the most significant increase in yearling buck ratios observed since the 3-points or more on either antler hunting season limitation had been implemented. It was presumed the increased yearling buck ratio was correlated more with the previous winter's mild conditions and improved range conditions than the hunting season limitation. The adult buck ratio increased in 2015 to 23/100 does, for a 22% increase from 2014. The overall buck ratios increased from 30/100 does in 2014 to 42/100 does in 2015. This increase was also attributed to previous winter's mild conditions and improved range conditions.

Fawn ratios increased significantly from 50/100 does in 2014, to 72/100 does in 2015, for a 31% increase. This increase was again attributed to mild winter conditions experienced by pregnant does and timely spring and summer precipitation which resulted in improved nutrition for lactating does.

Harvest Data

Overall, harvest and satisfaction rates increased in 2015. This marked the third year of the 3-points or more on either antler limitation in this herd unit. The antler point restriction was implemented as an additional protection specifically for yearling bucks. General season lengths had already been incrementally reduced to the current 7-day season during previous years to protect bucks from over exploitation. The final 2015 WGFD deer harvest survey report indicated 576 active general licensed hunters' harvested 233 mule deer for an overall success rate of 41%. General season buck harvest increased 17% and hunter numbers increased 3%, as compared with the 2014 hunting season statistics. The percentage of hunters with harvest survey satisfaction ratings of satisfied, or very satisfied, increased 5% to 56% in 2015.

Population

In 2015, we selected to use the CJ,CA model. This model produced the highest Fit score and the lowest AICc score. The TSJ,CA model's use was discontinued as it tended to simulate mule deer population dynamics with fawn survival rates alternating annually between the low and high parameters allowed for survival without correlating well with what managers observed annually for survival rates in fawns ratios and weather severity. We rated this model as poor, and not biologically defensible. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model, and primarily due to less than adequate sample sizes for postseason classification counts (Morrison 2012).

We also incorporated 3 abundance estimates into this model (Strickland, et. al 1994) which assisted in reducing the model's overall propensity to overestimate this population. This herd unit is considered to contain significantly less mule deer than the spreadsheet model estimates. Given the openness of the landscape, and well defined herd unit boundaries, we consider annual classification sample sizes were not representative of a population estimated at this magnitude. The trend depicted in the spreadsheet model's population estimates does appear to be fairly representative of the observed mule deer abundance in this herd unit. Without other information such as a recent independent abundance estimate or long-term survival data to incorporate into the model, accuracy of estimates will continue to be unknown.

In 2015, we reviewed the management objective (Appendix I). The management objective was decreased from a population objective of 10,000 mule deer postseason to 7,500 mule deer postseason. This reduction was completed to better align the population objective with the population estimates generated by the spreadsheet model, and to provide managers with a more sustainable management goal.

Management Summary

A 7-day General season for antlered mule deer, 3 points or more on either antler or any white - tailed deer will continue in 2016. The point restriction continued to provide protection for yearling buck mule deer. Although a more liberal hunting season could have been prescribed for this herd unit, managers were concerned this would have increased hunting pressure and harvest beyond acceptable limits by attracting General

season deer hunters from the more conservative surrounding herd units. Type 6 private land doe or fawn licenses continued to be prescribed to reduce damage and nuisance deer issues in the Lost Creek and Sage Creek drainages.

The Region D nonresident quota was retained at 400 licenses to align hunter opportunity with the current mule deer resource. This will also improve hunter satisfaction for both nonresidents and resident hunters.

Literature Cited

Morrison, T. 2012. User Guide: Spreadsheet Model for Ungulate Population data. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 41 pp.

Bibliography of Herd Specific Studies

McDaniel G. W., F. G. Lindzey. 1991. Seasonal Movements, Population Characteristics and Habitat Use of Mule Deer in the Shirley Mountain Area, Central Wyoming. Wyoming Cooperative Fishery and Wildlife Research Unit. University of Wyoming, Laramie. 64 pp.

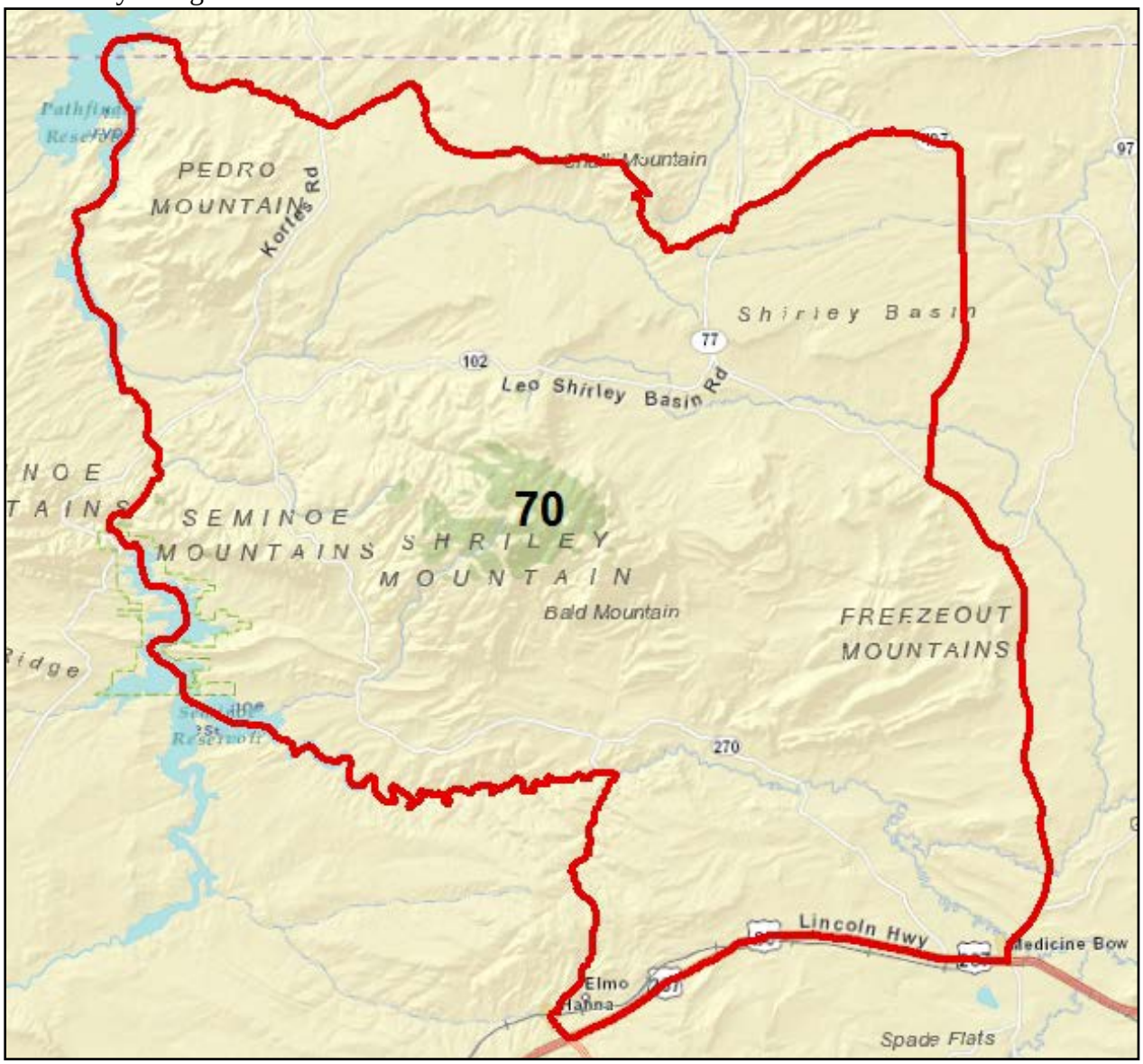
Strickland, D., L.L. McDonald, G. Johnson, W. Erickson, D. Young Jr., and J. Kern. 1994. An Evaluation of Mule Deer Classifications From Helicopter and Ground Surveys. Western Ecosystems Technology, Inc. Cheyenne. 61pp.

2015 SHIRLEY MOUNTAIN MULE DEER HERD UNIT OBJECTIVE REVIEW

Prepared by: Will Schultz, Saratoga Wildlife Biologist

The Shirley Mountain Mule Deer herd unit consists of deer Hunt Area 70, which lies north of U. S. Highway 30, west of Wyoming Highway 487, south of Bates Hole, and east of the North Platte River, in south-central Wyoming (Figure 1). The Herd Unit contains the Shirley, Bennett (Seminoe), Freezeout, and Pedro Mountains. Elevation ranges from approximately 1,798 meters to over 2,438 meters above sea level. Habitats include montane forests (primarily lodgepole pine), aspen, mountain shrub, sagebrush-grasslands, grasslands, riparian, agricultural lands, and reclaimed coal mines. Topographic relief can be dramatic and can offer quality hiding or escape terrain for mule deer.

Figure 1. Map of the Shirley Mountain mule deer herd unit, Hunt Area 70, located in south-central Wyoming.



The Shirley Mountain Herd Unit encompasses 3,735 km^2 of occupied mule deer habitat. Land ownership consists of 48% private ownership, 43% mixed federal lands, primarily Bureau of Land Management, and 9% Wyoming Office of State Land and Investments. The southern half of the herd unit is mostly a checkerboard of private, state, and BLM lands as a result of land grants to railroads in the 19th century. The northern half contains more single owner blocks of land with large areas of accessible public land. In recent years, one ranch has acquired a substantial amount of private land in and around the Shirley Mountains, and it controls access to a substantial amount of private and public mule deer habitat.

CURRENT POPULATION OBJECTIVE REVIEW

Wyoming Game and Fish Department (WGFD) has traditionally used postseason population objectives as a guide for mule deer management at the herd unit level. The postseason population objective is the desired number of mule deer remaining in the herd unit after the annual hunting season has been completed. Generally, if the population estimate is above the population objective, WGFD will propose changes to the herd unit's next hunting seasons which will increase harvest and reduce the number of mule deer toward the population objective. Conversely, if the population estimate is below the population objective, WGFD will propose changes to the herd unit's next hunting seasons which will decrease harvest and increase the number of mule deer toward the population objective.

In 1978, WGFD adopted the first postseason population objective of 5,200 (±20%) mule deer for the Shirley Mountain herd unit. Subsequently, the objective was reviewed in 1987 and increased to 10,000 (±20%) mule deer due to changes in estimation techniques, sportsmen desires, and landowner desires/tolerances. The Shirley Mountain herd unit population objective of 10,000 (±20%) mule deer has not been reviewed since 1987.

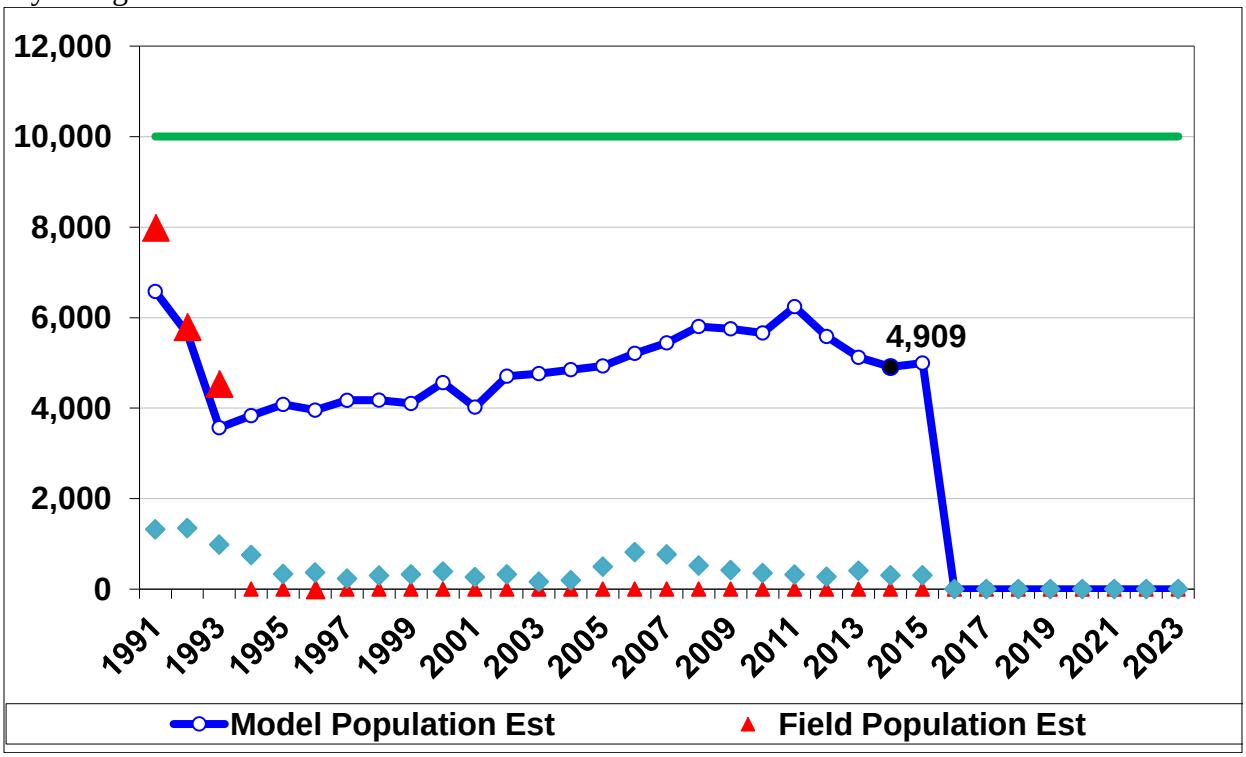
An actual count of all mule deer in a herd unit would be, for all practical purposes, impossible to complete. Therefore, WGFD develops herd unit population estimates using a computer-based population model. Data collected annually through hunter-harvest surveys and postseason mule deer sex and age classification surveys are incorporated into the population model. The population estimate produced by the computer-based population model is used to determine where the herd unit's mule deer population is at in relation to the established population objective.

Shirley Mountain herd unit hunter-harvest survey sample sizes have been adequate for producing estimates of harvest with an acceptable 80% confidence interval. However, postseason mule deer sex and age classification survey sample sizes have been less than adequate and may be a source of bias in the herd unit's population estimates. Low sample sizes for annual classification surveys may be due in part to conducting these surveys from the ground instead of with the use of a helicopter. Annual population estimates for the Shirley Mountain herd unit are currently produced using a computer-based, spreadsheet population model adopted by WGFD in 2012 (Morrison 2012). Retrospective comparison between population estimates produced by the former POP-II model and the current spreadsheet model indicated the spreadsheet model produced lower annual estimates. Generally, the spreadsheet model's estimates are considered

more accurate than the previous POP-II population model estimates for this herd unit. Additionally, 3 mule deer sightability surveys were conducted in the early 1990s in this herd unit (Strickland et.al 1994). Abundance estimates from these sightability surveys were incorporated into the current spreadsheet model to improve the population estimation accuracy.

The 2014 postseason population estimate was 4,909 mule deer (Figure 2). This estimate is considered to be biologically plausible. Like many of the mule deer herds in Wyoming, the Shirley Mountain herd unit experienced excellent population growth during the 1960s and 1970s. However since then this herd unit, like most of Wyoming's herd units, has experienced a significant reduction in annual fawn recruitment. This in turn has led to the herd units either stabilizing at lower population levels than those previously observed, or they continue to decrease in trend. Although there are many factors contributing cumulatively to today's reduced mule deer numbers, the direct and indirect impacts from severe winters and drought are considered to be the most significant factors.

Figure 2. 1991-2014 Shirley Mountain herd unit postseason mule deer population estimates, Wyoming.



CURRENT MANAGEMENT STRATEGY

Shirley Mountain herd unit is entirely contained in deer Hunt Area 70 and is managed under the recreational management strategy. This strategy directs WGFD to optimize recreational opportunity, while managing harvest to maintain 20-29 bucks/100 does postseason in the herd unit. Currently, mule deer hunting in this herd unit is permitted with a General deer license. In recent years, WGFD has recommended very conservative seasons for this herd unit with reduced season lengths and an antler point limitations because the population estimate is well below the management objective.

RECOMMENDED HERD UNIT OBJECTIVE AND MANAGEMENT STRATEGY

WGFD recommends the population objective for the Shirley Mountain herd unit be reduced to a level which is currently considered both biologically achievable, and sustainable. We recommend reducing the postseason population objective from 10,000 (±20%) mule deer to 7,500 (±20%) mule deer. We also recommend maintaining the recreational management strategy for the Shirley Mountain herd unit.

Three years ago, WGFD began the long overdue task of reviewing management objectives for all big game herd units in Wyoming, to be completed over the course of the next 5-years. At the root of this effort was a genuine need to update the objectives with goals which were both biologically achievable, and sustainable. Much has changed since many of these management herd unit objectives were last reviewed. Most notably, changes in the ability of the habitat to sustain the population levels which had been previously observed in many herd units.

An indicator of the habitat's inability to continue to support mule deer population levels previously observed in many herd units has been reduced recruitment rates for mule deer. A declining trend in recruitment has been documented in almost every herd unit in Wyoming, as well as in many areas across the west. This declining trend has been primarily attributed to changes in the ability of habitat to provide the specific forage, cover, and security required by mule deer. Changes in seral stages of vegetative communities to less productive stages, severe drought which has reduced annual forage production, and the conversion of habitat to residential and energy development, all have cumulatively reduced habitat for mule deer.

The recommended population objective of 7,500 (±20%) mule deer is 33% greater than the current population estimate of 4,909 mule deer. WGFD believes this to be a realistic goal to manage towards. In an effort to halt the mule deer decline and reverse the population trend, WGFD has supported several efforts to enhance mule deer habitat in this herd unit. The WGFD has continued to recommend liberal elk seasons in this herd unit in an effort to reduce potential competition between elk and mule deer for resources. WGFD has also supported efforts to reduce large carnivore and predator populations in this herd unit in an attempt to increase mule deer recruitment. While the effect of these and other efforts may not be immediately realized, WGFD believes these efforts will provide a benefit to mule deer in the Shirley Mountain herd unit.

LANDOWNER AND PUBLIC INVOLVEMENT

WGFD made a concerted effort to provide stakeholders with an opportunity to be involved in the review of the Shirley Mountain mule deer herd unit population objective, and to provide comment on the recommendations. Mule deer are a species of great concern for many of the stakeholders who participated in the review process. There was almost a unanimous desire by all stakeholders during this process to see the current number of mule deer increased.

Landowner Involvement

In February of 2015, a letter describing the objective review process and a survey were sent to all landowners (n=64) who owned at least 160 acres in the Shirley Mountain herd unit (ATTACHMENT A). WGFD received 20 survey responses from landowners for a return rate of 31%. Of the 17 landowners who responded to Question 1 about how satisfied they were with current mule deer numbers, 53% indicated they were somewhat satisfied or very satisfied with the current mule deer population and 47% were somewhat dissatisfied or very dissatisfied with the current mule deer population (ATTACHMENT B). Most landowners who were dissatisfied were so because there were too few mule deer in the herd unit. When asked what landowners thought about the current objective of 10,000 (±20%) mule deer in Question 3, 231 of the 16 landowners who responded indicated the objective needed to be increased, 6% thought it should be decreased, and 63% percent thought the current objective was acceptable. The herd unit objective was also reviewed at the Leo area landowner meeting. Comments from this meeting were similar to the landowner survey responses received by WGFD.

Public Involvement

In January of 2015, population objective review meetings were held in conjunction with post-season public information gathering (PIGM) meetings in Cheyenne, Hanna, and Laramie. We received only one (1) written comment on the Shirley Mountain mule deer objective review from these meetings (ATTACHMENT C).

In March of 2015, population objective recommendations were presented in conjunction with season-setting public information gathering meetings in Casper, Cheyenne, Laramie, Saratoga, and Wheatland. These meetings were attended by a total of 75 people. We received 7 written comments on the Shirley Mountain mule deer objective recommendation (ATTACHMENT D). All 7 (100%) written comments supported the recommendation to reduce the management objective from 10,000 (±20%) mule deer to 7,500 (±20%) mule deer.

In summary, most landowners and sportsmen would like to see more mule deer than what is currently in the herd unit. The WGFD recommendation will allow for increasing the mule deer population by approximately 33% over what is currently estimated for this herd unit. All of the written comments WGFD received at the PIGMs were in support of this recommendation to reduce the management objective from 10,000 (±20%) mule deer to 7,500 (±20%) mule deer.

LITERATURE CITED

Morrison, T. 2012. User Guide: Spreadsheet Model for Ungulate Population data. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 41 pp.

Strickland, D., L.L. McDonald, G. Johnson, W. Erickson, D. Young Jr., and J. Kern. 1994. An Evaluation of Mule Deer Classifications From Helicopter and Ground Surveys. Western Ecosystems Technology, Inc. Cheyenne. 61pp.

20 February 2015

Dear Landowner,

The Wyoming Game and Fish Department (Department) is seeking your assistance in the future management of big game wildlife in your area. During the spring of 2015, the Department will review the herd unit management objectives for several big game herd units including the Shirley Mountain mule deer and Shirley Mountain elk herd units. Enclosed in this letter you will find a short survey for the herd unit your property is located within and postage-paid return envelope. Please complete the survey questions, provide additional comments if you desire, and mail the survey in the enclosed return envelope.

The herd unit management objective is the "goal" which the Department manages big game wildlife towards. For most big game herd units in Wyoming, the Department manages big game wildlife towards a numeric management objective, usually identified as a postseason population estimate.

Many of Wyoming's big game wildlife rely on habitat located on private lands. Therefore, landowner opinions on herd unit management objectives are important to Department. The comments we receive from your completed surveys will be used in part to formulate Department recommendations for the future herd unit management objectives. Changes in the herd unit management objective could result in increasing harvest opportunities to decrease the number of big game animals, or conversely, changes could result in reducing harvest opportunities in order to increase the number of big game animals. For planning purposes, the Department would like to identify management objectives which are considered biologically achievable within the next five years.

Thank you for taking the time to share your thoughts and opinions with us. If you have any questions please contact Will Schultz at 307-326-3020. We look forward to receiving your survey and working with you on the future management of Wyoming's Wildlife.

Sincerely,

Will Schultz
Saratoga Wildlife Biologist

WS/ws

Shirley Mountain Mule Deer Herd Unit Objective Survey

1. How satisfied are you with the current Shirley Mountain mule deer population:
□ Very Satisfied □ Somewhat Satisfied □ Somewhat Dissatisfied □ Very Dissatisfied

2. Please indicate why you selected the response you did for question 1.
□ There are too many mule deer in the population
□ There is the right amount of mule deer in the population
□ There are too few mule deer in the population
□ Other _____

3. What do you think about the current post-season population objective of 10,000 (*8,000-12,000*) mule deer?

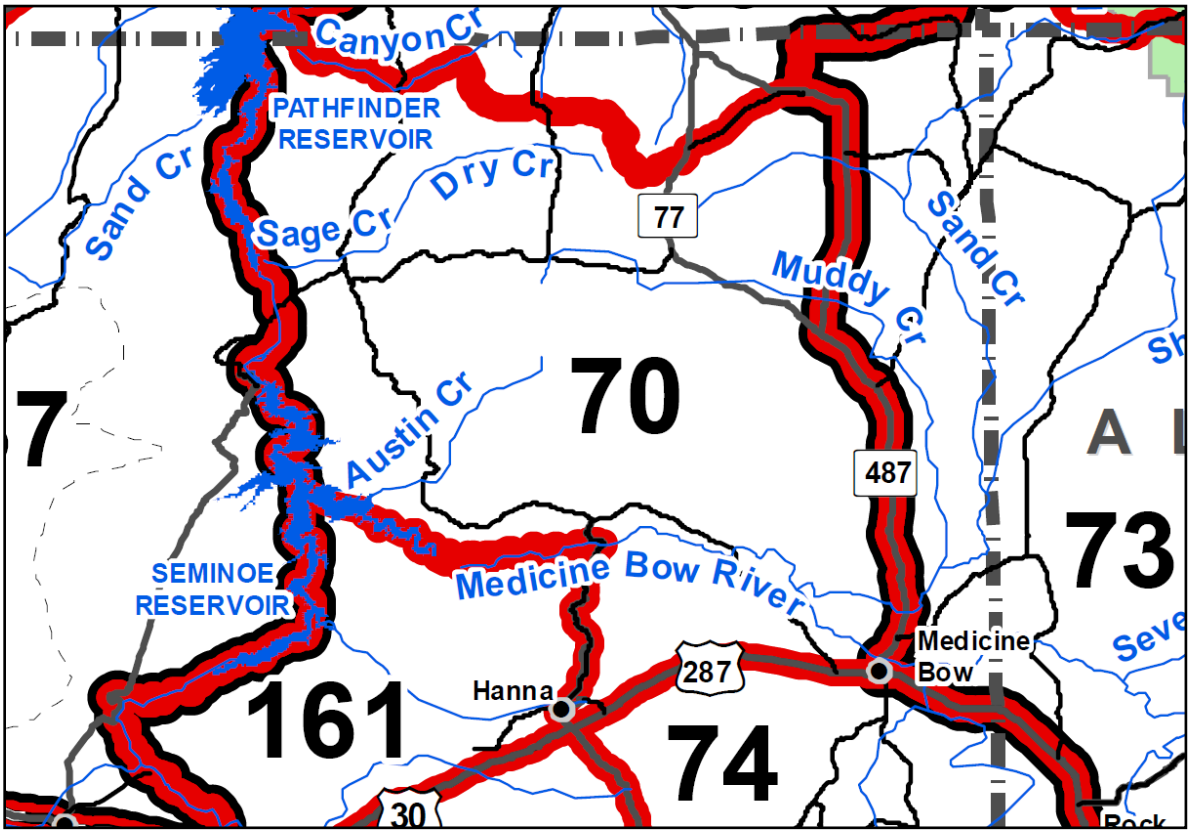
□ Current population objective needs to increase
□ Current population objective needs to decrease
□ Current population objective is acceptable

4. If you have additional comments, please share them in the space below:
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

If, in the future, you would like to be contacted through email please provide your email address below._____

Please Mail To: WGFD, 528 South Adams, Laramie, WY 82070 **By March 15th**.

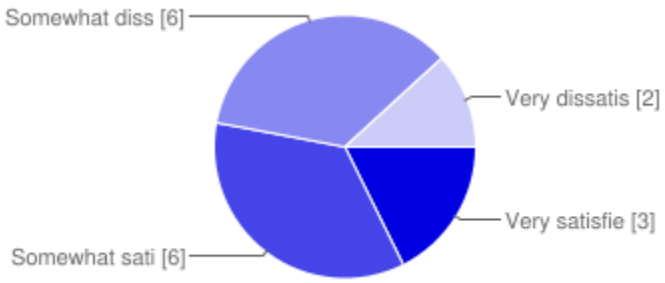
Deer Hunt Area 70 contains the entire Shirley Mountain Mule Deer Herd Unit.



Shirley Mountain Mule Deer
Landowner Survey
64 surveyed / 20 responses

Summary

1. How satisfied are you with the current Shirley Mountain mule deer population?

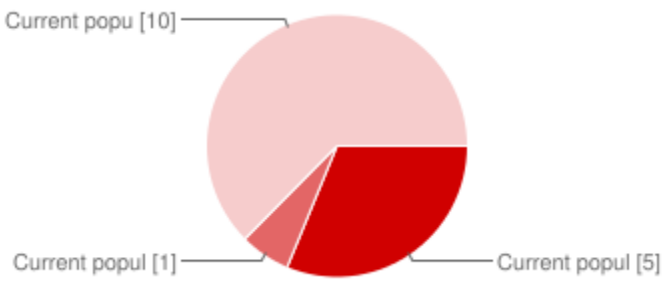


Very satisfied	**3**	18%
Somewhat satisfied	**6**	35%
Somewhat dissatisfied	**6**	35%
Very dissatisfied	**2**	12%

2. Please indicate why you selected the response you did for Question 1.:

There are too many mule deer in the population	**1**	6%
There is the right amount of mule deer in the population	**8**	44%
There are too few mule deer in the population	**9**	50%
Other	**0**	0%

3. What do you think about the current post-season population objective of 10,000 (8,000-12,000) mule deer?



Current population objective needs to increase	**5**	31%
Current population objective needs to decrease	**1**	6%
Current population objective is acceptable	**10**	63%

Additional Comments:

The three points and better on the bucks is a good idea and should stay in place until the deer herds come back.

Hi Will- as I said no data from me. Mule deer are on the property. (Windy Hill I80- exit 196). Frank-530-219-4477
On the one section of pasture I own I haven't seen a deer on the place. I have seen a few antelope.

The three point or better is a good program. I wouldn’t be opposed to making this area a special permit area.

How are we supposed to answer if we don’t know if that objective is an increase or a decrease?

Deer on our property have steadily decreased over the last 10-15 years. This area should be 4 points or better and SPECIAL PERMIT ONLY! We used to have a decent whitetail population as well as mule deer but they are completely gone at this point.

We control only about 2800 acres of BLM lease on west side of 487 in Shirley Basin. We use this as summer pasture only and never seen a deer on property, only antelope. I don't feel qualified to answer questions.

I see no need for 10,000 mule deer. The population base in conjunction with area 161 is more than adequate if not over populated. I do not believe there is any reason to increase the existing population for fear of hurting the habitats.
Limited Quota, 4 point of better

Deer populations in this part of the area are adequate for now. It will be interesting to see which way they go in the next 5 years. I am concerned that predators (wolf and lion) will play a large part in the population in the near future.

WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

Phone: (307) 777-4600 Fax: (307) 777-4699

wgfd.wyo.gov

Shirley Mountain Mule Deer Herd Unit Objective Review

1. How satisfied are you with the current Shirley Mountain mule deer population:
☐ Very Satisfied ☐Somewhat Satisfied ☐Somewhat Dissatisfied ☒Very Dissatisfied

2. Please indicate why you selected the response you did for question 1.
☐ There are too many animals in the population
☐ There is the right amount of animals in the population
☒There are too few animals in the population
☐ Other _____

3. What do you think about the current post-season population objective of 10,000 (8,000-12,000) mule deer?

☐ Current Herd Objective Needs to Increase
☐ Current Herd Objective Needs to Decrease
☒Current Herd Objective is Acceptable

4. If you have additional comments, please share them in the space below:
I would really like to see it be limited Quota

If, in the future, you would like to be contacted through email please provide your email address below. uglyturkey-101@yahoo.com

Please Mail To: WGFD, 528 South Adams, Laramie, WY 82070

THANK YOU for your participation!

WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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Herd Unit Management Objective Proposal Meeting Saratoga

Town Hall – 6:00 PM, 23 March 2014

Shirley Mountain Mule Deer

Current population estimate = 4,909(±20%) mule deer

Management Strategy: Recreational

Propose to decrease the management objective from 10,000 to 7,500 (±20%) mule deer and maintain recreational management for the next 5-years.

X I support this proposal

_____ I do not support this proposal

Shirley Mountain Elk

Current population estimate = 800 elk

Management Strategy: Recreational

Propose to change the management objective from a postseason population estimate of 800 to a mid-winter trend count objective of 800 (±20%) elk, and to change from a Recreational management strategy (15-29 bulls:100 cows) to a Special management strategy (30-34 bulls:100cows) for the next 5-years.

X I support this proposal

_____ I do not support this proposal

Comments: I'm in favor of increasing quality for deer & elk in the Shirley's.

Rick Trujillo

If, in the future, you would like to be contacted through email please provide your email address below.

_____

THANK YOU for your participation!

WYOMING GAME AND FISH DEPARTMENT

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_____ I do not support this proposal

Comments:

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_____

THANK YOU for your participation!

Randy Morrison

WYOMING GAME AND FISH DEPARTMENT

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X I support this proposal

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Comments:

I DEFINITELY SUPPORT QUALITY, MATURITY AND THIS STRATEGY

If, in the future, you would like to be contacted through email please provide your email address below.

THANK YOU for your participation!

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X I support this proposal

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Comments:

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X I support this proposal

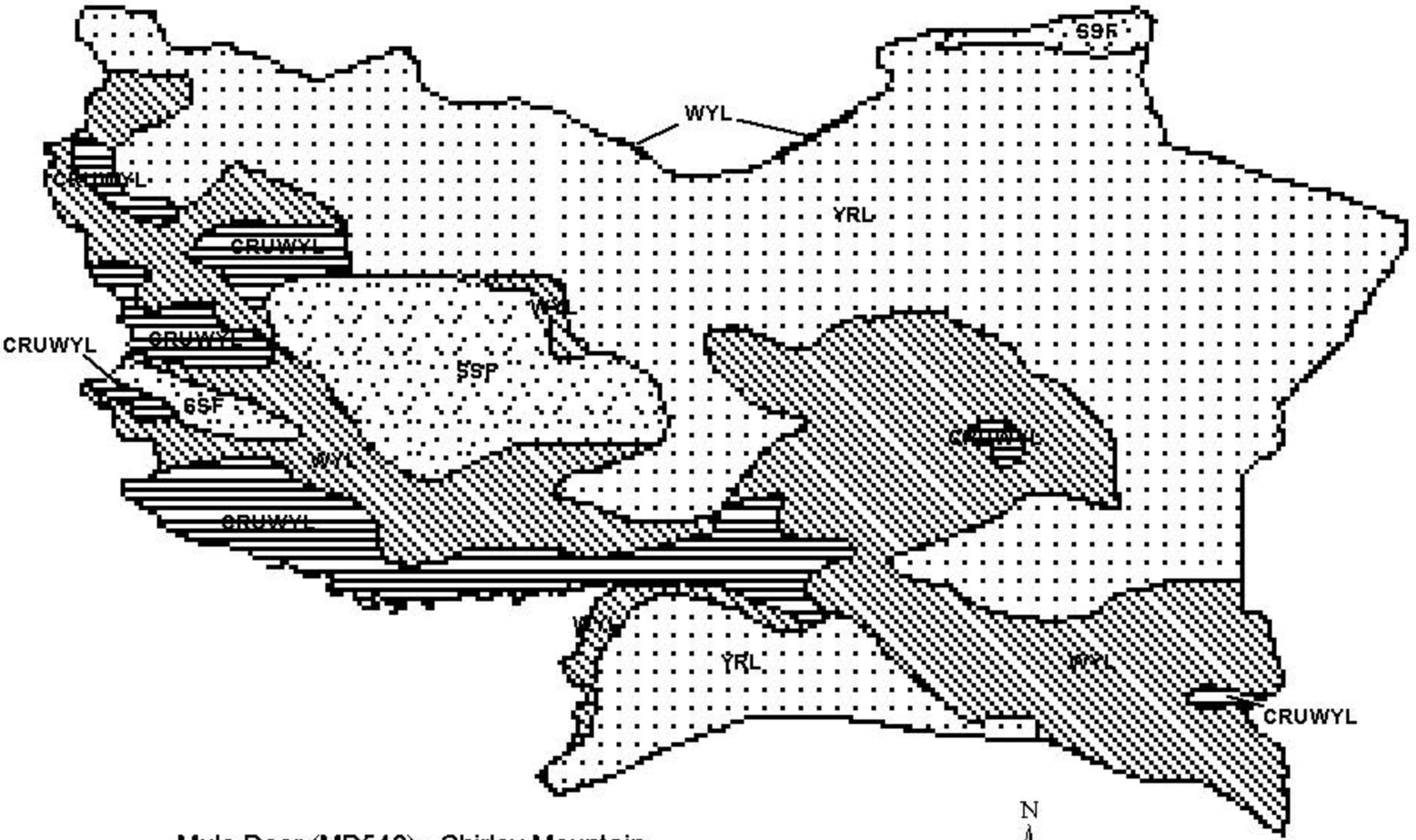
_____ I do not support this proposal

Comments:

Elk – maintain the quality

Deer – Area 70 was much better for deer years ago when it was a Limited Quota area

3/25/15



Mule Deer (MD540) - Shirley Mountain
HA 70
Revised - 12/87

2015 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2015 - 5/31/2016

HERD: MD541 - PLATTE VALLEY

HUNT AREAS: 78-81, 83, 161
PREPARED BY: WILL SCHULTZ

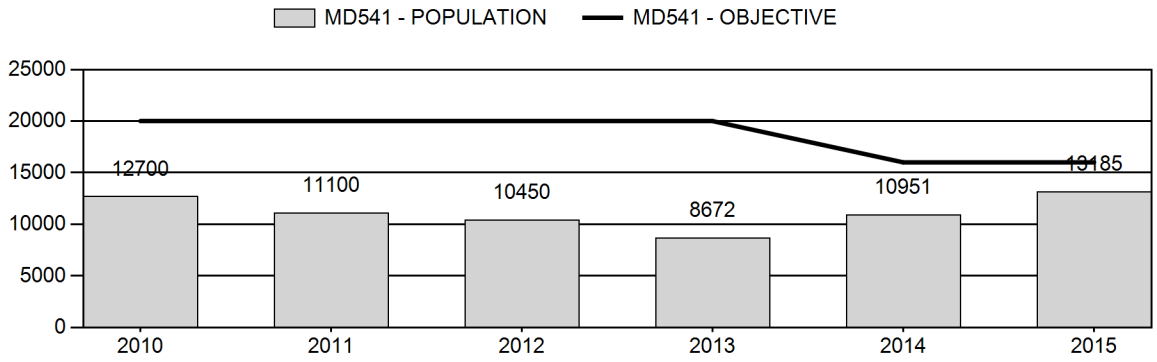
	2010 - 2014 Average	2015	2016 Proposed
Population:	10,775	13,185	13,605
Harvest:	540	523	530
Hunters:	1,898	894	1,025
Hunter Success:	28%	59%	52 %
Active Licenses:	1,918	894	1,025
Active License Success:	28%	59%	52 %
Recreation Days:	10,193	4,852	5,000
Days Per Animal:	18.9	9.3	9.4
Males per 100 Females	29	44	
Juveniles per 100 Females	54	72	

Population Objective (± 20%) :	16000 (12800 - 19200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-17.6%
Number of years population has been + or - objective in recent trend:	9
Model Date:	02/18/2016

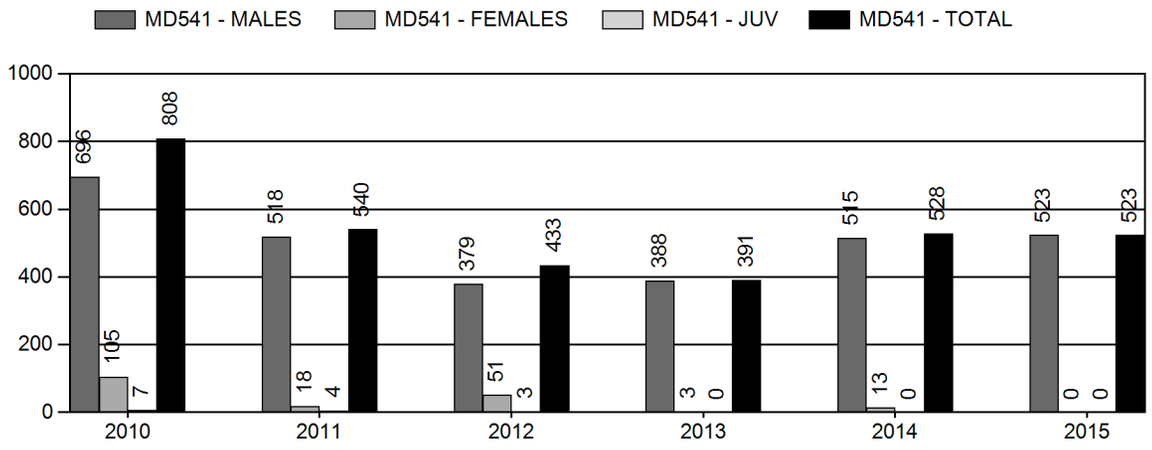
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	0.1%	0.2%
Males ≥ 1 year old:	19%	18%
Juveniles (< 1 year old):	0%	0%
Total:	5%	7.0%
Proposed change in post-season population:	0.03%	3.0%

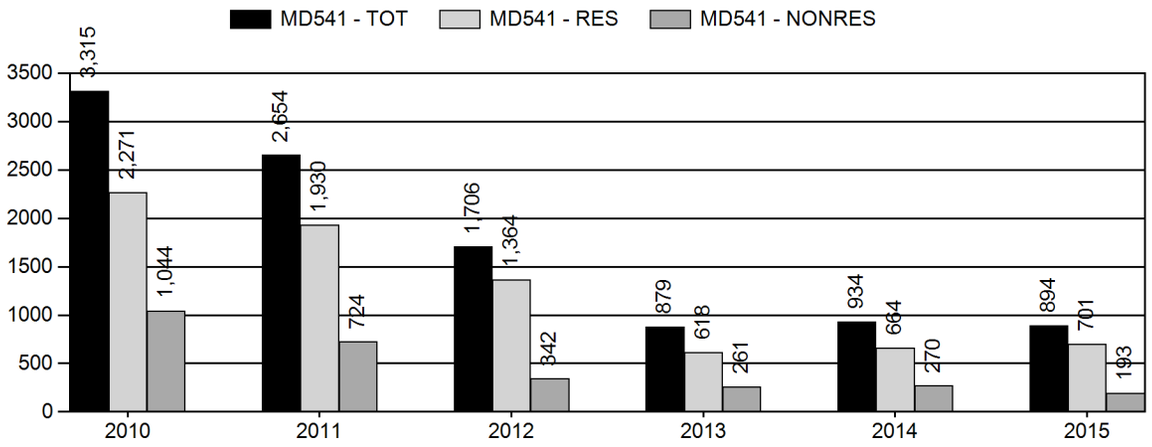
Population Size - Postseason



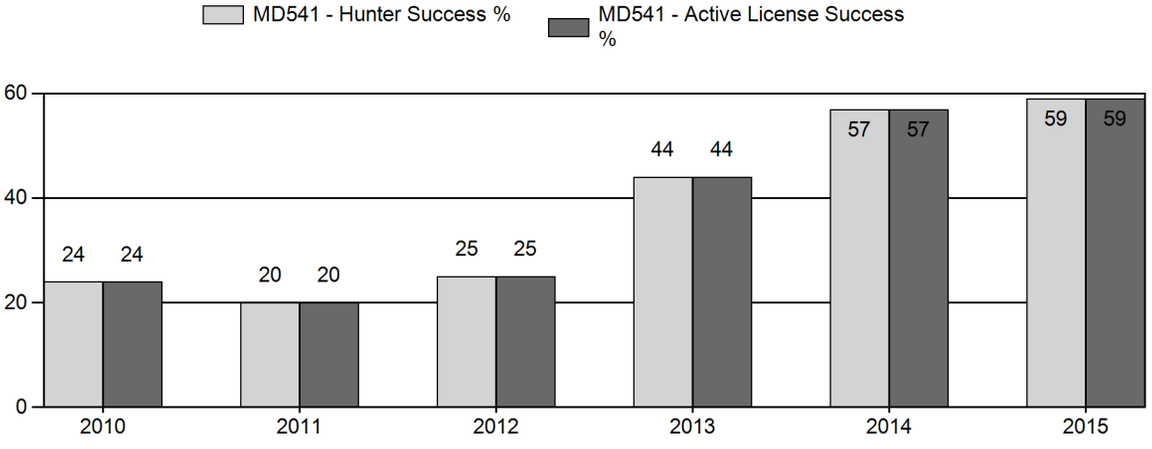
Harvest



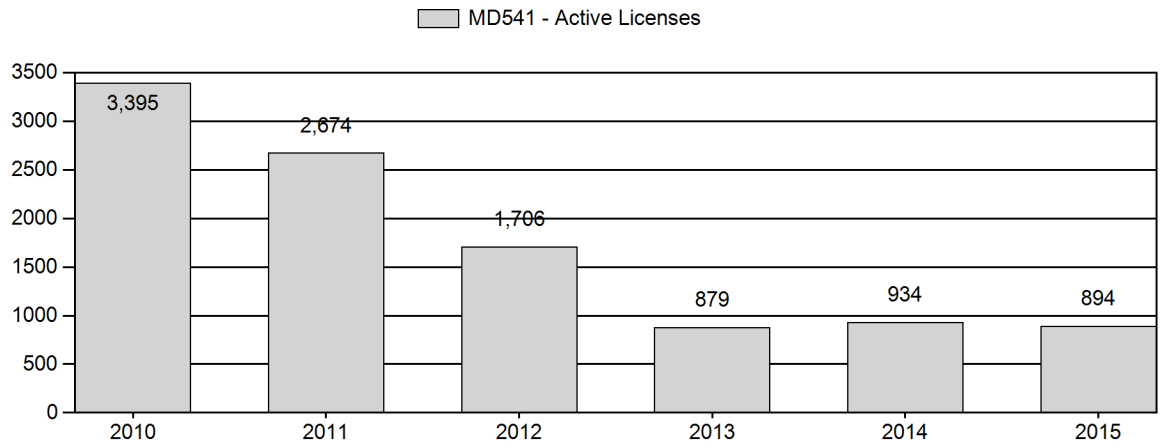
Number of Hunters



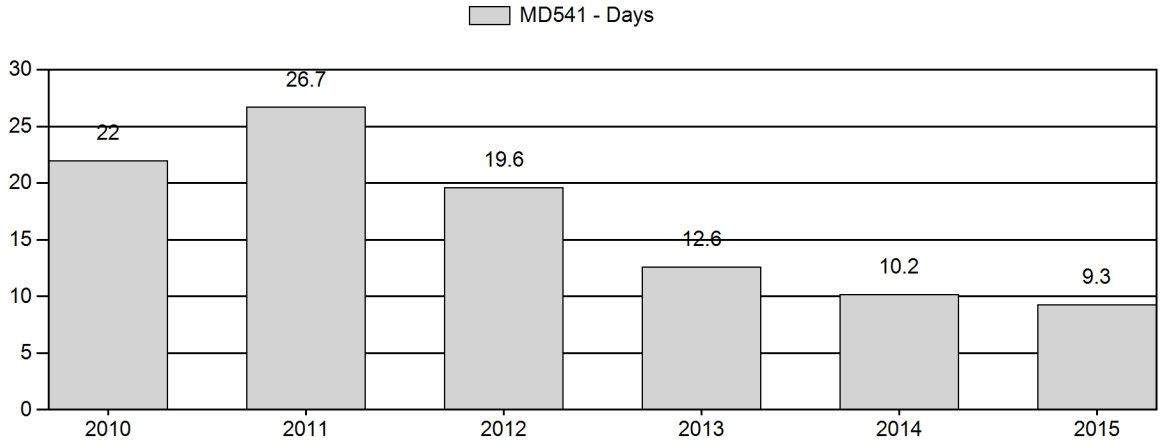
Harvest Success



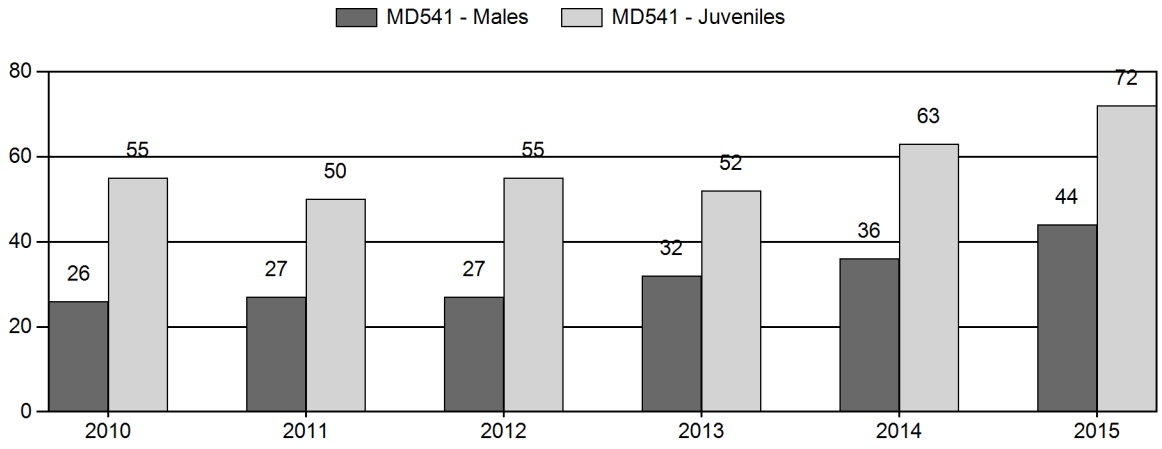
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD541 - PLATTE VALLEY

		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
2010	12,700	111	0	0	0	222	333	14%	1,265	55%	701	30%	2,299	1,094	9	18	26	± 2	55	± 3	44
2011	11,100	125	0	0	0	392	517	15%	1,895	56%	947	28%	3,359	999	7	21	27	± 1	50	± 2	39
2012	10,450	70	0	0	0	143	213	15%	794	55%	438	30%	1,445	980	9	18	27	± 2	55	± 4	43
2013	8,672	136	0	0	0	209	345	17%	1,092	55%	565	28%	2,002	937	12	19	32	± 2	52	± 3	39
2014	10,951	85	549	448	151	0	319	18%	888	50%	560	32%	1,767	964	10	26	36	± 3	63	± 4	46
2015	13,185	143	82	130	19	0	374	21%	842	46%	604	33%	1,820	962	17	27	44	± 3	72	± 5	50

2016 HUNTING SEASONS
PLATTE VALLEY MULE DEER (MD541)

Hunt Area	Type	Season Dates Opens	Season Dates Closes	Quota	License	Limitations
78	1	Oct. 1	Oct. 14	300	Limited quota	Antlered mule deer or any white-tailed deer
79	1	Oct. 1	Oct. 14	300	Limited quota	Antlered mule deer or any white-tailed deer
80, 83	1	Oct. 1	Oct. 14	200	Limited quota	Antlered mule deer or any white-tailed deer
81	1	Oct. 1	Oct. 14	200	Limited quota	Antlered mule deer or any white-tailed deer
161	1	Oct. 1	Oct. 14	25	Limited quota	Antlered mule deer or any white-tailed deer
	Archery	Sep. 1	Sep. 30			Refer to license type and limitations in Section 3 of Chapter 6

Hunt Area	License Type	Quota change from 2015
Herd Unit Total	**None**	**None**

Management Evaluation
Current Postseason Population Management Objective: 16,000 (12,800 – 19,200)
Management Strategy: Recreational
2015 Postseason Population Estimate: 13,200
2016 Proposed Postseason Population Estimate: 13,600
2015 Hunter Satisfaction: 74% Satisfied, 13% Neutral, 13% Dissatisfied

Mule deer in the Platte Valley herd unit are managed toward a numeric objective of 16,000. The population was estimated using a spreadsheet model developed in 2012 and is updated annually. The herd is managed for recreation opportunity. The objective was reviewed in 2014 and reduced from a postseason population management objective of 20,000 mule deer to 16,000 mule deer.

Herd Unit Issues

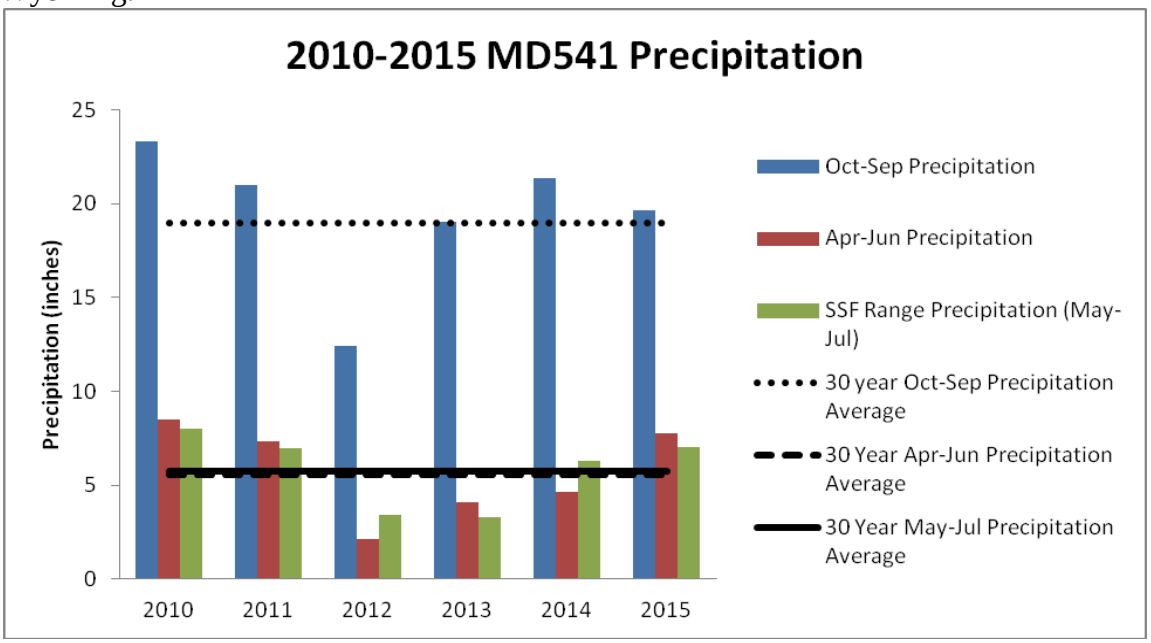
Fieldwork for several Platte Valley Habitat Partnership projects has been initiated during this past 2 years but progress on large scale projects has been delayed by the NEPA constraints associated with working on federally managed lands. A large proportion of the mule deer that reside in this herd unit during winter actually spend the summer and early fall in Colorado. The Platte Valley Mule Deer Initiative and Platte Valley Habitat Partnership continue to work on improving mule deer management and habitat. Efforts to reduce predators of mule deer in the Platte Valley were continued during this period. Carbon County Predator Management District completed the final year of a 3-year coyote removal project (Appendix I).

Weather

- Compiled by WGFD Terrestrial Habitat Biologist, Katie Cheesbrough

Annual bio-year precipitation from October 2014 through September 2015 was slightly higher than the 30 year average. Growing season precipitation (April-June 2015) and precipitation in high elevation spring/summer/fall ranges (May-July 2015) was notably higher than the 30 year average. As illustrated by Figure 1, most of the precipitation occurred outside of the primary growing season, likely in the form of snow. There was significant spring moisture in 2015 from both early spring snows and significant late spring rain events. Although August was fairly dry, there was some early fall moisture in September.

Figure 1. Parameter-Elevation Relationships on Independent Slopes Model (PRISM) was utilized to estimate precipitation by calculating a climate-elevation regression for each Digital Elevation Model grid cell (4 km resolution), Platte Valley mule deer herd unit, Wyoming.



As of mid-February the Platte Valley mule deer herd unit has seen fairly average winter conditions across elevations with the exception of particularly high wind speeds in February. At lower elevations, as reported by the South Brush Creek Snotel Site (Figure 2), snowpack (snow water equivalent) is at 95% of normal. Higher elevations are seeing similar winter snowpack with the North French Creek Snotel Site (Figure 3) reporting a snowpack that is 93% of normal.

Figure 2. October-February bio-year 2015 South Brush Creek Snotel Site precipitation data, Wyoming.

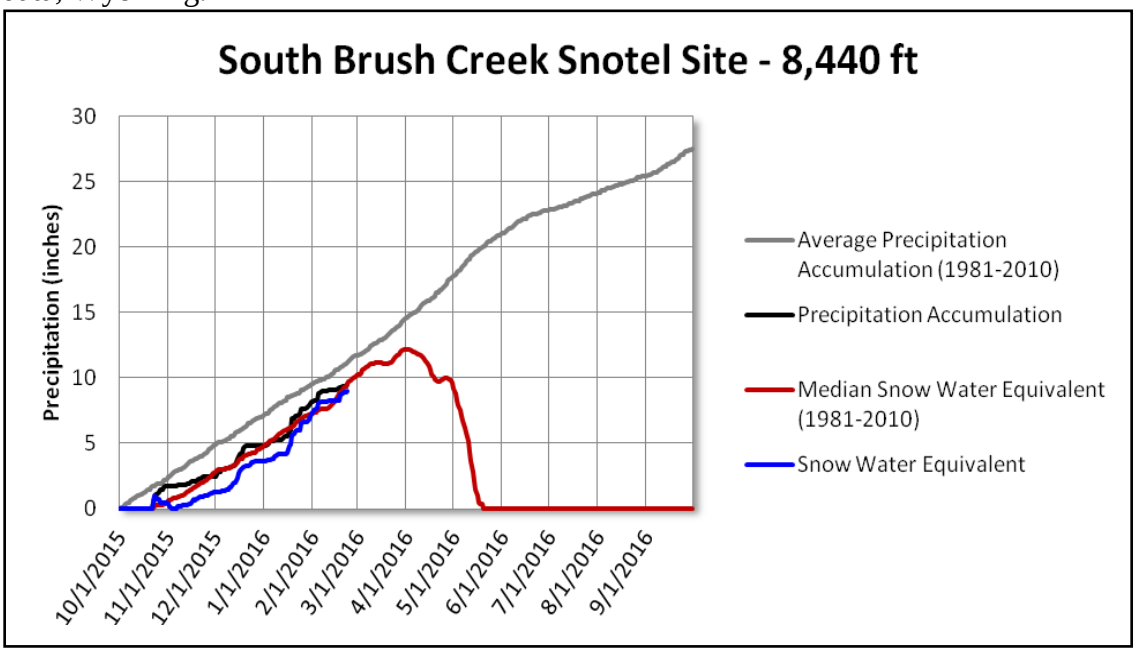
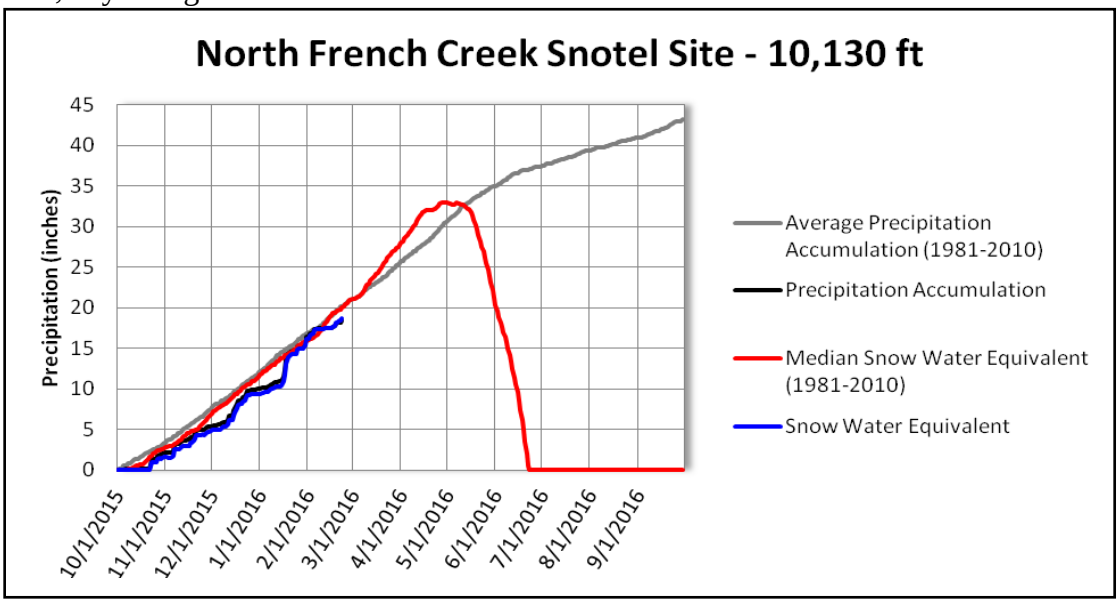


Figure 3. October-February bio-year 2015 North French Creek Snotel Site precipitation data, Wyoming.



Habitat

- Compiled by WGFD Terrestrial Habitat Biologist, Katie Cheesbrough

Exceptional fall precipitation in 2014 and mild 2014-2015 winter conditions allowed to deer enter winter with above average body condition. Growing season precipitation was higher than the 30 year average in 2015, resulting in excellent production of grasses, forbs, and shrubs across all seasonal ranges providing for ample forage during early parturition. However, despite favorable early season precipitation, many important shrub habitats continue to underperform due to maturity and decadence caused by a lack of disturbance. Early season precipitation over the past 2 years has also created a flush of cheatgrass across the Platte Valley which is starting to degrade mule deer habitat by outcompeting native grasses and forbs and can create conditions that are favorable to catastrophic wildfires.

Terrestrial Habitat Biologists began forage production monitoring on the Pennock Wildlife Habitat Management Area (WHMA) in 2014 to determine forage capacity for both wildlife and livestock. Plot sites were selected to capture the different vegetation types that exist within elevational ranges as well as on the irrigated meadow.

Above average precipitation was experienced in the Platte Valley in both 2014 and 2015 which influenced production values found on the Pennock WHMA. The total average production across the WHMA, based on total acres in each elevational range, was approximately 514 lbs/acre for 2015. Due to extremely wet spring weather and inaccessible roads, utilization sampling was not conducted in 2015 but will be collected in 2016.

Besides the Pennock WHMA forage production clipping, no permanent vegetative transects were analyzed this year within the herd unit, but the new Rapid Habitat Assessment developed by the WGFD were initiated in the Platte Valley herd unit. Landscape assessments were completed in July 2015 in the Savage Creek, Cedar Breaks, School Creek, and Prospect areas. Initial assessment areas were selected using local knowledge, mule deer collar data, and GIS maps and imagery. Habitat types assessed included aspen in known parturition habitats and mixed mountain shrubs in transitional and winter ranges. The assessments were conducted by the Saratoga Game Warden, Wildlife Biologist, Habitat Biologist, and Statewide Habitat Biologist. From the seven assessments completed it appears that much of the component is either in a mature or decadent age class, indicating the need for disturbance in order to increase nutritive content in these shrubs. Shrub hedging classes were mostly moderate with severe hedging found on heavily used winter range. The one aspen assessment that was conducted in 2015 indicated a conifer encroachment issue which is consistent with observations in aspen stands across the herd unit.

Field Data

The 2015 Platte Valley Herd Unit postseason classification ratios were 44 bucks and 72 fawns per 100 does; based on an adequate sample of 1,820 mule deer. The buck ratio

increased 18% in 2015. This increase was attributed to the combination of both a conservative limited quota hunting season and greater over winter survival than in recent years. The observed fawn ratio at 72 fawns/100 does was 12% greater than the previous year and 24% than the previous 5-year average. A mild winter and timely precipitation contributed to providing improved habitat conditions and increased nutrition for mule deer. Rodent and rabbit populations appeared to be at higher levels than in previous years and may have provided alternative food sources for many mule deer predators, resulting in lower predation rates on fawns in 2015.

Harvest Data

2015 marked the third year for limited quota hunting in the Platte Valley herd unit. Each hunt area was prescribed a license quota specific to the hunt area. The same quotas from the 2013 and 2014 were retained in 2015 as they had permitted harvest success to attain the PVMDI Mule Deer Plan goal of at least 40%. A total of 894 active licensed hunters harvested 523 bucks and 0 does. Overall harvest success increased from 57% in 2014 to 59% in 2015. Similar to the 2014 harvest rate, the 2015 harvest rate was attributed to the recent increase in fawn survival rates, a season length of 14-days, and perhaps most importantly, a reasonable alignment of hunter numbers with the current mule deer resource. The increased harvest success rate translated into an increase in the number hunters who selected a harvest survey satisfaction rating of satisfied, or very satisfied. Hunter satisfaction increased from 62% in 2014, to 74% in 2015.

Harvest rates of yearling bucks decreased in 2015. Yearling bucks made up 13% (n = 6) of the field checked sample for buck harvest. This was a decrease of 13% from 2014. Field checked harvest data from years previous to the implementation of limited quota hunting seasons indicated on average, greater than 25% of the buck harvest consisted of yearling bucks. The decreased number of yearling bucks observed in 2015 harvest was attributed to more 2-year and older age class bucks being conspicuously available.

Population

We continued the use of the TSJ,CA spreadsheet model in 2015. This model provided the balance of allowing juvenile survival rates to be optimized for alignment with observed population dynamics, while maintaining a constant survival rate for adult mule deer in model simulations. The TSJ,CA model produced a 2015 postseason population estimate of 13,185 mule deer for the Platte Valley herd unit. This was 9% increase in the population estimate from 2014. TSJ,CA model aligned very well with abundance estimates for this herd unit and corroborated with the observations from field managers and the public. The TSJ,CA model also offered the best AICc score of the suite of spreadsheet models. We rated this model as fair, and biologically defensible in our evaluation. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model (Morrison 2012).

In February of 2016, we completed a sightability survey to develop the 4th annual abundance estimate for mule deer in this herd unit. A stratified, random sample survey

design was employed, based on previous sightability survey results. A total of 11,594 mule deer were observed in 1,399 groups. A corrected abundance estimate of 16,600 mule deer (SE = 947, CI = ±1,856) was produced using the Hiller 12-E, Idaho (Spring), mule deer model in the Aerial Survey program (Unsworth, et. al. 1999)(Appendix II).

The Wyoming Cooperative Fish and Wildlife Research Unit completed the final report for the Platte Valley mule deer radio-collar movement project which began in 2011 (Kauffman, et.al. 2015). Results from this project included the delineation of migration corridors, migration bottlenecks and stopover habitats. WGFD will use this data to assess current and potential threats to maintaining connectivity for important mule deer habitat within this herd unit.

Management Summary

In 2016, the limited quota license quotas and season length will remain the same as in 2015. This hunting season framework will continue to support the goals identified in the Platte Valley Mule Deer Plan. Overall, hunters and other stakeholders appear to be very satisfied with the improvements we have made in mule deer management in this herd unit. Predator management and habitat improvement projects will also continue in 2016 as means to improve and sustain mule deer and their habitat in the Platte Valley herd unit. In 2016, we will conduct an in depth collaborative review and analysis of the Platte Valley Mule Deer Plan, including the limited quota hunting season framework.

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Kauffman, M., H. Sawyer, W. Schultz, and M. Hayes. 2015. Seasonal Ranges, Migration, and Habitat Use of the Platte Valley Mule Deer Herd. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 21 pp.

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Wyoming Game and Fish Dept. 2012. 2012 v.110512 Platte Valley Mule Deer Plan. Wyoming Game and Fish Department, Cheyenne. 90 pp.

Platte Valley Mule Deer Recruitment Project

Completed by:
Craig Acres, WS' Staff Biologist, Casper, Wyoming
Will Schultz, WGFD District Biologist, Saratoga, Wyoming

Carbon County Predatory Management District (CCPMD), USDA/APHIS/Wildlife Services (WS), Wyoming Game and Fish department (WGFD), Wyoming Animal Damage Management Board (ADMB)

Final Project Report 03/01/2013 - 06/30/2015

The Platte Valley Mule Deer Recruitment Project (PVMDRP) consisted of a 3 yr. cooperative effort aimed at the removal of coyotes (*Canis latrans*) within the *Platte Valley Mule Deer Initiative (PVMDI) area. Specifically, removal efforts took place within Wyoming Hunt Areas 78, 79, and 81. These efforts were aimed at increasing the viability of the mule deer (*Odocoileus hemionus*) herd fawning in these areas. The goal of the PVMDRP was to provide enhanced coyote removal to benefit mule deer fawn recruitment.

*http://wgfd.wyo.gov/web2011/wildlife-1000399.aspx.

Photo courtesy WGFD.

Year 1 of 3 (03/01/13 - 06/30/2013)

Work commenced in the removal area on 03/01/2013 and continued until 06/30/2013. Efforts will continue annually through 2014 and 2015 as ADMB funding permits.

Specific ADMB funds received for the PVMDRP (2013) consisted of $10,000.00. These funds were spent on 4.6 hrs. rotor wing time, per diem and hazard duty ($3,793.80 *Sky Aviation*) and 37.3 hrs. fixed wing time and hazard duty ($6,206.20 *WS*) aerial hunting.

Additionally, $19,841.35 was spent on the project for ground work, administrative/ground work activities, and helicopter deer classification. This funding came cooperatively from CCPMD operational funds ($4,548.30), WS ($4,093.05) and WGFD ($11,200.00).

A total of 85 coyotes and 2 dens within 14 different WS cooperative agreements were taken from the project area. Of the 85 coyotes taken, 19 coyotes (22%) were retrieved for comprehensive data collection. 5 WS/1 WGFD personnel were involved in project activities.

Comprehensive data from 19 coyotes verified for sampling and analysis below:

10	Adult Male Coyotes*
8	Adult Female Coyotes**
1	Juvenile Female Coyote

* 3 of the adult male coyotes exhibited the presence of Sarcoptic mange (*Sarcoptes scabiei*) mites.

**3 of the adult female coyotes exhibited signs of having whelped (7, 5, and 3 pups. (*5 avg.*). 1 of the adult female coyotes contained 3 unborn whelps.

Stomach content occurances of 19 coyotes verified for sampling and analysis below:

7	pronghorn	9	rabbit/rodent	8	Livestock	1	bird
3	grass						

Year 2 of 3 (03/01/2014 – 06/30/2014)

Work commenced in the removal area on 03/01/2014 and continued until 06/30/2014. Efforts will continue annually through 2015 as ADMB funding permits.

Specific ADMB funds received for the PVMDRP (2014) consisted of $15,000.00. These funds were spent on 9.55 hrs. rotor wing time, per diem and hazard duty ($8,078.98 *Sky Aviation*) and 40 hrs. fixed wing time and hazard duty ($6,921.02 *WS*) aerial hunting.

Additionally, $18,383.82 was spent on the project for ground work, administrative/ground work activities, and helicopter deer classification. This funding came cooperatively from CCPMD operational funds ($5,109.76), WS ($2,074.06) and WGFD ($11,200.00 approx.).

A total of 78 coyotes and 6 dens within 14 different WS cooperative agreements were taken from the project area. Of the 78 coyotes taken, 45 coyotes (58%) were retrieved for comprehensive data collection. 6 WS/1WGFD personnel were involved in project activities.

Comprehensive data from 45 coyotes verified for sampling and analysis below:

15	Adult Male Coyotes*
15	Adult Female Coyotes **
2	Juvenile Female Coyote
13	pups

* 2 of the adult male coyotes exhibited the presence of Sarcoptic mange (*Sarcoptes scabiei*) mites.

**11 of the adult female coyotes exhibited signs of having whelped (7, 7, 8, 6, 2, 6, ?, 6, 8, 6, 5 (? 1 Female was showing that she has nursed pups but placental scars were not counted)) for an average of 5.5 pups.

Stomach content occurances of 45 coyotes verified for sampling and analysis below:

1	pronghorn	21	rabbit/rodent	9	Livestock	3	deer
1	grass	1	frog	13	empty		

Year 3 of 3 (03/01/2015 – 06/30/2015)

Work commenced in the removal area on 03/01/2015 and continued until 06/30/2015. The data below is the last year of data of the 3 yr. project.

Specific ADMB funds received for the PVMDRP (2015) consisted of $21,500.00. These funds were expended on 14.7 hrs. rotor wing time, per diem and hazard duty ($12,561.33 Sky Aviation) and 50.8 hrs. fixed wing time and hazard duty ($8,938.67 WS) aerial hunting.

Additionally, $19,660.20 has been spent on the project for ground work, administrative/ground work and helicopter deer classification. This funding came cooperatively from CCPMD operational funds ($4,374.69), WS ($4,085.51) and WGFD ($11,200.00 approx.).

A total of 118 coyotes and 2 dens within 13 different WS cooperative agreements were taken from the project area. Of the 118 coyotes taken, 36 (32%) were retrieved for comprehensive data collection. 5 WS/1WGFD personnel were involved in project activities.

Comprehensive data from 36 coyotes verified for sampling and analysis below:

18	Adult Male Coyotes*
17	Adult Female Coyotes*,**
1	Juvenile male Coyote

* 2 of the adult males and 1 adult female coyote exhibited the presence of Sarcoptic Mange (*Sarcoptes scabiei*) mites.

**4 of the adult female coyotes exhibited signs of having whelped (7, 10, 7, ? (1 Female was showing that she has nursed pups but placental scars were not counted)) for an average of 8 pups. 2 of the adult female coyotes contained unborn whelps (8, and 5).

Stomach content occurances of 36 coyotes verified for sampling and analysis below:

2	pronghorn	29	rabbit/rodent	2	empty	2	deer

3 stomachs not sampled

Summary of PVMDRP

Coyote Removal		2013	2014	2015	3-Yr. Total
Coyotes Removed*		85	78	118	281
Dens Removed		2	6	2	10
Coyotes Necropsies		28	49	35	112
Stomach Contents:	Rabbit/Rodent	9	21	29	59
	Livestock	8	9		17
	Empty		13	2	15
	Pronghorn	7	1	2	10
	Deer		3	2	5
	Grass	3	1		4
	Bird	1			1
	Frog		1		1

Expenditures					
Helicopter Hours	Sky Aviation	4.6	9.6	14.7	28.9
Helicopter Cost	Sky Aviation	$3,794	$8,079	$12,561	$24,434
Airplane Hours	WS'	37.3	40.0	50.8	128.1
Airplane Cost	WS'	$6,206	$6,921	$8,939	$22,066
Groundwork Cost	WS'	$4,093	$2,074	$4,086	$10,253
Groundwork Cost	CCPMD	$4,548	$5,110	$4,375	$14,033
Annual Project Costs		$18,641	$22,184	$29,960	$70,785

Project Funding					
Special Project Grants Received	ADMB	$10,000	$15,000	$21,500	$46,500

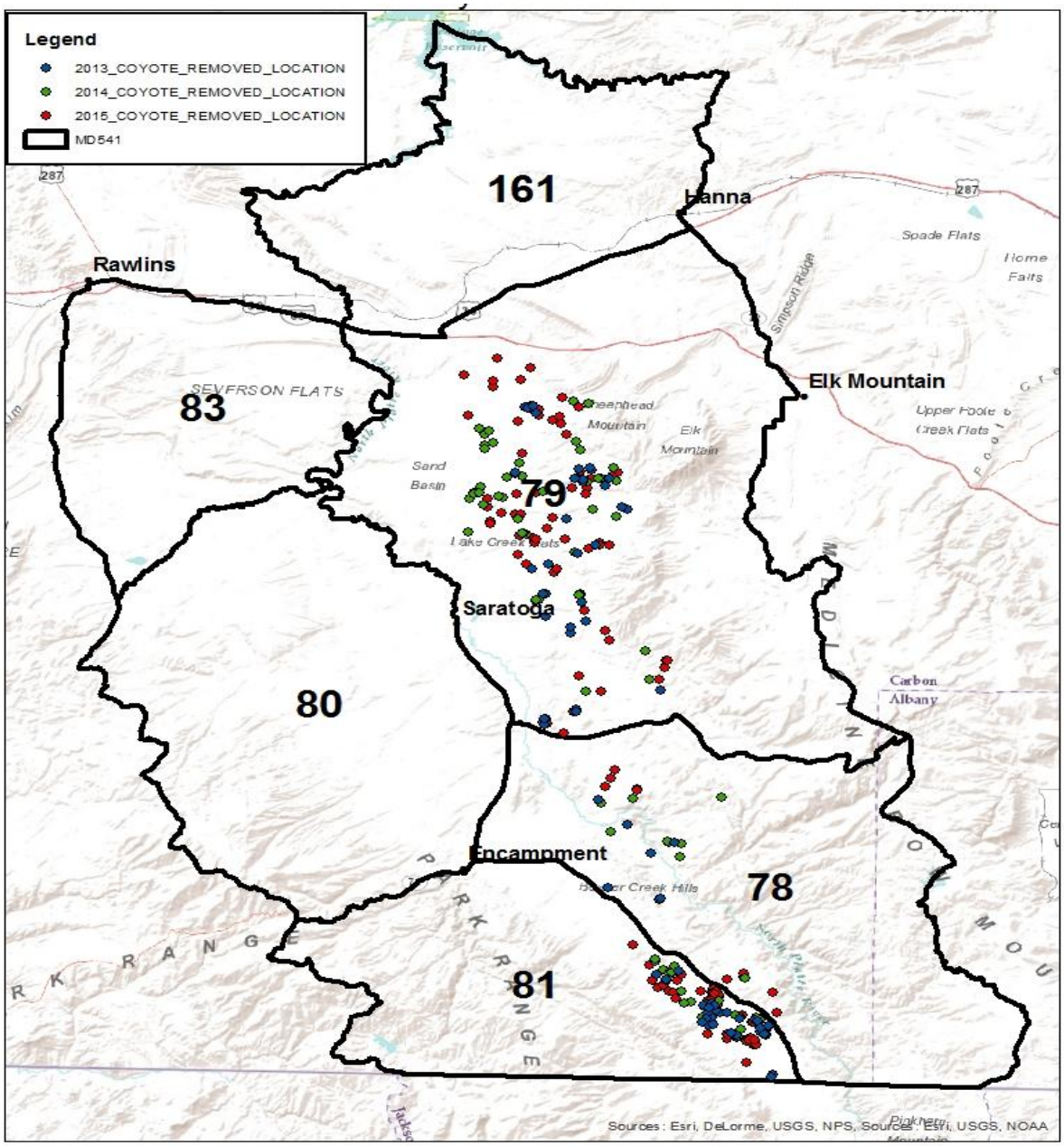
Mule Deer Recruitment Monitoring					
Mule Deer Helicopter Classification Cost	WGFD	$11,200	$11,200	$11,200	$33,600
Platte Valley Mule Deer Population Est.	WGFD	10,600	11,200	12,300	
Mule Deer Ratio (Fawns:100 Does)	WGFD	52:100	63:100	72:100	

* It is worthy to note, that there were 14 coyotes taken by WS after 07/01/2013 within the PVMDRP due to continued efforts on the last year of the southerly overlapping 3 year Big Creek Pronghorn Antelope Recruitment Project. Aditionally, 31 coyotes for calander year 2013, 30 coyotes for calander year 2014 and 5 coyotes for calendar year 2015 were taken by WS within the PVMDRP before and after the specific project dates in relation to livestock protection. These additional coyotes were not included in the PVMDRP data/report.

Discussion

Coyotes were removed in the vicinty of areas considered to contain important mule deer parturition habitat **(Figure 1)**. Removal efforts occurred between March 1 and June 30, annually. By focusing removal efforts in parturition habitat

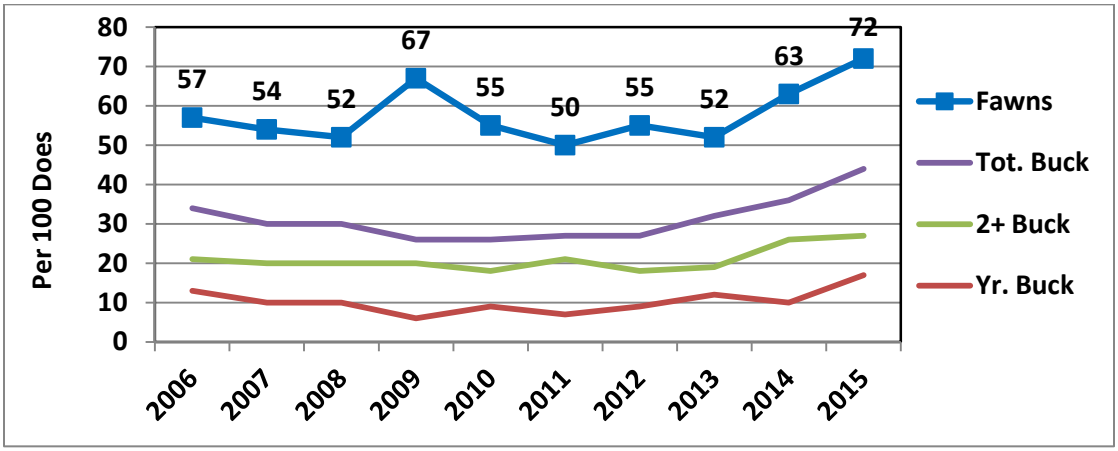
Figure 1. 2013-2015 Coyote Removal locations in the Platte Valley Mule Deer Herd Unit, Wyoming.



during this time period, it was assumed coyotes which were removed were predominantly resident, and potential predators of fawns during the parturition season.

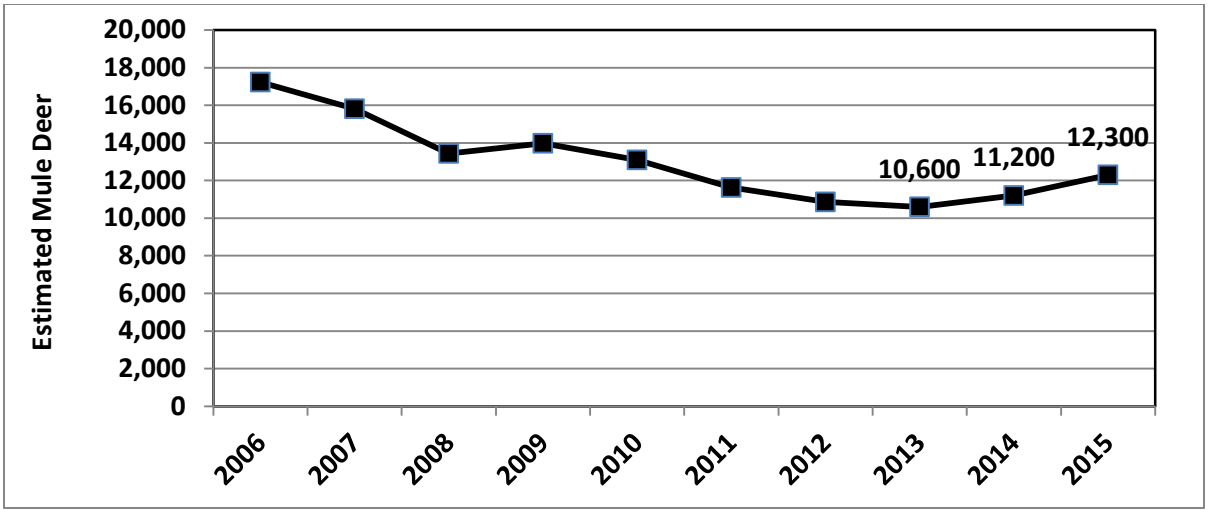
Wyoming Game and Fish Department conducted postseason helicopter surveys for the Platte Valley mule deer herd unit annually in December for the duration of the PVMDRP. Annual fawn to doe ratios were determined from these survey's results. Generally, mule deer populations are considered to require a fawn ratio of at least 66 fawns per 100 does in order to maintain population size. During the past ten years, the fawn ratio for the Platte Valley mule deer herd unit has only met or exceeded the 65 fawn per 100 does ratio during 2 years, including 2015 **(Figure 2)**. A multitude of environmental factors are assumed to contribute the less than adequate ratios observed during most past years, including poor fawn recruitment due to predation.

Figure 2. 2006-2015 Annual mule deer ratios for the Platte Valley Herd Unit, Wyoming.



During the PVMDRP 3-year time period, average fawn ratios improved 15% when compared to the average for fawn ratios during the 3-year period prior to the PVMDRP. The mule deer population estimate for Platte Valley herd unit also began to increase during the PVMDRP time period **(Figure 3)**.

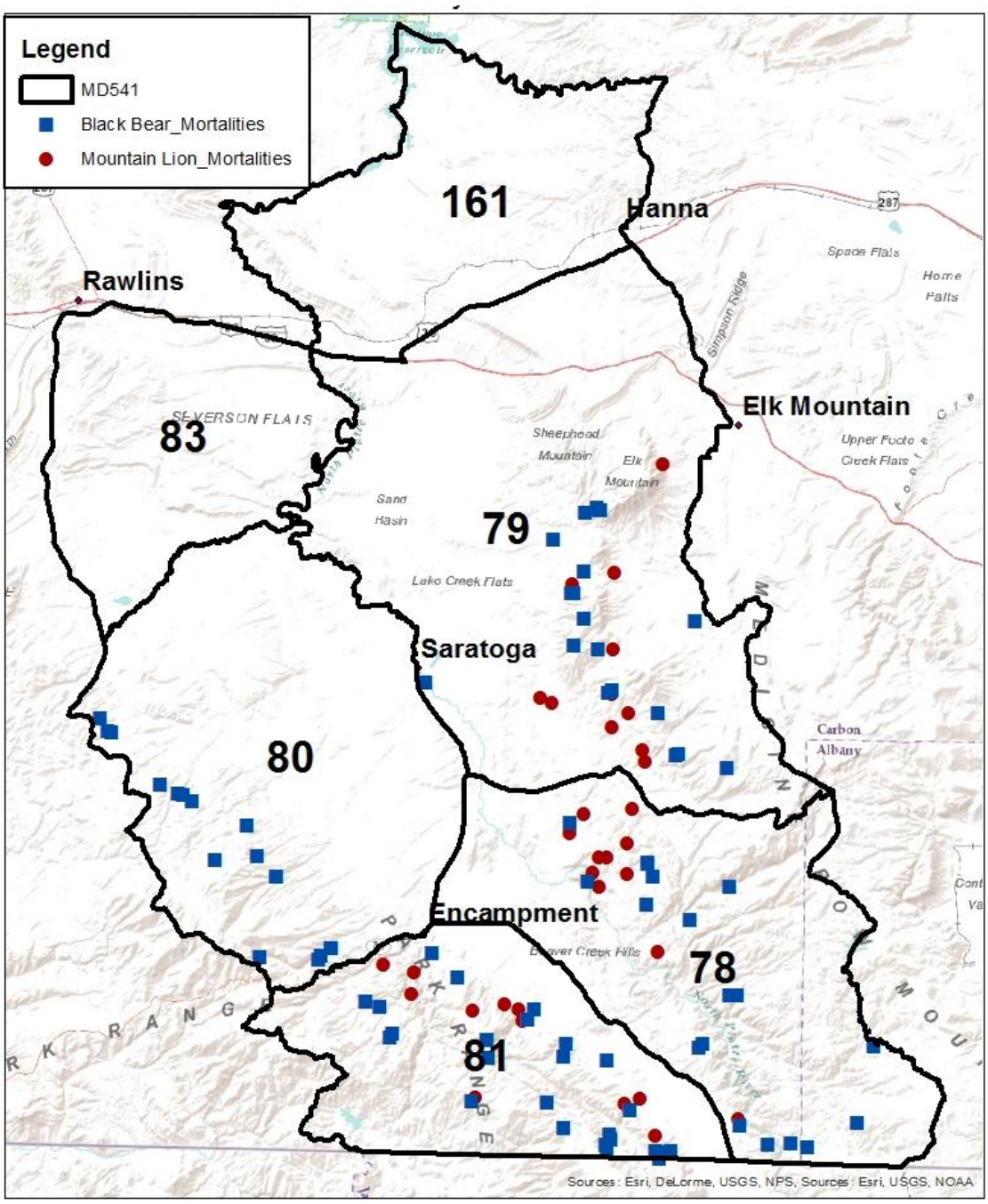
Figure 3. 2006-2015 Annual mule deer population estimates for the Platte Valley Herd Unit, Wyoming.



In addition to predation by coyotes, other predators such as mountain lion and black bear can negatively impact fawn recruitment. During the same time period as the PVMDRP, WGFD increased both mountain lion and black bear hunting season mortality limits. WGFD also increased the mountain lion hunting season from a September 1 – March 31 season to a year round season. The liberalization of mountain lion and black bear hunting seasons contributed to increased in harvest (mountain lion n=83 and black bear n=33) during the PVMDRP time period **(Figure 4)**. This may have also contributed to an increase in fawn recruitment.

As mentioned earlier a multitude of environmental factors are assumed to influence fawn recruitment. Good weather conditions, increased forage due to timely precipitation, and increases in alternative prey species such as rodents were all observed during the PVMDRP time period. Additionally, there was antidotal evidence the local coyote population could have been somewhat depressed by disease (Sarcoptic Mange). All of these factors may have cumulatively influenced the observed increase in fawn ratios during the PVMDRP.

Figure 4. 2013-2015 Mountion Lion and black bear harvest locations in the Platte Valley Mule Deer Herd Unit, Wyoming.



Conclusion

The PVMDRP was considered successful in that an increase in mule deer fawn ratios were observed. This is in corrolation with the direct control of coyotes, coupled with other favorable influencing conditions during the period of time the project was undertaken.

The Projects such as the PVMDRP demonstrate the positive contributions predator control efforts can have towards potentially sustaining and increasing big game and other wildlife populations. The PVMDRP also demonstrates that government enties, and most importantly landowners (without whom the PVMDRP could have not taken place) can work cooperatively to successfully address predator, wildlife, and access issues.

Special Thanks To:

PVMDRP Participating Landowners
CCPMD Members
USDA/APHIS/WS Troy Aleshire, Dan Braig, and Tracy Villwok (Wildlife Specialists), Jerry Hyatt (WS Pilot).
WGFD Will Shultz (District Biologist).
ADMB
Sky Aviation (WS Contract Helicopter Services)

Craig S. Acres

USDA/APHIS/WS
Staff Biologist (ret.)
Cc: Files

1/25/2016

Aerial Survey for Windows, Version 1.00 Beta 6.1.1 (17-Sep-1999)

Thursday, February 18, 2016 02:09 PM

Model: Mule Deer, Hiller 12-E, Idaho (Spring)

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.....

2016_MD541_Sightability

Section 1: Summary of Raw Counts

Stratum	Units Sampled	Total
1	8	171
2	20	2900
3	12	8523
Total	40	11594

Section 2: Summary of Raw Counts for Perfect Visibility Model

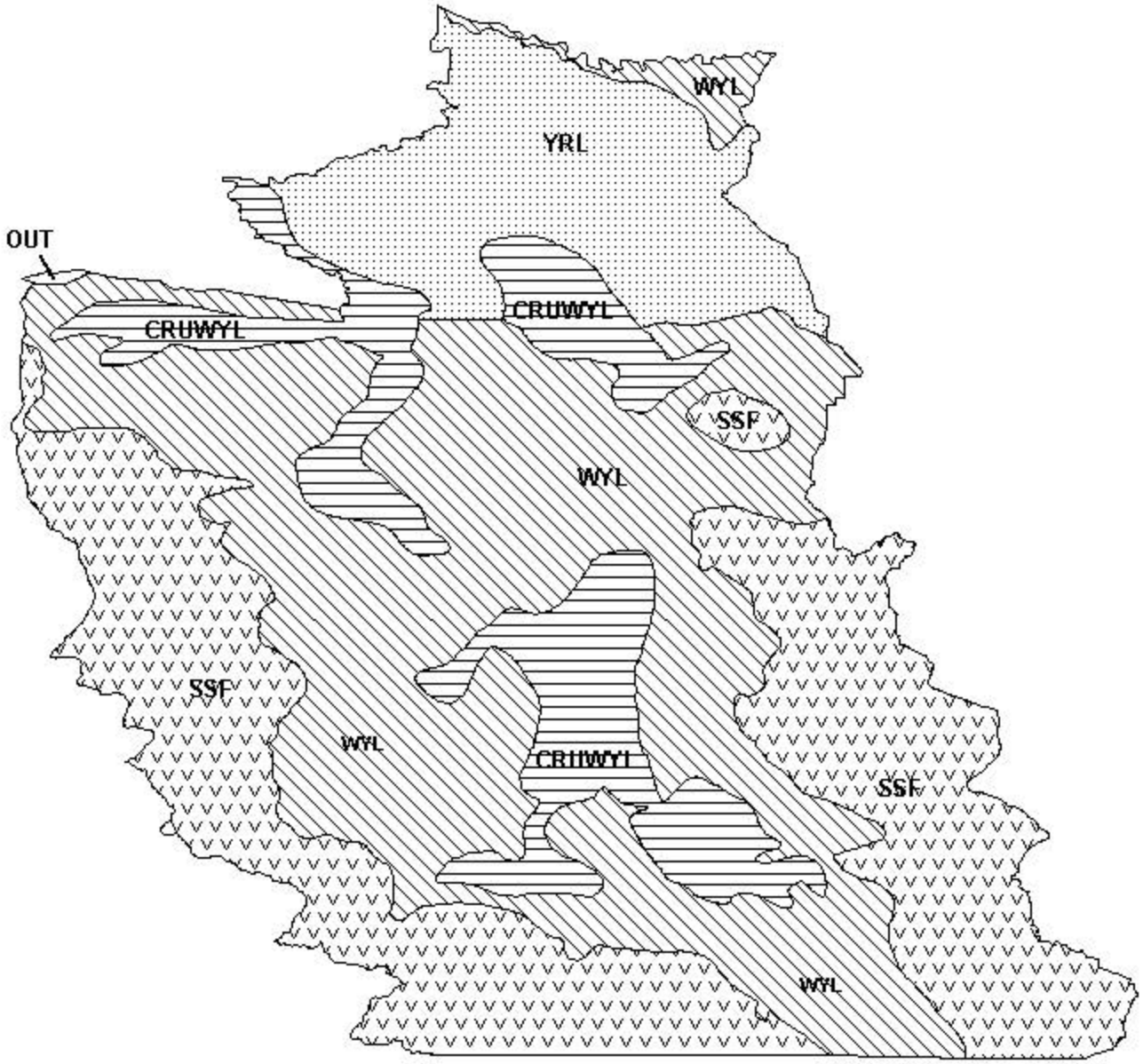
This table projects the number of animals that would have been counted if every unit had been flown and visibility had been perfect (no animals obscured by vegetation, etc.)

Strat	No of Units Popn	Sample	Total
1	42	8	898
2	33	20	4785
3	12	12	8523
Total	87	40	14206

Section 3: Estimates for Total Number

Total

Stratum	Number of Units Popn.	Sample	Estimate	Variance Sampling	Variance Sightability	Variance Model	Bound 95%
1	42	8	1104	311535	6670	905	1107
2	33	20	5891	534711	18273	2341	1461
3	12	12	9605	0	20289	2083	293
Total	87	40	**16600**	846246	45232	5329	1856



Mule Deer (MD541) - Platte Valley
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Revised - 12/87