

TABLE OF CONTENTS

Acknowledgement

ii

Antelope

Chalk Bluffs (520) - Area 111	1
Hawk Springs(521) - Areas 34-36	9
Meadowdale (522) - Area 11	19
Iron Mountain (523) – Area 38	27
Dwyer (524) – Area 103	35
Medicine Bow (525) – Areas30-32, 41-42, 46-48	45
Cooper Lake (526) – Area 43	55
Centennial (527) – Areas 37, 44-45	63
Elk Mountain (528) – Area 50	71
Big Creek (529) – Area 51	79

Bighorn Sheep

Douglas Creek (516) – Area 18	87
Laramie Peak (517) – Area 19	95
Encampment River (519) – Area 21	105

Elk

Iron Mountain (531) – Areas 5-6	113
Snowy Range (533) – Areas 8-12, 110, 114, 125	123
Shirley Mountain (534) – Area 16	133
Rawhide (730) – Area 3	163

Moose

Snowy Range (545) – Areas 38, 41	175
----------------------------------	-----

Mule Deer

Goshen Rim (534) – Areas 15-16, 55, 57	193
Laramie Mountains (537) – Areas 59-60, 62-64, 73	203
Sheep Mountain (539) – Areas 61, 74-77	215
Shirley Mountain (540) – Area 70	243
Platte Valley (541) – Areas 78-81, 83, 161	273

White-tailed Deer

Southeast Wyoming (504) – Areas 16, 55, 57, 59-64, 70, 73-81, 83, 161	297
---	-----

Acknowledgement

The field data contained in these reports was collected by the combined efforts of the Laramie Region Wildlife Division personnel including District Wildlife Biologists, District Game Wardens, the Wildlife Technicians, the Habitat Biologist, the Wildlife Management Coordinator and Region Supervisor, and other Department personnel and volunteers working at check stations. The authors wish to express their appreciation to all those who assisted in data collection.

2015 - JCR Evaluation Form

SPECIES: Pronghorn

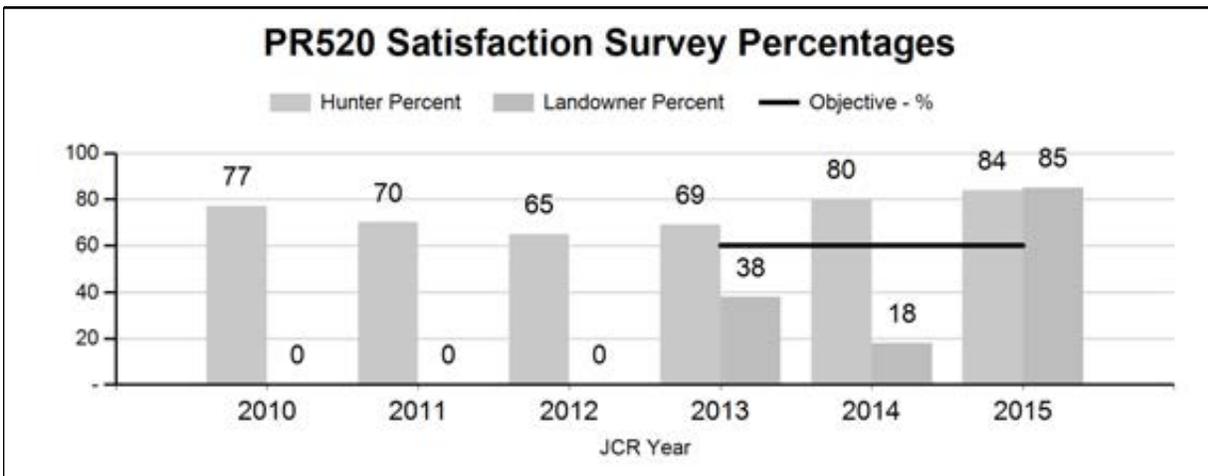
PERIOD: 6/1/2015 - 5/31/2016

HERD: PR520 - CHALK BLUFFS

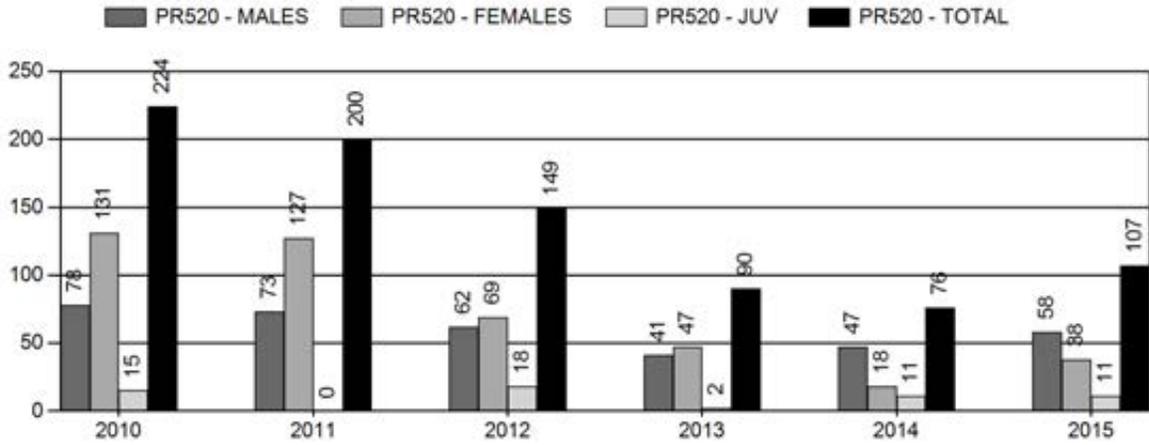
HUNT AREAS: 111

PREPARED BY: MARTIN HICKS

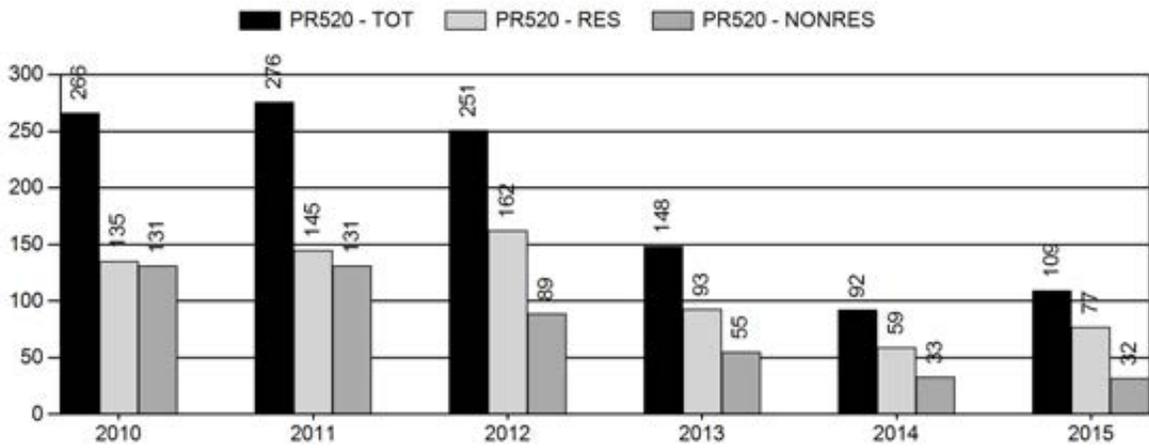
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Hunter Satisfaction Percent	72%	84%	85%
Landowner Satisfaction Percent	29%	85%	85%
Harvest:	148	107	100
Hunters:	207	109	100
Hunter Success:	71%	98%	100%
Active Licenses:	238	139	140
Active License Success:	62%	77%	71%
Recreation Days:	994	582	580
Days Per Animal:	6.7	5.4	5.8
Males per 100 Females:	22	17	
Juveniles per 100 Females	42	49	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			24%
Number of years population has been + or - objective in recent trend:			2



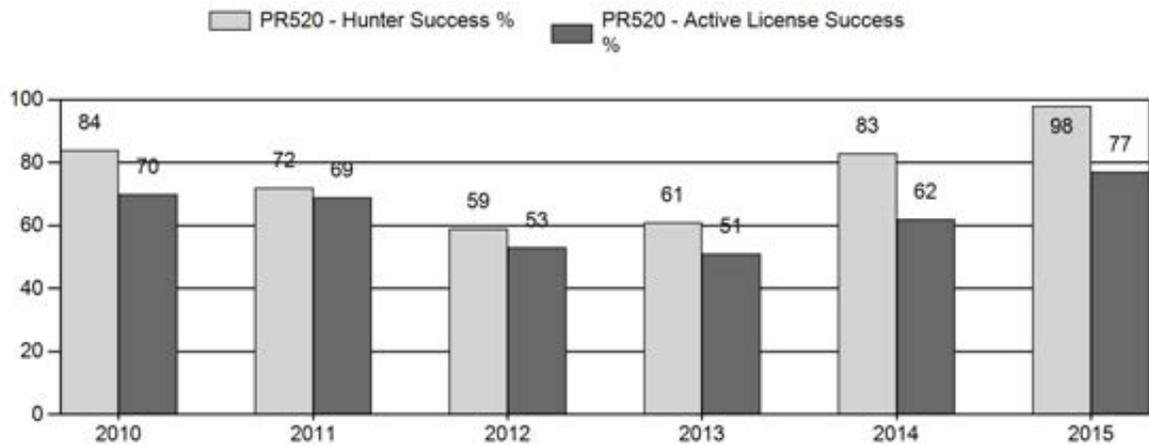
Harvest



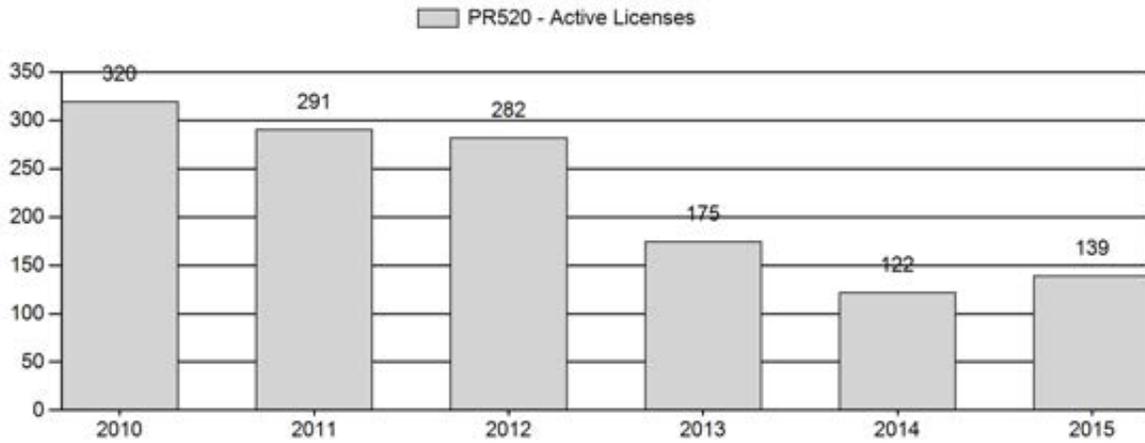
Number of Hunters



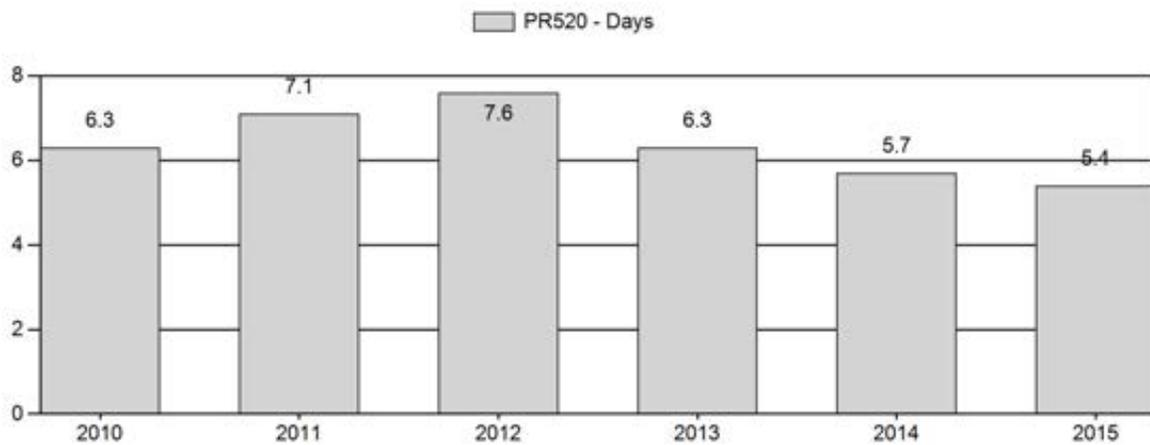
Harvest Success



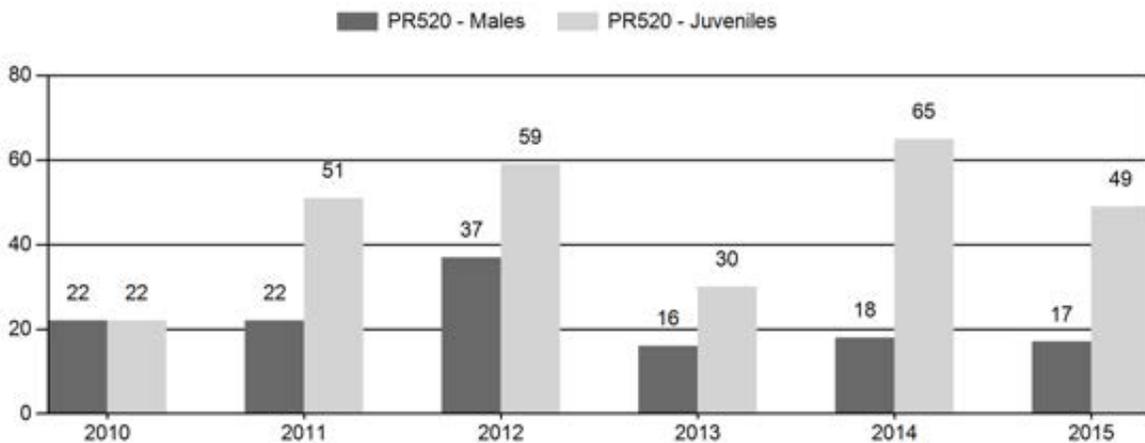
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



**2016 HUNTING SEASONS
CHALK BLUFFS PRONGHORN HERD (520)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
111	1	Sept. 20	Oct. 14	100	Limited quota	Any antelope
111	1	Nov. 15	Dec. 31			Doe or fawn
111	6	Sept. 20	Oct. 14	50	Limited quota	Doe or fawn
111	6	Nov. 15	Dec. 31			Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
111	Aug. 15	Sept. 19	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
111	1	0
	6	0

Management Evaluation

Current Hunter/Landowner Satisfaction Management Objective: Landowner and hunter satisfaction; Target goal $\geq 60\%$

Management Strategy: Private Land

2015 Hunter Satisfaction: 84% Satisfied, 7% Neutral, 9% Dissatisfied

2015 Landowner Satisfaction Estimate: 85% (44% response)

Most Recent 3-year Running Average Hunter Satisfaction Estimate: 77%

Most Recent 3-year Running Average Landowner Satisfaction Estimate: 47%

Herd Unit Issues

The management objective for the Chalk Bluffs Pronghorn Herd Unit numeric post-season population objective was changed starting the 2013 season to a landowner and hunter satisfaction based objective with a private land management strategy. The change was based on public involvement during the 2013 herd objective review process. Classification is now collected to gauge pronghorn numbers and locations prior to the season opener.

There is not a postseason population estimate for a variety of reasons: 1) Open population with Colorado and Nebraska, 2) Restricted access due to urban encroachment and industrial gas

development, which prevents our ability to influence harvest, 3) Poor classification data, which is always well below the adequate sample size and 4) No reliable working model.

Oil and gas along with rural development have become an increasing problem in the past 5 years. It appears this development has shifted pronghorn movement and habitat occupation.

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 Chalk Bluffs 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. 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 it is the predominant specie.

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 and Harvest Data

Due to our inability to collect data there is little confidence in classification data. In the adjacent Hawk Springs Herd Unit's fawn ratios remained about the same as 2014 which contributed to a slight increase in the population, it was expected the same is true for this herd unit. However, without a reliable population estimate, interstate movement with Colorado, and an increase in industrial and residential expansion, license numbers will remain conservative. Type 1 license

success in 2015 (75%) increased significantly compared to 2014 (55%) and the 5-year average of 64%. Effort in 2015 (6.5 days/harvest) was higher than 2014 (5.9 days/harvest), and well above the five-year state-wide effort of 3.8 days/harvest. The increase in success was most likely the result of increased pronghorn movement from Colorado into Wyoming. Increased effort could be contributed to limited access. Type 6 license success in 2015 (81%) was significantly higher than 2014 (54%) and the five-year average (59%). Type 6 license effort in 2015 (3.3 days/harvest) was significantly lower than 2014 (5.3 days/harvest) and the five-year average (6.2 days/harvest) but more in line with the five-year state-wide effort (3.8 days/harvest). There could be two possibilities for the increase in success: 1) the population increased or 2) increased movement into Wyoming. The improvement in effort is somewhat confusing given the lack of access. A possible explanation is hunters waited to harvest a doe when they came into Wyoming from Colorado during the late season (November/December) when access was easier to obtain.

One year of improved harvest data does not warrant an increase in Type 1 or Type 6 license numbers given poor access and as increase in residential and industrial development. Harvest is dependent on movement into Wyoming from Colorado, which is not reliable. In addition the majority of landowners (85%) responded that population is at or about at the desired level (Appendix A). The sportsmen echoed landowner comments with 83% of the hunters satisfied with their overall hunt, indicating pronghorn are at desired levels for sportsmen. Response rate was 44% which exceeded the minimum return threshold of 25%.

The number of pronghorn classified each August is always well below the adequate samples size. Typically pronghorn are still in Colorado during survey time so it is difficult to infer any population parameters. Managers will still use classification data to give hunters anecdotal information for the upcoming hunting season (e.g. distribution, buck quantity and quality).

Management Summary

The opening date will remain the same at September 20 with no change in Type 1 and Type 6 license numbers. Landowners are still in favor of the late season hunt from November 15 – December 31 to address any damage concerns. Based on past seasons we predict a harvest of 50 bucks, 20 does and 10 fawns for a total of 80 pronghorn.

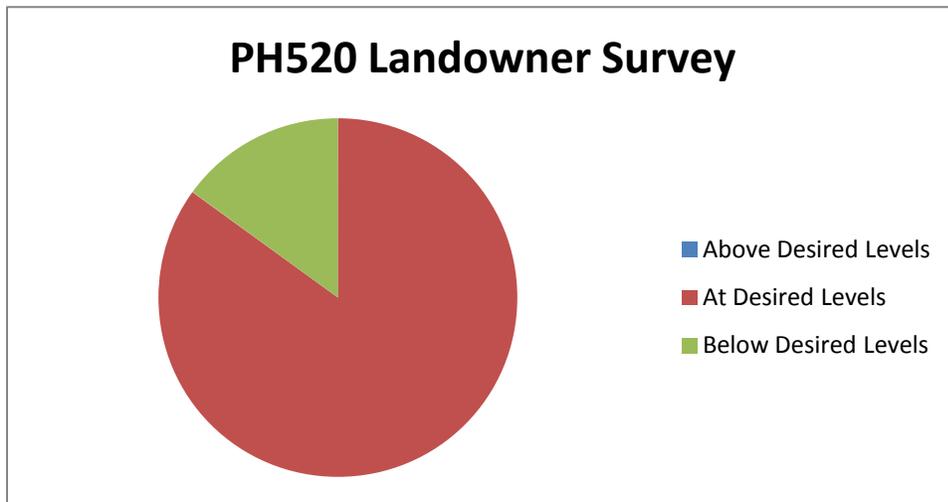
Appendix A

PH520 Landowner Satisfaction Survey

Please indicate your satisfaction level with the current pronghorn population:

15.4% 84.6%

- 1- Above Desired Levels 0
- 2- At or About at Desired Levels 11
- 3- Below Desired Levels 2
- 1- Above Desired Levels 0%
- 2- At or About at Desired Levels 85%
- 3- Below Desired Levels 15%



Additional Comments

Last 2 years oil pipeline put on ranch no pronghorn population. Since 2010 yr, oil mule and all of their trucks-no pronghorn population on ranch. Can not answer survey till activity dies down!!

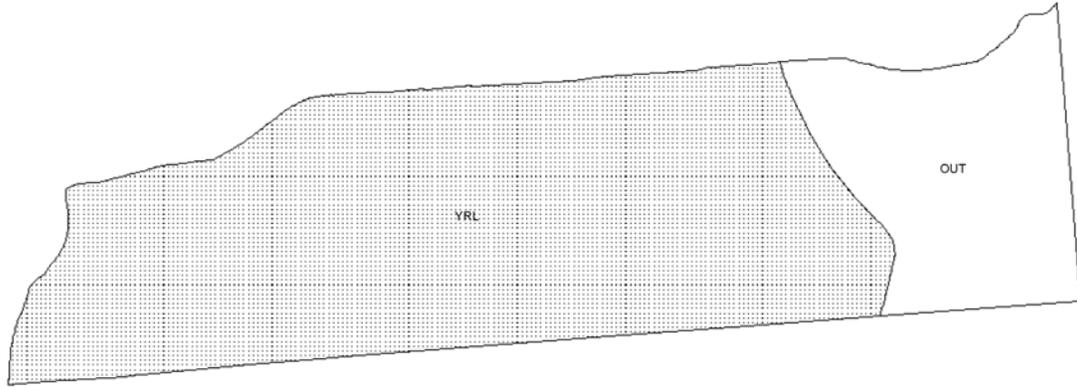
The only problem we have people come out just before sun down and want to get out and hunt. also they are not hunters they are shooters.

Oil and gas operations have really moved the population. THought the antelope would get use to the traffic-noise-fearing-but NOT

This doesn't really concern me I don't hunt and I don't live over there.-Janet would like to see the herd have a 50% increase over the next few years.

Close to desired-maybe a little below used to see quite a few. now hardly see any

PH520 - Chalk Bluffs
HA 111
Revised - 8/87



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR521 - HAWK SPRINGS

HUNT AREAS: 34

PREPARED BY: MARTIN HICKS

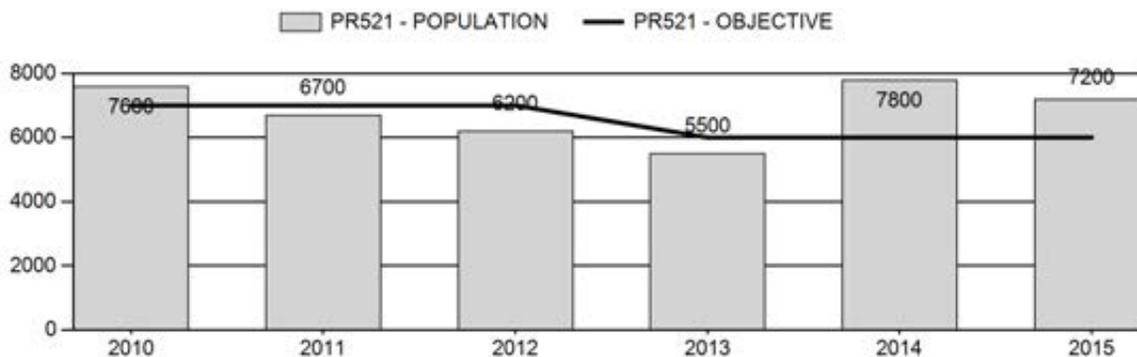
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	6,760	7,200	6,400
Harvest:	1,098	1,320	1,520
Hunters:	1,208	1,469	1,775
Hunter Success:	91%	90%	86%
Active Licenses:	1,387	1,487	1,785
Active License Success:	79%	89%	85 %
Recreation Days:	4,888	4,039	5,000
Days Per Animal:	4.5	3.1	3.3
Males per 100 Females	42	41	
Juveniles per 100 Females	52	65	

Population Objective (\pm 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	20%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/18/2016

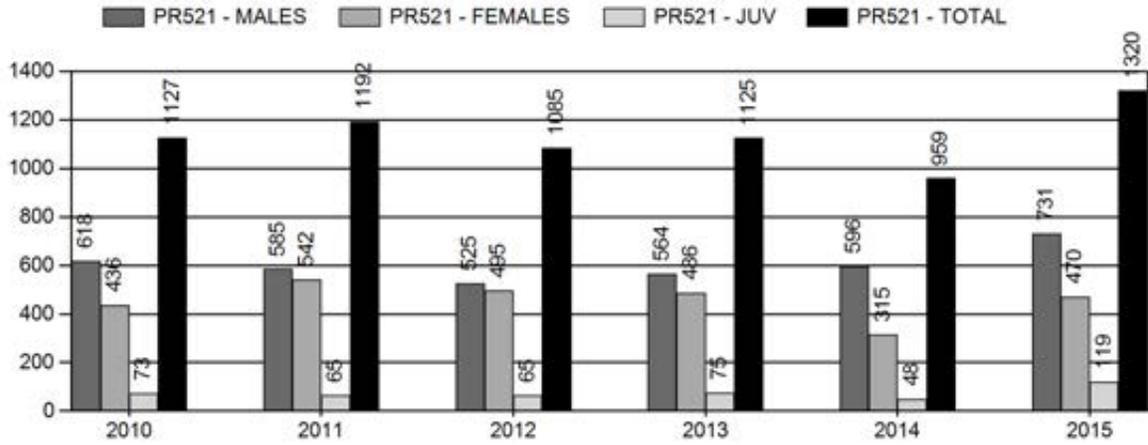
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	12%	15%
Males \geq 1 year old:	48%	59%
Juveniles (< 1 year old):	.4%	.5%
Total:	15%	18%
Proposed change in post-season population:	-2%	-8%

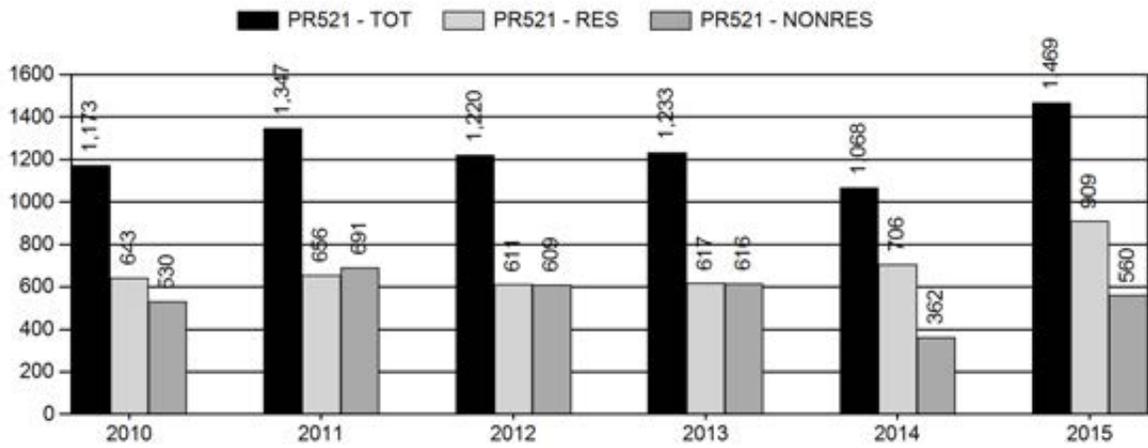
Population Size - Postseason



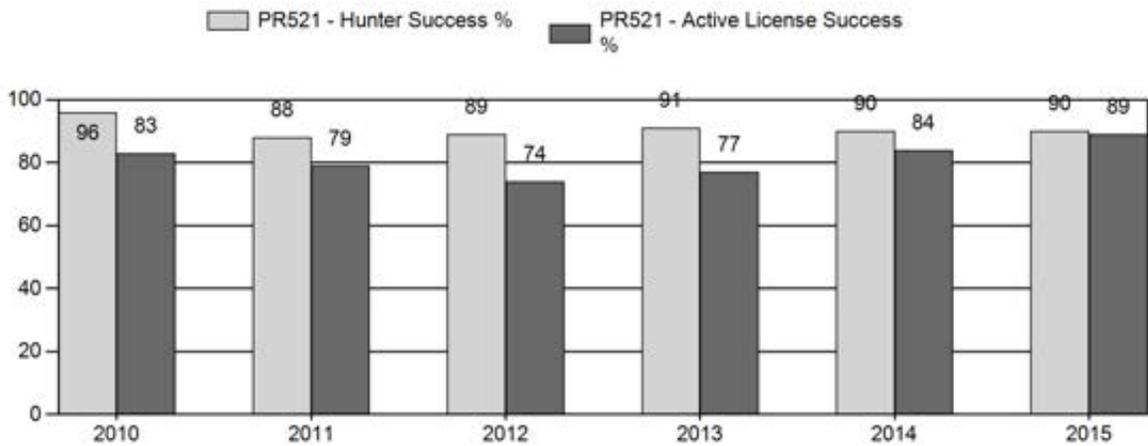
Harvest



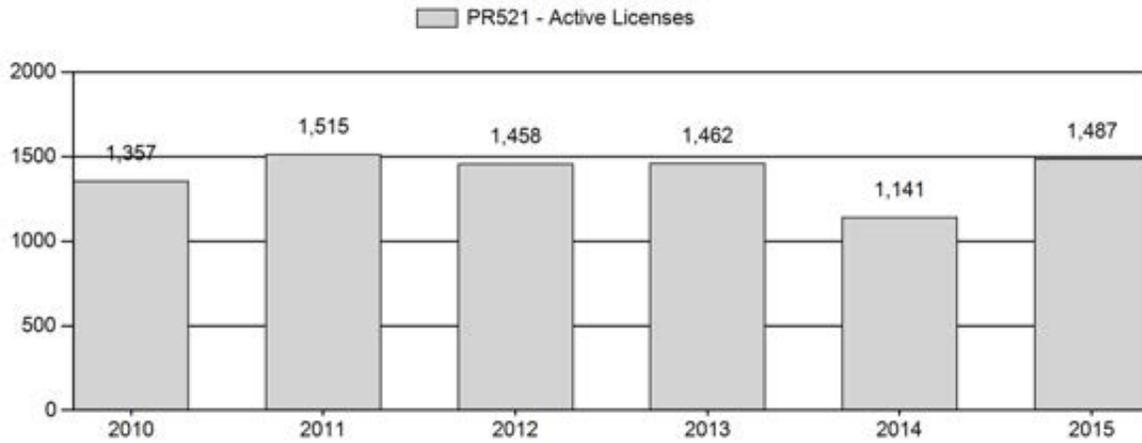
Number of Hunters



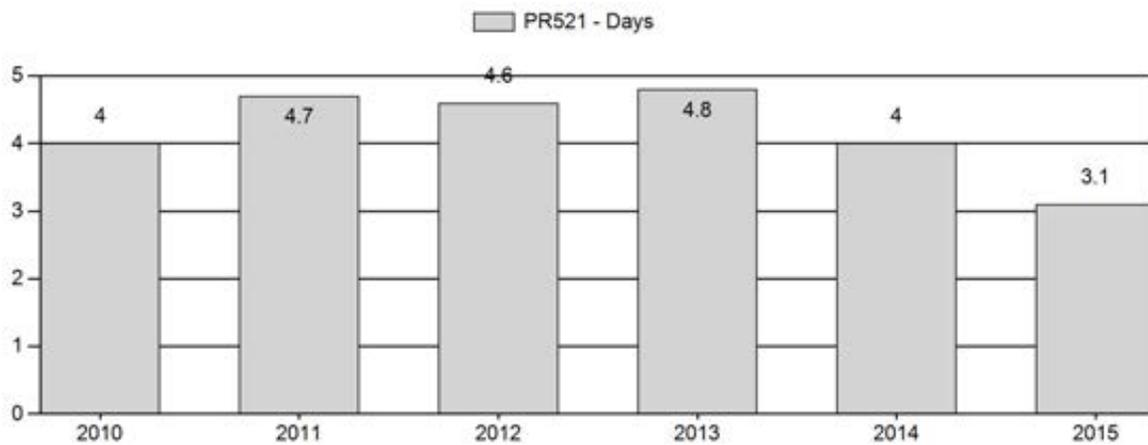
Harvest Success



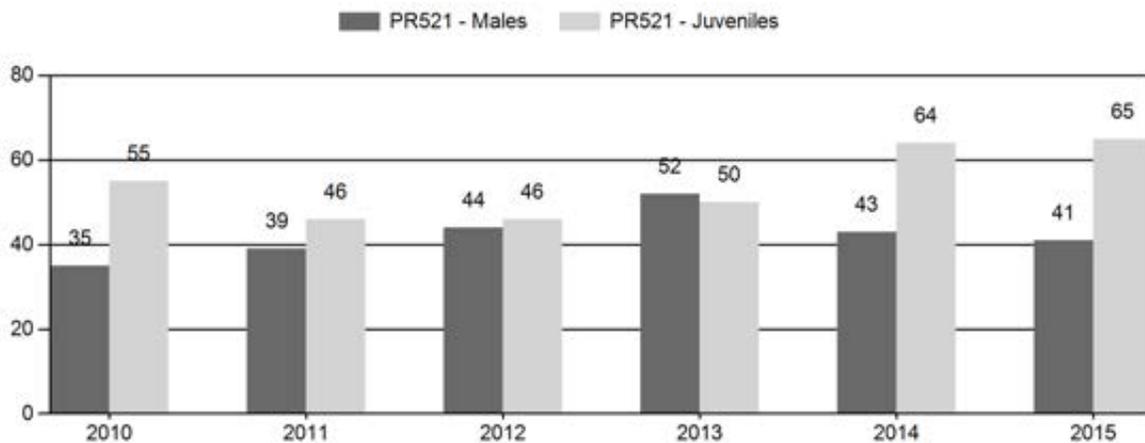
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR521 - HAWK SPRINGS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	8,800	69	161	230	18%	658	53%	360	29%	1,248	1,183	10	24	35	± 4	55	± 5	41
2011	8,000	104	160	264	21%	669	54%	309	25%	1,242	1,378	16	24	39	± 4	46	± 5	33
2012	7,400	94	132	226	23%	517	53%	240	24%	983	1,297	18	26	44	± 5	46	± 6	32
2013	6,800	88	201	289	26%	558	50%	279	25%	1,126	1,184	16	36	52	± 6	50	± 6	33
2014	8,800	59	155	214	21%	498	48%	317	31%	1,029	1,151	12	31	43	± 5	64	± 7	45
2015	8,600	117	179	296	20%	729	49%	472	32%	1,497	1,849	16	25	41	± 4	65	± 6	46

**2016 HUNTING SEASON
HAWK SPRINGS PRONGHORN HERD (PR521)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
34	1	Sept. 20	Oct. 14	1,000	Limited quota	Any antelope
	1	Oct. 15	Dec. 31			Doe or fawn
	6	Sept. 20	Dec. 31	900	Limited quota	Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Limitations
34	Aug. 15	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
34	1	+100
34	6	+200
Total		+300

Management Evaluation

Current Management Objective: 6,000 (4,800-7,200)

Management Strategy: Recreational

2015 Postseason Population Estimate: ~7,200

2016 Proposed Postseason Population Estimate: ~6,400

2015 Hunter Satisfaction: 87% satisfied, 9% Neutral, 4% Dissatisfied

Herd Unit Issues

The management objective for the Hawk Springs Herd Unit is a post-season population objective of 6,000 pronghorn. The objective was changed in 2014 from 7,000 to 6,000 and Hunt Areas 34-36 were combined into Hunt Area 34 as a result of the herd unit objective review process in 2013. The management strategy is recreational management with a pre-season buck ratio range of 20-59 Bucks:100 Does.

The 2015 post-season population estimate was about 7,200 pronghorn putting the population 20% above the objective of 6,000. The last line-transect survey conducted in this herd unit was June 2007 that resulted in a population estimate of 21,000 pronghorn. This survey implied the herd increased by 62% from the previous line-transect conducted in 2003 with a population estimate of 8,100. Given poor fawn production, poor habitat conditions, and loss of habitat this estimate does not seem plausible. As a result this model is anchored to the 2003 line-transect estimate.

The southern end of the herd unit along Interstate Highway 80 to U.S. Highway 85 has experienced an increase in urban and industrial development resulting in a decrease in usable habitat. The northern 2/3 of the unit is comprised of dryland farming, irrigated farming and land enrolled into the Conservation Reserve Program (CRP) and native rangeland. The majority of issues with landowners occur when there are high densities of pronghorn on irrigated and non-irrigated agricultural fields. This typically results in damage issues which is the rationale behind the late season doe/fawn licenses.

A majority of this herd unit is comprised of private land (84%). Access is available through the Department's PLPW program and limited access to 350 square miles of state land.

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 Hawk Springs 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 it is the predominant specie. This herd unit is comprised of a mix of native rangelands, CRP, dryland and irrigated croplands.

Habitat fragmentation caused by urban sprawl east of Cheyenne, and on-going oil exploration in eastern Laramie County are likely having negative impacts on pronghorn in this portion of the herd unit.

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

The Hawk Spring Pronghorn Herd Unit experienced a slight decrease in population from 2014 to 2015 as a result of increased harvest on the female segment of the population and average fawn production (64 fawns:100 does). Doe/fawn license issuance has fluctuated around 750 for the past 5 years but was decreased for the 2014 season to try and increase the population, which was accomplished by 30%. To maintain herd objective Type 6 licenses were increased from 500 to 700 in 2015, which resulted in 155 more doe pronghorn harvested compared to 2014. Buck ratios were similar compared to 2014 and are within the upper recommended recreational management range of 20-59 Bucks: 100 Does (41 Bucks:100 Does in 2015). Current buck ratios warrant an increase in Type 1 licenses. The sample size for field check tooth data collected in the field was too small to provide any relevancy for population parameters. Of the hunters surveyed in 2015, 87% were satisfied with their hunt. Based on comments in the field during the 2015 hunting season hunters had more success accessing private land and they appreciated the number of acres enrolled into the PLPW program.

Harvest Data

Active license success of 89% in 2014 was significantly higher than five-year average of 79% and moderately higher than the five-year state-wide average of 82%. Access is still difficult to obtain in the southern portion of the herd unit, but access did open up with the Nimmo HMA and private land in the northern portion of the herd unit, which could explain the increase in success. Hunter effort of 3.1 days per harvest in 2015 was lower than both the herd unit's and state-wide's five-year average of 4.4 and 3.8 days per harvest respectfully. Increased access through the Department's PLPW and landowners opening up access in the northern portion of the herd unit most likely contributed to the decrease in effort.

Population

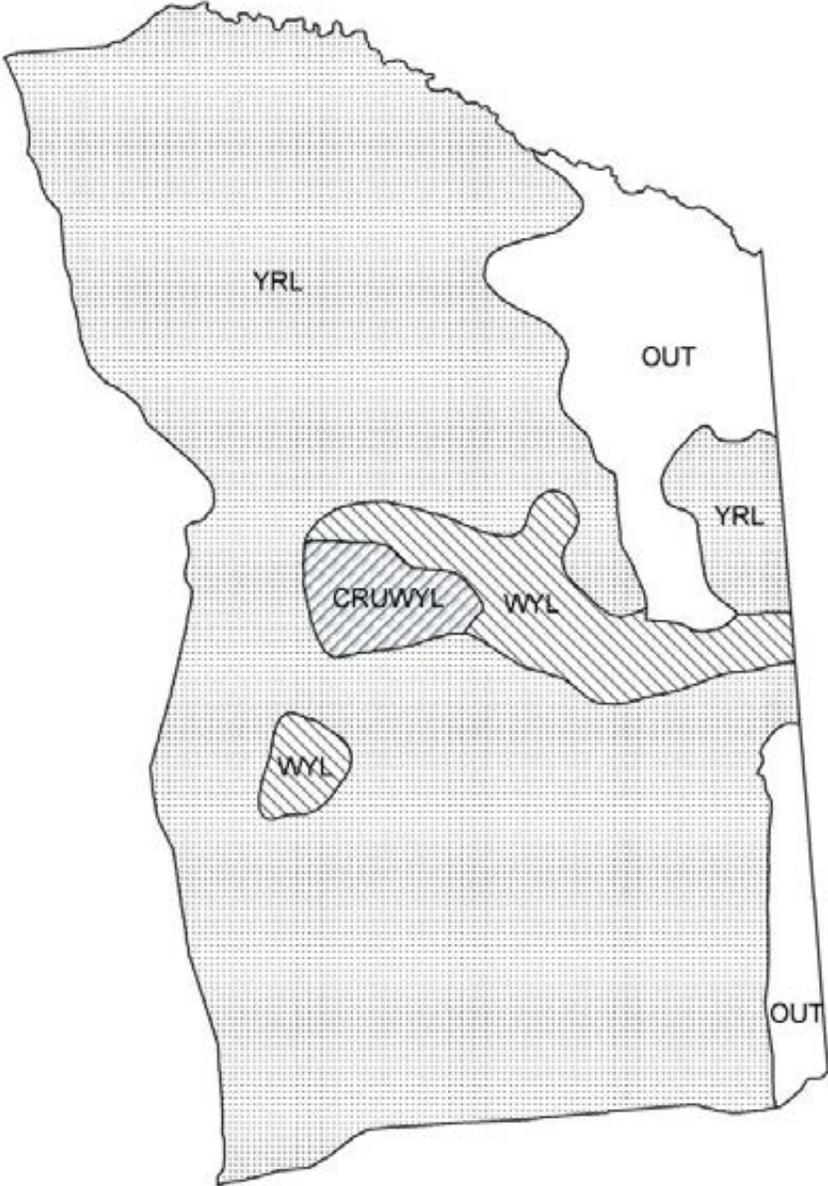
The "Constant Juvenile – Constant Adult Survival" (CJ,CA) spreadsheet model was chosen for the post season population estimate of this herd. The model did have the lowest AIC score, and the population estimate appears reasonable. The line-transect in 2007 was ignored because it doubled the population in three years and given poor fawn recruitment this is biologically improbable. The independent estimates of 2001 and 2003 are similar to model estimates, which the model does run through. The model predicted a decreasing trend since 2007; given poor fawn production despite years (2014,2015) with good forage production and consistent harvest of around 600 doe pronghorn, this seems plausible. WGFD personnel observations indicate that pronghorn densities would support this trend in certain portions of the herd unit. During the 2015/16 winter severe snow storm events forced pronghorn on dryland wheat fields resulting in perceived damage to the annual grain by landowners along the Wyoming Highway 313 corridor. Trends in harvest statistics (increase in success, and a decrease in effort) do not support a decreasing trend in the population. Given constant survival rates for the adults and juveniles the

model is trying to align with a slowly decreasing buck ratio, thus bringing the population down. However, given the population is on the upper end of the objective range and buck ratios are also on the recreational management range it appears there is room to increase harvest on both the male and female segment of the population. This model is ranked fair since the only data available is harvest and classification data and the most recent LT estimate is from back in 2003.

Management Summary

The 2015 season is designed to try and decrease the population with an additional 200 doe/fawn licenses and have the unused Type 1 licenses valid for doe or fawn from October 15 to December 31. With adequate buck ratios there is opportunity to increase buck harvest so Type 1 licenses will increase by 100. Given previous harvest rates and the 1,900 licenses available (1,000 Type 1 licenses, and 900 Type 6 licenses) we expect to harvest around 1,520 pronghorn, resulting in a post-season population estimate of 6,400 pronghorn.

PH521 - Hawk Springs
HA 34-36
Revised - 12/88



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR522 - MEADOWDALE

HUNT AREAS: 11

PREPARED BY: MARTIN HICKS

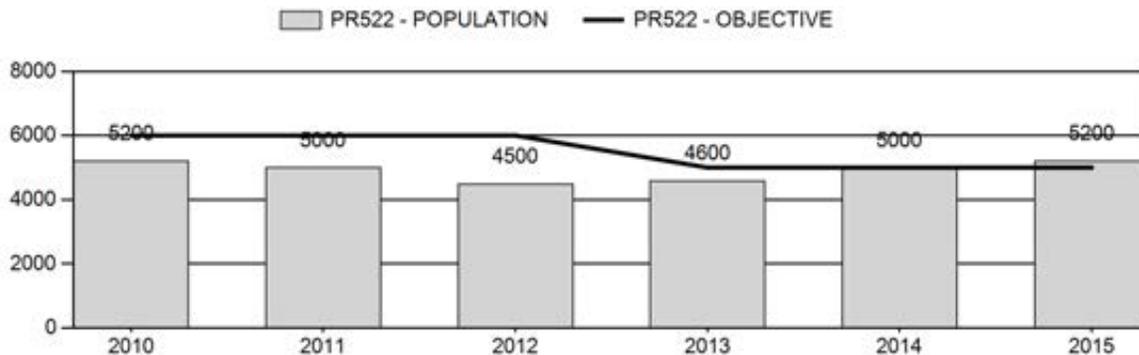
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	4,860	5,200	5,500
Harvest:	509	447	470
Hunters:	564	479	480
Hunter Success:	90%	93%	98%
Active Licenses:	634	535	535
Active License Success:	80%	84%	88%
Recreation Days:	1,841	1,458	1,500
Days Per Animal:	3.6	3.3	3.2
Males per 100 Females	36	46	
Juveniles per 100 Females	56	70	

Population Objective ($\pm 20\%$) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	4%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/18/2016

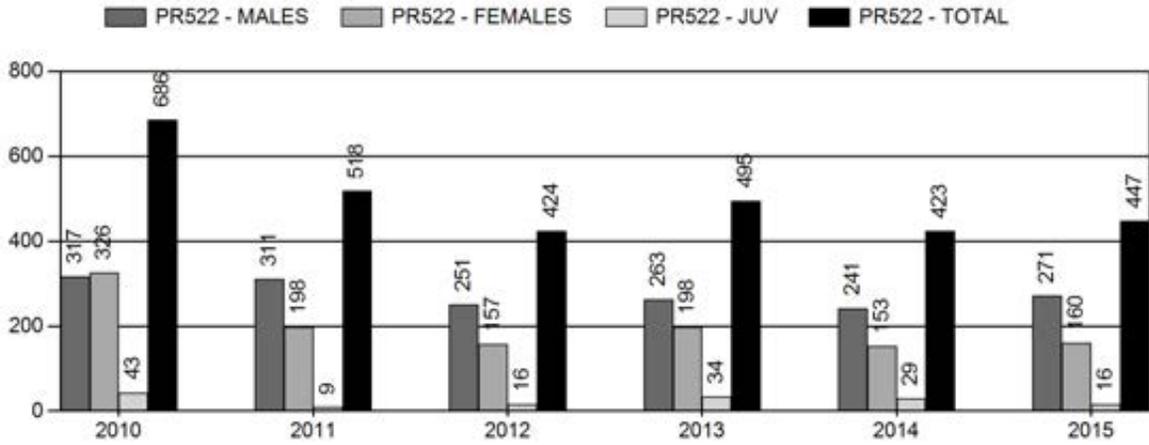
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	6.3%	6%
Males ≥ 1 year old:	33%	29%
Juveniles (< 1 year old):	.8%	.7%
Total:	7.9%	7%
Proposed change in post-season population:	+5%	+6%

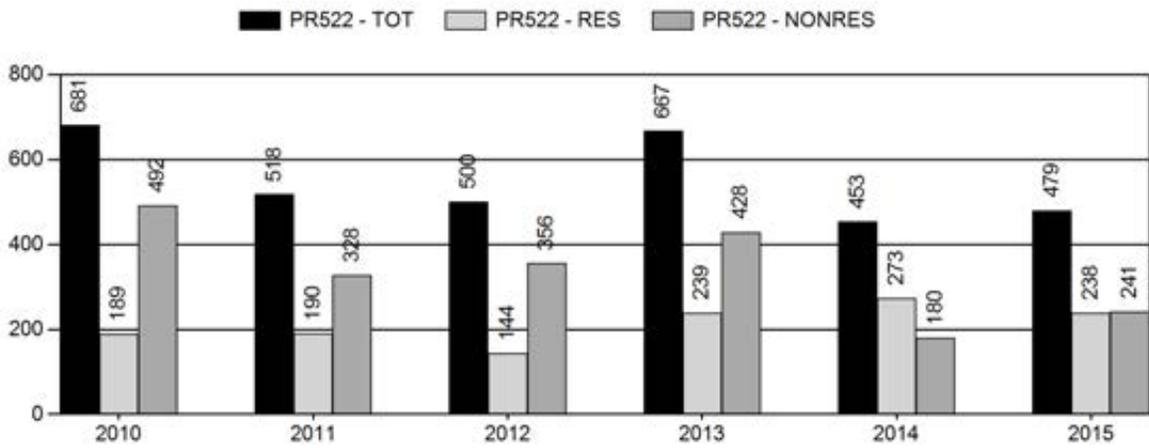
Population Size - Postseason



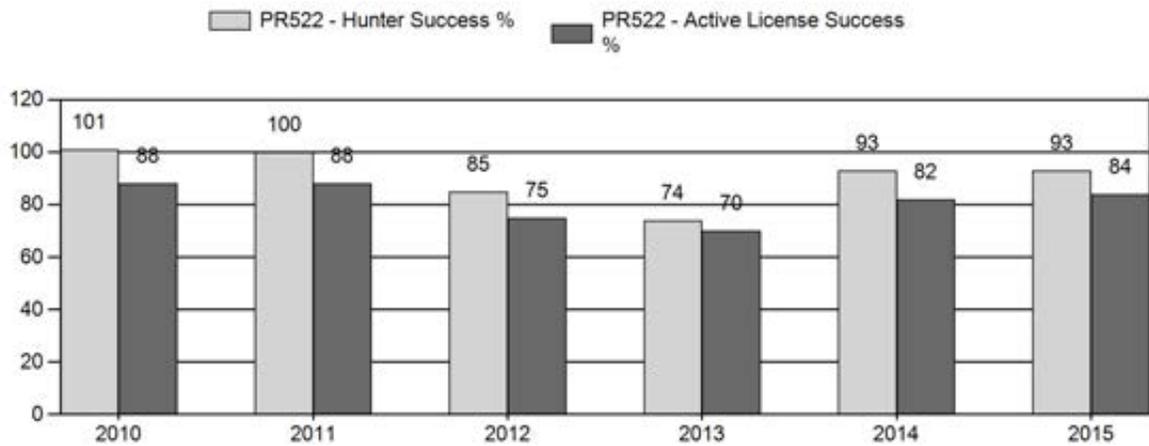
Harvest



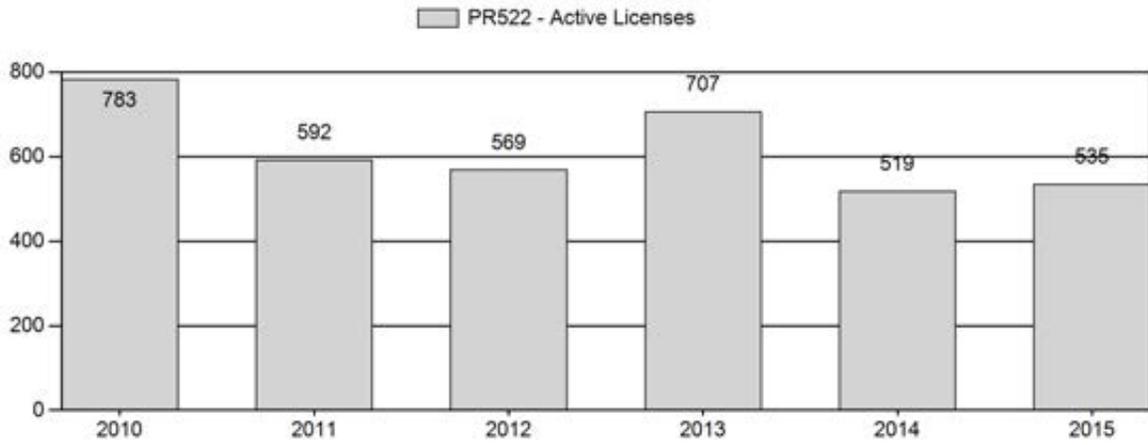
Number of Hunters



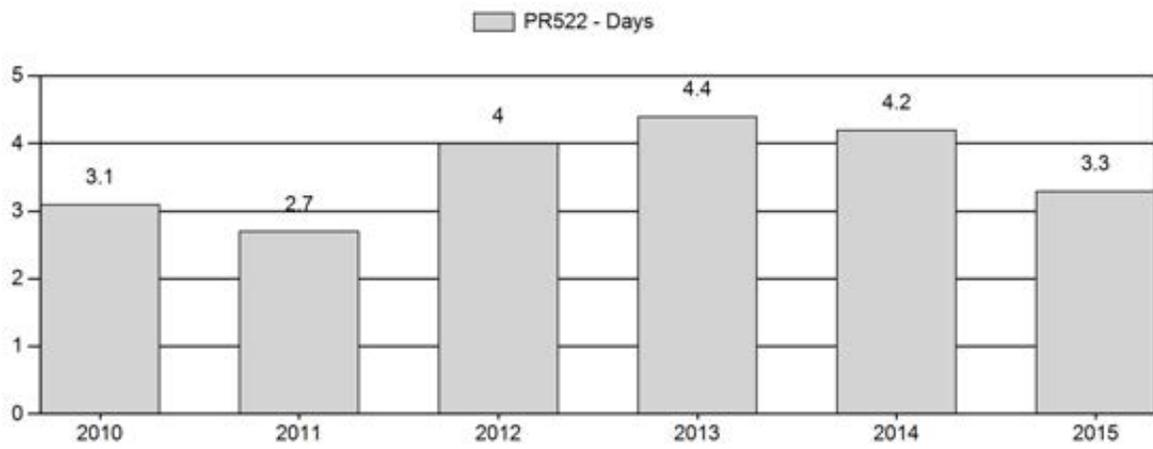
Harvest Success



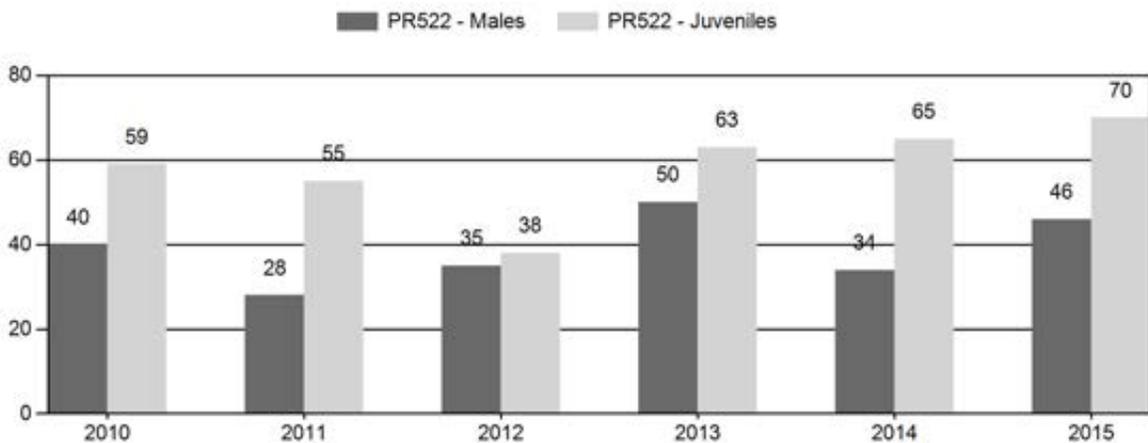
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR522 - MEADOWDALE

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	6,000	80	137	217	20%	543	50%	319	30%	1,079	1,404	15	25	40	± 5	59	± 6	42
2011	5,500	32	140	172	15%	612	55%	334	30%	1,118	1,426	5	23	28	± 4	55	± 5	43
2012	4,900	62	133	195	20%	553	58%	211	22%	959	838	11	24	35	± 4	38	± 5	28
2013	5,100	60	139	199	23%	402	47%	252	30%	853	1,154	15	35	50	± 6	63	± 8	42
2014	5,400	49	169	218	17%	637	50%	411	32%	1,266	1,327	8	27	34	± 4	65	± 6	48
2015	5,600	104	165	269	21%	590	46%	412	32%	1,271	1,441	18	28	46	± 5	70	± 6	48

**2016 HUNTING SEASONS
MEADOWDALE PRONGHORN HERD (PR522)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
11	1	Oct. 1	Oct. 31	350	Limited quota	Any antelope
11	6	Oct. 1	Oct. 31	200	Limited quota	Doe or fawn

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

Hunt Area	Type	Quota change from 2015
11	1	None
11	6	None

Management Evaluation

Current Management Objective: 5,000 (4,000-6,000)

Management Strategy: Recreational

2015 Post-season Population Estimate: ~5,200

2016 Proposed Post-season Population Estimate: ~5,500

2015 Hunter Satisfaction: 87% Satisfied, 11% Neutral, 2% Dissatisfied

Herd Unit Issues

The management objective for the Meadowdale Pronghorn Herd Unit of 6,000 was decreased to 5,000 as a result of internal and public input received during the 2013 herd objective review process. The management strategy is recreational management, which is a 20-59 buck:100 doe range.

The 2015 post-season population estimate was about 5,100 pronghorn with the population fluctuating around 5,000 pronghorn since 2010. The last line-transect was conducted in June of 2003 that resulted in an estimate of 5,800 pronghorn. The northern portion of the herd unit continues to have the highest densities of pronghorn resulting in more acres of private lands enrolled into the PLPW walk-in program as well as landowners allowing access, particularly during the doe/fawn season.

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 Meadowdale 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 it is the predominant species.

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

The Meadowdale population has been stable since 2010. In 2015 fawn ratios (70 fawns: 100 does) increased significantly compared to the five year average of 56 fawns:100 does, which resulted in a slight increase in the herd. The sample size was 12% below the 90% CI so herd classification data does need to be interpreted with some caution, but the increase was expected given above average precipitation during spring months. However, the same cold, wet weather most likely contributed to some neonate mortality. Buck to doe ratios have fluctuated from a low of 28:100 to a high of 50:100 within the last five years. Given the 2015 sample size was somewhat adequate the buck ratio of 46 bucks:100 does appears reasonable. As fawn ratios have fluctuated so has the population, but neither has seen a drastic change either positive or negative keeping the population within objective range of $\pm 20\%$ of 5,000 pronghorn. With the population at a desired level there is not a proposal to increase Type 6 licenses, and given buck ratios are within the recommended recreation management strategy parameters there is not a proposal to increase Type 1 licenses. However, to provide more consistency with Hunt Area 9 which allows harvest for any pronghorn from October 16 to October 31 in those portions of Hunt Area 11 in Converse and Niobrara counties there is a proposal to increase the season length for the Type 1 licenses by 16 days (10/1-10/31). This should result in an increase in harvest of both bucks and

does. Sample size for tooth data collected in the field is too small to infer any population dynamics.

Harvest Data

The 2015 hunter success rate of 93% was similar to the five-year average of 90%, and the exact same as the 2014 success rate. Effort in 2015 was 3.3 days per harvest which is slightly lower than the five-year average of 3.6 days per harvest, and significantly lower than 2014 (4.2 days/harvest). The 2015 harvest statistics (stable success and less effort) support a population that has been fluctuating slightly the past five years. License numbers have remained the same the past two years and there has not been a change in access in the past five years. Five-year trends in success and effort have slightly ebbed and flowed which mirrors the population trend. The hunter satisfaction survey showed that 87% of the hunters were satisfied or very satisfied with their hunt. Based on positive comments received from the field the survey seems plausible.

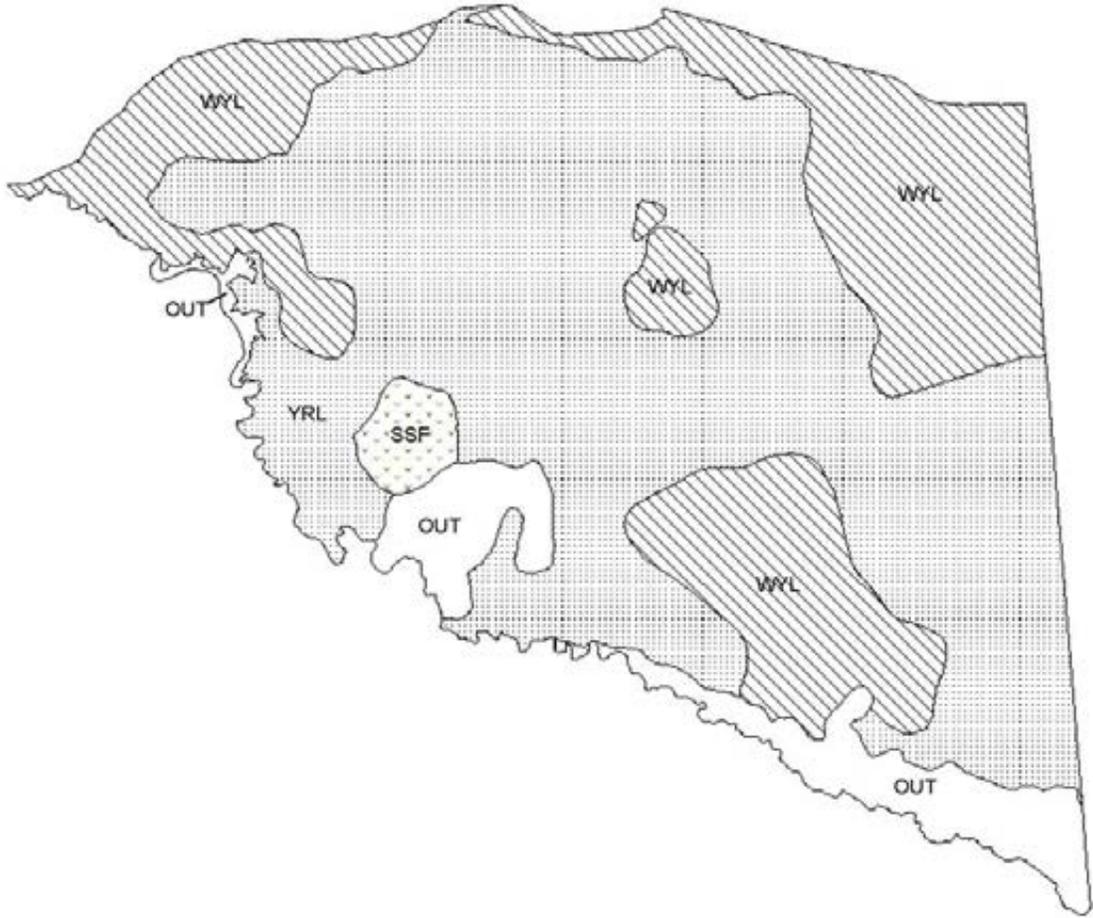
Population

The “Constant Juvenile – Constant Adult Survival” (CJCA) spreadsheet model was chosen to use for the post-season population estimate of this herd. This model did have the lowest AIC score, the best fit and the population estimate appears reasonable. We conducted line-transects in 1996, 1998, 2000 and 2003 that provide independent population estimates that were similar to the model estimates. Based on relatively consistent harvest regimes and classification surveys this population typically fluctuates around 5,000 pronghorn, (2015 post-season estimate: 5,100 pronghorn) and has not experienced a significant increase or decrease in the past 5 years. Adult and juvenile survival constraints were adjusted to account for a biologically unrealistic model (page 27, User Guide: Spreadsheet Model for Ungulate Population data). This model is ranked poor since the last LT this population was anchored to was in 2003, and the only other data available is harvest and classification data. WGFD personnel, landowner and hunter observations indicate that pronghorn densities remain low in the southern portion of the hunt area and high in the northern portion. Landowners in the northern portion of the herd unit have damage problems and have voiced their concern at several Department meetings over the past three years, so a proposal to increase the Type 1 season length is warranted.

Management Summary

The 2015 season was designed to maintain the population within the objective, which is the same goal for the 2016 season. However, there appears to be more opportunity and landowner support to increase the season length for the Type 1 licenses to the end of October. Given previous harvest rates we expect to attain a harvest of 470 pronghorn. We predict a 2016 post-season population estimate of 5,500 pronghorn, 10% above the objective of 5,000, but within the $\pm 20\%$ recommended range for herd management.

PH522 - Meadowdale
HA 11, 12
Revised - 5/88



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR523 - IRON MOUNTAIN

HUNT AREAS: 38

PREPARED BY: LEE KNOX

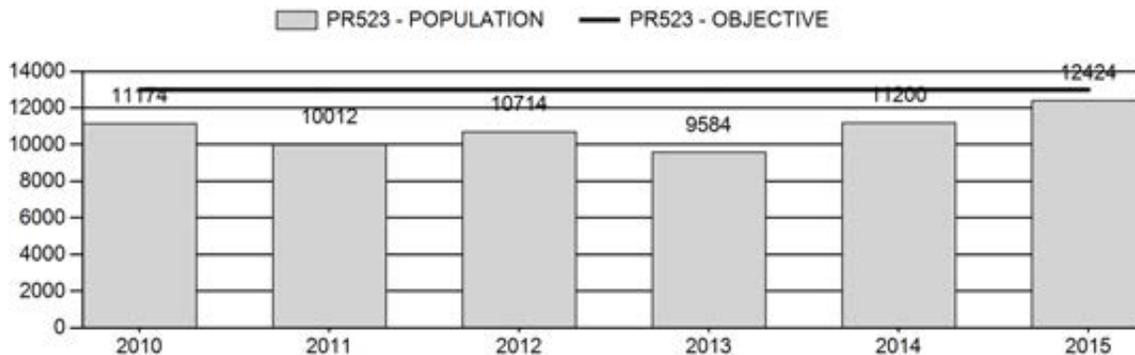
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	10,537	12,424	13,521
Harvest:	1,514	1,443	1,753
Hunters:	1,690	1,675	1,900
Hunter Success:	90%	86%	92 %
Active Licenses:	1,881	1,727	2,000
Active License Success:	80%	84%	88 %
Recreation Days:	5,714	5,951	6,000
Days Per Animal:	3.8	4.1	3.4
Males per 100 Females	48	63	
Juveniles per 100 Females	67	79	

Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-4.4%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/26/2015

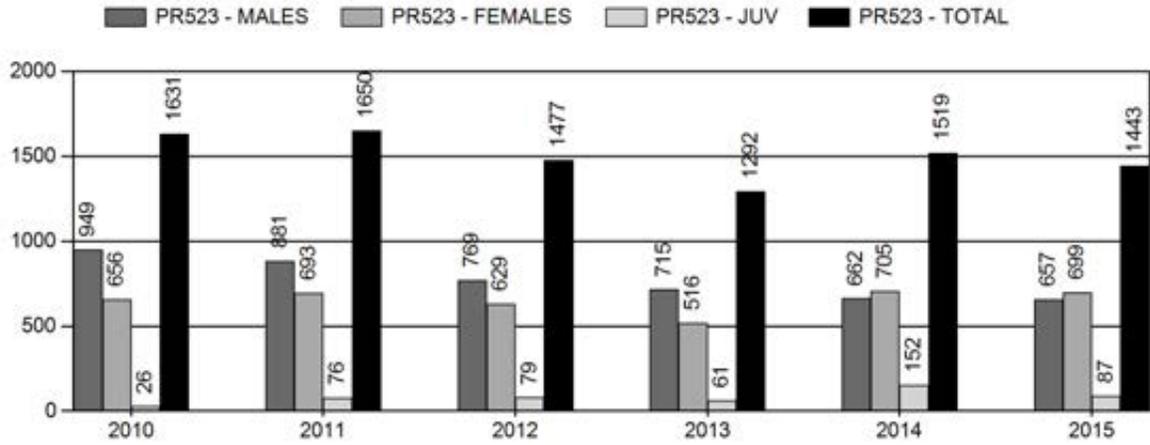
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	13%	15%
Males ≥ 1 year old:	21%	21%
Juveniles (< 1 year old):	1%	1%
Total:	10%	10%
Proposed change in post-season population:	2%	2%

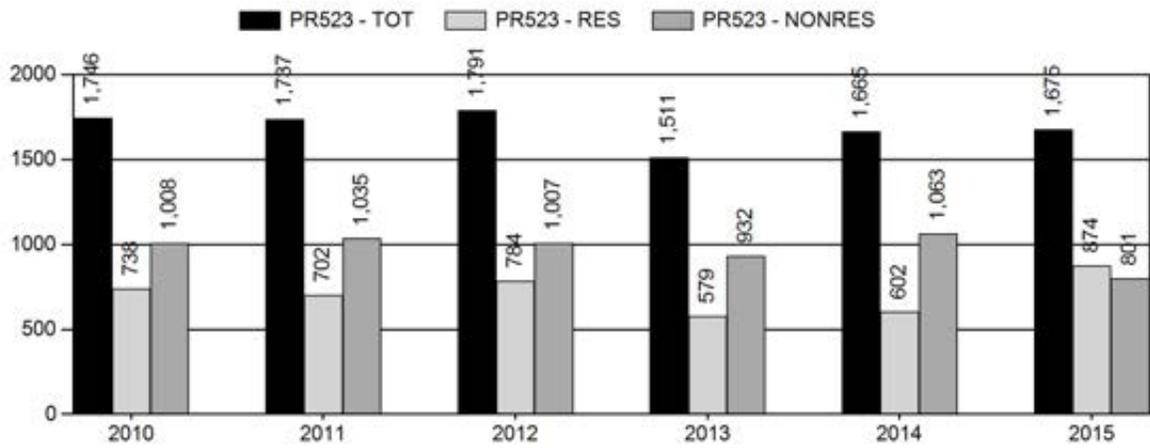
Population Size - Postseason



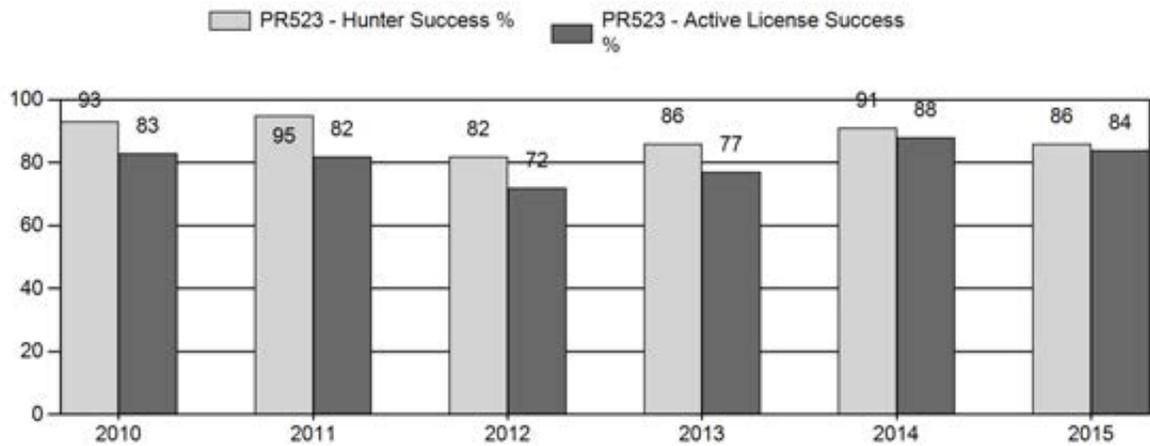
Harvest



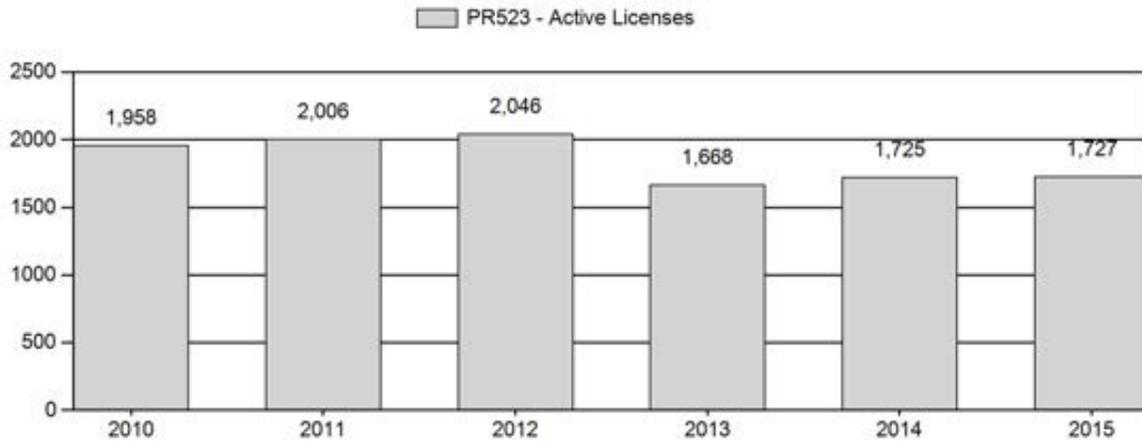
Number of Hunters



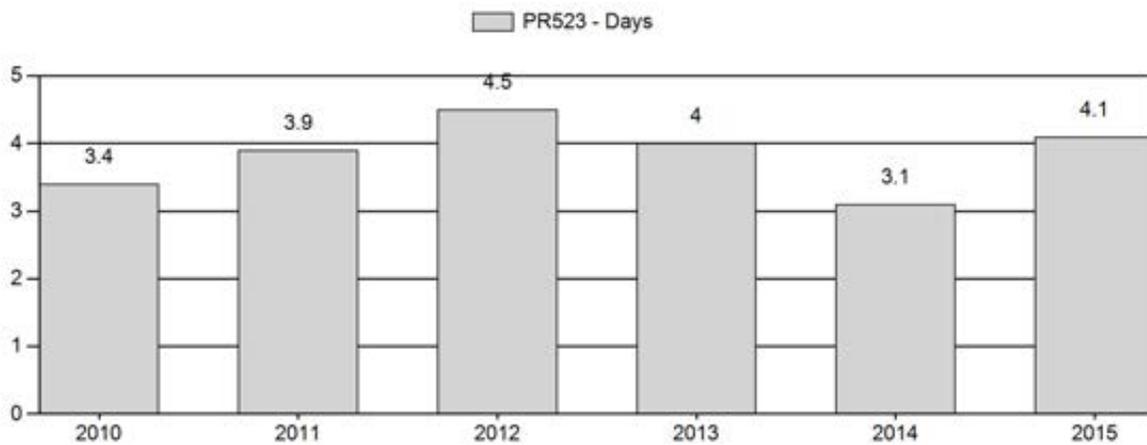
Harvest Success



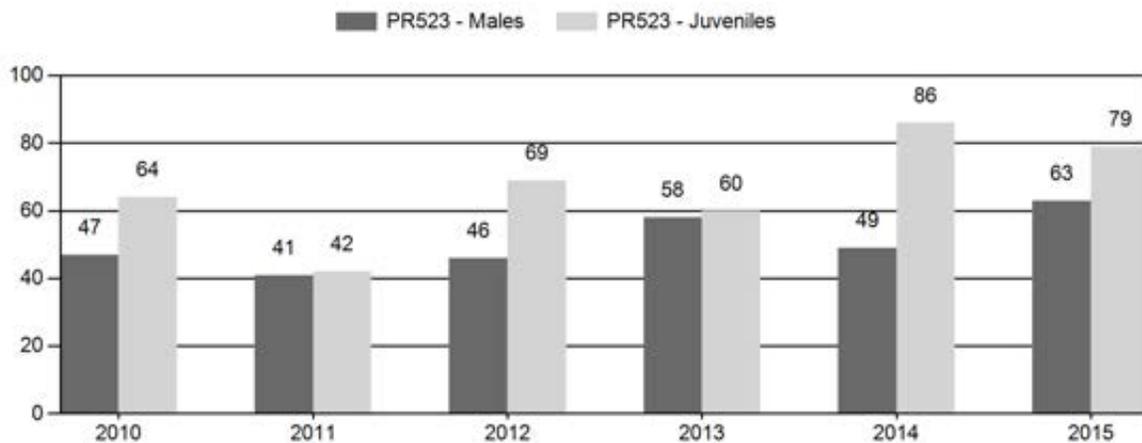
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	12,968	182	370	552	22%	1,186	48%	755	30%	2,493	2,176	15	31	47	± 4	64	± 4	43
2011	11,827	51	89	140	23%	339	55%	141	23%	620	0	15	26	41	± 7	42	± 7	29
2012	12,359	100	260	360	21%	789	47%	547	32%	1,696	2,355	13	33	46	± 4	69	± 6	48
2013	11,005	120	233	353	27%	608	46%	364	27%	1,325	1,987	20	38	58	± 6	60	± 6	38
2014	12,870	145	276	421	21%	861	43%	737	37%	2,019	2,094	17	32	49	± 4	86	± 6	57
2015	14,011	212	217	429	26%	676	41%	536	33%	1,641	3,021	31	32	63	± 6	79	± 7	49

**2016 HUNTING SEASONS
IRON MOUNTAIN PRONGHORN (PR523)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
38	1	Oct. 5	Oct. 31	1,250	Limited Quota	Any antelope
	6	Oct. 5	Oct. 31	1,050	Limited Quota	Doe or fawn
		Nov. 1	Dec. 31			Unused Area 38 Type 1 and Type 6 licenses valid for doe or fawn

Special Archery Season Hunt Areas	Opening Date	Limitations
38	Aug. 15	Refer to Section 2 of this Chapter

Area	Type	Change from 2015
38	1	+150
	6	+175
Herd Totals	1	+150
	6	+175
	TOTAL	+325

Management Evaluation

Current Postseason Population Management Objective: 13,000 (10,400-15,600)

Management Strategy: Recreational

2015 Postseason Population Estimate: 12,400

2016 Proposed Postseason Population Estimate: 13,500

2015 Hunter Satisfaction: 89% Satisfied, 9% Neutral, 2% Dissatisfied

The management objective for the Iron Mountain Pronghorn Herd Unit is a post-season population objective of 13,000 pronghorn. The management strategy is recreational management with a post hunt buck ratio of 30 to 59:100 does. The objective and management strategy was last revised in 2014.

Herd Unit Issues

The Iron Mountain Herd Unit consists of Hunt Areas 38, (combined 39, 40 and 104 into Hunt Area 38 in 2014) which is predominately private lands with traditional agricultural uses. The 2015 post-season population estimate was 12,400 with the population trending upward. Limited public access in this herd unit has typically deterred many hunters and in past years we would have licenses go unsold; however with significant license cuts state wide we have seen an insurgence of both residents and nonresidents hunting 38.

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 Iron Mountain 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. A significant die-off of big 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. 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 it is the predominant specie.

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

A total of 1,641 pronghorn were classified, which is below the recommended classification objective of 3,000. Fawn ratios were 79:100 does which is a decline from 2014 but above the 5 year average of 71:100 and expected after the excellent amount of spring/summer forage. The buck ratio increased from 49:100 does in 2014 to 63:100 however adult buck ratios remained at 32:100 in 2014 and 2015. The yearling buck ratio doubled from 2014 to 2015 at 31:100 and indicates a great survival of 2014 fawns. The hunter satisfaction survey showed 89% of hunters were either satisfied or very satisfied with their hunt which has been increasing since 2012.

Harvest Data

Hunter success declined slightly from 91% in 2014 to 86%. Hunter success on the type 6 license actually increased from 2014 to 2015, while the hunter success on the Type 1 license declined by 12% to 79%. This herd is typically a low priority area for resident hunters, due to lack of public access, and many of the licenses are purchased after the draw by nonresidents, typically 60% - 65% of the license holders. In 2015 nonresidents accounted for 48% of the licenses due to an increase in resident license holders, which may also explain the decrease in hunter success. License issuance has been the same since 2013; in 2013 we had 728 licenses left over after the draw, in 2014 230 type 6s, and in 2015 none. We assume the increase in interest is due to the decrease in licenses state wide in 2014, hunters to draw their 2nd and 3rd choices.

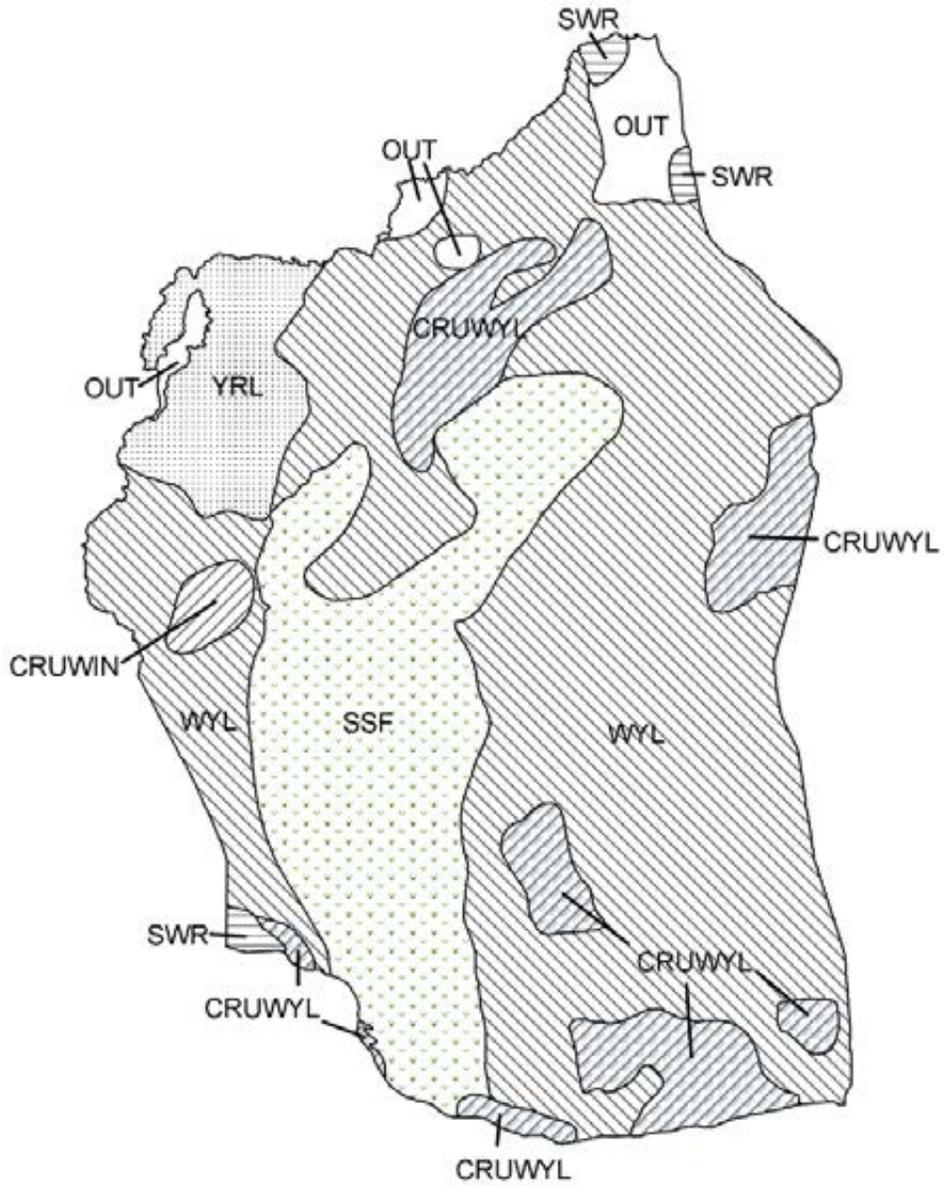
Population

The population is increasing due to exceptional spring/summer forage the last three years producing the highest fawn ratios in a decade. The spreadsheet model for this herd estimates a post hunt population of 12,400. This estimate uses the Constant Juvenile & Adult Survival model which had a AIC score of 28 and a best fit score of 18. This is a poor model due to little data available; ratio data, if available, considered highly biased because of poor sample sizes or an inability to survey the entire area; results not biologically defensible. To get the model to run we truncated years to 2002 to eliminate years of poor classification data. We also did not include LT estimates as they are also of poor quality due to such large deviations in terrain height resulting in large standard errors.

Management Summary

This herd has always been hard to manage due to limited population data and a large percentage of inaccessible private lands. We combined Hunt Areas 38, 39, 40 and 104 in 2014 to simplify regulations and allow hunters more opportunity to move where the pronghorn are most accessible. With the model indicating a growing population, high hunter success, and a renewed interest by hunters, we will be increasing the type 1 license by 150 and the type 6 licenses by 175 for a total of 2,300 licenses in 2016.

PH523 - Iron Mtn.
HA 38-40, 104
Revised - 7/88



2015 - JCR Evaluation Form

SPECIES: Pronghorn
 HERD: PR524 - DWYER
 HUNT AREAS: 103

PERIOD: 6/1/2015 - 5/31/2016

PREPARED BY: MARTIN HICKS

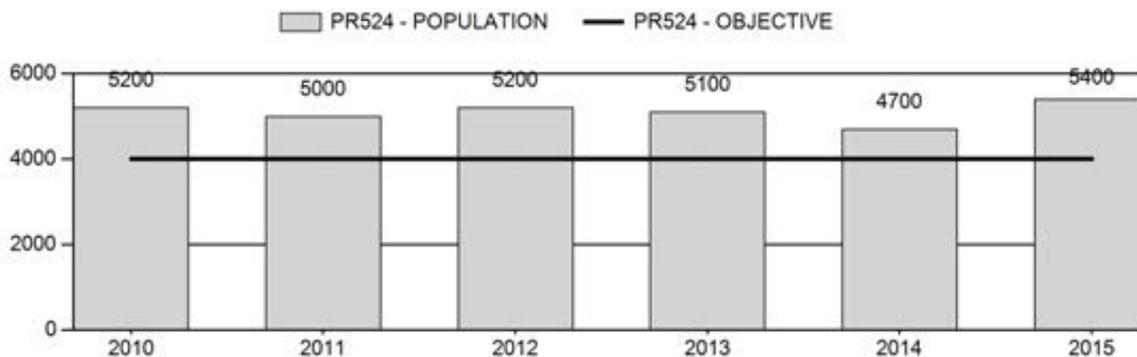
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	5,040	5,400	5,600
Harvest:	537	487	640
Hunters:	541	518	715
Hunter Success:	99%	94%	90 %
Active Licenses:	641	564	755
Active License Success:	84%	86%	85 %
Recreation Days:	2,043	1,372	1,900
Days Per Animal:	3.8	2.8	3.0
Males per 100 Females	49	48	
Juveniles per 100 Females	50	50	

Population Objective (± 20%) : 4000 (3200 - 4800)
 Management Strategy: Recreational
 Percent population is above (+) or below (-) objective: 35%
 Number of years population has been + or - objective in recent trend: 2
 Model Date: 02/18/2016

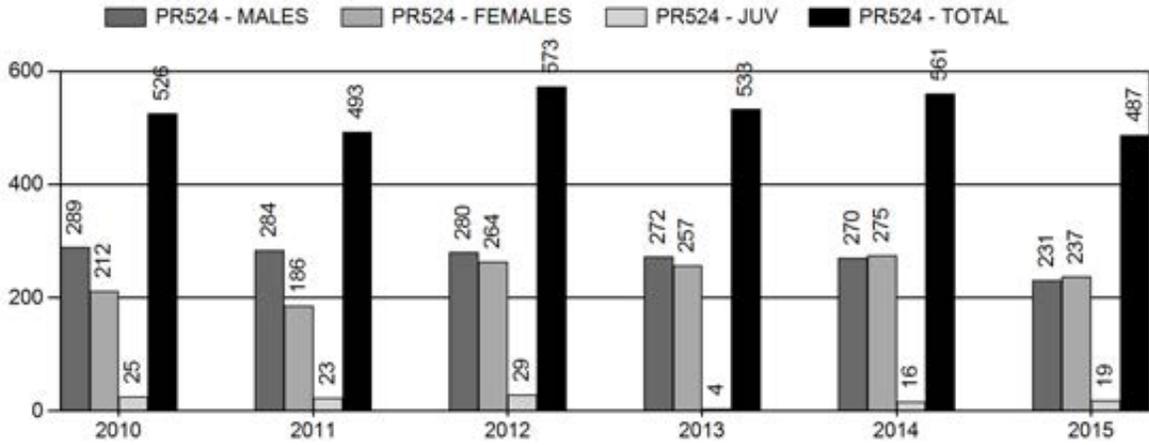
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	8.8%	10.9%
Males ≥ 1 year old:	16.3%	18.2%
Juveniles (< 1 year old):	1.3%	2.5%
Total:	8.1%	10%
Proposed change in post-season population:	+8%	+8%

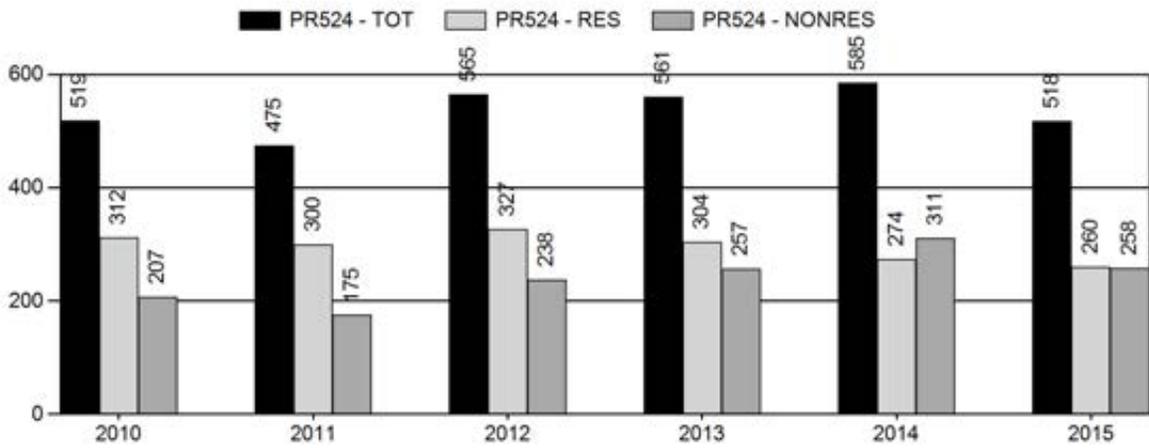
Population Size - Postseason



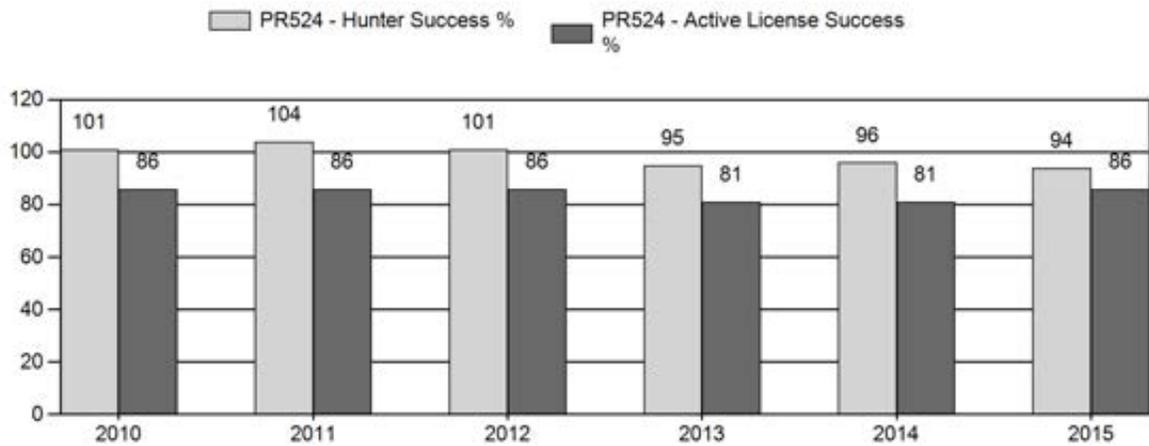
Harvest



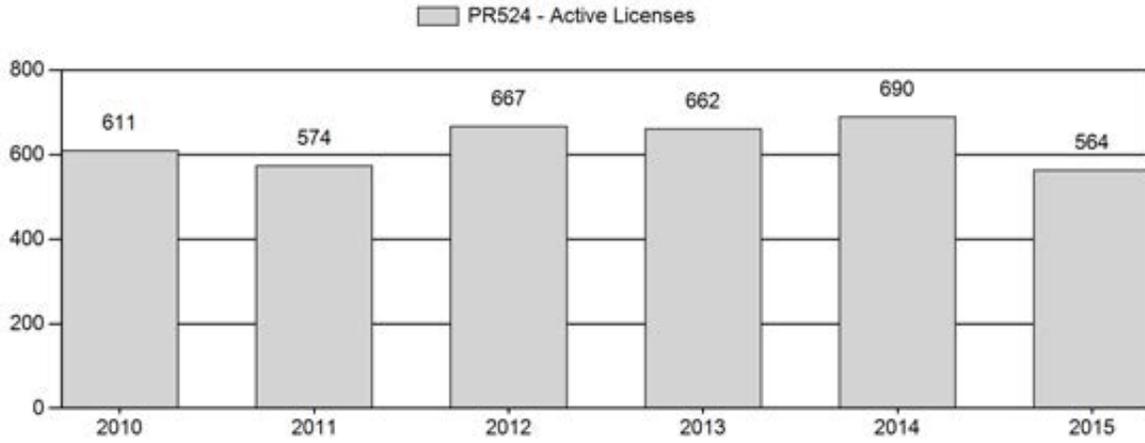
Number of Hunters



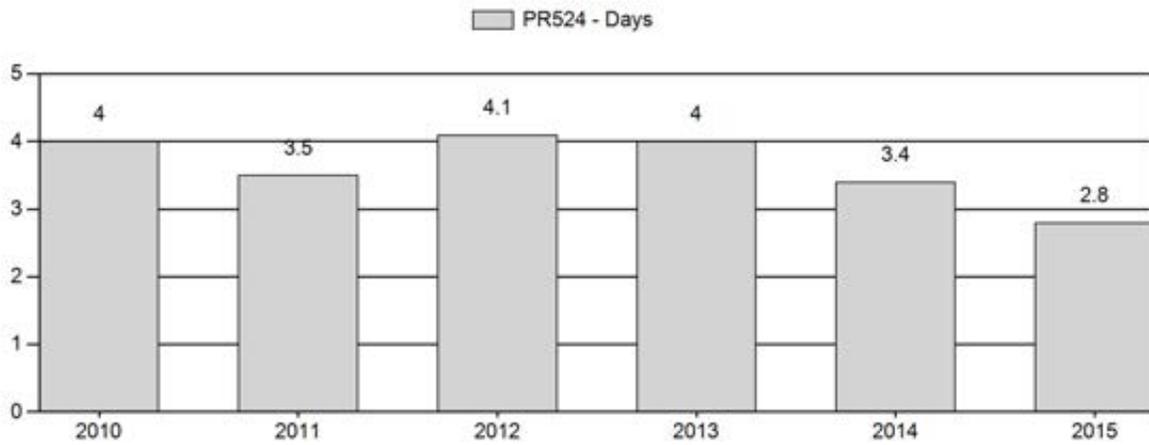
Harvest Success



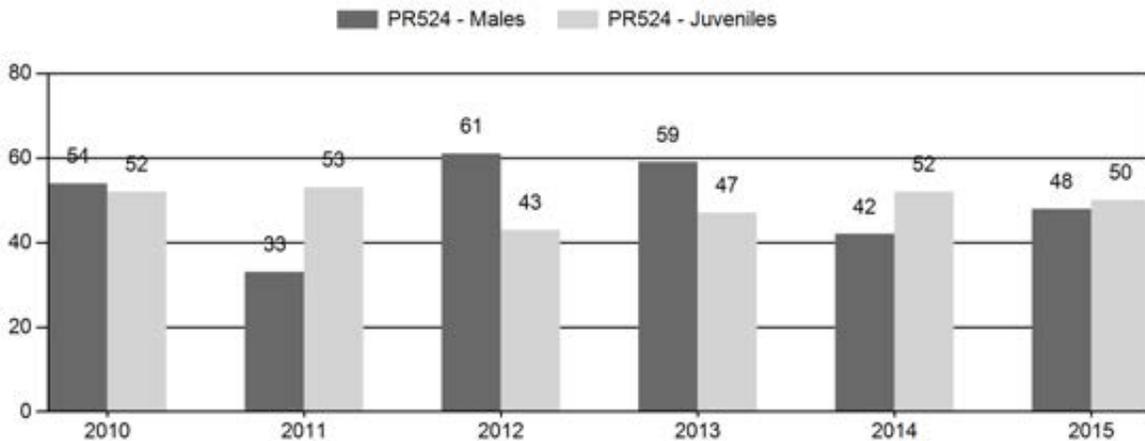
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR524 - DWYER

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	5,800	78	113	191	26%	356	49%	185	25%	732	807	22	32	54	± 7	52	± 7	34
2011	5,600	56	115	171	18%	512	54%	271	28%	954	1,345	11	22	33	± 4	53	± 6	40
2012	5,800	93	106	199	30%	326	49%	140	21%	665	1,224	29	33	61	± 8	43	± 7	27
2013	5,700	105	221	326	29%	552	49%	258	23%	1,136	1,146	19	40	59	± 6	47	± 5	29
2014	5,400	68	167	235	21%	566	52%	295	27%	1,096	1,362	12	30	42	± 5	52	± 5	37
2015	5,900	88	137	225	24%	466	50%	234	25%	925	1,091	19	29	48	± 6	50	± 6	34

**2016 HUNTING SEASONS
DWYER PRONGHORN HERD (524)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
103	1	Oct. 5	Oct. 31	475	Limited quota	Any antelope
	6	Oct. 5	Dec. 31	450	Limited quota	Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
103	Aug. 15	Oct. 4	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
103	1	+100
103	6	+100
Total		+200

Management Evaluation

Current Management Objective: 4000 (3,200-4,800)

Management Strategy: Recreational

2015 Postseason Population Estimate: ~5,400

2016 Proposed Post-season Population Estimate: ~5,600

2015 Hunter Satisfaction: 89% Satisfied, 8% Neutral, 3% Dissatisfied

Management Issues

The management objective for the Dwyer Pronghorn Herd Unit is a post-season population objective of 4,000 pronghorn. The management strategy is recreational management with a 20-59 buck:100 doe ratio range. The herd objective and management strategy was reviewed in 2014 and to the decision was made to maintain the same population objective of 4,000 pronghorn and recreational management.

The 2015 post-season population estimate of 5,400 was derived from the end-of- the biological year 2014 line-transect estimate. The spreadsheet model was then anchored to that density estimate which increased the population by 38% compared to the 2015 post-season population estimate without the LT density estimate. This report will reflect the population trend from 2010-2016 that is anchored to the 2014 line-transect estimate.

There has been little urban and industrial development within this herd unit. The herd unit is comprised of 90% private land and some accessible state land. Land use is comprised of native range land, irrigated and dry land agriculture fields, and land enrolled into the Conservation

Reserve Program (CRP). The majority of access is in the northern portion of the herd unit via the PLPW program and private land opened up address damage situations.

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 Dwyer 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. 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 it is the predominant species.

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

Based on the 2014 line-transect density estimate of 5,400 the previous 5 years of population data was retrofitted to reflect population trends that are anchored to the 2014 end-of-the-year line-transect density estimate of 5,400 pronghorn. The model simulates a population that from 2010-2015 fluctuated around 5,000 pronghorn. The sample size for pre-season classifications has not been met in the past 6 years so herd composition data should be interpreted with caution. Fawn ratios have fluctuated around 50 fawns:100 does from 2010-2015 which is a level that does not grow a herd. However buck ratios that have fluctuated from a low of 33:100 to a high of 61:100 from 2010-2015 are well within recreational management levels. In fact they fall at the

upper level of the recreation management range, which indicates that fawns are surviving into adults providing for a healthy population that is maintaining itself. Sample size for tooth data collected in the field is too small to infer any population dynamics.

Harvest Data

Active license success (86%) in 2015 was similar to the herd unit five-year average (84%) and the five-year state-wide average (82%). Effort (2.8 days per harvest) decreased significantly in 2015 compared to the five-year herd unit and state-wide average of 3.8 days per harvest. Private land access dynamics have remained stable but additional access has opened up in central portion of the herd unit which could explain the decrease in effort. The hunter satisfaction survey showed that 89% of the hunters were either satisfied or very satisfied with their hunt, an increase compared to 2014 (78%). Additional hunting opportunity most likely affected hunter attitudes.

Population

A 2014 end-of-the biological year line transect (LT) was completed in June 2015 (Appendix A). The half-normal cosine model was selected. The % CV was 11.74 and had the lowest AIC score. The histogram misses the B and C bands, this is most likely due to observers concentrating more on the B and C bands. Given the low CV the population of 5,752 appears plausible. Pre-season classifications are not a reliable gauge to determine fawn recruitment since they very rarely reach the sample size to challenge the LT density estimate. In other words this estimate is more reliable than trying to model male and juvenile ratios in the spreadsheet model for a post-season population estimate.

The “Time Specific Juvenile- Constant Adult Survival” (TSJ, CA) spreadsheet model was chosen over the simpler Constant Juvenile-Constant Adult (CJ,CA) model, and resulted in a post-season population of 5,400 pronghorn. The simpler CJ,CA model tries to run through the previous LT’s and underestimates the 2014 LT density estimate by 1,000 pronghorn. By allowing for a variation in juvenile survival the TSJ,CA model runs through the 2014 LT and provides a plausible population estimate. The CJ,CA’s AIC score was slightly lower than the TSJ,CA score, but the TSJ,CA has a better fit than the CJ,CA model. This model is ranked fair since it runs through one sample-based population estimate and has ratio data for all the years.

Management Summary

Managers have been trying to maintain a population within the range of 3,200-4,800 pronghorn. Based on the 2014 end-of-the-biological year density estimate this population is 30% above the objective. To try and change population growth Type 6 licenses increased by 100. This will slow the population down but not decrease it. Managers want to take small steps in reducing the herd by not flooding the area with too many doe/fawn licenses. To take advantage of buck ratios in the upper end of the recreational range Type 1 licenses increased by 100.

If the projected harvest of 640 pronghorn is attained coupled with normal fawn recruitment the pronghorn population will slightly increase to 5,600, 40% above the objective of 4,000.

Appendix A

2014 End-of-the-Year Line Transect Results for PH524

Point Parameter	Standard Estimate	Percent Error	Coef. of Variation	95% Percent Confidence Interval	
DS	5.2216	0.58906	11.28	4.1836	6.5171
E(S)	1.4649	0.47702E-01	3.26	1.3740	1.5617
D	7.6489	0.89813	11.74	6.0747	9.6311
N	5752.0	675.39	11.74	4568.0	7243.0

Measurement Units

Density: Numbers/Sq. miles

ESW: meters

Component Percentages of Var(D)

Detection probability : 55.1

Encounter rate : 37.2

Cluster size : 7.7

Estimation Summary - Encounter rates

	Estimate	%CV	df	95% Confidence Interval	
n	358.00				
k	47.000				
L	792.30				
n/L	0.45185	7.16	46.00	0.39126	0.52182
Left	0.0000				
Width	206.00				

Estimation Summary - Detection probability

	Estimate	%CV	df	95% Confidence Interval	
--	----------	-----	----	-------------------------	--

Half-normal/Cosine

m	2.0000				
LnL	-573.83				
AIC	1151.7				
AICc	1151.7				
BIC	1159.4				
Chi-p	0.18013E-03				
f(0)	0.71806E-02	8.72	356.00	0.60514E-02	0.85206E-02
p	0.67604	8.72	356.00	0.56972	0.80219

ESW 139.26 8.72 356.00 117.36 165.25
 Estimation Summary - Expected cluster size

Estimate	%CV	df	95% Confidence Interval	
----------	-----	----	-------------------------	--

Average cluster size

1.7402	5.86	357.00	1.5511	1.9524
--------	------	--------	--------	--------

Half-normal/Cosine

r -0.10126

r-p 0.27803E-01

E(S)	1.4649	3.26	356.00	1.3740	1.5617
------	--------	------	--------	--------	--------

Estimation Summary - Density&Abundance

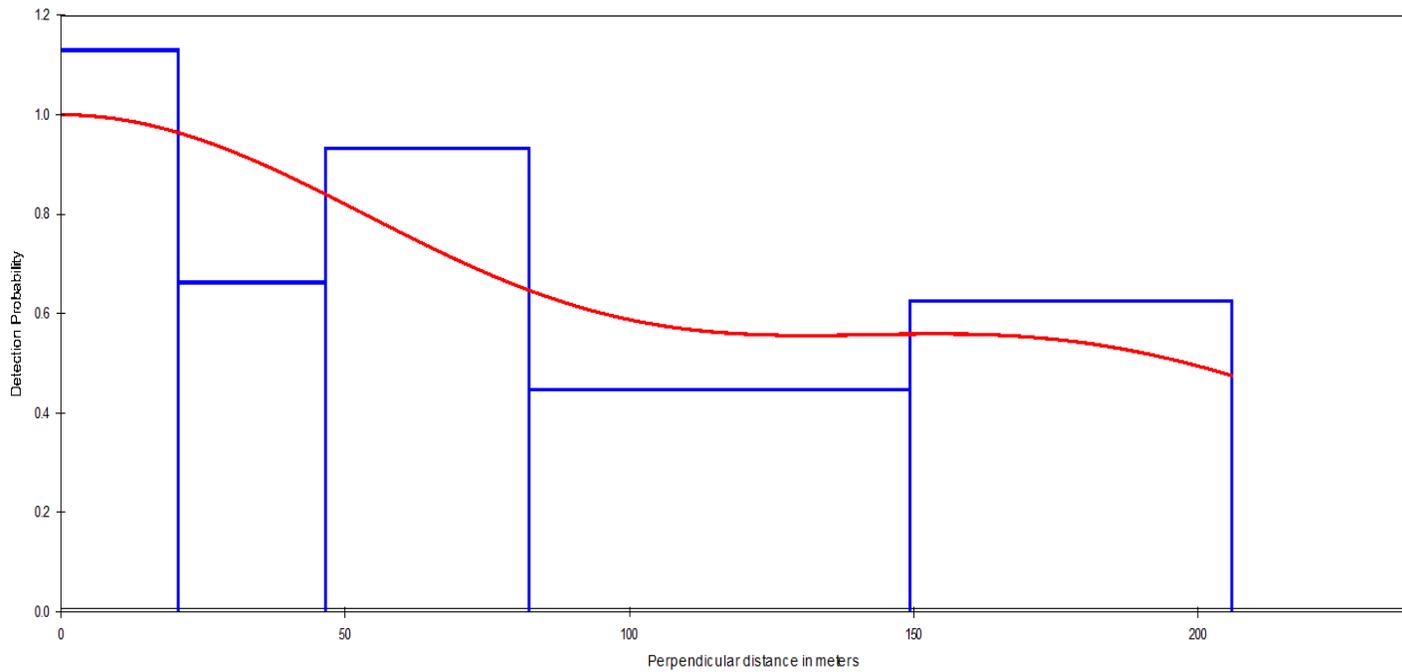
Estimate	%CV	df	95% Confidence Interval	
----------	-----	----	-------------------------	--

Half-normal/Cosine

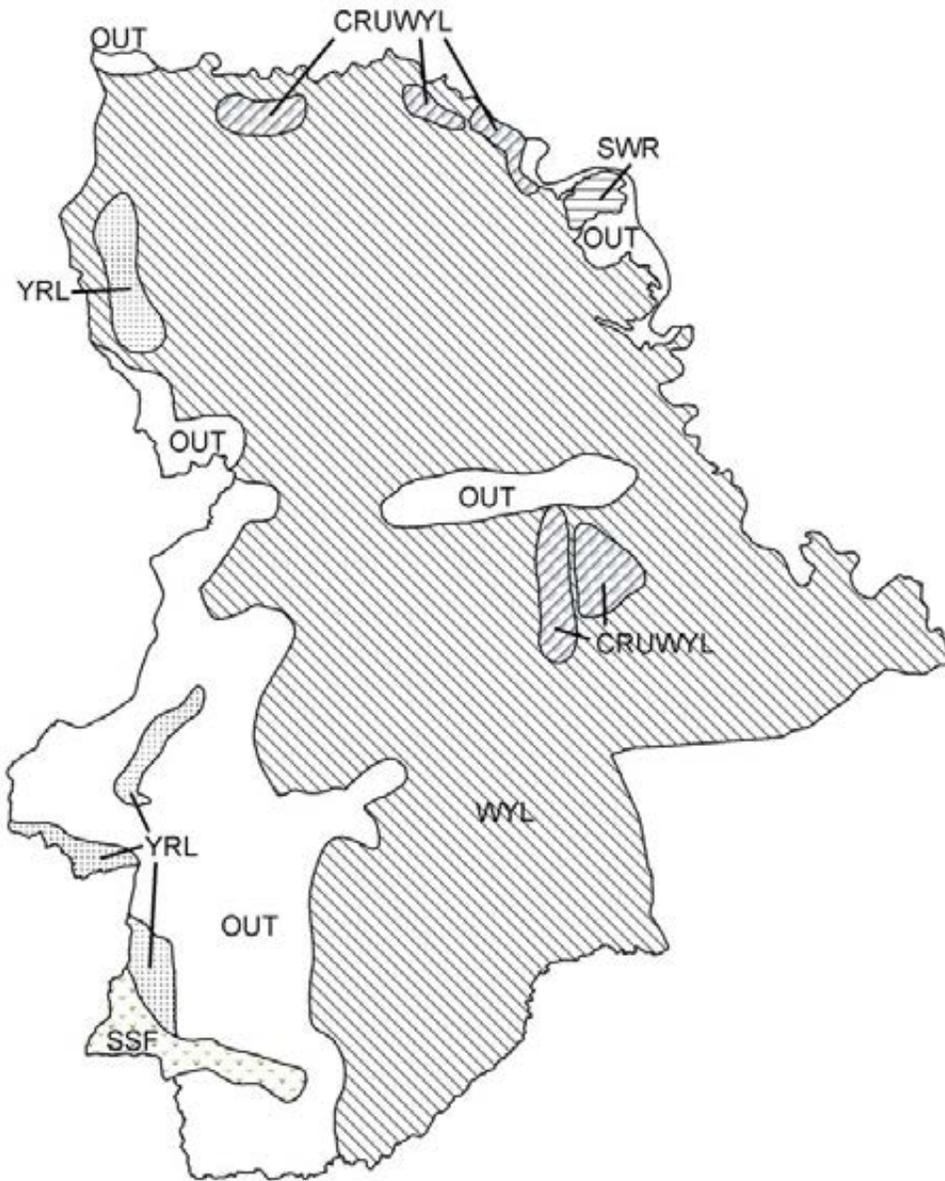
DS	5.2216	11.28	220.66	4.1836	6.5171
----	--------	-------	--------	--------	--------

D	7.6489	11.74	257.85	6.0747	9.6311
---	--------	-------	--------	--------	--------

N	5752.0	11.74	257.85	4568.0	7243.0
---	--------	-------	--------	--------	--------



PH524 - Dwyer
HA 103
Revised - 7/88



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR525 - MEDICINE BOW

HUNT AREAS: 30-32, 42, 46-48

PREPARED BY: LEE KNOX

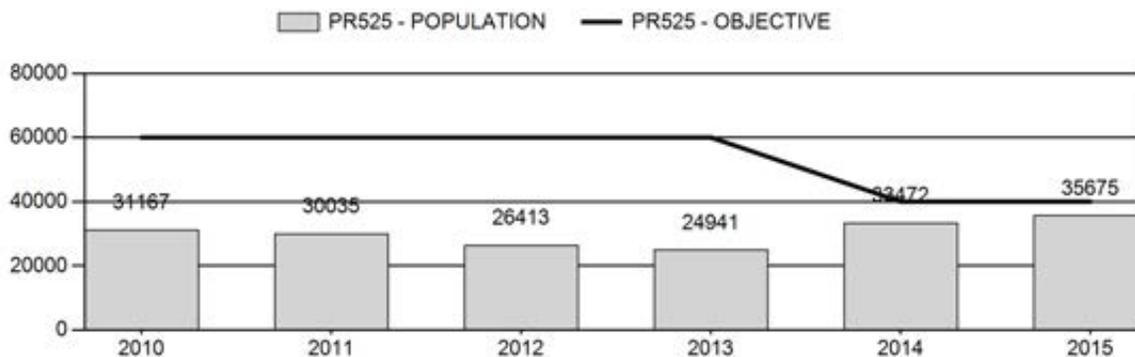
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	29,206	35,675	39,200
Harvest:	5,417	2,139	2,200
Hunters:	6,054	2,270	2,300
Hunter Success:	89%	94%	96 %
Active Licenses:	6,711	2,487	2,500
Active License Success:	81%	86%	88 %
Recreation Days:	19,759	6,626	6,600
Days Per Animal:	3.6	3.1	3
Males per 100 Females	44	42	
Juveniles per 100 Females	63	78	

Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-10.8%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/26/2016

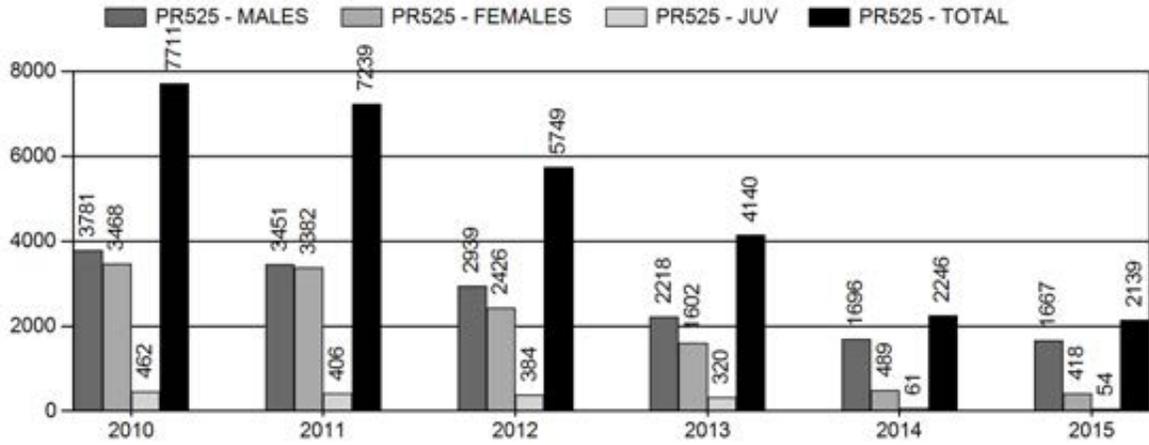
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	2.3%	2%
Males ≥ 1 year old:	25%	21%
Juveniles (< 1 year old):	1%	1%
Total:	6%	6%
Proposed change in post-season population:	6%	6%

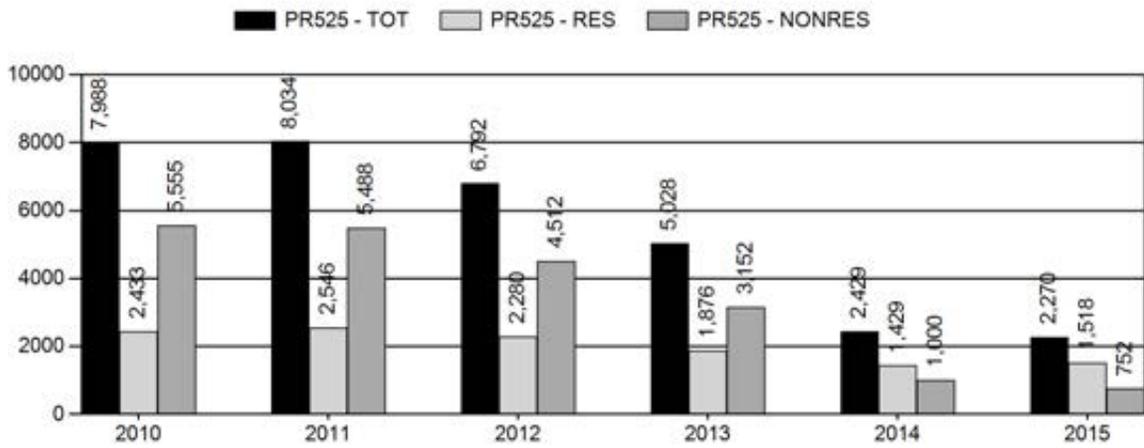
Population Size - Postseason



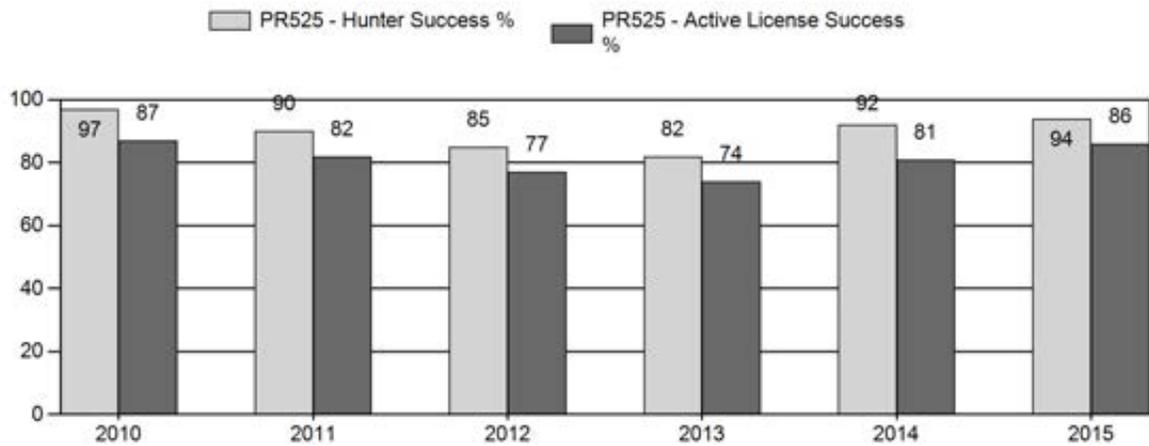
Harvest



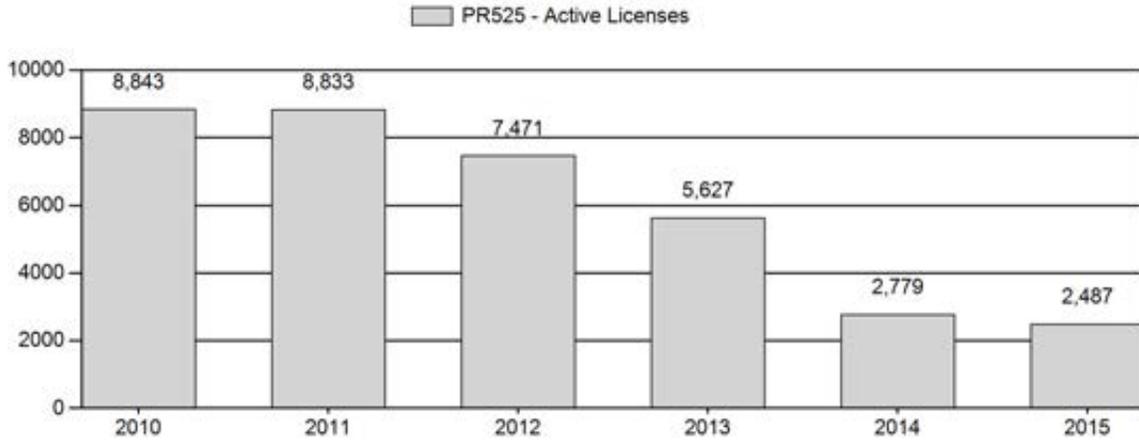
Number of Hunters



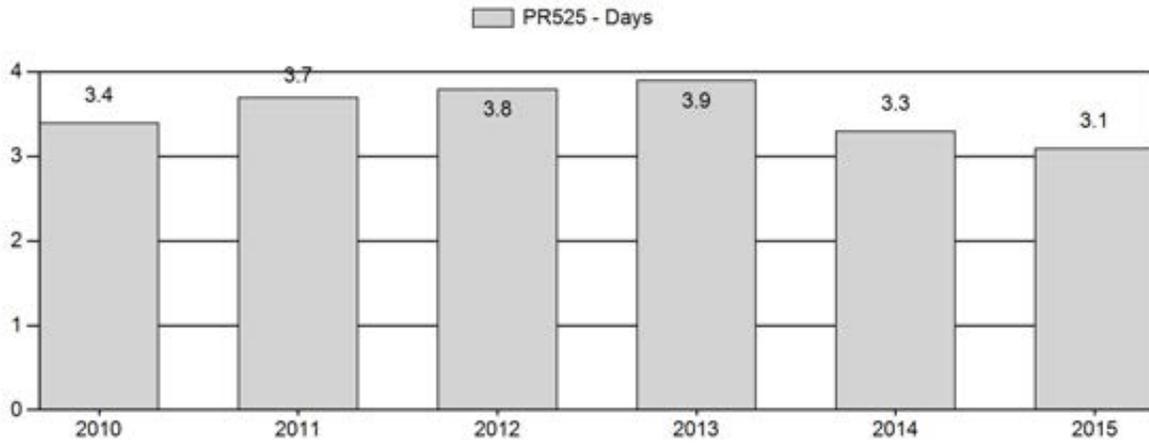
Harvest Success



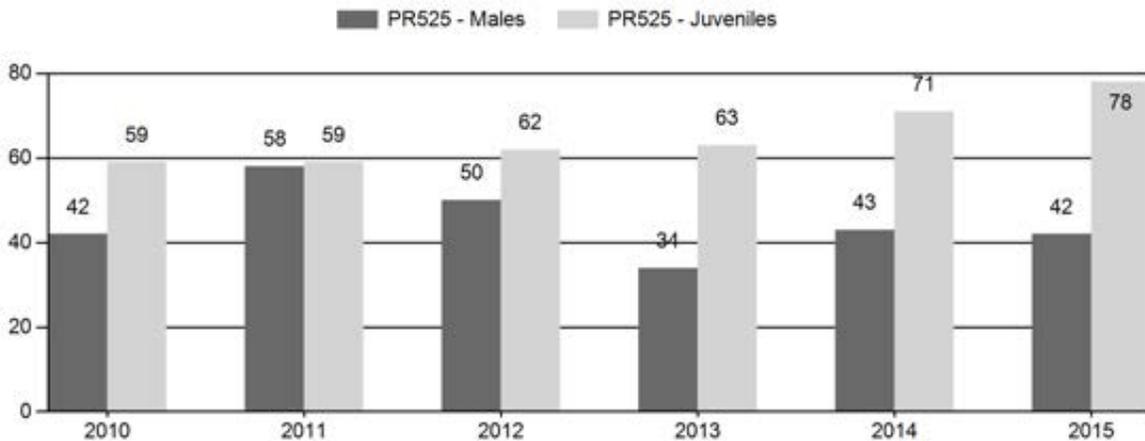
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	39,649	446	840	1,286	21%	3,072	50%	1,809	29%	6,167	1,978	15	27	42	± 2	59	± 3	42
2011	37,998	299	994	1,293	27%	2,222	46%	1,306	27%	4,821	2,104	13	45	58	± 3	59	± 3	37
2012	32,743	312	616	928	24%	1,857	47%	1,143	29%	3,928	2,433	17	33	50	± 3	62	± 4	41
2013	29,495	301	614	915	17%	2,708	51%	1,698	32%	5,321	2,221	11	23	34	± 2	63	± 3	47
2014	35,942	514	617	1,131	20%	2,655	47%	1,882	33%	5,668	2,598	19	23	43	± 2	71	± 3	50
2015	38,028	424	529	953	19%	2,249	45%	1,747	35%	4,949	2,810	19	24	42	± 3	78	± 4	55

**2016 HUNTING SEASONS
MEDICINE BOW PRONGHORN (PR525)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
30	1	Oct. 5	Oct. 31	400	Limited quota	Any antelope
	6	Oct. 5	Oct. 31	50	Limited quota	Doe or fawn
31	1	Sep. 25	Oct. 31	150	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn
32	1	Sep. 25	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	100	Limited quota	Doe or fawn
	7	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn valid on private land
42	1	Sep. 25	Oct. 31	400	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn
46	1	Sep. 25	Oct. 31	100	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	150	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	75	Limited quota	Doe or fawn
47	1	Sep. 25	Oct. 31	400	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	150	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	150	Limited quota	Doe or fawn
48	1	Sep. 25	Oct. 31	100	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	100	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Limitations
30-32,42,46-48	Aug. 15	Refer to Section 2 of this Chapter

Management Evaluation

Current Postseason Population Management Objective: 40,000 (32,000 – 48,000)

Management Strategy: Recreational

2015 Postseason Population Estimate: ~ 35,700

2016 Proposed Postseason Population Estimate: ~ 39,300

2015 Hunter Satisfaction: 89% Satisfaction, 6% Neutral, 5% Dissatisfied

The management objective for the Medicine Bow Pronghorn Herd Unit is a postseason population objective of 40,000. The management strategy is recreational management which requires maintaining for buck ratios of 30 to 59:100 does. The objective and management strategy were last revised in 2014.

Herd Unit Issues

The Medicine Bow Herd Unit encompasses hunt areas 30, 31, 32, 42, 46, 47 and 48. These hunt areas vary between predominantly public land and exclusively private land. Large scale wind farms and coal mining within this herd may be negatively impacting habitat and productivity. The population saw a large decline from a high of 49,700 in 2004 to 25,000 in 2013. Most recently the population has been increasing to the current estimate of 35,700. In the early 2000s the Department was trying to reduce the population below the objective of 60,000 to try and prevent irreparable habitat damage in the Shirley Basin and Bates Hole areas. At the same time this herd was hit hard by harsh winters, drought, and disease, causing the herd to decline below 30,000 pronghorn. Current season structure and license issuance are designed to increase the population. The herd objective was last reviewed in 2014; the herd objective was decreased from 60,000 to 40,000 pronghorn post season. This will still allow the herd to increase substantially and at the same time manage for a more sustainable population in line with habitat.

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 Medicine Bow 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. 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.

Shrubs within this herd unit continue to be comprised of predominantly mature to decadent age classes and show signs of excessive historical herbivory. Historical overutilization of key shrubs in much of this herd unit will likely limit the herd's growth potential.

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

A total of 5,000 pronghorn were classified in 2015, exceeding the estimated classification objective of 2,800. Classification methods were changed from aerial to ground in 2013 due to budget and time constraints. Buck ratios are comparable to 2014 at 42:100 does. Adult buck ratios are 24:100 does, well below the 10 year average of 30:100 does, however, the yearling buck ratio of 19:100 is above the 10 year average of 16:100. Since 2012 herd unit wide fawn ratios have been increasing and 2015 was no exception at 78:100 does. Most hunt areas saw fawn ratios that either remained stable or increased except in hunt area 30, which declined to 59:100. The hunter satisfaction survey shows 89% of hunters were either satisfied or very satisfied with their hunt and 6% remaining neutral, comparable to past years.

Harvest Data

Hunter success for all active licenses types was 94%, up from 92% in 2014 and 82% in 2013. All hunt areas saw an increase in success except for in hunt area 31 which declined below 80% for both license types. Hunter effort for the herd unit declined for the third straight year to 3.1 days to harvest in 2015. We expect to have high success and lower effort with the current season structure and license issuance. We hope we will be able to increase hunter opportunity in the next few years, however, it is concerning that some of the populations within hunt areas 30, 31 and 48 do not seem to be recovering as quickly.

Population

The spreadsheet model for this herd indicates the population is increasing with a post hunt population of 35,700. This estimate was derived using the Time-Specific Juvenile and Constant Adult Survival model which had a AIC score of 261 and a best fit score of 169. The last line transect was conducted in 2011 with an estimate of 31,132 with a standard error of 4,328. The model is of good quality, predicted end of year population trends align well with past line transect estimates, and is comparable with what field personnel have noted from landowner and hunter comments. The model has 15-20 years of data; ratio data available for all years in model; juvenile and adult survival estimates with standard errors available at least 2 out of 10 years, (Grogan et al and Taylor, 2014) and at least one sample-based population estimate with standard error available.

Management Summary

If the projected harvest of 2,200 is attained, and the average fawn ratio of 70 fawns: 100 does is maintained, the population is estimated to increase to near 40,000. If we have another year of good spring/summer forage, the population will increase even more substantially. License issuance will remain status quo so that we can continue to grow the population towards objective.

Bibliography of Herd Specific Studies

Grogan, R. Lindzey, F. *Pronghorn survival in Wyoming*. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, WY, 82071, USA

Taylor, K. L. 2014. Pronghorn (*Antilocapra americana*) Response to Wind Energy Development on Winter Range in South-Central, Wyoming. Master's Thesis. Department of Ecosystem Science and Management. University of Wyoming. Laramie. 141 pp.

PH525 - Medicine Bow
HA 30-32, 41, 42, 46-48
Revised - 6/04



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR526 - COOPER LAKE

HUNT AREAS: 43

PREPARED BY: LEE KNOX

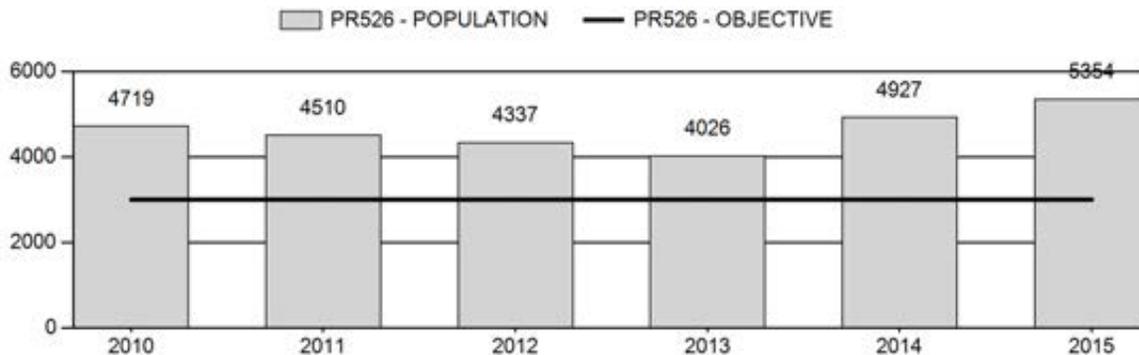
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	4,504	5,354	5,000
Harvest:	666	635	780
Hunters:	734	685	800
Hunter Success:	91%	93%	98 %
Active Licenses:	792	755	900
Active License Success:	84%	84%	87 %
Recreation Days:	2,328	2,743	2,500
Days Per Animal:	3.5	4.3	3.2
Males per 100 Females	42	49	
Juveniles per 100 Females	80	94	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	78%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/26/2015

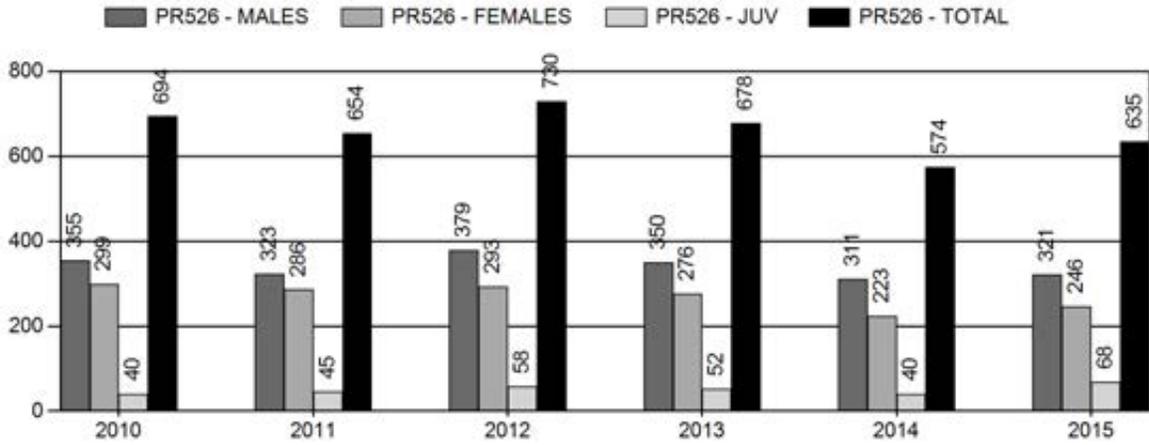
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	10%	18%
Males ≥ 1 year old:	33%	31%
Juveniles (< 1 year old):	1%	1%
Total:	11%	13%
Proposed change in post-season population:	-12%	-15%

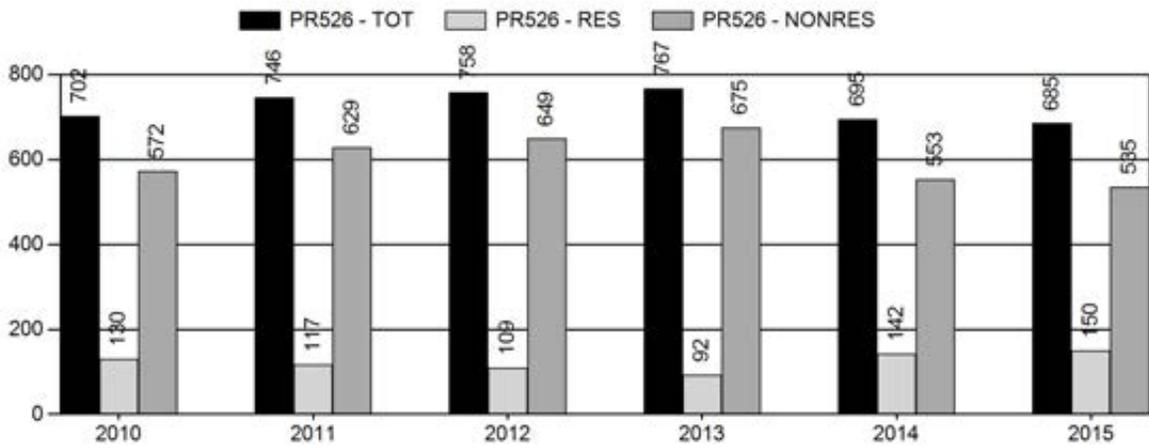
Population Size - Postseason



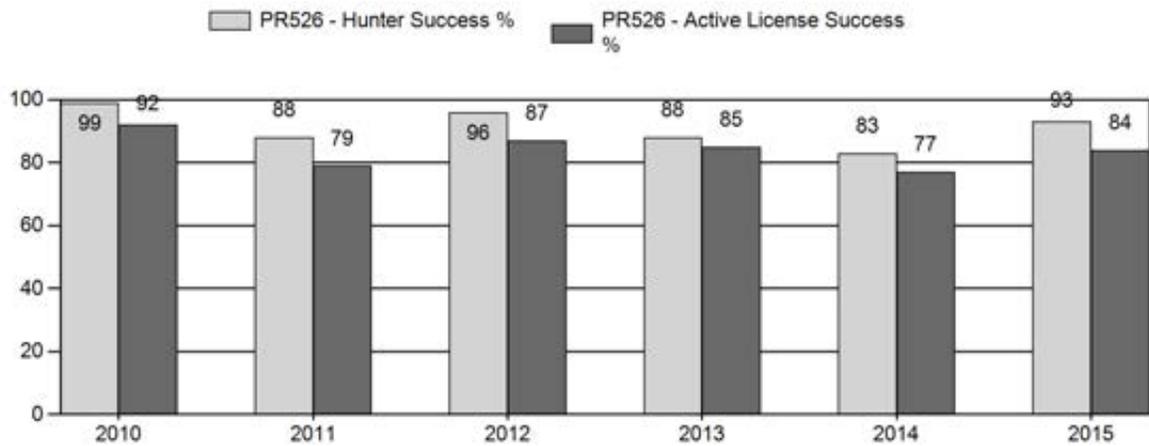
Harvest



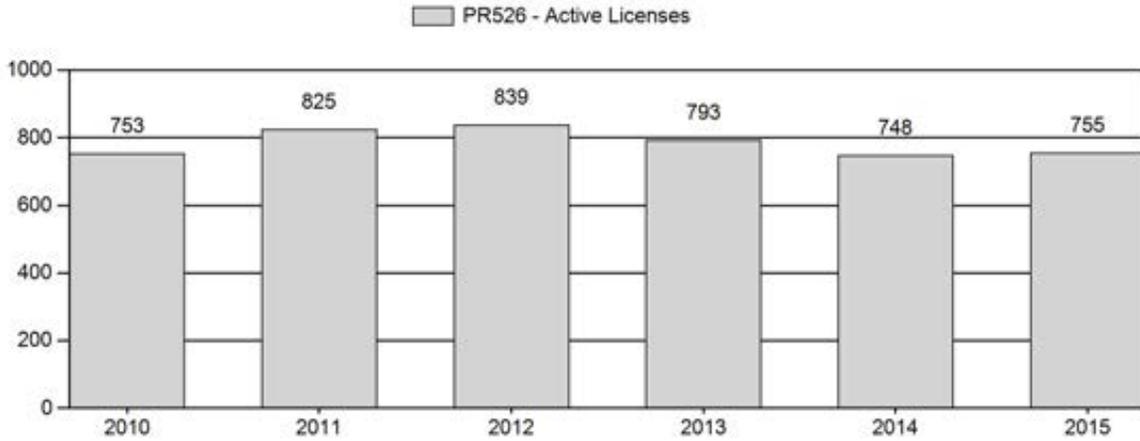
Number of Hunters



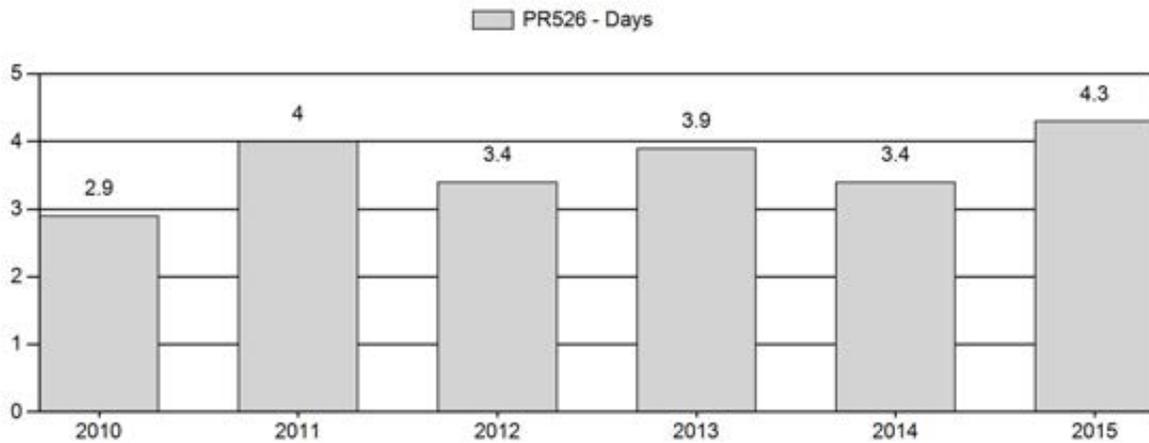
Harvest Success



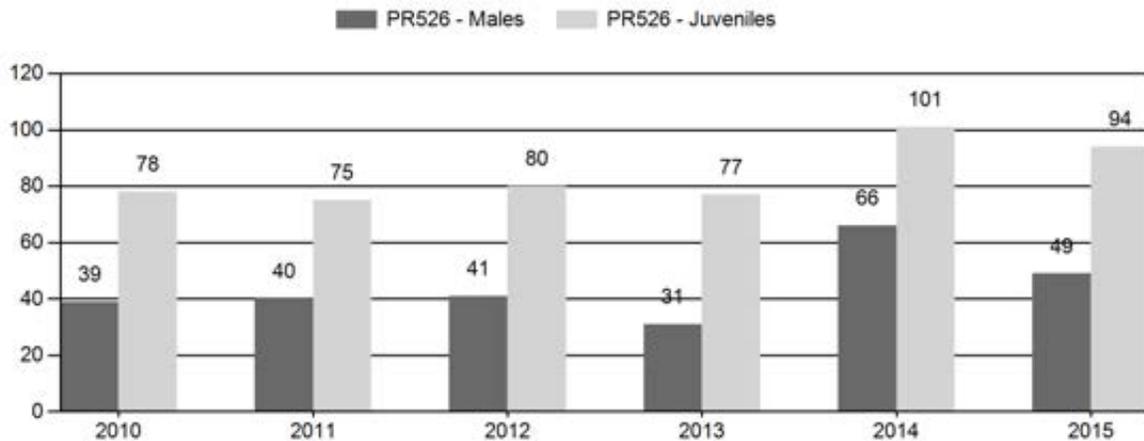
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	5,482	89	147	236	18%	599	46%	468	36%	1,303	2,318	15	25	39	± 4	78	± 7	56
2011	5,230	56	162	218	19%	544	47%	406	35%	1,168	2,231	10	30	40	± 5	75	± 7	53
2012	5,154	33	52	85	18%	209	45%	167	36%	461	2,064	16	25	41	± 8	80	± 13	57
2013	4,772	45	82	127	15%	409	48%	314	37%	850	1,784	11	20	31	± 5	77	± 9	59
2014	5,558	101	96	197	25%	300	38%	303	38%	800	1,538	34	32	66	± 9	101	± 13	61
2015	6,052	68	92	160	20%	325	41%	307	39%	792	2,352	21	28	49	± 7	94	± 12	63

**2016 HUNTING SEASONS
COOPER LAKE PRONGHORN (PR526)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
43	1	Sept. 15	Oct. 14	400	Limited quota	Any antelope
	6	Sept. 15	Oct. 14	600	Limited Quota	Doe or fawn
Archery						Refer to Section 3 of this Chapter

Special Archery Season Hunt Areas	Opening Date	Limitations
43	Aug. 15	Refer to Section 2 of this Chapter

Area	Type	Change from 2015
43	6	+150
Herd Totals	6 TOTAL	+150 +150

Management Evaluation

Current Postseason Population Management Objective: 3,000 (2,400-3,600)

Management Strategy: Recreational

2015 Postseason Population Estimate: ~ 5,300

2016 Proposed Postseason Population Estimate: ~ 5,000

2015 Hunter Satisfaction: 90% Satisfied, 5% Neutral, 5% Dissatisfied

The management objective for the Cooper Lake Pronghorn Herd Unit is a post-season population objective of 3,000 pronghorn. The management strategy is recreational management with a buck ratio of 30 to 59:100 does. The objective and management strategy was last revised in 2013.

Herd Unit Issues

Recent trends show the population increasing from 4,200 in 2013 to the current population estimate at 5,300. The last line transect survey was conducted in 2013, estimating 8,953 pronghorn with an estimated standard error of 1,603. This herd is predominately private land with increasing urban sprawl near Laramie, and a large wind farm in the western portion of the herd. Limited public access has hindered efforts to decrease this herd through harvest. Currently most public hunting is limited to the Diamond Lake and Laramie River Hunter Management Areas (HMA) which encompass half of the Herd Unit. Field staff documented Epizootic Hemorrhagic Disease (EHD) in the herd unit in 2012 and 2013.

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 Cooper Lake 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking.

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

A total of 800 pronghorn were classified which is below the estimated sample size of 2,300. Classification samples have been below the estimated sample size since 2006. Routes were established in 2013 so that some inference can be made between classification samples year to year and since 2013 we have sampled near 800 pronghorn each year; Additional routes may need to be added to reach the estimated sample size. With another green spring and summer, fawn ratios remain high at 94 fawns:100 does. We are seeing similar adult buck ratios to 2014 and even though yearling numbers declined they are still good compared to past years. The total buck ratio of 49:100 is down which is mostly due to fewer yearlings sampled than last year but overall still a high buck ratio for this herd.

Harvest Data

We issued 850 licenses which did not completely sell in the resident draw but were picked up after the draw by non-residents who account for 78% of the licenses sold. Hunter success rebounded to similar percentages before 2014, with type 1s at 93% and type 6s at 87%. We are not sure why it dipped in 2014 and rebounded in 2015 considering similar weather, hunting

access and license issuance. The Hunter Satisfaction Survey shows 90% of hunters were either satisfied or very satisfied with their hunt.

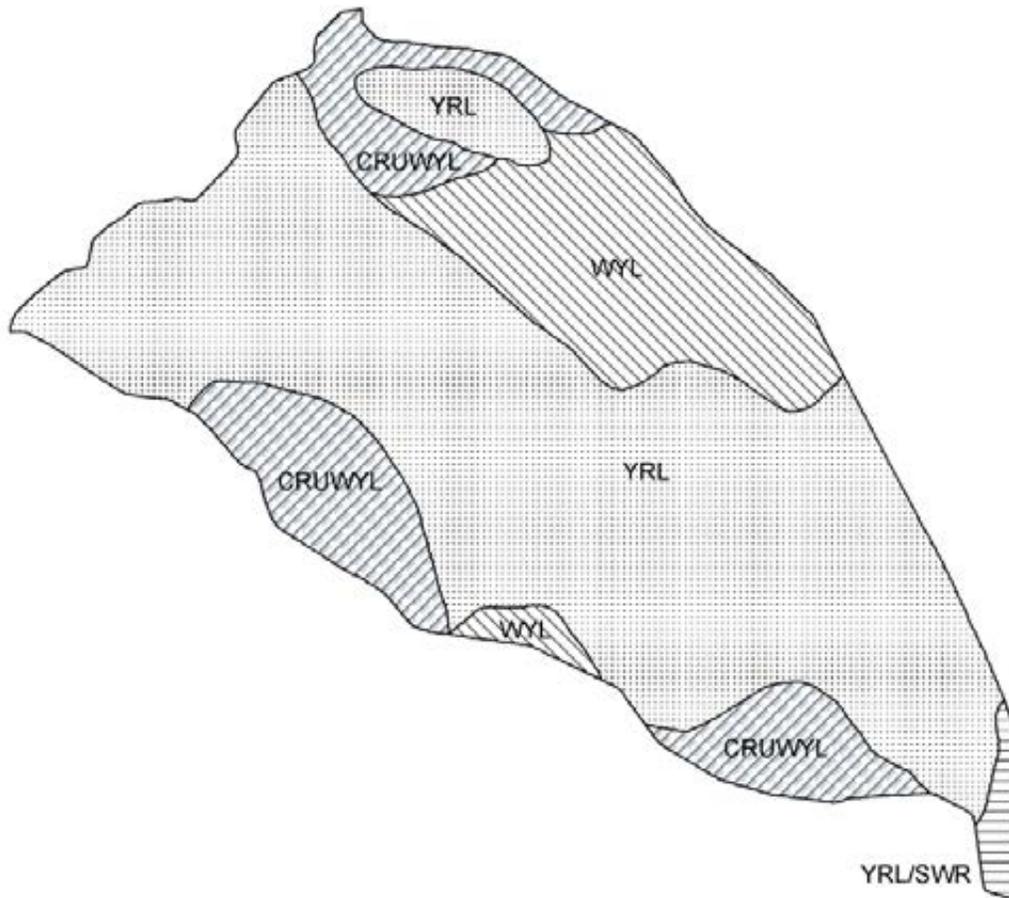
Population

The model estimates the population is near 5,300 pronghorn and predicts it will decline to 5,000 in 2016. The Constant Juvenile- Constant Adult Mortality Rate (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. The model chosen had the lowest AIC of all three models and the end of year population estimate trends well with the past LTs. We conducted a Line Transect in June 2014 that estimates an end of bio year estimate of 8,900 with a standard error of 1,600. The histogram for this survey shows that the E band is higher than the B, C or D bands, and therefore breaks the first assumption. This is a poor model due to ratio data, if available, considered highly biased because of poor sample sizes or an inability to survey the entire area; lacks adult and juvenile survival data; results not biologically defensible.

Management Summary

This herd is very productive and has recovered quickly from the drought in 2012. The current population estimate is over objective and increasing. We are increasing doe fawn type 6 licenses by 150, which we estimate will be enough harvest to curb the growth of this herd.

PH526 - Cooper Lake
HA 43
Revised - 3/91



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR527 - CENTENNIAL

HUNT AREAS: 37, 44-45

PREPARED BY: LEE KNOX

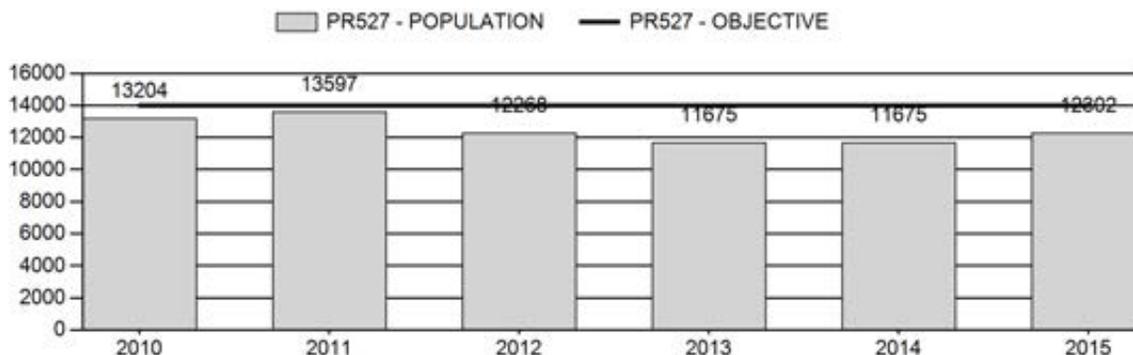
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	12,484	12,302	12,000
Harvest:	1,189	1,011	1,000
Hunters:	1,374	1,044	1,050
Hunter Success:	87%	97%	95%
Active Licenses:	1,547	1,183	1,200
Active License Success:	77%	85%	83%
Recreation Days:	5,078	3,908	3,900
Days Per Animal:	4.3	3.9	3.9
Males per 100 Females	38	40	
Juveniles per 100 Females	72	68	

Population Objective (\pm 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-12.1%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/18/2016

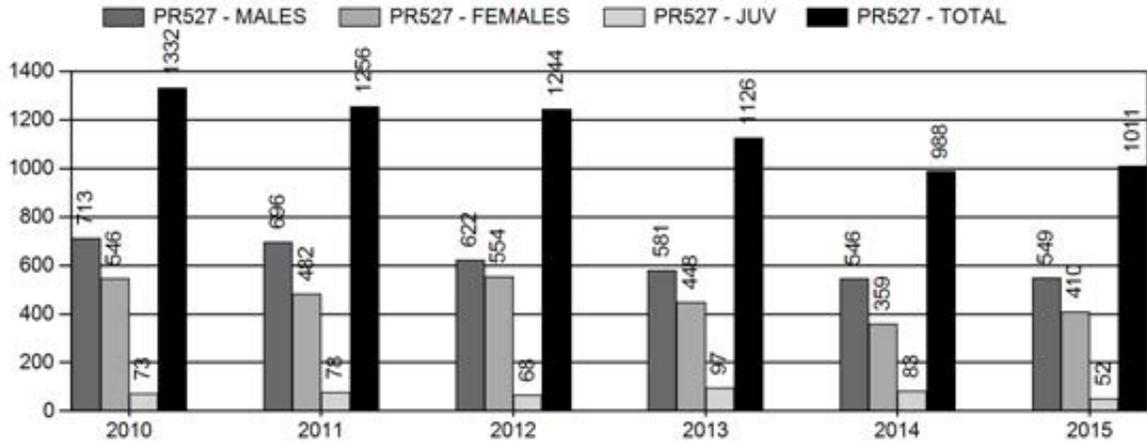
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	7%	7%
Males \geq 1 year old:	22%	22%
Juveniles (< 1 year old):	1%	1%
Total:	8%	8%
Proposed change in post-season population:	3%	-2%

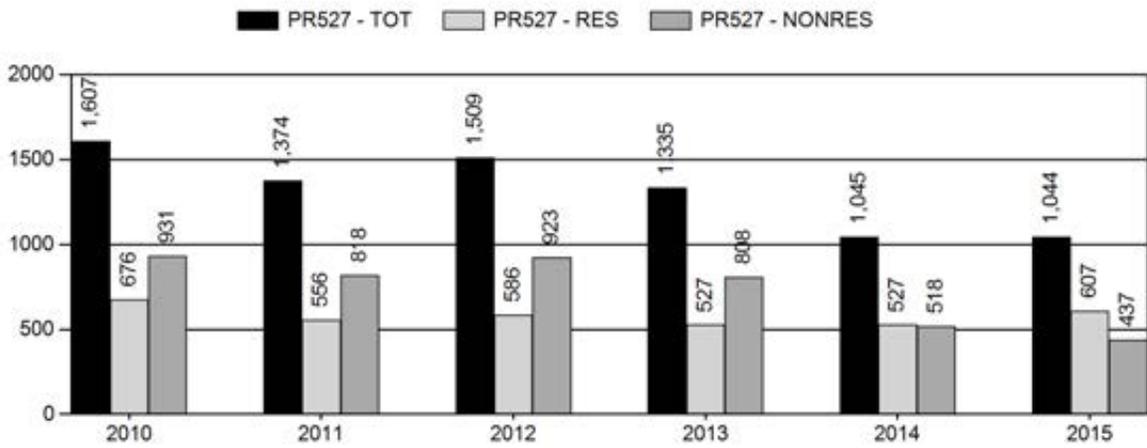
Population Size - Postseason



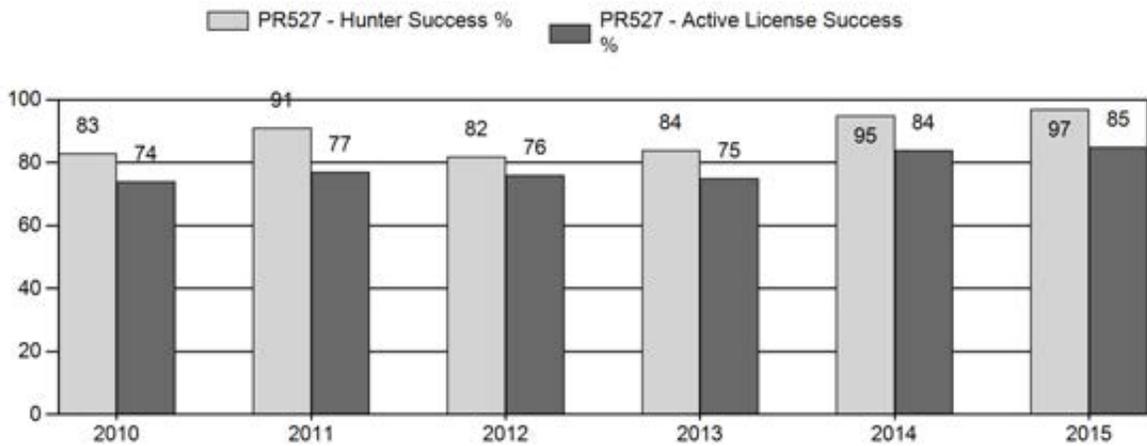
Harvest



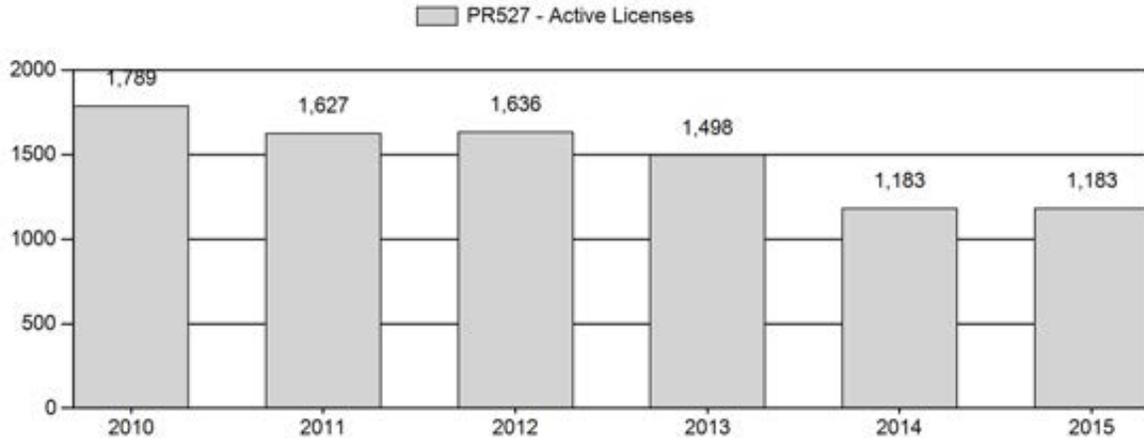
Number of Hunters



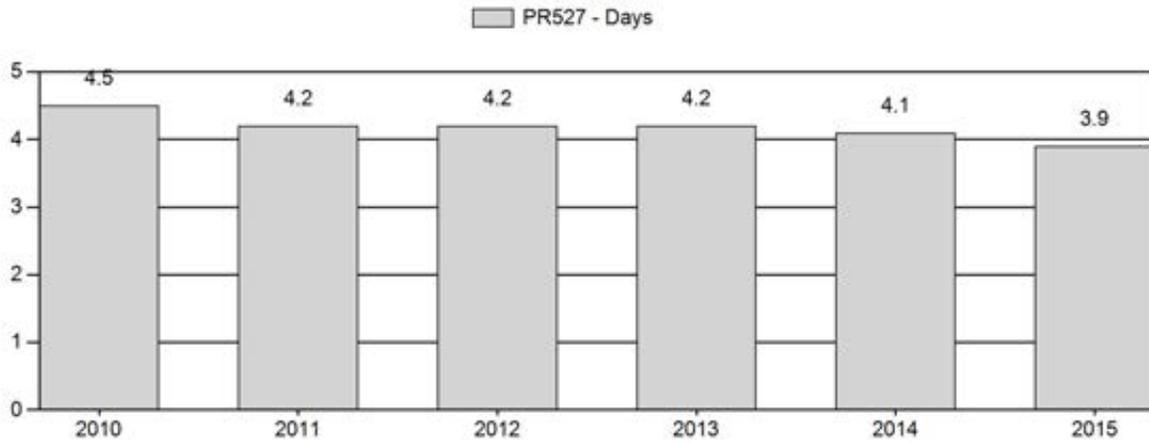
Harvest Success



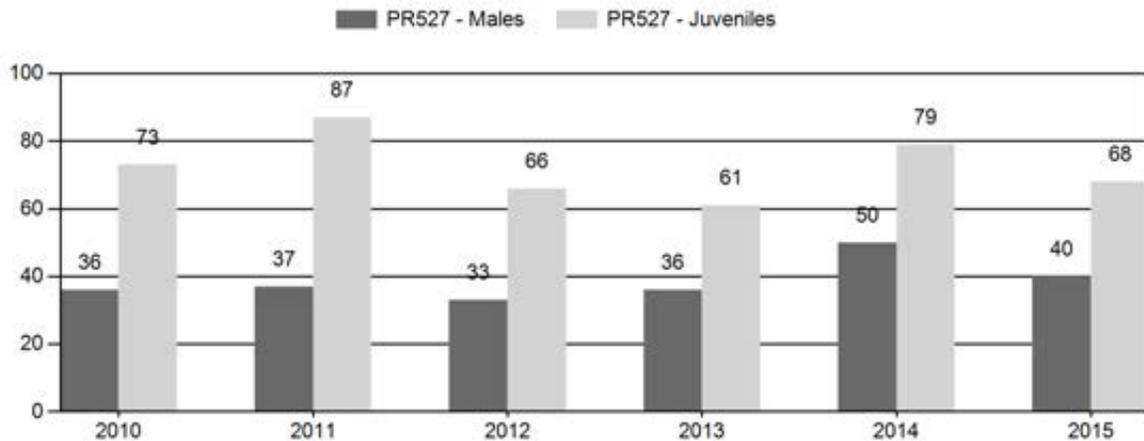
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	14,669	131	357	488	17%	1,337	48%	978	35%	2,803	2,589	10	27	36	± 3	73	± 5	54
2011	14,978	59	214	273	16%	741	45%	641	39%	1,655	2,886	8	29	37	± 4	87	± 7	63
2012	13,611	190	252	442	17%	1,326	50%	878	33%	2,646	2,016	14	19	33	± 3	66	± 4	50
2013	12,536	113	239	352	18%	975	51%	595	31%	1,922	1,832	12	25	36	± 3	61	± 5	45
2014	12,762	249	321	570	22%	1,149	44%	907	35%	2,626	2,149	22	28	50	± 4	79	± 5	53
2015	13,414	199	277	476	19%	1,181	48%	802	33%	2,459	2,207	17	23	40	± 3	68	± 5	48

**2016 HUNTING SEASONS
CENTENNIAL PRONGHORN (PR527)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
37	1	Sep. 20	Oct. 14	225	Limited Quota	Any antelope
	6	Sep. 20	Oct. 14	75	Limited Quota	Doe or fawn
44	1	Sep. 15	Oct. 31	150	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	150	Limited Quota	Doe or fawn
45	1	Sep. 15	Oct. 31	350	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	350	Limited Quota	Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Limitations
37, 44, 45	Aug. 15	Refer to Section 2 of this Chapter

Management Evaluation

Current Postseason Population Management Objective: 14,000 (11,200 – 15,800)

Management Strategy: Recreational

2015 Postseason Population Estimate: ~ 12,300

2016 Postseason Population Estimate: ~ 12,000

2015 Hunter Satisfaction: 93% Satisfied, 6% Neutral, 1% Dissatisfied

The Management objective for the Centennial Pronghorn Herd Unit is a post-season population of 14,000. The management strategy is recreational management requiring a buck ratio of 30 to 59:100 does. The objective and management strategy was last revised in 2013.

Herd Unit Issues

The Centennial Pronghorn Herd Unit encompasses hunt areas 37, 44, and 45 which are predominately private land with little public access. The 2015 post-season population estimate was approximately 12,300 with the population trending downward from 18,000 in 2004. The last line transect was conducted in 2013. Harvest strategies are designed to maximize harvest where possible. Most of the harvest is limited to Hunter Management Areas (HMA). This herd is experiencing a steady loss of habitat from an increase in subdivisions being built annually. There is significant interchange with Colorado; most if not all of the pronghorn in hunt area 37 winter in Colorado, while it is thought most of the pronghorn in the Laramie River Valley from Colorado winter in hunt area 44.

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 Centennial 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Residential development / subdivisions continue to fragment seasonal ranges in this herd unit. New fences that are often associated with subdivisions can have impacts on migratory movements of pronghorn, and may limit their ability to traverse to key wintering areas.

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

A total of 2,459 pronghorn were classified, exceeding the estimated classification objective of 2,207. Classification routes have been standardized so that some inference can be made from year to year classifications; in 2 of the 3 hunt areas we saw an increase in pronghorn. Fawn production in 2015 was 68:100 does, 10 fawns: 100 less than in 2014. Fawn ratios in hunt areas 45 and 37 declined while hunt area 44 we saw an increase. Buck ratios declined from 50 bucks: 100 does in 2014 to 40 bucks: 100 does in 2015; however the decline was mostly in the yearling age class while the adult buck ratio remained similar to previous years.

Harvest Data

Hunter success in 2015 was similar to 2014 at 97%, and hunter effort decreased slightly to 3.9 days to harvest even with the increased season length in 2015. The hunter satisfaction survey showed 93% of hunters were satisfied or very satisfied with their hunt, 6% of respondents

remaining neutral. Overall the current season structure and license issuance is working well and it is reflected in the high hunter success and satisfaction. This herd unit is popular with nonresidents who accounted for 40% of the licenses in 2015, and in past years as high as 60%. Residents interested in this herd has increased, claiming more of their allocation of licenses, but we believe this is an effect of the statewide decrease in license issuance that occurred in 2014, caused more residents to draw their second and third choices.

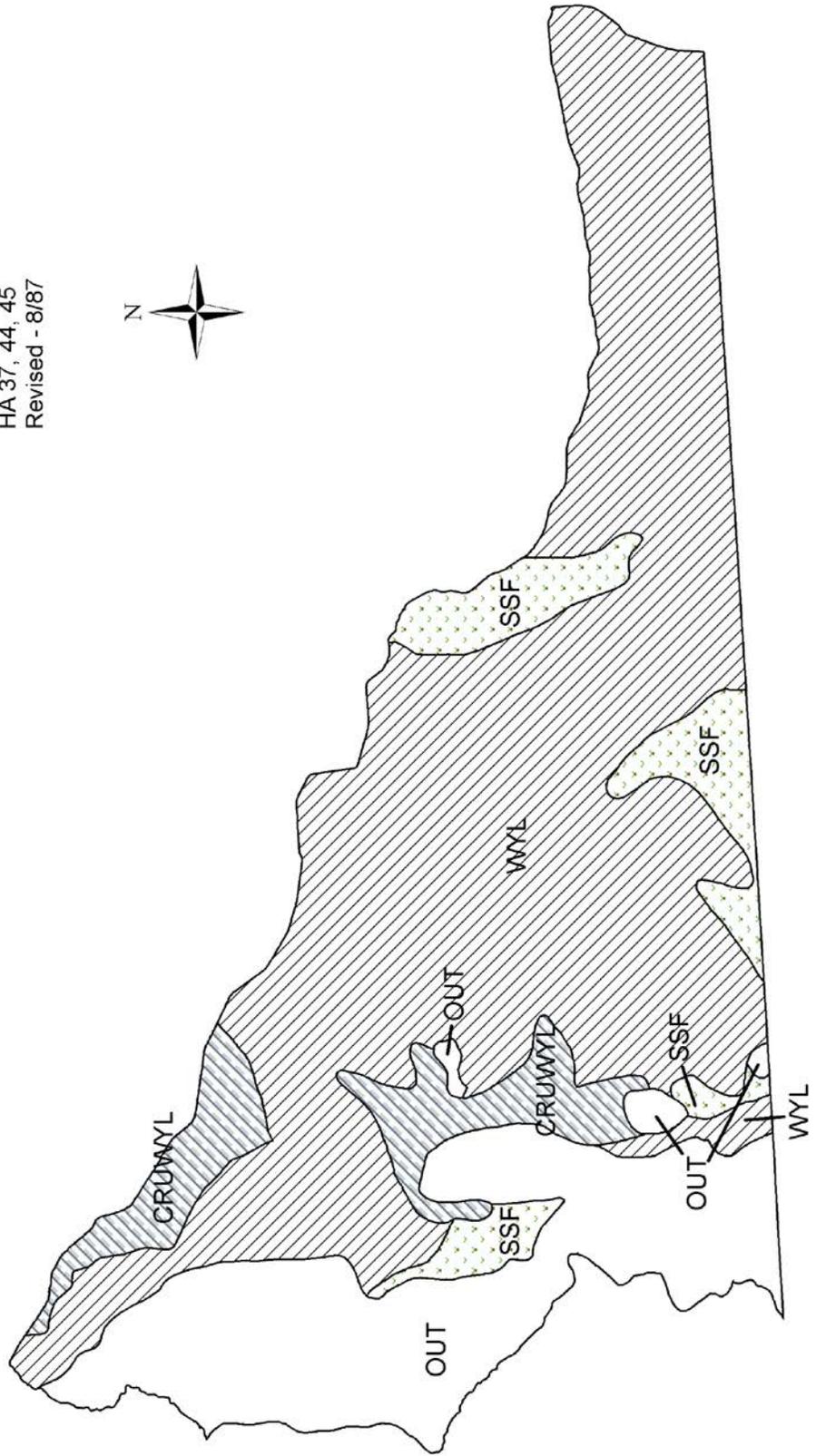
Population

The Constant Juvenile – Constant Adult Mortality Rate (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model did not have the lowest relative AIC score but had the most reasonable population estimate, and considering the issue with herd data we wanted to use the simplest model. We truncated the years to 2000 to eliminate low quality data. The model estimates the Centennial pronghorn herd has slowly trended downward since 2004 when the population was estimated at 18,000 and is currently near the population objective. This is a poor model due to ratio data, if available, considered highly biased because of poor sample sizes or an inability to survey the entire area; significant interchange with populations in Colorado; lacks adult and juvenile survival data; results not biologically defensible. We conducted a line transect survey for this herd in the spring of 2014 which estimates 21,009 pronghorn with a standard error of 3,300. The CI is between 15,370 and 28,700 pronghorn. E band estimates are too high and violates the first assumption of the LT survey.

Management Summary

In the past we have not been able to manage this herd through harvest due to high fawn ratios and limited access. Due to extreme weather events and increased hunter access we estimate the population has been reduced by half since 2004 and we are near objective. With the high fawn ratios and mild winter, we expect the herd will start increasing. We will maintain the current number of licenses that were issued in 2014 and 2015 as we believe we have reached a good balance with hunter densities. Extending the season to the end of October in hunt areas 44 and 45 worked well to provide more opportunity by spreading out hunting pressure and was well received by landowners and hunters. If we attain the projected harvest of 1,000 pronghorn and have fawn ratios near 70 to 75, the population will remain near the objective. We predict a 2016 post-season population of approximately 12,000 pronghorn.

PH527 - Centennial
HA 37, 44, 45
Revised - 8/87



2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR528 - ELK MOUNTAIN

HUNT AREAS: 50

PREPARED BY: WILL SCHULTZ

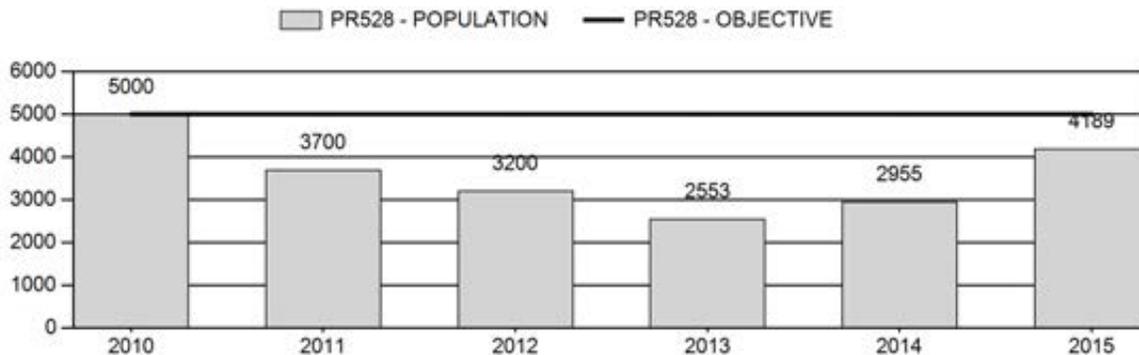
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	3,482	4,189	4,500
Harvest:	781	295	300
Hunters:	863	327	375
Hunter Success:	90%	90%	80%
Active Licenses:	921	341	375
Active License Success:	85%	87%	80%
Recreation Days:	2,915	1,303	4
Days Per Animal:	3.7	4.4	0.0
Males per 100 Females	36	37	
Juveniles per 100 Females	49	71	

Population Objective ($\pm 20\%$) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-16.2%
Number of years population has been + or - objective in recent trend:	5
Model Date:	01/20/2016

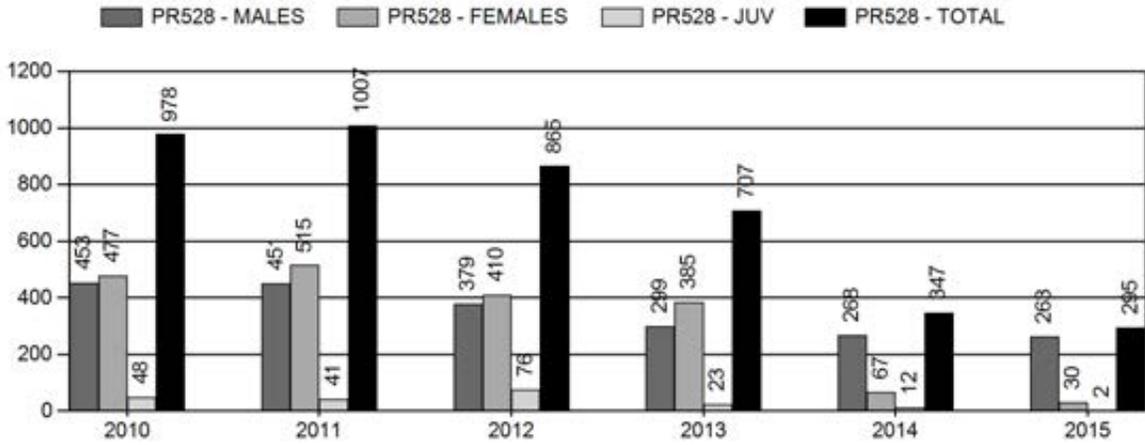
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	54%	42%
Juveniles (< 1 year old):	1%	.2%
Total:	-8%	-6%
Proposed change in post-season population:	5%	7%

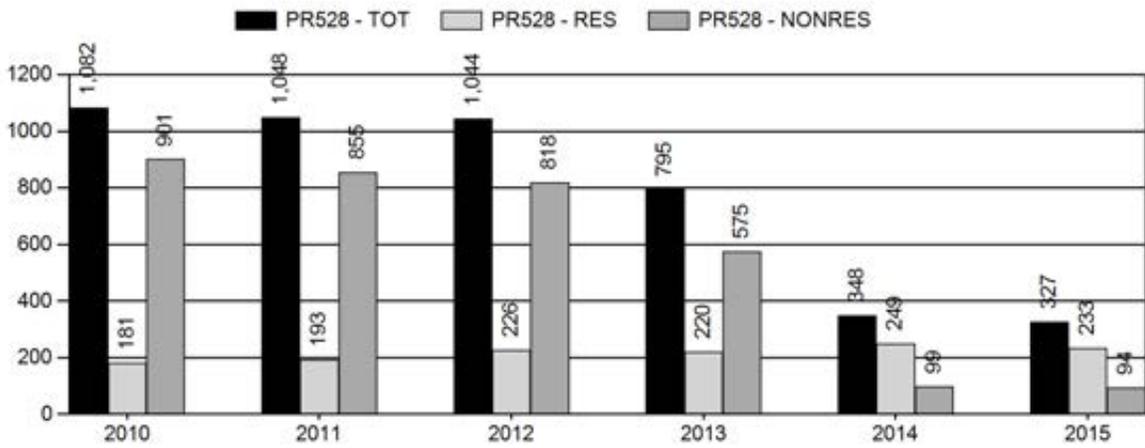
Population Size - Postseason



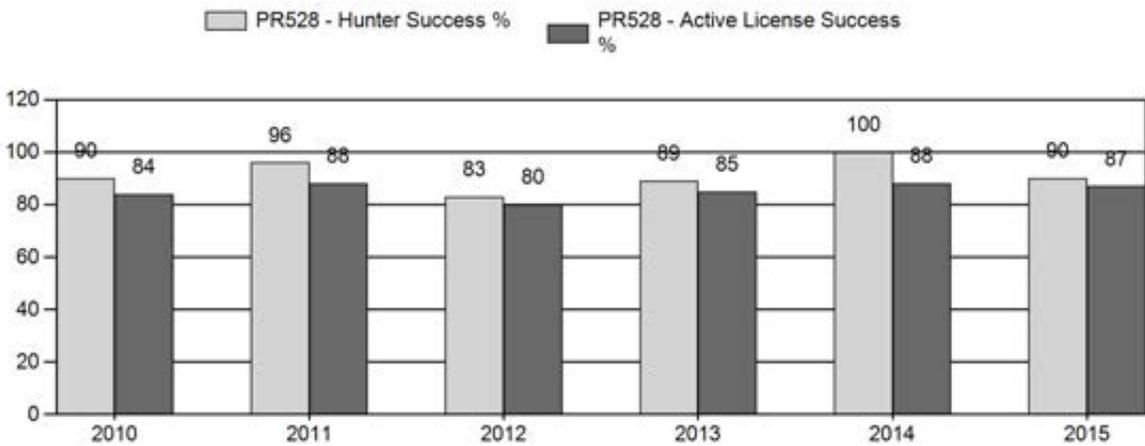
Harvest



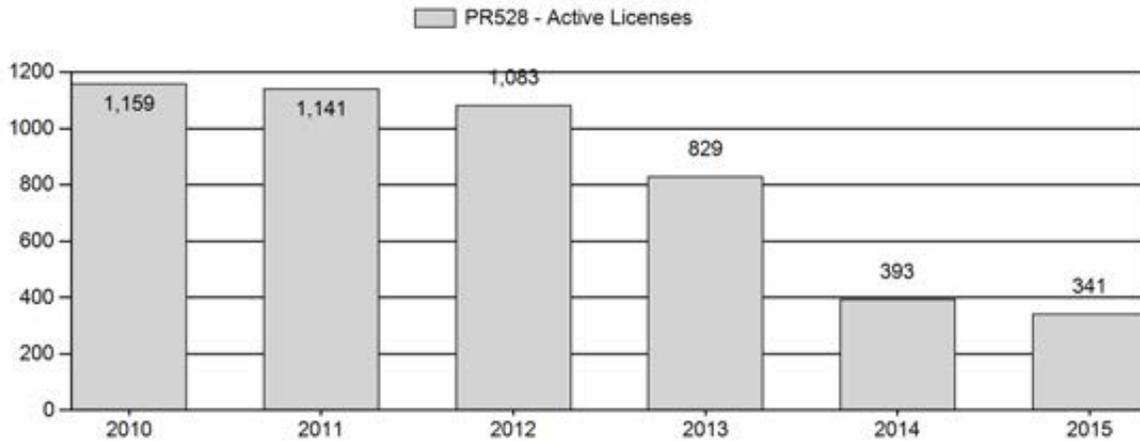
Number of Hunters



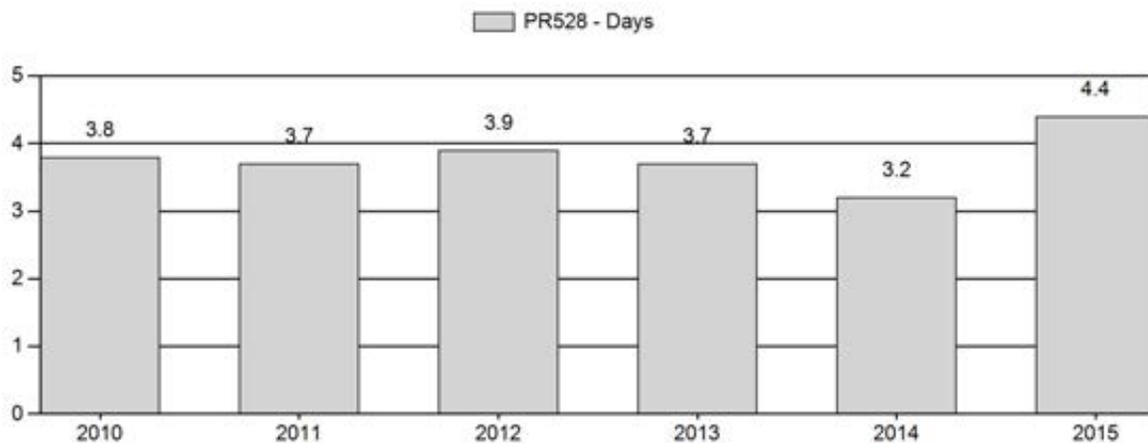
Harvest Success



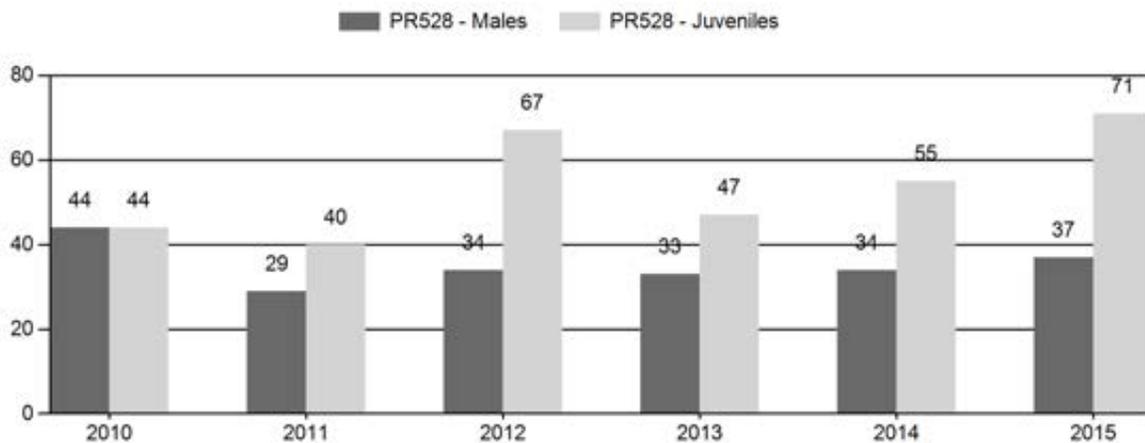
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	6,000	91	305	396	23%	907	53%	396	23%	1,699	1,668	10	34	44	± 4	44	± 4	30
2011	4,800	82	140	222	17%	764	59%	303	24%	1,289	1,221	11	18	29	± 3	40	± 4	31
2012	4,200	73	115	188	17%	545	50%	367	33%	1,100	1,098	13	21	34	± 4	67	± 6	50
2013	3,331	75	95	170	18%	510	55%	239	26%	919	1,000	15	19	33	± 4	47	± 5	35
2014	3,337	64	111	175	18%	511	53%	280	29%	966	1,021	13	22	34	± 4	55	± 6	41
2015	4,502	118	108	226	18%	612	48%	437	34%	1,275	1,153	19	18	37	± 4	71	± 6	52

**2016 HUNTING SEASONS
ELK MOUNTAIN PRONGHORN (PR528)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
50	1	Sep. 16	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 16	Oct. 31	25	Limited quota	Doe or fawn
	0	Sep. 1	Sep. 15	50	Limited quota	Any antelope, muzzle-loading firearms only
	Archery	Aug. 15	Aug. 31			Refer to license type and limitations in Section 3 of Chapter 5

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

Management Evaluation

Current Postseason Population Management Objective: 5,000 (4,000 – 6,000)

Management Strategy: Recreational

2015 Postseason Population Estimate: 4,200

2016 Proposed Postseason Population Estimate: 4,500

2015 Hunter Satisfaction: 92% Satisfied, 6% Neutral, 2% Dissatisfied

Pronghorn in the Elk Mountain herd unit are managed toward a numeric objective of 5,000. The population was estimated using a spreadsheet model developed in 2012 and updated in 2016. The herd is managed for recreational opportunity. The objective was reviewed in 2014 and retained at a postseason estimate of 5,000 pronghorn.

Herd Unit Issues

The Elk Mountain herd unit is comprised predominantly of either private or land-locked public land. Hunter access to these lands is limited, particularly east of Elk Mountain, where most pronghorn in this herd unit are found during the hunting season. Private lands open to hunters receive a large amount of pressure. Much of the herd unit's sagebrush ecosystem remains intact. However, increased agricultural, energy, and residential development does threaten the sagebrush habitat in this area.

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. 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 pronghorn. Mild fall temperatures and lack of persistent snow allowed pronghorn 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 Elk 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

Preseason ratios for this herd were 37 bucks and 71 fawns/100does in 2015. Buck ratios and fawn ratios both increased in recent classification trend. Beginning in 2011, classification surveys have been conducted from the ground and have lower sample sizes than those previously completed from fixed-wing aircraft. The ground surveys also may contain more sampling biases in comparison with surveys conducted prior to 2011 due to limited data from more remote areas of the herd unit.

Harvest Data

The 2015 harvest survey indicated a total of 295 pronghorn were harvested which was a increase of 15% from 2014. Overall harvest success decreased 10% to 90% for 327 licensed hunters in 2015. The days/pronghorn increased from 3.2 in 2014, to 4.4 days/harvest in 2015. The decrease in harvest success and increase in days/harvest was attributed to the relatively hot weather which was experienced in the early portion of the season which appeared to lower hunter participation rates.

Population

Spreadsheet model estimates indicated the Elk Mountain herd is currently below the management objective of 5,000 pronghorn. The CJ, CA model was selected again for the Elk Mountain herd unit in 2015. The model's population estimates are plausible and match trends in harvest and preseason classifications. The model's end-of-year estimates

are less than the corresponding year Line-Transect survey density estimates conducted in 2007, 2010, and 2012. A portion of the Elk Mountain herd unit was used as a control area for the University of Wyoming's Dunlap Wind Farm research project. We incorporated adult survival rates from this research into the model for bio-year 2010 and 2011.

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).

Management Summary

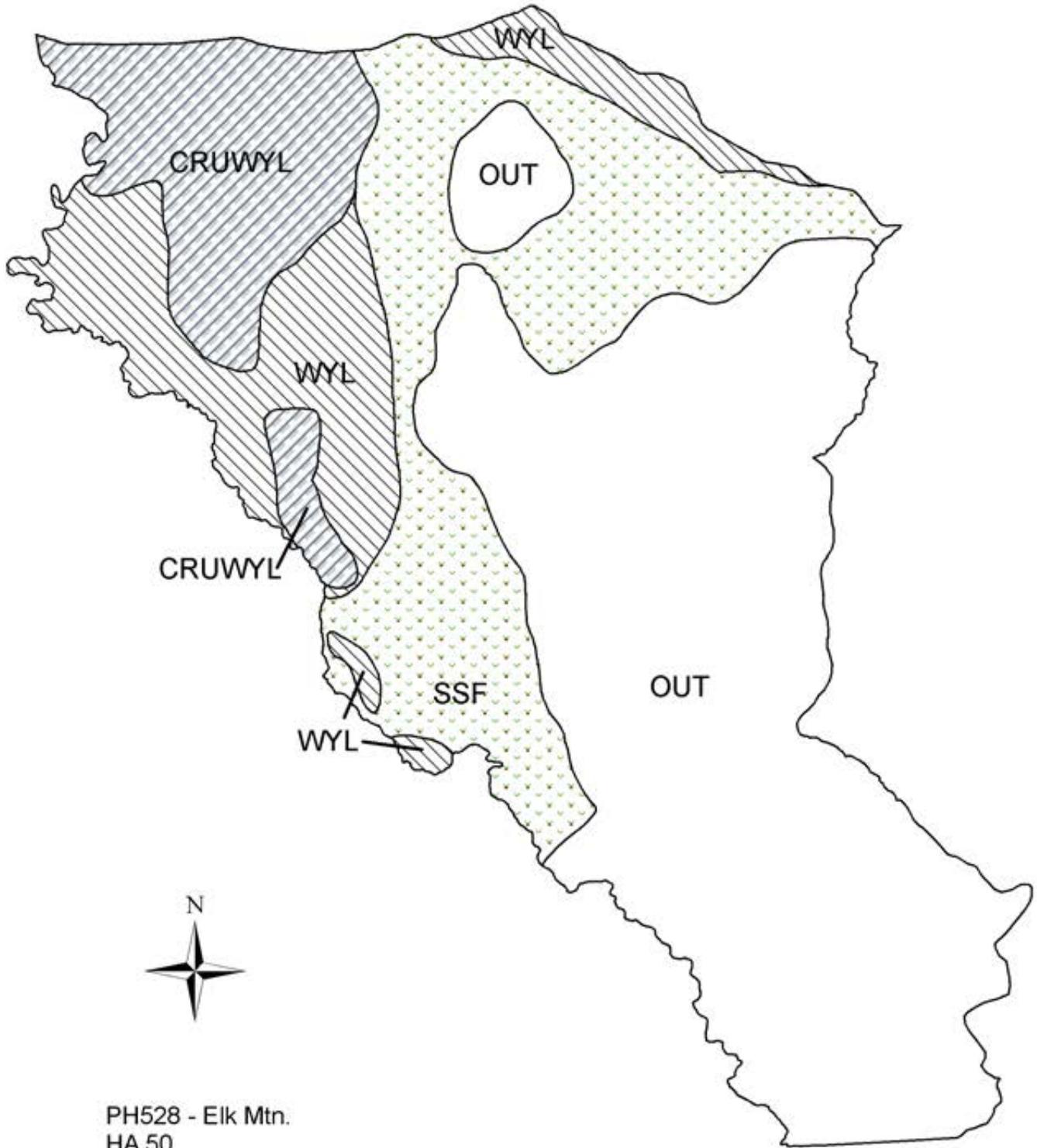
The reduced numbers for the Type 6 license numbers were maintained again for the 2015 season. Liberal seasons in the recent past and severe winters have reduced pronghorn numbers in this herd unit during the past 5 years. The decreased license numbers will assist in increasing the population toward the management objective. The popular muzzleloader only season continued to be offered in 2015.

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

Taylor, K. L. 2014. Pronghorn (*Antilocapra americana*) Response to Wind Energy Development on Winter Range in South-Central, Wyoming. Master's Thesis. Department of Ecosystem Science and Management. University of Wyoming, Laramie. 141 pp.



PH528 - Elk Mtn.
HA 50
Revised - 8/87

2015 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2015 - 5/31/2016

HERD: PR529 - BIG CREEK

HUNT AREAS: 51

PREPARED BY: WILL SCHULTZ

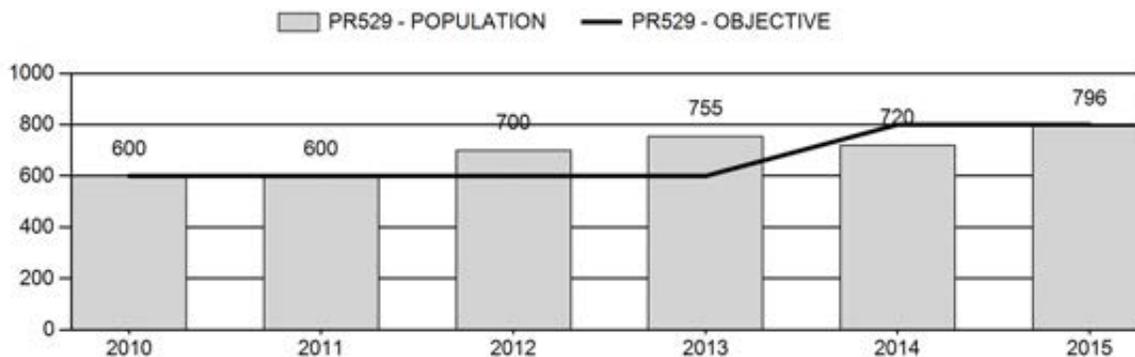
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	675	796	800
Harvest:	55	78	100
Hunters:	55	78	100
Hunter Success:	100%	100%	100 %
Active Licenses:	64	91	100
Active License Success:	86%	86%	100 %
Recreation Days:	193	235	300
Days Per Animal:	3.5	3.0	3
Males per 100 Females	42	60	
Juveniles per 100 Females	47	57	

Population Objective ($\pm 20\%$) :	800 (640 - 960)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-0.5%
Number of years population has been + or - objective in recent trend:	1
Model Date:	01/20/2016

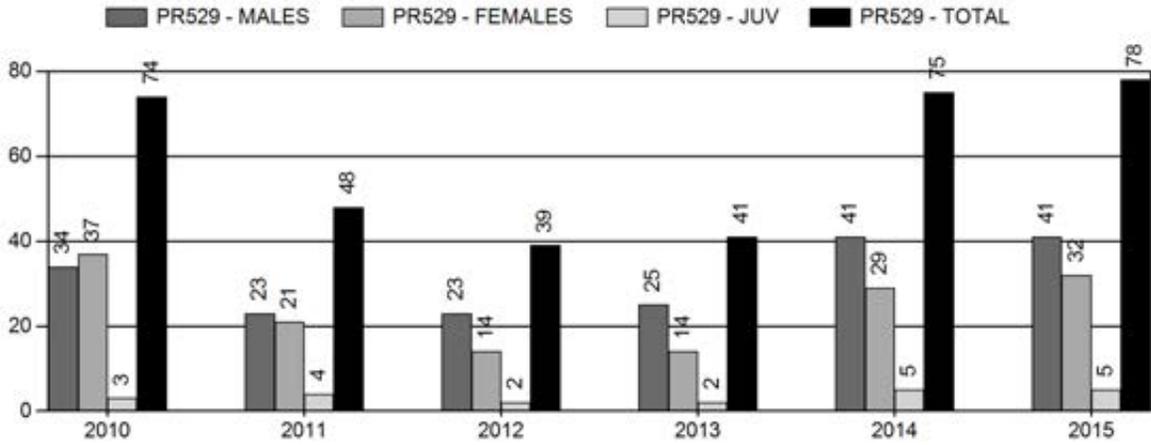
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	9%	8%
Males ≥ 1 year old:	25%	23%
Juveniles (< 1 year old):	0%	2%
Total:	12%	11%
Proposed change in post-season population:	-4%	2%

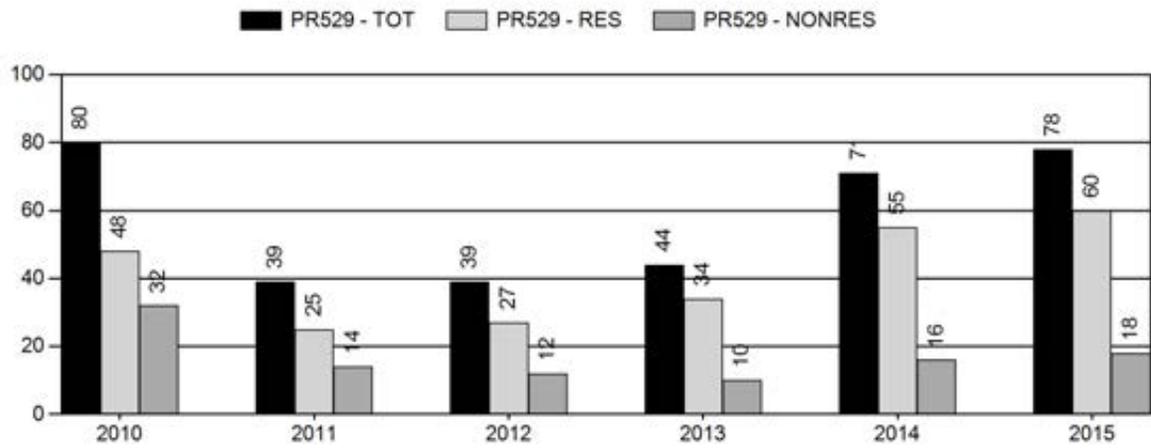
Population Size - Postseason



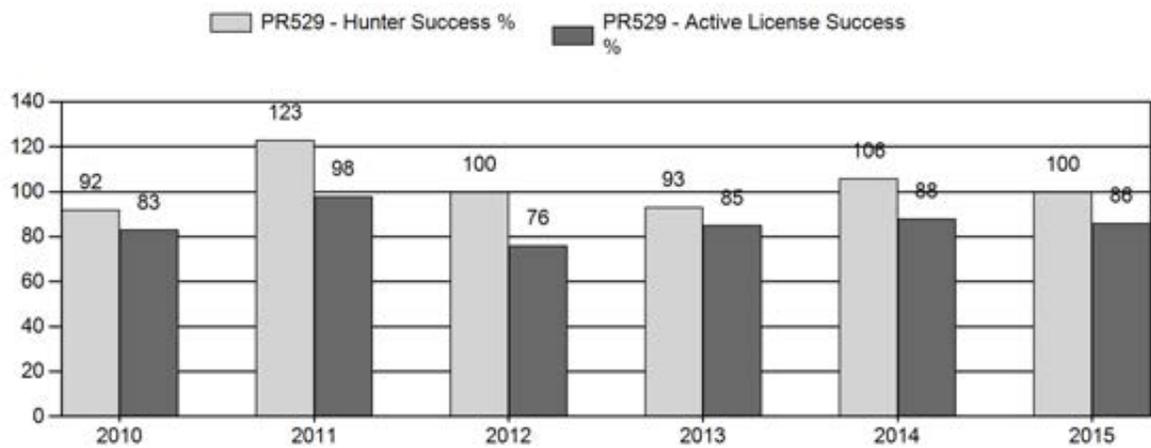
Harvest



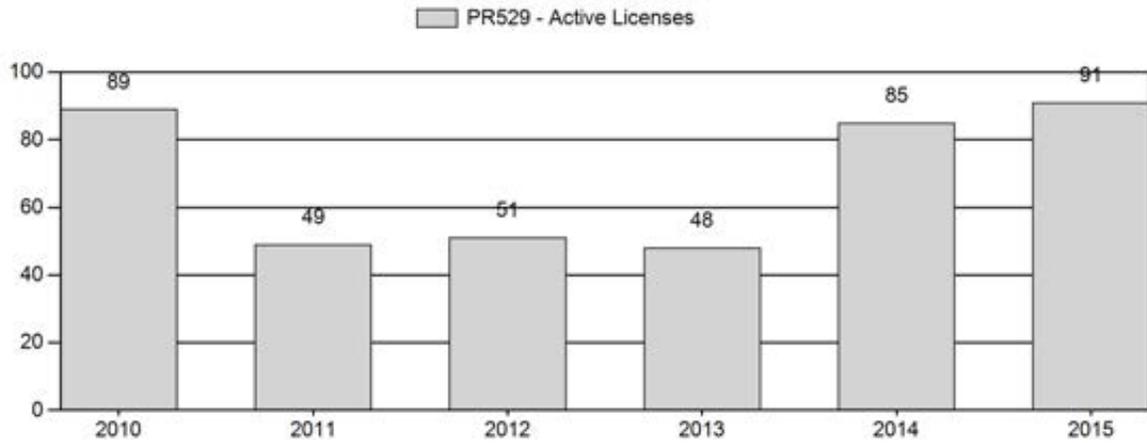
Number of Hunters



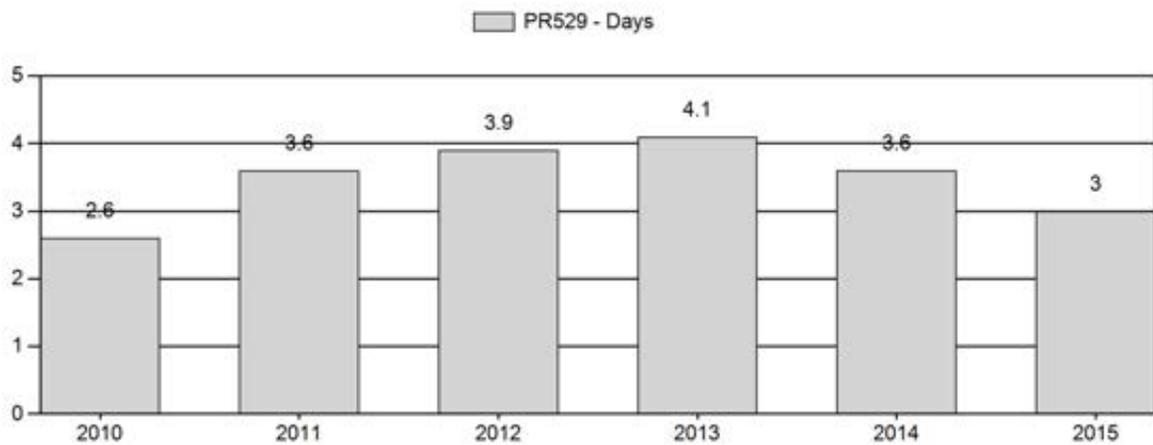
Harvest Success



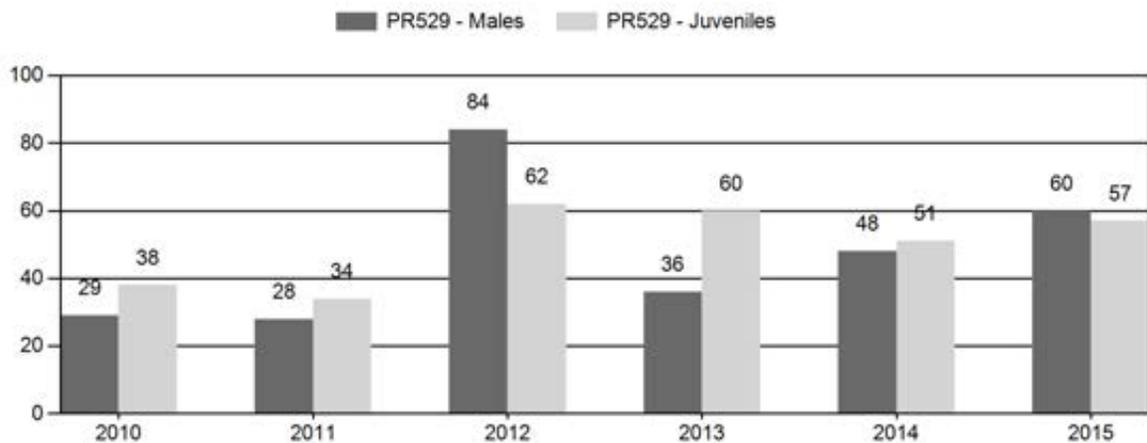
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	700	13	49	62	17%	214	60%	82	23%	358	361	6	23	29	± 5	38	± 6	30
2011	650	15	33	48	17%	170	62%	57	21%	275	446	9	19	28	± 6	34	± 6	26
2012	750	32	60	92	34%	110	41%	68	25%	270	441	29	55	84	± 16	62	± 13	34
2013	800	8	43	51	18%	141	51%	84	30%	276	503	6	30	36	± 8	60	± 11	44
2014	802	42	87	129	24%	271	50%	137	26%	537	501	15	32	48	± 5	51	± 5	34
2015	882	58	91	149	28%	248	46%	141	26%	538	561	23	37	60	± 6	57	± 6	36

**2016 HUNTING SEASONS
BIG CREEK PRONGHORN (PR529)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
51	1	Sep. 16	Nov. 14	50	Limited quota	Any antelope
	6	Sep. 16	Nov. 14	50	Limited quota	Doe or fawn
	Archery	Aug. 15	Sep. 15			Refer to license type and limitations in Section 3 of Chapter 5

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

Management Evaluation

Current Postseason Population Management Objective: 800 (640 – 960)

Management Strategy: Recreational

2015 Postseason Population Estimate: 800

2016 Proposed Postseason Population Estimate: 810

2015 Hunter Satisfaction: 89% Satisfied, 9% Neutral, 2% Dissatisfied

Pronghorn in the Big Creek herd unit are managed toward a numeric objective of 800. The population was estimated using a spreadsheet model developed in 2012 and updated in 2016. The herd is managed for recreational opportunity. The management objective was reviewed in 2014 and increased to a postseason population estimate of 800 pronghorn.

Herd Unit Issues

Pronghorn damage to alfalfa crops has diminished due to the low number of pronghorn observed in this herd unit. Access is difficult except for on those private lands receiving damage. Recent changes in land use have been observed in this herd unit. Several sections of abandoned wheat fields have been converted into cattle pastures which have been grazed intensively. Development in the Trail Run subdivision is also continuing. In the past these areas provided pronghorn with seasonal habitat and the observed changes in land use appear to be displacing pronghorn into other areas.

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. 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 pronghorn. Mild fall temperatures and lack of persistent snow allowed pronghorn 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 Big Creek 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

The 2015 preseason ratios were 60 bucks and 57 fawns per 100 does produced from a less than adequate sample of 538 pronghorn obtained through ground surveys. 2015 fawn ratios had increased from 51 fawns/100 does in 2014, to 57 fawns/100 does in 2015. This increase was attributed to mild spring weather having been more conducive to fawn survival than in previous years.

Harvest Data

The harvest survey data for the 2015 hunting season indicated a total of 78 pronghorn, 41 bucks, 32 does, and 5 fawns were harvested with an overall harvest success rate of 100%. This high success rate was due to many of the successful hunters possessing both Type 1 and Type 6 licenses and is typical for this herd unit.

Population

In 2015, the CJ, CA spreadsheet model was selected again for the Big Creek herd unit because it produced the lowest AICc score. The population estimate from this model was also considered to be plausible and representative of field observations. The end of year density estimates developed from Line-Transect density surveys appeared to overestimate actual pronghorn abundance in this herd unit. Small sample sizes and interstate movements of pronghorn for this herd unit may produce bias in Line-Transect survey estimates for this herd unit.

We rated this model as poor, and not biologically defensible in our evaluation. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model (Morrison 2012). The poor rating was primarily due to inadequate sample sizes for preseason classification surveys and the likely violation of an assumption that this is a closed population.

Management Summary

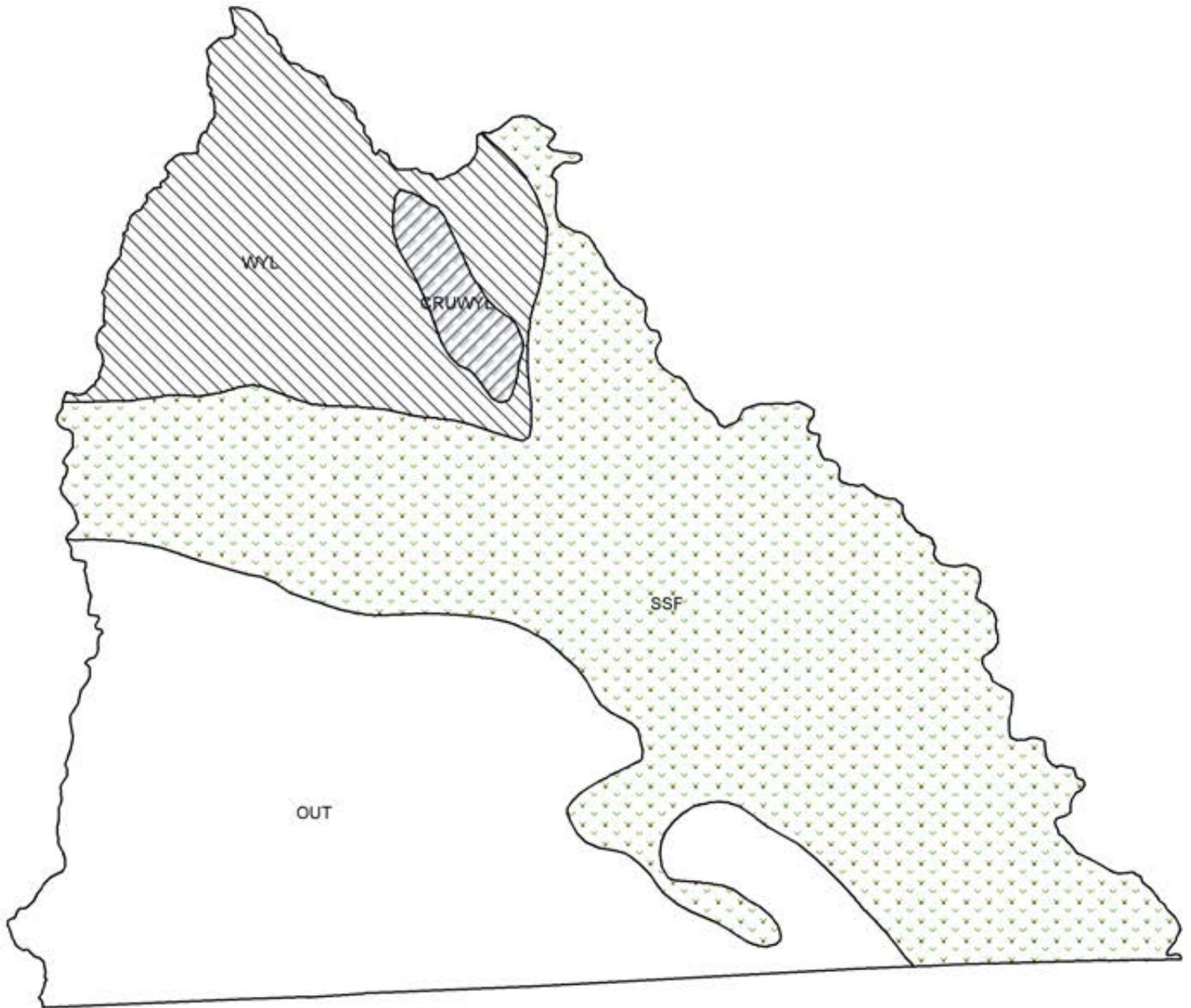
A total of 50 Type 1 and 50 Type 6 licenses were maintained in 2016 for the Big Creek herd unit. The postseason population estimate was at the management object for 2015 and predicted to be maintained at that level in 2016 with the prescribed hunting season. Interstate movement of pronghorn complicates monitoring and subsequent management activities in this herd unit.

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

None.



PH529 - Big Creek
HA 51
Revised - 7/87



2015 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2015 - 5/31/2016

HERD: BS516 - DOUGLAS CREEK

HUNT AREAS: 18

PREPARED BY: LEE KNOX

	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	15	75	75
Harvest:	1	0	2
Hunters:	1	0	2
Hunter Success:	100%	0%	100 %
Active Licenses:	1	0	2
Active License Success:	100%	0%	100 %
Recreation Days:	3	0	10
Days Per Animal:	3	0	5
Males per 100 Females	33	30	
Juveniles per 100 Females	48	80	

Population Objective (± 20%) :	350 (280 - 420)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-78.6%
Number of years population has been + or - objective in recent trend:	200
Model Date:	2/22/2016

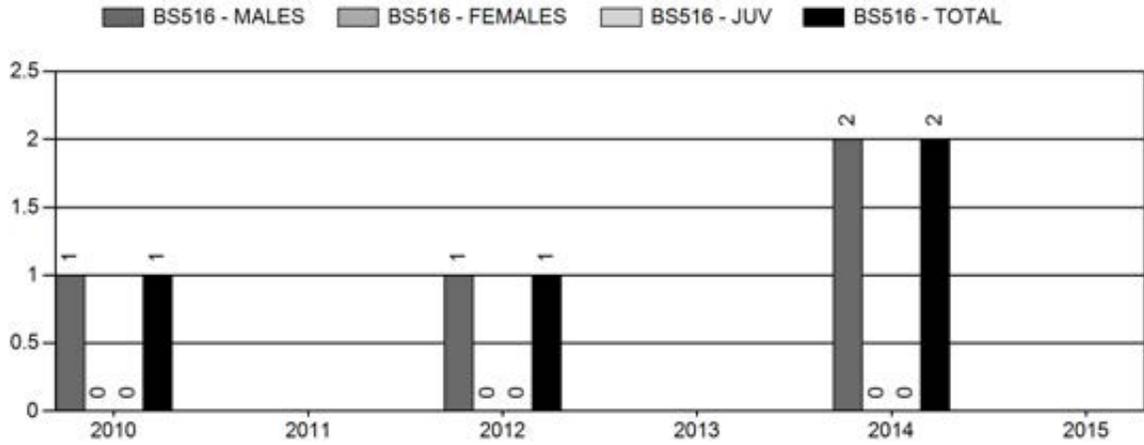
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	00%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	00%
Total:	0%	0%
Proposed change in post-season population:	0%	0%

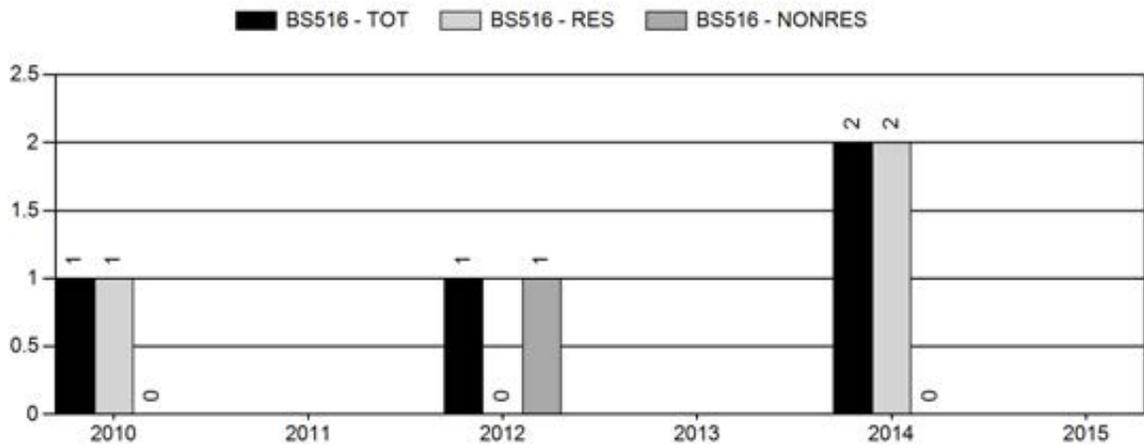
Population Size - Postseason



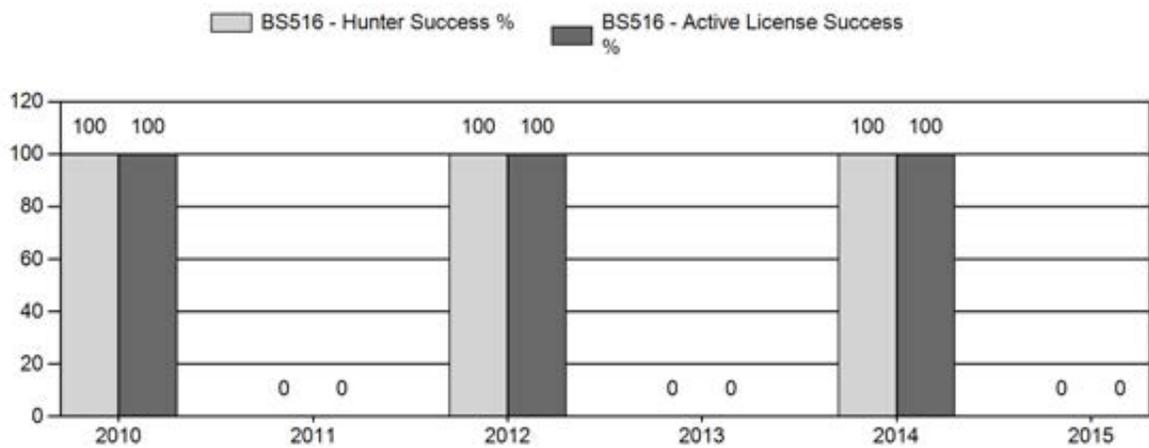
Harvest



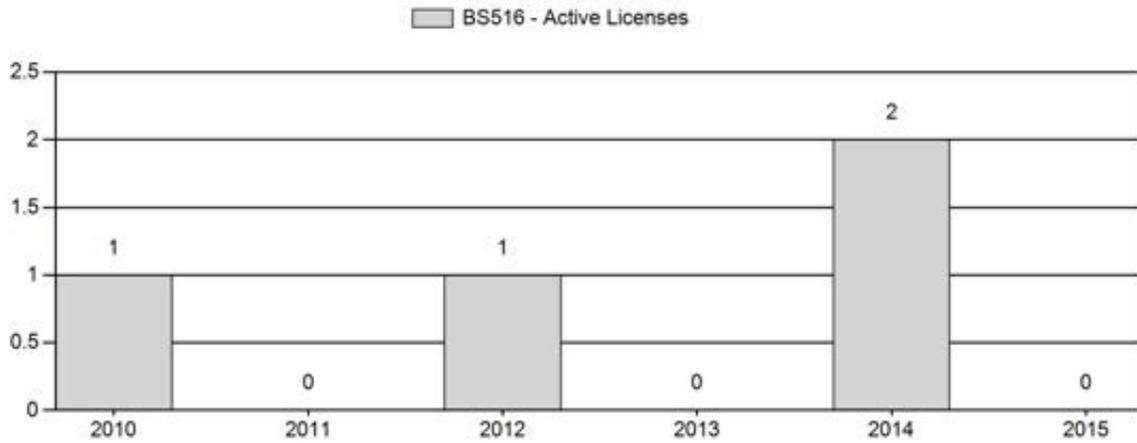
Number of Hunters



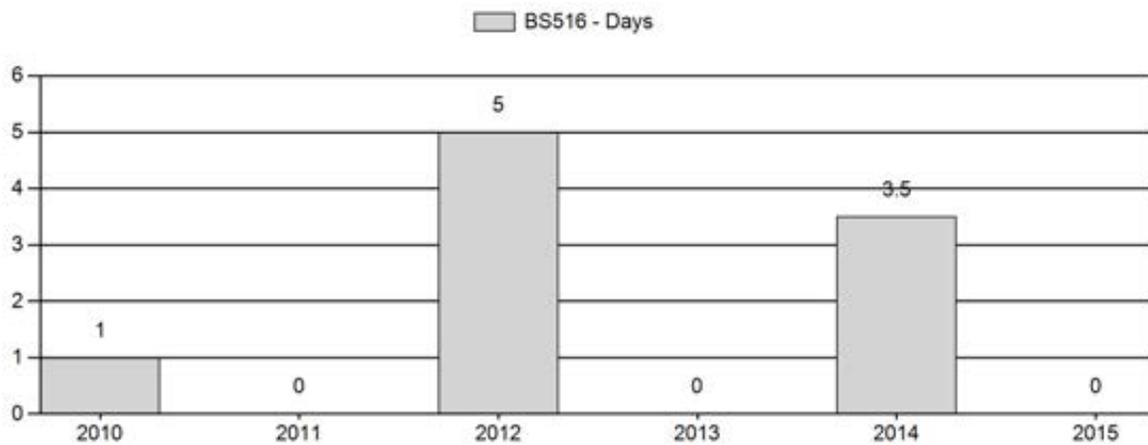
Harvest Success



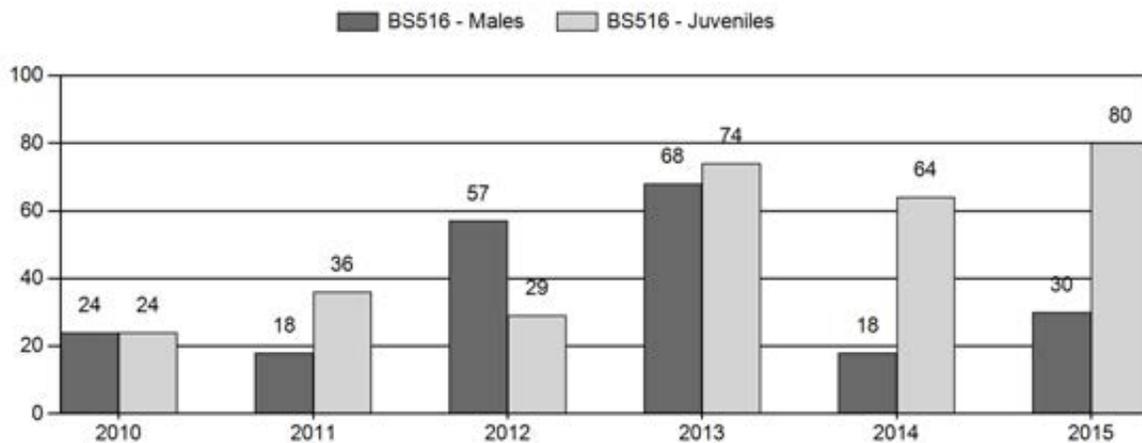
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Bighorn Sheep Herd BS516 - DOUGLAS CREEK

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	0	1	3	4	16%	17	68%	4	16%	25	74	6	18	24	± 0	24	± 0	19
2011	0	0	4	4	12%	22	65%	8	24%	34	0	0	18	18	± 0	36	± 0	31
2012	0	1	3	4	31%	7	54%	2	15%	13	0	14	43	57	± 0	29	± 0	18
2013	0	6	7	13	28%	19	41%	14	30%	46	0	32	37	68	± 0	74	± 0	44
2014	75	3	1	4	10%	22	55%	14	35%	40	0	14	5	18	± 9	64	± 19	54
2015	75	0	3	3	14%	10	48%	8	38%	21	0	0	30	30	± 21	80	± 41	62

2016 HUNTING SEASONS

DOUGLAS CREEK BIGHORN SHEEP (BS516)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
18,21	1	Sept. 1	Oct. 31	2	Limited quota	Any ram; (1 resident, 1 nonresident)

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
18,21	Aug.15	Aug. 31

Area	Type	Change from 2015
18,21	1	+2
Herd Totals	1	+2

Management Evaluation

Current Postseason Population Management Objective: 350

2015 Postseason Population Estimate: ~ 75

2016 Proposed Postseason Population Estimate: ~ 75

Management Strategy: Special

The management objective for the Douglas creek Bighorn Sheep Herd Unit is a post-season population objective of 350 bighorn sheep. The management strategy is special management. The herd objective and management strategy were last revised in 1986 and will be reviewed in 2016.

Herd unit Issues

The Douglas Creek Herd Unit is located primarily in the Savage Run and Platte River wilderness areas in the Snowy Range Mountains on the Medicine Bow National Forest. The herd is under special management guidelines which require a mean age of harvested rams to be between 6-and 8 years old. This direction was taken to provide trophy opportunity to the public and allow this herd to grow. Pine beetles have dramatically changed the landscape in the Medicine Bow National Forest where a large percentage of mature pines have died and starting to fall over. The impacts from the beetle kill are unclear but could improve sheep habitat as the forest becomes more open. Area 18 was closed from 2004 through 2007 and then again in 2009, 2011, 2013, 2015 because this population has remained below desired levels. Hunt Area 18 will be open for 1 resident and 1 nonresident in 2016.

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 Douglas Creek 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 in low elevations. At upper elevations, May, June, and July precipitation was also above average, and created favorable forage conditions. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Conifer encroachment and windthrow of beetle-killed pine trees is suspected to, or likely will have negative impacts on bighorn sheep movements and migrations. Cheatgrass prevalence at lower elevations is also concerning to habitat managers, particularly on south facing aspects in the Platte Valley.

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. While this effort is targeted at mule deer initially, it is hoped efforts will expand to other big game species as methodologies are perfected and adopted. 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

We have very little data on this population. The general public provides a few reports during the summer and hunting seasons. Our field personnel make some effort to document the status of segments of the herd during other big game surveys and an annual winter ground survey. Past observation data consistently documents low post-weaning lamb survival. Poor habitat conditions, lack of habitat, and the lack of well-defined seasonal migrations, and perhaps lingering effects of Pasteurellosis or some other disease may be stagnating this population. We classified 21 sheep in February, with a lamb to ewe ratio of 80:100, which is up from previous years. Fifteen sheep were also observed by highway 230 at the state line.

Harvest Data

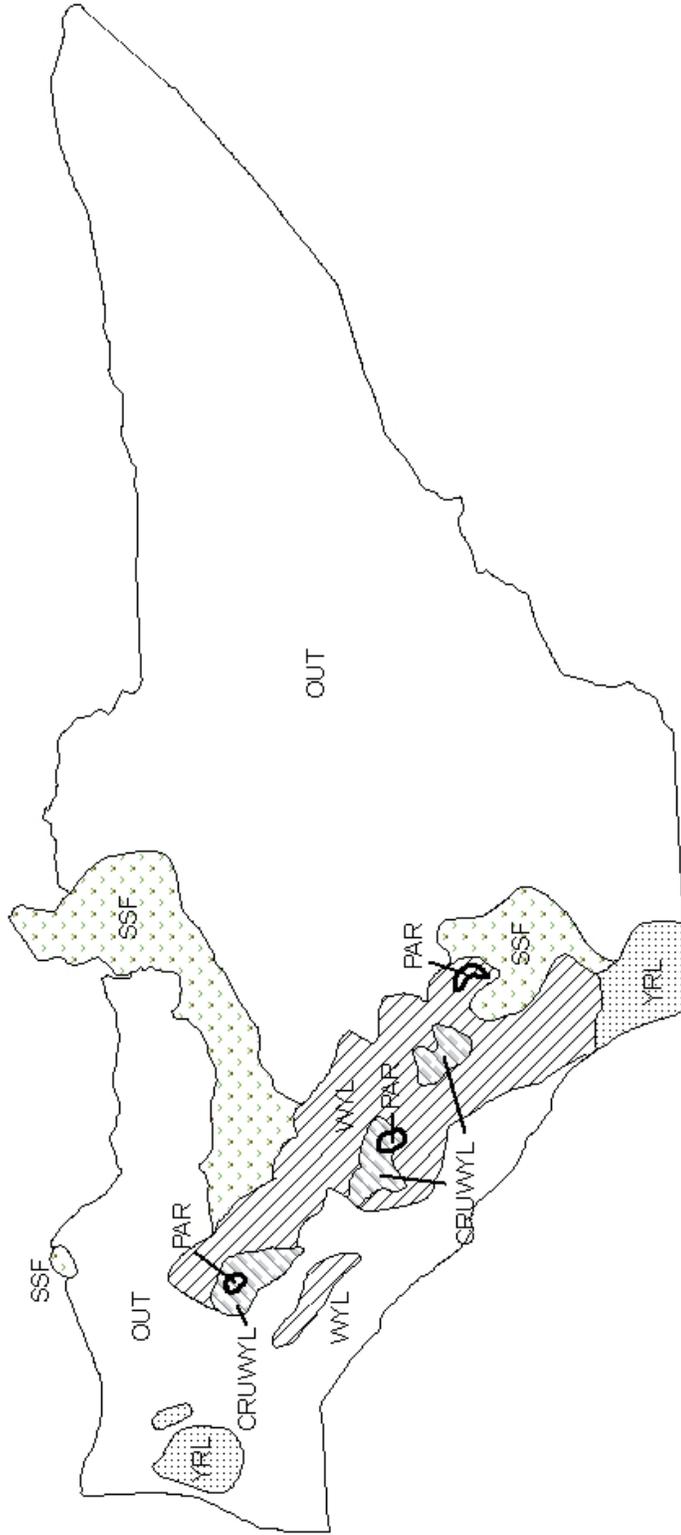
Hunting season was closed in 2015

Population

Data is not adequate for developing a reasonable population model. We are unable to collect the data needed to reliably estimate the population size of this sheep herd.

Management Strategy

We open the season for 2 rams every other year to maintain the opportunity to harvest a 6 year or older age class ram, which is specified by the special management guidelines. The season will be open in 2016 for one nonresident and one resident.



BHS516 - Douglas Creek
 HA 18
 Revised 7/02

2015 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2015 - 5/31/2016

HERD: BS517 - LARAMIE PEAK

HUNT AREAS: 19

PREPARED BY: MARTIN HICKS

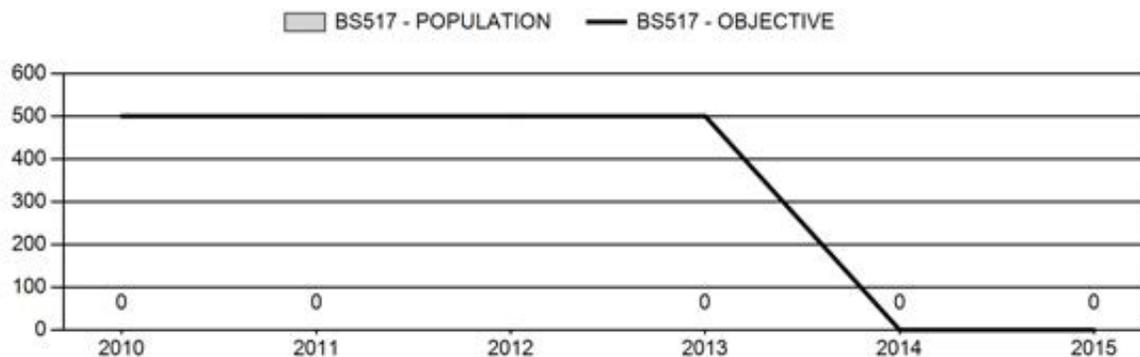
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	0	N/A	N/A
Harvest:	7	8	8
Hunters:	7	9	8
Hunter Success:	100%	89%	100 %
Active Licenses:	7	9	8
Active License Success:	100%	89%	100 %
Recreation Days:	78	102	100
Days Per Animal:	11.1	12.8	12.5
Males per 100 Females	56	55	
Juveniles per 100 Females	43	40	

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

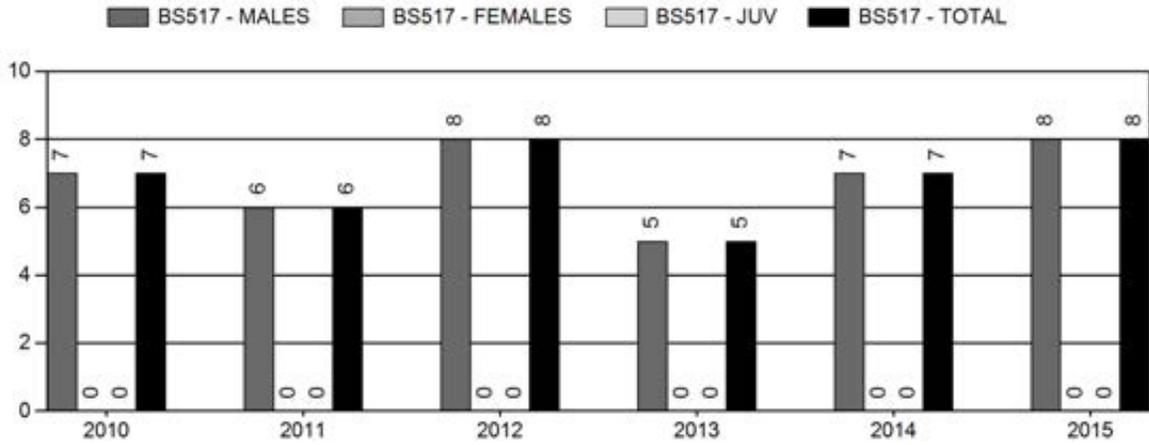
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

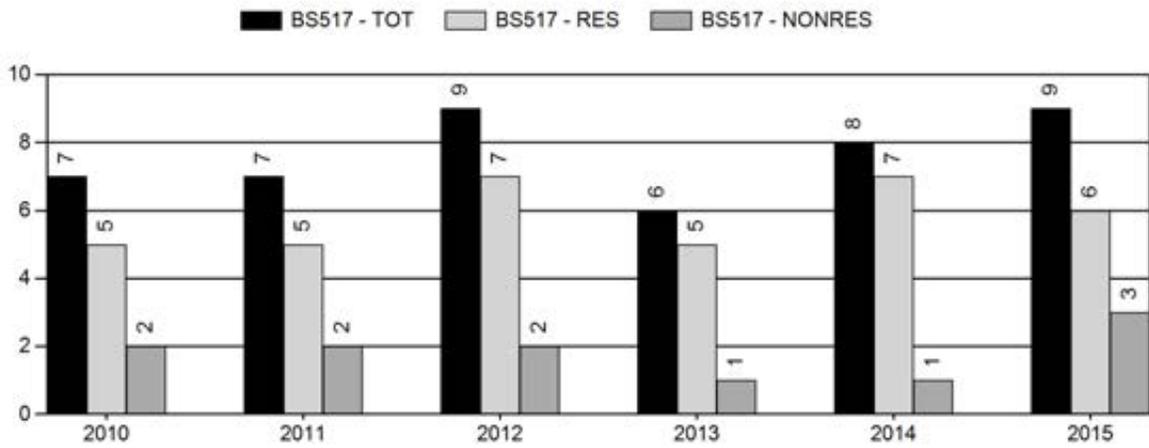
Population Size - Postseason



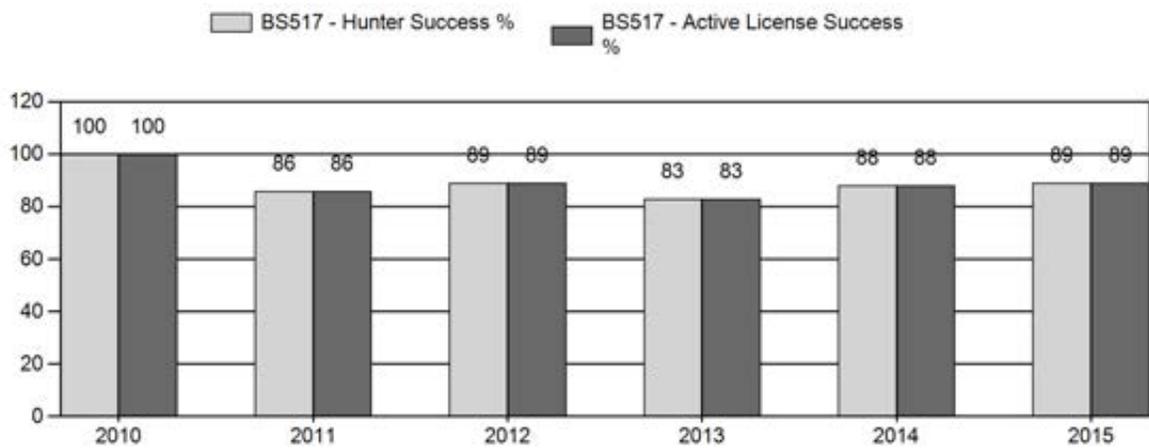
Harvest



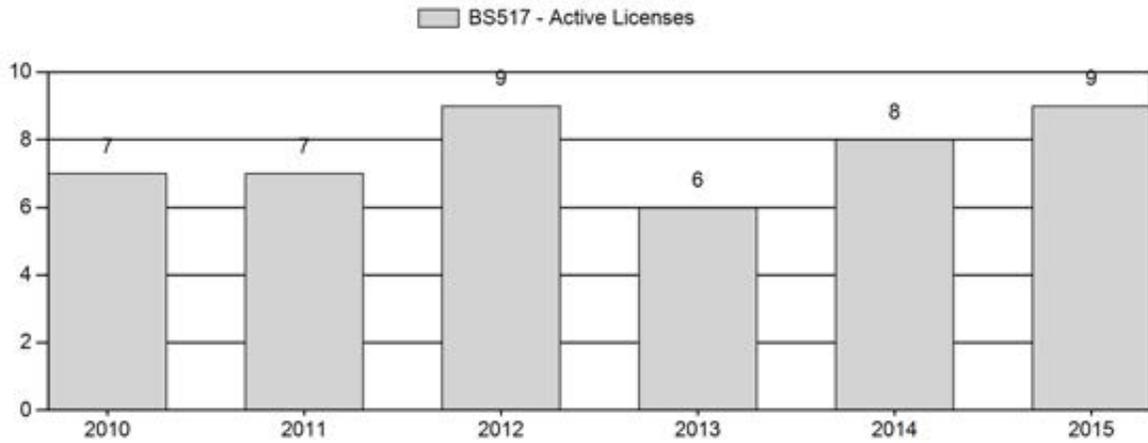
Number of Hunters



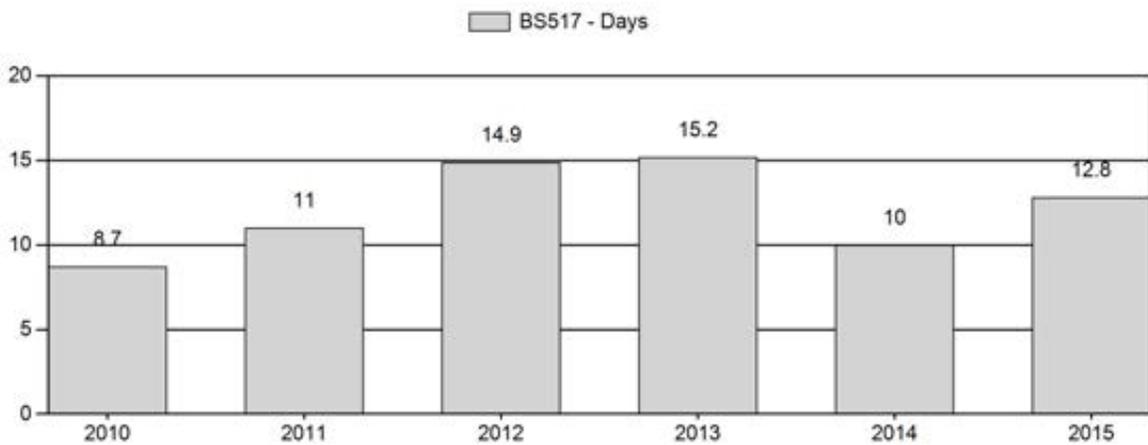
Harvest Success



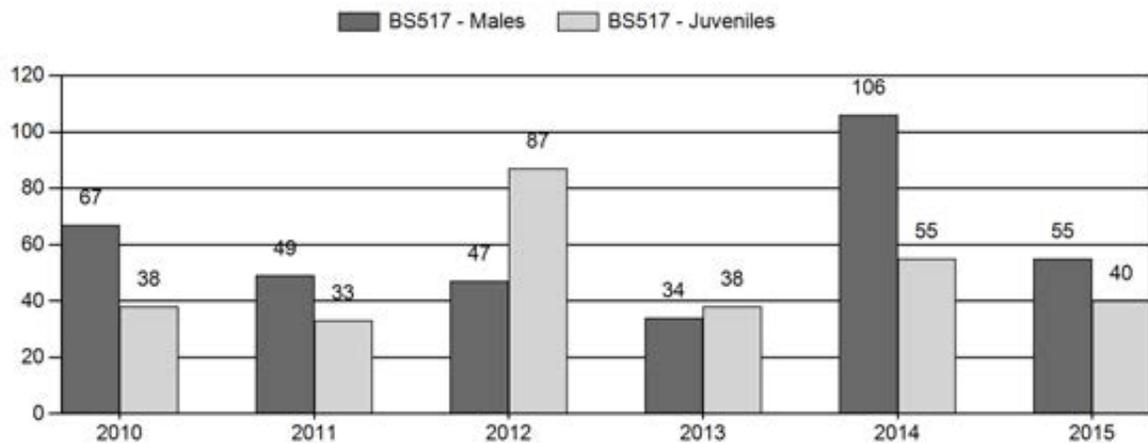
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Bighorn Sheep Herd BS517 - LARAMIE PEAK

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	0	3	23	26	32%	39	49%	15	19%	80	0	8	59	67	± 0	38	± 0	23
2011	0	4	20	24	27%	49	55%	16	18%	89	0	8	41	49	± 0	33	± 0	22
2012	0	0	7	7	20%	15	43%	13	37%	35	0	0	47	47	± 0	87	± 0	59
2013	0	7	16	23	20%	68	58%	26	22%	117	0	10	24	34	± 0	38	± 0	29
2014	0	8	25	33	41%	31	38%	17	21%	81	0	26	81	106	± 0	55	± 0	27
2015	0	2	21	23	28%	42	51%	17	21%	82	0	5	50	55	± 0	40	± 0	26

**2016 HUNTING SEASONS
LARAMIE PEAK BIGHORN SHEEP HERD (BHS517)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
19	1	Sept. 1	Oct. 31	8	Limited quota	Any ram

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
19	Aug. 15	Aug. 31	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
19	1	0

Management Evaluation

Current Management Objective:

- 1) **5-year running average of $\geq 75\%$ hunter success:** 94%
- 2) **5-year running average age of harvested rams between 6 and 8 years of age:** 2011-2015 Average Age: 6 years old
- 3) **Documented occurrence of adult rams in the population:** ~45 observed rams

Management Strategy: Recreational

Herd Unit Issues

The management objective for the Laramie Peak Bighorn Sheep herd was a post-season population objective of 500 wild sheep. The management strategy is recreational management. The objective and strategy were last revised in 1978. The population objective was reviewed during the winter/spring of 2014. Based on department staff, landowner, and public comments the following population management alternative objectives were approved by the WGFD Commission:

- 1) 5-year running average of $\geq 75\%$ hunter success
- 2) 5-year running average age of harvested rams between 6 and 8 years of age
- 3) Documented occurrence of adult rams in the population

The Laramie Peak Herd Unit is comprised of 70% private land. The southern portion (south of WY Hwy 34) is over 90% private land. Hunters can expect to pay a trespass/trophy or outfitter fee to hunt on private land. There are two state sections that hunters can access that hold sheep throughout the season and have produced adult rams in past hunting seasons. A portion of occupied sheep habitat was within the 2012 Arapahoe fire that burned over 98,000 acres. This affected sheep distribution post-fire, but above average summer/fall precipitation in 2013 and spring precipitation in 2014 resulted in increased vegetation production for pre-winter diets and early spring green up that will benefit parturition areas for pregnant ewes. The fire will have

long-term benefits for wild sheep, but initially there has been a flush of noxious weeds (e.g. cheatgrass, Canada thistle) that land managers will need to address. A majority of wild sheep are harvested within the northern portion of the herd unit. The Laramie Peak Wildlife Habitat Management Unit is essential for sheep habitat and harvest where 200 plus sheep inhabit. In 2007 forty-two sheep were released in this area from the Perma-Paradise Herd in Montana. These sheep have thrived and improved the overall genetics and health of the existing herd.

During the winter of 2015/16 the WGFD tried to gather biological samples for disease surveillance, with a target goal of 15 bighorn sheep across Wyoming through the use of drop nets, free-darting, and aerial captures. The goal of this effort is to obtain information on each herd and its overall health. Some animals will be fitted with GPS radio-collars to increase our understanding of movements and habitat use. The goal for the Laramie Peak Herd Unit was to collect samples from 15 wild sheep between Sybille Canyon and Iron Mountain. The drop net was not set up on Iron Mountain due to high winds and lack of sheep in the area. Grants through the Governor's Big Game License Coalition and the Wyoming Wild Sheep Foundation will be submitted for aerial capture efforts during the 2016/17 winter to obtain the necessary sample size of 15.

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 Peak 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking.

Cheatgrass prevalence at lower elevations such as Sybille Canyon and areas burned by the Arapaho Fire of 2012 is concerning to habitat managers. While wildfires have reduced conifer canopies in the Laramie Range, deemed to be largely conducive to bighorn sheep movements and migrations, the prevalence of cheatgrass is cause for concern. 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.

A significant die-off of big 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.

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. While this effort is targeted at mule deer initially, it is hoped efforts will expand to other big game species as methodologies are perfected and adopted. 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

In 2015 there were eight out of the nine bighorn sheep harvested in with an average of 6 years old for a 88% success rate. The five-year age average is also 6 years old and the five-year running success average is 94%, which met the two alternative objective criteria.

Since 1964 there have been a total of 228 wild sheep released from two herd sources: Whiskey Mountain in Wyoming and Perma-Paradise in Montana (Table 1). These transplants have helped to supplement the herd and improve overall herd health.

Table 1. Transplant release data for the Laramie Peak Bighorn Sheep Herd.

<u>Year</u>	<u>Number</u>	<u>Release Location</u>	<u>Source Herd</u>
1964	40	North Laramie River Canyon	Whiskey Mountain Herd
1965	36	Labonte Canyon	Whiskey Mountain Herd
1966	21	Labonte Canyon	Whiskey Mountain Herd
1973	42	Duck Creek Canyon	Whiskey Mountain Herd
1982	27	Marshall	Whiskey Mountain Herd
1989	20	Marshall	Whiskey Mountain Herd
2007	42	Hay Canyon	Perma-Paradise- MT
Total	228		

Lamb recruitment continues to improve compared to ratios prior to the 2007 release. There were a total of 82 wild sheep classified in 2015 with lamb ratios (40 lambs:100 ewes) slightly below the 5-year average of 50 lambs:100 ewes. Adult ram ratios were 50 rams:100, which was

slightly above the 4-year average of 49 rams:100 ewes (2014 was thrown out due to poor classification data). Yearling ram ratios were similar to the 5-year average. Based on surveys there is a well represented number for each age class. Several 8+ old rams were observed in the Duck Creek sub-herd. Hunters reported seeing 75-100 bighorn sheep within the Duck Creek sub-herd and 30-45 of those were rams.

Harvest Data

Success has reached 100% three out of the past five years. This last year active license hunters harvested 8 out of 9 rams, with a success rate of 88%. There was one carry over license from 2014. Hunters who pre-scout and/or hire an outfitter typically harvest their ram within 3-5 days. This year the average hunter effort was 12.8 days, which is slightly higher than the five-year average of 11.9 days per harvest. Hunters that chose not to use an outfitter spend more time scouting and hunting. There is limited public land within occupied wild sheep habitat. Overcrowding is an issue that results in pushing bighorn sheep onto private land, where there is no access. To maintain high harvest success no more than 8 licenses are issued. In the past when the quota was increased to 12, success decreased drastically. There were issues this year with nine hunters going to the field. The majority chose to hunt the Duck Creek sub-herd, and based on conversations with those hunters there were some crowding issues. However, the majority of hunters communicated with each other to try and avoid any conflicts. The one hunter that did not harvest a ram was a nonresident that was looking for a 180" plus ram. He had several opportunities to harvest a mature ram but opted to try and pursue a ram that would meet those criteria.

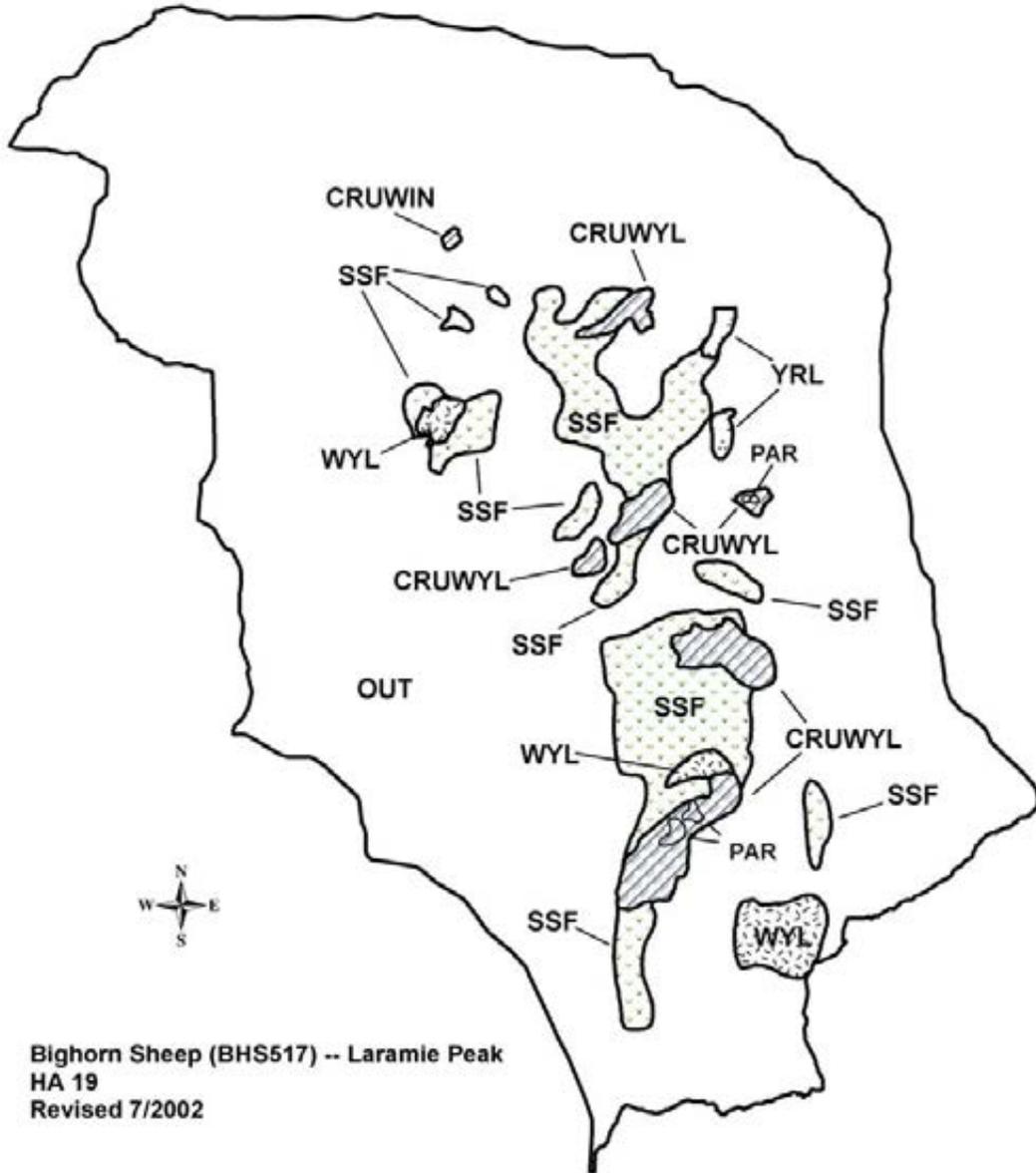
Two rams stood out in the 2015 harvest data. The first was a ram from the 2007 transplant from Montana that was released as a yearling (now 9 years old) and the second was a 10 year old ram that scored 186 points using the Boone and Crocket (B&C) scoring system. Typically the older rams harvested in this herd unit score around 175 B&C points. News about this ram went viral on social media and most likely license demand for 2016 will go up.

The Laramie Peak bighorn sheep season has been September 1-October 31 for the past 25 years. Prior to that, the season ran from September 1- October 14. The increased season length appears to provide adequate opportunity to harvest a ram, given this is typically a once in a lifetime license.

In 2012 there were several fires that burned within bighorn sheep occupied habitat. The Arapahoe, Cow Camp, and Russell's Camp fires burned over 112,000 acres, with the Arapahoe fire being the largest (98,000 acres). Throughout the area there is observed recovery in vegetation. Photo points have been established throughout the fire to document plant succession. Perennial forbs and grasses along with aspen have re-established post-fire.

There is not a reliable working model for this herd unit due to limited population data collected on an annual basis.

For the 2016 season, 8 licenses will be offered for any ram. Given previous harvest statistics hunters should have a high probability of harvesting a mature ram. To improve harvest success hunters will need to put more time into scouting and hunting if they are accessing public lands.



Bighorn Sheep (BHS517) -- Laramie Peak
 HA 19
 Revised 7/2002

2015 - JCR Evaluation Form

SPECIES: Bighorn Sheep

PERIOD: 6/1/2015 - 5/31/2016

HERD: BS519 - ENCAMPMENT RIVER

HUNT AREAS: 21

PREPARED BY: WILL SCHULTZ

	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	0	N/A	N/A
Harvest:	0	0	1
Hunters:	0	0	1
Hunter Success:	0%	0%	100%
Active Licenses:	0	0	1
Active License Success:	0%	0%	100%
Recreation Days:	1	0	2
Days Per Animal:	0	0	2
Males per 100 Females	45	91	
Juveniles per 100 Females	27	45	

Population Objective ($\pm 20\%$) :	200 (160 - 240)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	20
Model Date:	None

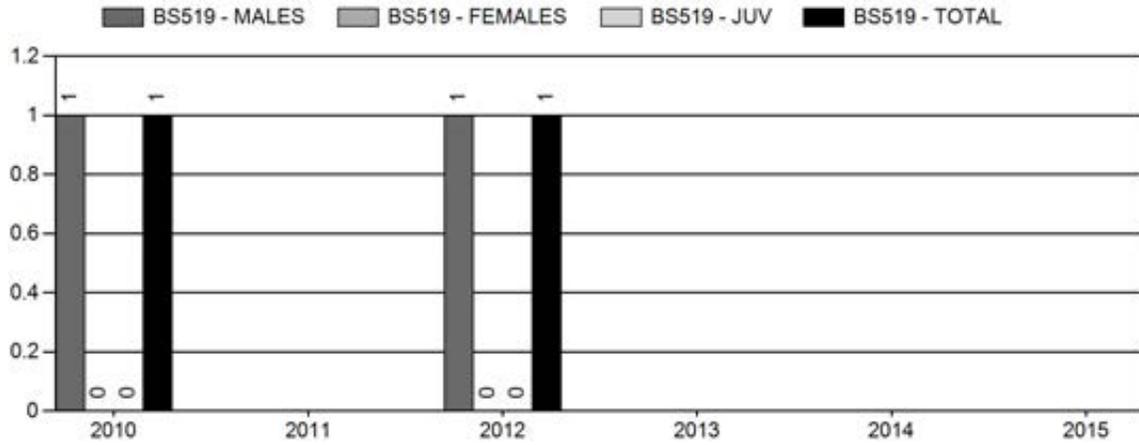
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

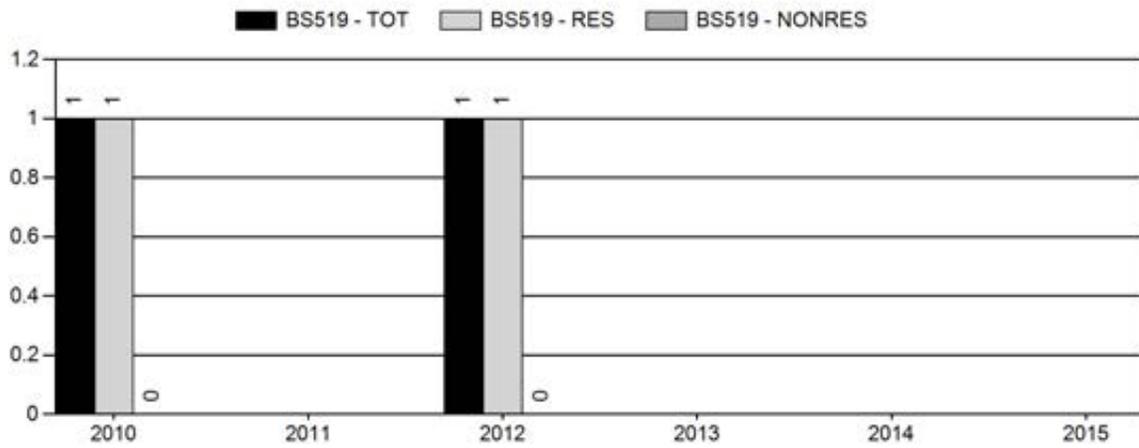
Population Size - Postseason



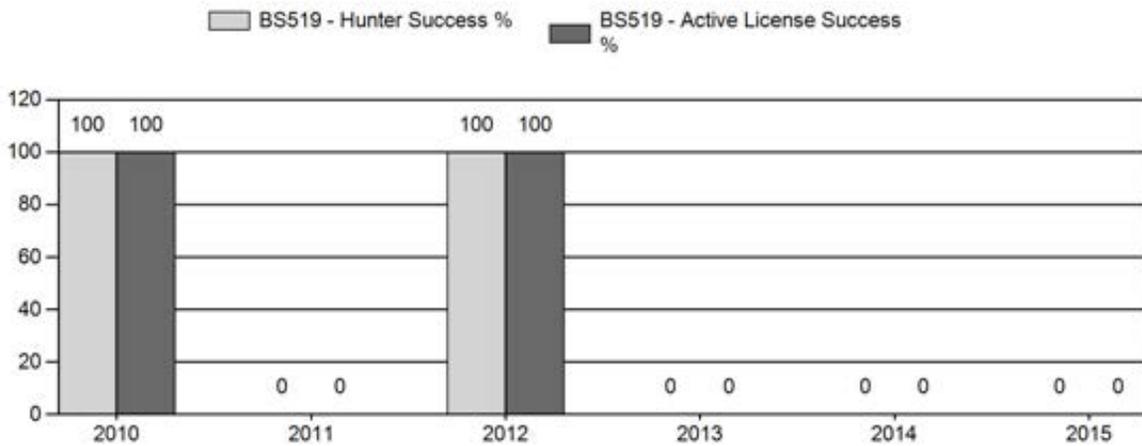
Harvest



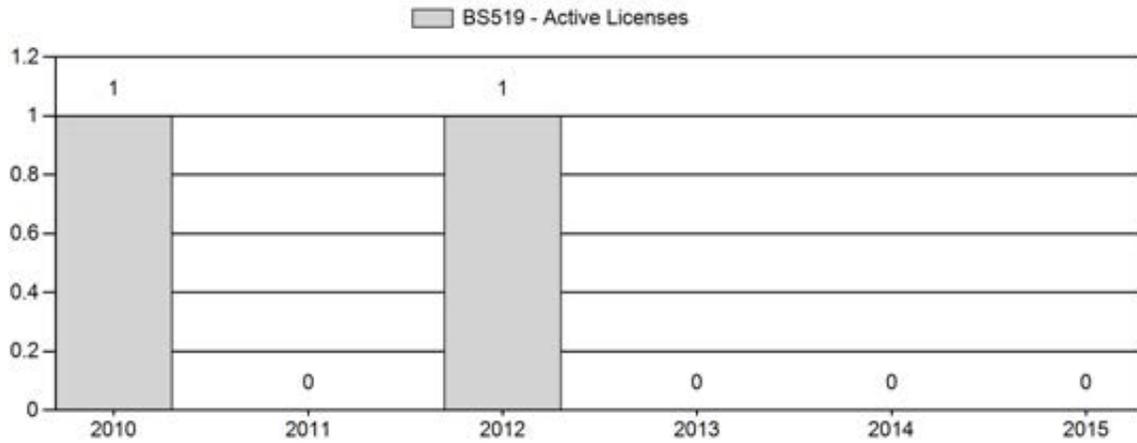
Number of Hunters



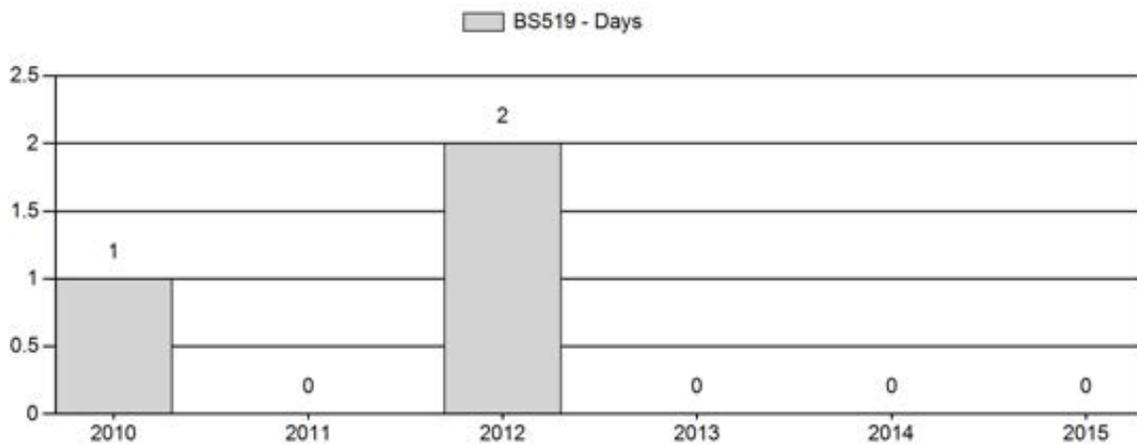
Harvest Success



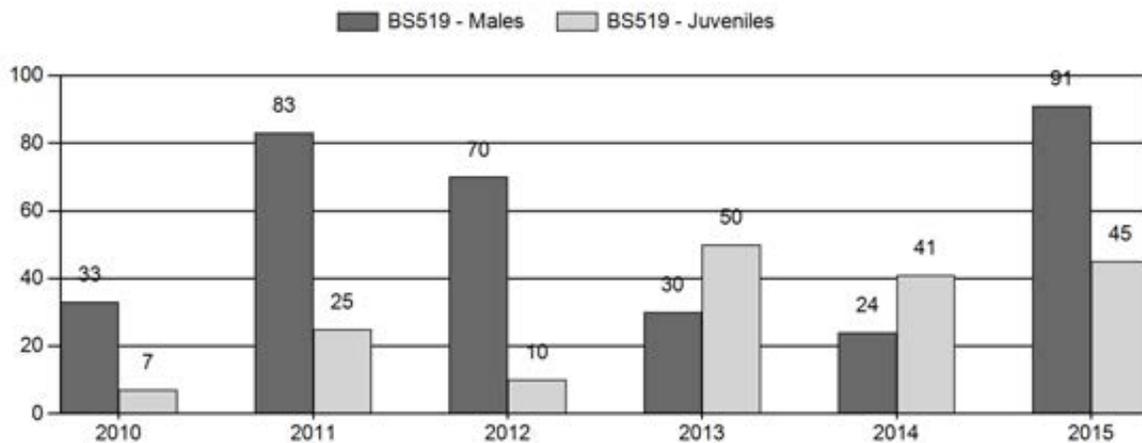
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary
for Bighorn Sheep Herd BS519 - ENCAMPMENT RIVER

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	0	0	5	5	24%	15	71%	1	5%	21	0	0	33	33	± 0	7	± 0	5
2011	0	0	10	10	40%	12	48%	3	12%	25	0	0	83	83	± 0	25	± 0	14
2012	0	0	7	7	39%	10	56%	1	6%	18	0	0	70	70	± 0	10	± 0	6
2013	0	0	3	3	17%	10	56%	5	28%	18	0	0	30	30	± 0	50	± 0	38
2014	0	1	3	4	14%	17	61%	7	25%	28	0	6	18	24	± 0	41	± 0	33
2015	0	2	8	10	38%	11	42%	5	19%	26	47	18	73	91	± 0	45	± 0	24

**2016 HUNTING SEASONS
Encampment River Bighorn Sheep (BS519)**

Season Dates						
Hunt Area	Type	Opens	Closes	Quota	License	Limitations
18,21	1	Sep. 1	Oct. 31	2	Limited quota	Any ram (1 resident, 1 nonresident)
	Archery	Aug. 15	Aug. 31			Refer to license type and limitations in Section 4 of Chapter 9

Hunt Area	License Type	Quota change from 2015
18, 21	1	+2
Herd Unit Total	1	+2

Management Evaluation

Current Postseason Population Management Objective: 200 (160-240)

Management Strategy: Special

2015 Postseason Population Estimate: NA

2016 Proposed Postseason Population Estimate: NA

Bighorn sheep in the Encampment River herd unit are managed toward a postseason population objective of 200. A population model has not been constructed for the herd unit. The herd is managed under the bighorn sheep special management strategy. The objective was last reviewed in 1987. We plan to review the management objective in 2016.

Herd Unit Issues

Bighorn sheep numbers in this herd unit appeared to peak in the late 1970s, not long after reintroduction efforts. Bighorn sheep numbers have been in decline since the early 1980s. The lack of a rebound in numbers has been attributed to decadent habitat. Domestic sheep in grazing on the west slope of the Sierra Madres also poses a disease concern for managers. The population is now at such a low number it is assumed natural recovery is not possible. Limited harvest opportunities have been offered in past years, in combination with the Douglas Creek bighorn sheep herd unit.

In 2013, the State of Wyoming, and thus the Wyoming Game and Fish Department, intervened on behalf of the U.S. Forest Service, in the U.S. District Court case, BIODIVERSITY CONSERVATION ALLIANCE vs. BUTCH BLAZER, et al. This case continues to await a ruling, and may affect future management of bighorn sheep in this herd unit.

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 bighorn sheep. Mild fall temperatures and lack of persistent snow allowed bighorn sheep 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 Encampment River 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

Adequate classification data for this herd has been difficult to collect. 2015 postseason classification observations were obtained while conducting a mule deer sightability survey from a helicopter in February of 2016. The classification results were 8 adult rams, 2 yearling ram, 11 ewes, and 5 lambs. Past postseason classification efforts generally have located a greater number of ewes and lambs than what was observed in 2015. We received several reports of a group of 25+ ewes and lambs in the Miner Creek area during the summer of 2015 but we were unable to locate this number of ewes and lambs for classification in December.

Population

A population model has not been constructed for this herd unit due to limited classification and no annual survival information. Based on the trend of classification data and casual observations, a reasonable estimate of 30-50 bighorn sheep should be considered for this herd unit. A review of the management objective, currently at 200 bighorn sheep postseason, will be evaluated in 2016.

Harvest Data

In 2015 the hunting season was closed in this herd unit.

Management Summary

The hunting season will be reopened in 2016. We will offer two Type 1 licenses, 1 resident and 1 nonresident, valid for any ram. This hunting opportunity will be valid in both Hunt Area 18 (Douglas Creek herd unit) and Hunt Area 21.

Bibliography of Herd Specific Studies

Arnett, E.B. 1990. Bighorn sheep habitat selection patterns and response to fire and timber harvest in Southcentral Wyoming. M.S. Thesis, University of Wyoming, Laramie. USA. 156 pp.

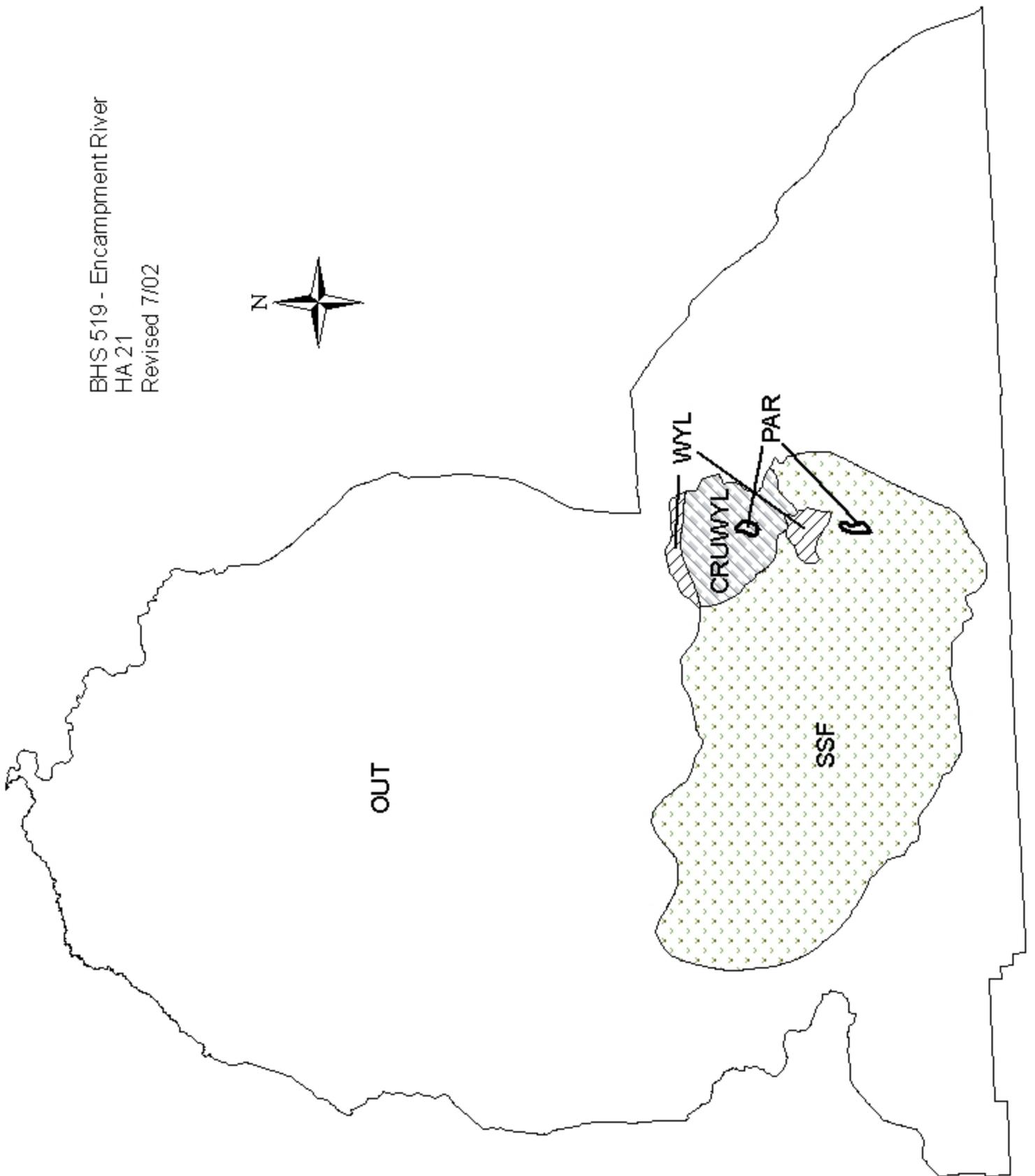
Cook, J.G. 1990. Habitat, nutrition, and population ecology of two transplanted bighorn sheep populations in southcentral Wyoming. Ph.D. Thesis, University of Wyoming, Laramie. Wyoming. USA. 310 pp.

_____ E.B. Arnett, L.L. Irwin, F. Lindzey. 1989. Ecology and Population Dynamics of Two Transplanted Bighorn Sheep Herds in Southcentral Wyoming. University of Wyoming, Laramie. Wyoming. USA. 234 pp.

Haas, W.L. 1979. Ecology of an introduced herd of Rocky Mountain bighorn sheep in southcentral Wyoming. M.S. Thesis, Colorado State University, Fort Collins. Colorado. USA. 343 pp.

_____ and E. Decker. 1980. A study of a recently introduced bighorn sheep herd in Proc. Bien Symp. North Wild Sheep and Goat Coun. 2:143-166.

BHS 519 - Encampment River
HA 21
Revised 7/02



2015 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2015 - 5/31/2016

HERD: EL531 - IRON MOUNTAIN

HUNT AREAS: 6

PREPARED BY: LEE KNOX

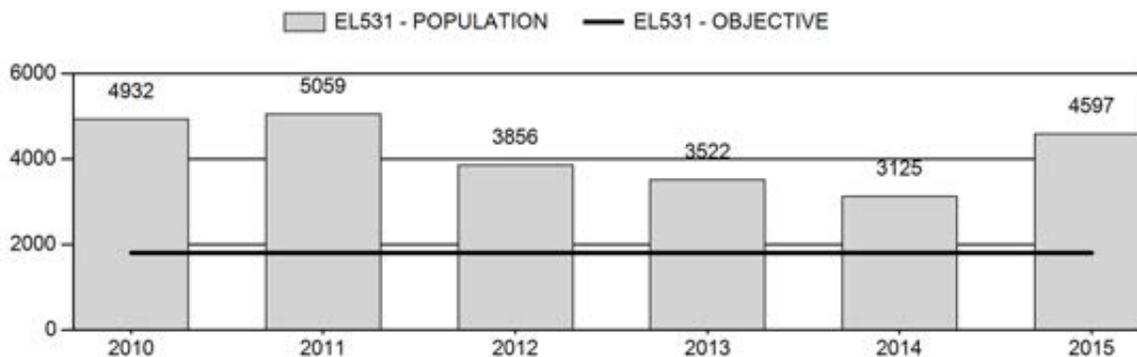
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	4,099	4,597	4,200
Harvest:	824	726	730
Hunters:	1,605	1,638	1,600
Hunter Success:	51%	44%	46 %
Active Licenses:	1,671	1,676	1,600
Active License Success:	49%	43%	46 %
Recreation Days:	10,398	8,639	8,500
Days Per Animal:	12.6	11.9	11.6
Males per 100 Females	23	48	
Juveniles per 100 Females	49	58	

Population Objective ($\pm 20\%$) :	1800 (1440 - 2160)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	155%
Number of years population has been + or - objective in recent trend:	20
Model Date:	02/18/2016

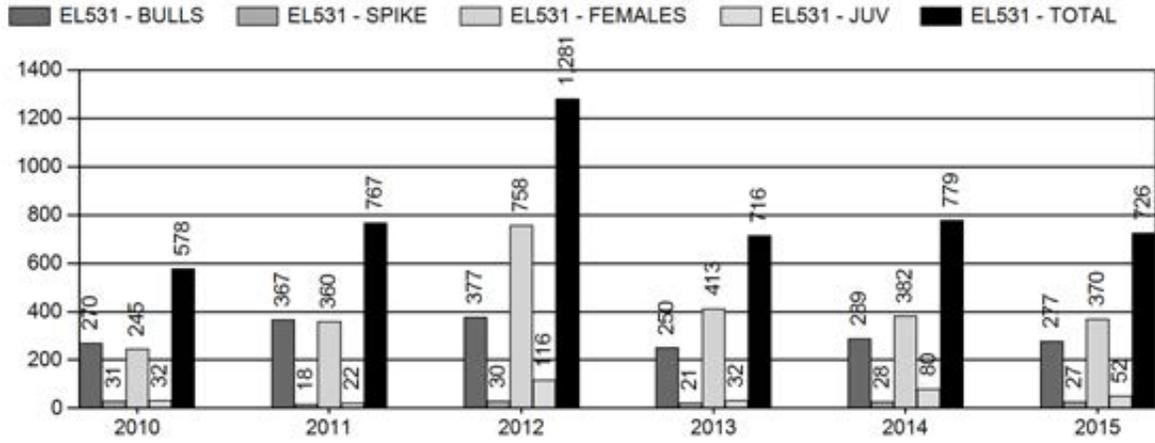
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	20%	20%
Males ≥ 1 year old:	30%	30%
Juveniles (< 1 year old):	4.5%	4.5%
Total:	25%	25%
Proposed change in post-season population:	-15%	-15%

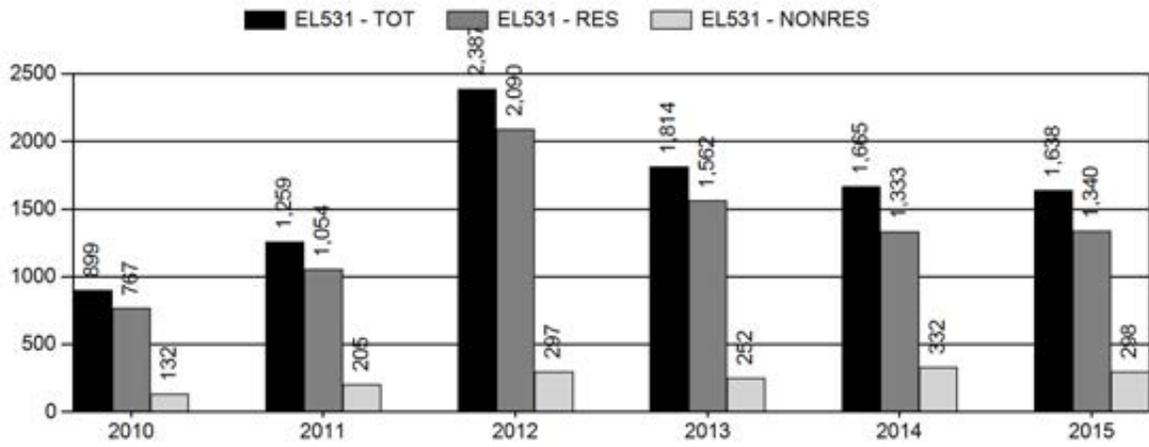
Population Size - Postseason



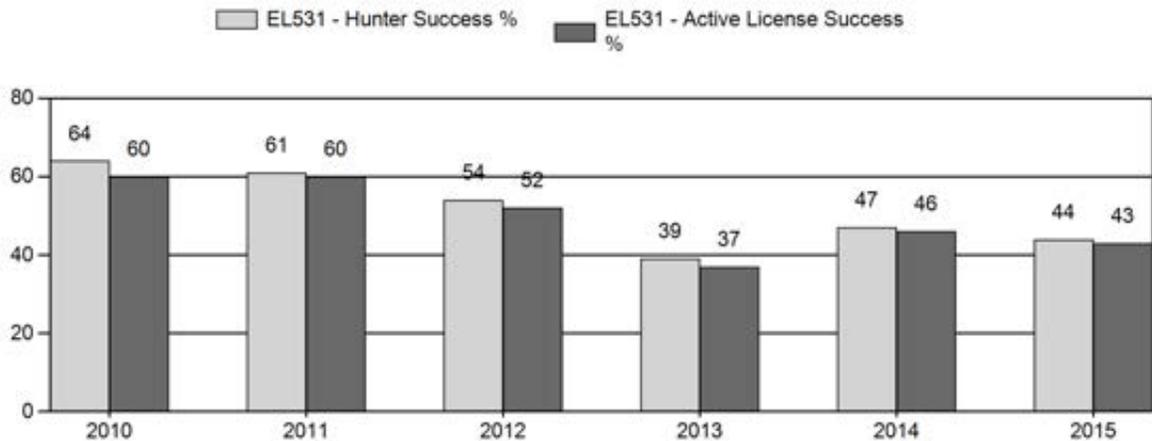
Harvest



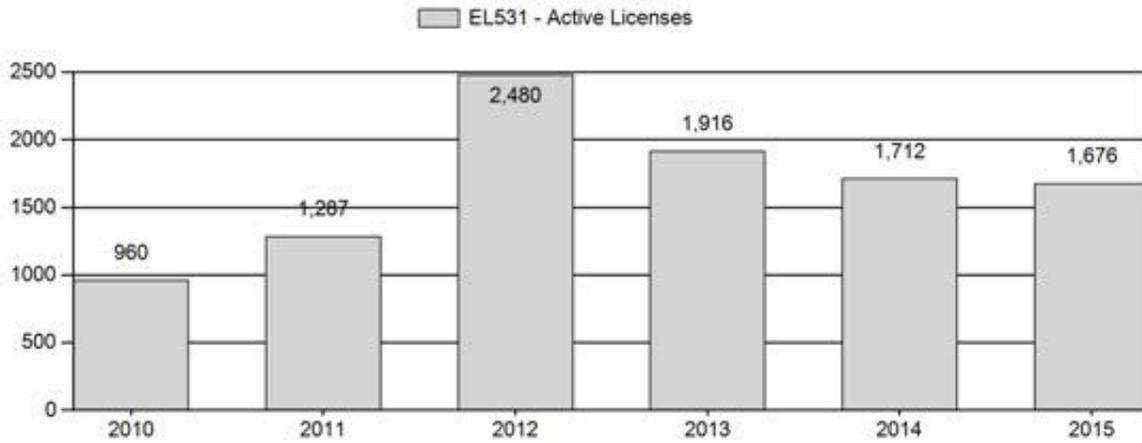
Number of Hunters



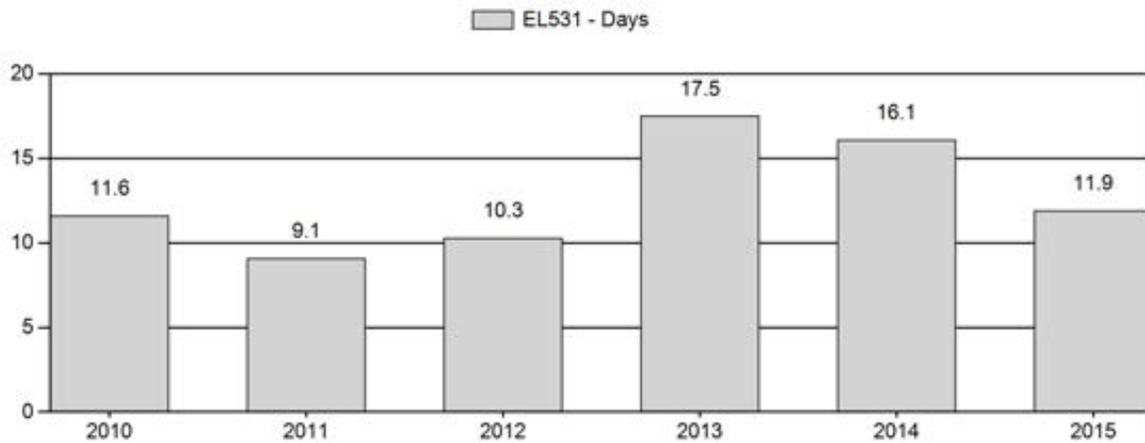
Harvest Success



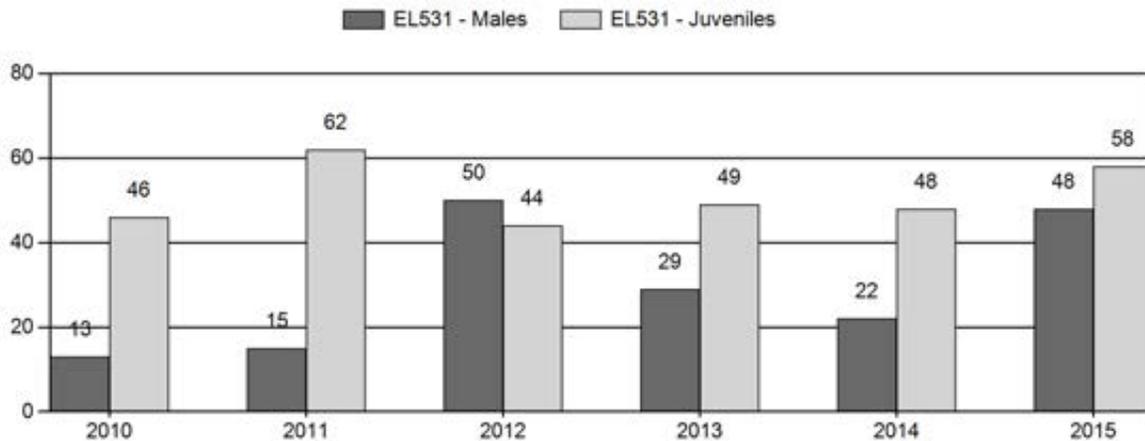
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Elk Herd EL531 - IRON MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Yng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	4,932	53	26	79	8%	604	63%	278	29%	961	617	9	4	13	± 2	46	± 4	41
2011	5,059	20	16	36	9%	235	56%	145	35%	416	646	9	7	15	± 3	62	± 8	54
2012	3,856	52	46	98	26%	196	51%	87	23%	381	617	27	23	50	± 8	44	± 7	30
2013	3,522	75	86	161	16%	557	56%	273	28%	991	707	13	15	29	± 3	49	± 4	38
2014	3,125	44	67	111	13%	499	59%	238	28%	848	671	9	13	22	± 3	48	± 4	39
2015	4,597	152	142	294	23%	616	49%	355	28%	1,265	0	25	23	48	± 4	58	± 4	39

**2016 HUNTING SEASONS
IRON MOUNTAIN ELK (EL531)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
6		Oct. 1	Oct. 31		General	Any elk valid off national forest
		Nov. 1	Nov. 30		General	Antlerless elk valid off national forest
	1	Oct.15	Oct. 31	75	Limited quota	Any elk
		Nov.1	Jan. 31		Limited quota	Unused Area 6 Type 1 licenses valid for antlerless elk
	4	Nov. 1	Jan. 31	100	Limited Quota	Antlerless elk
	6	Aug. 15	Jan. 31	1100	Limited Quota	Cow or calf valid off national forest

Special Archery Season Hunt Areas	Type	Season Dates		Limitations
		Opens	Closes	
6	General	Sep. 1	Sep. 30	Valid off National Forest
	1,4	Sep. 1	Sep. 30	Valid in the entire area
	6	Sep. 1	Sep. 30	Valid off National Forest

MANAGEMENT EVALUATION

Current Postseason Population Management Objective: 1,800 (1,440-2,160)

Management Strategy: Recreational

2015 Postseason population Estimate: ~ 4,600

2016 Proposed Postseason Population Estimate: 4,200

2015 Hunter Satisfaction: 65% Satisfied, 18% Neutral, 17% Dissatisfied

The management objective for the Iron Mountain Elk herd unit is a post-season population objective of 1,800 elk. The management strategy is recreational management which requires maintaining a post hunt bull ratio of 15 to 29:100 cows. The objective and management strategy were last revised in 2013.

Herd Unit Issues

The Iron Mountain Elk herd unit includes hunt area 6 (combined hunt areas 5 and 6 for 2014 season) which is composed of mostly private lands except for the Pole Mountain National Forest

segment which is managed under a limited quota license to maintain hunt quality. Urban sprawl and nontraditional landowners are increasing in the herd unit, as well as growing stone quarries in parts of Rogers canyon as well as between I-80 and Wyoming Highway 287. This herd unit continues to be a concern with landowners due to large wintering herds of elk sometimes exceeding 800 elk. At the same time most all of the landowners in the herd unit outfit bull elk hunts to some degree on their property, and bull quality and quantity are a concern. The 2015 post-season population estimate was 4,600 with the population trending downward from a high of 6,200 in 2011.

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 Iron Mountain 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. 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.

One 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.

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 it is the predominant specie.

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

A total of 1,300 elk were classified, exceeding the estimated classification objective of 700. Classification flights occurred after extreme cold and heavy snows which caused elk to be heavily concentrated in the northeast corner of the herd unit. Bull ratios are high at 48:100 cows with half being yearlings. Considering the conditions during the flight we believe few bull or cow groups were missed and the total bull ratio well represents what is actually on the ground. This herd has been very productive and continues to be so with 58 calves: 100 cows. After changing the license issuance from limited quota to general, hunter numbers have been on a steady decline from a high of 2,480 hunters in 2012 to 1,600 in 2015. We may now be seeing hunter numbers stabilizing with 2015 seeing similar numbers to 2014 at 1,600 hunters.

Harvest Data

Elk harvest appears to be stabilizing after changing to a general season strategy in 2012. Elk harvest in 2015 is similar to the past two years at 700 elk. More landowners are taking advantage of the liberal cow elk season structure and harvest levels in the herd are being maintained at an appropriate level to decrease the population towards objective. General license hunters were most successful in September and October. Only 8% of the elk harvested on a general tag were harvested after November (Figure 1.).

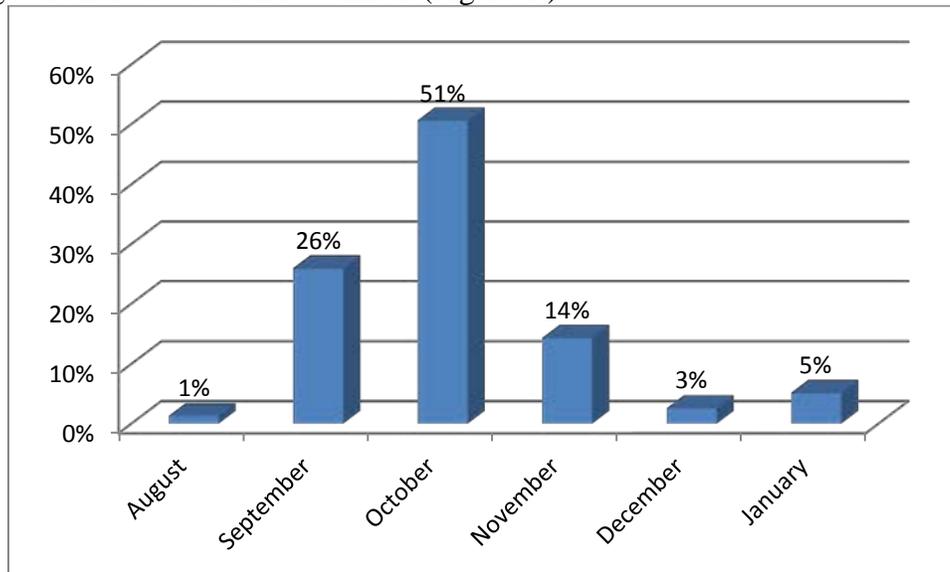


Figure 1. The Percent of harvest by general licenses per month in the Iron Mountain Herd Unit.

Both the type 1 and type 4 licenses remain very popular with the public. For the type 1 license drawing odds are less than 10% for residents and nonresidents need 5 or more preference points.

Hunter success has been declining on the type 1 license from 65% in 2012 to 45% in 2015. The type 4 licenses have always been a more difficult hunt but success declined from 35% in 2014 to 13% in 2015. Harvest was poor with only 11 elk harvested on the type 4 licenses in 2015.

Population

This is the third year that we have collected adequate classification data for the model to not crash. The constant juvenile and adult survival model had an AIC score of 468 and a best FIT of 478. It did not have the lowest AIC score but considering the lack of data the more complicated models are not appropriate for this herd unit. This model predicts the population declining from a high of 6,800 in 2011 to the current population estimate of 4,600 in 2015. This model has a tendency to jump around each time an additional year of data is added and although the population trend may be accurate, the population estimate is most likely not. This Model is ranked Poor for a variety of reasons including: little data available; ratio data, if available, considered highly biased because of poor sample sizes or an inability to survey the entire area; herd unit closure issues apparent; results not biologically defensible.

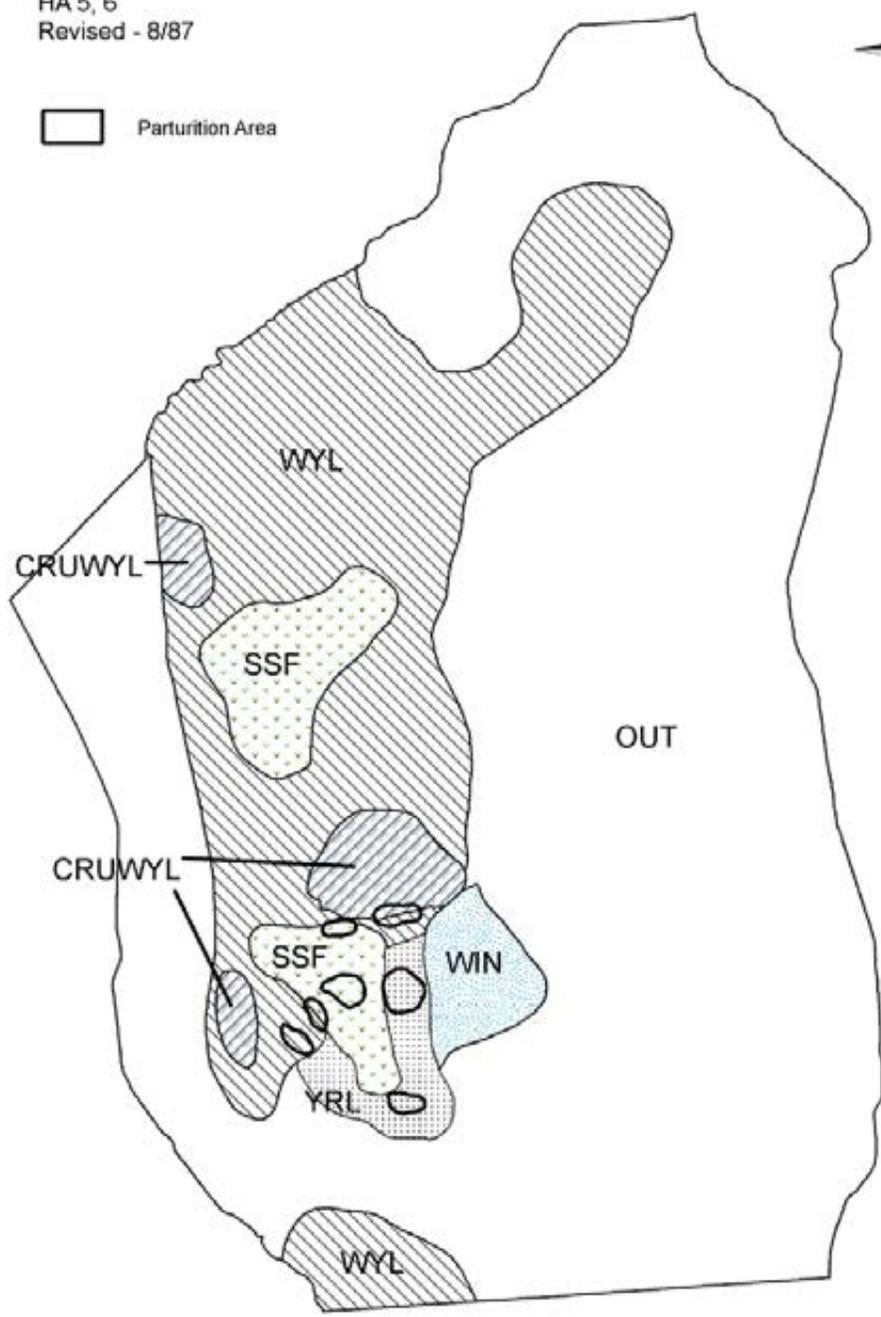
Management Summary

The 2015 season structure went well and maintained the 2014 harvest of 700 elk. We will remain status quo for license issuance in the 2016 season. If we harvest a minimum of 650 elk, we will continue to reduce the population towards the objective. There are concerns from Department personnel and landowners of increased poaching and trespassing cases due to hunt area 6 being one of the last general seasons to close. After October, hunt area 6 attracts hunters from around the state that still have a general license to fill, and frankly we do not have any access or landowners to send them to. As shown in figure 1, very few elk are harvested on a general license after November. We hired a Hunt Management Coordinator (HMC) for Iron Mountain in 2015. Through no fault of his own, the HMC was only able to get a very limited amount of private access for hunters, and harvest was minimal. Considering the ample number of type 6 licenses that provide opportunity through January 31st, we will end the general license on November 30th.

E531 - Iron Mtn.
HA 5, 6
Revised - 8/87



 Parturition Area



2015 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2015 - 5/31/2016

HERD: EL533 - SNOWY RANGE

HUNT AREAS: 8-12, 110, 114, 125

PREPARED BY: WILL SCHULTZ

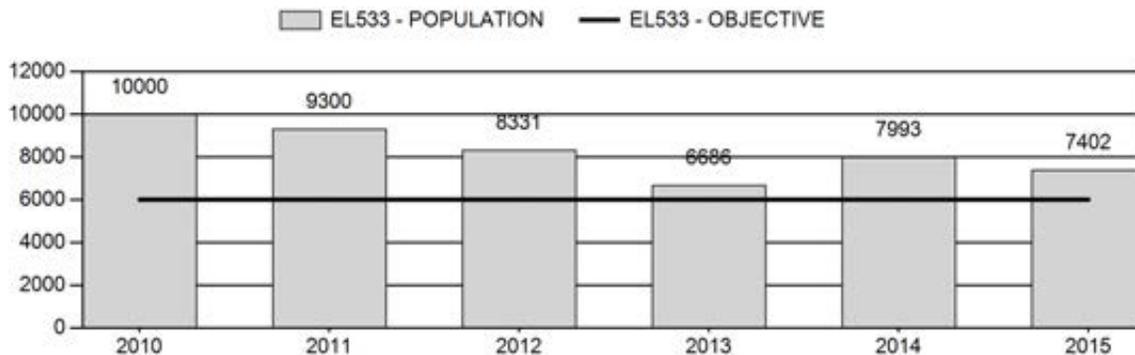
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	8,462	7,402	6,800
Harvest:	1,892	1,888	1,890
Hunters:	5,800	6,056	5,900
Hunter Success:	33%	31%	32 %
Active Licenses:	6,017	6,328	6,200
Active License Success:	31%	30%	30 %
Recreation Days:	45,387	47,914	46,000
Days Per Animal:	24.0	25.4	24.3
Males per 100 Females	23	21	
Juveniles per 100 Females	45	46	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	23%
Number of years population has been + or - objective in recent trend:	23
Model Date:	02/20/2016

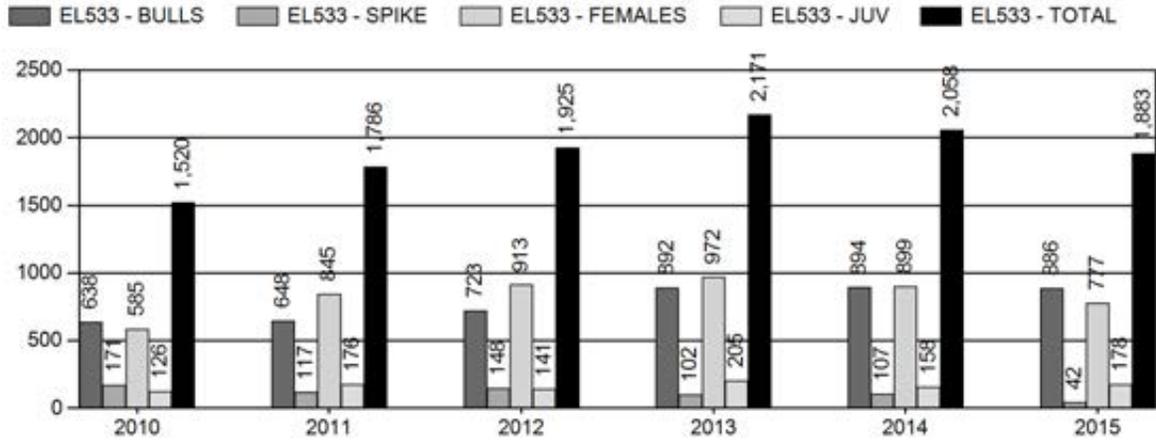
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	17%	17%
Males ≥ 1 year old:	51%	64%
Juveniles (< 1 year old):	5%	10%
Total:	21%	23%
Proposed change in post-season population:	-6%	-9%

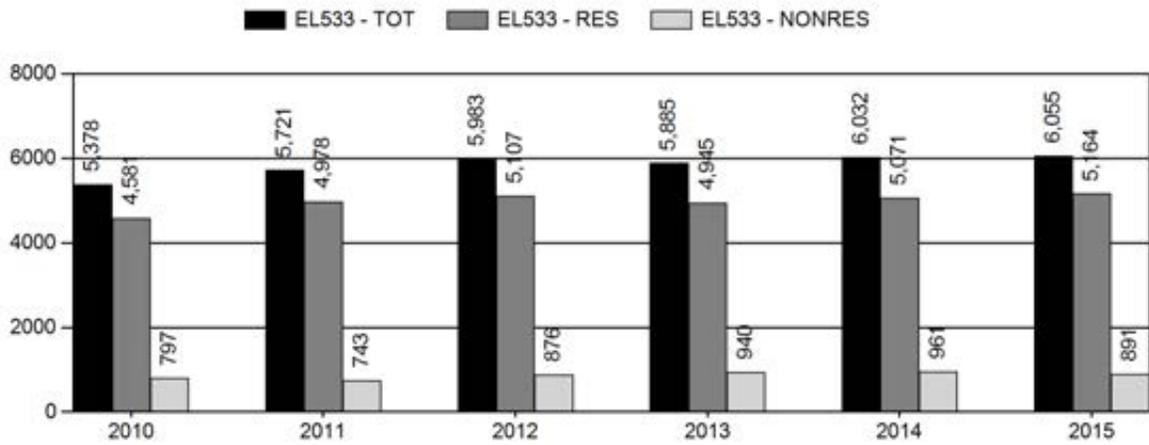
Population Size - Postseason



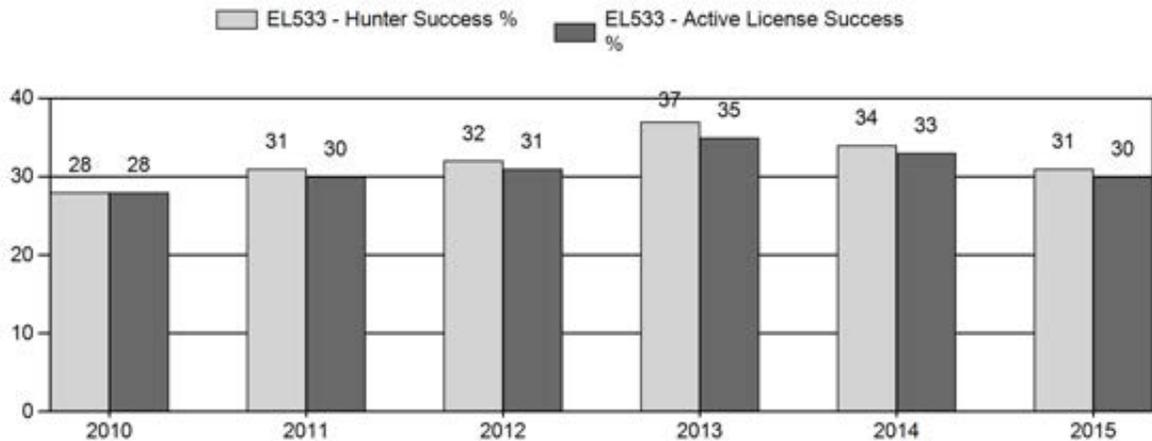
Harvest



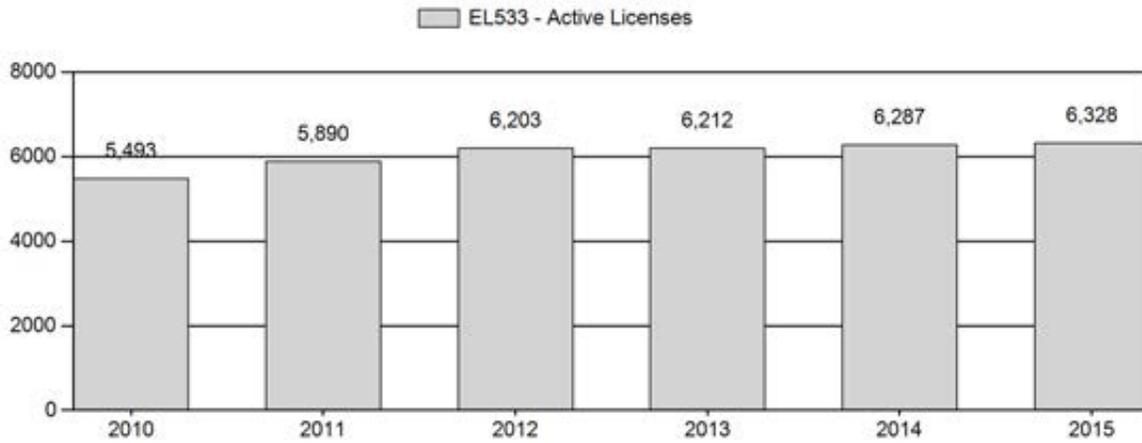
Number of Hunters



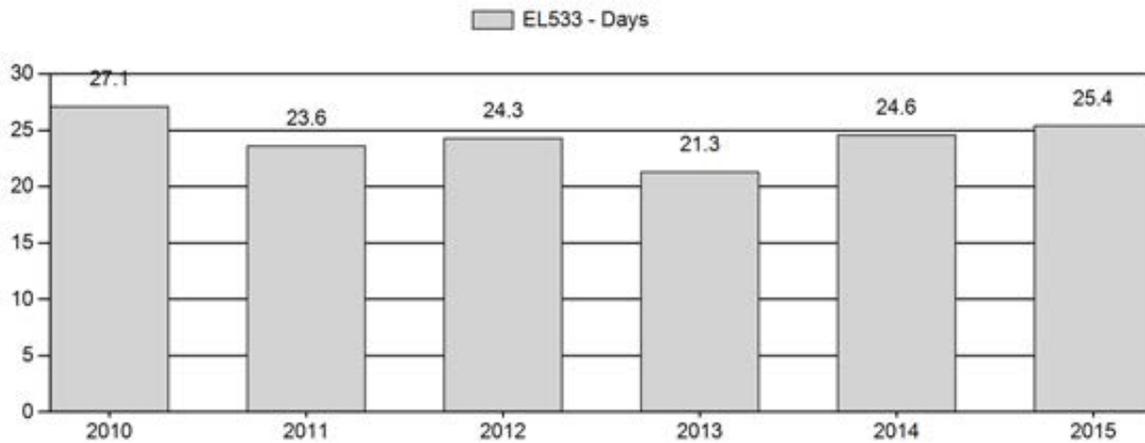
Harvest Success



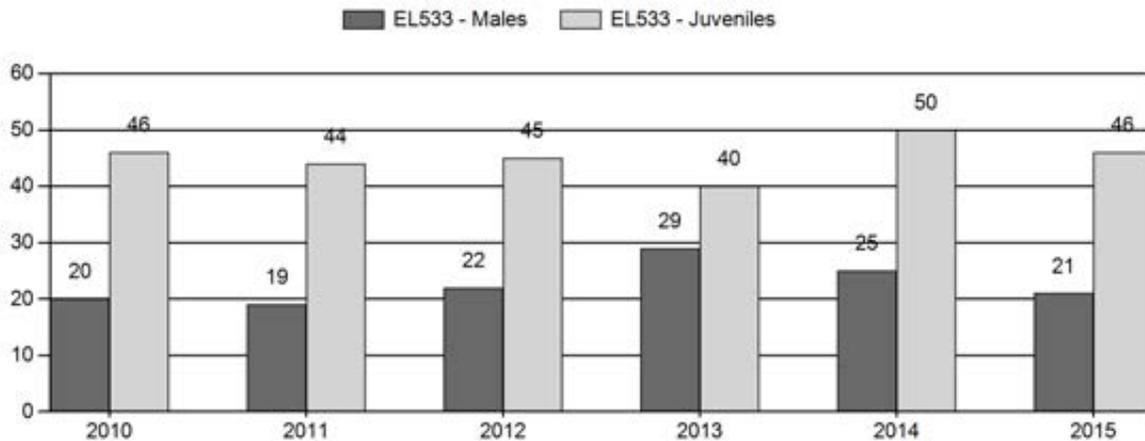
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Elk Herd EL533 - SNOWY RANGE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	10,000	318	200	518	12%	2,633	60%	1,211	28%	4,362	650	12	8	20	± 1	46	± 2	38
2011	9,300	145	109	254	12%	1,308	61%	576	27%	2,138	639	11	8	19	± 1	44	± 2	37
2012	8,331	252	218	470	13%	2,181	60%	990	27%	3,641	664	12	10	22	± 1	45	± 2	37
2013	6,686	292	456	748	17%	2,539	59%	1,023	24%	4,310	646	12	18	29	± 1	40	± 1	31
2014	7,993	259	148	407	14%	1,609	57%	800	28%	2,816	640	16	9	25	± 1	50	± 2	40
2015	7,402	206	190	396	13%	1,885	60%	876	28%	3,157	657	11	10	21	± 1	46	± 2	38

**2016 HUNTING SEASONS
SNOWY RANGE ELK (EL533)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
8	1	Oct. 1	Oct. 31	150	Limited quota	Any elk
		Nov. 1	Jan. 31			Valid for any elk west of Sand Creek Road (Albany County Road 34) and antlerless elk east of Sand Creek Road (Albany County Road 34)
	6	Aug. 15	Jan. 31	100	Limited quota	Cow or calf
9		Oct. 15	Oct. 31		General	Any elk
	6	Aug. 15	Sep. 30	150	Limited quota	Cow or calf valid on private land
		Oct. 1	Dec. 31			Cow or calf
		Jan. 1	Jan. 31			Cow or calf valid off national forest
10		Oct. 15	Oct. 31		General	Any elk
	6	Aug. 15	Sep. 30	400	Limited quota	Cow or calf valid on private land
		Oct. 1	Nov. 30			Cow or calf
		Dec. 1	Jan. 31			Cow or calf valid off national forest
11	1	Oct. 1	Oct. 31	150	Limited quota	Any elk
	4	Oct. 1	Oct. 31	300	Limited quota	Antlerless elk
	6	Aug. 15	Jan. 31	50	Limited quota	Cow or calf valid off national forest and off the Wyoming Game and Fish Commission's Wick Wildlife Habitat Management Area
	9	Sep. 1	Sep. 30	50	Limited quota	Any elk, archery only
12		Oct. 15	Oct. 31		General	Any elk
	6	Oct. 1	Nov. 14	150	Limited quota	Cow or calf
		Nov. 15	Jan. 31			Cow or calf valid west of Wyoming Highway 130
12, 13, 15, 110	7	Aug. 15	Jan. 31	75	Limited quota	Cow or calf valid on private land
110		Oct. 15	Oct. 31		General	Any elk
	6	Oct. 1	Nov. 14	50	Limited quota	Cow or calf

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
114	1	Oct. 1	Jan. 31	50	Limited quota	Any elk
	6	Aug. 15	Jan. 31	75	Limited quota	Cow or calf
125	1	Oct. 1	Dec. 31	200	Limited quota	Any elk
		Jan. 1	Jan. 31			Valid for antlerless elk
	6	Oct. 1	Jan. 31	200	Limited quota	Cow or calf
					Archery	Refer to Section 3 of Chapter. 7

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

Management Evaluation

Current Management Objective: 6,000 (4,800 – 7,200)

Management Strategy: Recreational

2015 Postseason Population Estimate: 7,400

2016 Proposed Postseason Population Estimate: 6,800

2015 Hunter Satisfaction: 62% Satisfied, 20% Neutral, 18% Dissatisfied

Elk in The Snowy Range herd unit are managed toward a numeric objective of 6,000. The population was estimated using a spreadsheet models developed in 2012 and updated in 2014. The herd is managed for recreation opportunity. The objective was last reviewed in 2013.

Herd Unit Issues

The Snowy Range herd unit covers a large portion of south central Wyoming. Issues here include development in the form of energy, agricultural, residential, invasive and noxious plants, forestry and range management, and travel management in important elk habitat.

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 were 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 Snowy Range herd unit the reviewer is referred to the following link: <http://www.ncdc.noaa.gov/cag/>.

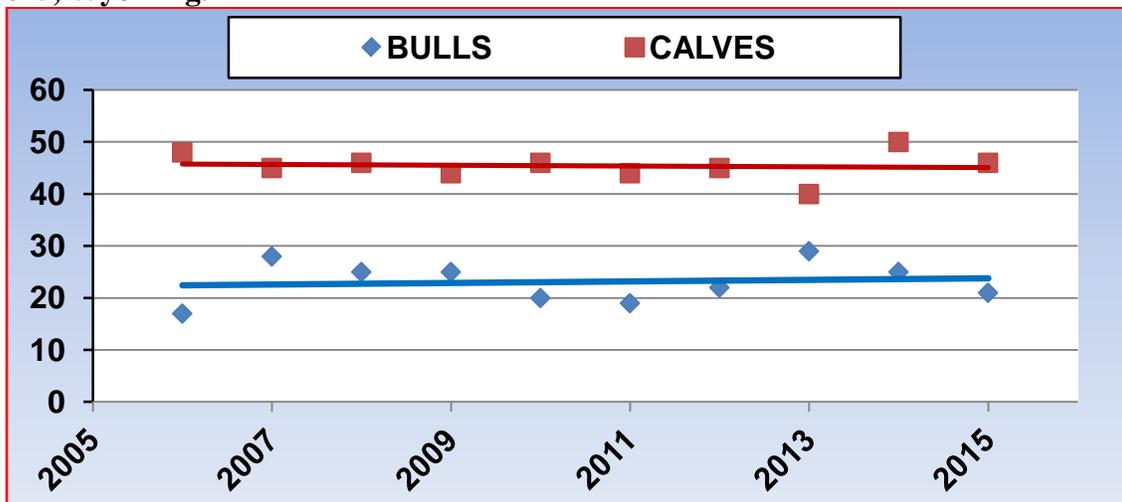
Habitat

Habitat conditions continued to improve in 2015 with increased amounts of timely precipitation being 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Cheatgrass continued to be a threat to native rangelands; particularly on south facing aspects and in areas of high fire severity associated with the 11,000 acre Squirrel Creek Wildfire of 2012. During habitat assessments conducted during the summer 2015, aspen regeneration in areas burned by wildfire was excellent, and showed little sign of browsing by wildlife or livestock. This may be due to the fact that the areas which recently burned have a high road density and are heavily utilized by motorized recreationists; resulting in displacement of elk from these preferred habitats. The limited number of habitat transects established throughout the Laramie Region have not provided sufficient data to make reliable inferences about habitat quantity or quality.

Field Data

In 2015, we classified elk from a helicopter in conjunction with local mule deer classifications. A postseason classification sample of 3,157 elk produced ratios of 21 bulls and 46 calves per 100 cows in this herd unit. Figure 1 illustrates the trend in bull and calf ratios during the past 10 years for the Snowy Range herd unit. High calf ratios continued to provide for an excellent recruitment rate in this herd unit.

Figure 1. Bull and calf ratios per 100 cows in the Snowy Range elk herd unit, 2006-2015, Wyoming.



Harvest Data

The 2015 harvest survey data indicated 6,055 active licensed hunters harvested 1,883 elk, which was an 8% decrease from 2014. The total harvest success rate of 31% was a 3% decrease from 2014. Branch antlered bulls accounted for 95% of the male harvest in 2015 and 49% of the overall harvest. The spikes excluded seasons in General season Hunt Areas 9, 10, 12 and 110 did result in lower spike harvest rates in those hunts when compared to previous year's harvest rates. The proportion of spikes in the male harvest for the entire herd unit declined from 11% in 2014 to 5% in 2015. Antlerless elk accounted for 51% of the total 2015 elk harvest. Harvest rates, days per harvest, and harvest success rates under the current liberal hunting season structure continued to be considered acceptable. The addition of 50 Type 9 archery licenses in Hunt Area 11 in 2015 did not appear to significantly increase archery harvest rate in this area. In 2014, 11% of the overall elk harvest was attributed to archery; while in 2015, 15% of the overall elk harvest was attributed to archery.

Population

In 2015, we continued to use the CJ,CA spreadsheet model to simulate Snowy Range herd unit population dynamics. The other 2015 models in the spreadsheet model suite had either ceased to function due to predicting bull harvest exceeding the number estimated to be available; or were not biologically realistic (i.e. 50,000 elk in 1993). Without other information such as an independent abundance estimate or historical survival data to incorporate into the model, accuracy of estimates will continue to be unknown. We rated this model as poor, 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).

The 2015 postseason population estimate for the Snowy Range herd unit was 7,400 elk. The change in model types in 2014, and the relatively high 2014 calf ratio, increased the postseason population estimates by approximately 2,000 elk over what we were predicting prior to 2014. A decreasing trend in the annual estimate continued with CJ,CA model and was considered to be consistent with the observations by field managers. We considered the 2015 postseason population estimate produced by the CJ,CA spreadsheet model to be plausible.

Management Summary

The hunting seasons in the Snowy Range Herd Unit continued to provide opportunities to reduce the overall elk population. Elk numbers appear to be declining towards the management objective and we may need to consider reducing antlerless harvest rates in the not so distant future. The spikes excluded limitations were removed from all General season limitations for the 2016 hunting season.

Literature Cited

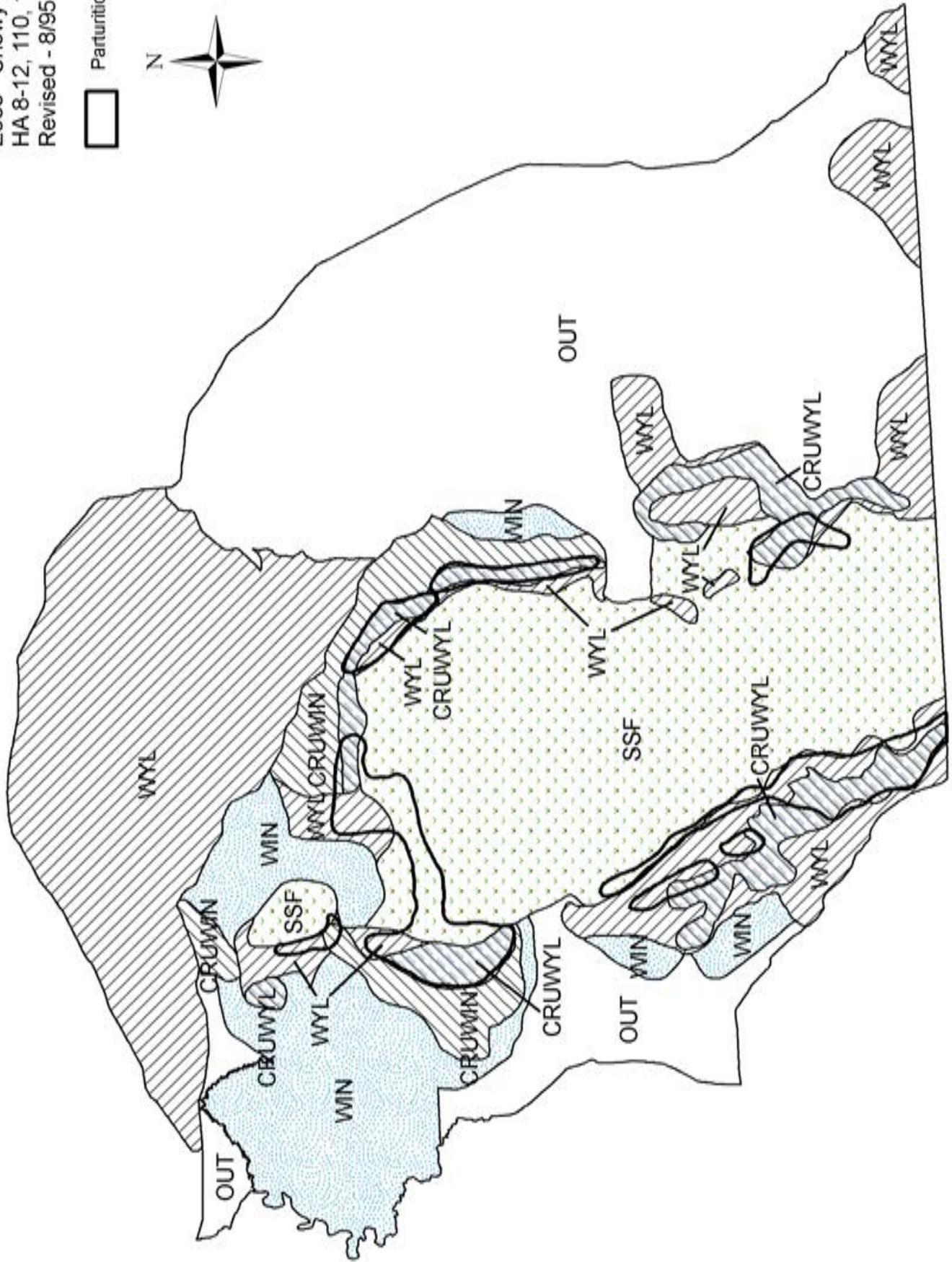
Morrison, T. 2012. User Guide: Spreadsheet Model for Ungulate Population data Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 41 pp.

Bibliography of Herd Specific Studies

Reeve, A.F., F.G. Lindzey, and S.H. Anderson. 2003. Elk population in Wyoming: 1978-2001. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, Wyoming. USA. 138pp.

E533 - Snowy Range
HA 8-12, 110, 114, 125
Revised - 8/95

□ Parturition Area



2015 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2015 - 5/31/2016

HERD: EL534 - SHIRLEY MOUNTAIN

HUNT AREAS: 16

PREPARED BY: WILL SCHULTZ

	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Trend Count:	0	1,759	800
Harvest:	358	348	360
Hunters:	594	620	625
Hunter Success:	60%	56%	58%
Active Licenses:	619	645	625
Active License Success	58%	54%	58%
Recreation Days:	4,576	4,838	4,550
Days Per Animal:	12.8	13.9	12.6
Males per 100 Females:	28	45	
Juveniles per 100 Females	42	40	

Trend Based Objective ($\pm 20\%$)

800 (640 - 960)

Management Strategy:

Special

Percent population is above (+) or (-) objective:

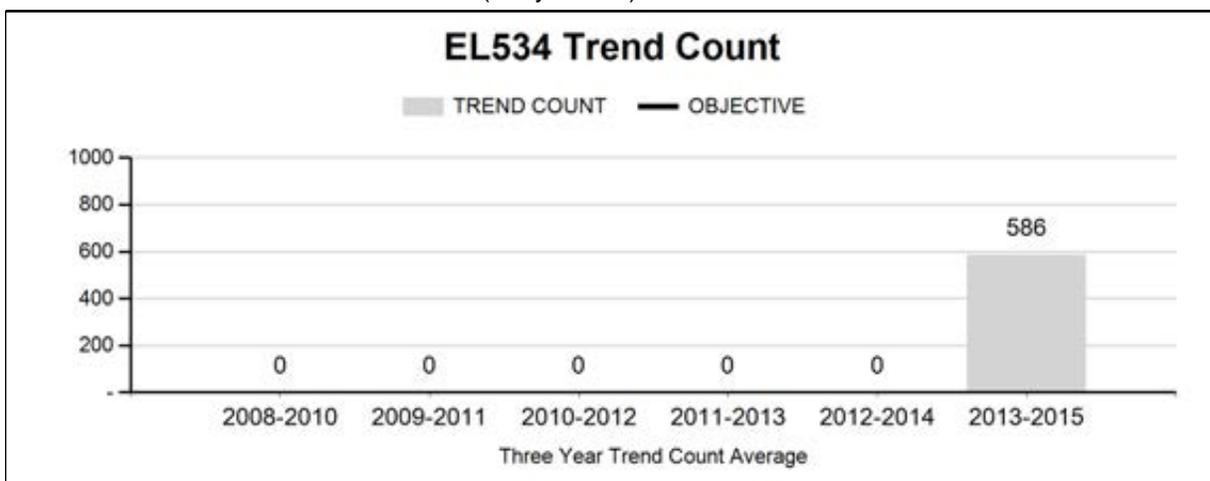
120%

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

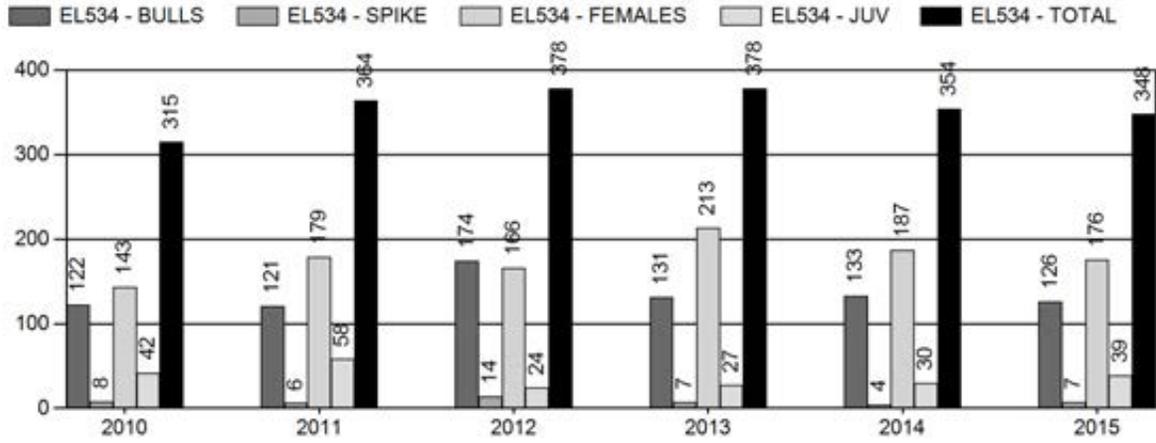
1

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

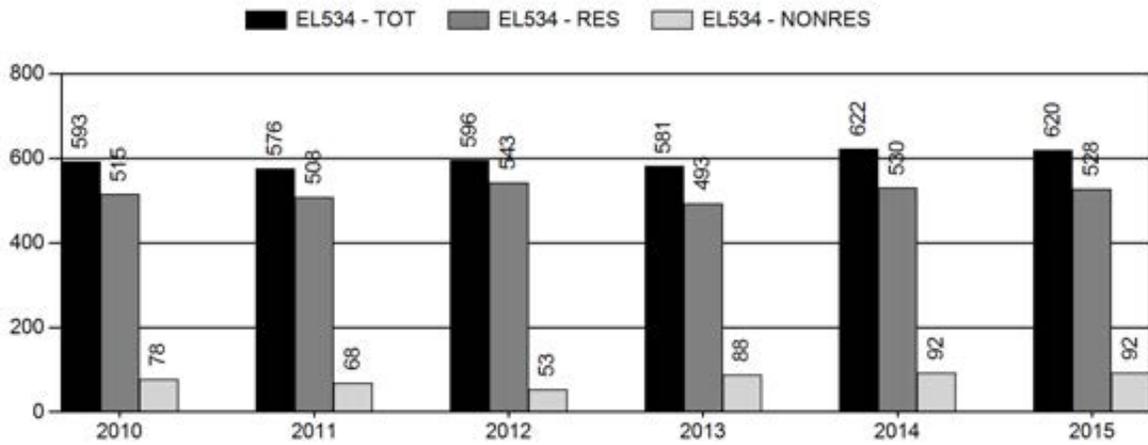
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	NA%	NA%
Males ≥ 1 year old:	NA%	NA%
Juveniles (< 1 year old):	NA%	NA%



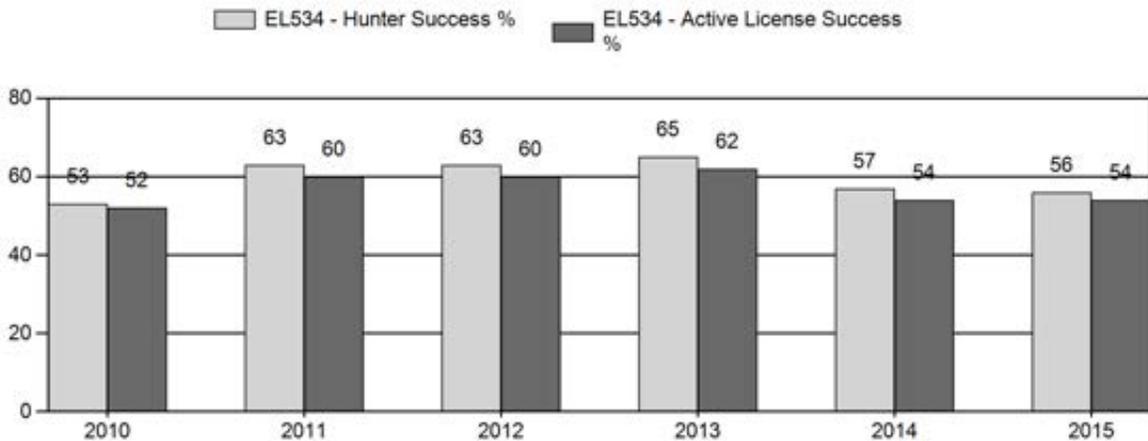
Harvest



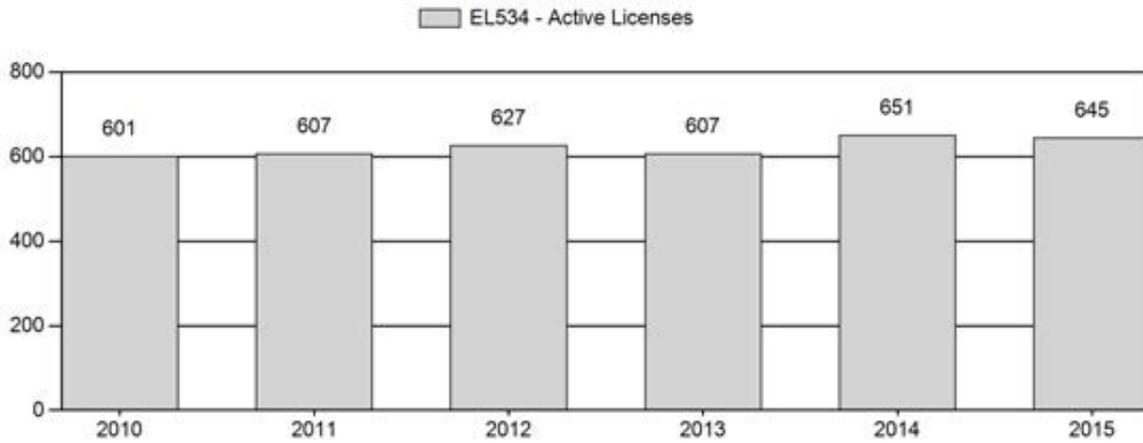
Number of Hunters



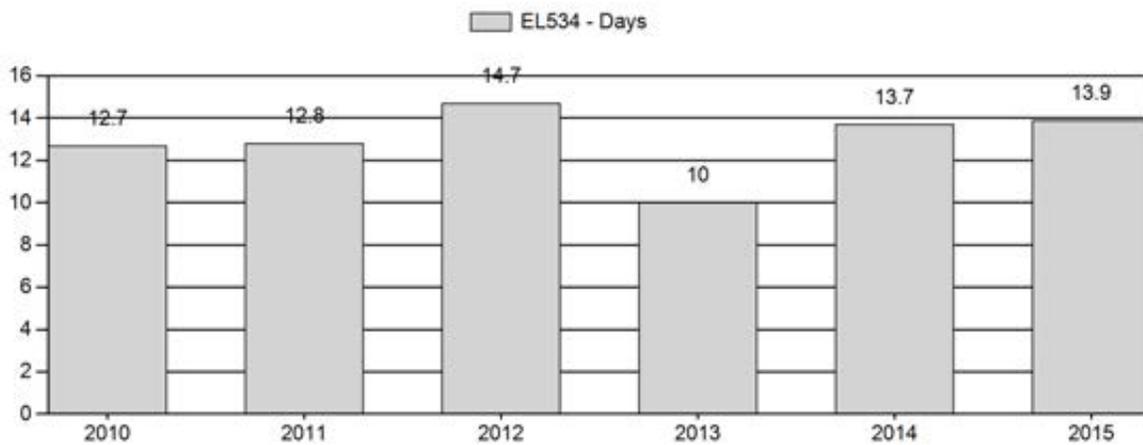
Harvest Success



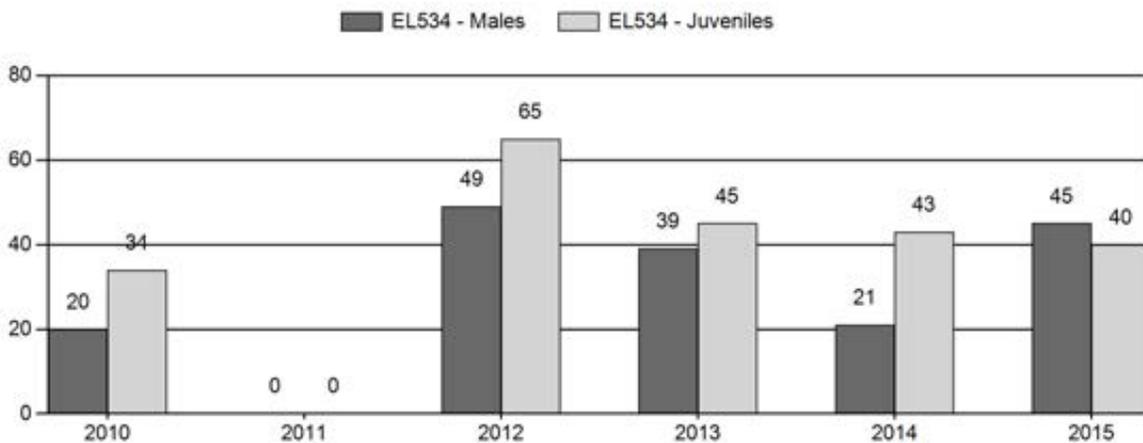
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Elk Herd EL534 - SHIRLEY MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylg	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	1,400	49	42	91	13%	449	65%	151	22%	691	469	11	9	20	± 2	34	± 3	28
2011	1,200	0	0	0	0%	0	0%	0	0%	0	500	0	0	0	± 0	0	± 0	0
2012	880	8	32	40	23%	81	47%	53	30%	174	420	10	40	49	± 11	65	± 13	44
2013	1,462	52	90	142	21%	365	54%	165	25%	672	568	14	25	39	± 4	45	± 4	33
2014	767	14	47	61	13%	294	61%	127	26%	482	395	5	16	21	± 2	43	± 4	36
2015	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0

**2016 HUNTING SEASONS
SHIRLEY MOUNTAIN ELK (EL534)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
16	1	Oct. 1	Oct. 31	150	Limited quota	Any elk
	1	Dec. 1	Jan. 31			Antlerless elk
	2	Nov. 1	Nov. 30	50	Limited quota	Any elk
	2	Dec. 1	Jan. 31			Antlerless elk
	4	Oct. 1	Jan. 31	300	Limited quota	Antlerless elk
	6	Aug. 15	Sep. 30	200	Limited quota	Cow or calf valid on private land
	6	Oct. 1	Jan. 31			Cow or calf
	Archery	Sep. 1	Sep. 30			Refer to license type and limitations in Section 3 of Chapter 7

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

Management Evaluation

Current Mid-Winter Trend Count Management Objective: 800 (640-960)

Management Strategy: Special

2015 Trend Count: 1,759

Most Recent 3-year Running Average Trend Count: Not available until 2017

2015 Hunter Satisfaction: 76% Satisfied, 11% Neutral, 13% Dissatisfied

Elk in the Shirley Mountain herd unit are managed toward a numeric objective of 800. The management strategy was changed in 2015 from recreational management to special management. The management objective was reviewed in 2015 and changed from a postseason population objective of 800 elk to a mid-winter trend count of 800 elk.

Herd Unit Issues

Wind energy developments are a relatively new land use in this herd unit. There are currently 2 wind farms in this herd unit and there is interest in developing more wind farms. Our ability to manage elk numbers through harvest is difficult because a large portion of the elk habitat in this herd unit is owned by one landowner who provides a very limited amount of access. Elk damage in this herd unit is minimal. Interchange of elk with adjacent herd units may compromise the closed population assumption for this herd unit. Annual population monitoring efforts and results have been highly variable.

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 elk. Mild fall temperatures and lack of persistent snow allowed elk 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/>

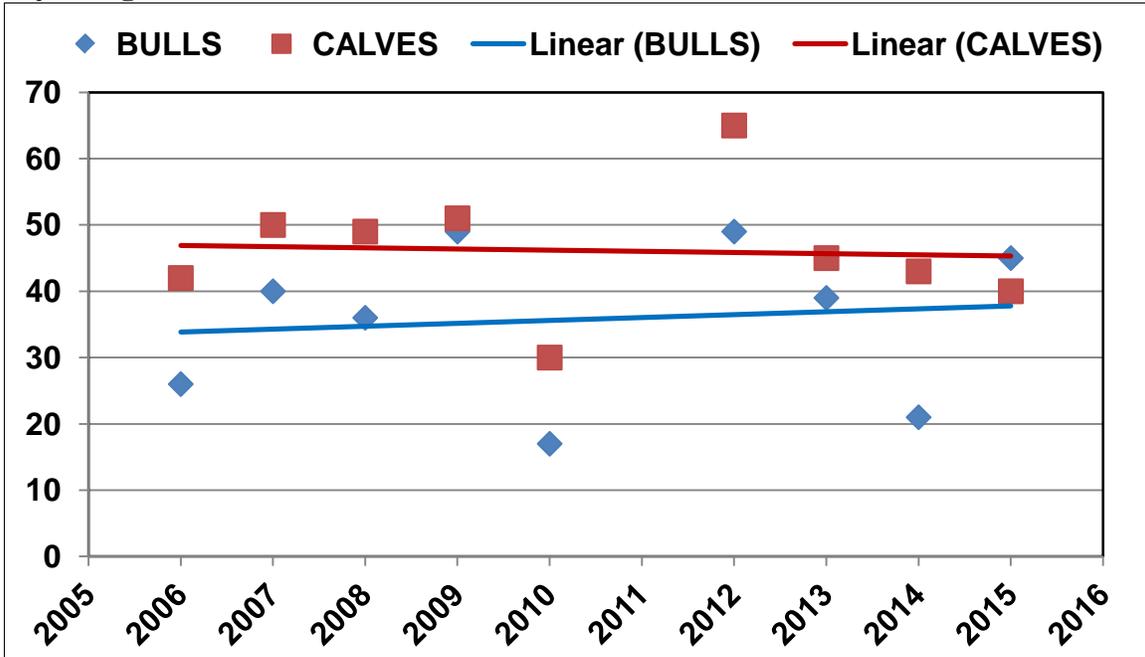
Habitat

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 sex and age classifications were conducted in conjunction with a mid-winter trend survey in March of 2016. The results were a total of 45 bull and 40 calves per 100 cows, from a sample of 1,759 elk. Figure 1 illustrates how the 2015 postseason ratios compared to previous classification results during the past 10-years. In previous years, the collection of classification data varied annually in methodology, primarily due to no dedicated survey flight budget for this herd. With the change in management objective type from a postseason population objective, to a mid-winter trend count objective, a dedicated budget for helicopter surveys has been established. This should result in more consistent sampling for sex and age data collection.

Figure 1. Shirley Mountain elk herd unit bull and calf ratio trend, 2006-2015, Wyoming.



Harvest Data

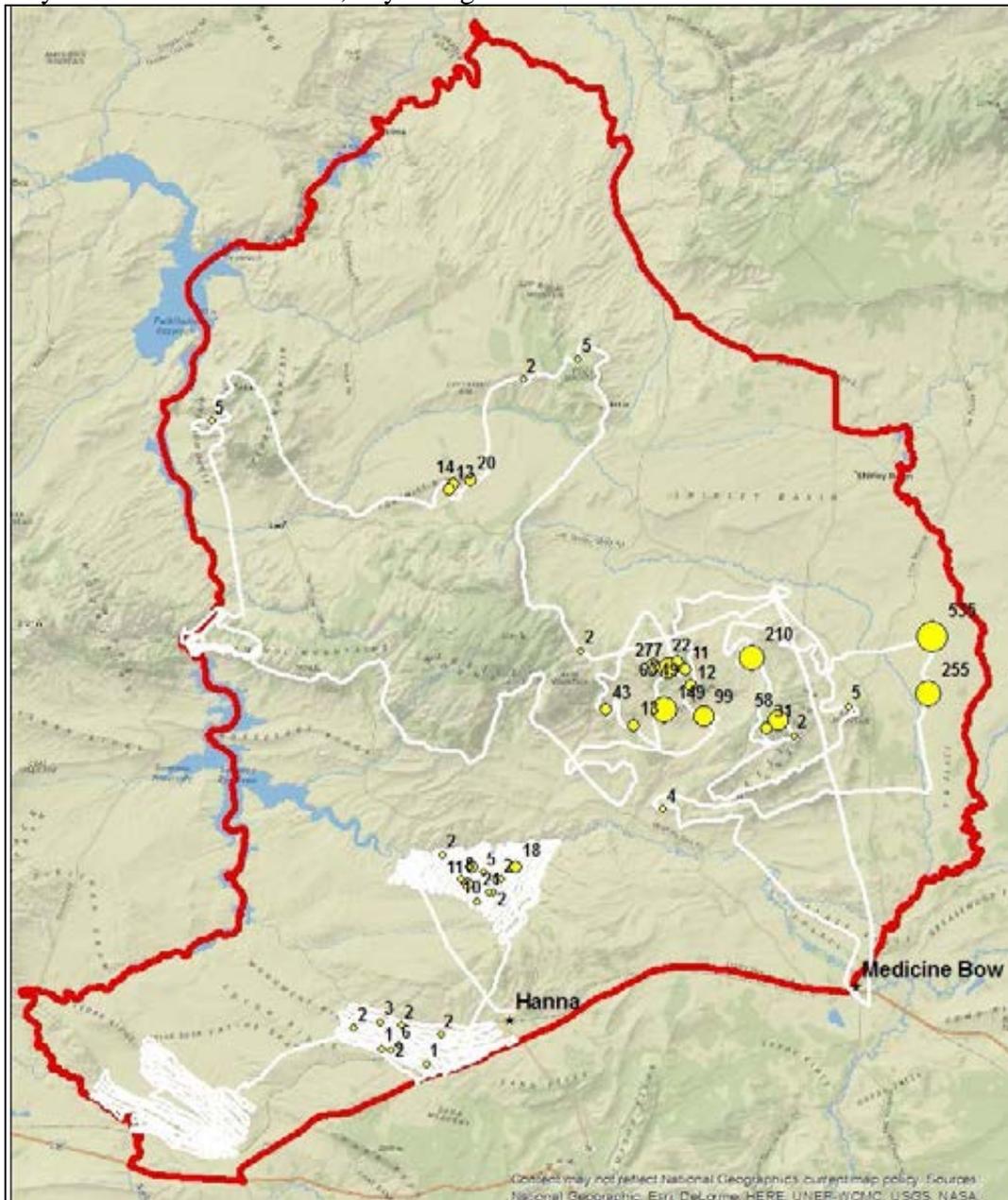
Preliminary elk harvest survey data indicated 620 active licensed hunters harvested 348 elk in 2015, with an overall success rate of 56%. 2015 had the fifth greatest number of elk harvested and the second greatest number of active licensed hunters ever recorded. The 2015 harvest success decreased 2% from 2014 harvest. 2014 bull harvest (n=133) was a 1% decrease from 2014. Antlerless harvest (n=217) decreased 13% in 2015.

Population

In 2015, we reviewed the management objective and converted from a population management objective of 800 elk postseason, to a mid-winter trend count objective of 800 elk postseason (Appendix I). The spreadsheet model which was previously used to develop the annual population estimate for elk in this herd unit did not function adequately enough to provide managers with a reliable estimate. This was the primary reason for changing from a population based management objective to a mid-winter trend count objective. Maintaining sustainable numbers of elk in the Shirley Mountain herd unit, while also maintaining bulls ratios within the special management parameters, is the ultimate management objective. Improving our monitoring techniques is keystone to insuring we are meeting these management objectives. Replacing the spreadsheet model derived population estimate with the mid-winter trend count as our management benchmark will provide for a more accurate assessment of annual elk numbers in the is herd unit.

A mid-winter trend count survey was completed in March of 2016 (Figure 2). A total of 1,759 elk were observed in the herd unit. This was a significant increase in the survey sample size when compared to previous helicopter surveys, covering relatively the same area in the herd unit. In 2010 we observed 691 elk and in 2013 we observed 672 elk during helicopter classification surveys. Two (2) large groups of elk ($n=255$ and $n=535$) were observed in the northeast portion of the herd unit. These 2 groups were suspected to have migrated into the Shirley Mountain herd unit from the adjacent Laramie Peak herd unit.

Figure 2. 2015 Mid-winter trend count and helicopter coverage and observations in the Shirley Mountain elk herd unit, Wyoming.



Management Summary

The 2016 hunting season recommendations were prescribed with the continued objectives of maintaining bull ratios within the special management parameters and maintaining approximately 800 elk postseason. The December and January seasons for the Beer Mug Mountain Hunter Management Area were discontinued at the request of the landowners. We retained the same number of licenses for the 2016 hunting season as were allocated in the previous 2 hunting seasons. Allowing Type 1 and Type 2 hunters to hunt for antlerless elk in December and January will assist in maintaining a sustainable population level.

Literature Cited

None

Bibliography of Herd Specific Studies

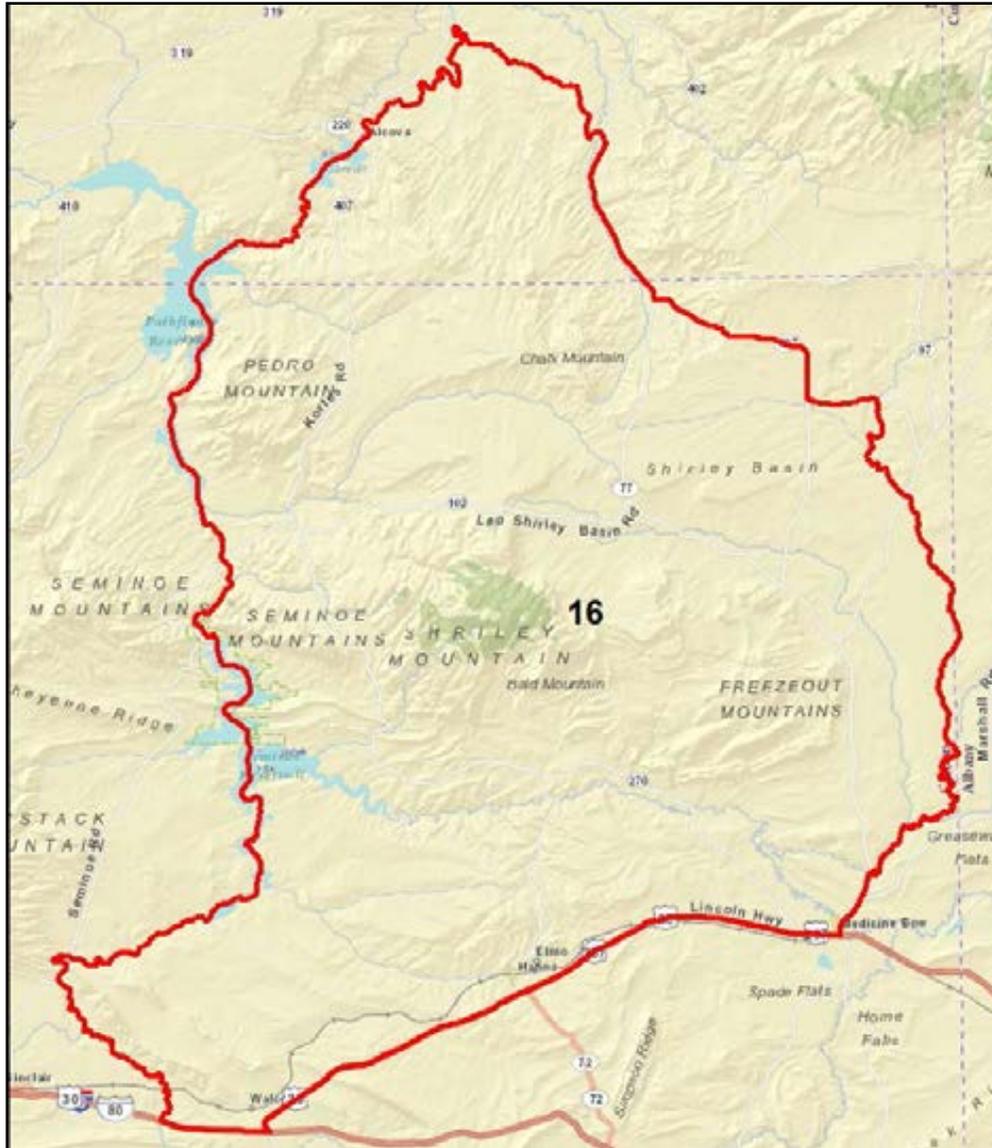
None

2015 SHIRLEY MOUNTAIN ELK HERD UNIT OBJECTIVE REVIEW

Prepared by: Will Schultz, Saratoga Wildlife Biologist

The Shirley Mountain elk herd unit consists of elk Hunt Area 16, and generally lies north of U. S. Highway 30, west of Wyoming Highway 487 and the Little Medicine Bow River, and south and east of the North Platte River, in south-central Wyoming (Figure 1). The herd unit contains the Shirley, Chalk, 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 elk.

Figure 1. Map of the Shirley Mountain elk herd unit, Hunt Area 16, located in south-central Wyoming.



The Shirley Mountain Herd Unit encompasses 4,548 km² of occupied elk habitat. Land ownership consists of 55% mixed federal lands, primarily Bureau of Land Management, 35% private ownership, and 10% Wyoming Office of State Land and Investments land. 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 elk habitat.

CURRENT POPULATION OBJECTIVE REVIEW

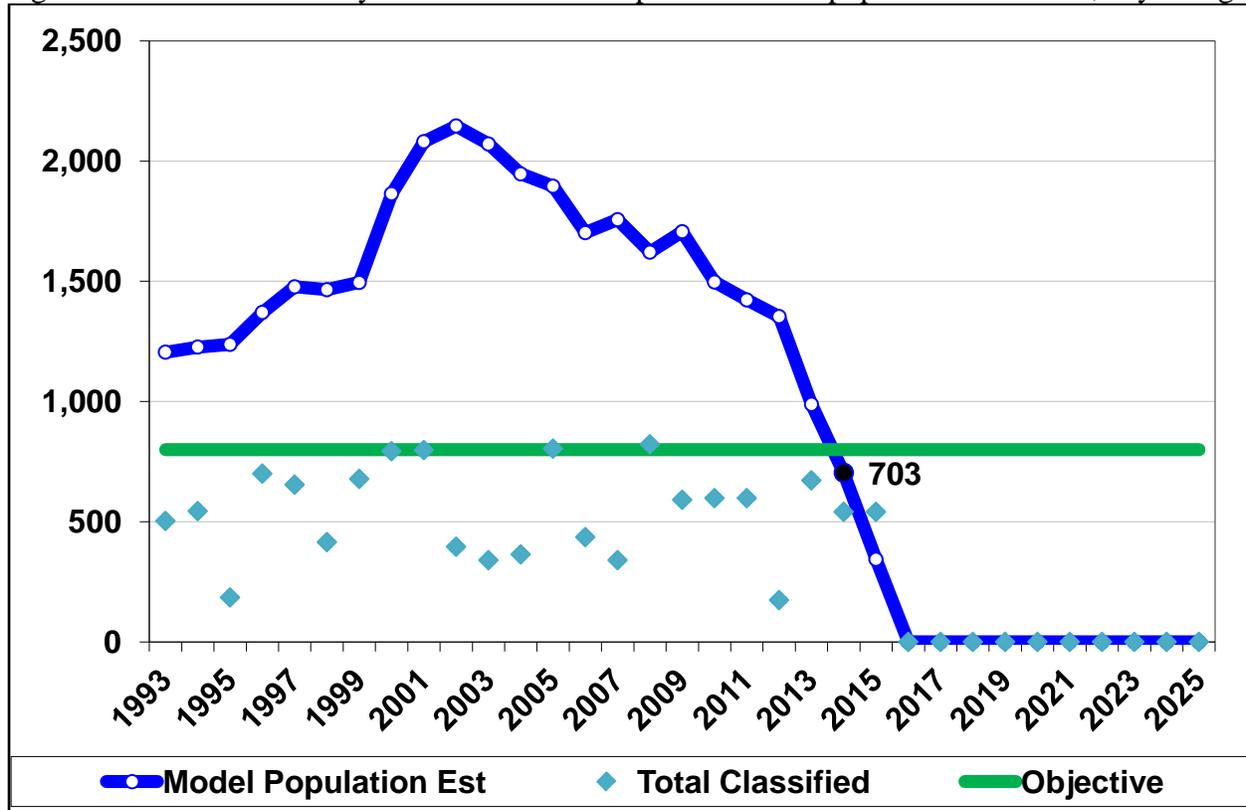
Wyoming Game and Fish Department (WGFD) traditionally has used postseason population objectives as a guide for elk management at the herd unit level. The postseason population objective is the desired number of elk remaining in the herd unit after the annual hunting season has been completed. Generally, 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 elk 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 elk toward the population objective.

In 1978, WGFD adopted the first postseason population objective of 800 ($\pm 20\%$) elk for the Shirley Mountain herd unit. Subsequently, the objective was reviewed in 1997 and retained at 800 ($\pm 20\%$) elk. The Shirley Mountain herd unit population objective of 800 ($\pm 20\%$) elk has not been reviewed since 1997.

Computer based population models have been used by WGFD to simulate elk population dynamics since the mid 1980s. These models use annual harvest and postseason age/sex classification survey data in conjunction with standardized parameters for population indices such as reproduction, survival, etc. to simulate the dynamics for the population. Annual population estimates from the model are then compared to the population objective to determine the appropriate management direction and harvest prescription. Shirley Mountain herd unit hunter-harvest survey sample sizes have been adequate (80% confidence interval) for use in the population model. However, postseason elk 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. This has been an issue when the surveys were completed from the ground. Elk can be difficult to locate and accurately survey postseason from the ground in this herd unit due to inaccessibility caused by winter weather and topography. Helicopters have been employed sporadically in recent years to conduct the postseason classification surveys unit due to flight budget prioritization but these surveys produced adequate sample sizes. 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). This spreadsheet model currently used WGFD may not accurately simulate elk population dynamics, particularly with relatively smaller populations (Andrew Holland, Colorado Division of Parks & Wildlife, personal communication).

The 2014 postseason population estimate from the spreadsheet model was 703 elk (Figure 2). The 2014 estimate was considered to be biologically plausible, despite the limitations of the current spreadsheet model described earlier in this section. However, the historic population levels calculated by the model, along with the current precipitously decreasing trajectory do not appear to be a reasonable representation of the elk population dynamics for this herd unit.

Figure 2. 1993-2014 Shirley Mountain herd unit postseason elk population estimates, Wyoming.



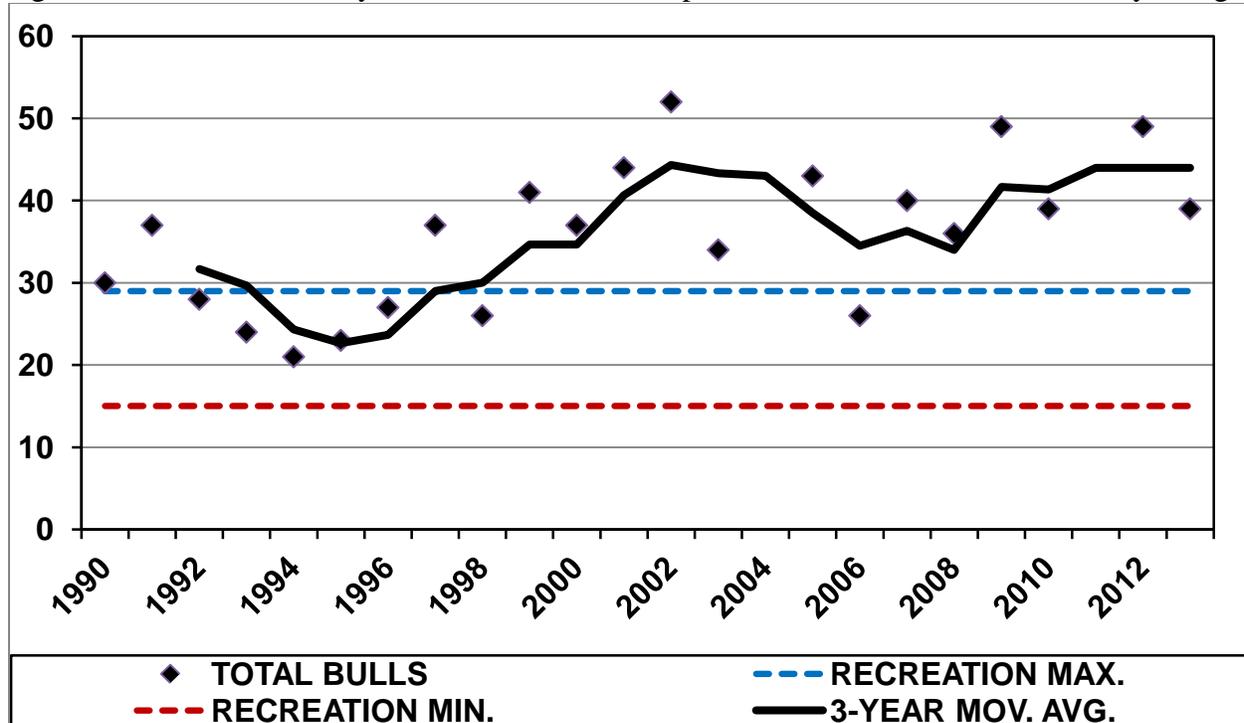
Another factor which has made modeling this elk population difficult has been interchange of elk with adjacent herd units. Although the exact rate of interchange is unknown, interchange has been documented anecdotally by radio-collared elk. By WGFD definition, a big game herd unit assumes the interchange rate to be less than 10% of the estimated population. Although the rate of actual interchange for the Shirley Mountain herd unit is unknown, it is speculated it may violate the 10% threshold.

CURRENT MANAGEMENT STRATEGY

Shirley Mountain herd unit is entirely contained in elk Hunt Area 16 and is managed under the recreational management strategy. This strategy directs managers to optimize recreational opportunity, while managing harvest rates to maintain 15-29 bulls/100 cows postseason in the herd unit. However, since 2006, bull ratios in this herd unit have exceeded the parameters for recreational management (Figure 3). This is due to a lack of consistent public hunting access in areas inhabited by bulls during the hunting season. Currently, elk hunting in this herd unit is

permitted by a limited quota elk license. In recent years, WGFD has recommended liberal seasons for this herd unit with extended season lengths and additional cow or calf licenses in an attempt to maintain or decrease the numbers of elk in this herd unit.

Figure 3. 1990-2013 Shirley Mountain elk herd unit postseason bulls/100 cows ratio, Wyoming.



RECOMMENDED HERD UNIT OBJECTIVE AND MANAGEMENT STRATEGY

WGFD recommends the postseason population objective of 800 ($\pm 20\%$) elk, derived from the spreadsheet model be converted to a mid-winter trend count objective of 800 ($\pm 20\%$) elk. This type of management objective would provide a quantifiable population goal yet eliminate issues associated with developing annual spreadsheet model estimates for this herd unit. This management objective is considered both biologically achievable, and sustainable.

WGFD also recommend converting from a recreational management strategy to the special management strategy in the Shirley Mountain elk herd unit. Adopting the special management strategy will align our ability to effectively manage bull ratios through harvest with hunter access to bull elk in this herd unit. WGFD believes the mid-winter trend count and a special management strategy to be realistic objectives to manage elk in this herd unit towards.

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 elk herd unit population objective, and to provide comment on

the recommendations. Elk are a species of great concern for many of the stakeholders who participated in the review process.

Landowner Involvement

In February of 2015, a letter describing the objective review process and a survey were sent to all landowners (n=67) who owned at least 160 acres in the Shirley Mountain herd unit (ATTACHMENT A). WGFD received 25 survey responses from landowners for a return rate of 37%. Of the 21 landowners who responded to Question 1 about how satisfied they were with current elk numbers, 62% indicated they were somewhat satisfied or very satisfied with the current elk population, and 38% were somewhat dissatisfied or very dissatisfied with the current elk population (ATTACHMENT B). Most landowners who were dissatisfied were so because they thought there were too many elk in the herd unit. When asked what landowners thought about the current objective of 800 ($\pm 20\%$) elk in Question 3, 10% of the 21 landowners who responded indicated the objective needed to be increased, 14% thought it should be decreased, and 76% 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 meetings (PIGM) in Cheyenne, Hanna, and Laramie. We received only one (1) written comment on the Shirley Mountain elk objective review (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 elk objective recommendation (ATTACHMENT D). All 7 (100%) written comments supported the recommendation,

In summary, most landowners and sportsmen would like to see about the same or less elk than what is currently in the herd unit. All of the written comments WGFD received at the March PIGMs were in support of the recommendation to convert the management objective from a postseason management objective of 800 ($\pm 20\%$) elk to a mid-winter trend count objective of 800 ($\pm 20\%$) elk. These written comments also supported the recommendation to change from a recreational management strategy (15-29 bulls/100 cows postseason) to a special management strategy (30-40 bulls/100 cows postseason) in the Shirley Mountain elk herd unit.

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.

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.

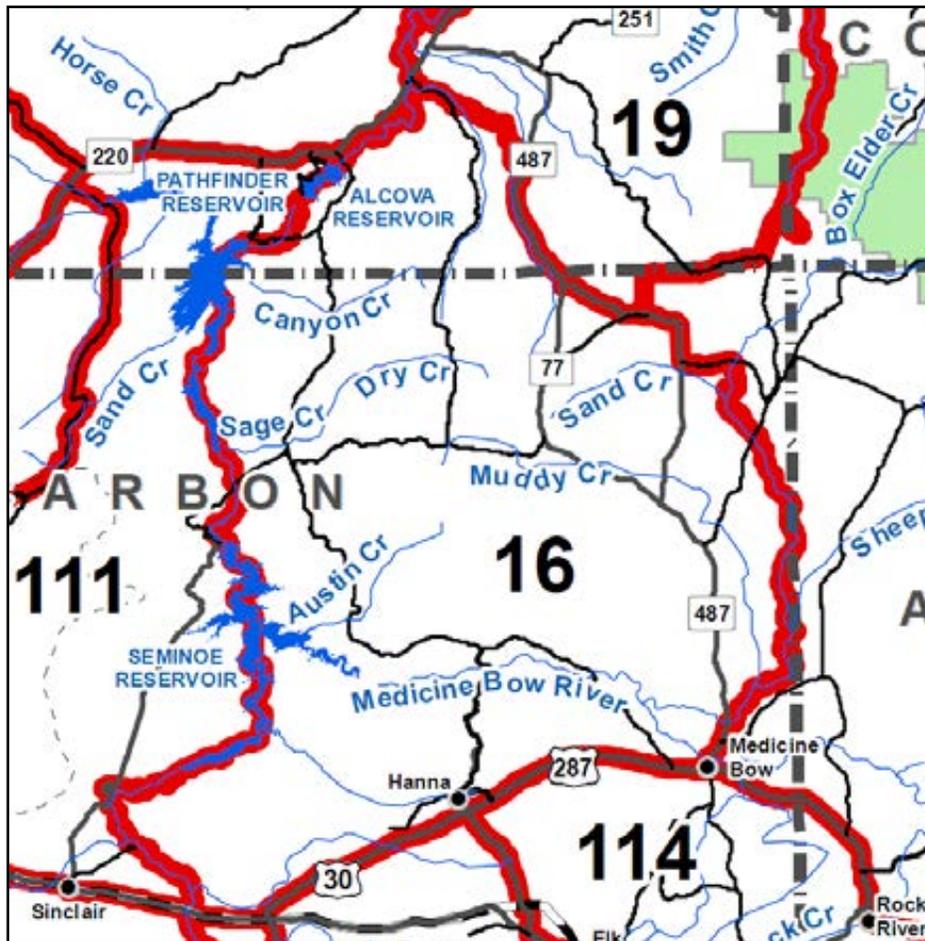
Sincerely,



Will Schultz
Saratoga Wildlife Biologist

WS/ws

Elk Hunt Area 16 contains the entire Shirley Mountain Elk Herd Unit.

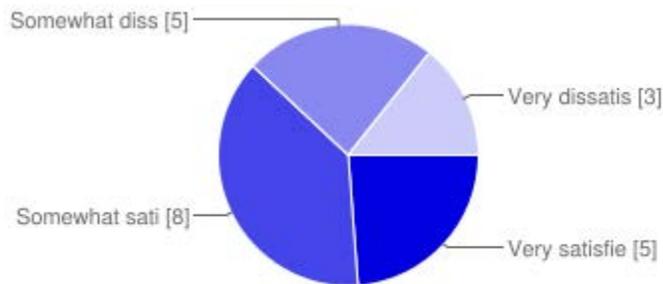


Shirley Mountain Elk Landowner Survey

67 surveyed / 25 responses

Summary

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

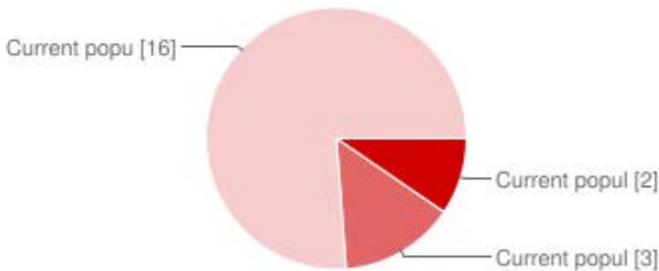


Very satisfied	5	24%
Somewhat satisfied	8	38%
Somewhat dissatisfied	5	24%
Very dissatisfied	3	14%

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

There are too many elk in the population	7	28%
There is the right amount of elk in the population	9	38%
There are too few elk in the population	4	17%
Other	4	17%

3. What do you think about the current post-season population objective of 800 (640-960) elk?



Current population objective needs increased	2	10%
Current population objective needs decreased	3	14%
Current population objective is acceptable	16	76%

Additional comments

Hi Will- As I said no data from me. Red Desert elk come up to our Windy Hill I80-Reiner exit 196. Frank 530-219-4477

On the one section of pasture I own I haven't seen an elk on the place. I have seen a few antelope.

The herd needs to decrease to more traditional numbers, pre 1995 or so. The Game and Fish hands are tied because a large part of the area is not available for a proper harvest increasing animal use days on access available land during non-hunting dates. I was told a few years back we did not have a food source for wolves so we should not be concerned about them. With the elk population increasing and access being denied for hunting i think we are creating a food source the Game and Fish can not manage and most hunters and landowners don't want.

Elk in outfitting areas have become scarce. They end up concentrated on private land in or near the Shirley Mtns.

I think you are doing a great job. Thank you. -Ken Hunt

We seldom see many elk.

Despite popular belief the elk population woes are not entirely the fault of the Q Creek Ranch. The hunters are generally pathetic, as they have little idea of what it takes to stalk and kill an elk. The G&F needs to open up more types of tags. Perhaps they could work with the Q to open a late cow season on THE ENTIRE area.

Garrett Ranch is on the northern boundary of area 16. So the elk really don't get on us too much. What there is we can live with. Our main concern is all the antelope that come out of area 47 and 48 to winter down here. We winter between 1,500 and 4,000 head. They don't migrate any farther down. That is a rise in number in area 322, too damn many to winter.

We have state and federal leases with small amount of private land on the very eastern boundary by county road 2 and Little Med River. This pasture is used summer grazing only. Have never encountered elk on property. There is possibility of some winter use, but not witnessed. I feel unqualified to answer questions.

The elk herds have a good population in the area. But access to private land seems like it is getting harder in the area especially when the bow hunters have the elk run off to the private land prior to rifle season. Maybe if there was a week of non-hunting in between this might help some of the public land hunting.

Shut season off end of November- October-November only

I don't know enough about this herd to comment- Marvin Cronberg

Your Casper crew has done a nice job in responding to landowner concerns here on the Platte River. Without knowing what your population objective was 10 years ago, it is somewhat difficult to answer question 3. I can only use population numbers on our ranch to answer question 2.

I have property in the Pedro mountains. There was a small herd that stayed in the area at one time. Now they usually move through to join the larger herds. Better vegetation last year. have seen more activity over the winter. Larry Rubis- 307-259-2204



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSELM
AARON CLARK
KEITH CULVER
MIKE HEALY
T. CARRIE LITTLE

Shirley Mountain Elk Herd Unit Objective Review

1. How satisfied are you with the current Shirley Mountain elk 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 800 (640-960) elk?

- 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 think theres is too many I think
the ~~herd~~ hunter management areas help
and would really like to see more*

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

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSEMI
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

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.

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 Tamilla

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

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAE

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.

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.

I support this proposal

I do not support this proposal

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!



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAELE

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.

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

I support this proposal

I do not support this proposal

Shirley Mountain Elk

Current population estimate = 800 elk

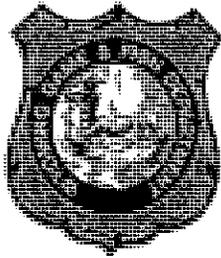
Management Strategy: Recreational

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSEMI
PATRICK CRANK
KEITH CULVER
T. GARRIE LITTLE
DAVID RAEI

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.

- 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.

- I support this proposal
- I do not support this proposal

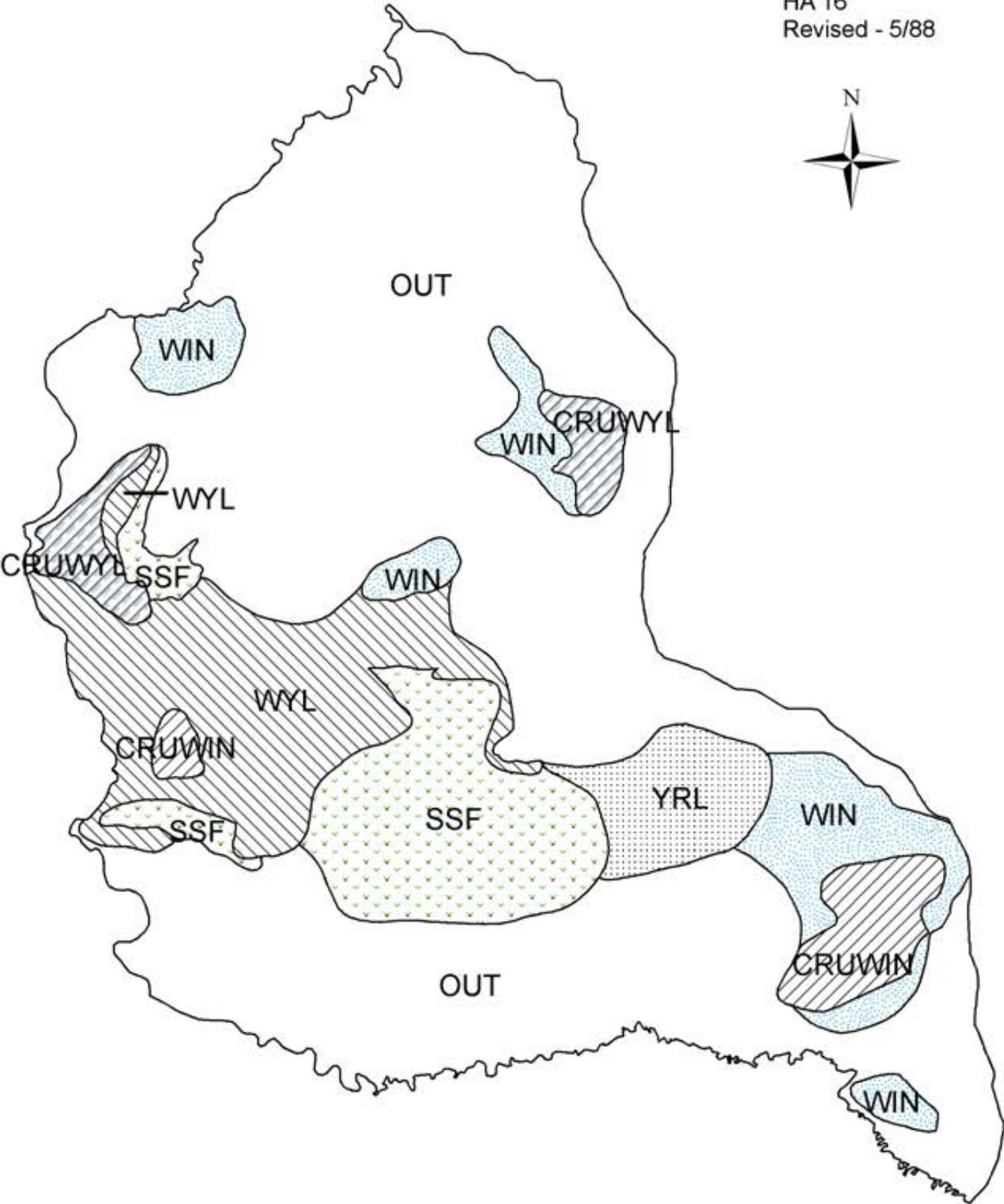
Comments:

Elk - maintain the quality

Deer - Area 20 was much better for deer years ago when it was a limited quota area.

[Handwritten Signature] 3/25/15

E534 - Shirley Mtn.
HA 16
Revised - 5/88



2015 - JCR Evaluation Form

SPECIES: Elk

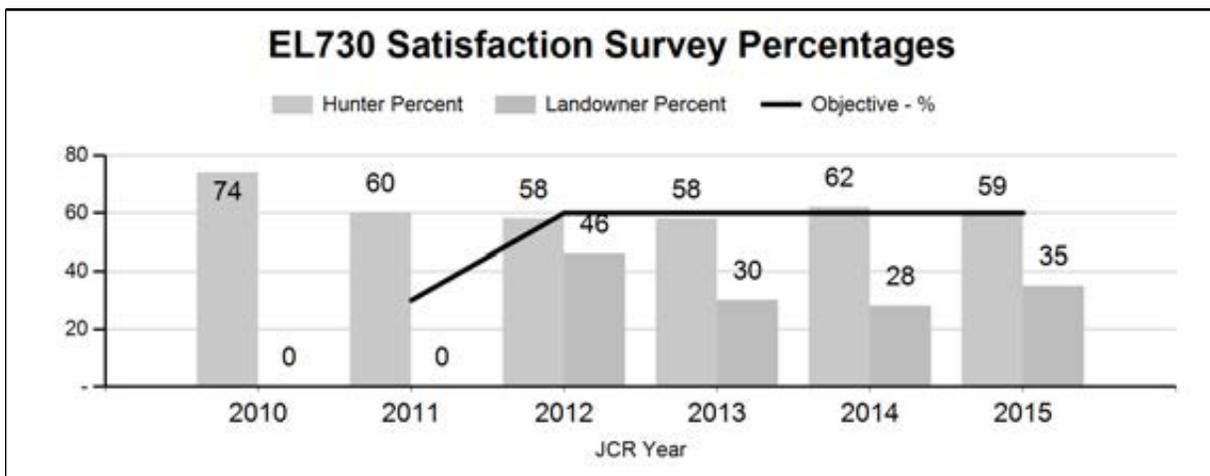
PERIOD: 6/1/2015 - 5/31/2016

HERD: EL730 - RAWHIDE

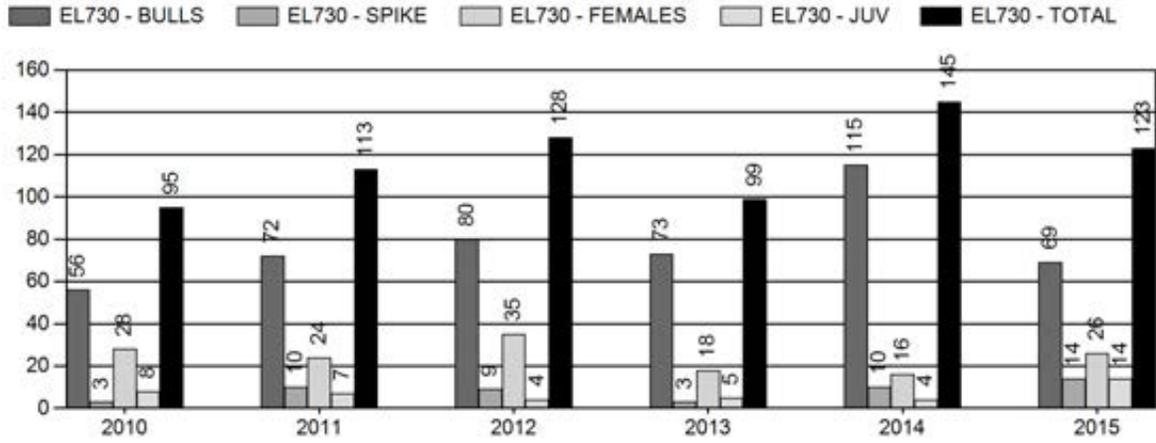
HUNT AREAS: 3

PREPARED BY: MARTIN HICKS

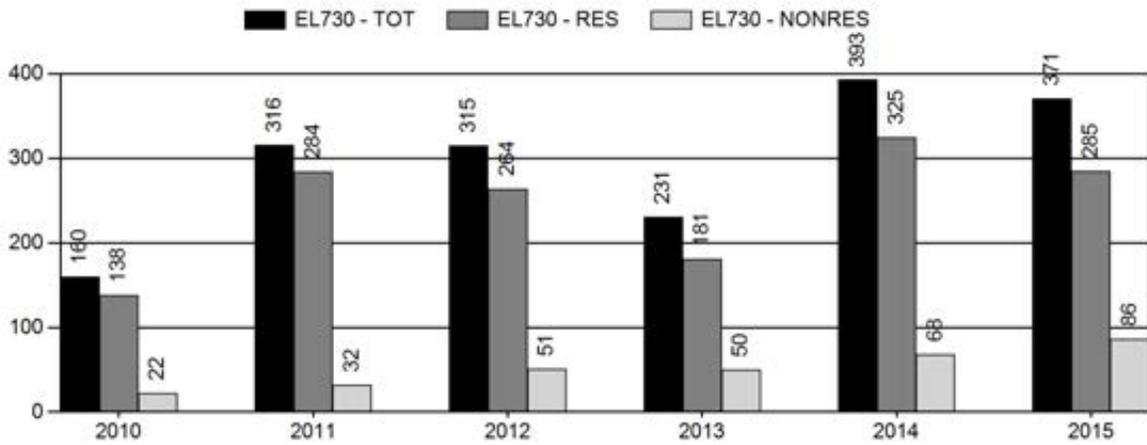
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Hunter Satisfaction Percent	62%	59%	60%
Landowner Satisfaction Percent	38%	35%	60%
Harvest:	116	123	115
Hunters:	283	371	350
Hunter Success:	41%	33%	33%
Active Licenses:	301	387	360
Active License Success:	39%	32%	32%
Recreation Days:	2,193	2,439	2,400
Days Per Animal:	18.9	19.8	20.9
Males per 100 Females:	52	0	
Juveniles per 100 Females	61	0	
Satisfaction Based Objective			60%
Management Strategy:			Special
Percent population is above (+) or (-) objective:			-13%
Number of years population has been + or - objective in recent trend:			2



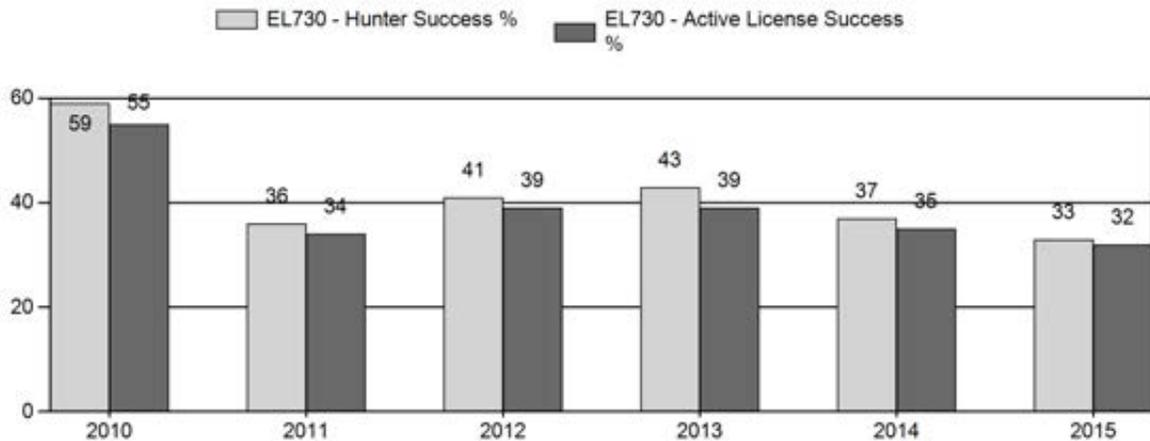
Harvest



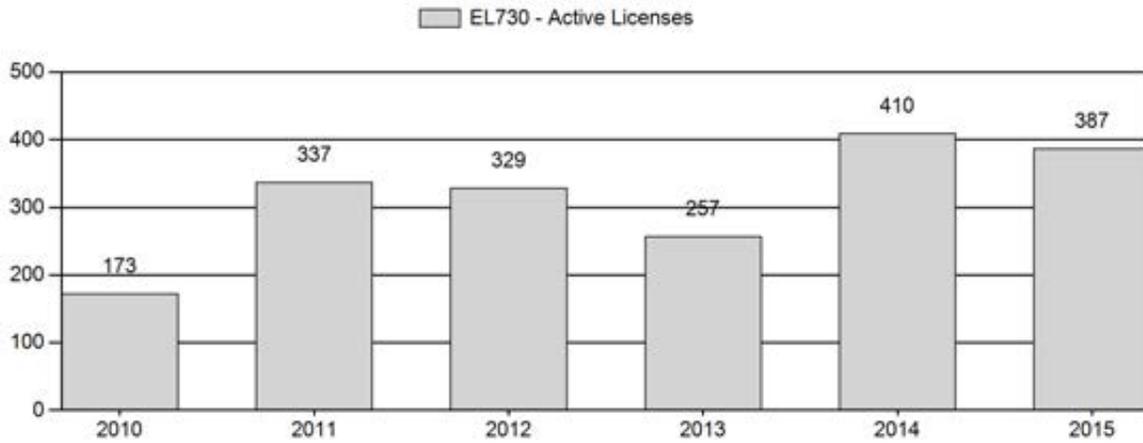
Number of Hunters



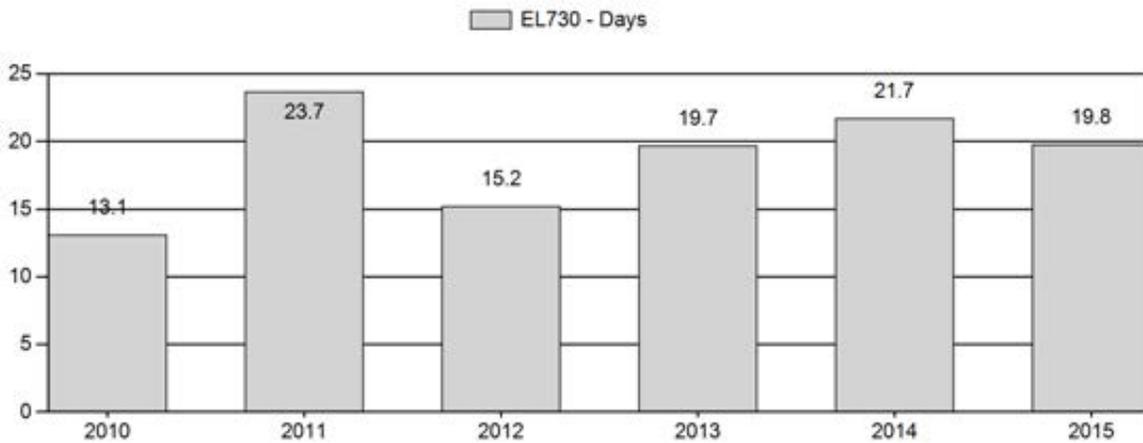
Harvest Success



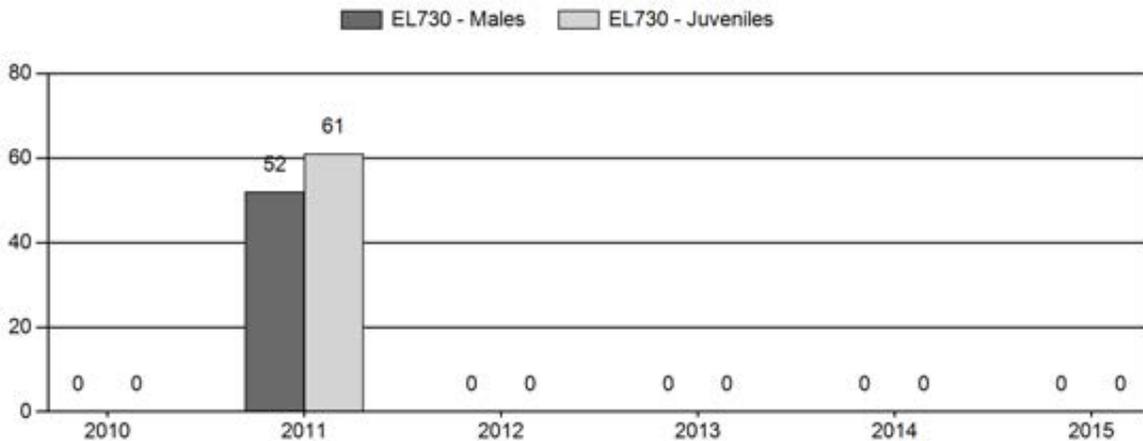
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**RAWHIDE ELK HERD (730)
2016 HUNTING SEASONS**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
3	Gen	Sept. 15	Oct. 14		General	Any elk
		Oct. 15	Jan. 31			Any elk south of U.S. Highway 26
3	6	Aug. 15	Nov. 30	200	Limited quota	Cow or calf
3	6	Dec. 1	Jan. 31			Cow or calf elk south of U.S. Highway 26

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
3	Sept. 1	Sept. 14	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
3	6	0

Management Evaluation

Current Hunter/Landowner Satisfaction Management Objective: 60% landowner/hunter satisfaction: bull quality; Target goal: \geq 61% branch antlered bulls in harvest survey

Management Strategy: Special

2015 Hunter Satisfaction: 60% Satisfied, 23% Neutral, 17% Dissatisfied

2015 Landowner Satisfaction Estimate: 35%

Most Recent 3-year Running Average Hunter Satisfaction Estimate: 59%

Most Recent 3-year Running Average Landowner Satisfaction Estimate: 31%

2015 Bull Quality: 82% branch antlered bulls in harvest survey

Most Recent 3-year Running Average Bull Quality: 92% branch antlered bulls in harvest survey

Management Issues

The management objective for this herd was changed in 2012 from a post-season population objective of 40 elk to a nonnumeric population objective based on landowner and hunter satisfaction and the percentage of branch antlered bulls in the harvest. The management strategy was changed from recreational to special. We will follow trends over time to make management decisions based on constituent satisfaction and bull harvest parameters. There is not a working model for this herd unit due to our inability to collect adequate population data.

This herd unit has been difficult to manage based on our inability to collect adequate herd composition data along with field harvest data. Based on field personnel and landowner observations we estimate there are over 400 elk in the Rawhide Elk Herd, with the population expanding south of the North Platte River into Goshen, Platte and Laramie Counties. There have been several public meetings to address the increasing population, and as a result the herd boundary was expanded south to the Colorado border for the 2012 season. Additionally the portion of Area 3 north of U.S. Highway 26 was changed to a general season for the 2014 season (the southern portion was changed to a general in 2011).

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 Rawhide 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. While early season growing conditions were optimal, late summer and fall precipitation were lacking.

Areas burned by wildfires within the last 10 years have responded mostly favorably due to reduction in conifers and enhancement of herbaceous plant communities. Cheatgrass continues to be a major threat to native rangelands and big game ranges in this herd unit. Some portions of burned areas are predominantly cheatgrass, and will likely remain in that state unless treated with herbicides.

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/Harvest Data

Harvest success and effort has fluctuated around 38% and 20 days per harvest. Harvest is driven by access and if hunters are limited to public land, success decreases and effort increases. Finding elk in this herd unit can be difficult due to landownership patterns. Access is restricted to the Broom Creek HMA north of US Hwy 26 and is dependent on crop damage south of US Hwy 26. A majority of landowners do not want elk south of the highway and are willing to allow access. In 2011 elk were plentiful and hunters were successful. In 2012 the severe drought displaced elk and they were not found in traditional places (i.e. alfalfa fields). In 2014 and 2015 above average spring and summer precipitation re-distributed elk which increased forage production and as a result elk were not dependent upon irrigated crops. Elk that were traditionally found within Whalen Canyon appear to have re-distributed to other areas of the herd unit. The percent of branched antlered bulls in the harvest survey was 82%, a decrease from 2014. Hunters and landowners have made the observations that there are fewer trophy quality bulls within the Rawhide Hills, Haystack Range, and Wildcat Hills. Our ability to manage this segment of the population is limited due to access and adult bulls within the harvest will likely remain high. The high percentage of branch antlered elk is indicative of the quality of bulls and the amount of private land that provides sanctuaries to allow bulls to reach maturity.

Licenses numbers have fluctuated from 50 to 200 over the years. Starting in 2011 that portion of Hunt Area 3 south of U.S. Highway 26 became a general season. After several public meetings over the past three years coupled with a landowner survey it was decided to convert that portion of Area 3 north of US Hwy 26 from a limited quota area to a general hunt area. However, in 2015 landowners north of U.S. Hwy 26 voiced their concern that elk were no longer in their traditional areas and therefore damage issues have decreased. Lack of elk and damage will prompt managers to propose to close the Type 6 season north of U.S. Hwy 26 on November 30.

Since this herd unit changed to a satisfaction management evaluation and the percent of branch antlered bulls in the harvest we no longer collect classification data.

Landowner/Hunter Satisfaction Survey Results

The landowner satisfaction survey results (Appendix A) showed that 35% of the landowners were satisfied elk were at or about at desired levels, 17% indicated elk were above desired levels and 47% indicated the elk population was below desired levels. There were 23 surveys returned for a 35% return rate, slightly higher than 2014, which had a return rate of 30%. Return rate exceeded the 25% threshold required for the satisfaction survey. Based on the past three years of surveys landowners are still not pleased with the number of elk. Based on input from the field, meeting and survey comments, about half of the landowners want to reduce elk and the other half want to manage for trophy bulls. Bringing their satisfaction up to 60% will be a challenge. The hunter satisfaction survey indicated that 57% were satisfied with their hunt. This is similar to 2014 and given there have not been any management changes to the elk population the percent of satisfied hunters appears reasonable.

There was also some concern voiced by some landowners that the general firearm season was too early. Since the opening date for the general firearm coincides with the breeding season

there was concern from some landowners in the northern portion of the hunt area that bull quality and quantity was decreasing since they were more susceptible to harvest . Survey results indicated that 57% of the landowners thought the opening date was just right. Based on the survey results a proposal to change the opening date will not be submitted.

Management Summary

In summary, the 2016 season is designed to reduce elk numbers particularly in the southern portion of the herd unit. The Type 6 license will decrease by 62 days north of U.S. Hwy 26. We hope to attain a harvest of 115 elk.

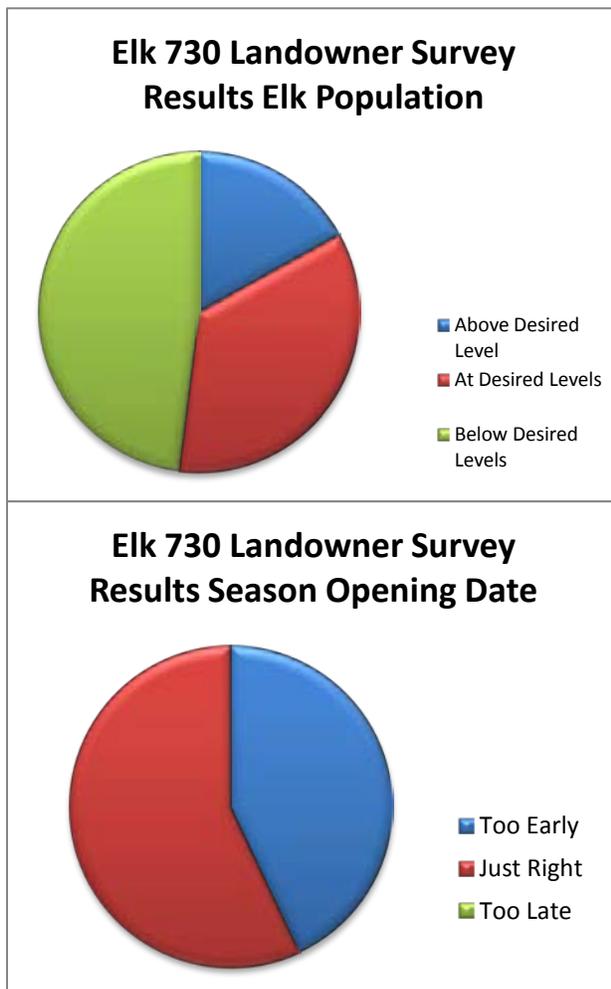
Appendix A

2015 Elk 730 Landowner Summary

Please indicate your satisfaction level with current elk population:

17.4% 47.8% 34.8%

1- Above Desired Levels	4	
2- At or About at Desired Levels	8	
3- Below Desired Levels	11	
1- Above Desired Levels	4	17.4%
2- At or About at Desired Levels	8	34.8%
3- Below Desired Levels	11	47.8%



Do you think the general firearm season opening date (Sept 15) is:

57.1%42.9%

1- Too Early 9

2- Just Right 12

3- Too Late 0

1- Too Early 9 42.9%

2- Just Right 12 57.1%

3- Too Late 0 0%

Additional Comments

The general license has created multiple problems for landowners. Poaching, trespassing, trash. Landowners get no benefit. Locals run all over you, but can't sell out of states hunts because they are still a draw.

Do not want the elk!

Where I live here south of the Rawhide Buttes we haven't seen any elk for 6 or more years.

Guess there is elk on the Glen Southwise Ranch, but he won't let any of his neighbors hunt as he wants to get Big Football Stars something like that to pay him 5 to 10 thousand dollars to get one. That's my opinion about the elk. We use to have elk down toward Gurnsey haven't seen any there for quite some time.

We have not seen signs of any elk in our vicinity and have only heard of any sightings of a few odd elk in several years. So as far as we are concerned there is not a Rawhide herd anymore.

Don't know the reasons, but the overall elk population in this area is down from previous years. It was tough to even see an elk after 5 days of hunting. Hunting the elk during the rut (Sept 15) adds to the ability to locate elk.

Would like to see the bull season moved back away from the rut. Oct 15 or Nov 1 start would be great.

I really don't like the general license-Thanks

1 elk east of I-25 is too many!!

I liked having the longer season. It would be nice to have a tag that would allow one to harvest a bull or a cow for the first month and then cows only until January.

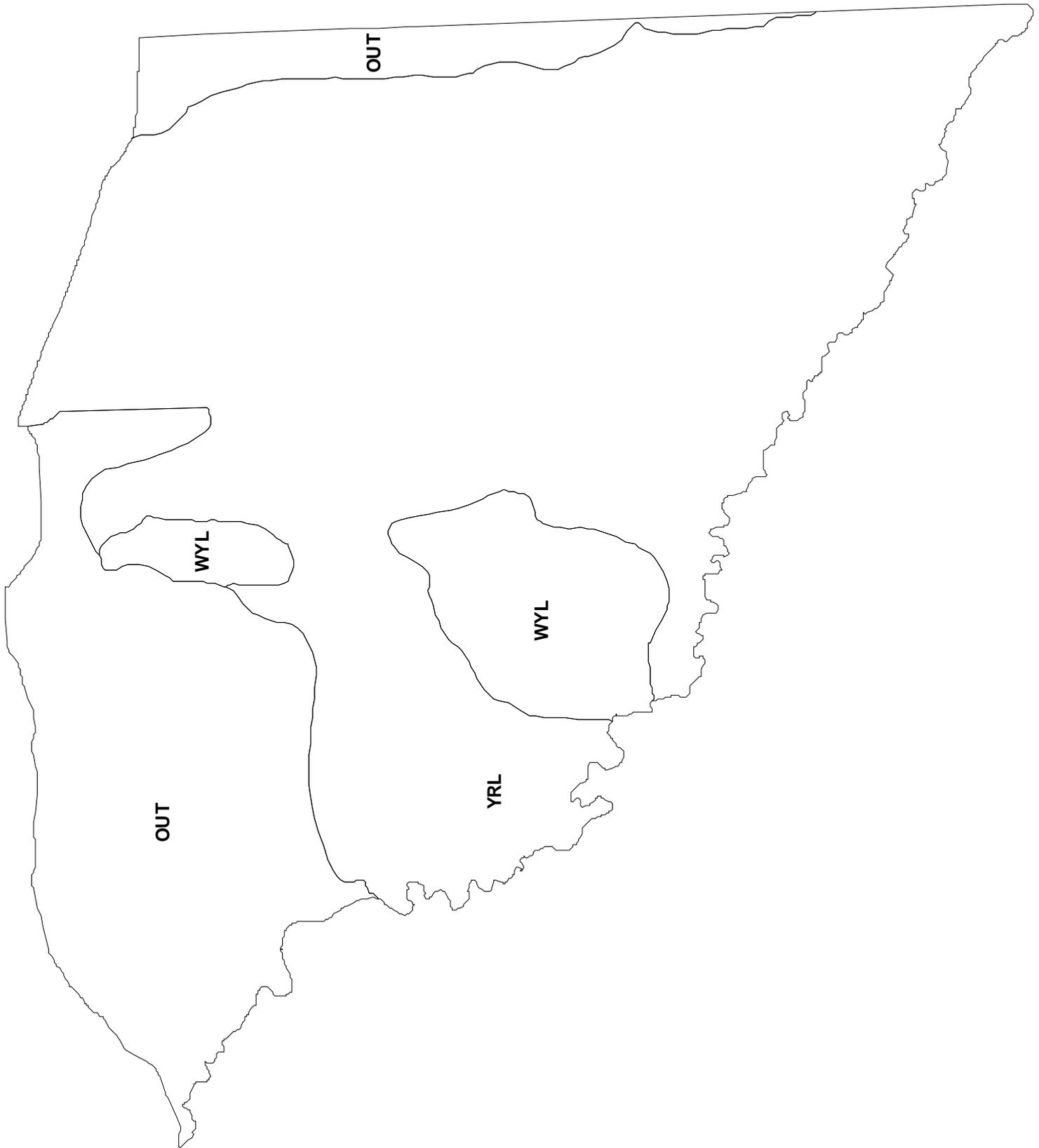
I see no need for an archery season here. All that does is get the elk wound up before rifle season and we need elk shot and less worry about recreation. Also closing the area north of highway 26 is a slap in the face to those of us that raised this herd for you.

What elk? And what regulations have you been looking at? The season opens as early as August and goes through January the following year? This relates to nearly a 6 month long season, not to mention a general season?

As a landowner in Goshen County I fought the G&F for years to keep Elk Area #3 a limited quota elk area only, however the G&F were very persistent and eventually got their way in making area 3 a general season elk area. Our ranch (Dave Stenson) in Goshen County went from having hundreds of elk with numerous trophy bulls to absolutely NO elk! Over the years we experienced some of the most fantastic elk hunting I have ever known. It was not uncommon to

see a herd of 300 head of elk with at least 100 head being bulls and at least 10 of those bulls being in the 350+ BL scoring range. Needless to say, we didn't even consider harvesting a bull that wasn't at least a 350 class! Yes you, the G&F took a premier elk area with numerous trophy bulls, some even world class and destroyed it by making it a general elk area and extending the damn season to nearly 6 months! Do you really want my honest opinion about the elk hunting in general hunt area #3? There are none! Congratulations, you accomplished what you set out to do, get rid of the elk!David A Stenson

the elk population is non-existent in the area north of highway 26
I am not involved in this hunt area. I feel just the land owners in the area should be involved. I appreciate your concerns for managing different areas to get the best hunting for everyone involved.
No elk found after start of deer season.



2015 - JCR Evaluation Form

SPECIES: Moose

PERIOD: 6/1/2015 - 5/31/2016

HERD: MO545 - SNOWY RANGE

HUNT AREAS: 38, 41

PREPARED BY: WILL SCHULTZ

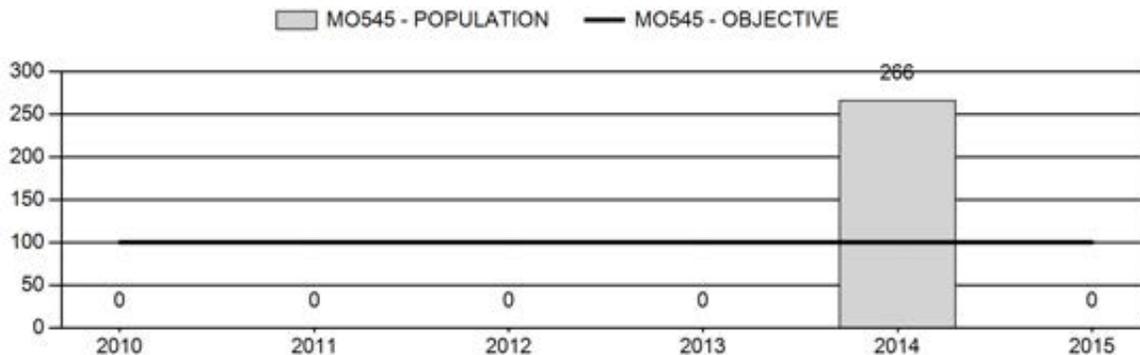
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	53	N/A	N/A
Harvest:	49	36	40
Hunters:	54	46	45
Hunter Success:	91%	78%	89 %
Active Licenses:	54	46	45
Active License Success:	91%	78%	89 %
Recreation Days:	441	311	350
Days Per Animal:	9	8.6	8.8
Males per 100 Females	97	212	
Juveniles per 100 Females	49	62	

Population Objective (\pm 20%) :	100 (80 - 120)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	20
Model Date:	None

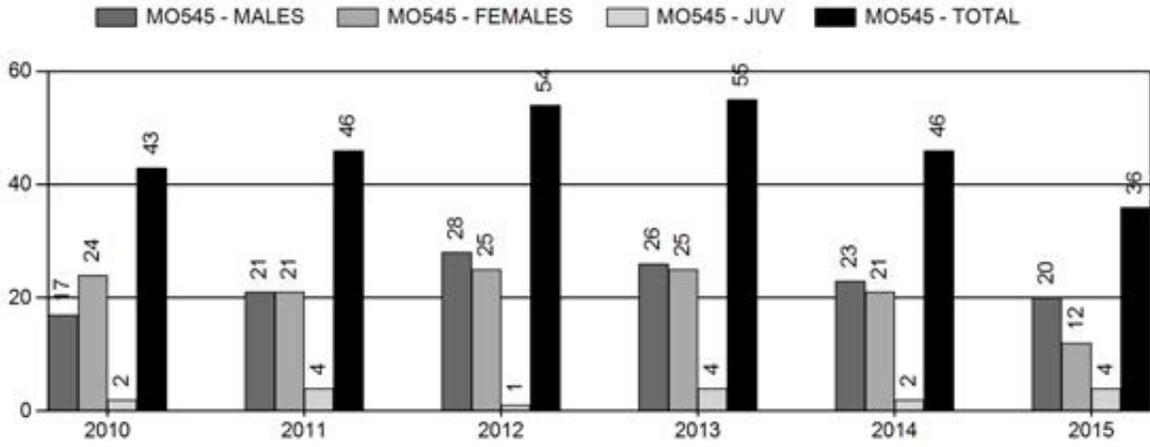
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

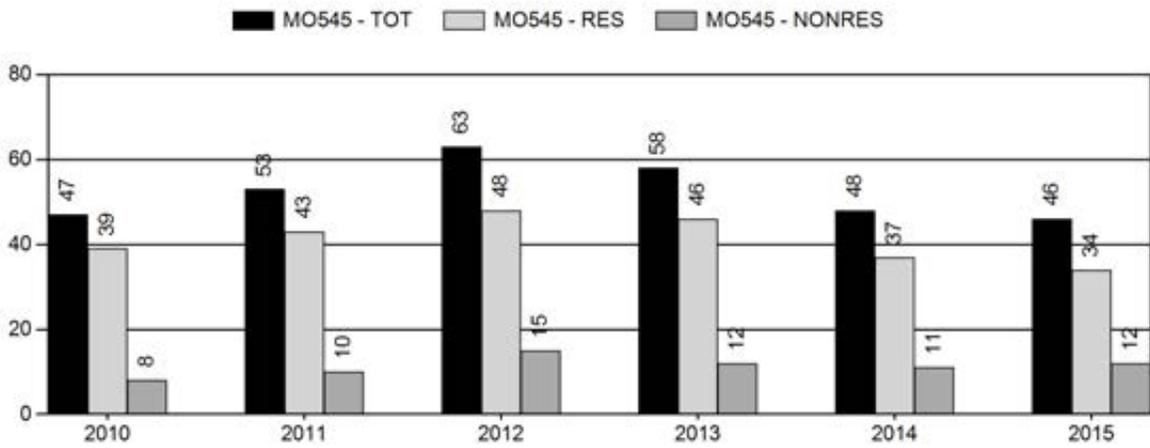
Population Size - Postseason



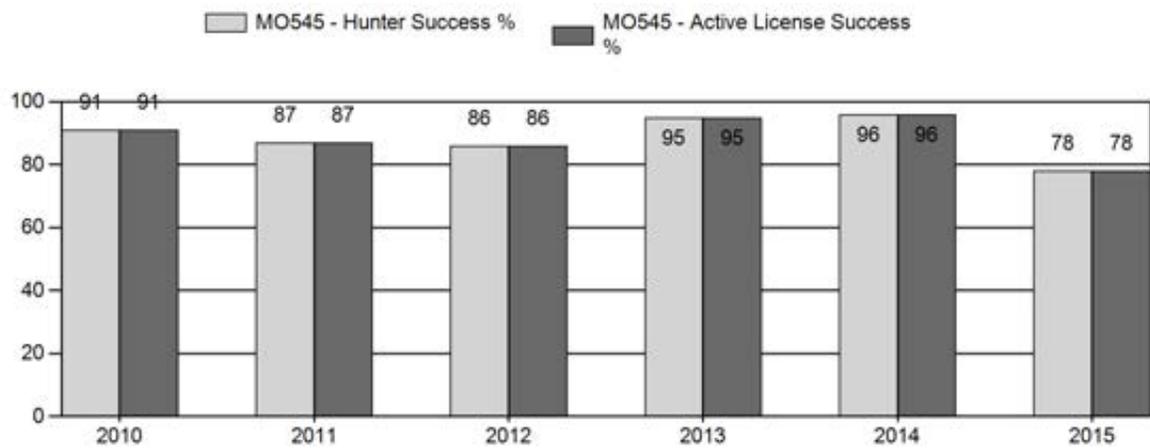
Harvest



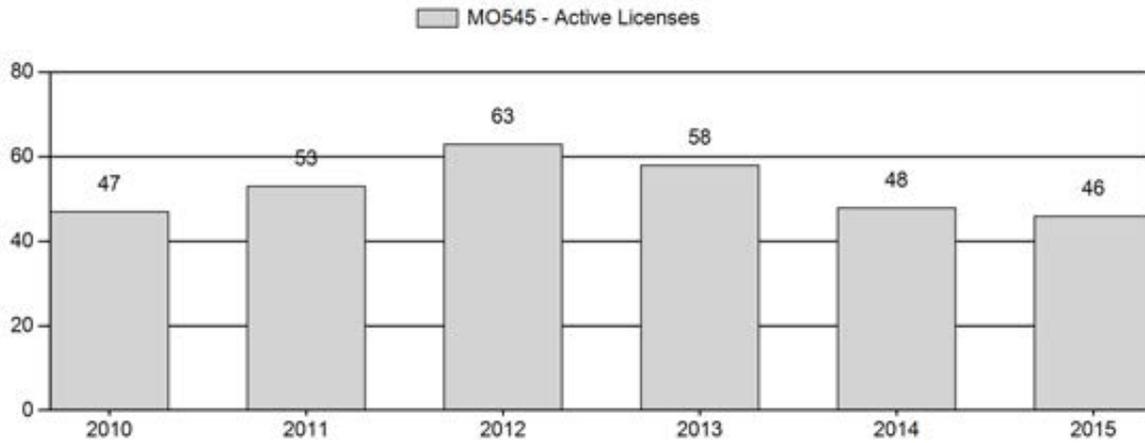
Number of Hunters



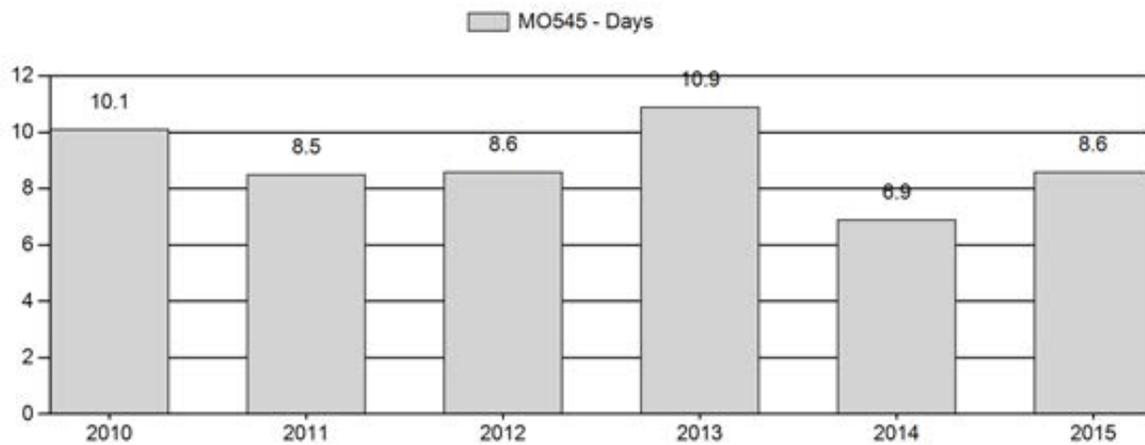
Harvest Success



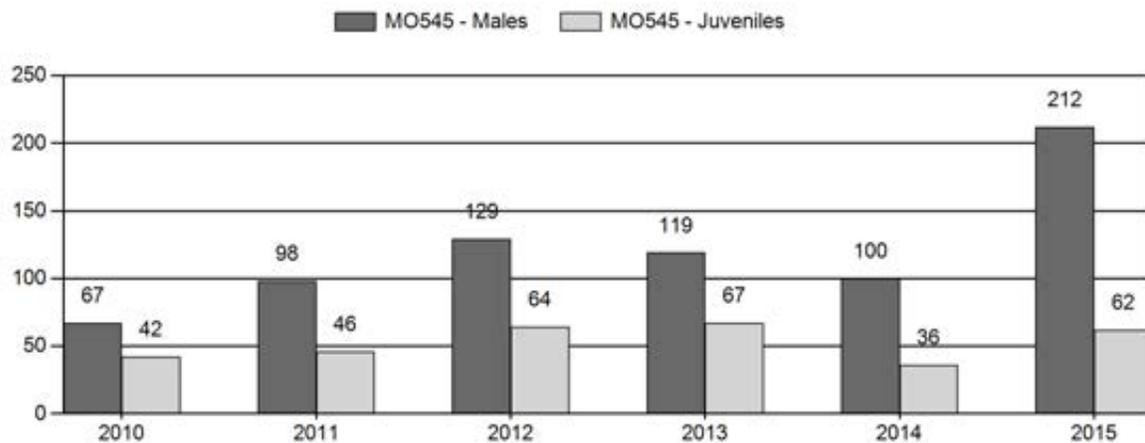
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Moose Herd MO545 - SNOWY RANGE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2010	0	7	17	24	32%	36	48%	15	20%	75	0	19	47	67	± 0	42	± 0	25
2011	0	3	46	49	40%	50	41%	23	19%	122	0	6	92	98	± 0	46	± 0	23
2012	0	4	14	18	44%	14	34%	9	22%	41	0	29	100	129	± 0	64	± 0	28
2013	0	5	27	32	42%	27	35%	18	23%	77	0	19	100	119	± 0	67	± 0	31
2014	266	2	20	22	42%	22	42%	8	15%	52	254	9	91	100	± 35	36	± 17	18
2015	0	0	17	17	57%	8	27%	5	17%	30	246	0	212	212	± 0	62	± 0	20

**2016 HUNTING SEASONS
SNOWY RANGE MOOSE (MO545)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
38, 41	1	Oct. 1	Nov. 14	20	Limited quota	Any moose, except cow moose with calf at side
	4	Oct. 1	Nov. 14	20	Limited quota	Antlerless moose, except cow moose with calf at side
	Archery	Sep. 1	Sep. 30			Refer to license type and limitations in Section 3 of Chapter 8

Hunt Area	License Type	Quota change from 2015
38	4	-5
Herd Unit Total	4	-5

Management Evaluation

Current Postseason Population Management Objective: 100 (80 – 120)

Management Strategy: Special

2015 Postseason Population Estimate: NA

2016 Proposed Postseason Population Estimate: NA

Moose in the Snowy Range herd unit are managed toward a numeric objective of 100. A moose population model has not been developed for this herd unit. The herd is managed under a special management strategy. The management objective was last reviewed in 1997. We plan to review the management objective in 2016.

Herd Unit Issues

The Snowy Range herd unit stretches across southern Wyoming, along the Colorado border, from Baggs to Cheyenne. Moose are found year-round in areas on Pole Mountain, Sierra Madre Mountains, and most notably, the Snowy Range Mountains. These moose descended from moose transplanted in Colorado and historically were not native to this area. Challenges for managing moose in this herd unit include a rapidly changing forest ecosystem, high infestation rates for parasites, and human conflict/safety. Limited population monitoring for moose has been an issue in this herd unit.

Weather

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 thru July 2015) was notably higher than the 30-year average. As is consistent with most prominent mountain ranges in Wyoming, the majority of precipitation accumulated during the period outside of the primary growing season, primarily in the form of snow. From August – October, conditions were very mild and dry. Winter 2015 - 2016, as of mid-February, has been fairly mild, with upper elevations in the Snowy Range near 100% of normal for snowpack (Figure 1), but lower elevations lacking in persistent snow through most of the winter.

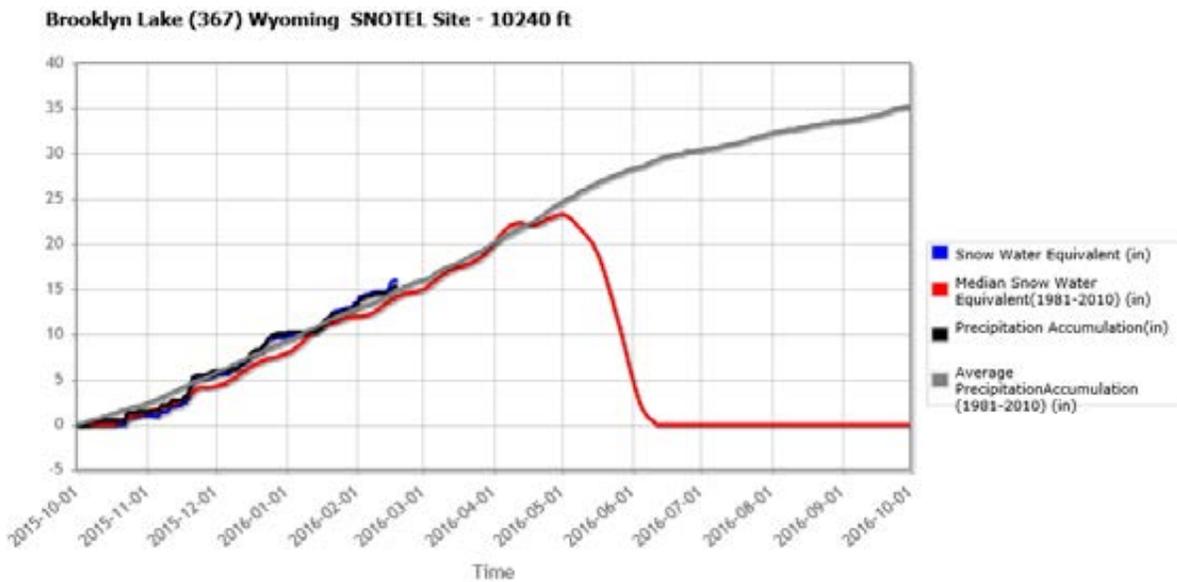


Figure 1. Snotel Site within Snowy Range Moose Herd Unit, Wyoming (October 2015 – February 2016).

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. 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. Moose fecal pellets were collected in winter 2015 in the southernmost portions of the herd unit, south of Woods Landing, to determine winter dietary preferences within the herd unit. In summary, fecal collections were comprised of 73% *Salix spp* and 20% *Betula spp*. It will be important to monitor these riparian plant communities in the future knowing these dietary preferences.

Moose habitat conditions were monitored 2012-2014 across Wyoming and in the North Park, Colorado area through a University of Wyoming project. Preliminary results published in a recent annual report for this project indicated the Snowy Range's willow habitat quality and moose fitness were relatively low when compared to the other areas (Jesmer, et. al. 2014).

Habitat conditions improved in 2015 with an increase in timely seasonal precipitation. However, much of the transition and winter ranges were severely impacted by the drought conditions experienced in bio-year 2012. No WGFD moose habitat production/utilization data was available for this herd unit. However, annual production rates were assumed to have improved from the previous year, while utilization rates on winter ranges were assumed to have continued to be high.

Field Data

Traditionally there has been little allocation of funding in this herd unit to collect moose classification data. Moose classification data in the Snowy Range herd unit has been collected incidentally during annual mule deer and elk classification surveys. A classification sample of 30 moose was collected in December of 2015 in conjunction with mule deer and elk surveys. Although moose were known to be present in Hunt Area 41, no moose were observed there during the classification flight. The 2015 classification ratios were 212 bulls/100 cows and 62 calves/100 cows. Although no yearling bulls were observed during the classification survey, total bull ratios were considered to be inflated substantially for this less than adequate classification sample.

Harvest Data

A total of 20 bulls were harvested by 23 hunters in 2015, for a harvest success rate of 87%. In addition to the hunters who drew licenses in the regular drawing, there were 4 nonresidents who harvested in the Snowy Range herd unit with Wyoming Governor's licenses, and the 2015 Wyoming Super Trifecta Tag winner also harvested in the Snowy Range herd unit. Overall antlerless harvest was 16 moose by 23 hunters for a success rate of 70%. As is typically the case in this herd unit, many of the antlerless moose hunters struggled to locate a cow without calves at side, and influenced the overall antlerless success rate. A bull moose was illegally harvested by an elk hunter in Hunt Area 41, on the west slope of the Sierra Madres.

The Snowy Range herd unit has a reputation for producing trophy quality bulls, and this continued again in 2015. Median age for tooth samples (n=17) from harvested bulls remained at 5-years of age in 2015 (Figure 1). The 3-year running average for median age of harvested bulls decreased slightly to 4.7 years of age (Figure 2). The proportion of bulls in the harvest which were 5-years or older increased to 70% (Figure 3). Overall, the bull harvest continued to be within the Department's parameters for "prime-age bulls."

The age of antlerless moose in 2015 harvest was similar to the 2014 results (Figure 4). The proportion of antlerless harvest ≤ 2 years in age (60%) was considered acceptable.

Figure 1. Median age of bulls harvested for the Snowy Range moose herd unit, from lab aged teeth (n=17), Wyoming,

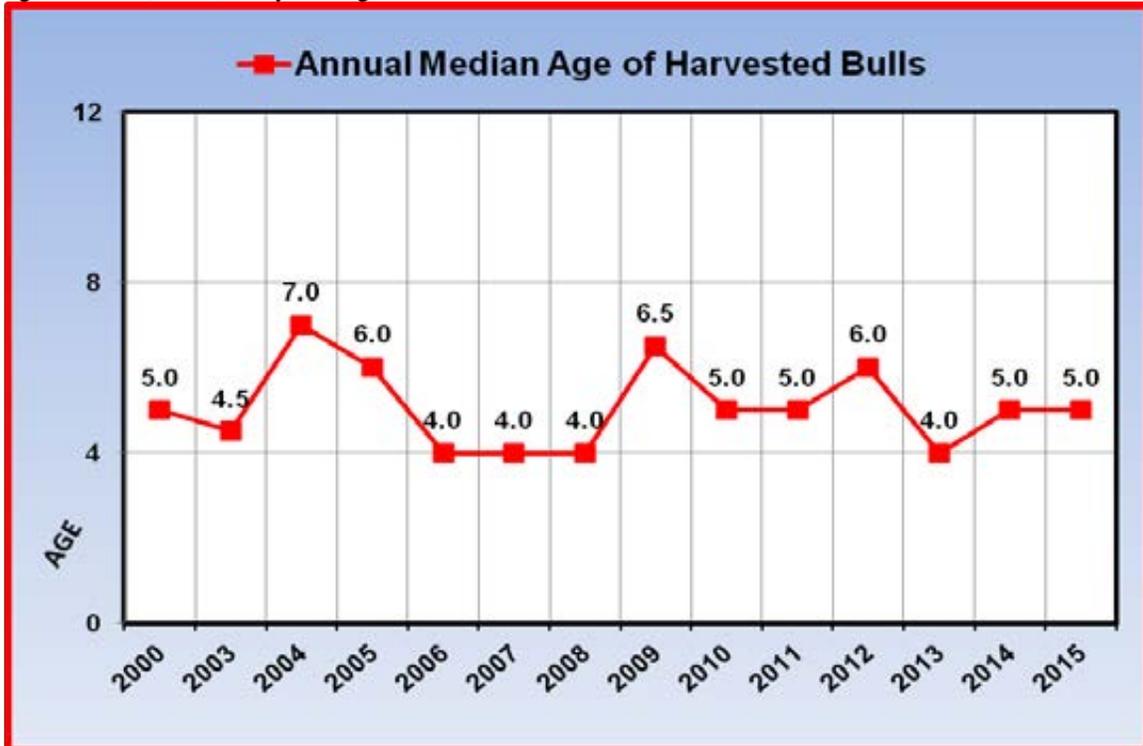


Figure 2. Average (3-year running) median age of bulls harvested for the Snowy Range moose herd unit, from lab aged teeth (n=17), Wyoming,

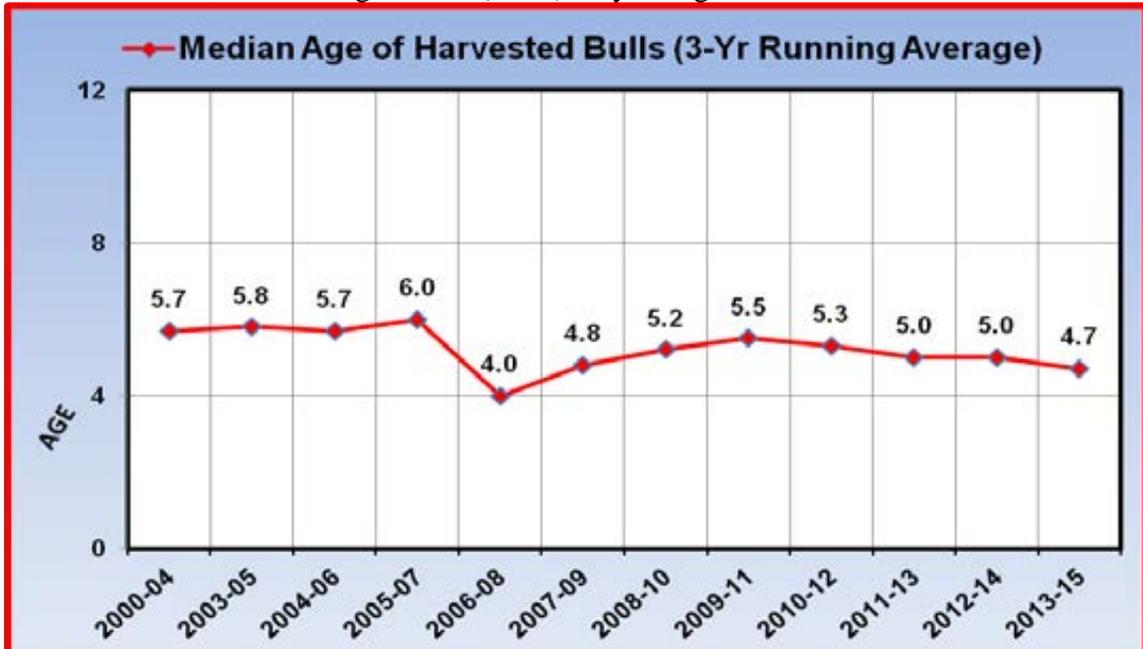


Figure 3. Annual Percentages of the bull harvest \geq 5-years in age from Snowy Range Moose Herd Unit, from lab aged teeth (n=17), Wyoming,

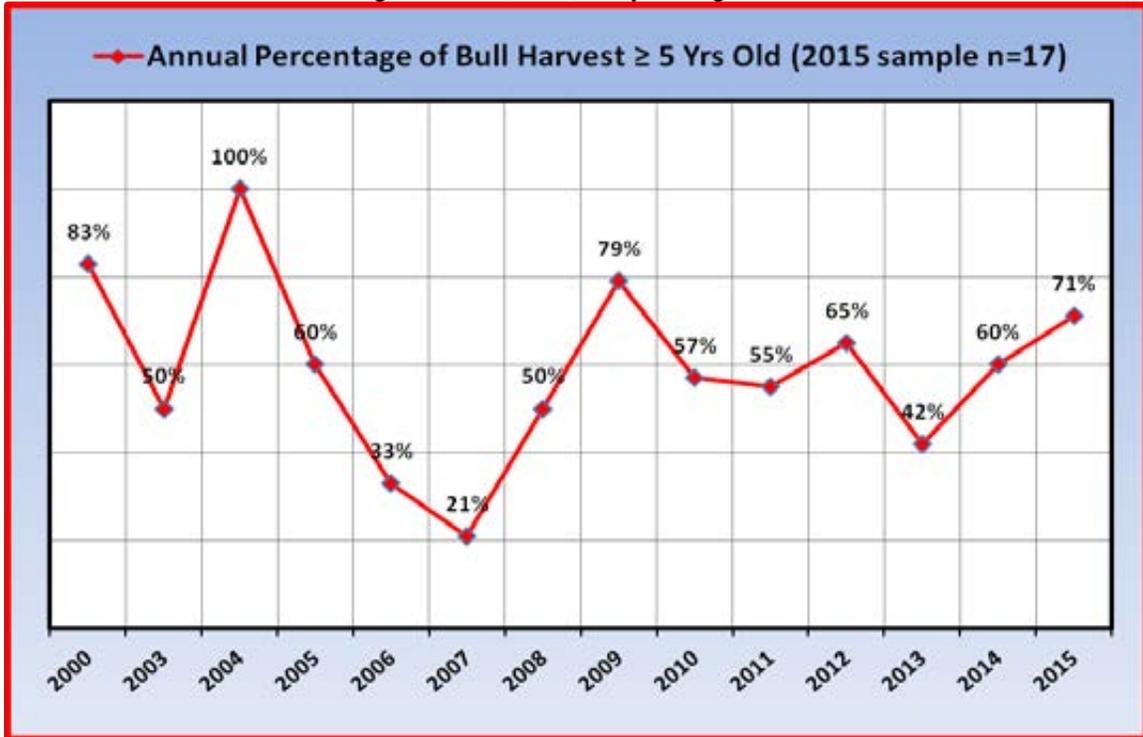
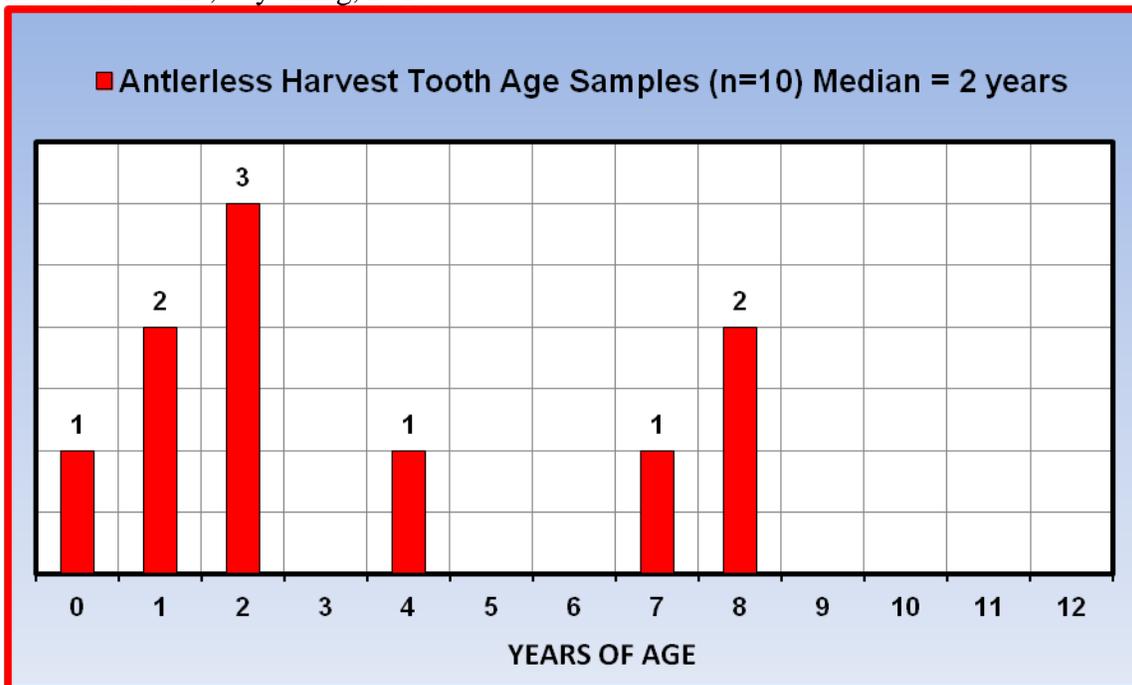


Figure 4. Age class distribution for antlerless moose harvested from Snowy Range moose herd unit, Wyoming, 2015.



Population

A population model has not been developed for this herd unit. A moose abundance survey was completed in the Snowy Range herd unit in March 2015. Results of this bi-year 2014 survey were a mid-winter total abundance estimate of 266 ± 56 (90% CI) ($SE = 34$) moose. These results provided managers with the first plausible abundance estimate for moose wintering in the Snowy Range herd unit. The abundance estimate will be useful in constructing a population model and making future harvest recommendations for moose in this herd unit. The management objective of 100 moose postseason will be reviewed later in 2016.

Management Summary

In 2016, hunting season lengths remained the same as in 2015. Type 1 license numbers remained at 20 licenses. Type 4 antlerless moose licenses were decreased from 25 to 20 because of concern for over harvest. This decrease was completed in part to keep the Snowy Range moose population from reaching a less than acceptable population level.

Current Herd Specific Studies

A current study initiated in fall 2014 by the Wyoming Cooperative Fish and Wildlife Research Unit and the Wyoming Game and Fish Department presents an excellent opportunity to examine the relationship between moose habitat use and seral changes brought about by bark beetles (Appendix I). By making use of an existing GPS dataset collected prior to extensive beetle damage (Baigas 2008), comparing it to new GPS data, and examining current individual movement strategies through the lens of body condition, this project will provide new information on the status of moose in the Snowy Range and their response to its beetle-killed forests.

The project began its field component in March 2015. Thirty (30) female moose (29 adults and one yearling) were captured via helicopter darting on winter habitats within and surrounding the Medicine Bow National Forest. Moose were fitted with GPS store-on-board collars set to collect 90-minute fixes. The fix-rate is identical to that used in the previous study, which will allow us to compare movement strategies and space use of moose prior to and following the extensive bark beetle damage. Collars will remain deployed until the spring of 2017; during which study animals will be recaptured twice per year to gather longitudinal data on demography and body condition (measured via ultrasonography). Monitoring body condition in the context of pregnancy (during winter) and lactation costs (in summer) will allow the project to critically examine the habitat quality of the Snowy Range, with the goal of understanding where the herd sits relative to nutritional carrying capacity.

Bibliography of Herd Specific Studies

Baigas, P. E. 2008. Winter Habitat selection, winter diet, and seasonal distribution mapping of Shiras moose (*Alces alces shirasi*) in southeastern Wyoming. M.S. Thesis, Univ. Wyoming, Laramie, Wyoming. USA. 220 pp.

Wyoming Game and Fish Department [WGFD]. 2000. Snowy Range – Sierra Madre Moose Herd Management Plan. Wyoming Game and Fish Department, Laramie. USA. 15 pp.

Literature Cited

Jesmer, B., Jacob Goheen, Matthew Kauffman, Kevin Monteith, Aly Courtemanch. 2014. Statewide Moose Habitat Project: Linking Habitat and Nutrition with Population Performance in Wyoming Moose. Annual Report 2014. Department of Zoology and Physiology, University of Wyoming, Laramie. 11 pp.

Thomas, T. P. 2008. Moose Population Management Recommendations. Wyoming Game and Fish Department, Cheyenne. 17 pp.



Snowy Range Moose Project

January 2016 Update

Alex May¹, Kevin Monteith¹, Matt Kauffman¹, Corey Class², Lee Knox², Will Schultz³

¹ Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie, Wyoming 82071

² Wyoming Game and Fish Department, Laramie Region, Laramie, WY 82070

³ Wyoming Game and Fish Department, Laramie Region, Saratoga, WY 82331

Project Description

Shiras moose have seen declines in recent decades across much of their statewide range due to a multitude of factors. The Snowy Range herd, which colonized the area following an introduction into North Park Colorado in the 1970s, is thought to be robust to these changes. Relatively new, lacking wolves or grizzly bears, and with liberal human harvest, the Snowy Range herd may be free of density-dependent pressures and existing as a small but highly productive population. Despite the impressions of stable population performance, the landscape of the Snowy Range has been altered dramatically by the mountain pine beetle, and the moose herd has not been studied since 2006. Moreover, effects of pine beetle outbreak on large mammals are almost entirely unknown. A collaborative study initiated in fall 2014 by the Wyoming Cooperative Fish and Wildlife Research Unit and the Wyoming Game and Fish Department presents an excellent opportunity to examine the relationship between moose habitat use and seral changes brought about by bark beetles. By making use of an existing GPS dataset collected prior to extensive beetle damage (Baigas 2008), comparing it to new GPS data, and examining current individual movement strategies through the lens of body condition, this project will provide new information on the status of moose in the Snowy Range and their response to its beetle-killed forests. The project began its field component in March 2015; 30 female moose (29 adults and one yearling) were captured via helicopter darting on winter habitats within and surrounding the Medicine Bow National Forest. Moose were fitted with GPS store-on-board collars set to collect 90-minute fixes, which will allow us to compare movement strategies and space use of moose prior to and following the extensive bark beetle damage. Collars will remain deployed for a period of two years, during which study animals will be recaptured twice per year to gather longitudinal data on demography and body condition (measured via ultrasonography). Monitoring body condition in the context of pregnancy (during winter) and lactation costs (in summer) will allow the project to critically examine the habitat quality of the Snowy Range, with the goal of understanding where the herd sits relative to nutritional carrying capacity.

Project Update

A summer field season has been completed and the first recapture was executed in early December. Calf survival was monitored during two ground survey efforts (one at the beginning of July and the other at the end of August) and calves with collared females were noted during December recaptures. Willow communities were sampled by Philip Baigas and Brett Jesmer in 2007 and 2013 respectively; a selection of survey locations were re-visited this summer for long term habitat quality monitoring. Vegetation sampling was conducted in pine forests in an effort to quantify differences in thermal cover and forb communities across a gradient of tree canopy losses attributed to bark beetle mortality. Four collared moose died since initial collaring, although no deaths were attributed to capture mortality. 25 of the remaining 26 moose were recaptured in December, and three recovered collars were deployed on new moose, bringing the current sample size up to 29. One collar suffered minor damage that prohibited immediate redeployment; this collar is being repaired and will be deployed in March. One moose slated for recapture was in terrain inaccessible to the helicopter; we expect to recapture her in March. The March recapture will be followed by an expanded second summer field season.

Project Moose Status (as of December 2015)

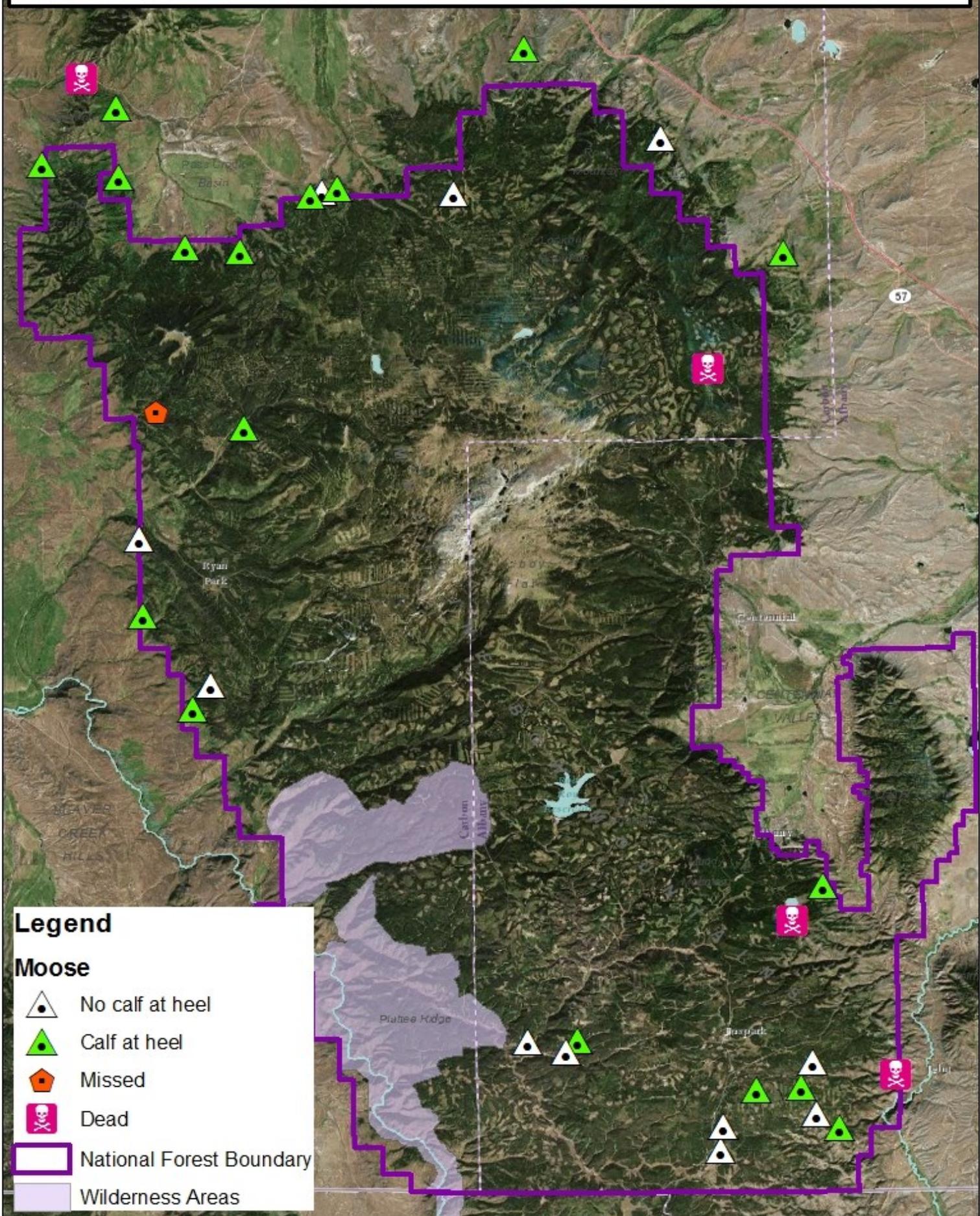


Figure 1: Most recent pertinent locations of all moose collared for the project. Calf status current as of December 2015.



Summer Calf Surveys

Collared moose that were found to be pregnant in March (n=22) were re-sighted in early July and late August/early September to determine calf survival. One pair of twins was seen during the summer surveys. Two moose that were pregnant in March failed to produce a calf that survived to July. Two calves were lost between the July and September survey. An additional calf was lost between the last calf survey and the recapture earlier this month. All told, 16 moose calves have been produced from the 30 moose initially collared in March.



Habitat Quality and Vegetation Monitoring

Willow communities are extremely important food sources for moose in the Rocky Mountains. A metric of browsing pressure developed by Richard Keigley was employed by two other University of Wyoming students working in the area in 2007 and 2013. Previously established transects (n=20) were revisited this past summer with the intention of quantifying habitat quality trends for moose. Vegetation sampling and habitat monitoring efforts will continue in an expanded capacity next summer.

Plots were established in conifer patches within the National Forest in an effort to evaluate how the bark beetle epidemic has potentially modified moose habitat. Tree death and resulting canopy loss may affect moose forage availability and the ability of a pine stand to provide thermal cover and snow refuges. Canopy closure, visual obstruction, and forb/shrub cover was measured within each plot (n=23). Percent tree death will be calculated for each surveyed plot by remote sensing to examine whether heavily affected areas are different in these respects compared to less affected stands.

Seasonal Change in Body Fat Among Individuals

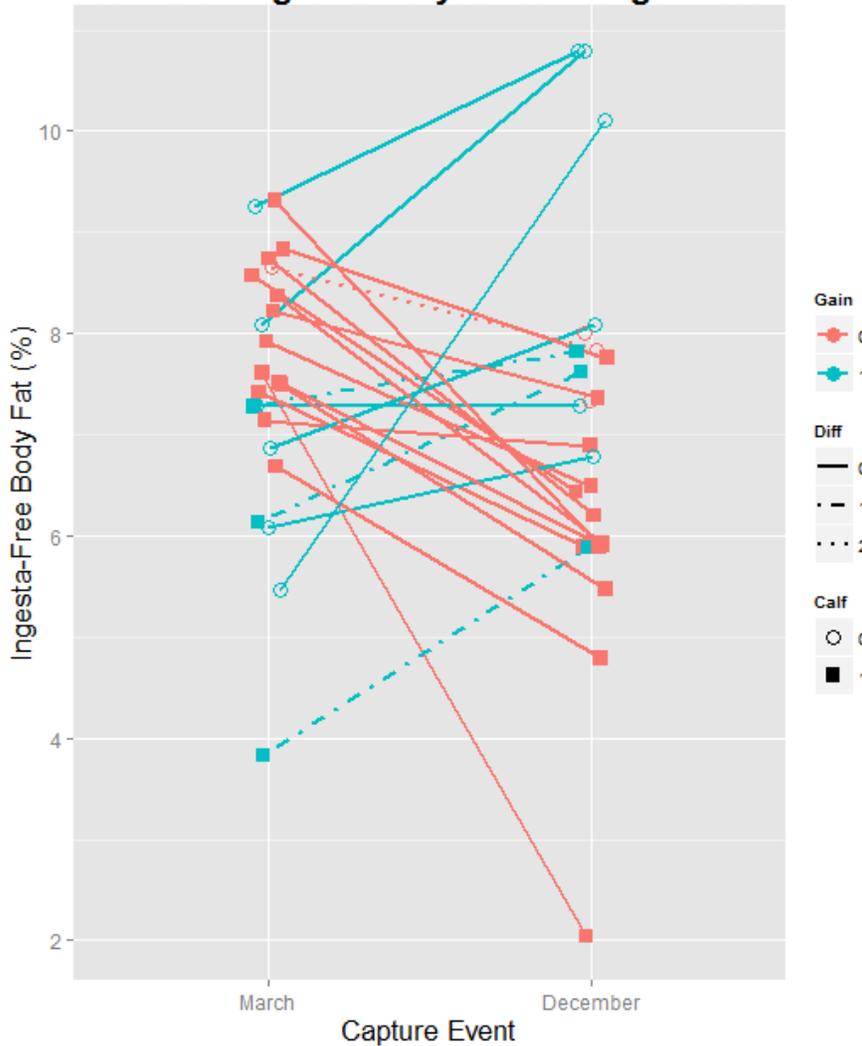


Figure 2: A gain of 0 indicates that moose lost fat reserves between March and December. Gain of 1 indicates that a moose gained fat. Dotted lines represent moose that had trends opposite of the majority given their reproductive status (i.e. moose with calves that gained fat, and lone cows that lost fat).

December Recapture

Assessing longitudinal trends in body condition as a function of habitat selection and reproduction is a crucial component of this project. Measuring percent ingesta-free body fat (IFBFat) through ultrasonography is an informative method to determine nutritional condition. The majority of moose with calves lost fat reserves between captures, which likely reflects the costs associated with lactation and associated behavioral sacrifices related to calf rearing. Some females who raised calves were able to gain fat reserves (indicated by blue dashed lines in Figure 2) and some lone cows lost fat reserves (red dashed lines in Figure 2). Overall, median IFBFat was lower among all females in December than in March (Figure 2, 7.08 and 7.35, respectively). Mean IFBFat was somewhat higher (7.12 in December and 6.84 in March), which was likely attributable to large fat gains in a few individuals.

Ear-cropping (a clinical presentation of *Elaeophora schneideri* infection) was unchanged between the two captures; moose with cropped ears did not display additional cropping, and moose without cropping in March did not lose ear tissue between captures. Tick monitoring continued during the December capture, though most ticks existed as nymphs in December and were very difficult to detect. Comparisons in the upcoming March capture should be more interesting.

2015 Distribution of IFBFat

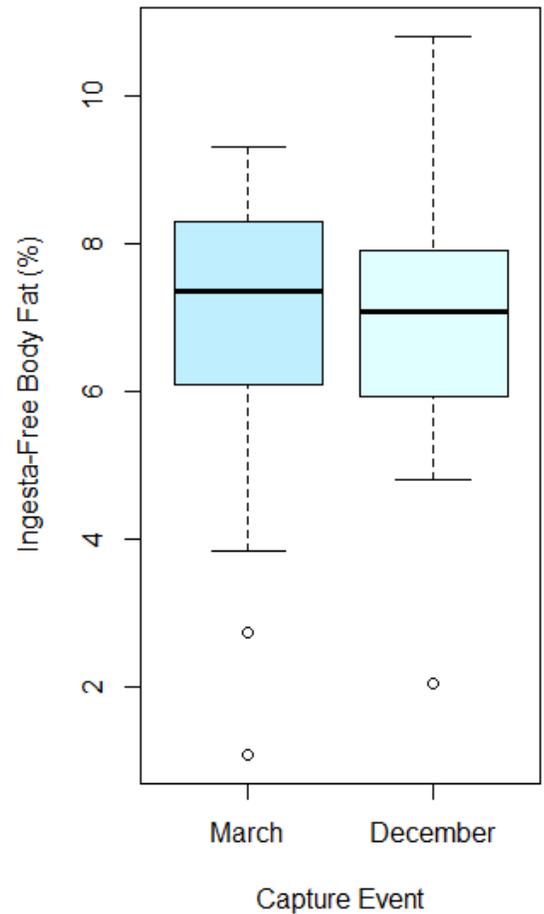


Figure 3: Distributions of percent ingesta-free body fat of all females between capture events. Bolded lines represent means.



Hunter Samples

WGFD personnel facilitated collection of kidney, tooth, and blood samples from moose harvested in units 38 and 41. 22 out of 45 tag holders submitted at least one sample for study. Teeth were obtained from 19 moose, which will help expand age structure sample size for females and add valuable information about males. At least 8 pairs of kidneys were contributed in analyzable condition; kidneys from hunter harvested moose will develop our understanding of moose body condition in the Snowies beyond those already radio-collared.

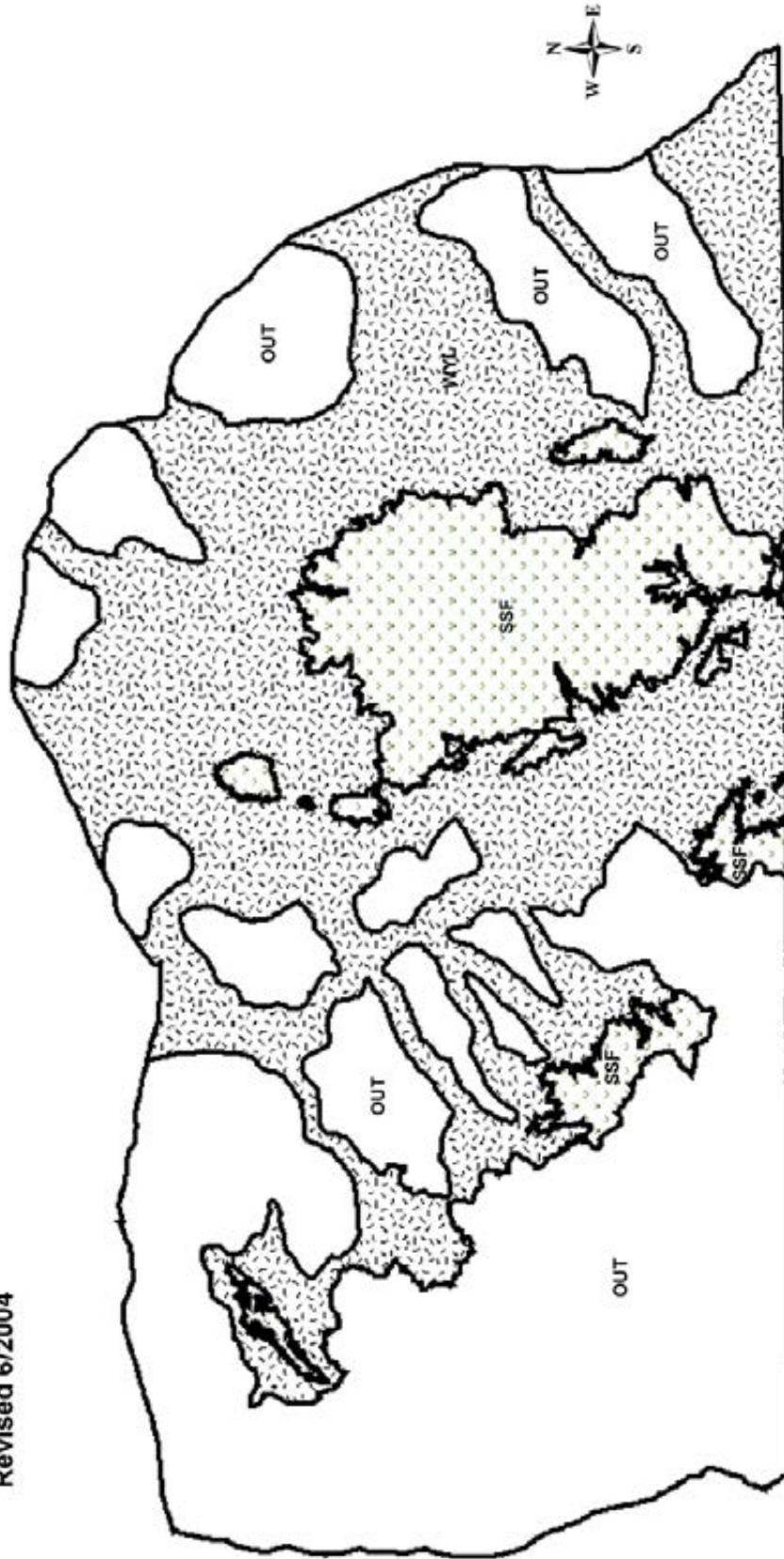


Acknowledgments

Research is funded by the Wyoming Game and Fish Department and the Wyoming Governor’s Big Game License Coalition. We are grateful to Laramie Region WGFD personnel for their extensive summer field support, landowner contacts, and for facilitating capture operations this December. We are deeply indebted to private landowners around the Medicine Bow National Forest; many project moose resided on private lands throughout the summer and into the December capture. Their willingness to provide access to project personnel for field surveys and recaptures has been critical to the success of this project. Moose were also captured on public lands administered by the USFS, BLM, and State of Wyoming.



Moose (M545) -- Snowy Range/Sierra Madre
HA 38, 41
Revised 6/2004



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

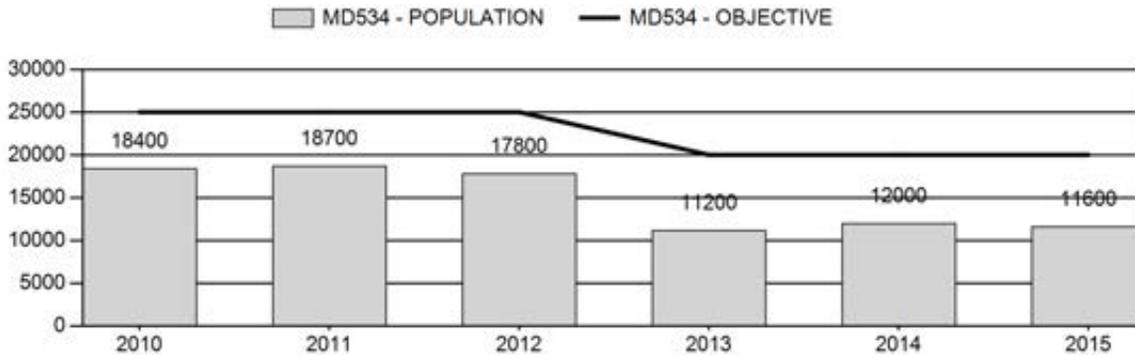
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	15,620	11,600	12,300
Harvest:	809	924	905
Hunters:	1,677	1,651	1,650
Hunter Success:	48%	56%	55 %
Active Licenses:	1,747	1,742	1,740
Active License Success:	46%	53%	52 %
Recreation Days:	6,460	6,759	6,700
Days Per Animal:	8.0	7.3	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

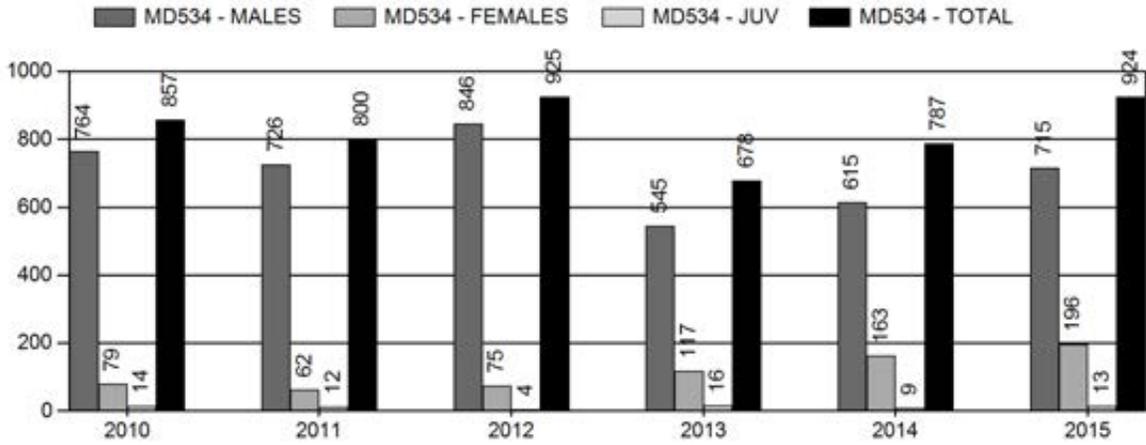
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

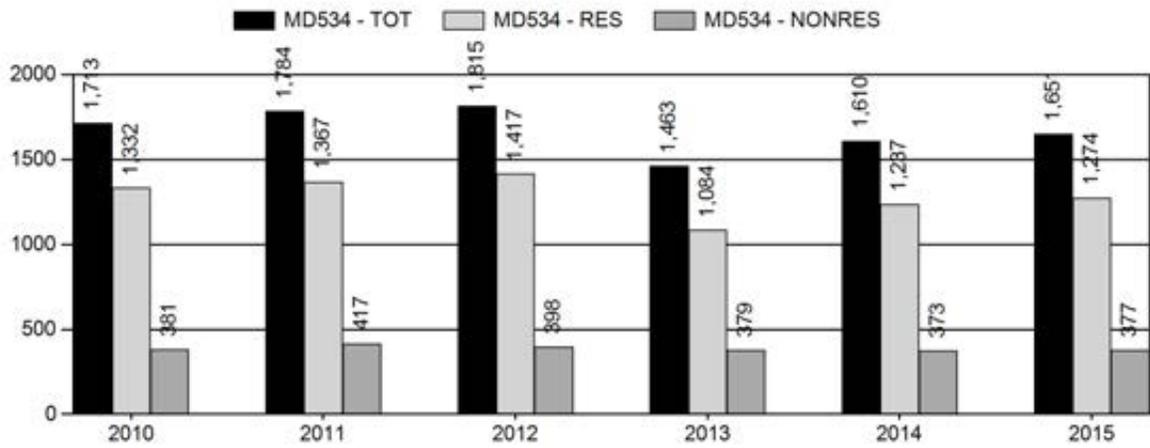
Population Size - Postseason



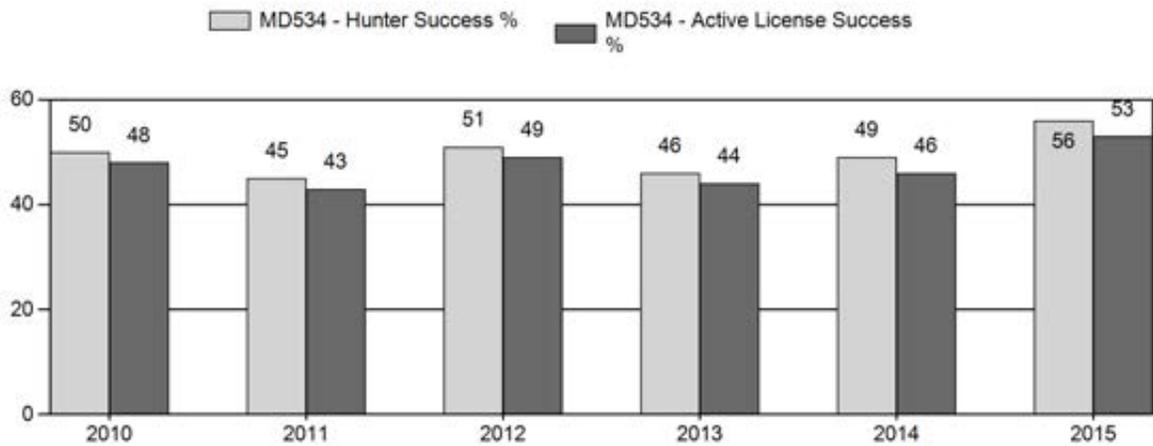
Harvest



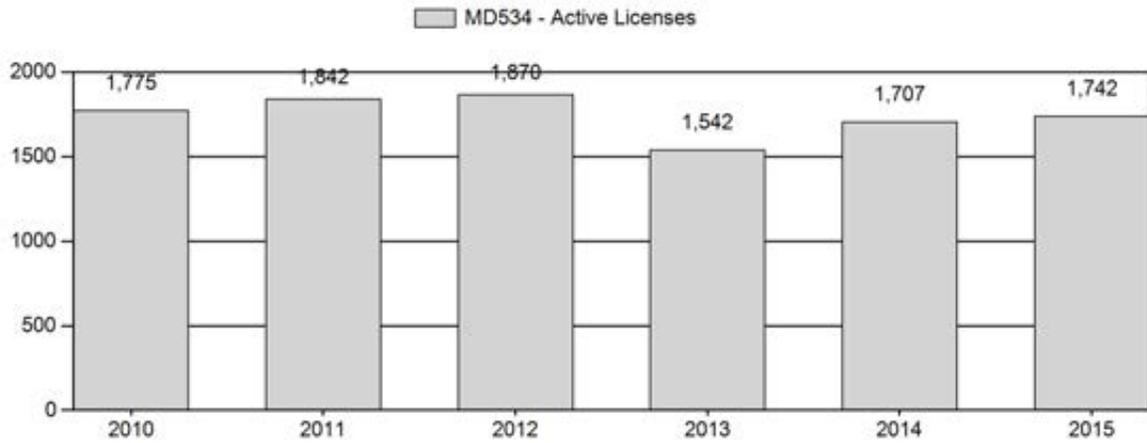
Number of Hunters



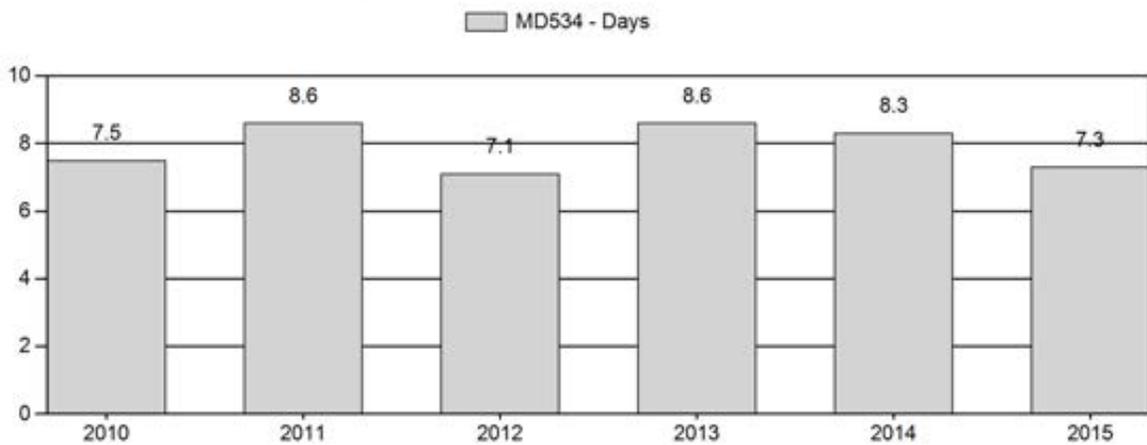
Harvest Success



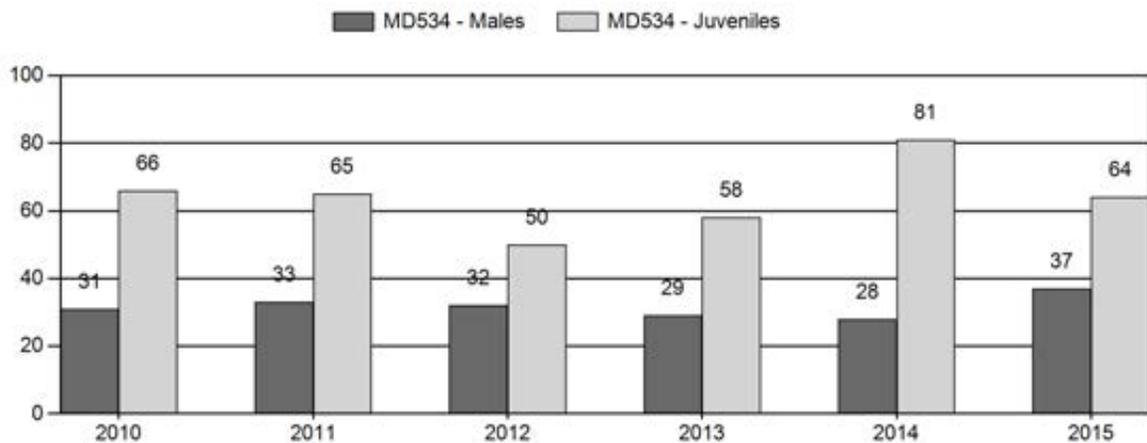
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD534 - GOSHEN RIM

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs		Males to 100 Females			Young to			
		Ylg	2+ CIs	2+ CIs	2+ CIs	2+ CIs	UnCIs	Total	%	Total	%	Total	%	Cls	Obj	YIng	Adult	Total	Conf Int	100 Fem	Conf Int
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.

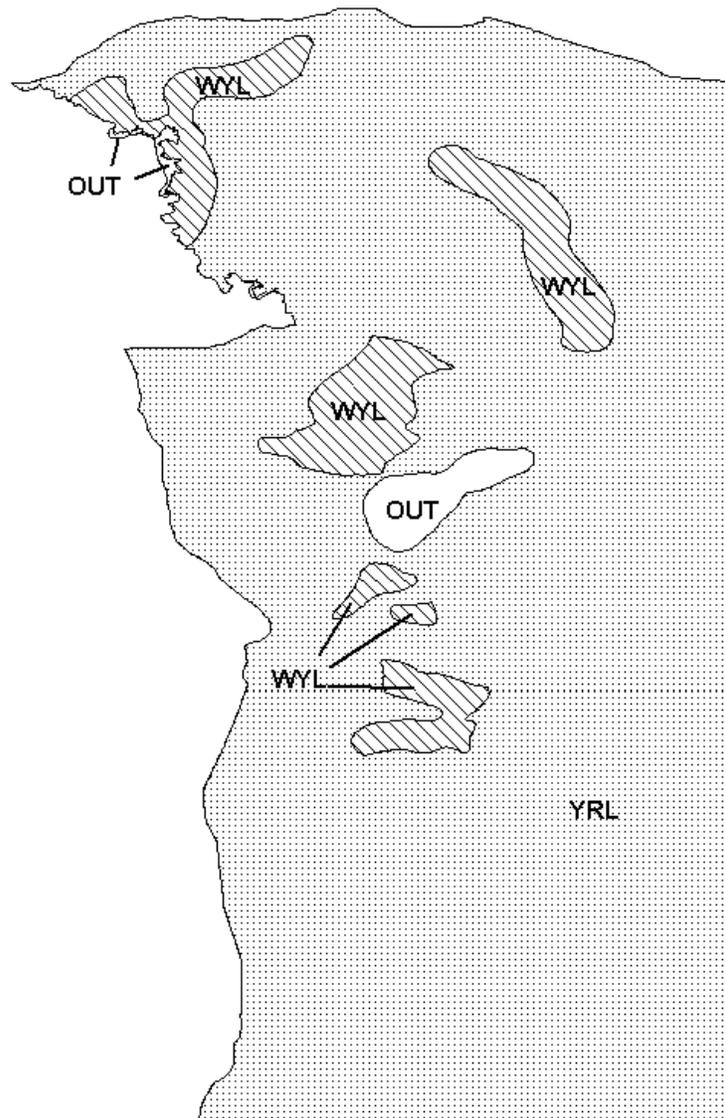
Management Summary

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

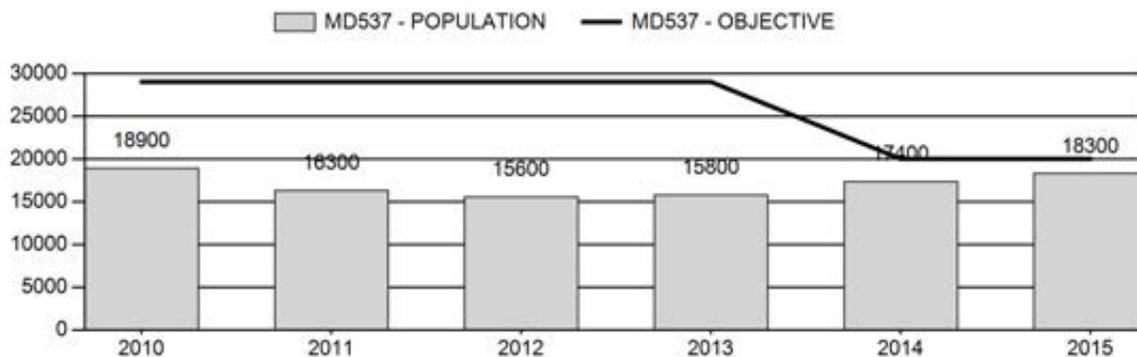
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	16,800	18,300	18,200
Harvest:	1,093	1,065	1,000
Hunters:	2,068	1,839	1,840
Hunter Success:	53%	58%	54 %
Active Licenses:	2,143	1,879	1,880
Active License Success:	51%	57%	53 %
Recreation Days:	9,588	7,134	7,135
Days Per Animal:	8.8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

Population Objective (\pm 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

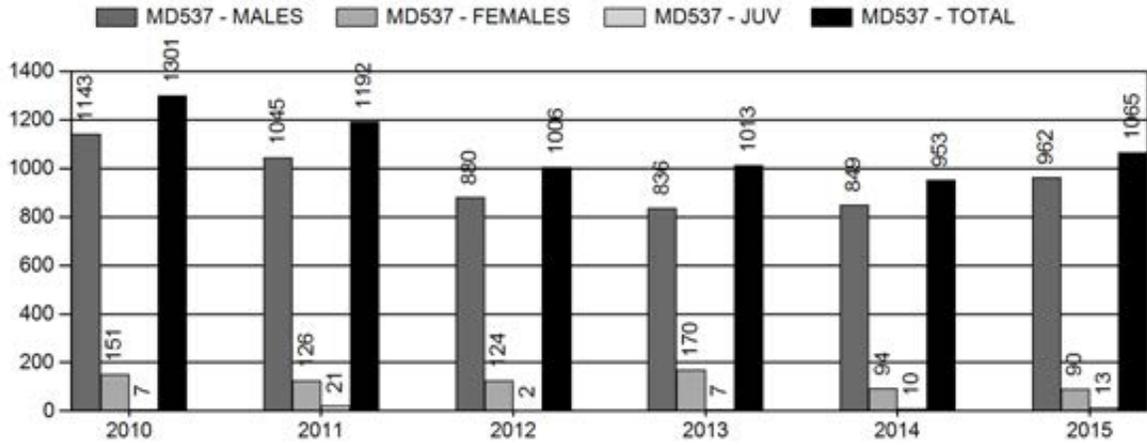
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

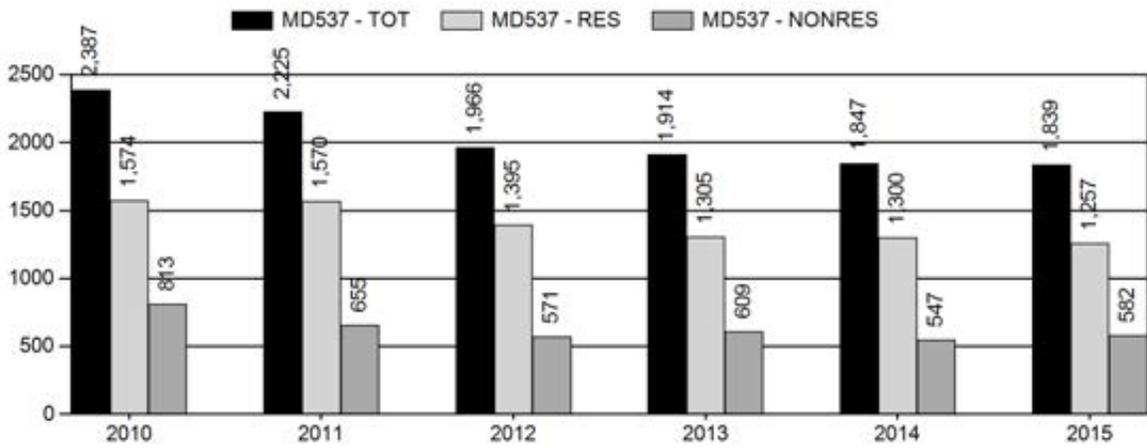
Population Size - Postseason



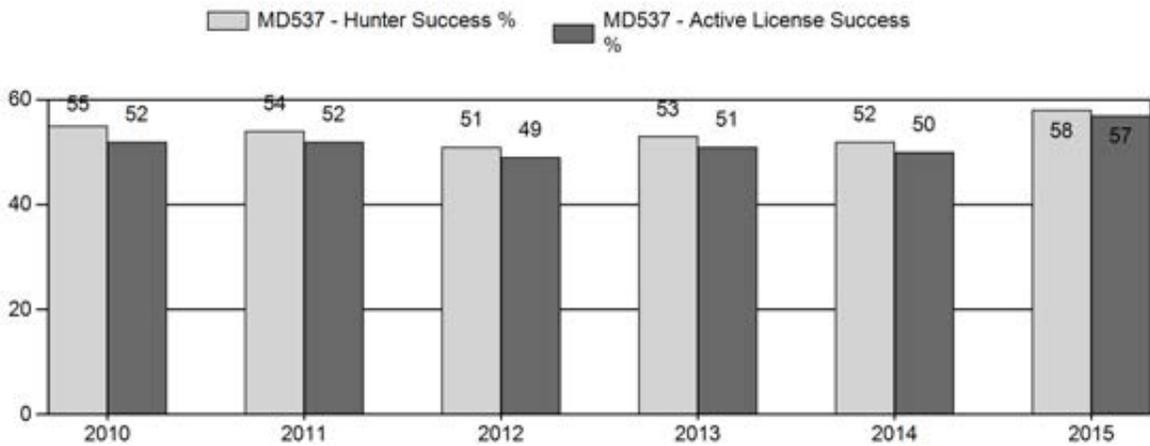
Harvest



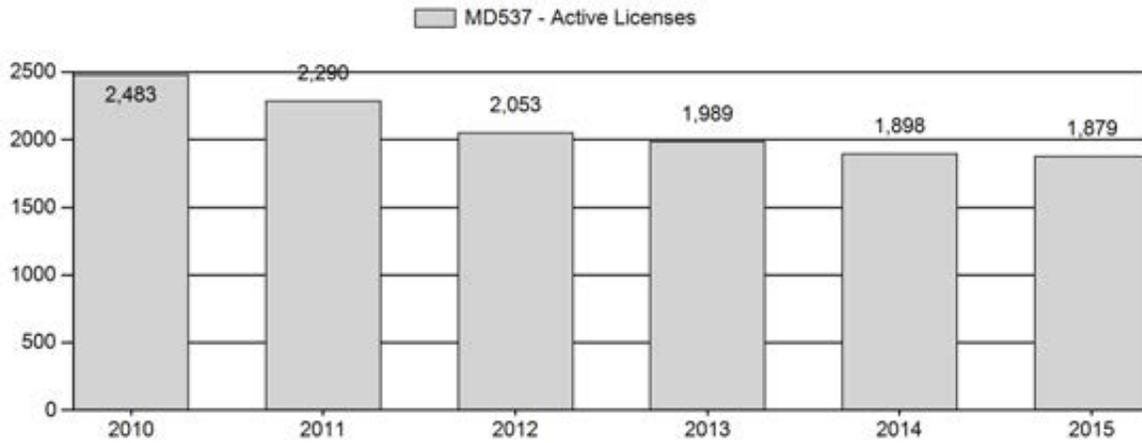
Number of Hunters



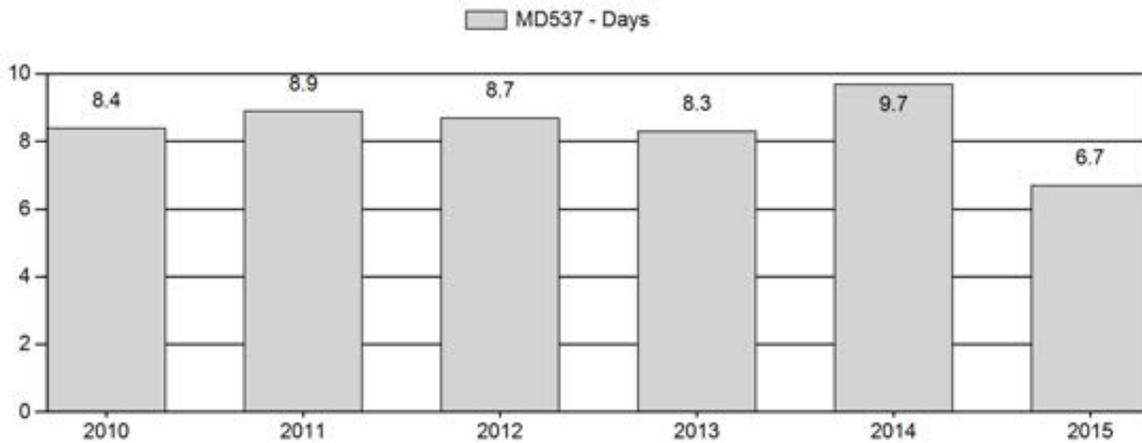
Harvest Success



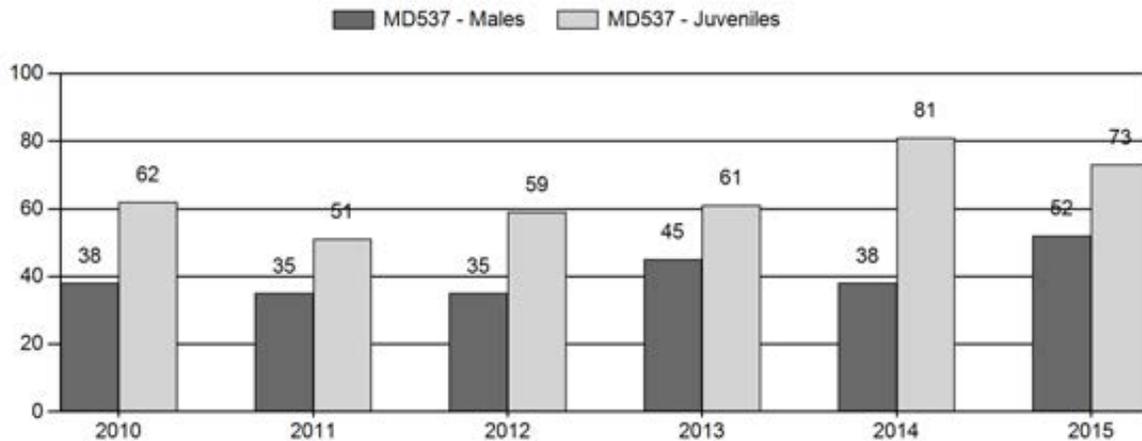
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD537 - LARAMIE MOUNTAINS

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot Cls		Males to 100 Females				Young to		
		Ylg	2+ Cls	2+ Cls	2+ Cls	2+ Cls	UnCls	Total	%	Total	%	Total	%	Cls	Obj	Yng	Adult	Total	Conf Int	100 Fem	Conf Int
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 forest; 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- ≤ 19 ", 2) Class II- 20-25", Class III- ≥ 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.

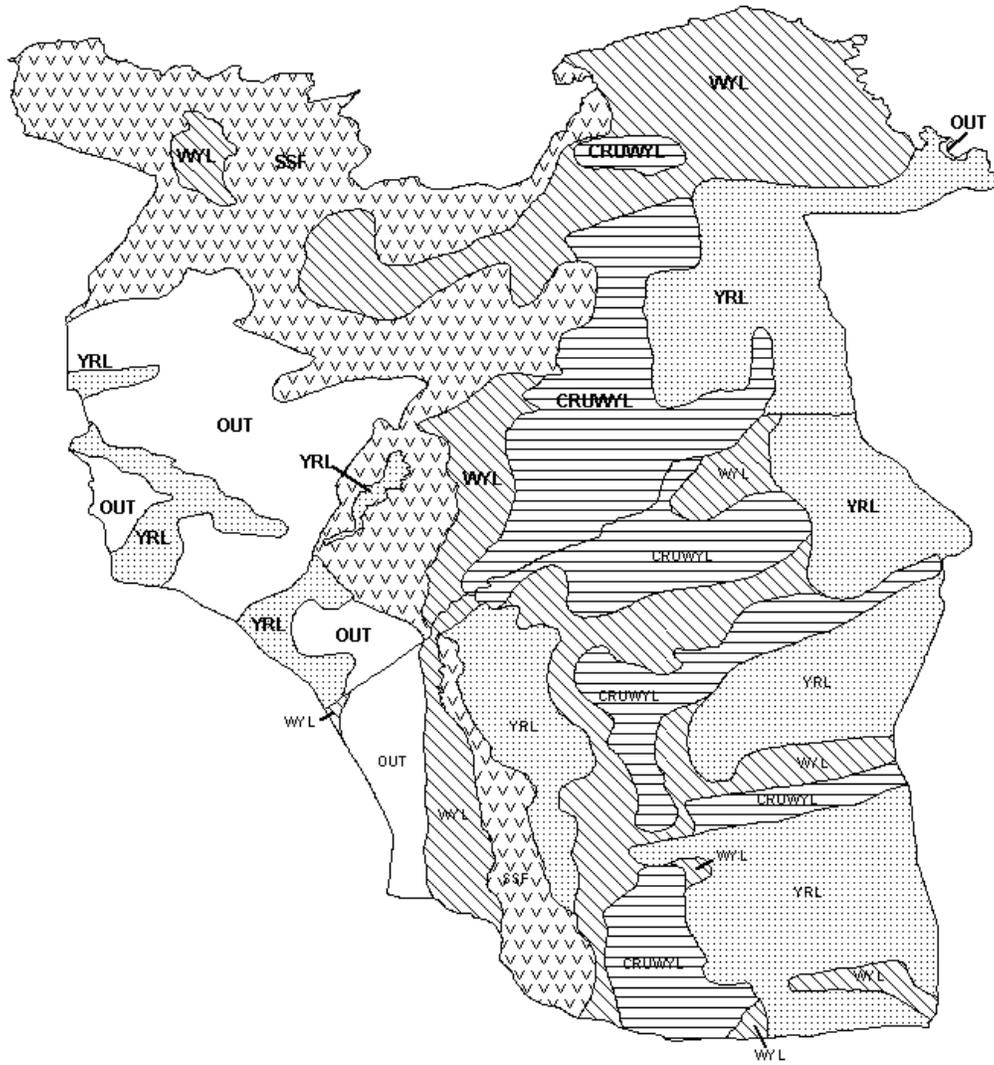
Management Summary

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



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

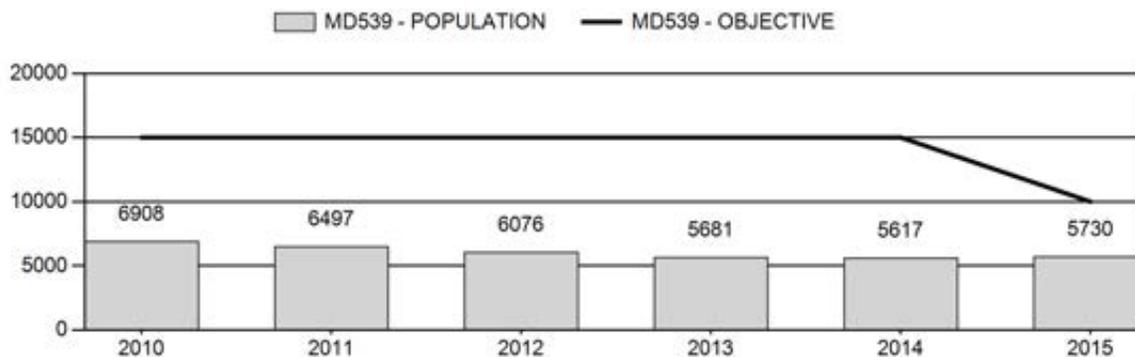
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	6,156	5,730	6,100
Harvest:	330	368	350
Hunters:	1,532	1,367	1,200
Hunter Success:	22%	27%	29 %
Active Licenses:	1,532	1,367	1,200
Active License Success:	22%	27%	29 %
Recreation Days:	7,750	7,305	7,300
Days Per Animal:	23.5	19.9	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

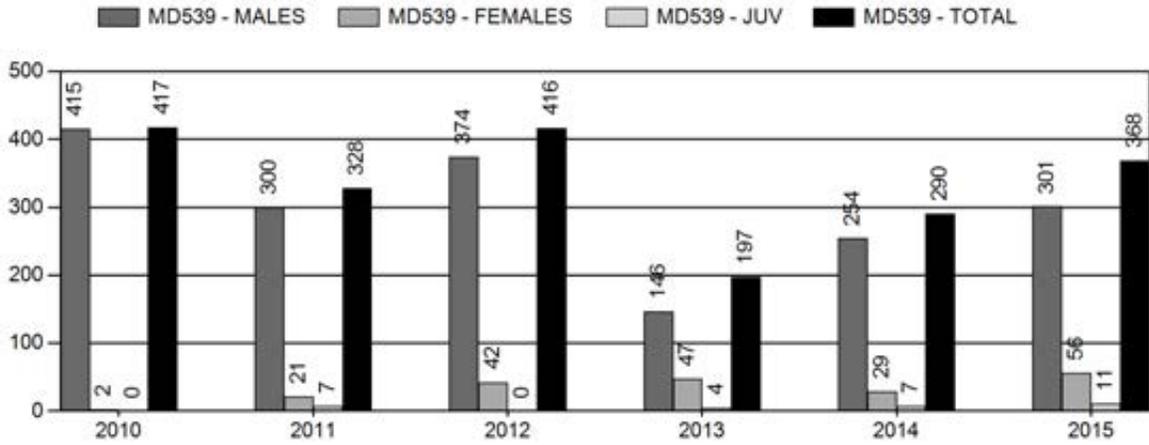
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

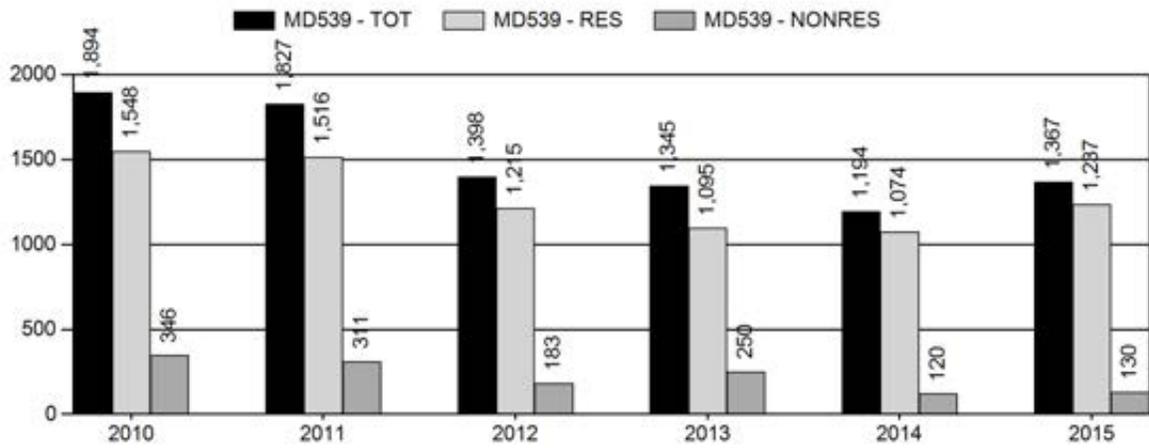
Population Size - Postseason



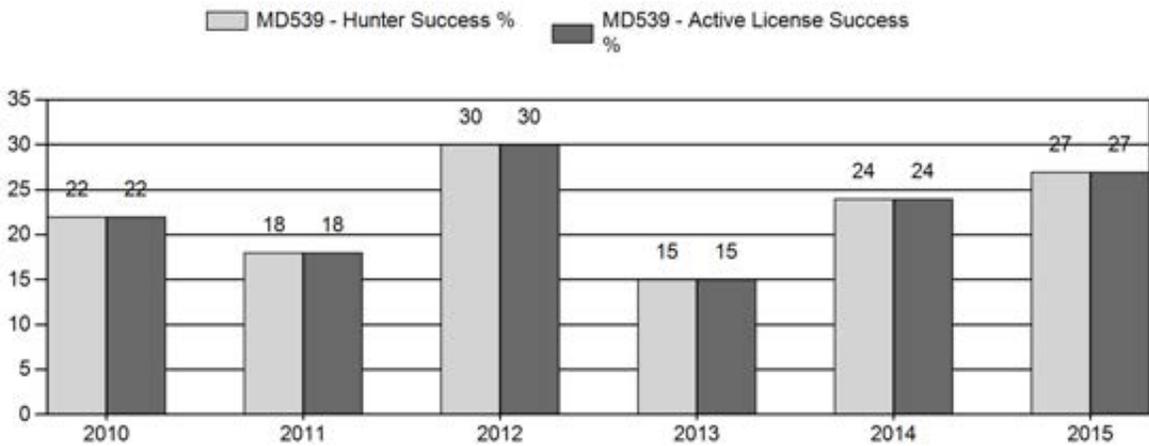
Harvest



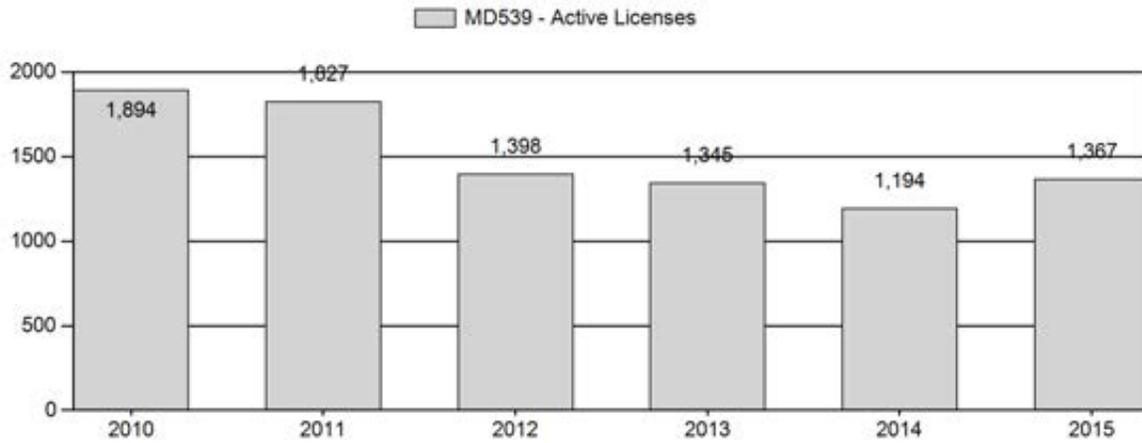
Number of Hunters



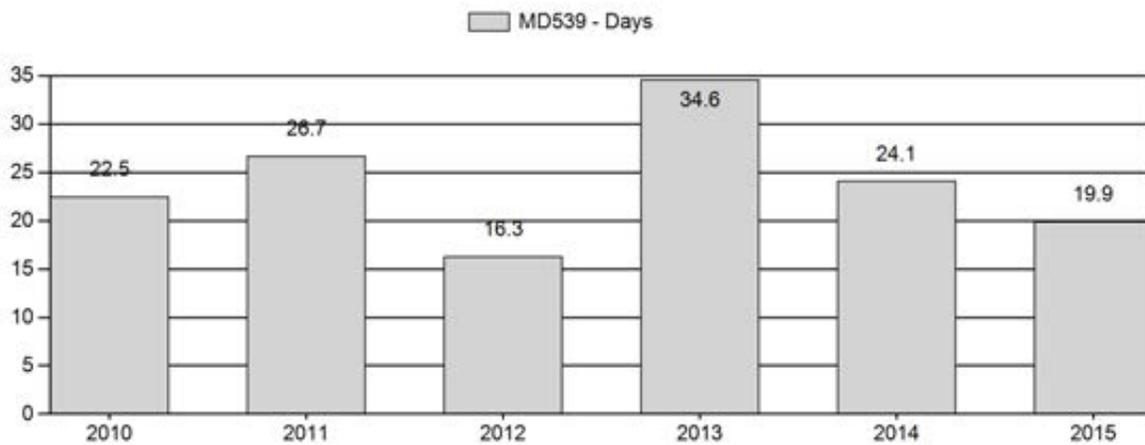
Harvest Success



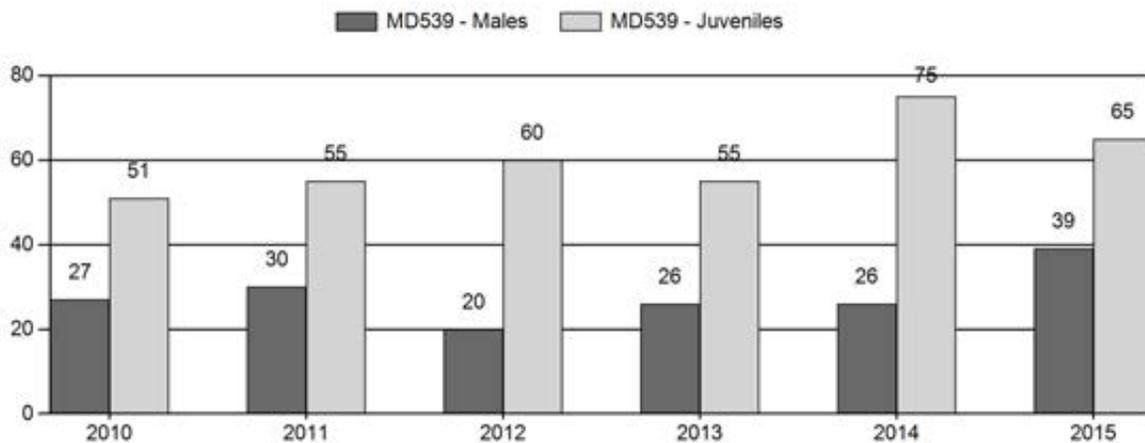
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD539 - SHEEP MOUNTAIN

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%			Yng	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

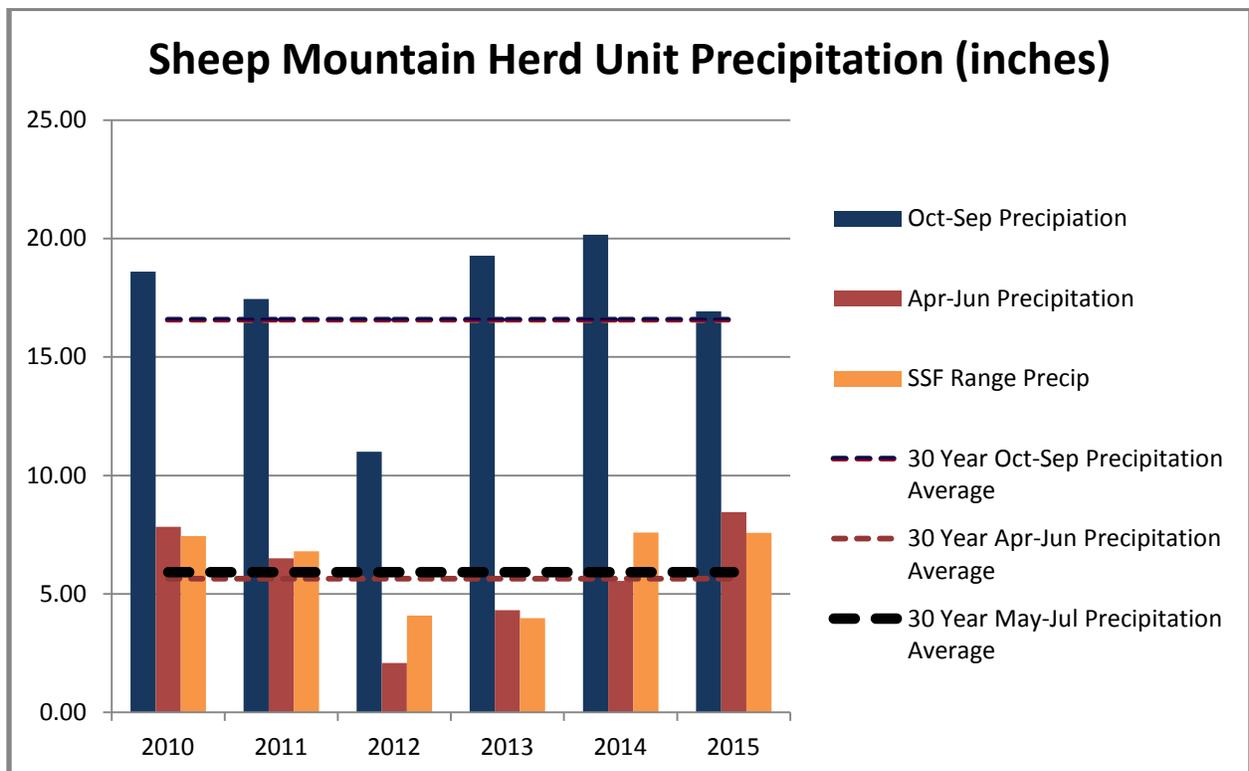
The management objective for the Sheep Mountain Mule Deer herd unit is a post-season population objective of 10,000 mule deer. The management strategy is recreational management

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

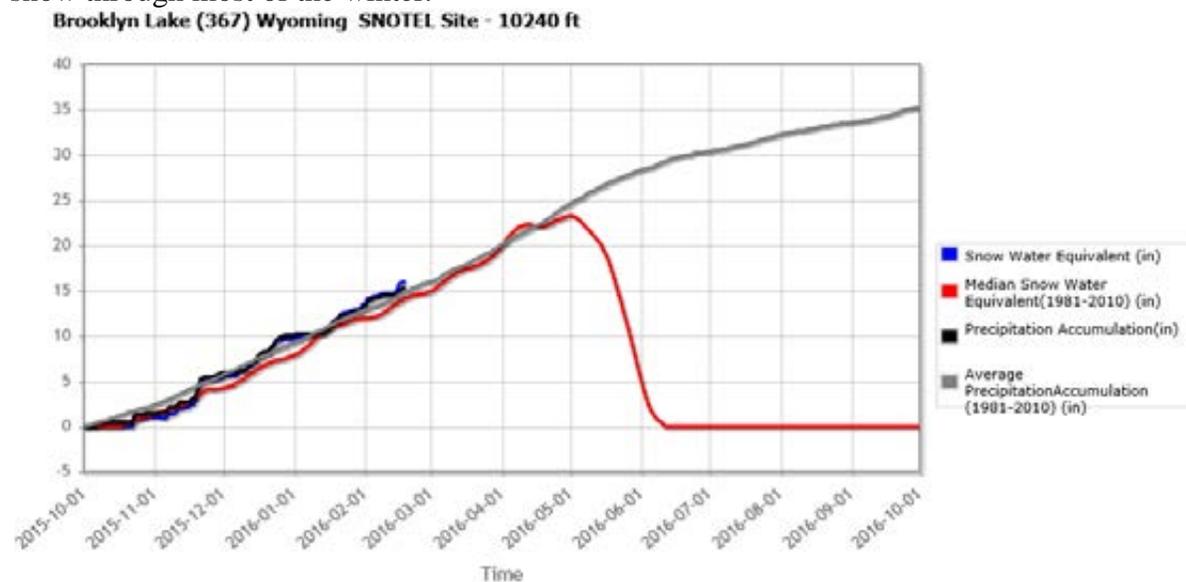


Parameter-Elevation Relationships on Independent Slopes Model (PRISM) utilized to estimate to estimate precipitation by calculating a climate-elevation regression for each Digital Elevation Model grid cell (*4 km resolution*).

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

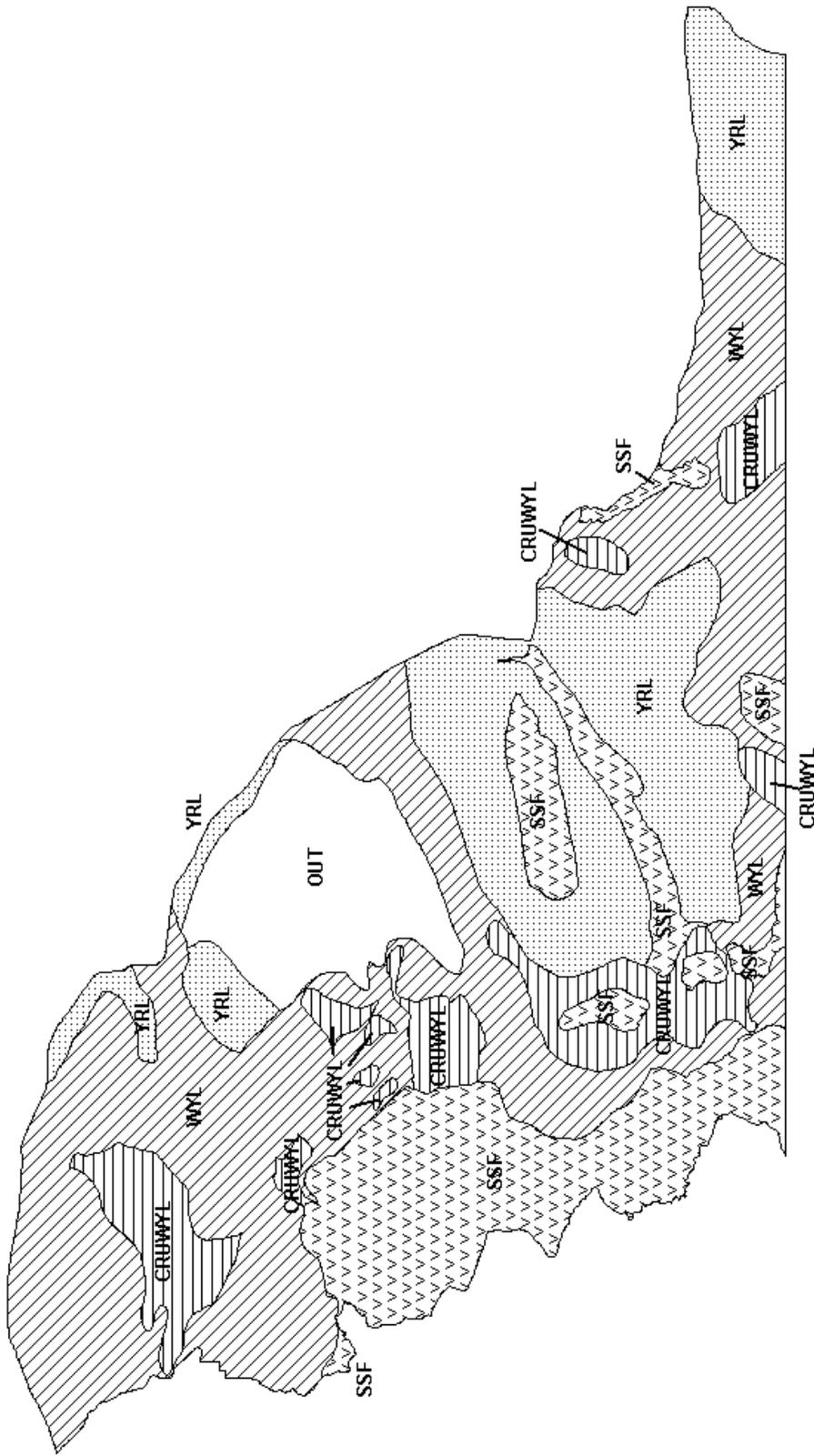
Time-Specific Juvenile & Constant Adult Survival (TSJ, CA) spreadsheet model was chosen for this Herd Unit. This model has the lowest AIC score of 159 and a fit of 71, and estimates the population at 5,700. This model is ranked as fair; there is 15-20 years of data; ratio data available for all years 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 ($\leq 10\%$) 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.

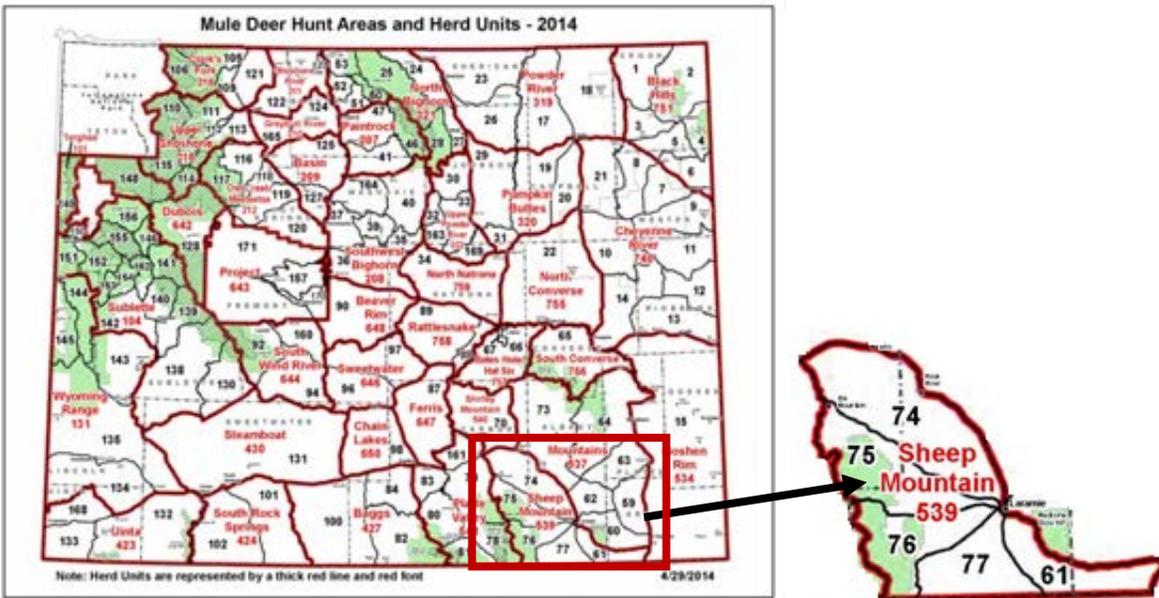


Figure 1. 2014 Wyoming mule deer herd units. The Sheep Mountain Mule Deer Herd Unit is highlighted.

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.

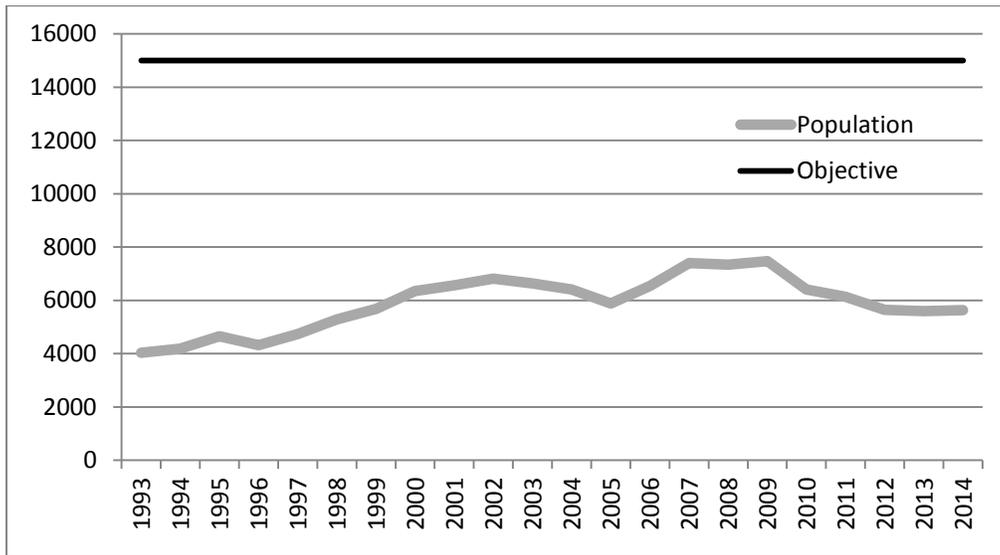


Figure 2. Population estimates and objective for the Sheep Mountain Mule Deer Herd Unit, 1993-2014.

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).

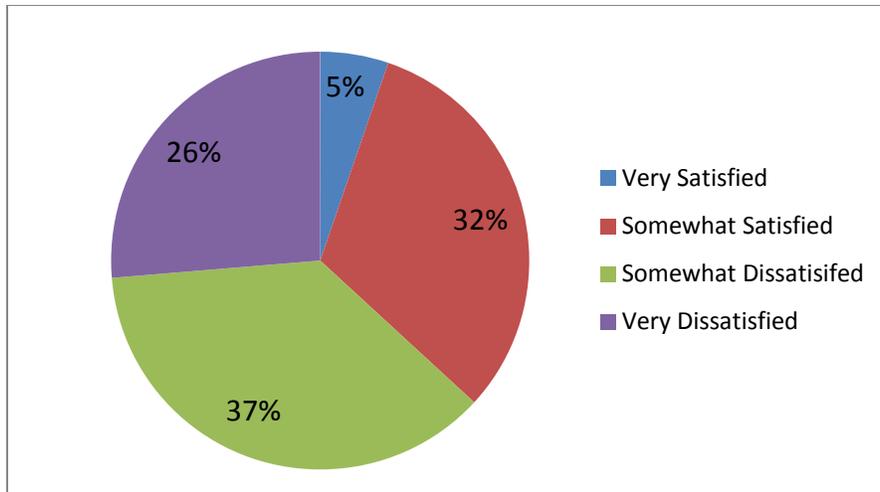


Figure 3. Current landowner satisfaction with the SMMDHU population.

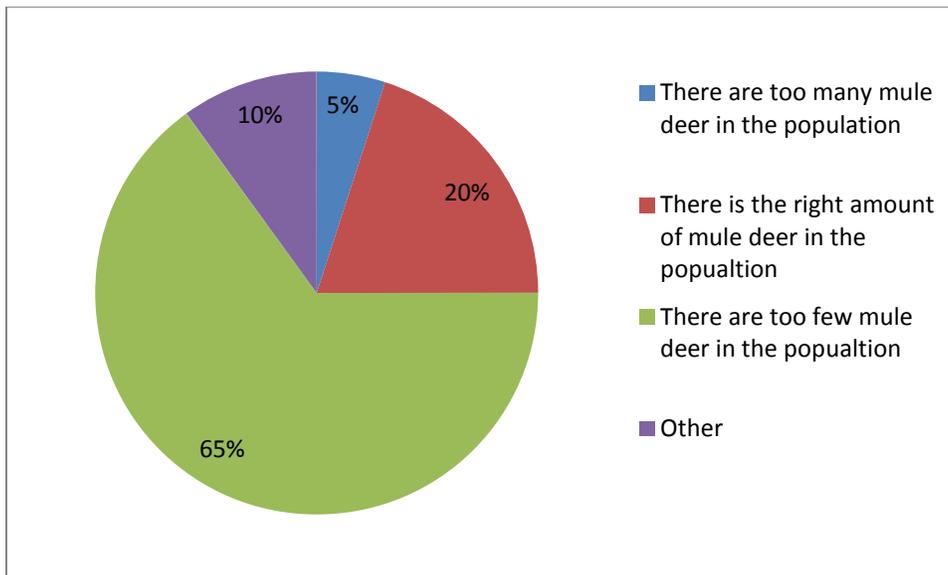


Figure 4. Landowner response as to why they were satisfied/dissatisfied. .

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).

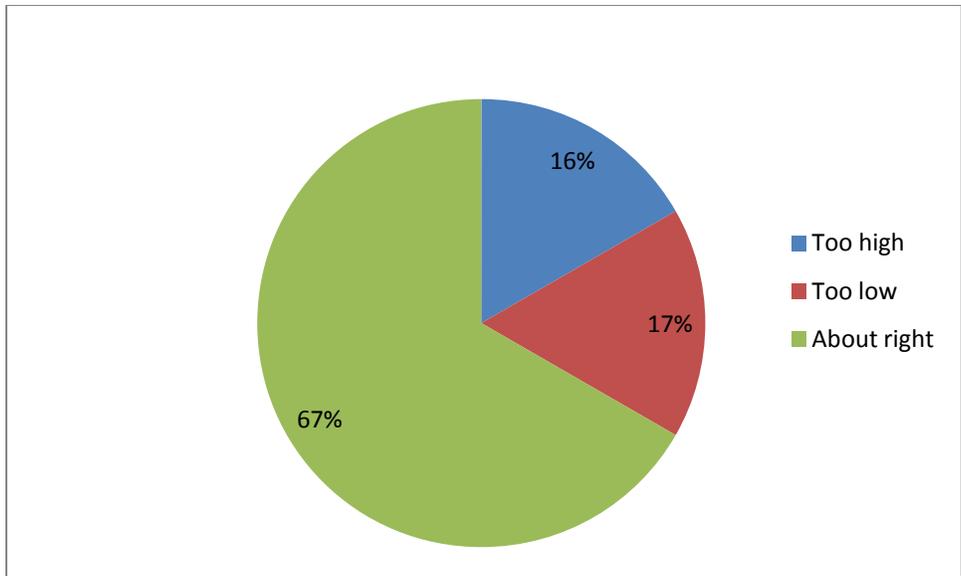


Figure 5. Landowner opinion of the current population objective of 15,000 mule deer.

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).

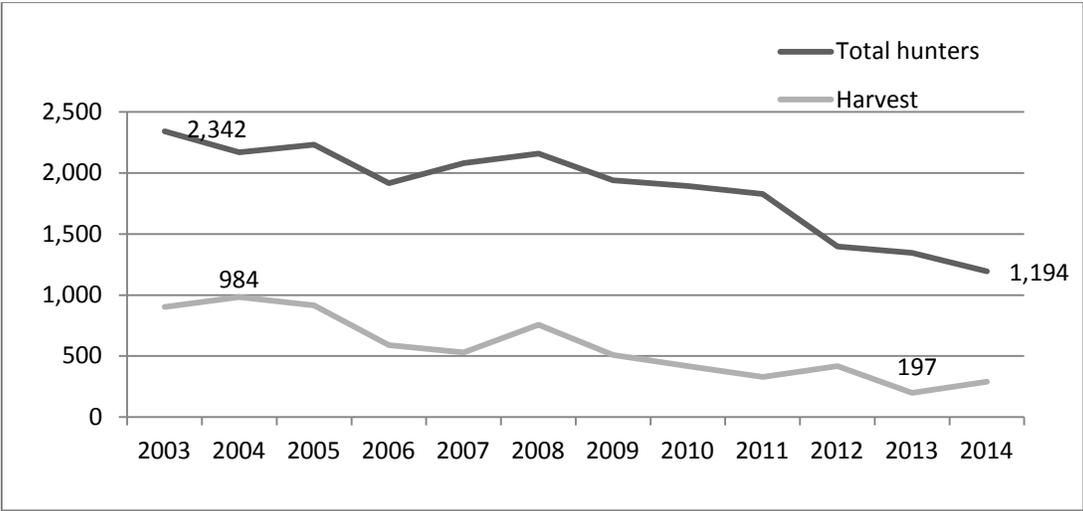


Figure 6. Number of hunters and mule deer harvested in the SMMDHU from 2003-2014.

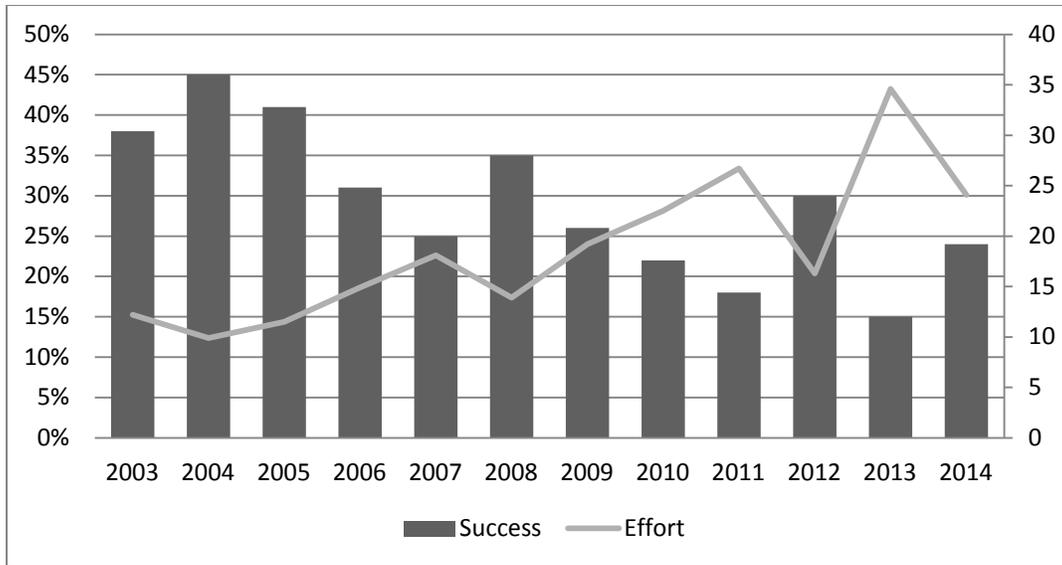


Figure 7. Hunter success and effort, measured as days per harvest, from 2003 to 2014.

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.

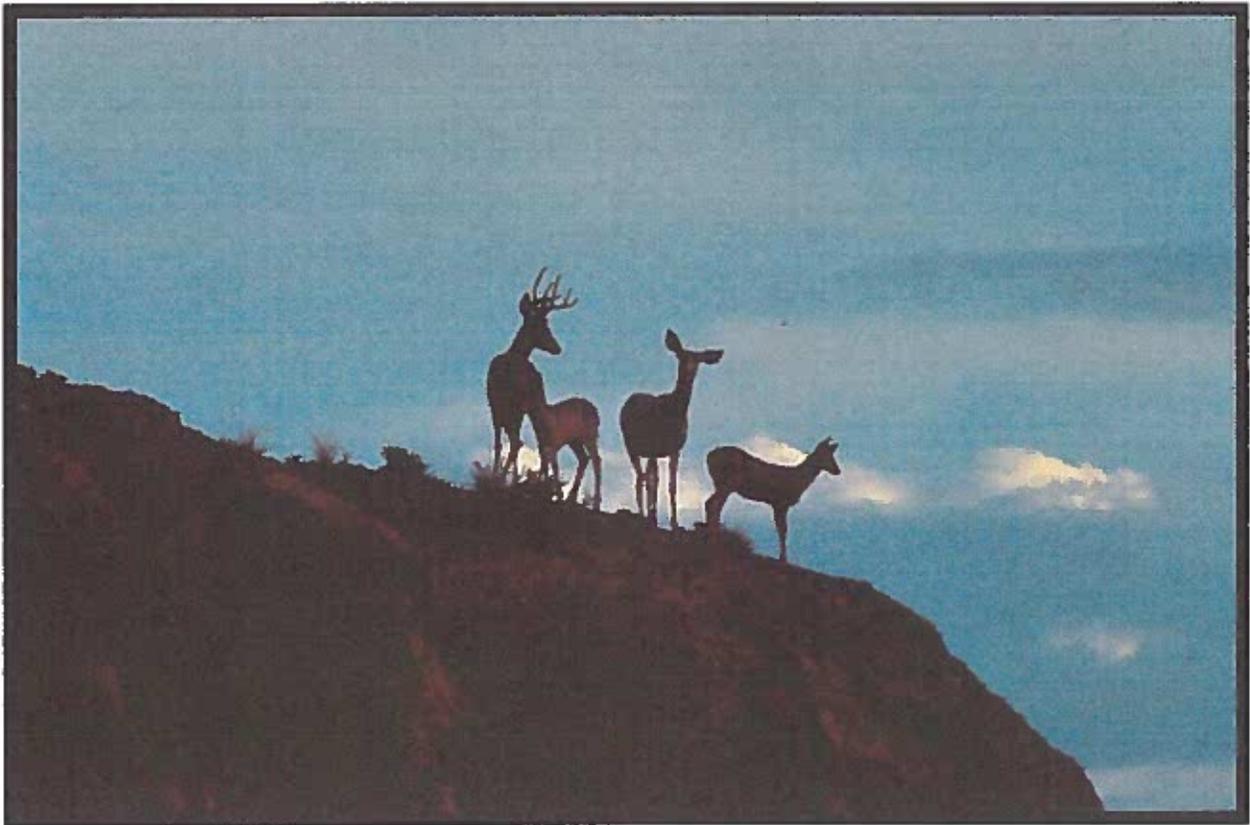
APENDIX B

ADMB SHEEP MOUNTAIN MULE DEER RECRUITMENT PROJECT

Sheep Mountain Mule Deer Recruitment Project

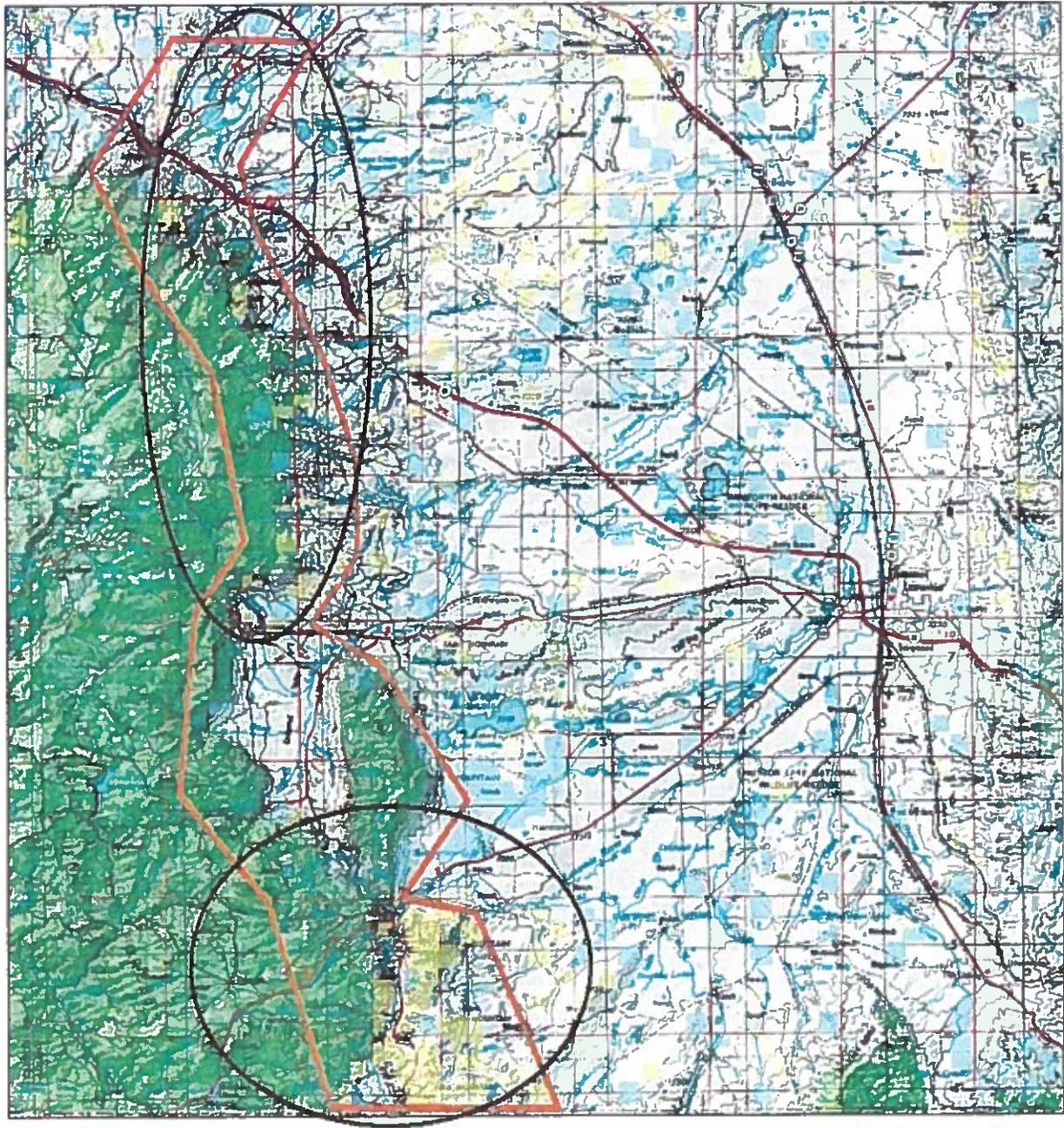
Albany County Predatory Management District (ACPM), USDA/APHIS/Wildlife Services (WS'),
Wyoming Game and Fish Department (WGFD)

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'/ACPM 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)*

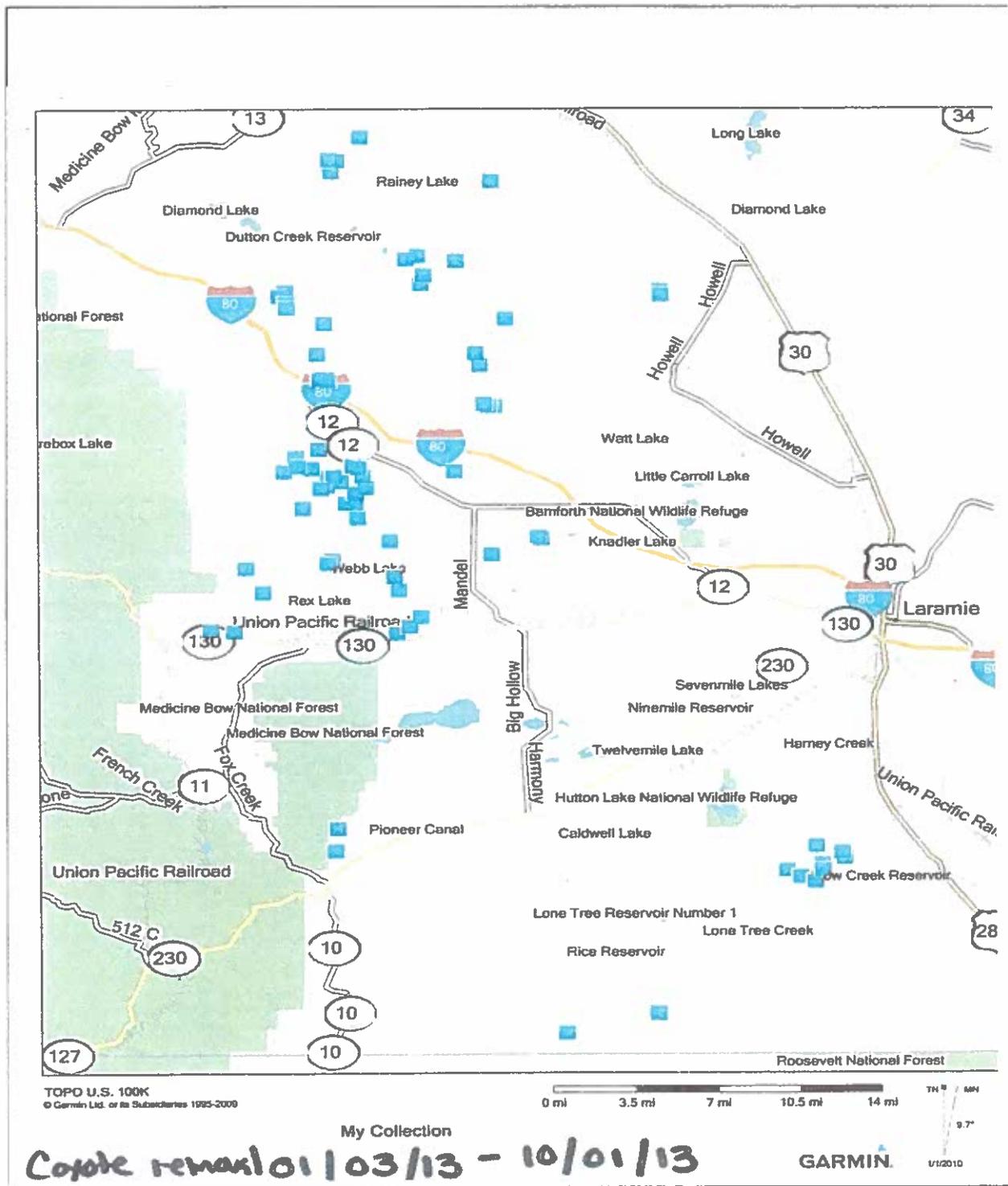
24 of 89 total (27%) coyotes taken verified for sampling and analysis below:

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)*

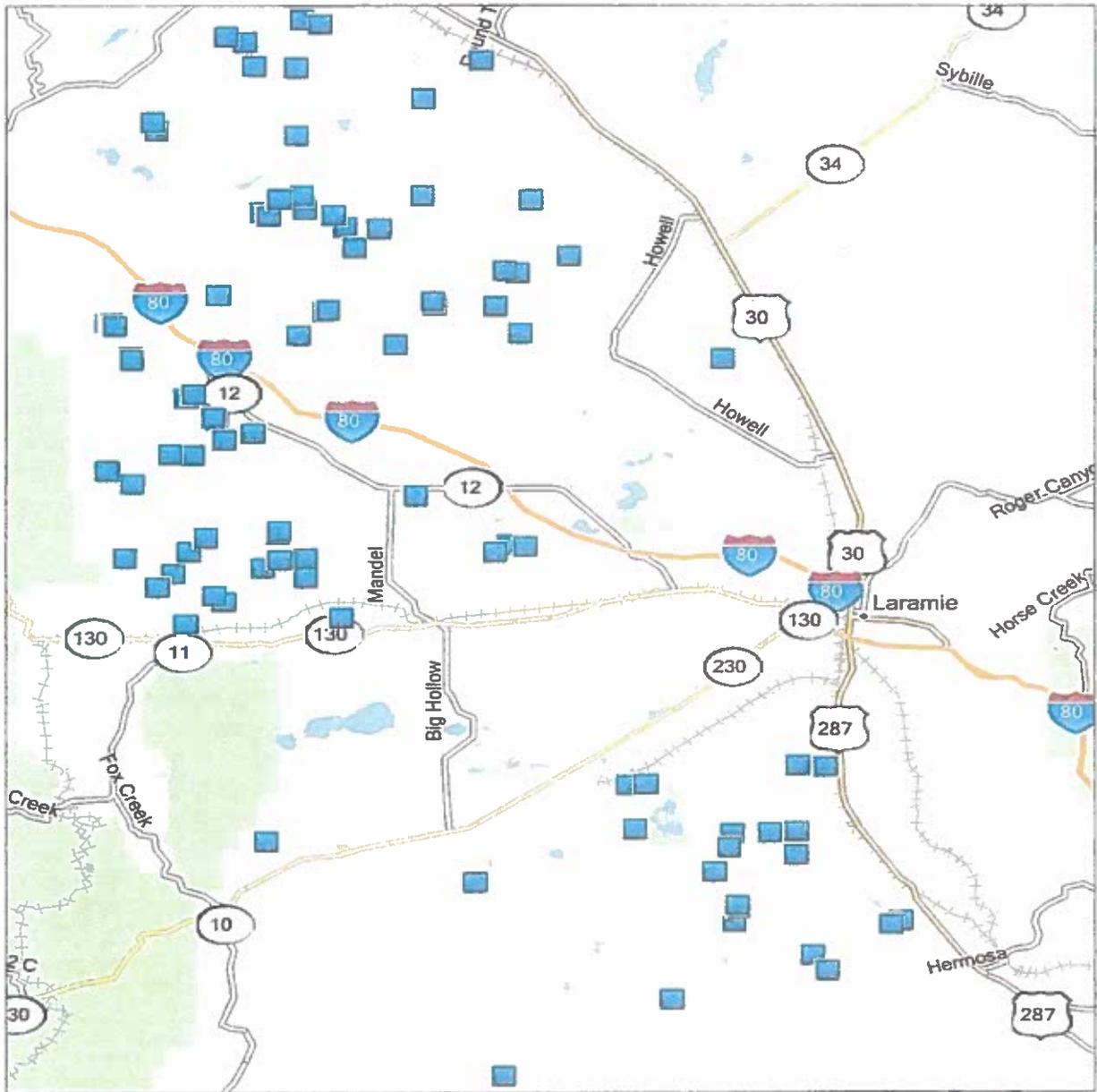
29 of 116 total (25%) coyotes taken verified for sampling and analysis below:

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



TOPO U.S. 100K
© Garmin Ltd. or its Subsidiaries 1995-2009

Coyote Removal 10/2/13-12/31/14'

My Collection

GARMIN

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)*

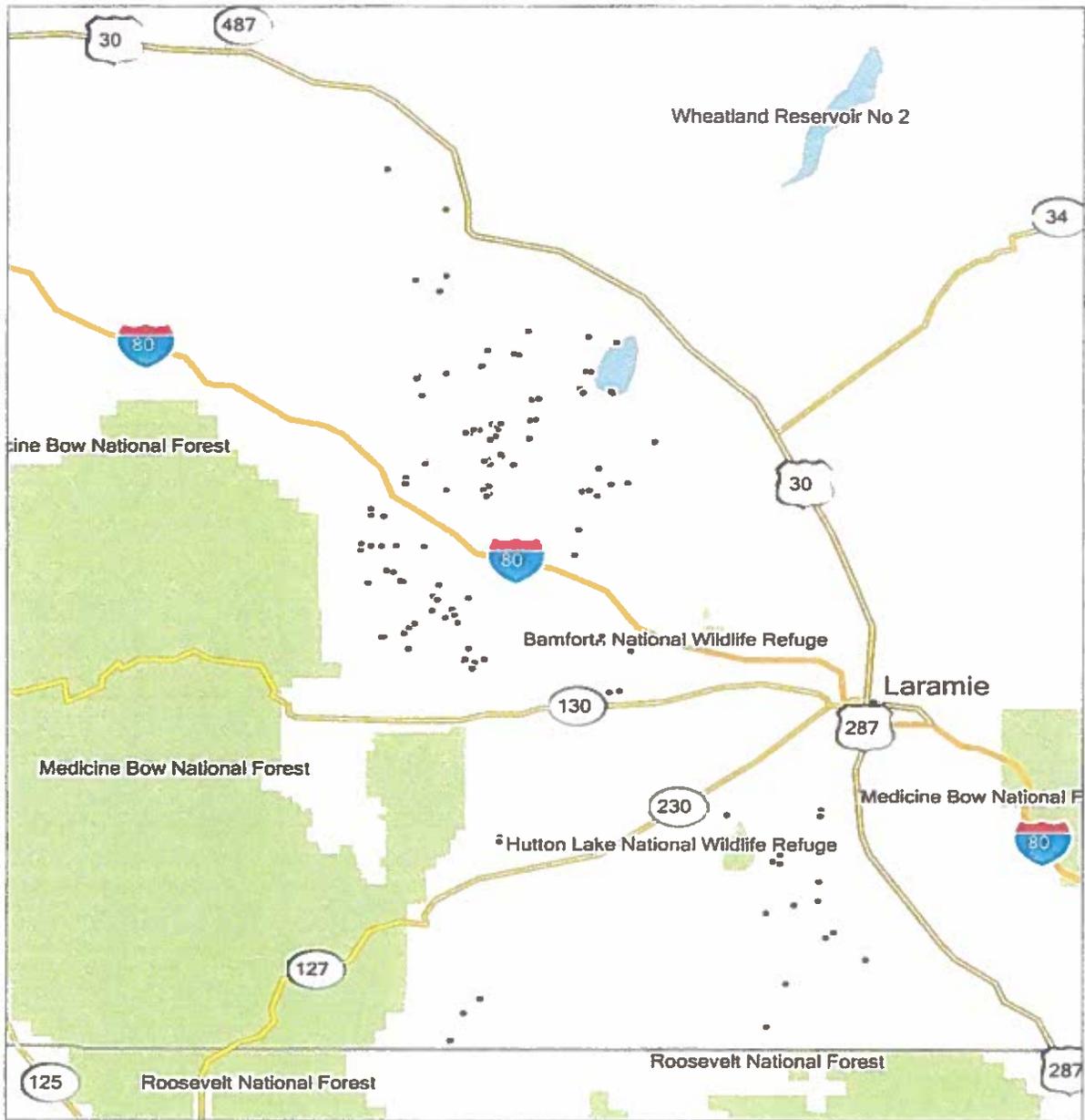
18 of 148 total (12%) coyotes taken verified for sampling and analysis below:

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)



TOPO U.S. 2008
 © Garmin Ltd. or its Subsidiaries 1995-2007

My Collection

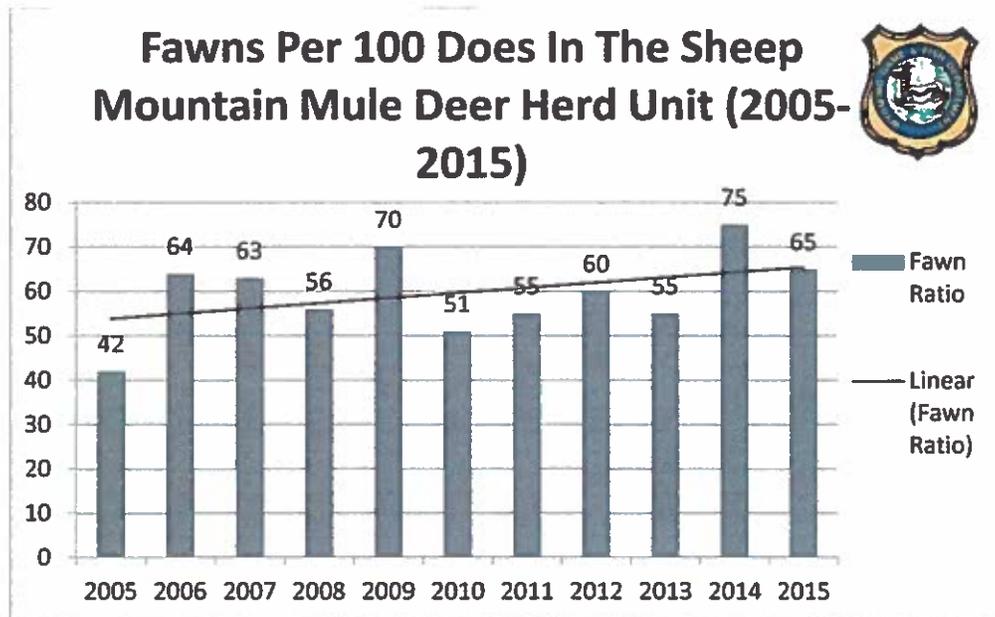
GARMIN

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, WGF D 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

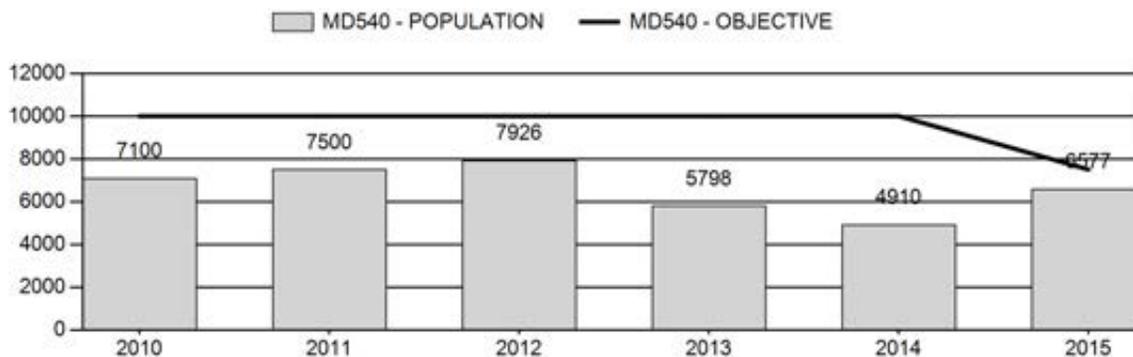
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	6,647	6,577	7,177
Harvest:	294	233	250
Hunters:	693	576	600
Hunter Success:	42%	40%	42 %
Active Licenses:	699	583	600
Active License Success:	42%	40%	42 %
Recreation Days:	2,793	2,590	2,600
Days Per Animal:	9.5	11.1	10.4
Males per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

Population Objective ($\pm 20\%$) :	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

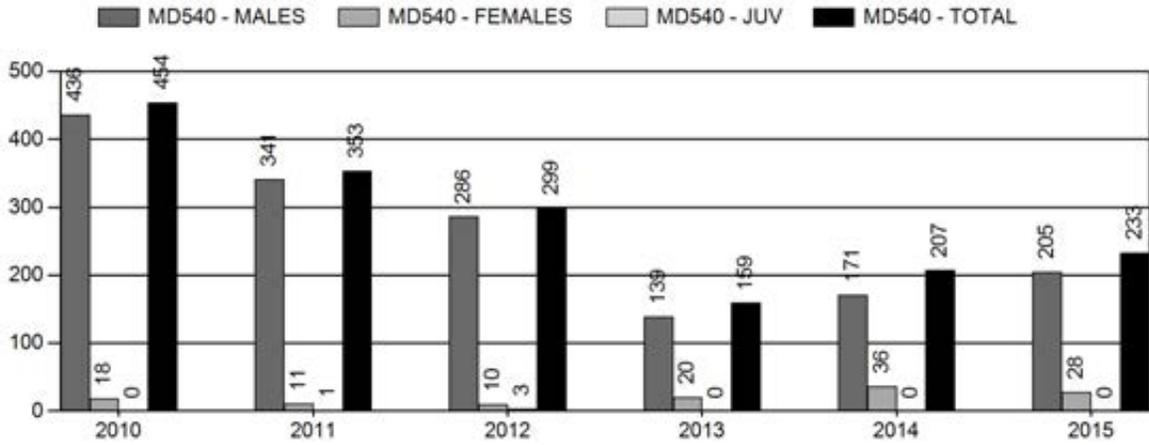
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

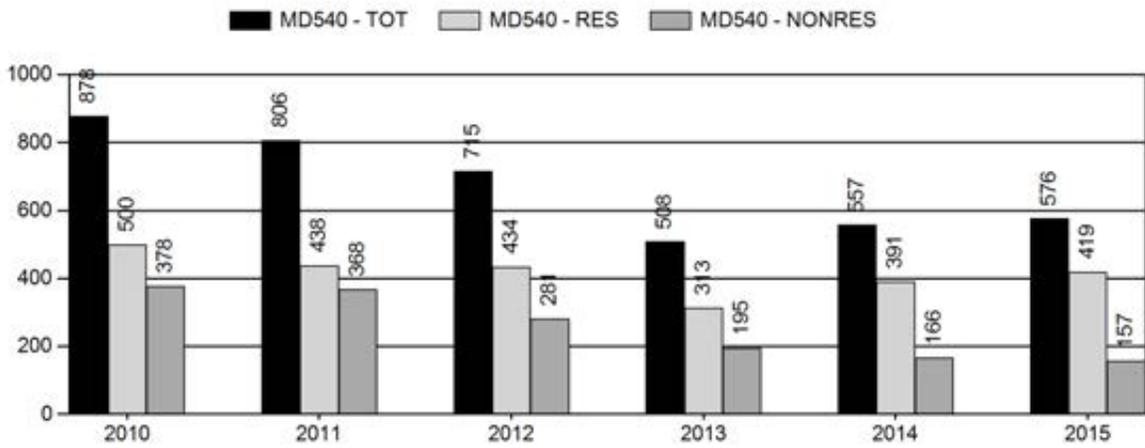
Population Size - Postseason



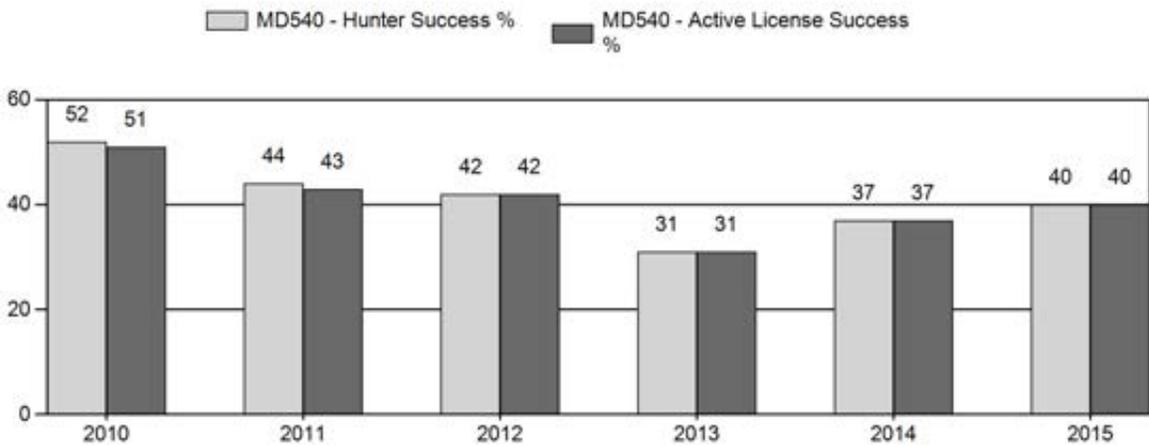
Harvest



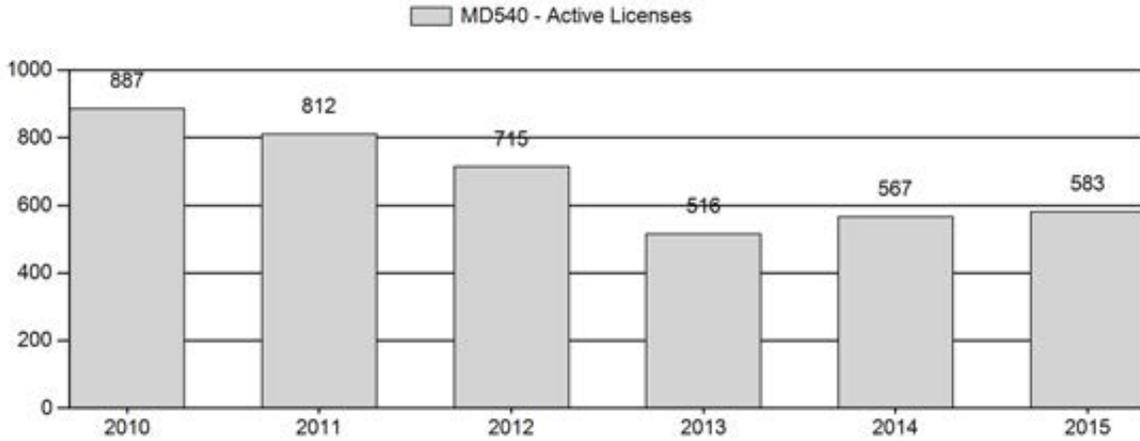
Number of Hunters



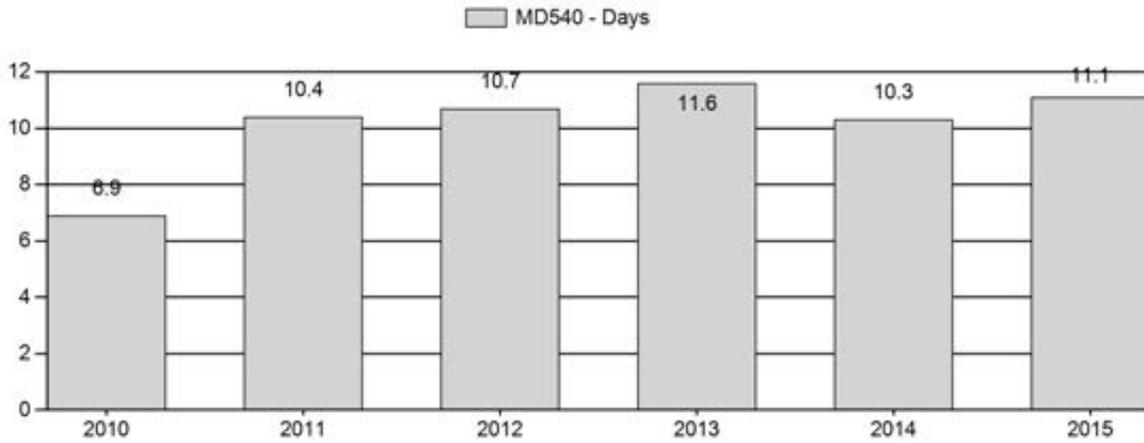
Harvest Success



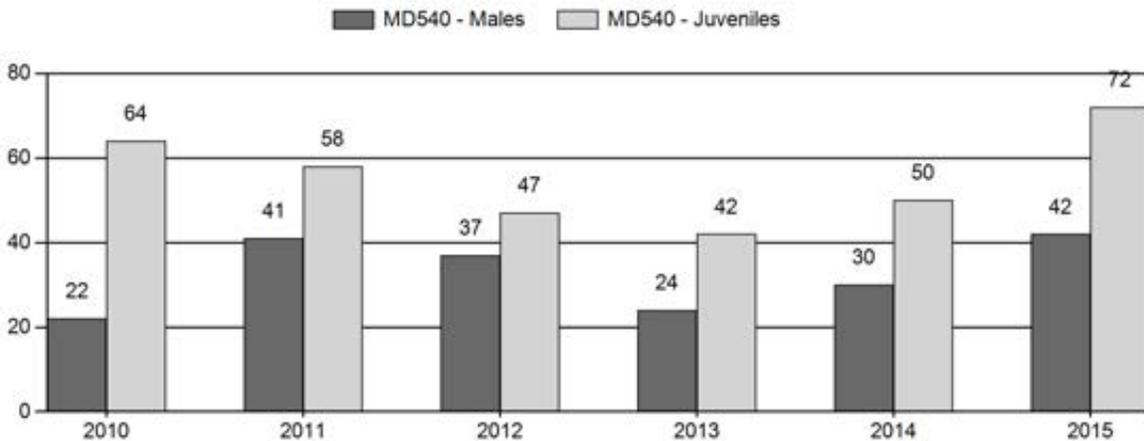
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD540 - SHIRLEY MOUNTAIN

Year	Post Pop	MALES								FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Yng			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		Quota	License	Limitations
		Opens	Closes			
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 km² 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 ($\pm 20\%$) mule deer for the Shirley Mountain herd unit. Subsequently, the objective was reviewed in 1987 and increased to 10,000 ($\pm 20\%$) mule deer due to changes in estimation techniques, sportsmen desires, and landowner desires/tolerances. The Shirley Mountain herd unit population objective of 10,000 ($\pm 20\%$) mule deer has not been reviewed since 1987.

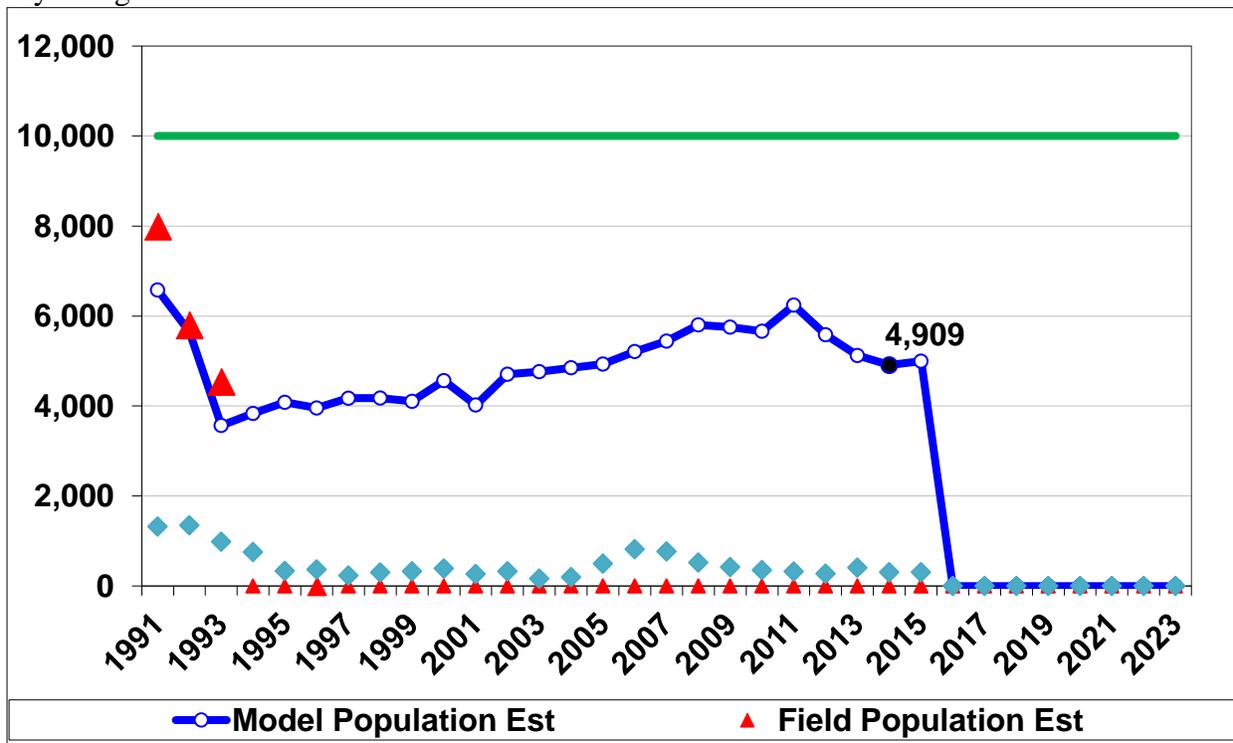
An actual count of all mule deer in a herd unit would be, for all practical purposes, impossible to complete. Therefore, WGFD develops herd unit population estimates using a computer-based population model. Data collected annually through hunter-harvest surveys and postseason mule deer sex and age classification 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 ($\pm 20\%$) mule deer to 7,500 ($\pm 20\%$) 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 ($\pm 20\%$) 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 ($\pm 20\%$) 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 ($\pm 20\%$) mule deer to 7,500 ($\pm 20\%$) 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 ($\pm 20\%$) mule deer to 7,500 ($\pm 20\%$) 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.

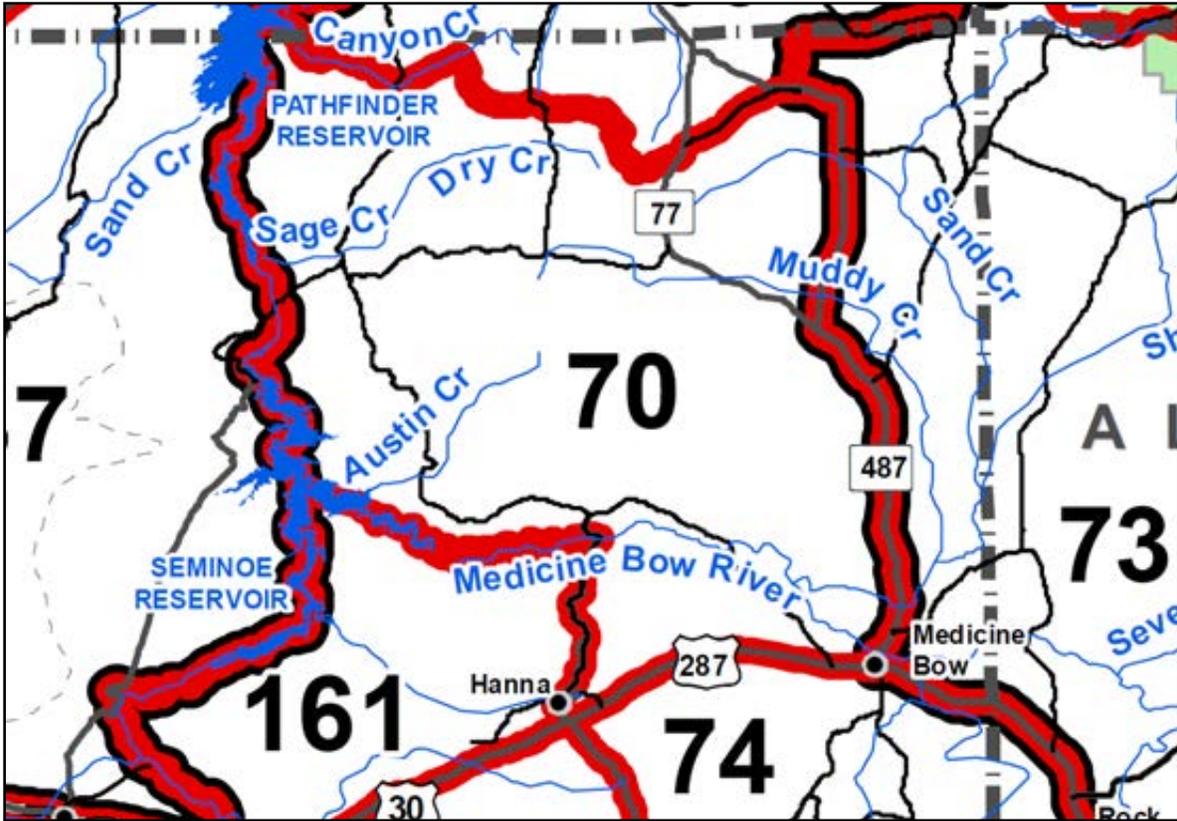
Sincerely,



Will Schultz
Saratoga Wildlife Biologist

WS/ws

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

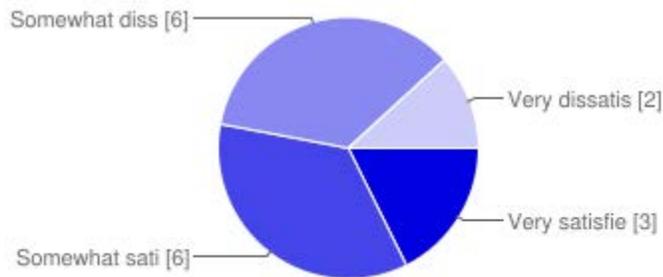


Shirley Mountain Mule Deer Landowner Survey

64 surveyed / 20 responses

Summary

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

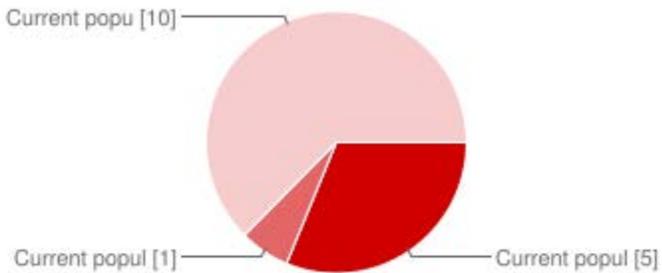


Very satisfied	3	18%
Somewhat satisfied	6	35%
Somewhat dissatisfied	6	35%
Very dissatisfied	2	12%

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

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSELM
AARON CLARK
KEITH CULVER
MIKE HEALY
T. CARRIE LITTLE

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
Phone: (307) 777-4600 Fax: (307) 777-4699
wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD
DIRECTOR
SCOTT TALBOTT
COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

- 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.

- 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 Tamilla

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

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAE

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.

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.

I support this proposal

I do not support this proposal

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!



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA – President
CHARLES PRICE – Vice President
MARK ANSELM
PATRICK CRANK
KEITH CULVER
T. CARRIE LITTLE
DAVID RAEI

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.

I support this proposal

I do not support this proposal

Shirley Mountain Elk

Current population estimate = 800 elk

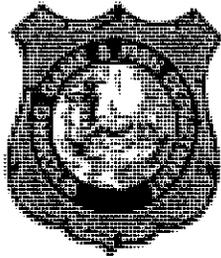
Management Strategy: Recreational

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.

I support this proposal

I do not support this proposal

Comments:



WYOMING GAME AND FISH DEPARTMENT

5400 Bishop Blvd. Cheyenne, WY 82006

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

wgfd.wyo.gov

GOVERNOR
MATTHEW H. MEAD

DIRECTOR
SCOTT TALBOTT

COMMISSIONERS
RICHARD KLOUDA - President
CHARLES PRICE - Vice President
MARK ANSEMI
PATRICK CRANK
KEITH CULVER
T. GARRIE LITTLE
DAVID RAEI

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.

- 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.

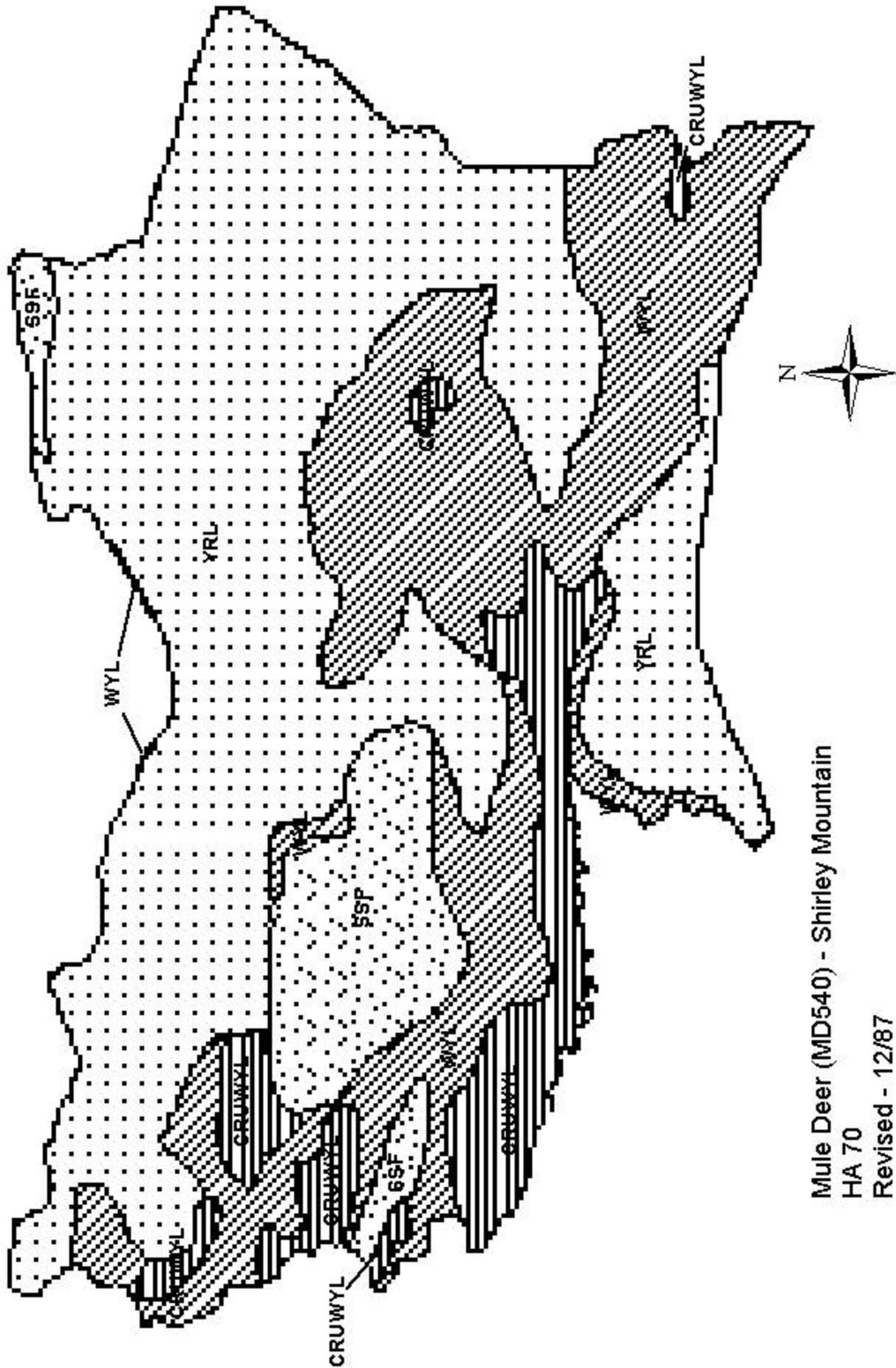
- I support this proposal
- I do not support this proposal

Comments:

Elk - maintain the quality

Deer - Area 20 was much better for deer years ago when it was a limited quota area.

[Handwritten Signature] 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

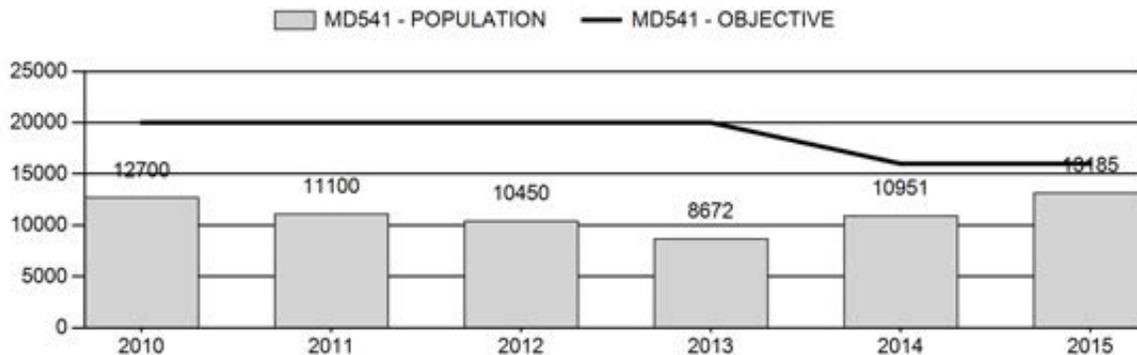
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Population:	10,775	13,185	13,605
Harvest:	540	523	530
Hunters:	1,898	894	1,025
Hunter Success:	28%	59%	52 %
Active Licenses:	1,918	894	1,025
Active License Success:	28%	59%	52 %
Recreation Days:	10,193	4,852	5,000
Days Per Animal:	18.9	9.3	9.4
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

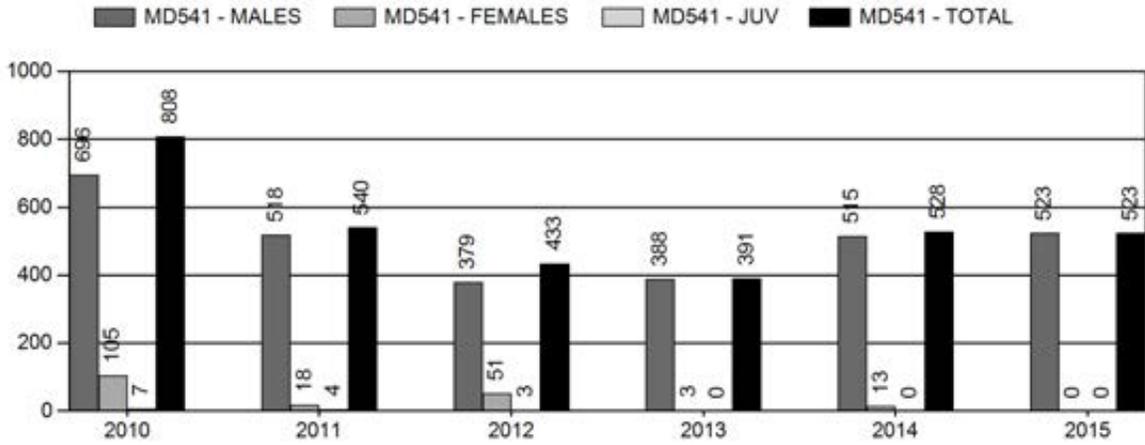
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

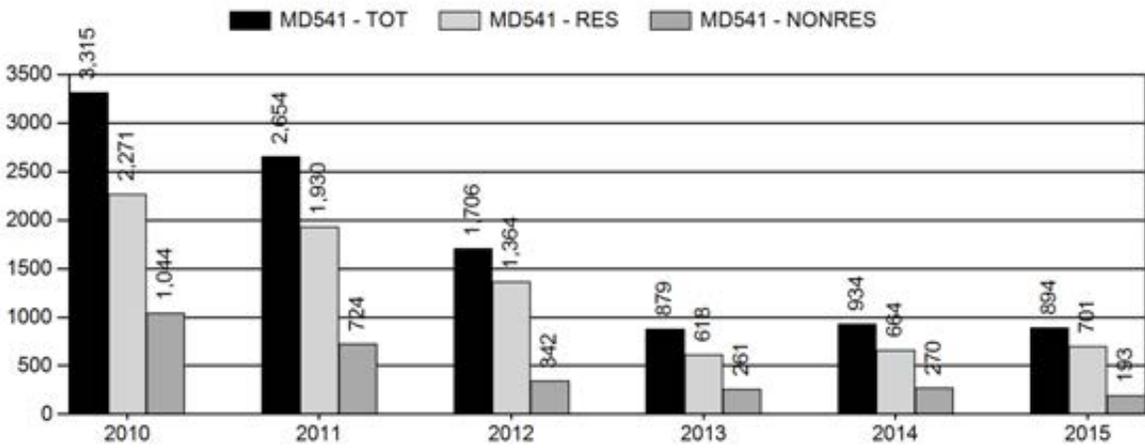
Population Size - Postseason



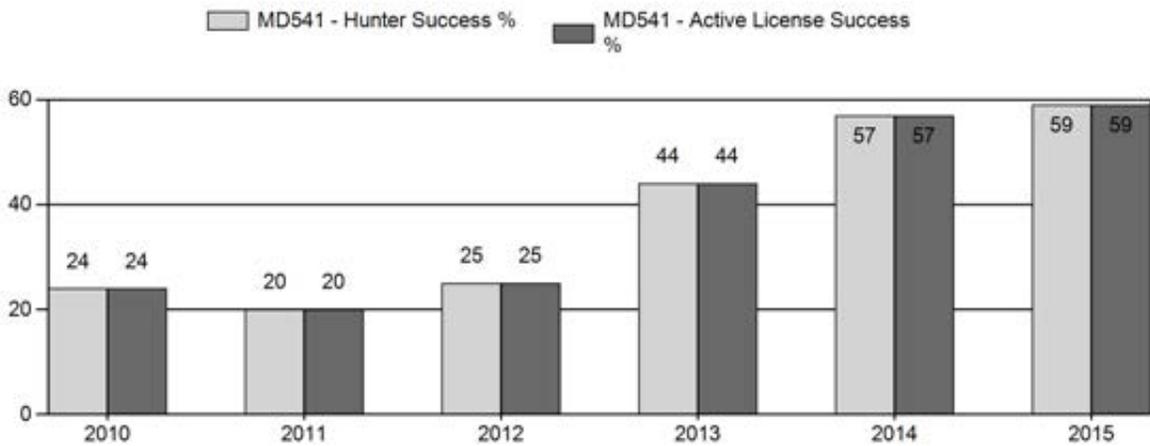
Harvest



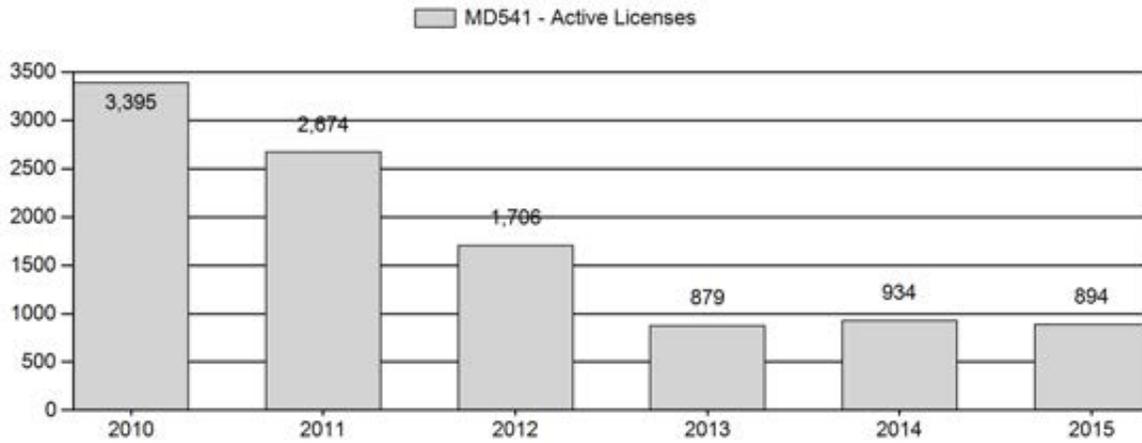
Number of Hunters



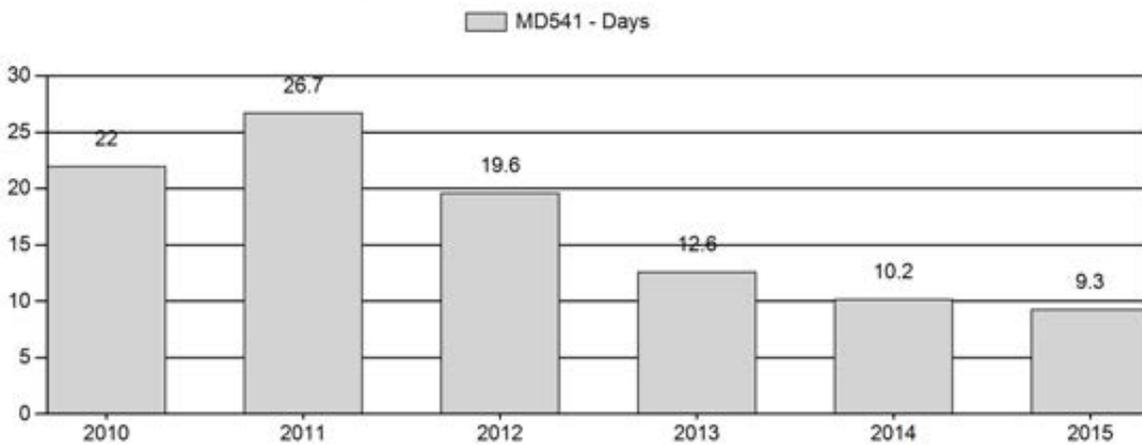
Harvest Success



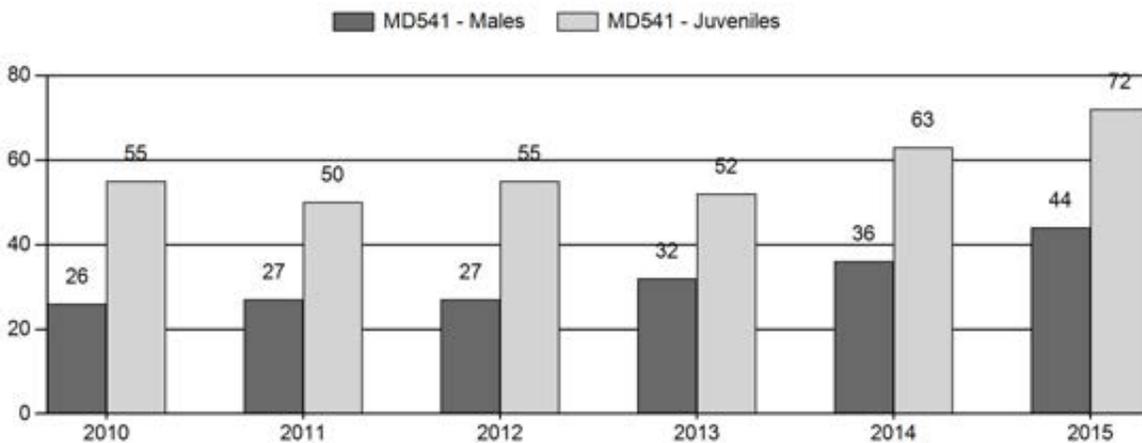
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2010 - 2015 Postseason Classification Summary

for Mule Deer Herd MD541 - PLATTE VALLEY

Year	Post Pop	MALES								FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Yng			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		Quota	License	Limitations
		Opens	Closes			
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

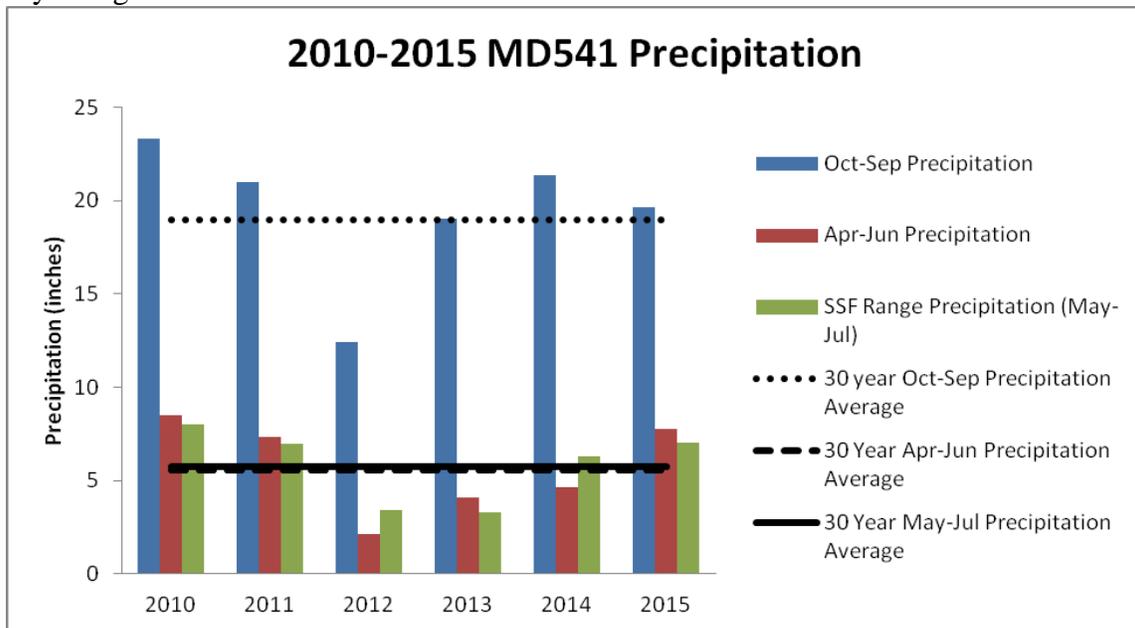
Fieldwork for several Platte Valley Habitat Partnership projects has been initiated during this past 2 years but progress on large scale projects has been delayed by the NEPA constraints associated with working on federally managed lands. A large proportion of the mule deer that reside in this herd unit 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.

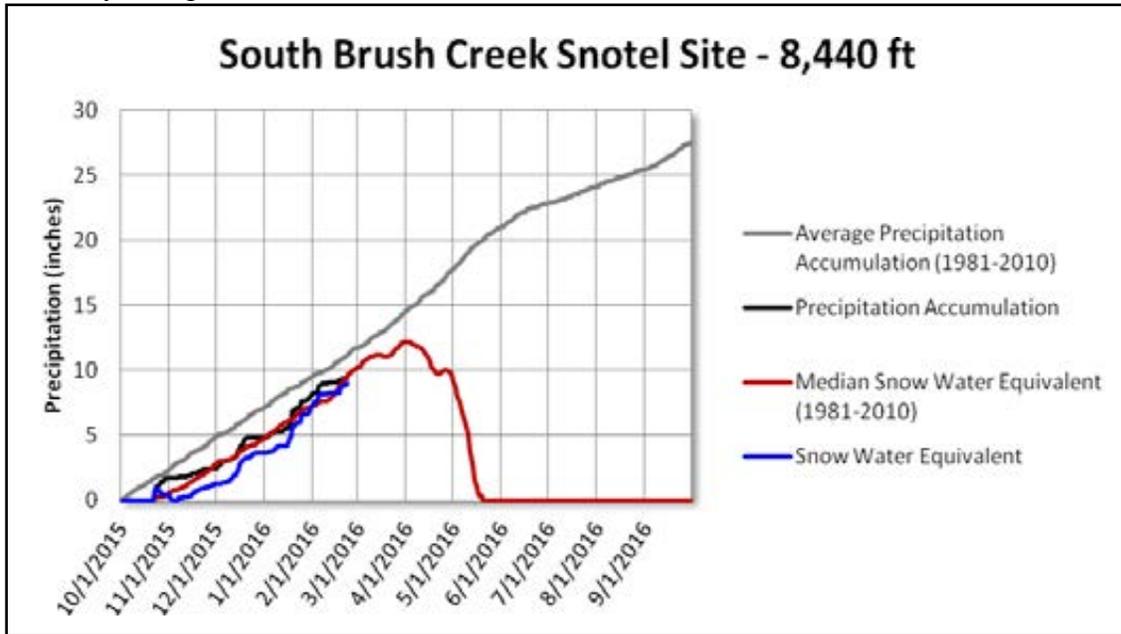
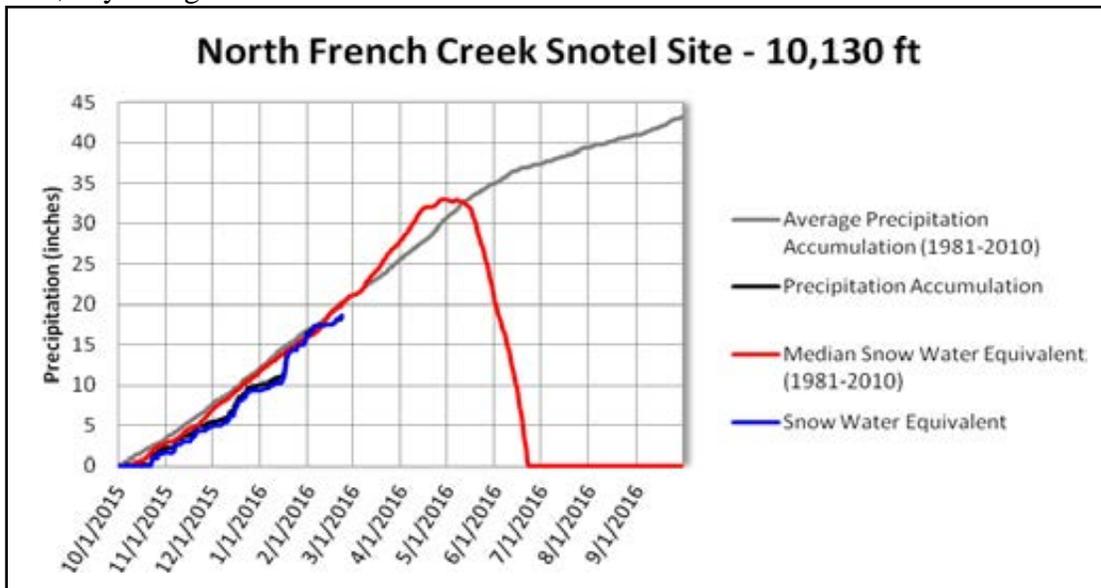


Figure 3. October-February bio-year 2015 North French Creek Snotel Site precipitation data, Wyoming.



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 = $\pm 1,856$) 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.

Literature Cited

- 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.
- 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.
- Unsworth, J. W., F. A. Leban, E. O. Garton, D. J. Leptich, and P. Zager. 1999. Aerial Survey: User's Manual. Electronic Edition. Idaho Department of Fish & Game, Boise, Idaho, USA.

Bibliography of Herd Specific Studies

- 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.
- Newman, J. 1968. Deer Distribution and Movement Studies. Final Report. Wyoming Game and Fish Department, Cheyenne.

- Strickland, M. D. 1975. An investigation of the factors affecting the management of a migratory mule deer herd in southeastern Wyoming – the Snowy Range. Ph.D. Dissertation, University of Wyoming, Laramie. 171 pp.
- Yost, J. 2009. North Park Deer Movement and Distribution Study Update - March, 2009. Colorado Division of Wildlife, Steamboat Springs. 4 pp.
- 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 occurrences 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*/1*WGFD* 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 occurrences 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 occurrences 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

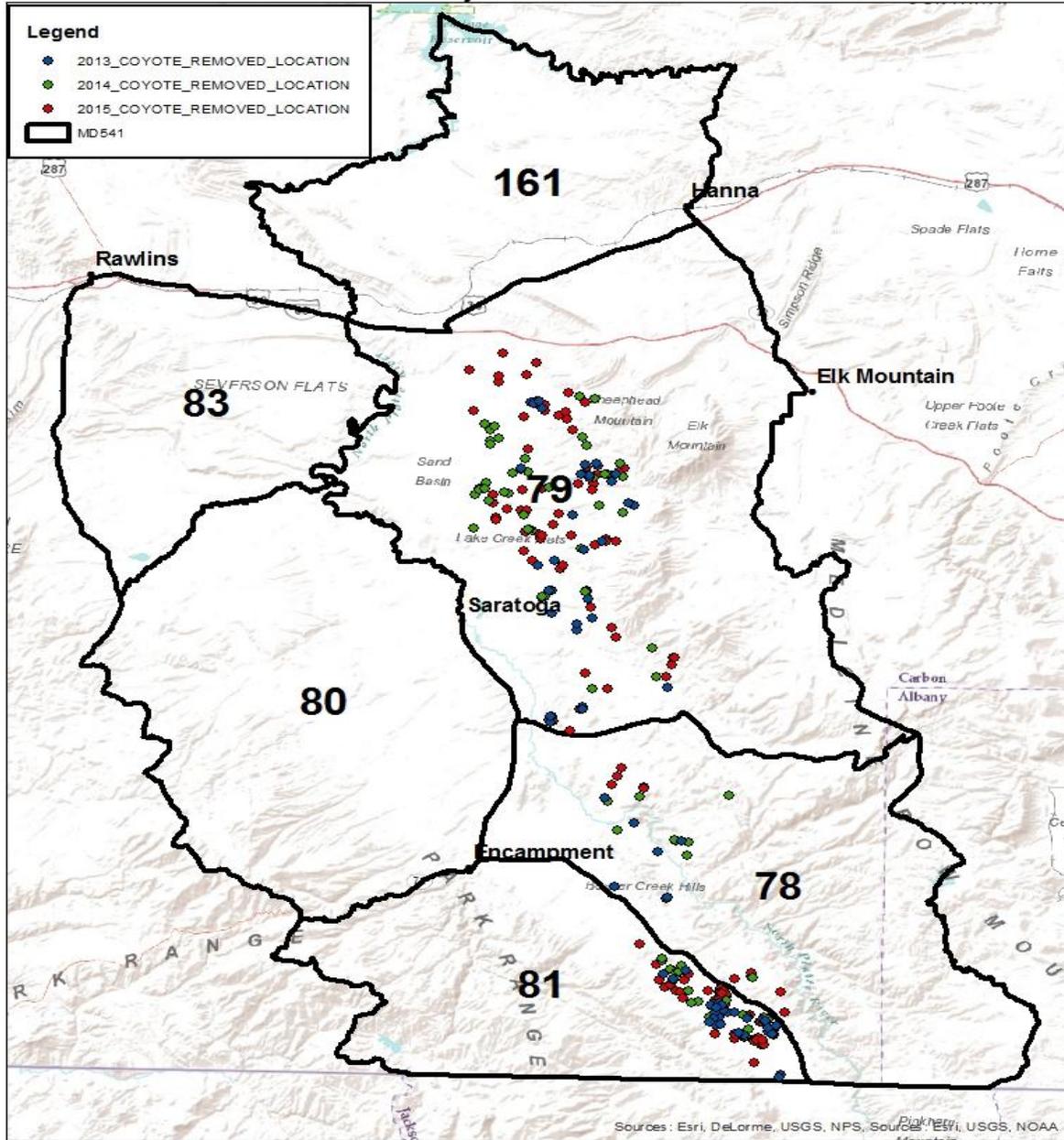
Mule Deer Recruitment Monitoring					
Mule Deer Helicopter Classification Cost	WGFD	\$11,200	\$11,200	\$11,200	\$33,600
Platte Valley Mule Deer Population Est.	WGFD	10,600	11,200	12,300	
Mule Deer Ratio (Fawns:100 Does)	WGFD	52:100	63:100	72:100	

* 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. Additionally, 31 coyotes for calendar year 2013, 30 coyotes for calendar 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 vicinity 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

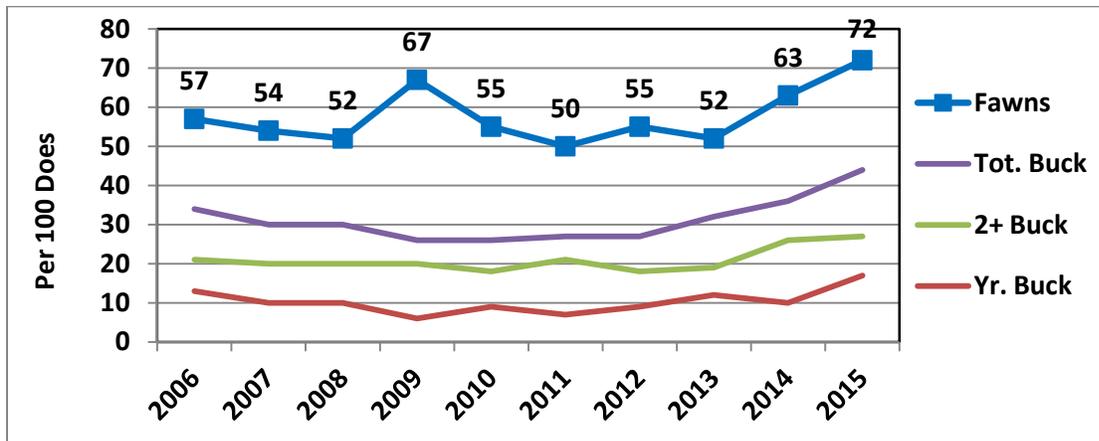
Figure 1. 2013-2015 Coyote Removal locations in the Platte Valley Mule Deer Herd Unit, Wyoming.



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

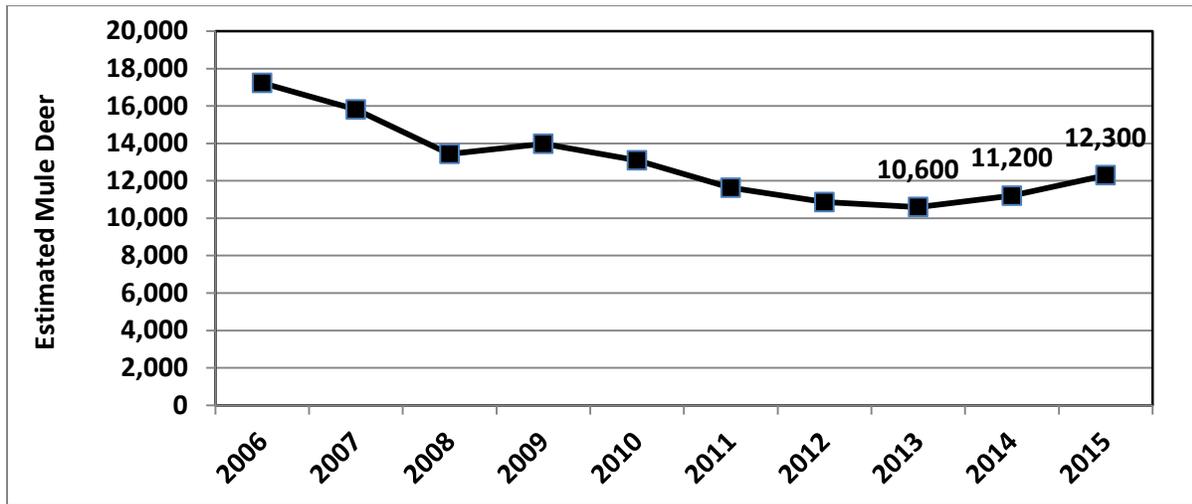
Wyoming Game and Fish Department conducted postseason helicopter surveys for the Platte Valley mule deer herd unit annually in December for the duration of the PVMDRP. Annual fawn to doe ratios were determined from these survey's results. Generally, mule deer populations are considered to require a fawn 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**).

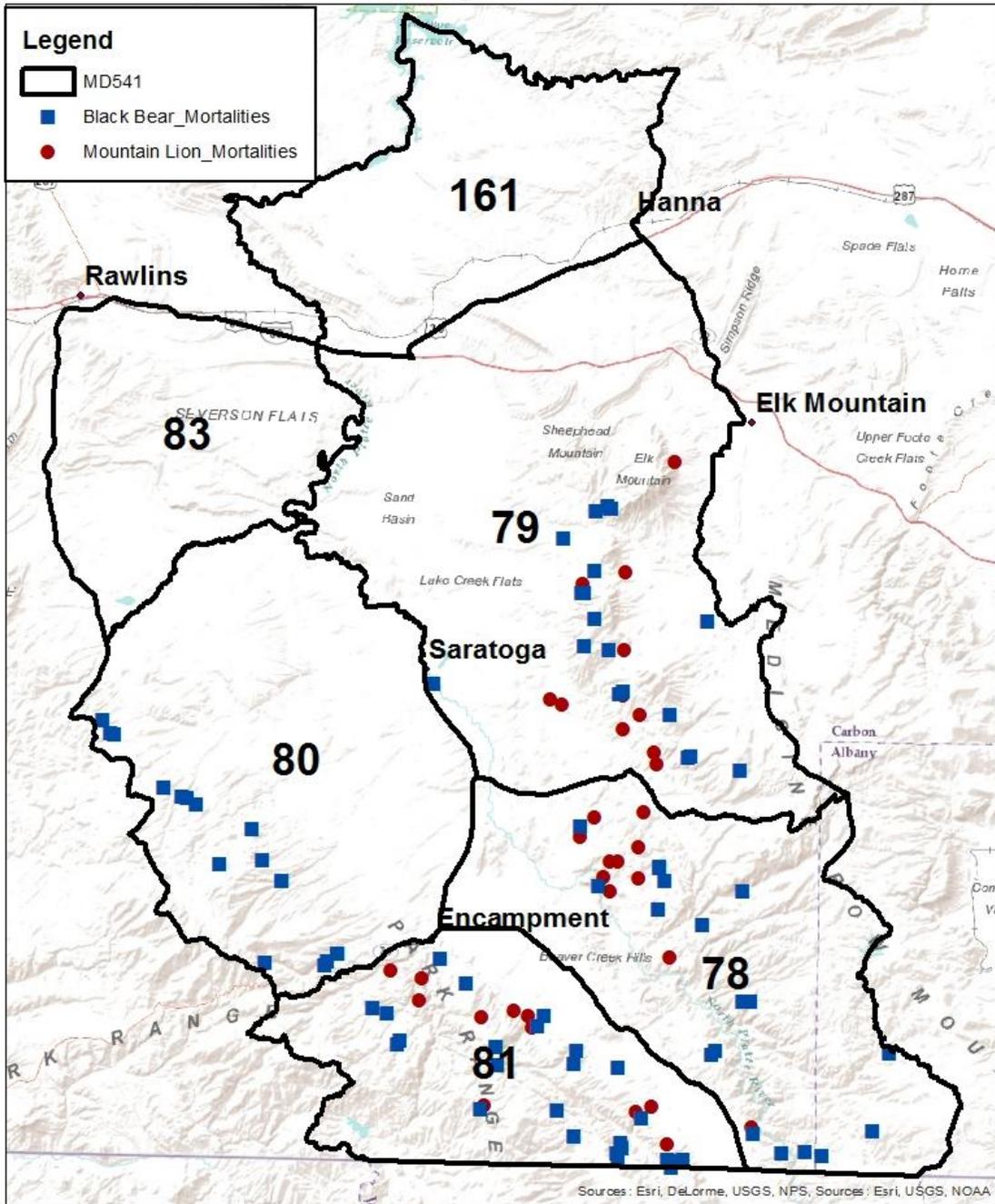
Figure 3. 2006-2015 Annual mule deer population estimates for the Platte Valley Herd Unit, Wyoming.



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 Mountain 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 correlation 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 entities, 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

Thursday, February 18, 2016 02:09 PM

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

[Files]

Title = C:\Program Files\IDFG\Aerial Survey\16_MD541.ttl

Summary = C:\Program Files\IDFG\Aerial Survey\16_MD541.sum

.....
2016_MD541_Sightability

Section 1: Summary of Raw Counts

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

Section 2: Summary of Raw Counts for Perfect Visibility Model

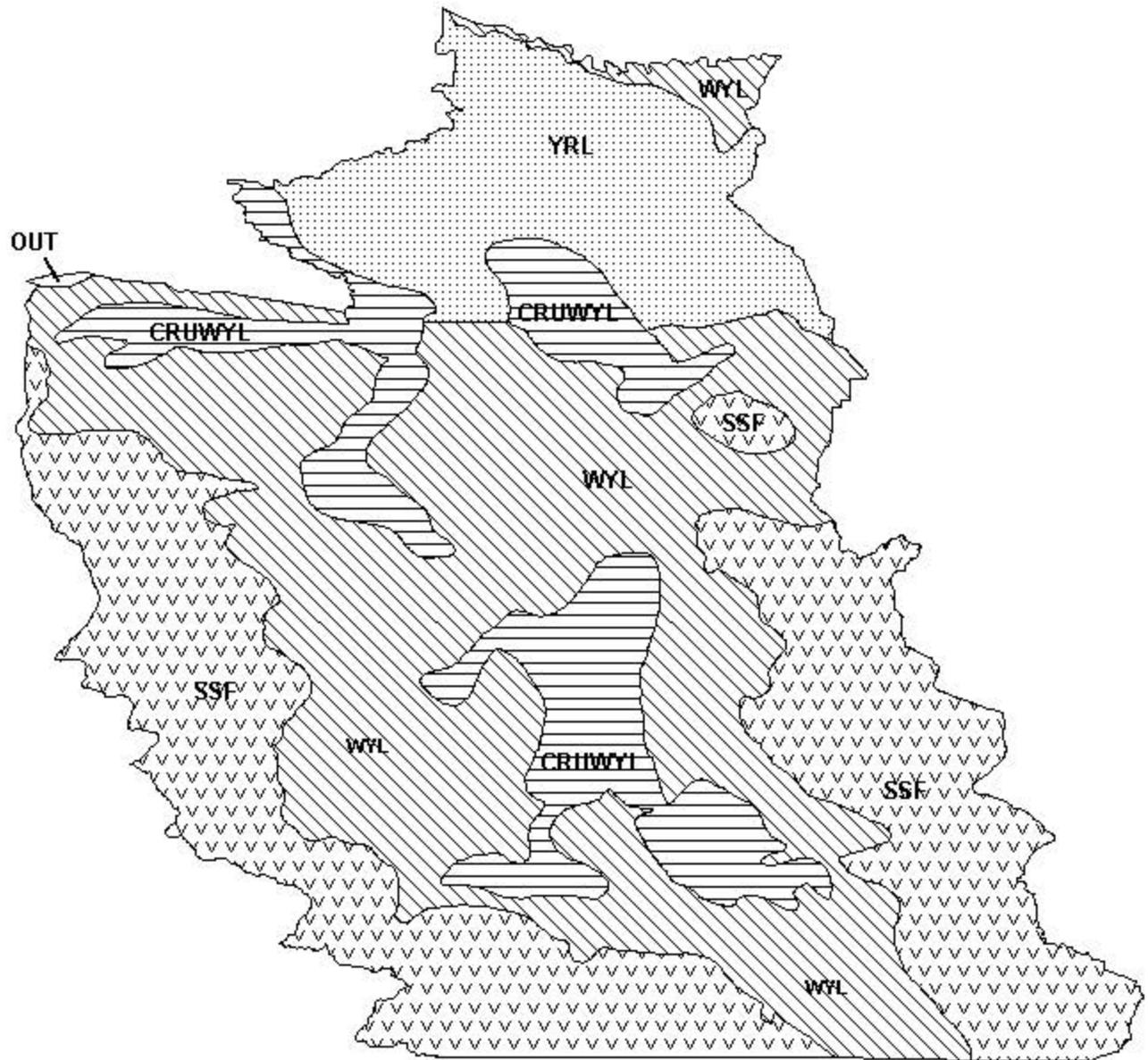
This table projects the number of animals that would have been counted if every unit had been flown and visibility had been perfect (no animals obscured by vegetation, etc.)

	No of Units		
Strat	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		Estimate	Variance		Model	Bound 95%
	Popn.	Sample		Sampling	Sightability		
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
 HA 78-81, 83, 161
 Revised - 12/87



2015 - JCR Evaluation Form

SPECIES: White tailed Deer

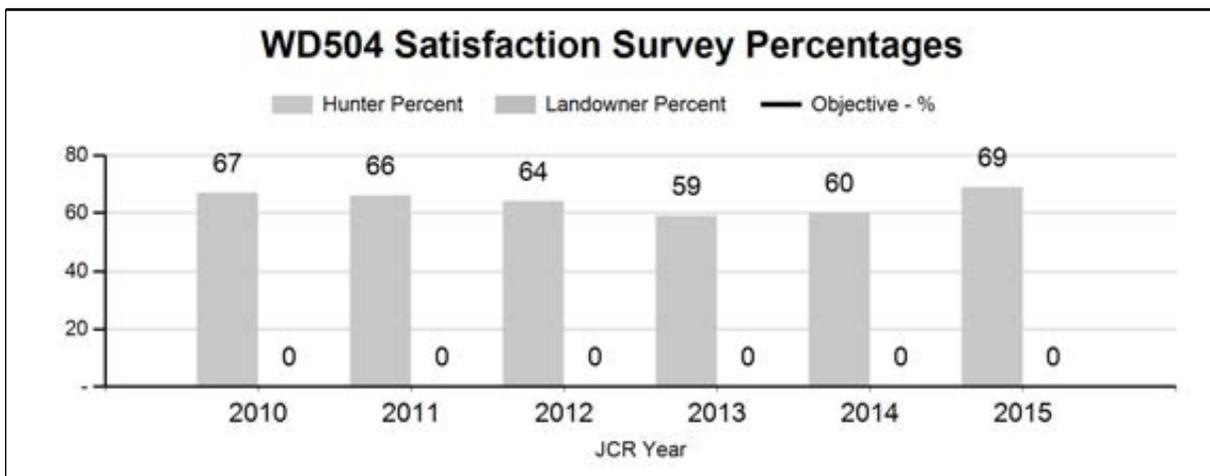
PERIOD: 6/1/2015 - 5/31/2016

HERD: WD504 - SOUTHEAST WYOMING

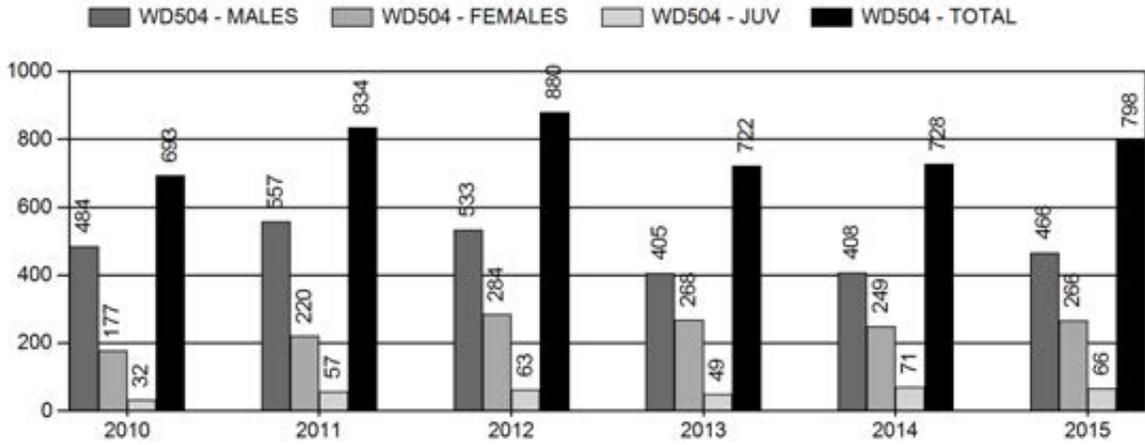
HUNT AREAS: 15, 59-64, 70, 73-81, 83, 161

PREPARED BY: MARTIN HICKS

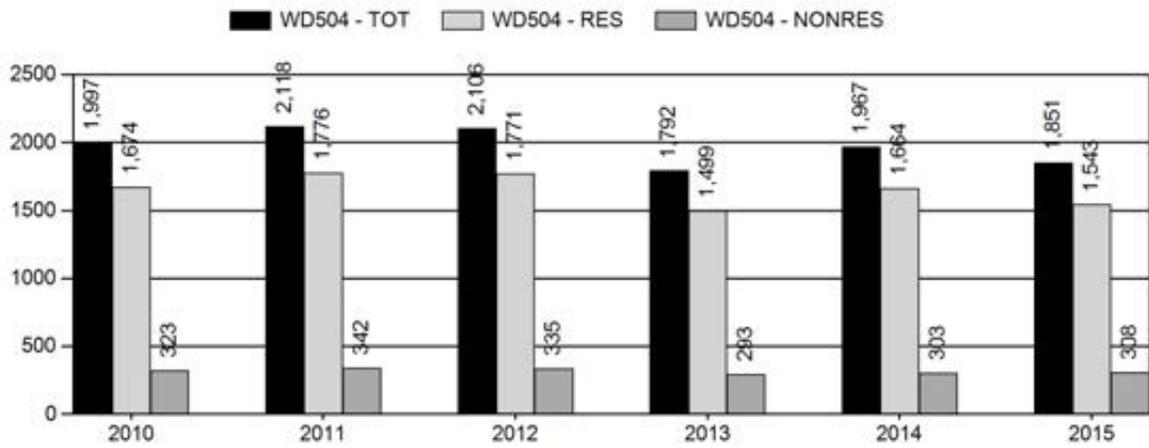
	<u>2010 - 2014 Average</u>	<u>2015</u>	<u>2016 Proposed</u>
Hunter Satisfaction Percent	64%	69%	60%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	771	798	850
Hunters:	1,996	1,851	1,850
Hunter Success:	39%	43%	46%
Active Licenses:	2,192	2,104	2,100
Active License Success:	35%	38%	40 %
Recreation Days:	8,475	8,297	8,200
Days Per Animal:	11.0	10.4	9.6
Males per 100 Females:	39	0	
Juveniles per 100 Females	68	0	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			N/A%
Number of years population has been + or - objective in recent trend:			1



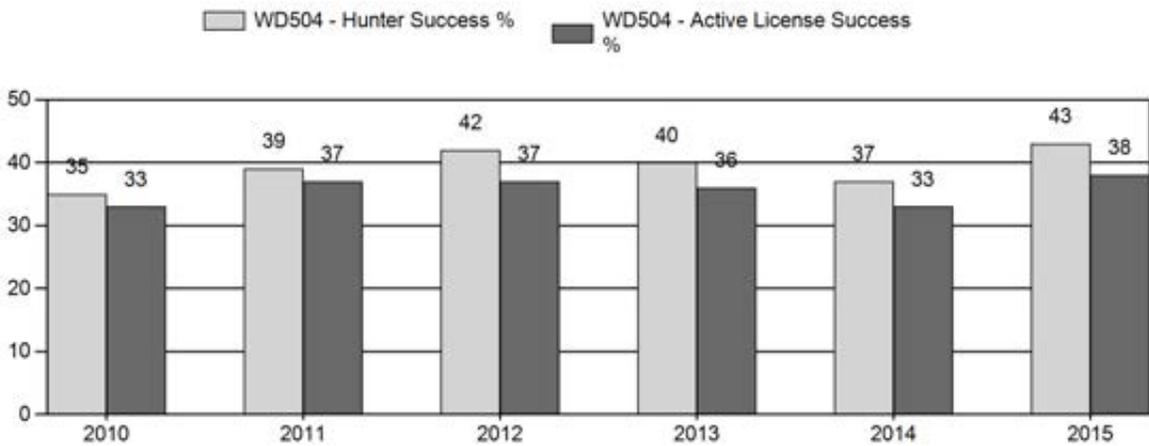
Harvest



Number of Hunters



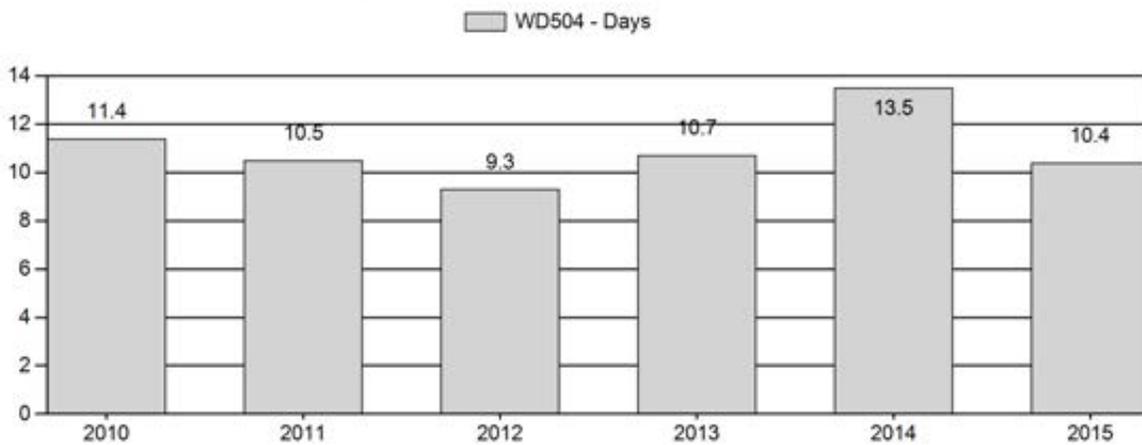
Harvest Success



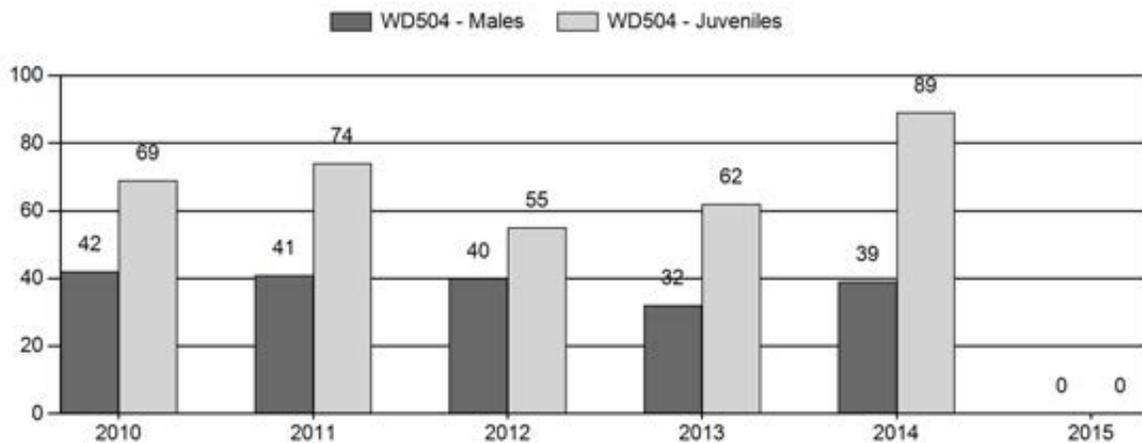
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**2016 HUNTING SEASONS
SOUTHEAST WYOMING WHITE-TAILED DEER HERD (WTD504)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
15	3	Oct. 1	Nov. 30	400	Limited quota	Any white-tailed deer
	3	Dec. 1	Dec. 31			Doe or fawn white-tailed deer
15	8	Oct. 1	Dec. 31	300	Limited quota	Doe or fawn white-tailed deer
59,60,64	3	Nov. 1	Nov. 30	150	Limited quota	Any white-tailed deer, all lands within Curt Gowdy State Park, archery only; the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Research Center at Sybille (Sybille Wildlife Research Unit) south of Wyoming Highway 34 shall be closed
59,60,64	3	Dec. 1	Dec. 31			Doe or fawn white-tailed deer valid in Area 59 and Area 64
59,60,64	8	Nov. 1	Dec. 31	125	Limited quota	Doe or fawn white-tailed deer, except the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Research Center at Sybille (Sybille Wildlife Research Unit) south of Wyoming Highway 34 shall be closed; all lands within Curt Gowdy State Park, archery only
70,74	3	Oct. 1	Nov. 30	50	Limited quota	Any white-tailed deer
70,74	8	Oct. 1	Dec. 15	25	Limited quota	Doe or fawn white-tailed deer
75,76,77	3	Oct. 1	Dec. 31	50	Limited quota	Any white-tailed deer
75,76,77	8	Oct. 1	Dec. 31	25	Limited quota	Doe or fawn white-tailed deer
78,79,80,81,161	3	Oct. 1	Dec. 15	25	Limited quota	Any white-tailed deer
78,79,80,81,161	8	Sept. 1	Dec. 15	25	Limited quota	Doe or fawn white-tailed deer

Special Archery Season Hunt Areas	Opening Date	Closing Date	Limitations
15,59,60,64,70,74,75,76,77,78,79,80, 81,161	Sept. 1	Sept. 30	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2015
15	3	+125
70, 74	8	+25
75,76,77	3	+25
75,76,77	8	+25
Total	3	+150
	8	+50
Total		+200

Management Evaluation

Current Hunter Satisfaction Management Objective: Hunter satisfaction; Target goal: $\geq 60\%$

Management Strategy: Private Land

2015 Hunter Satisfaction: 68% Satisfied, 18% Neutral, 14% Dissatisfied

Most Recent 3-year Running Average Hunter Satisfaction Estimate: 62%

The management objective for the Southeast Wyoming Herd Unit was reviewed in 2015 through the public objective review process. It was determined to abandon the numeric objective of 4,000 white-tailed deer and go with a sportsmen satisfaction survey with a satisfaction goal of $\geq 60\%$ and a private land management strategy. A landowner satisfaction survey will not be used in conjunction with the sportsmen survey. The sample size would be very low and the majority of occupied white-tailed deer habitat is on private land, which complicates management since there is little access opportunities.

There is not a reliable post-season population estimate. This is an open herd with Colorado and Nebraska so trying to model this herd would violate the assumption that it is closed. Seasons are designed to provide opportunity during the mating period when male deer are more vulnerable to harvest. Management is driven primarily by local Department personnel perception of population trend and landowner tolerance for this species.

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 Platte Valley 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. 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.

Many riparian areas within the herd unit experienced some level of springtime flooding in 2015. With favorable land management post-flooding, the potential does exist for cottonwood and willow regeneration in many stream systems. Establishment of these species may aid in reversing negative trends in woody species composition and age classes of important understory browse species and woody species that provide thermal and hiding cover values. White-tailed deer inhabit areas that are supported by agriculture, including dryland and irrigated croplands.

Field/Harvest Data

This herd will grow rapidly until densities become too high, then seasons are adjusted to try and bring the population down or an EHD outbreak occurs that reduces densities. Hunter success is typically around 35% with hunter effort running about 11 days per harvest. Hunting opportunity is limited to private land. Low success and high effort rates were contributed to hunters trying to find a white-tailed deer on public land or trying to harvest a deer during the general season when they are less vulnerable to harvest. Chronic wasting disease is found throughout the herd unit but to what extent it has on this herd unit is unknown. The long-term prevalence rate average is around 20%, but with a small sample size. There are a limited number of tooth samples so a reliable inference into population performance is not available.

The hunter satisfaction level was 69% for the 2015 season, which was higher than the five-year average of 64%. White-tailed deer appear to be rebounding from the 2012 EHD outbreak which could explain a slightly higher satisfaction level.

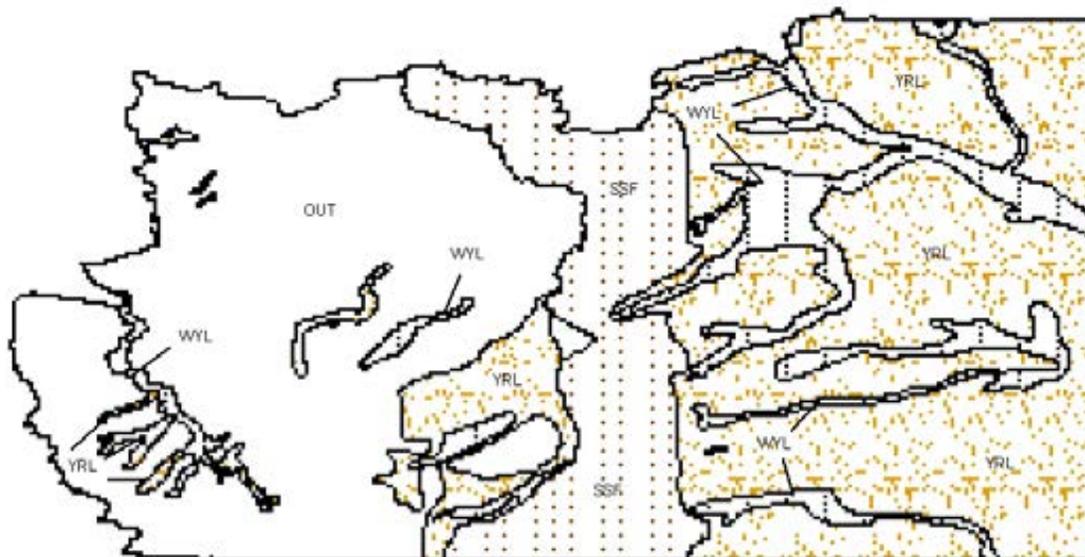
Population

There is not a reliable post-season population estimate. This is an open herd with Colorado and Nebraska so trying to model this herd would violate the assumption that it is closed. Seasons are designed to provide opportunity during the mating period when male deer are more vulnerable to harvest. Management is driven primarily by local Department personnel perception of population trend and landowner tolerance for this species. There is not enough tooth samples collected in the field to infer any population dynamics.

Management Summary

Population trend varies on weather conditions and disease outbreaks. As densities become too high, the population will typically crash from an EHD outbreak. Severe winter conditions will also reduce white-tailed deer numbers if they go into the winter in poor condition. There have been no reports of winter mortalities. There was an EHD outbreak in 2012 that prompted a decrease in Type 8 licenses for hunt areas in southeast Wyoming. It does appear white-tailed deer are recovering from the 2012 outbreak in hunt area 15 so for the 2016 season the Type 3 licenses will increase by 125 and move the opening date back from November 1 to October 1. In addition there will be 25 Type 8 licenses in Hunt Areas 75-77 and 25 Type 8 licenses in Hunt Areas 70,74. Type 1 licenses in Hunt Areas 75~~37~~ will increase by 25.

For the 2016 season we will try to attain a harvest of around 850 white-tailed deer. Our objective is to provide opportunity and minimize damage and maintain a hunter satisfaction level greater than 60%.



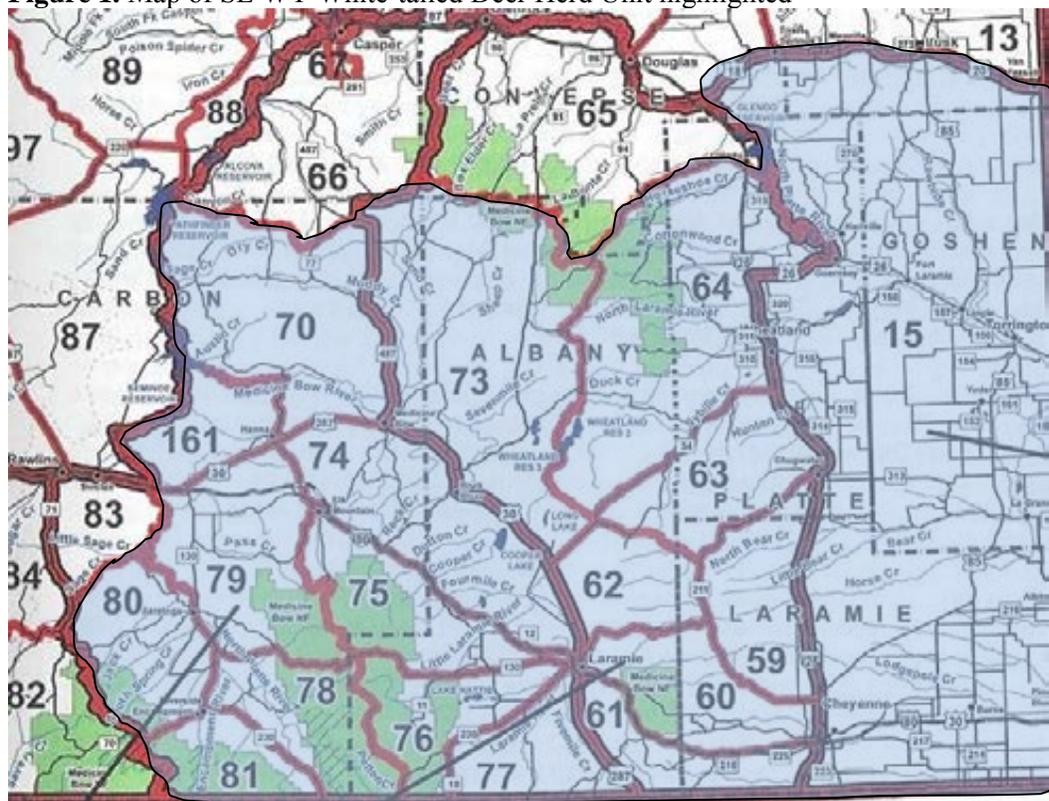
White-tailed Deer (WT504) - Southeast Wyoming
HA 16, 55, 57, 59-64, 70, 73-81, 83, 161
Revised 10/99



Prepared by: Martin Hicks, Wheatland Wildlife Biologist

The Southeast Wyoming White-Tailed Deer Herd Unit contains Hunt Areas 15,59,60,64,70,73-81,161 is located in southeastern Wyoming (Figure 1.). The management objective for the Southeast Wyoming Herd Unit is a post-season population objective of 4,000 white-tailed deer. The management strategy is recreational management with a post-season male:female range of 20-29 bucks:100 does. The objective and management strategy were last revisited in 1998.

Figure 1. Map of SE WY White-tailed Deer Herd Unit highlighted



Population Objective Review:

The postseason population objective is developed based upon both biological and social factors, including, but not limited to: winter range carrying capacity, hunter desires, landowner desires and tolerance, land status, and competition with other wild and domestic animals. From 1976-1996 this herd unit was labeled the Laramie River White-tailed Deer Herd Unit, comprised of Hunt Areas 70-81,83,161 with a initial objective of 200, then increased to 1,000 in 1986. In 1998 Hunt Areas 15,16,55,57 (combined into Hunt Area 15 in 2014) 59-64 were added to create the SE WY WTD Herd Unit with a new objective of 4,000.

Current Management Strategy:

There is not a reliable post-season population estimate. This is an open herd with Colorado and Nebraska so trying to model this herd would violate the assumption that it is closed. Seasons are designed to provide opportunity during the mating period when male deer are more vulnerable to harvest. Management is driven primarily by local Department personnel perception of population trend and landowner tolerance for this species.

Recommended Hunt Unit Objective and Management Strategies by Herd Unit:

Due to our inability to manage this herd unit and lack of adequate population data to derive a post-season population objective we recommend to abandon the numeric objective of 4,000 white-tailed deer and use a sportsmen/landowner survey with a target goal of 60% or greater satisfaction level.

Landowner, Agency, and Public Involvement:

A power point presentation was prepared on the background of the Southeast Wyoming White-tailed Deer Herd Unit and presented at the following public meetings: Wheatland, Torrington, Laramie and Cheyenne in January 2015. In addition a survey requesting input on the future management of this herd was handed out to the attendees. There were a total of 17 people in attendance at the four public meetings. There was very little interest or concern in the future management of the SE WY WTD Herd Unit gathered from the crowd at the meetings and no surveys were returned. At these meetings the public was informed about herd objectives and the alternative and secondary objectives available as provided by Wildlife Administration. Department personnel preferred to abandon the current objective of 4,000 white-tailed deer and adopt an alternative objective of sportsmen/landowner satisfaction survey. No federal or state agencies were involved because the majority of occupied habitat is on private land. A copy of comments, public meeting attendants and the survey can be found in Appendix A.

Landowner/Sportsmen Survey:

A public service announcement was sent to all local newspapers along with posters distributed throughout the different communities inviting the public to attend one of four public meetings that were held in January. No surveys were returned.

Recommendation:

In summary we propose to eliminate the numeric objective of 4,000 white-tailed deer and go with an alternative objective of a landowner/sportsmen survey. Surveys will be mailed to landowners that have larger acres (>160 acres) of contiguous white-tailed deer habitat in Platte, Goshen, Laramie, Albany and Carbon counties.

This recommendation is based upon the department's inability to collect adequate population data to derive a population estimation. Based on the outreach effort and past comments from landowners and sportsmen there is less interest/concern placed on white-tailed deer compared to other big game species in southeast Wyoming.