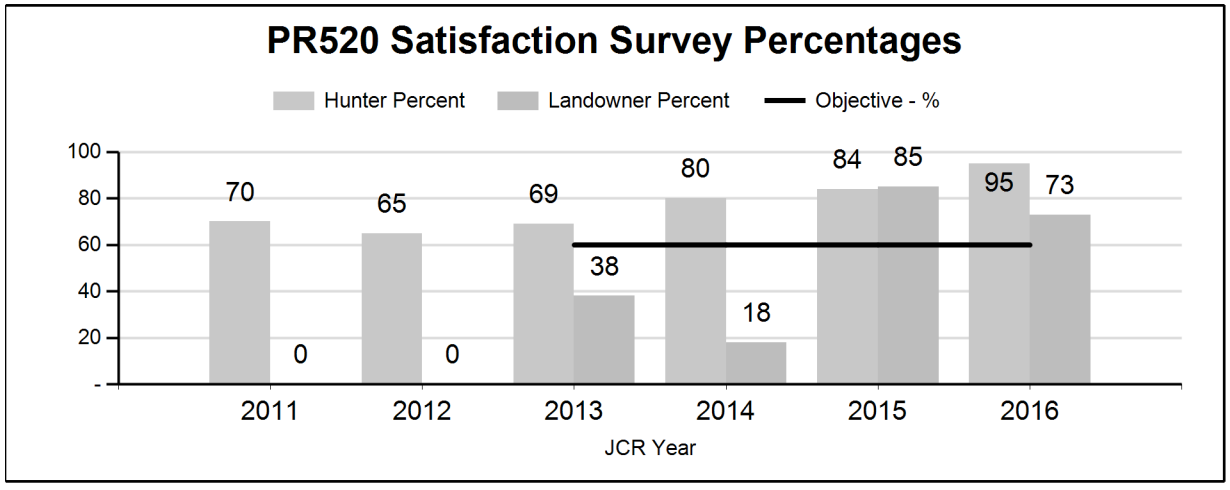
2016 - JCR Evaluation Form

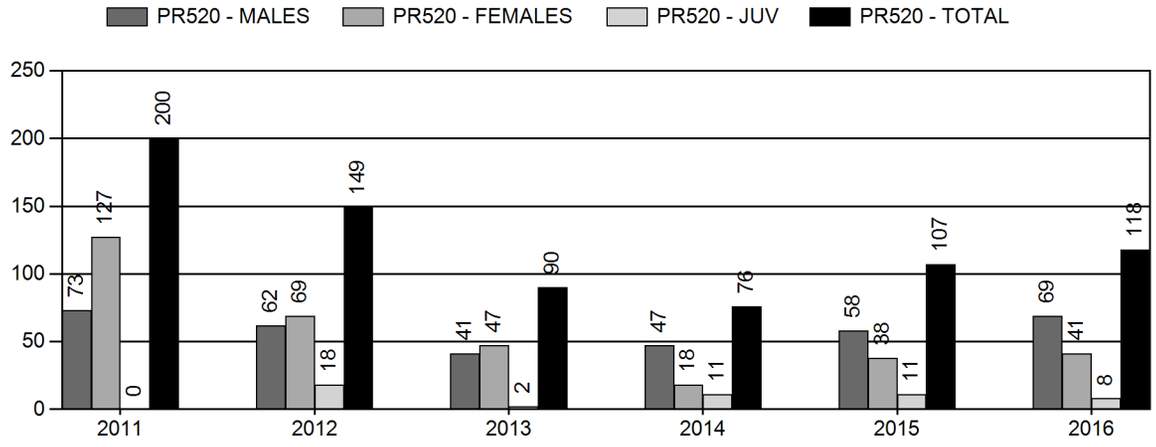
SPECIES: Pronghorn
PERIOD: 6/1/2016 - 5/31/2017
HERD: PR520 - CHALK BLUFFS
HUNT AREAS: 111
PREPARED BY: MARTIN HICKS

	2011 - 2015 Average	2016	2017 Proposed
Hunter Satisfaction Percent	73%	73%	95%
Landowner Satisfaction Percent	49%	49%	75%
Harvest:	124	118	120
Hunters:	175	103	100
Hunter Success:	71%	115%	120 %
Active Licenses:	202	139	140
Active License Success:	61%	85%	86 %
Recreation Days:	829	394	395
Days Per Animal:	6.7	3.3	3.3
Males per 100 Females:	21	36	
Juveniles per 100 Females	49	71	

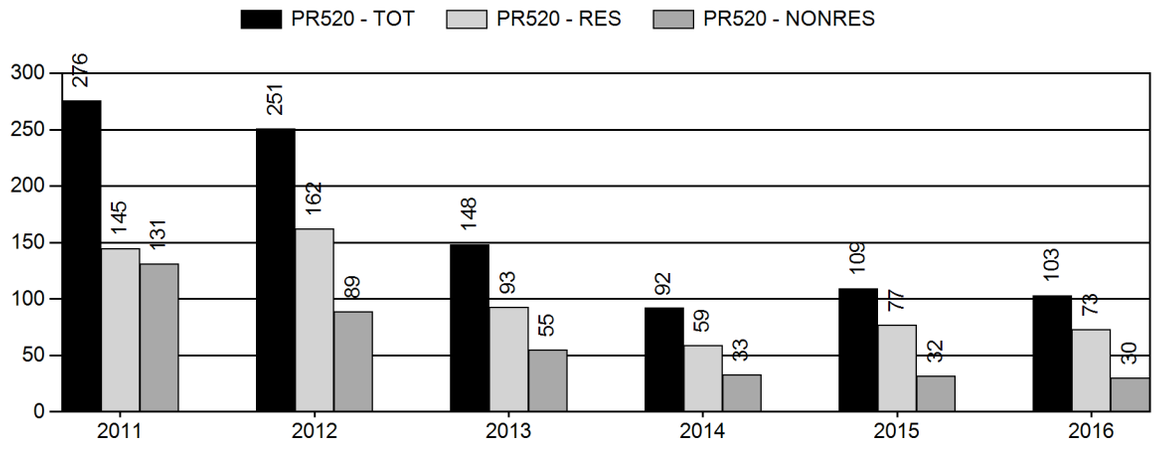
Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	24%
Number of years population has been + or - objective in recent trend:	1



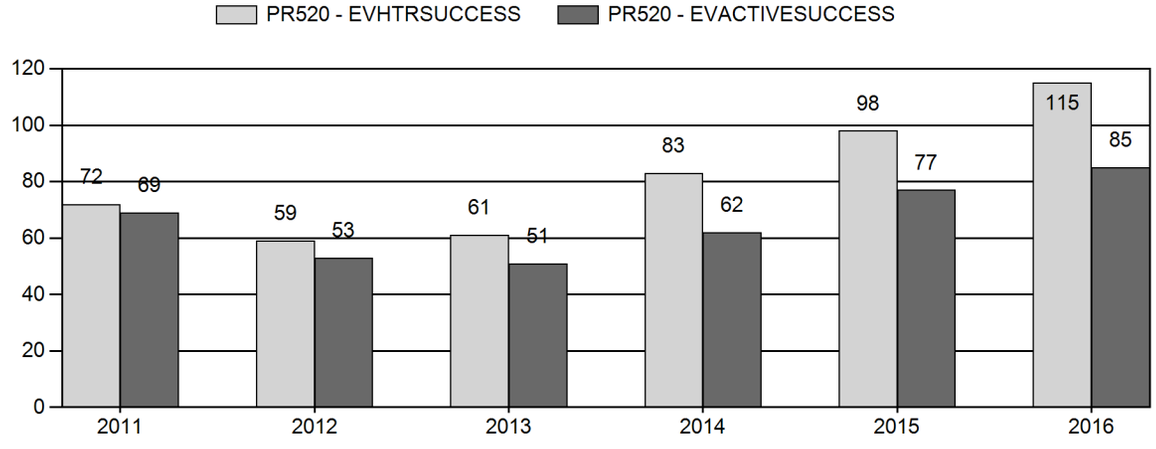
Harvest



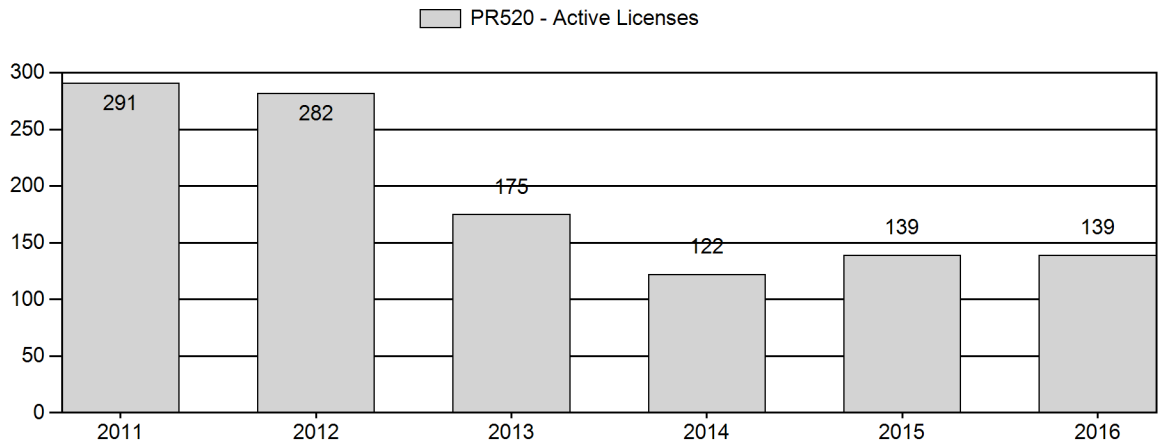
Number of Active Licenses



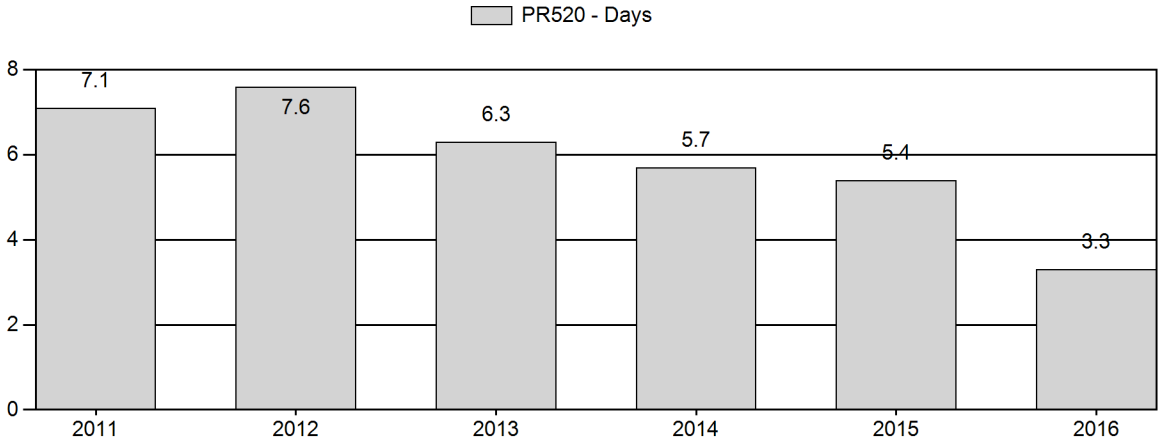
Harvest Success



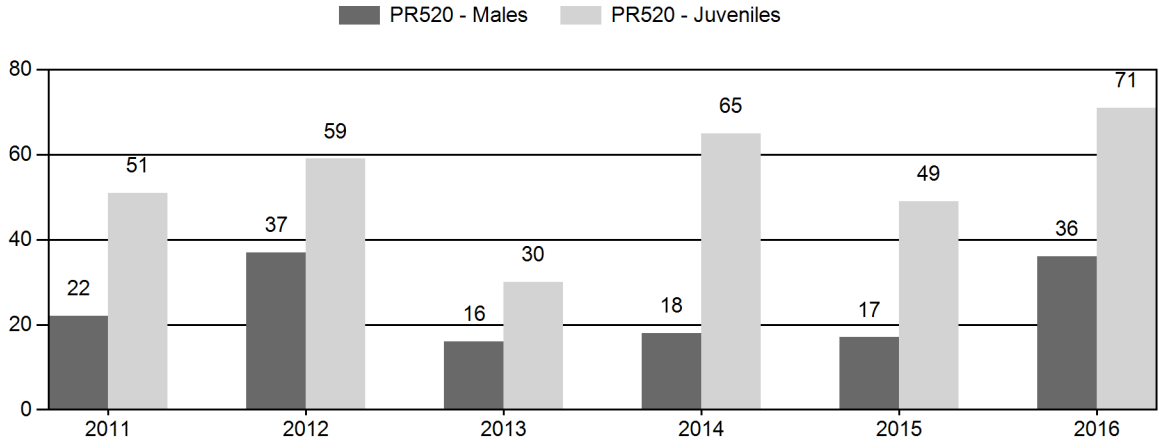
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2017 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 2016
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
2016 Hunter Satisfaction Estimate: 94%
2016 Landowner Satisfaction Estimate: 73% (58% response)
Most Recent 3-year Running Average Hunter Satisfaction Estimate: 86%
Most Recent 3-year Running Average Landowner Satisfaction Estimate: 60%

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 during spring months then became dry and hot from July through November. 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 was similar to 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. However, precipitation events decreased and temperatures increased as the summer progressed resulting in drier than normal conditions July through August. 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.

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 2016 (84%) increased compared to 2015 (75%) but well above the 5-year average of 63%. Effort in 2015 (2.9 days/harvest) dropped drastically compared to 2015 (6.5 days/harvest), and slightly lower than the five-year statewide effort of 3.8 days/harvest. The increase in success was most likely the result of increased pronghorn movement from Colorado into Wyoming. The significant decrease in effort is most likely a result of the same interstate pronghorn movement. Type 6 license success in 2016 (81%) was slightly higher than 2015 (81%) and significantly higher than the five-year average (61%). Type 6 license effort in 2016 (4.2 days/harvest) was slightly higher than 2015 (3.3 days/harvest) but moderately lower than the five-year average (5.7 days/harvest) and more in line with the five-year statewide effort (3.9 days/harvest). There could be two possibilities for the increase in success: 1) the population increased and/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.

Two years 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 (73%) 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 58% 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.

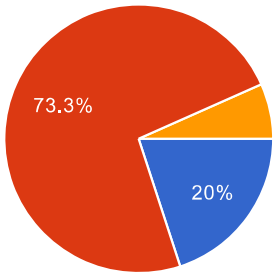
Appendix A

17 responses

View all responses

Summary

Please indicate your satisfaction level with the current pronghorn population



Above Desired Levels	**3**	20%
At or About at Desired Levels	**11**	73.3%
Below Desired Levels	**1**	6.7%

Additional Comments

we don't get many antelope but are getting overrun with whitetail!

very rare to see any antelope any more

this does not concern me I am not a hunter-janet smith

Population seems more balanced here than west of Albin and up on Iowa Flats at Chugwater-those herds do damage.

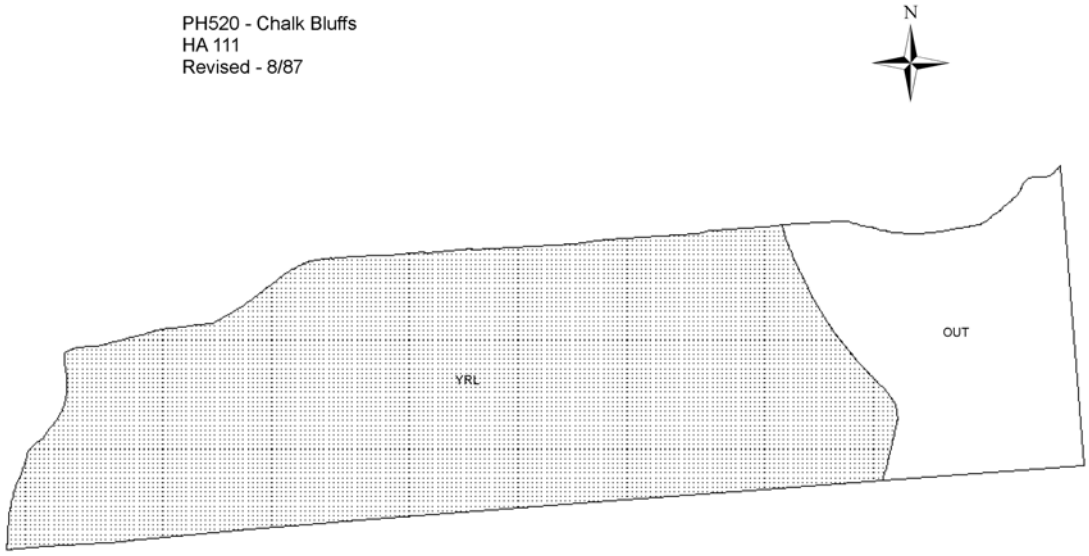
Charles Dunning

Population is above satisfactory levels. The size of the bucks is below satisfactory levels.

We are seeing more levels or numbers-I can't say if the herds overall are larger or if due to increased housing and increase in population of the cityerey is forcing more on our grazing operation-more people forces more intense numbers.

Number of daily responses

PH520 - Chalk Bluffs
HA 111
Revised - 8/87



2016 - JCR Evaluation Form

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

HERD: PR521 - HAWK SPRINGS

HUNT AREAS: 34 PREPARED BY: MARTIN HICKS

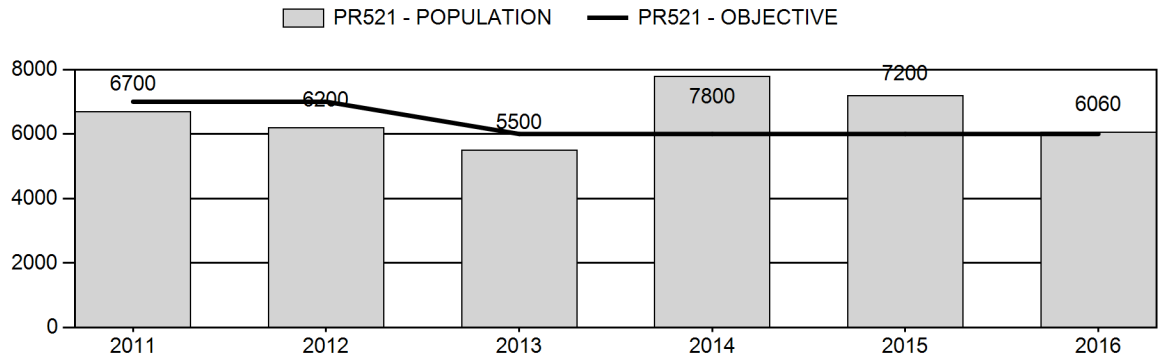
	2011 - 2015 Average	2016	2017 Proposed
Population:	6,680	6,060	5,800
Harvest:	1,136	1,170	1,150
Hunters:	1,267	1,511	1,500
Hunter Success:	90%	77%	77%
Active Licenses:	1,413	1,557	1,550
Active License Success:	80%	75%	74%
Recreation Days:	4,786	4,544	4,500
Days Per Animal:	4.2	3.9	3.9
Males per 100 Females	43	46	
Juveniles per 100 Females	54	38	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	1%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/22/2017

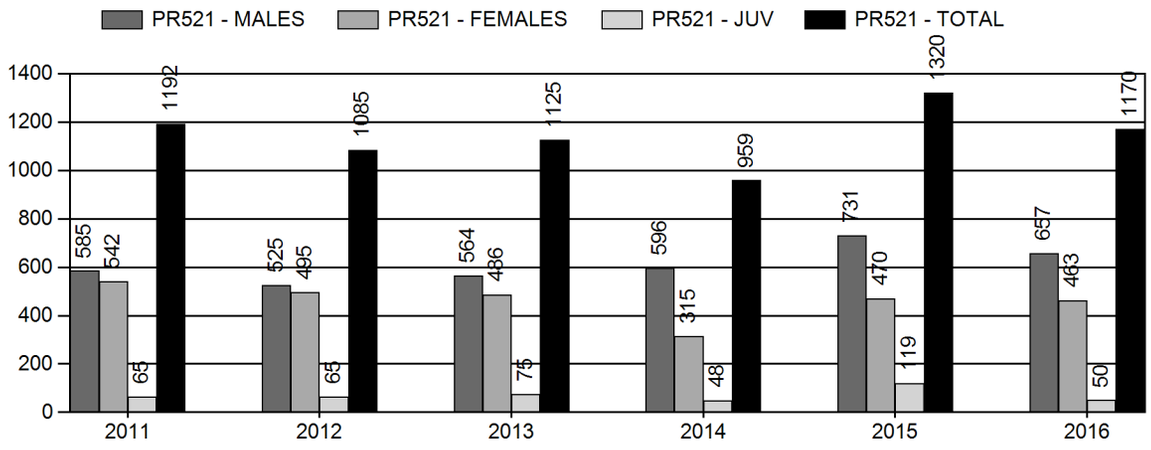
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	13%	13%
Males ≥ 1 year old:	44%	57%
Total:	16%	16%
Proposed change in post-season population:	-18%	-5%

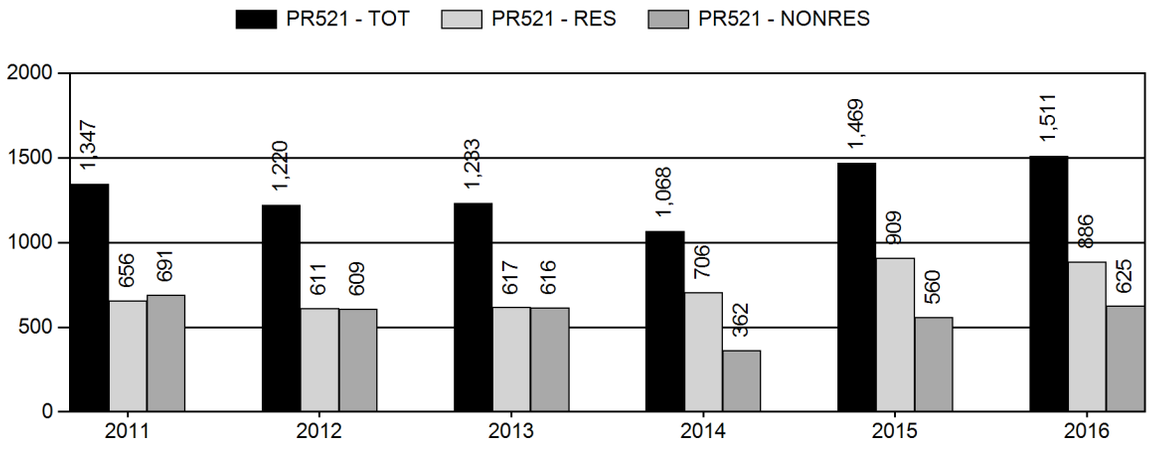
Population Size - Postseason



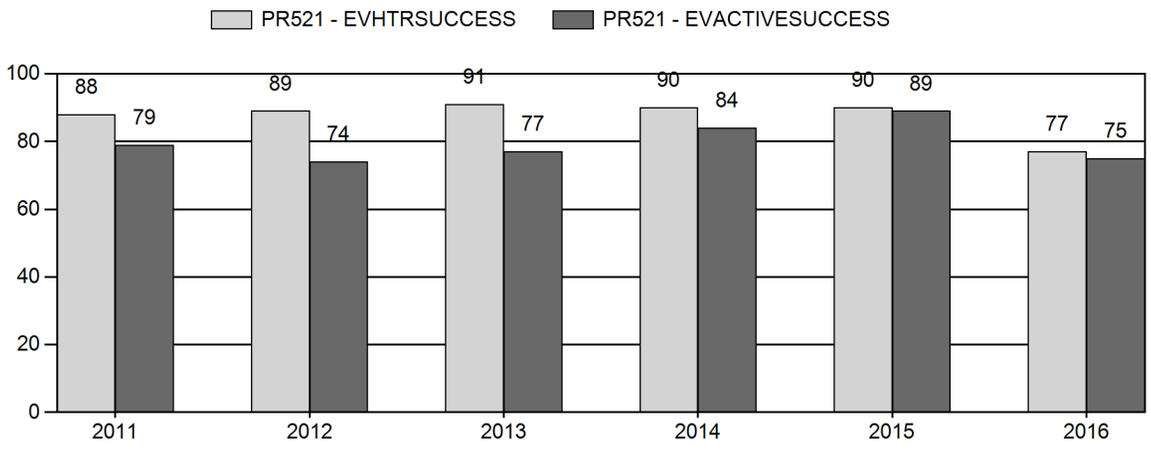
Harvest



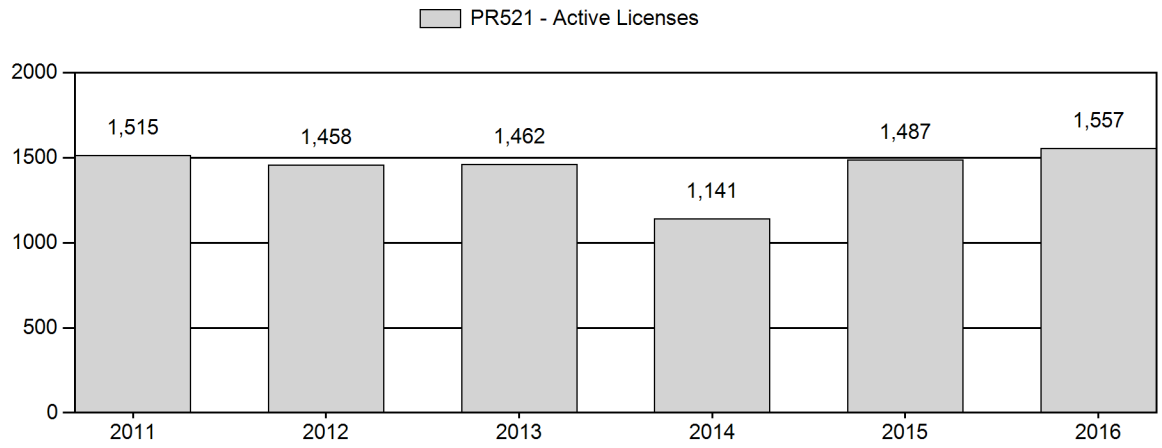
Number of Active Licenses



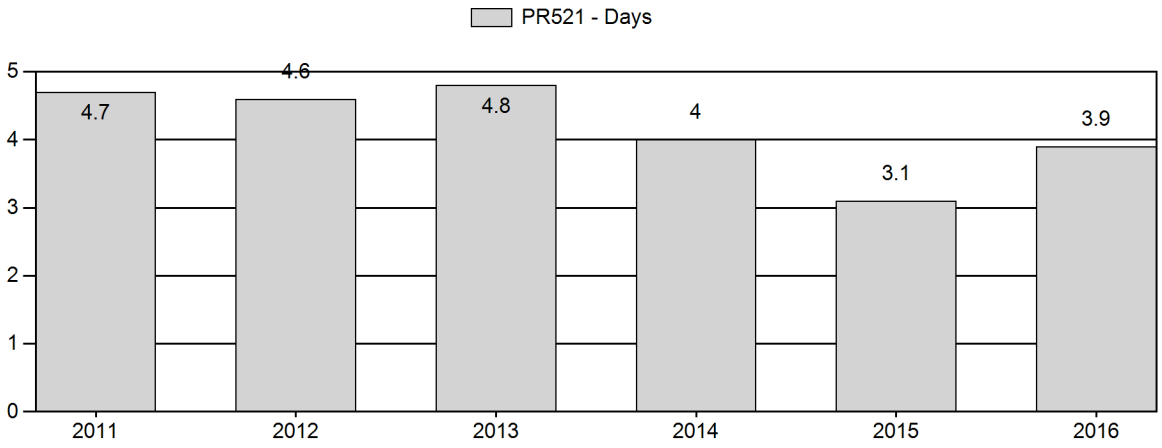
Harvest Success



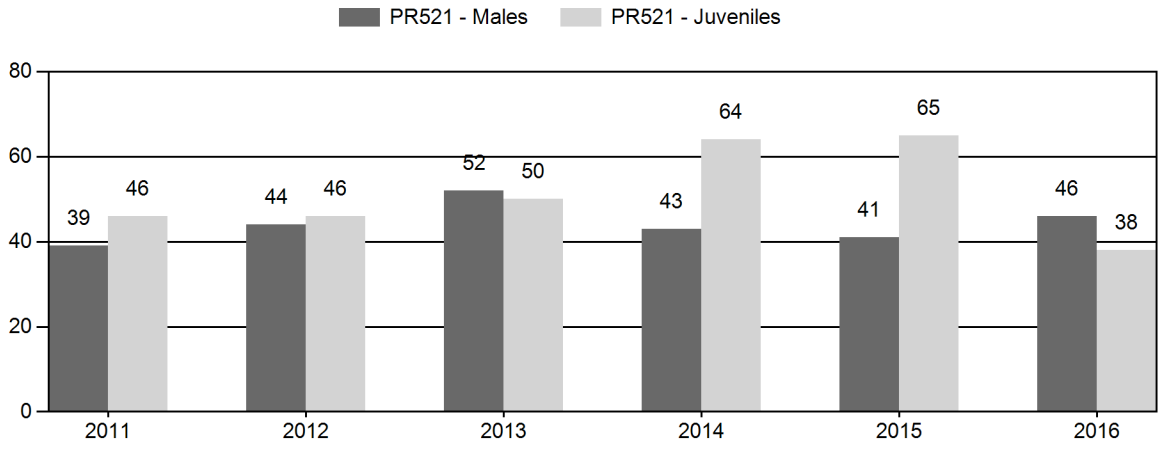
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR521 - HAWK SPRINGS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	7,300	126	194	320	25%	696	54%	262	21%	1,278	1,243	18	28	46	± 5	38	± 4	26

2017 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 2016
34	1	0
34	6	0
Total		**0**

Management Evaluation
Current Management Objective: 6,000 (4,800-7,200)
Management Strategy: Recreational
2016 Postseason Population Estimate: ~6,060
2017 Proposed Postseason Population Estimate: ~5,800
2015 Hunter Satisfaction: 88% satisfied, 6% Neutral, 6% 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. These changes were a direct result of the herd unit objective review process in 2013. The management strategy is recreational management with a pre-season buck ratio range of 30-59 Bucks:100 Does.

The 2016 post-season population estimate was about 6,060 pronghorn putting the population 1% 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 during spring months then became dry and hot from July through November. 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. Generally speaking 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 2016 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.

Field Data

The Hawk Spring Pronghorn Herd Unit has experienced a steady decline in population since 2014 as a result of increased harvest on the female segment of the population and average to poor fawn production (5-year average 52 fawns:100 does). Doe/fawn license issuance has fluctuated around 800 licenses for the past 5 years to bring the population towards objective.

The 2016 preseason buck ratios were slightly higher compared to 2015 and are within the upper recreational management range of 20-59 bucks: 100 Does (46 bucks:100 does in 2016). Type 1 licenses were increased in 2016 to take advantage of the surplus bucks, however, the number of active licenses in 2016 were similar to 2015 which suggests the hunter saturation point has been reached. 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, 88% were satisfied with their hunt, similar to 2015's level. Based on comments in the field during the 2016 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 77% in 2016 was the same as the five-year average of 79% and slightly lower than the five-year state-wide average of 84%. Access is still difficult to obtain in the southern portion of the herd unit, but with the addition of the Nimmo HMA and over several thousand acres of private land enrolled into walk-in areas are enough to maintain adequate success. Hunter effort of 3.9 days per harvest in 2016 was slightly higher than the herd unit's and state-wide's five-year average of 4.1 and 3.5 days per harvest respectfully. The department's Access Yes Program along with landowners opening up access in the northern portion of the herd unit most likely contributed to help prevent a more drastic increase in hunter effort.

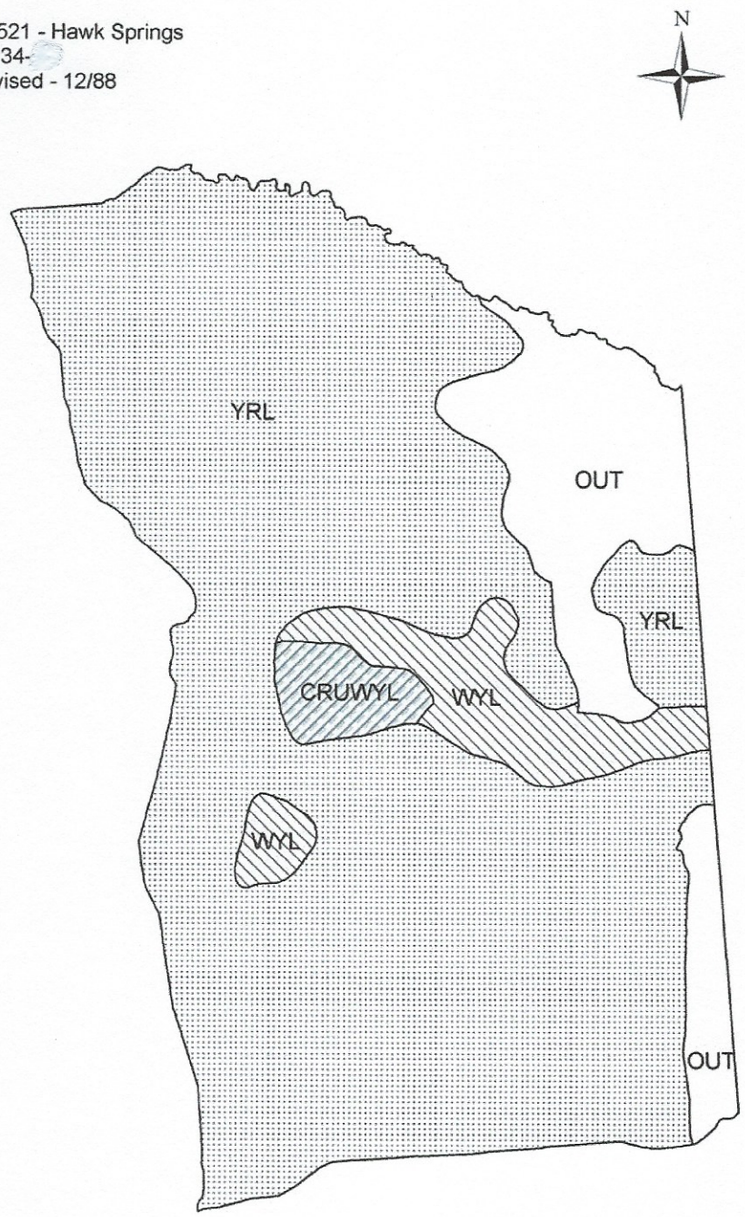
Population

The "Constant Juvenile – Constant Adult Survival" (CJ,CA) spreadsheet model was chosen for the post season population estimate of this herd and until survival data has been collected it will more than likely remain the model of choice. 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 500 doe pronghorn, this seems plausible. WGFD personnel observations indicate that pronghorn densities would support this trend in certain portions of the herd unit. Trends in harvest statistics (stable success, and a increase in effort) suggest the population is stable to declining. 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. Given the increase in harvest and a decline in buck ratios this appears plausible. 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 2017 season is designed to maintain not only the population within the objective but buck ratios within the recreational management range as well. We will offer 1,000 Type 1 and 900 Type 6 licenses to achieve this goal. Given previous harvest rates and the 1,900 licenses available we expect to harvest around 1,150 pronghorn, resulting in a post-season population estimate of 5,800 pronghorn.

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



2016 - JCR Evaluation Form

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

HERD: PR522 - MEADOWDALE

HUNT AREAS: 11
PREPARED BY: MARTIN HICKS

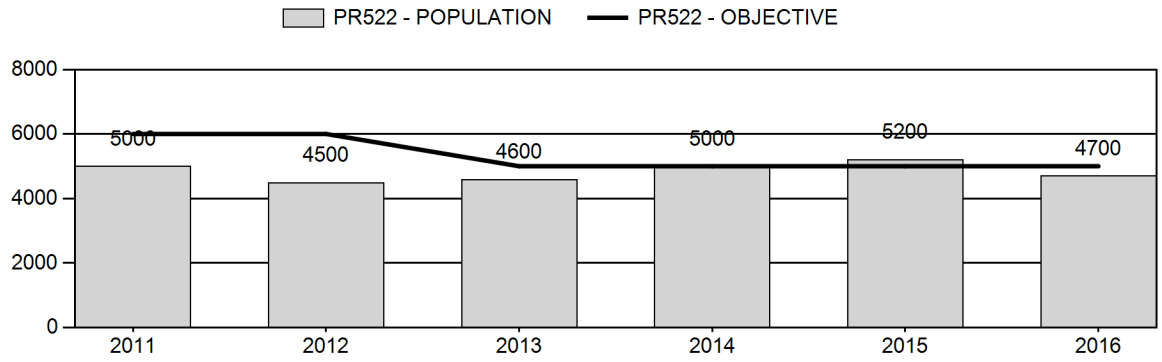
	2011 - 2015 Average	2016	2017 Proposed
Population:	4,860	4,700	4,500
Harvest:	461	462	615
Hunters:	523	501	650
Hunter Success:	88%	92%	95%
Active Licenses:	584	551	700
Active License Success:	79%	84%	88 %
Recreation Days:	1,704	1,506	2,500
Days Per Animal:	3.7	3.3	4.1
Males per 100 Females	38	50	
Juveniles per 100 Females	58	47	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-6%
Number of years population has been + or - objective in recent trend:	1
Model Date:	03/24/2017

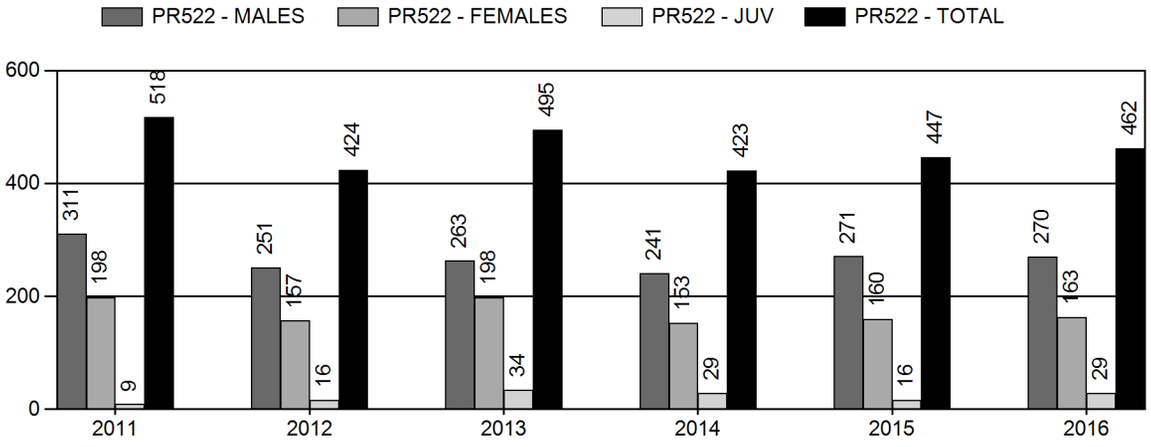
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	6%	6%
Males ≥ 1 year old:	31%	34%
Total:	9%	12%
Proposed change in post-season population:	-10%	-4%

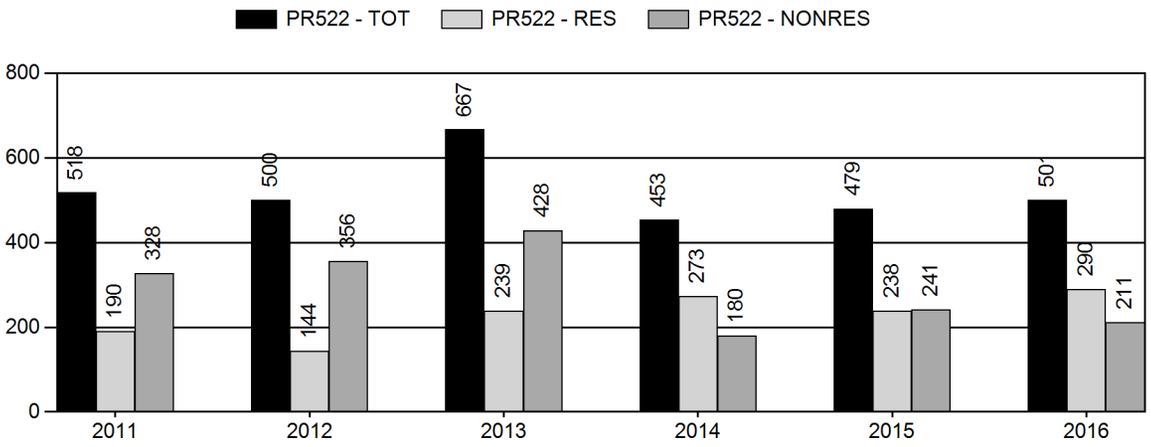
Population Size - Postseason



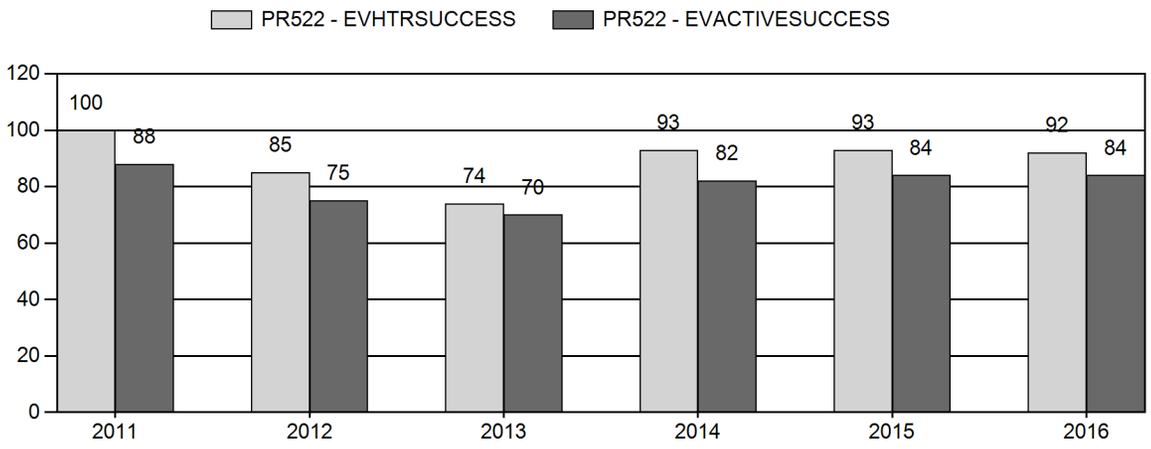
Harvest



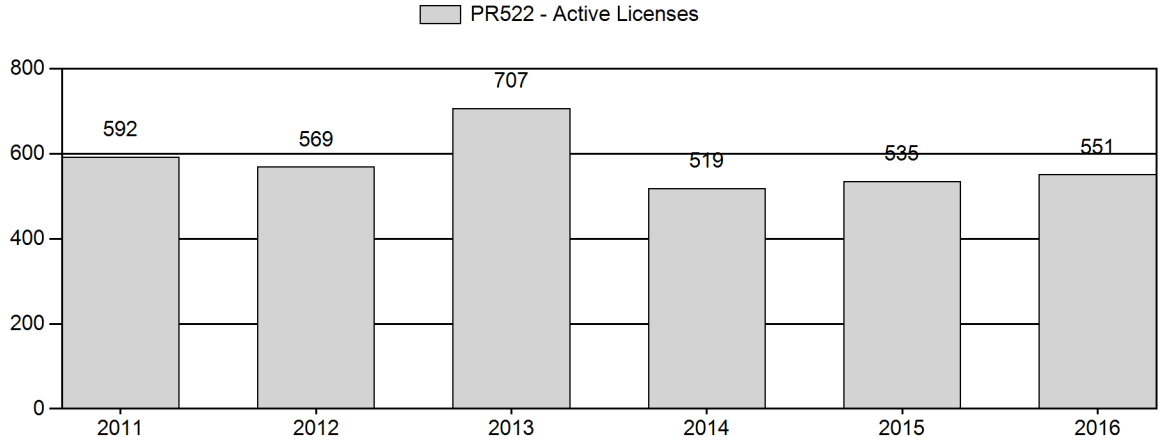
Number of Active Licenses



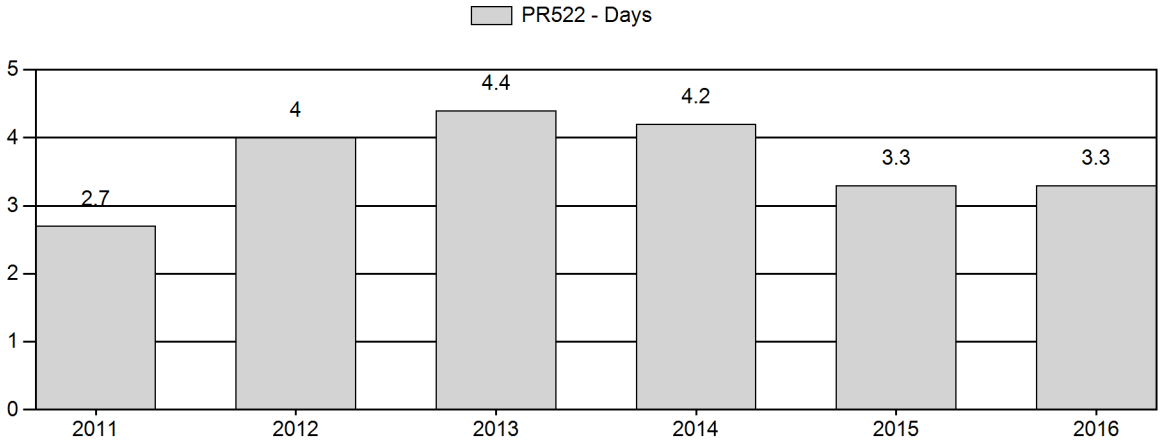
Harvest Success



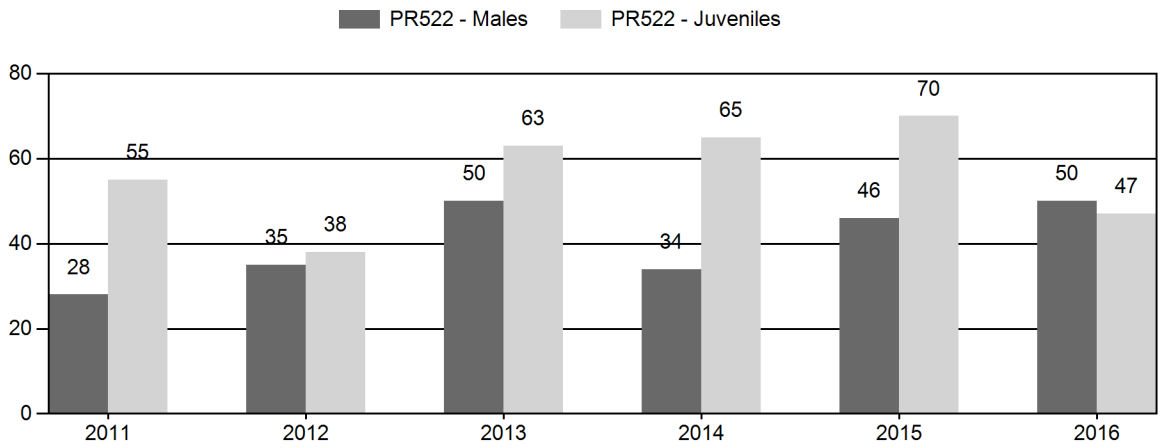
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR522 - MEADOWDALE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,100	142	251	393	25%	786	51%	368	24%	1,547	1,330	18	32	50	± 4	47	± 4	31

2017 HUNTING SEASONS
MEADOWDALE PRONGHORN HERD (PR522)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
11	1	Oct. 1	Oct. 31	450	Limited quota	Any antelope
11	6	Oct. 1	Oct. 31	300	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 2016
11	1	+100
11	6	+100

Management Evaluation
Current Management Objective: 5,000 (4,000-6,000)
Management Strategy: Recreational
2016 Post-season Population Estimate: ~4,700
2017 Proposed Post-season Population Estimate: ~4,500
2016 Hunter Satisfaction: 85% Satisfied, 12% Neutral, 3% 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 30-59 buck:100 doe range.

The 2016 post-season population estimate was about 4,600 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 Access Yes walk-in hunting 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 during spring months then became dry and hot from July through November. 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. Generally speaking 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 2016 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.

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.

Field Data

The Meadowdale population has been stable since 2010. In 2016 fawn ratios (46 fawns: 100 does) decreased significantly compared to 2015 (69:100) as well as the five-year average of 58 fawns:100 does. Buck to doe ratios have fluctuated to a low of 35:100 to a high of 50:100 within the past 5 years. Above average fawn ratios in 2014 and 2015 help to increase buck ratios in 2015 and 2016, which resulted in a slight increase in population despite below average fawn production in 2016. The sample size was 16% above the 90% CI so herd classification data appears valid. Spring conditions of cold, heavy wet snow coupled with dry conditions in July/August most likely contributed to the drop in fawn production.

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

Harvest Data

The 2016 hunter success rate of 92% was only slightly higher than the five-year average of 89%, and similar as the 2015 success rate of 93%. Effort in 2016 was 3.3 days per harvest which is slightly lower than the five-year average of 3.7 days per harvest, and the same as 2015. The 2016 harvest statistics (more or less stable success and effort) support a population that has been fluctuating slightly the past five years. License numbers have remained the same the past three years, the only change in season structure was to increase the Type 1 season length by 16 days which did not increase buck harvest as expected. The majority of harvest typically comes the first week of the season then tapers off, which might explain why more bucks were not harvested. Five-year trends in success and effort have slightly ebbed and flowed which mirrors

the population trend. The hunter satisfaction survey showed that 85% of the hunters were satisfied or very satisfied with their hunt. Based on positive comments received from the field and the amount of opportunity of access through the Department's Access Yes program the survey seems plausible.

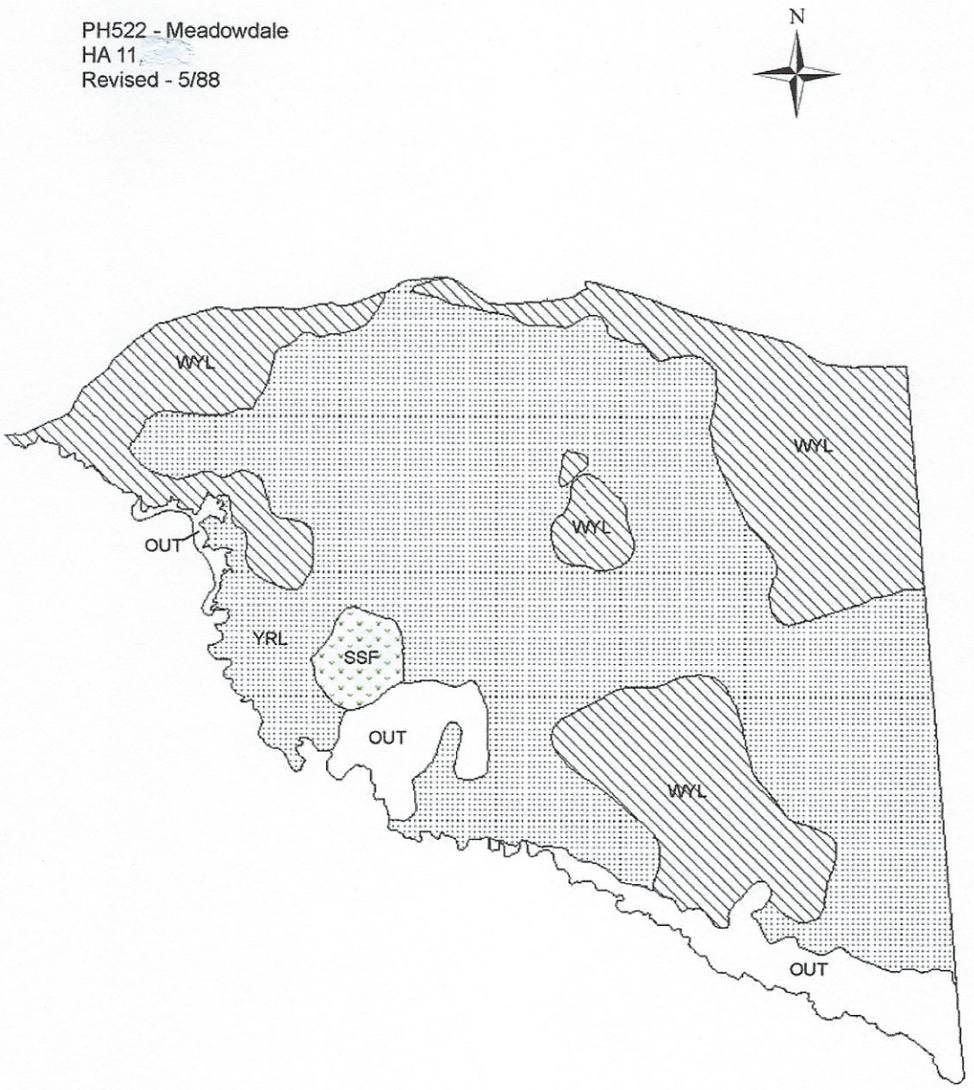
Population

The "Constant Juvenile – Constant Adult Survival" (CJCA) spreadsheet model was chosen to use for the post-season population estimate of this herd and until there is survival data specifically for this herd unit will remain the model of choice. 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, (2016 post-season estimate: 4,600 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 occurred 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.

Management Summary

The 2016 season was designed to maintain the population within the objective, which is the same goal for the 2017 season. However, there appears to be additional access available in the northern portion of the herd unit where pronghorn densities are the highest and buck ratios are on the upper end of the management criteria so there will be a increase of 100 Type 1 and 100 Type 6 licenses. Given previous harvest rates we expect to attain a harvest of around 460 pronghorn. We predict a 2017 post-season population estimate of 4,500 pronghorn, 6% below the objective of 5,000, but within the $\pm$20% recommended range for herd management.

PH522 - Meadowdale
HA 11
Revised - 5/88



2016 - JCR Evaluation Form

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

HERD: PR523 - IRON MOUNTAIN

HUNT AREAS: 38
PREPARED BY: LEE KNOX

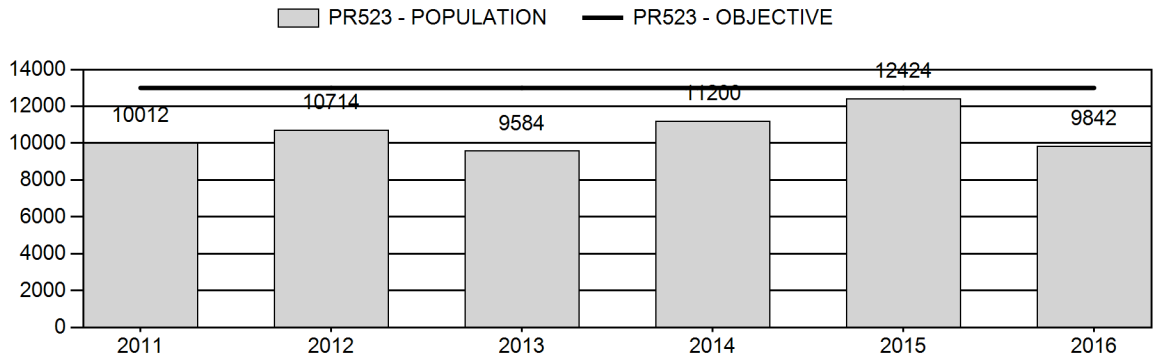
	2011 - 2015 Average	2016	2017 Proposed
Population:	10,787	9,842	9,952
Harvest:	1,476	1,879	1,880
Hunters:	1,676	2,002	2,000
Hunter Success:	88%	94%	94 %
Active Licenses:	1,834	2,051	2,051
Active License Success:	80%	92%	92 %
Recreation Days:	5,783	5,553	5,550
Days Per Animal:	3.9	3.0	3.0
Males per 100 Females	52	49	
Juveniles per 100 Females	71	54	

Population Objective (± 20%) :	13000 (10,400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-24.2%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/22/2017

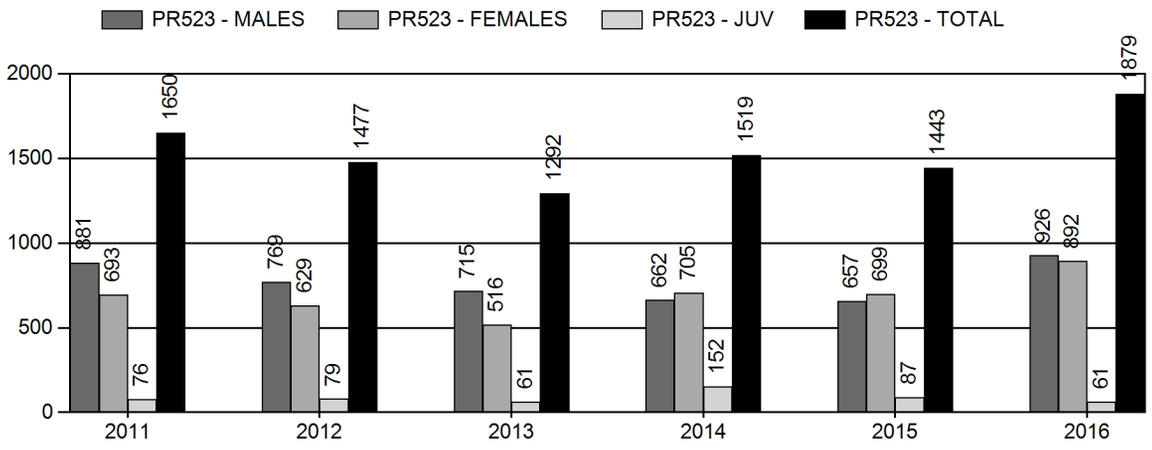
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	15%	15%
Males ≥ 1 year old:	21%	21%
Total:	10%	10%
Proposed change in post-season population:	2%	2%

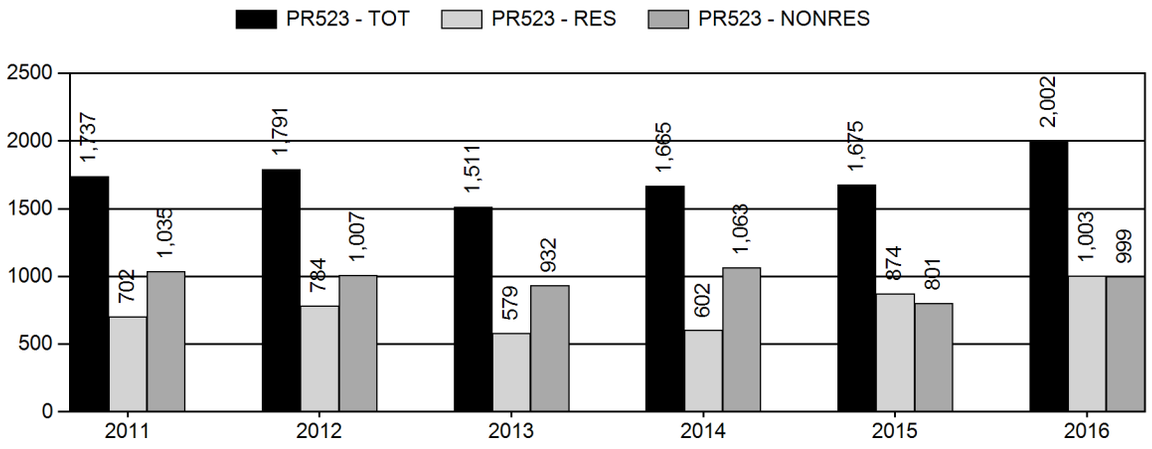
Population Size - Postseason



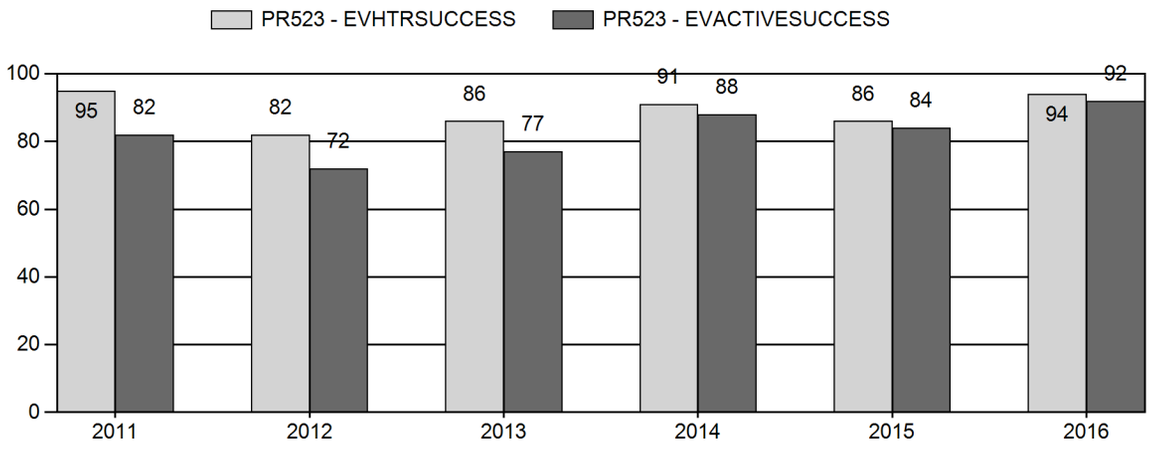
Harvest



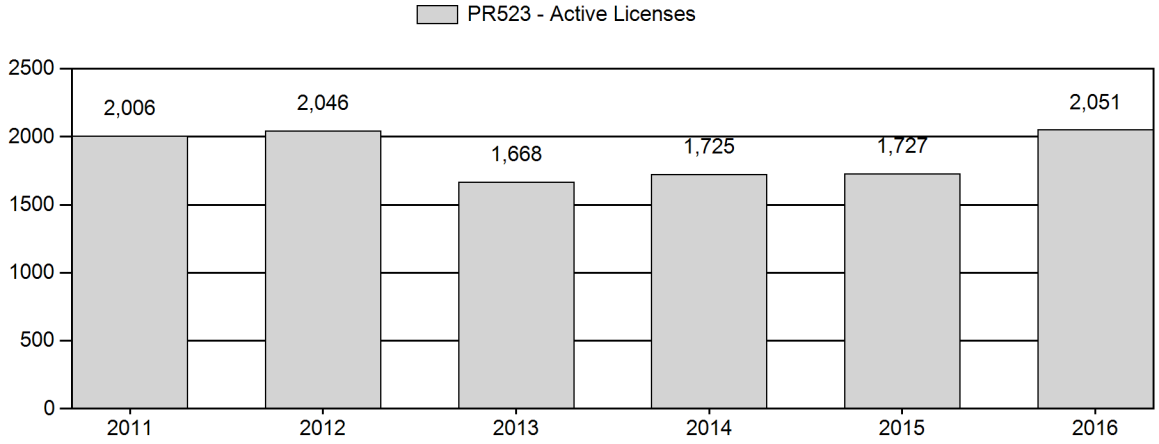
Number of Active Licenses



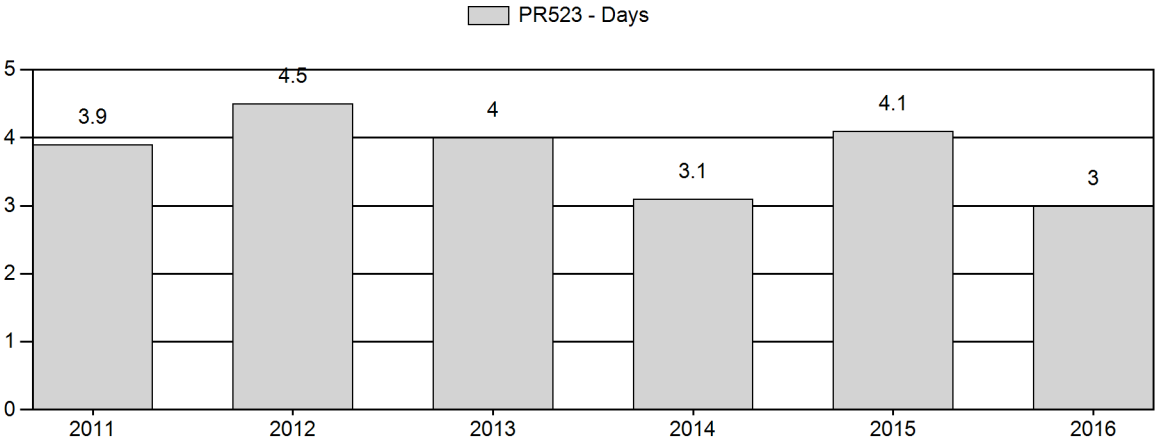
Harvest Success



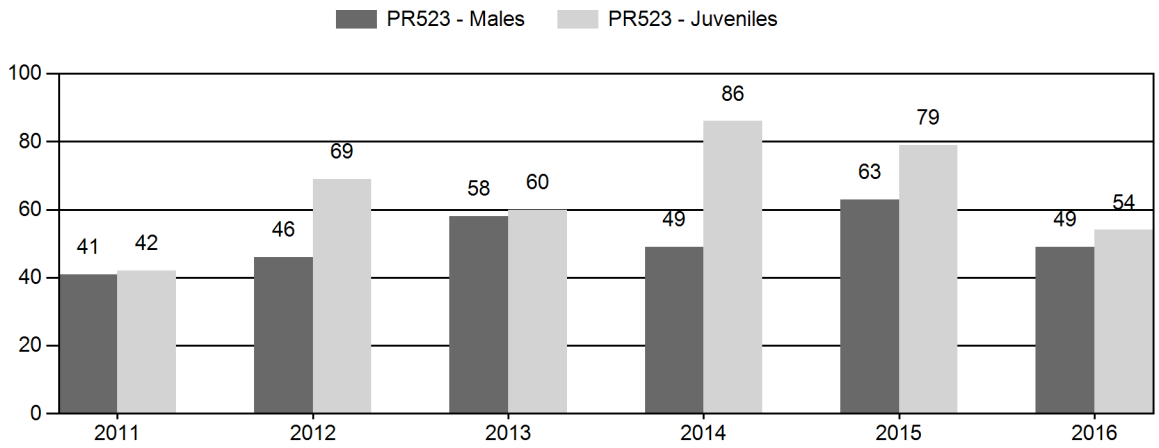
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	11,909	162	259	421	24%	862	49%	463	27%	1,746	1,586	19	30	49	± 4	54	± 5	36

2017 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
	Archery	Aug. 15	Oct. 4			Refer to Section 2 of this Chapter

Area	Type	Change from 2016
38	1 6	0 0
Total	**1** **6**	**0** **0**
Herd Unit Total		**0**

Management Evaluation

Current Postseason Population Management Objective: 13,000 (10,400-15,600)
Management Strategy: Recreational
2016 Postseason Population Estimate: 9,800
2017 Proposed Postseason Population Estimate: 9,900
2016 Hunter Satisfaction: 96% Satisfied, 4% Neutral, 0% 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 2016 post-season population estimate was 9,800 with the population stable to slightly declining. Limited public access in this herd unit has typically deterred many hunters and in past years licenses would go unsold, however, with significant license cuts state wide we have seen an increase in 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 reader is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat

Forage availability continued to improve in 2016 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.

Field Data

A total of 1,750 pronghorn were classified, above the recommended classification objective of 1,580. Fawn ratios declined to 54:100 does, the lowest ratio since 2011. Fawn ratios on the east side of the hunt area were as low 30:100 does in areas, while fawns ratios on the west side were higher near 60:100 does. The buck ratio declined to 49:100 does but the decline was mostly in yearling bucks while adult buck ratios remained similar to 2015 and 2014. The hunter satisfaction survey showed an increase from 89% in 2015 to 96% in 2016 of hunters that were either satisfied or very satisfied with their hunt, which has been increasing since 2012.

Harvest Data

Hunter success increased from 86% to 94% in 2016, one of the highest success rates in the Laramie region. This herd is typically a low priority area for resident hunters due to lack of public access, and many of the licenses are purchased by nonresidents, typically 60% -65% of the license holders. In 2016 nonresidents accounted for 50% of the licenses due to an increase in resident license holders. License issuance was the same from 2013 through 2015. Type 6 licenses increased in 2016. In 2013 there were 728 licenses leftover after the draw, in 2014 there were 230, and in 2015 and 2016 there were no leftover licenses available. We assume the increase in

interest is due to the decrease in licenses statewide in 2014, forcing hunters to draw their 2nd and 3rd choices. There is only one HMA and very little public land, however, hunter seem to be able to easily find access and pronghorn to harvest.

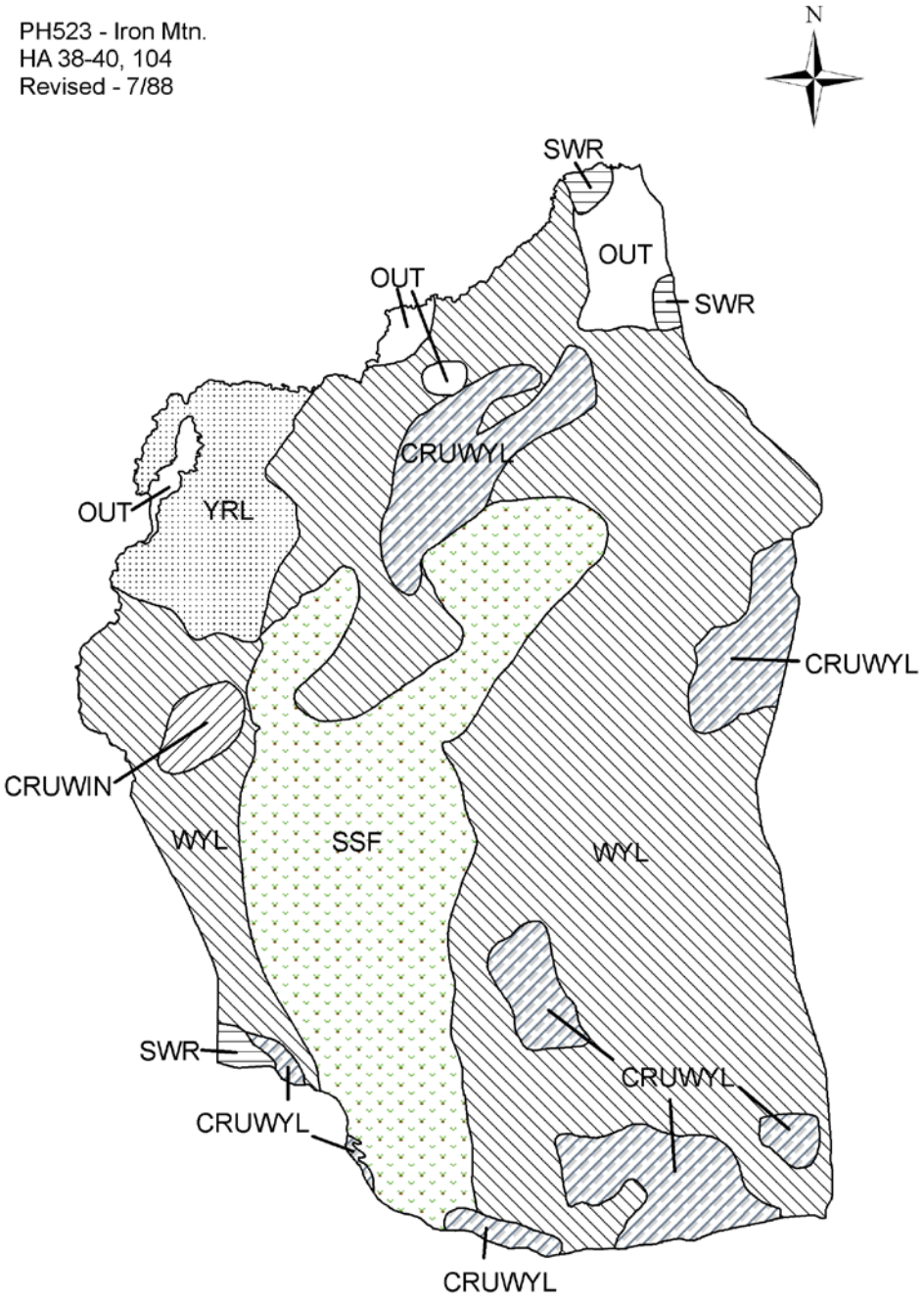
Population

The population had been increasing due to exceptional spring/summer forage the last three years producing the highest fawn ratios in a decade. With currently low fawn recruitment and high harvest, the population is predicted to remain stable to slightly decreasing. The spreadsheet model for this herd estimates a post hunt population of 9,800. This estimate uses the Constant Juvenile & Adult Survival model which had a AIC score of 28 and a best fit score of 19. 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 historically been difficult to manage due to limited population data and a large percentage of inaccessible private lands. hunt areas 38, 39, 40 and 104 were combined in 2014 to simplify regulations and allow hunters more opportunity to move where the pronghorn are most accessible, which seems to be working. The current season structure and license issuance adequately manages the populations to our goals.

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



2016 - JCR Evaluation Form

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

HERD: PR524 - DWYER

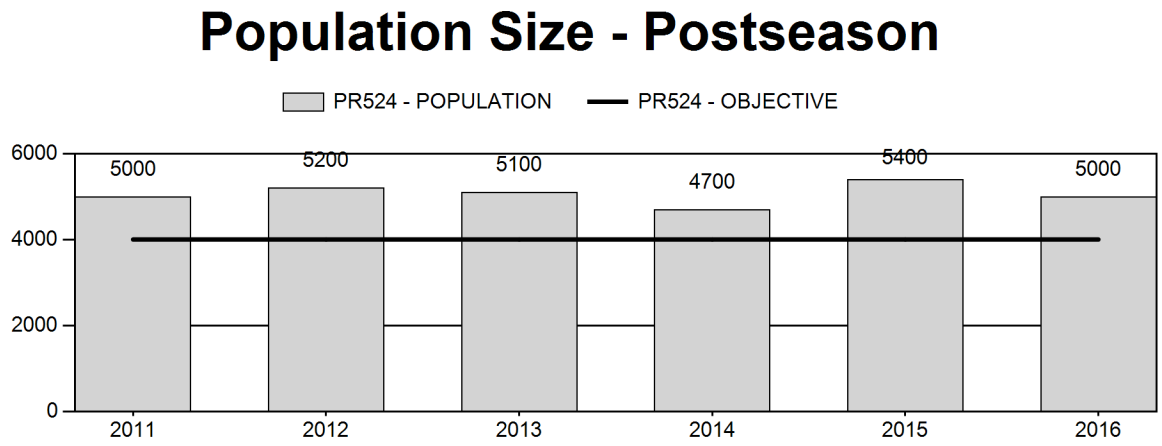
HUNT AREAS: 103
PREPARED BY: MARTIN HICKS

	2011 - 2015 Average	2016	2017 Proposed
Population:	5,080	5,000	4,800
Harvest:	529	730	875
Hunters:	541	775	945
Hunter Success:	98%	94%	93 %
Active Licenses:	631	825	995
Active License Success:	84%	88%	88 %
Recreation Days:	1,895	2,370	3,000
Days Per Animal:	3.6	3.2	3.4
Males per 100 Females	48	39	
Juveniles per 100 Females	49	32	

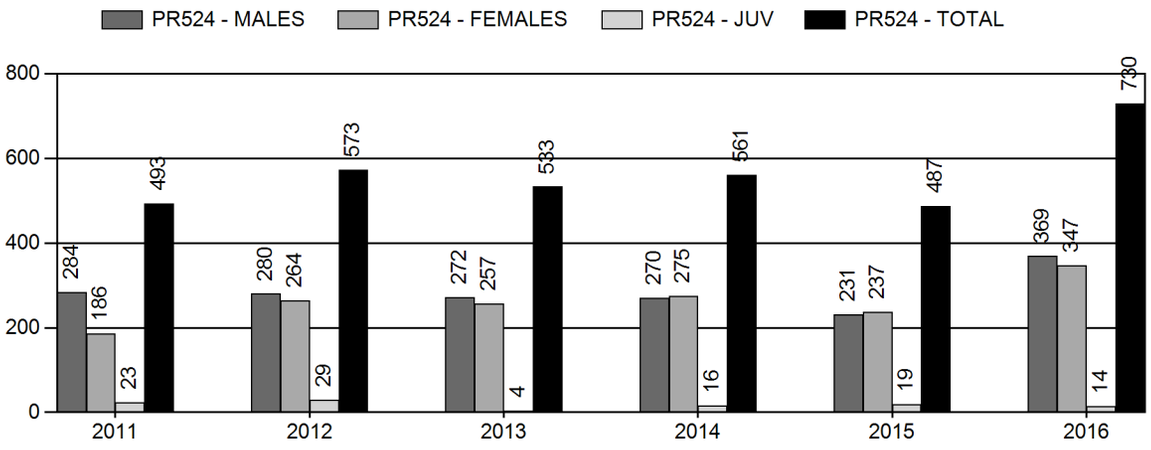
Population Objective (± 20%) :	4000 (3200 - 4800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	25%
Number of years population has been + or - objective in recent trend:	7
Model Date:	02/22/2017

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

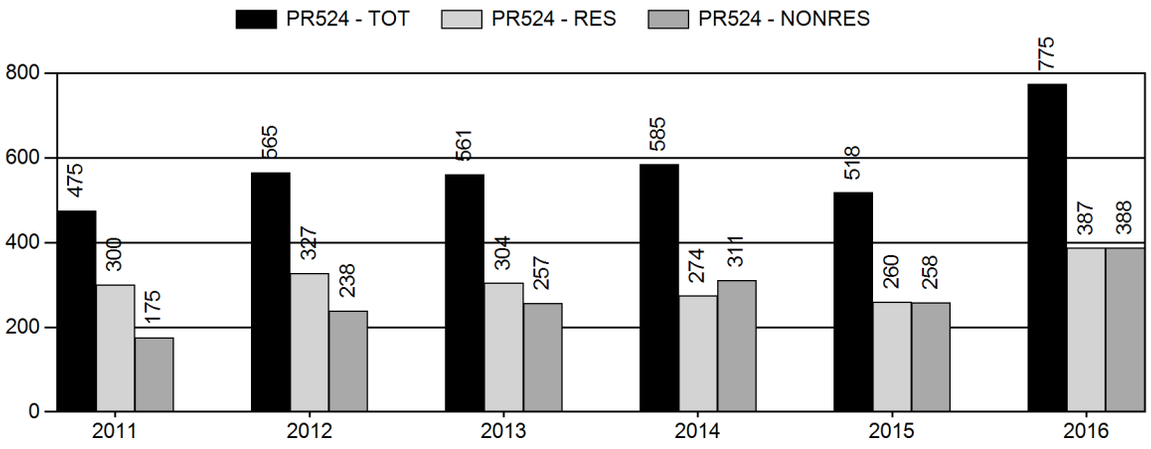
	JCR Year	Proposed
Females ≥ 1 year old:	12%	14%
Males ≥ 1 year old:	22%	32%
Total:	12%	15%
Proposed change in post-season population:	-8%	-4%



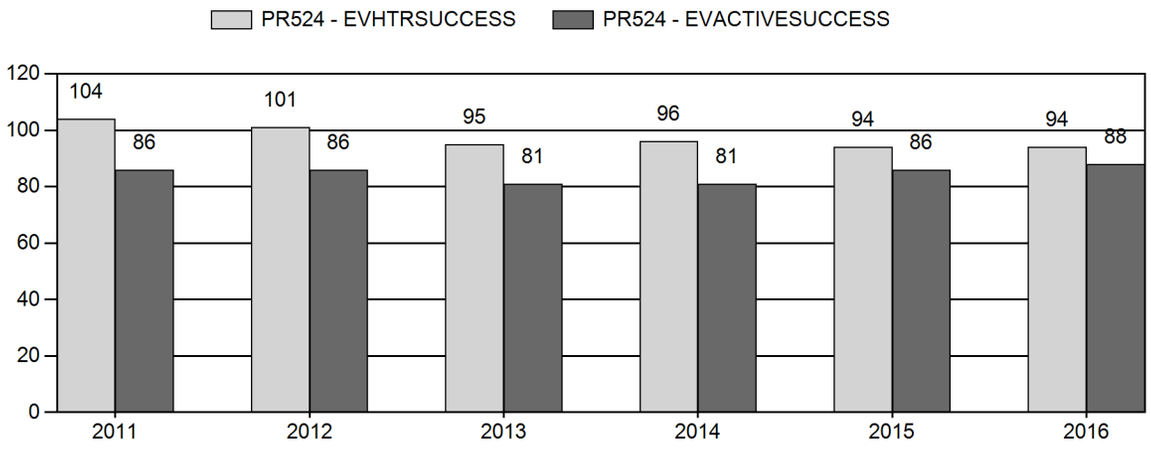
Harvest



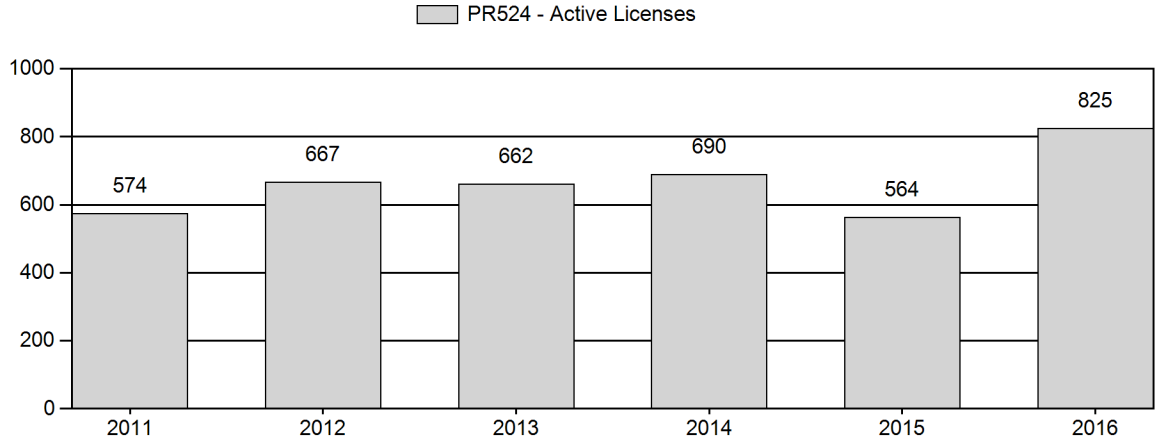
Number of Active Licenses



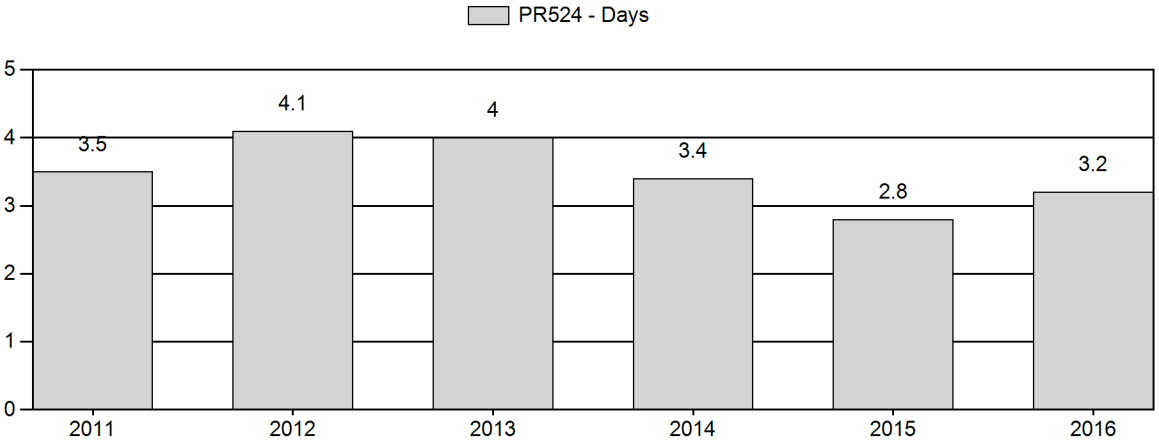
Harvest Success



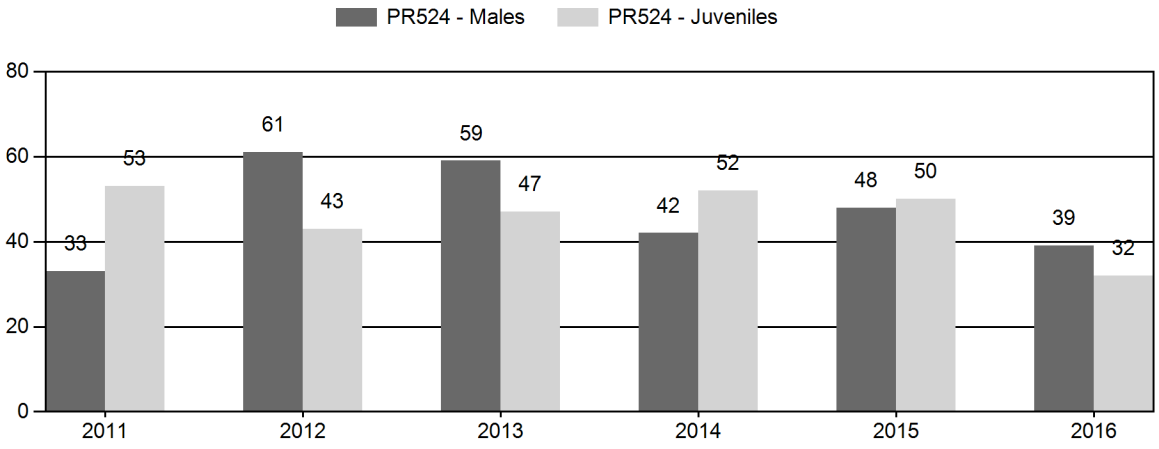
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR524 - DWYER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,800	60	104	164	23%	416	58%	135	19%	715	1,257	14	25	39	± 6	32	± 5	

2017 HUNTING SEASONS
DWYER PRONGHORN HERD (524)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
103	1	Oct. 5	Oct. 31	575	Limited quota	Any antelope
	6	Oct. 5	Dec. 31	550	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 2016
103	1	+100
103	6	+100
Total		**+200**

Management Evaluation
Current Management Objective: 4000 (3,200-4,800)
Management Strategy: Recreational
2016 Postseason Population Estimate: ~5,000
2017 Proposed Post-season Population Estimate: ~4,800
2016 Hunter Satisfaction: 90% Satisfied, 8% Neutral, 2% 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 30-59 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.

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 during spring months then became dry and hot from July through November. 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. Generally speaking weather patterns most likely had a positive influence on all big game species. For specific meteorological information for the Dwyer herd unit the reader is referred to the following link: http://www.ncdc.noaa.gov/cag/

Habitat

Forage availability continued to improve in 2016 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.

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.

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 2011-2016 fluctuated around 5,000 pronghorn. The sample size for pre-season classifications has not been met in the past 7 years so herd composition data should be interpreted with caution. Fawn ratios have fluctuated around 49 fawns:100 does from 2011-2016 which is a level that does not grow a herd and in 2016 they decreased significantly to 32 fawns:100 does. However buck ratios that have fluctuated from a low of 39:100 to a high of 61:100 from 2011-2016 are well within recreational management levels. In fact they fall at the upper level of the recreation management range, which indicates that fawns are recruiting 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 (88%) in 2016 was slightly higher to the herd unit five-year average (84%) and the five-year state-wide average (82%). Effort (3.2 days per harvest) slightly decreased in 2016 compared to the five-year herd unit average of 3.5 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 90% of the hunters were either satisfied or very satisfied with their hunt. Additional hunting opportunity most likely affected hunter attitudes.

Population

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

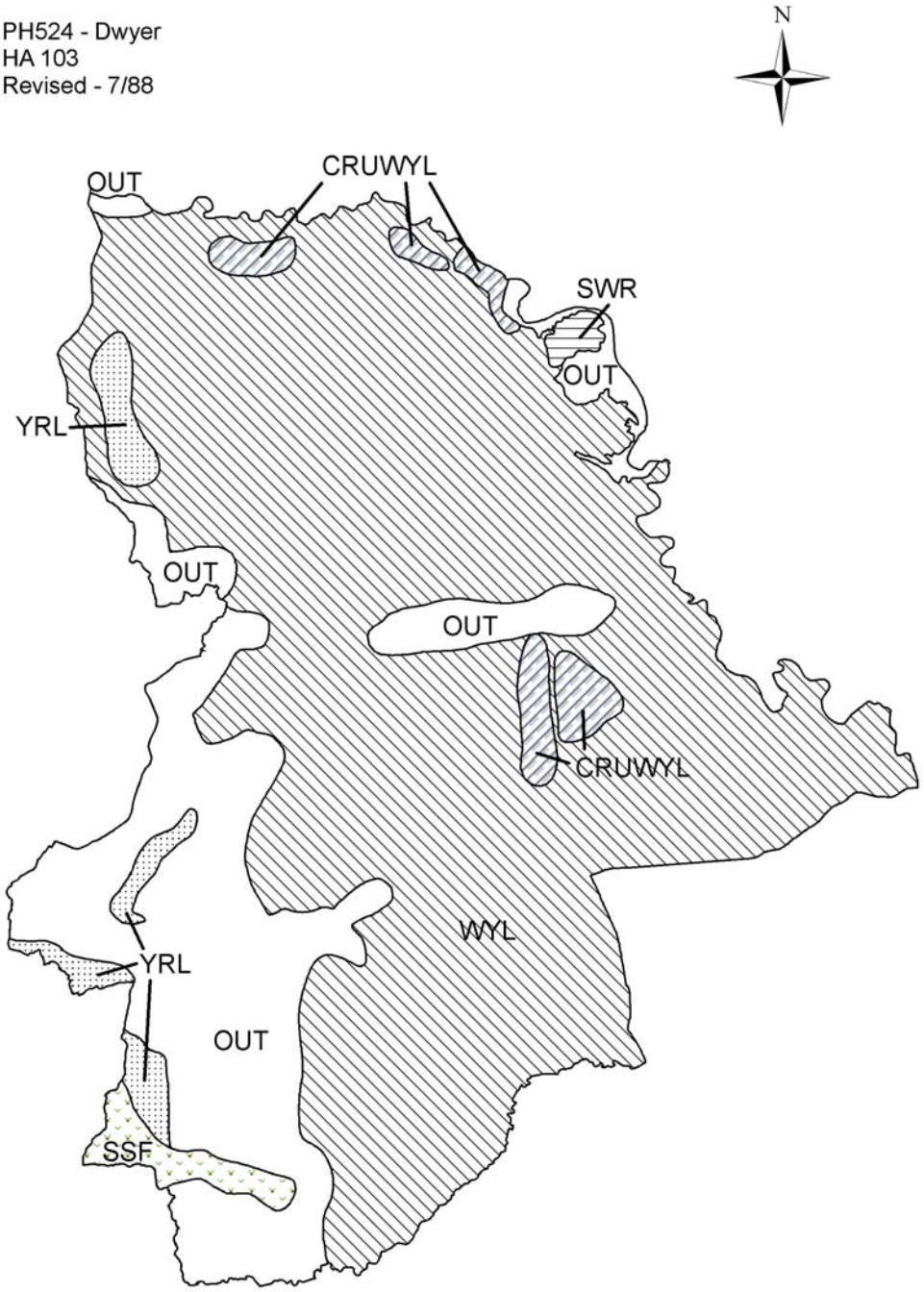
previous LT's and underestimates the 2014 LT density estimate by 1,000 pronghorn. By allowing for a variation in juvenile survival the TSJ,CA model runs through the 2014 LT and provides a plausible population estimate. The CJ,CA's AIC score was slightly lower than the TSJ,CA score, but the TSJ,CA has 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

To minimize population growth and take advantage of above average buck ratios we propose to increase the Type 1 licenses by 100 and to bring the population towards the objective the Type 6 licenses will increase by 100. Managers want to take small steps in reducing the herd by not flooding the area with too many doe/fawn licenses.

If the projected harvest of 875 pronghorn is attained coupled with normal fawn recruitment the pronghorn population will slightly decrease to 4,800, 20% above the objective of 4,000.

PH524 - Dwyer
HA 103
Revised - 7/88



2016 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2016 - 5/31/2017

HERD: PR525 - MEDICINE BOW

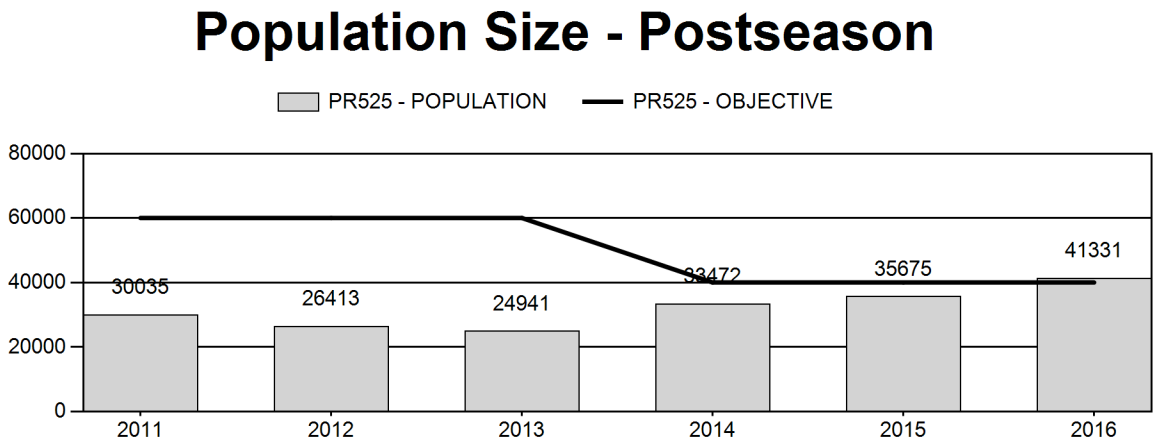
HUNT AREAS: 30-32, 42, 46-48 | PREPARED BY: LEE KNOX

	2011 - 2015 Average	2016	2017 Proposed
Population:	30,107	41,331	40,412
Harvest:	4,303	2,312	3,000
Hunters:	4,911	2,440	3,100
Hunter Success:	88%	95%	97 %
Active Licenses:	5,439	2,681	3,200
Active License Success:	79%	86%	94 %
Recreation Days:	15,843	6,698	7,500
Days Per Animal:	3.7	2.9	2.5
Males per 100 Females	45	47	
Juveniles per 100 Females	67	68	

Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	3%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/23/2017

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

	JCR Year	Proposed
Females ≥ 1 year old:	2%	4%
Males ≥ 1 year old:	21%	28%
Total:	13%	1%
Proposed change in post-season population:	13%	2%



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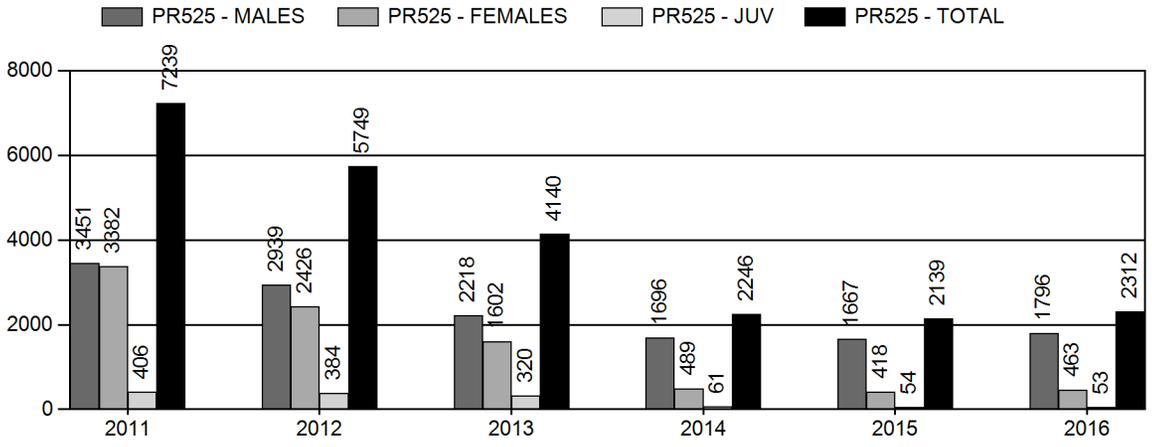
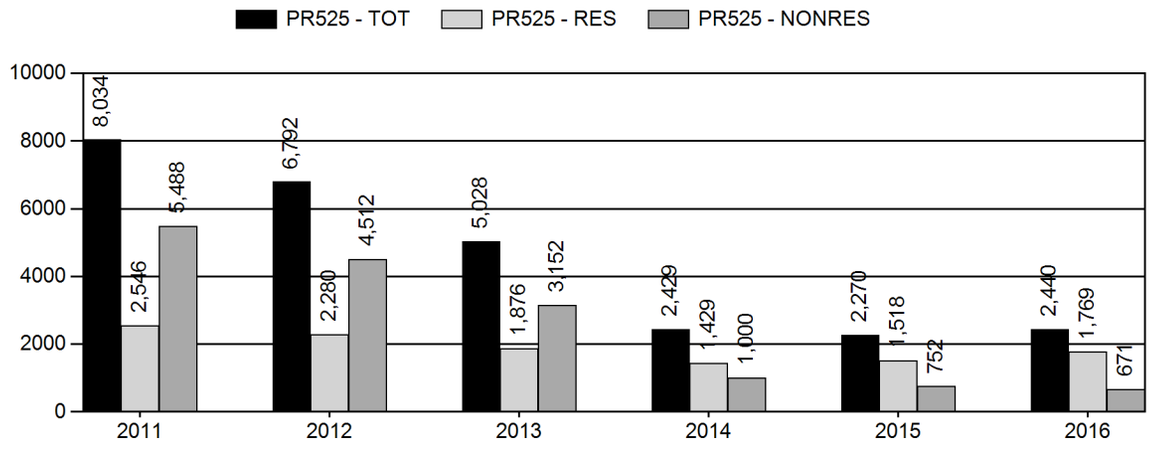
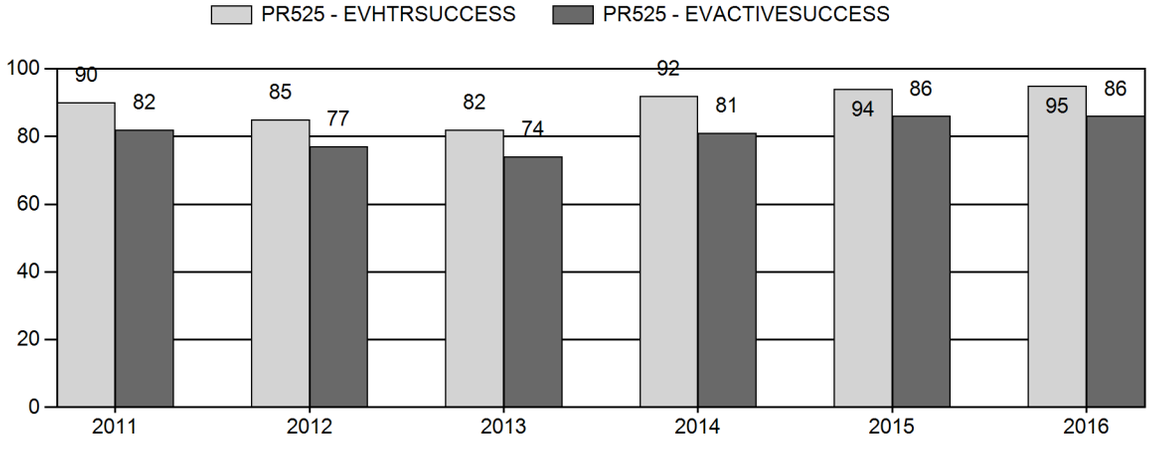


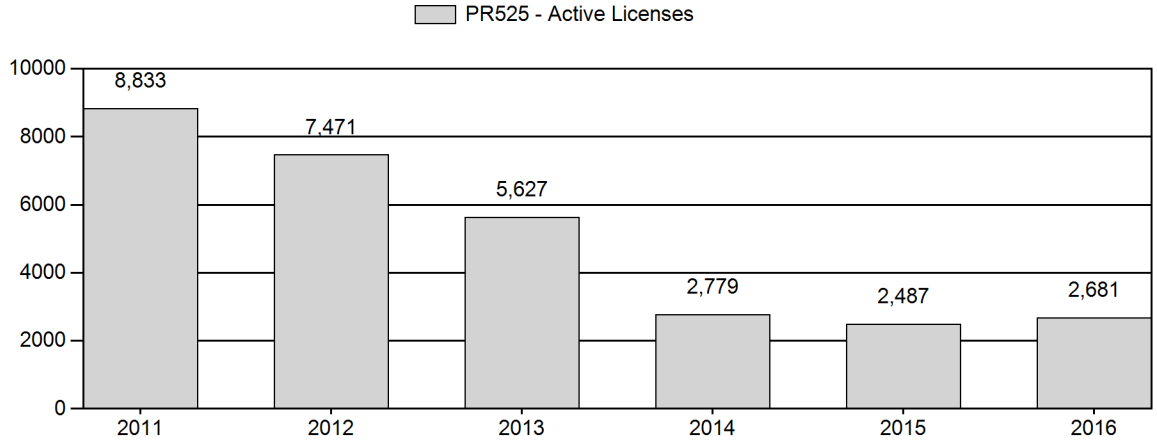
Number of Active Licenses



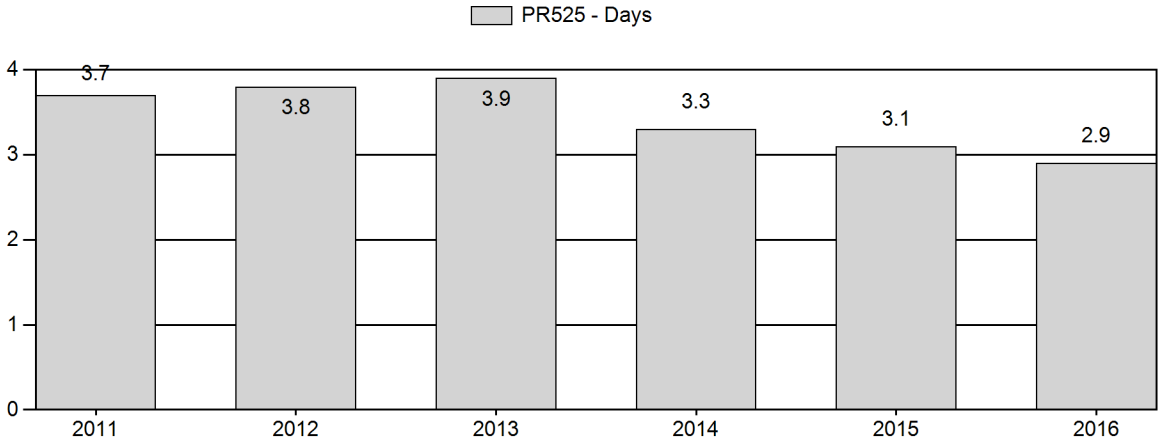
Harvest Success



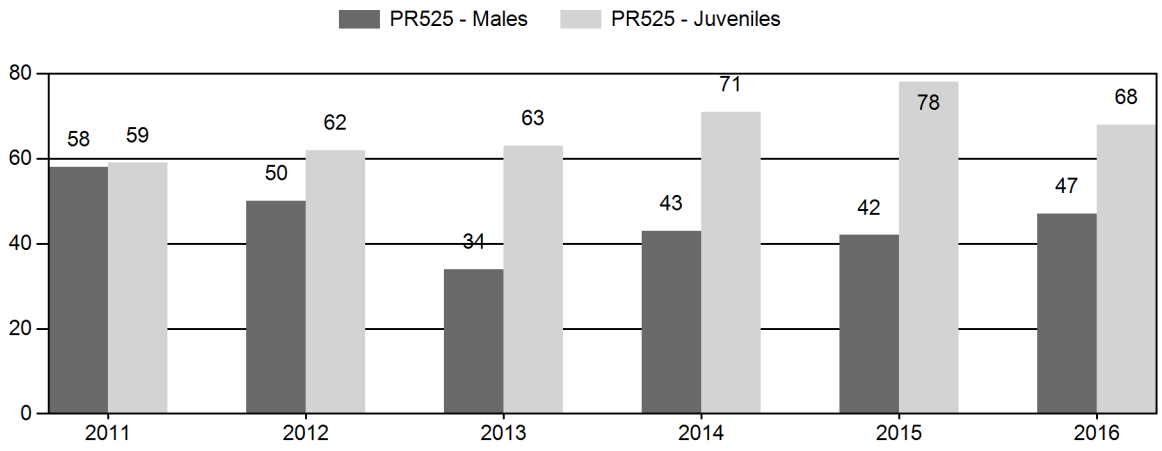
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	41,331	614	806	1,420	22%	3,007	46%	2,046	32%	6,473	2,492	20	27	47	± 2	68	± 3	46

2017 HUNTING SEASONS
MEDICINE BOW PRONGHORN (PR525)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
30	1	Oct. 5	Oct. 31	500	Limited quota	Any antelope
	6	Oct. 5	Oct. 31	100	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	400	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	200	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	500	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	150	Limited quota	Doe or fawn
46	1	Sep. 25	Oct. 31	150	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	200	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	250	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	250	Limited quota	Doe or fawn
48	1	Sep. 25	Oct. 31	150	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	150	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn
30,	Archery	Aug. 15	Oct. 4			Refer to Section 2 of this Chapter
31, 32, 42, 46, 47, 48	Archery	Aug. 15	Sept. 24			Refer to Section 2 of this Chapter

Hunt Area	License Type	Changes from 2016
30	1	+100
	6	+50
32	1	+100
	6	+100
42	1	+100
	6	+100
46	1	+50
	2	+50
47	2	+100
	6	+100
48	1	+50
	2	+50
TOTAL	1	**+400**
	2	**+200**
	6	**+350**
Herd Unit Total		**+950**

Management Evaluation

Current Postseason Population Management Objective: 40,000 (32,000 – 48,000)
Management Strategy: Recreational
2016 Postseason Population Estimate: ~ 41,300
2017 Proposed Postseason Population Estimate: ~ 40,400
2016 Hunter Satisfaction: 90% Satisfaction, 6% Neutral, 4% 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 managing 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 to exclusively private land. Large scale wind farms and coal mining within this herd may be negatively impacting habitat and productivity. More wind farms are proposed. The population saw a large decline from a high of 50,000 in 2004 to 25,000 in 2013. Most recently the population has been increasing to the current estimate of 41,300. In the early 2000s the Department was trying to reduce the population 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. 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 reader is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat
Forage availability continued to improve in 2016 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.

Field Data
A total of 6,500 pronghorn were classified in 2016, exceeding the estimated classification objective of 2,500. Classification methods were changed from aerial to ground in 2013 due to budget constraints. Buck ratios increased to 47 bucks: 100 does in 2016. Adult buck ratios accounted for most of the increase with 27:100 does, still the yearling buck ratio of 20:100 is above the 10 year average of 16:100. Since 2012 we have seen a steady increase in fawn ratios which has corresponded in an increasing population. This year we did see a decline from 78 fawns: 100 does in 2015 to 68 fawns: 100 does 2106. The decline could be from severe spring weather or an increase in yearlings, however, 68 fawns per 100 is still above the 10 year average of 66:100 and should maintain a growing population. The hunter satisfaction survey shows 90% 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 is 96%, continuing to increase annually from 82% in 2013. Hunter effort for the herd unit declined for the third straight year to 2.9 days to harvest in 2016. We expected to have high success and lower effort with the current license issuance and a growing population. Total harvest increased from 2,100 in 2015 to 2,300 in 2016 with 2,400 active licenses, a significant reduction in harvest compared to 2010 with 7,700 pronghorn and 8,900 active licenses. Adult bucks harvested over 3 years old has increased from 53% in 2012 to 64% in 2016. Adult doe harvest over 3 years old also has increased from 32% in 2014 to 52% in 2016, signs of a growing population with limited harvest.

Population
The spreadsheet model for this herd indicates the population is increasing with a post hunt population of 41,300. This estimate was derived using the Time-Specific Juvenile and Constant Adult Survival model which had a AIC score of 280 and a best fit score of 171. The last line transect (LT) survey was conducted spring of 2016 with a 2015 postseason population estimate of 36,250 and a standard error of 4,300 (Appendix A). 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 3,100 is attained, and we have an average fawn ratio of 70 fawns: 100 does, the population is estimated to stabilize near 40,000. Given the increase in the buck ratio throughout the herd unit, we are increasing Type 1 licenses by a total of 500 in the hunt areas that can best offer that opportunity. We are also increasing Type 6 licenses by 250 to start to address the population reaching objective. Given the varying winter from harsh to mild conditions we are hesitant to increase doe harvest to much the first year, and will evaluate more increases in 2018.

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.

2016 PR525 - MEDICINE BOW Pronghorn Line-Transect Summary

Survey Dates:	6/1/2017 - 6/6/2017
Survey Cost:	$ 6,725.00
Flight Service:	LAIRD FLYING SERVICE
Aircraft:	HUSKY
Observers:	Will Shultz, Lee Knox, Cody Bish 24 hours at 250 an hour

Weather Conditions:

Temperature (Degrees Fahrenheit):	70
Cloud Cover (%):	0
Wind Speed (MPH):	0 - 20

Transect Limits:	106 35' to 105 30'
Transect Direction:	North/South
Transect Interval (Minutes of Longitude):	5
Transect Length: (Mi.):	16,226
Transect Altitude (AGL):	315 ft.
Occupied Habitat (mi^2):	3,000
Density Estimate (Animals/mi^2 with Confidence Intervals):	36249 (28729 - 45736)
Population Estimate (with Confidence Intervals):	30,408 (0 - 0)

Effort : 2374.700
samples : 99
Width : 210.0000
Left : 0.0000000
observations: 953

Model
Hazard Rate key, k(y) = 1 - Exp(-(y/A(1))**-A(2))

Parameter	Point Estimate	Standard Error	Percent Coef. of Variation	95 Percent Confidence Interval
A(1)	45.15	9.028		
A(2)	1.000	0.1190		
f(0)	0.10732E-01	0.88037E-03	8.20	0.91390E-02 0.12603E-01
p	0.44370	0.36396E-01	8.20	0.37782 0.52105
ESW	93.176	7.6432	8.20	79.343 109.42

Sampling Correlation of Estimated Parameters

	A(1)	A(2)
A(1)	1.000	0.827
A(2)	0.827	1.000

Detection Fct/Global/Plot: Detection Probability

Expected cluster size estimated based on regression of: log(s(i)) on g(x(i))
** Warning: Exact distance values, rather than distance intervals,
have been used in size bias regression calculations. **

Regression Estimates

Slope = -0.638401E-01 Std error = 0.795540E-01
Intercept = 0.593026 Std error = 0.508798E-01
Correlation= -0.0260 Students-t = -0.802476
Df = 951 Pr(T < t) = 0.211239

Expected cluster size = 2.1663 Standard error = 0.54657E-01

Mean cluster size = 2.3820 Standard error = 0.86746E-01
Cluster size/Global/Regression plot

Effort : 2374.700
samples : 99
Width : 210.0000
Left : 0.0000000
observations: 953

Model
Hazard Rate key, k(y) = 1 - Exp(-(y/A(1))**-A(2))

Parameter	Point Estimate	Standard Error	Percent Coef. of Variation	95% Percent Confidence Interval	
DS	5.5776	0.64672	11.60	4.4437	7.0008
E(S)	2.1663	0.54657E-01	2.52	2.0617	2.2763
D	12.083	1.4338	11.87	9.5765	15.245
N	36249.	4301.4	11.87	28729.	45736.

Measurement Units

Density: Numbers/Sq. miles
ESW: meters

Component Percentages of Var(D)

Detection probability : 47.8
Encounter rate : 47.7
Cluster size : 4.5
Estimation Summary - Encounter rates

Estimate	%CV	df	95% Confidence Interval	
n 953.00				
k 99.000				
L 2374.7				
n/L 0.40131	8.19	98.00	0.34117	0.47206
Left 0.0000				
Width 210.00				

Estimation Summary - Detection probability

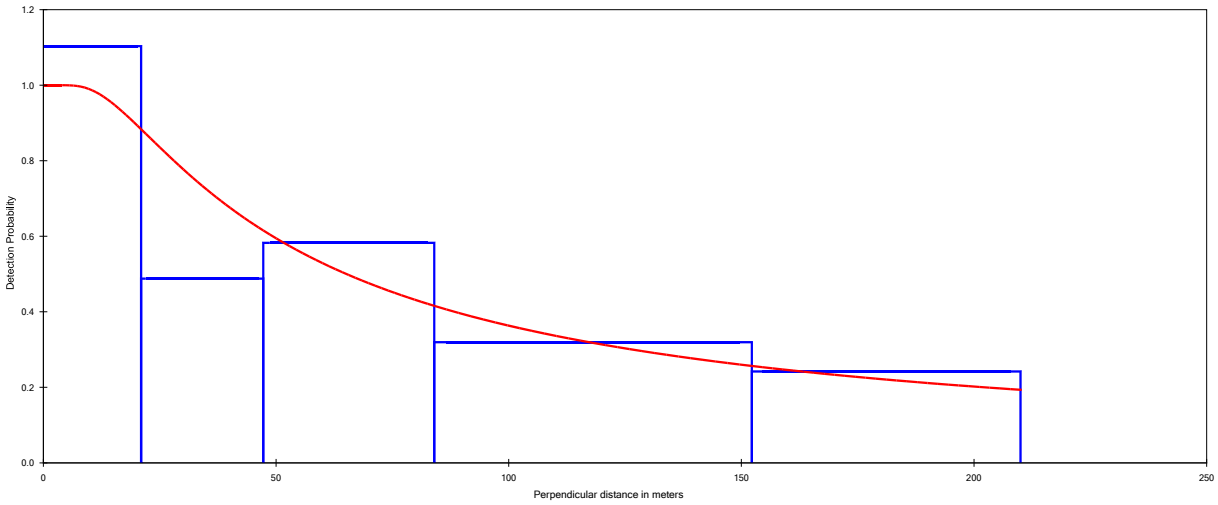
Estimate	%CV	df	95% Confidence Interval	
Hazard/Cosine				
m 2.0000				
LnL -1524.7				
AIC 3053.3				
AICc 3053.3				
BIC 3063.0				
Chi-p 0.59605E-07				
f(0) 0.10732E-01	8.20	951.00	0.91390E-02	0.12603E-01
p 0.44370	8.20	951.00	0.37782	0.52105
ESW 93.176	8.20	951.00	79.343	109.42

Estimation Summary - Expected cluster size

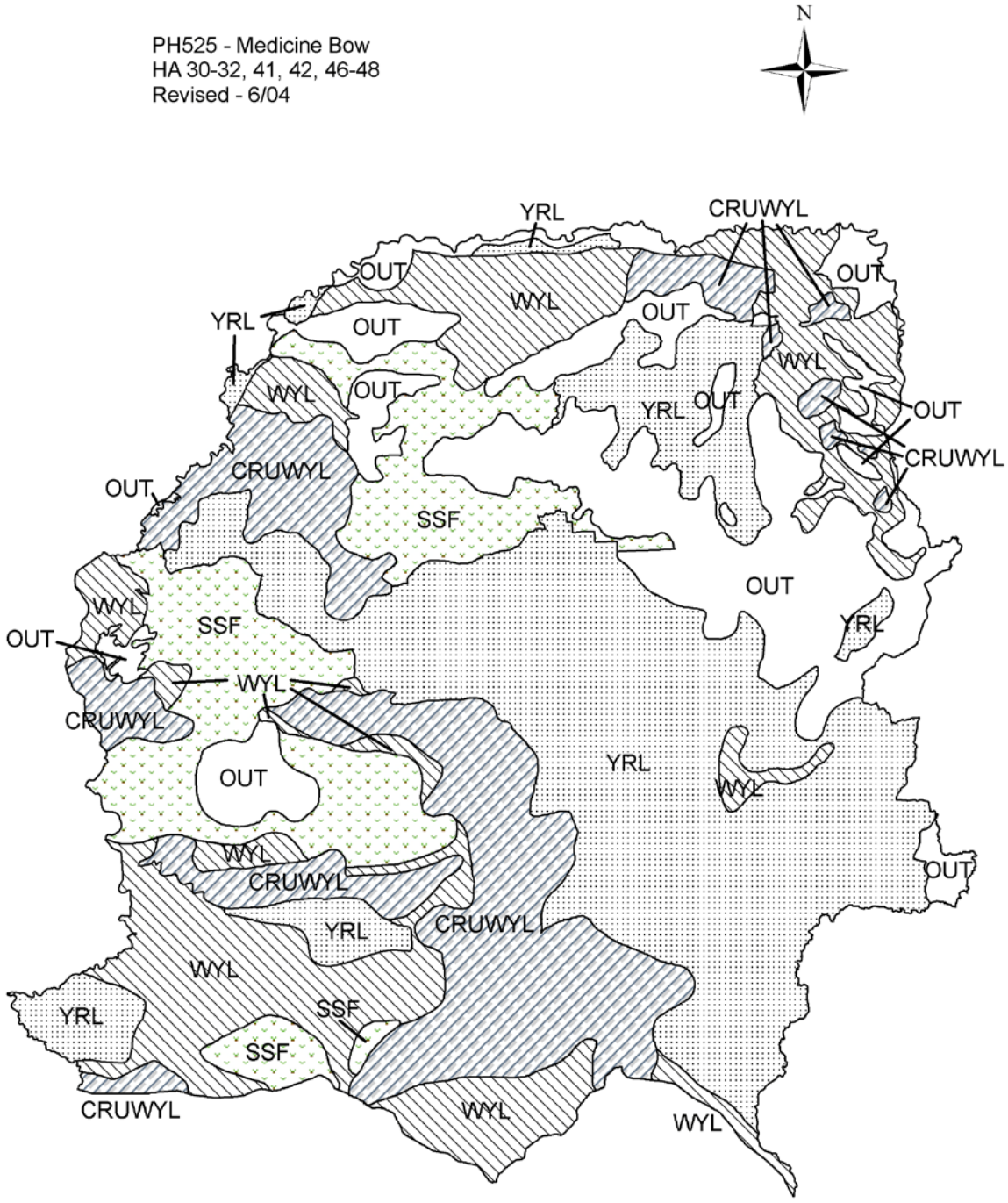
Estimate	%CV	df	95% Confidence Interval	
Average cluster size				
2.3820	3.64	952.00	2.2177	2.5584
Hazard/Cosine				
r	-0.26013E-01			
r-p	0.21124			
E(S)	2.1663	2.52	951.00	2.0617	2.2763

Estimation Summary - Density&Abundance

Estimate	%CV	df	95% Confidence Interval	
Hazard/Cosine				
DS	5.5776	11.60	355.95	4.4437	7.0008
D	12.083	11.87	390.13	9.5765	15.245
N	36249.	11.87	390.13	28729.	45736.
C1	C2	C3	C4		



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



2016 - JCR Evaluation Form

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

HERD: PR526 - COOPER LAKE

HUNT AREAS: 43
PREPARED BY: LEE KNOX

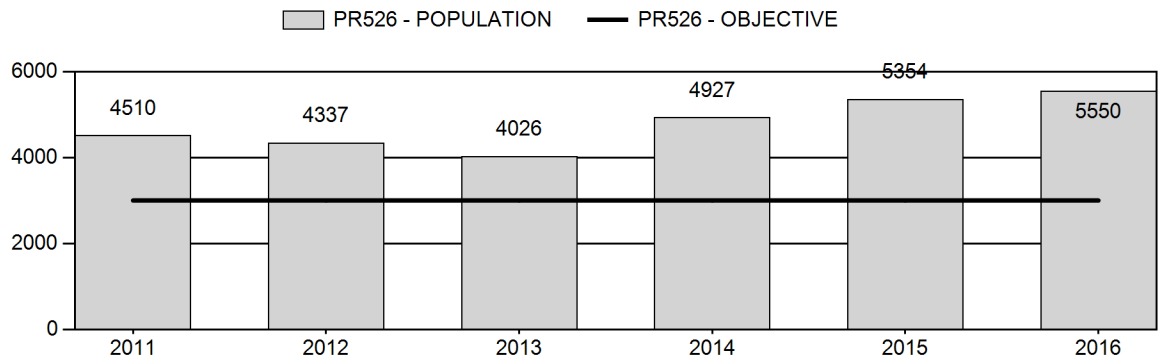
	2011 - 2015 Average	2016	2017 Proposed
Population:	4,631	5,550	5,317
Harvest:	654	807	928
Hunters:	730	883	1,000
Hunter Success:	90%	91%	93 %
Active Licenses:	792	926	1,050
Active License Success:	83%	87%	88 %
Recreation Days:	2,479	2,212	2,250
Days Per Animal:	3.8	2.7	2.4
Males per 100 Females	44	72	
Juveniles per 100 Females	84	94	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	85%
Number of years population has been + or - objective in recent trend:	20
Model Date:	02/22/2017

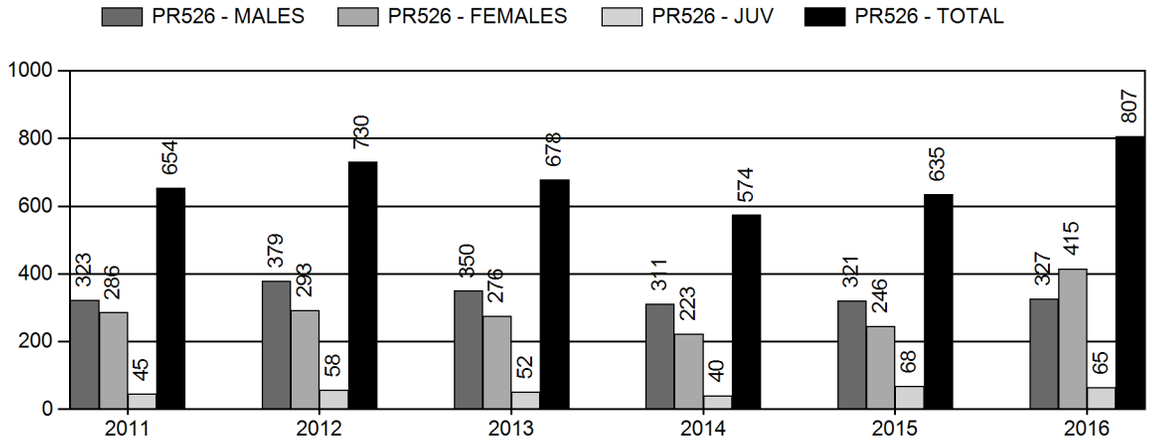
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	18%	18%
Males ≥ 1 year old:	31%	28%
Total:	13%	13%
Proposed change in post-season population:	-15%	-15%

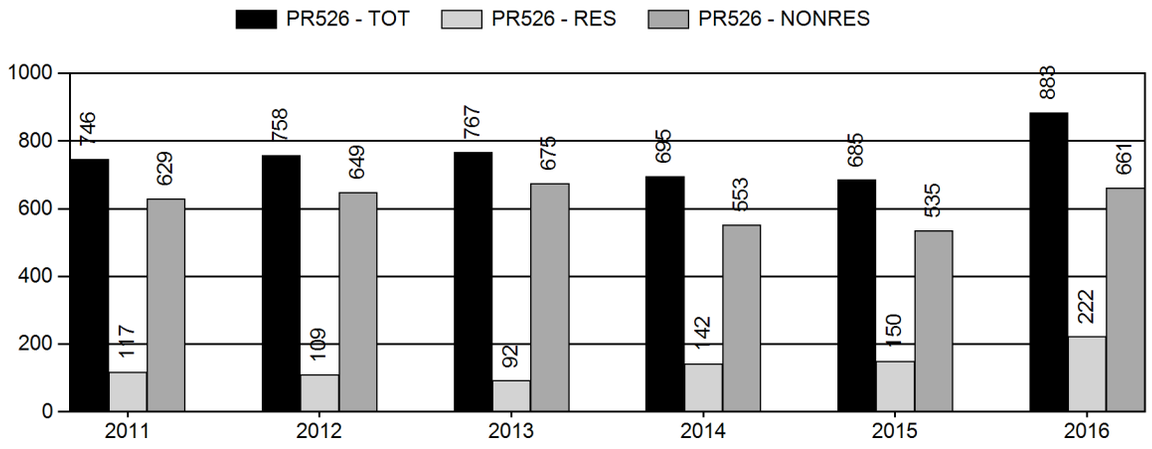
Population Size - Postseason



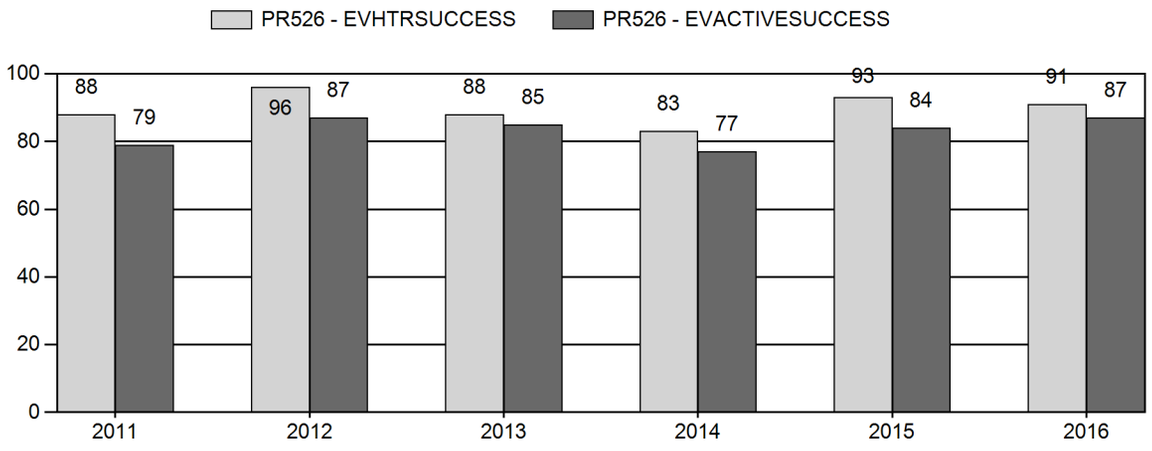
Harvest



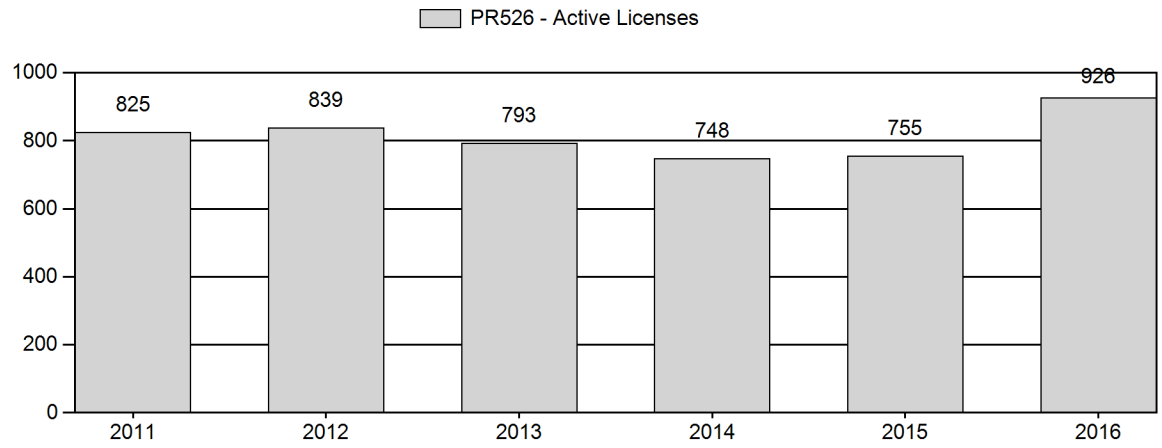
Number of Active Licenses



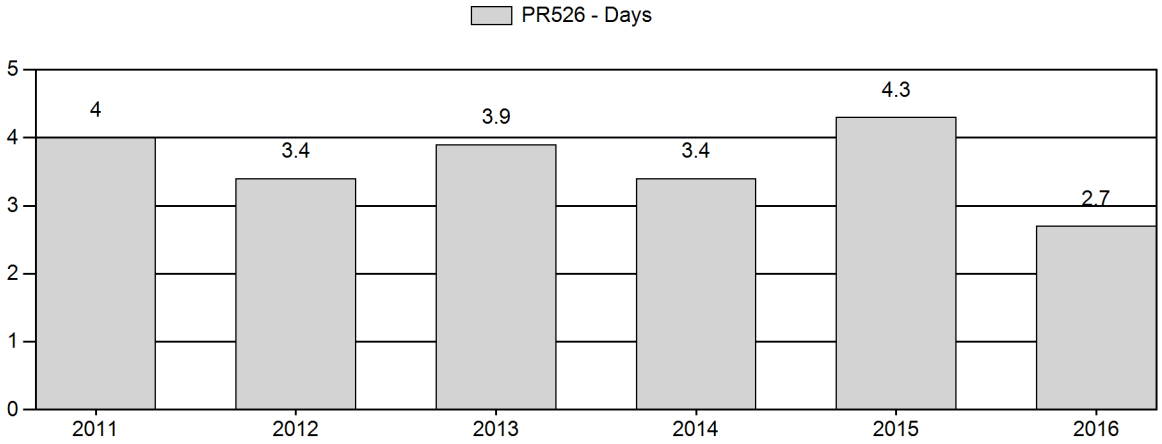
Harvest Success



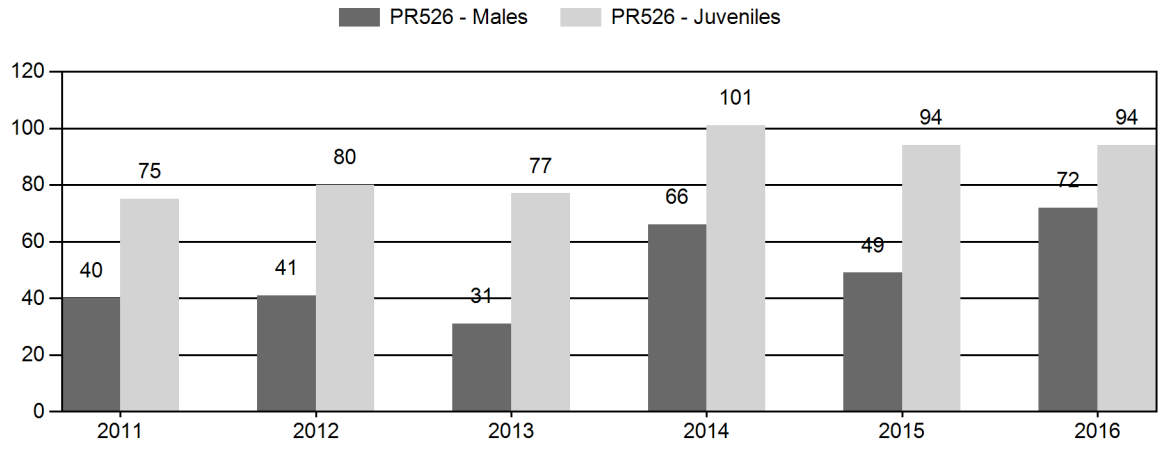
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,550	109	139	248	27%	345	38%	324	35%	917	2,878	32	40	72	± 9	94	± 11	55

2017 HUNTING SEASONS
COOPER LAKE PRONGHORN (PR526)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
43	1	Sept. 15	Oct. 31	500	Limited quota	Any antelope
	6	Sept. 15	Oct. 31	600	Limited Quota	Doe or fawn
Archery		Aug. 15	Sept. 14			Refer to Section 3 of this Chapter

Area	Type	Change from 2016
43	1	+100
Herd Totals	**TOTAL**	**+100**

Management Evaluation
Current Postseason Population Management Objective: 3,000 (2,400-3,600)
Management Strategy: Recreational
2016 Postseason Population Estimate: ~ 5,500
2017 Proposed Postseason Population Estimate: ~ 5,300
2016 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 5,500. 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. A wind farm exists in the western portion of the herd with more proposed. 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). 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 reader is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat
Forage availability continued to improve in 2016 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.

Field Data
A total of 917 pronghorn were classified which is below the estimated sample size of 2,878. 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; increasing length of 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. Buck ratios increased in both yearling and adult bucks for a total buck ratio of 74:100 does.

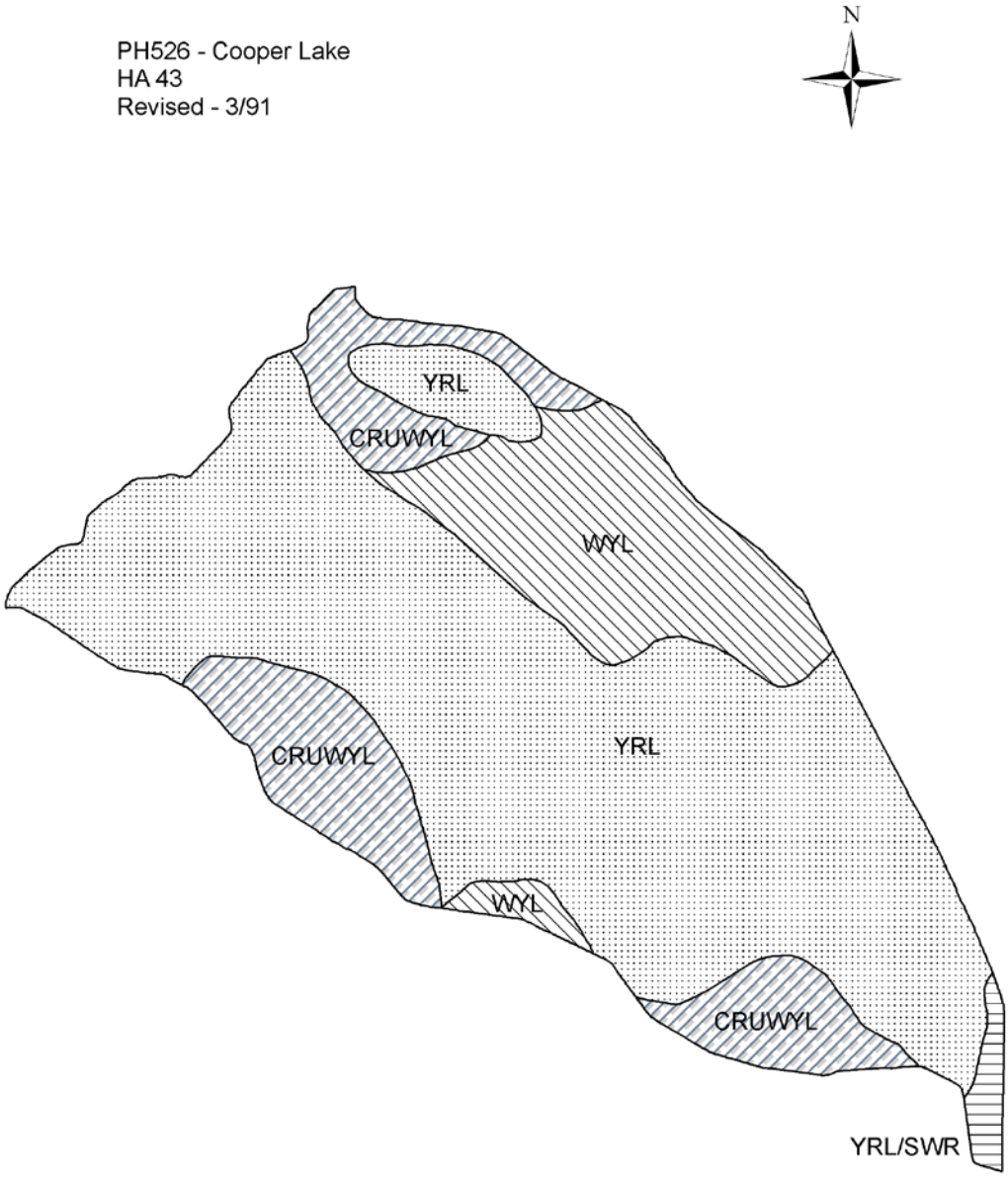
Harvest Data
We issued 1,000 licenses which did not completely sell in the resident draw and non-residents account for 75% of the licenses sold. Hunter success remains high with type 1s at 91% and type 6s at 85%. The Hunter Satisfaction Survey shows 90% of hunters were either satisfied or very satisfied with their hunt.

Population
The model estimates the population is near 5,500 pronghorn and predicts it will remain stable to slightly declining to 5,300 in 2017. The Constant Juvenile- Constant Adult Mortality Rate (CJCA) spreadsheet model was selected to use for the post season population estimate of this herd. The model selected had the lowest AIC of all three models and the end of year population estimate trends well with the past line transect (LT) surveys. We conducted an LT 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. Buck ratios are well above recreational management and fawns ratios remain high. Type 1 licenses will be increased by 100 to provide more opportunity. Type 6 licenses will remain the same so that we can assess the increase in 2016 with more than one year of harvest data. We are concerned that increasing licenses could lead to hunter crowding issues given the lack of public hunting access in the herd unit. To address these concerns and the increasing population, the season will be lengthened for both Type 1 and 6 licenses to Oct. 31st to provide more time on the HMAs.

PH526 - Cooper Lake
HA 43
Revised - 3/91



2016 - JCR Evaluation Form

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

HERD: PR527 - CENTENNIAL

HUNT AREAS: 37, 44-45
PREPARED BY: LEE KNOX

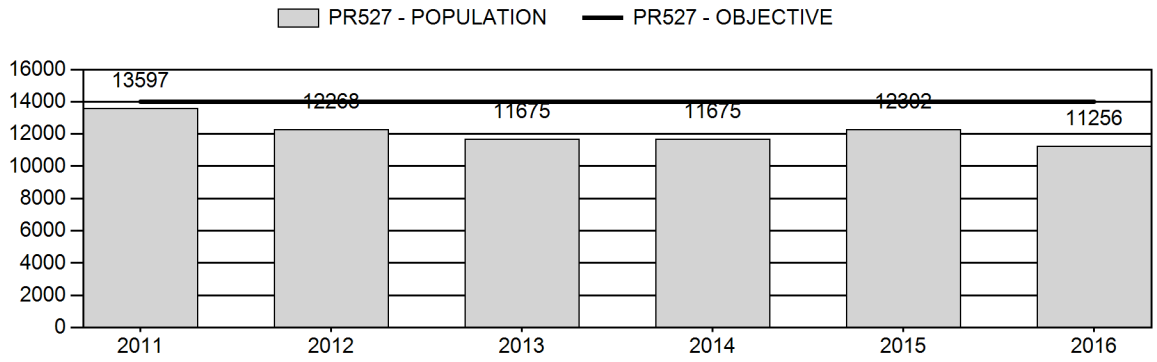
	2011 - 2015 Average	2016	2017 Proposed
Population:	12,303	11,256	11,030
Harvest:	1,125	1,029	1,195
Hunters:	1,261	1,097	1,200
Hunter Success:	89%	94%	100 %
Active Licenses:	1,425	1,215	1,350
Active License Success:	79%	85%	89 %
Recreation Days:	4,649	3,649	3,700
Days Per Animal:	4.1	3.5	3.1
Males per 100 Females	39	54	
Juveniles per 100 Females	71	56	

Population Objective (± 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-19.6%
Number of years population has been + or - objective in recent trend:	6
Model Date:	02/22/2017

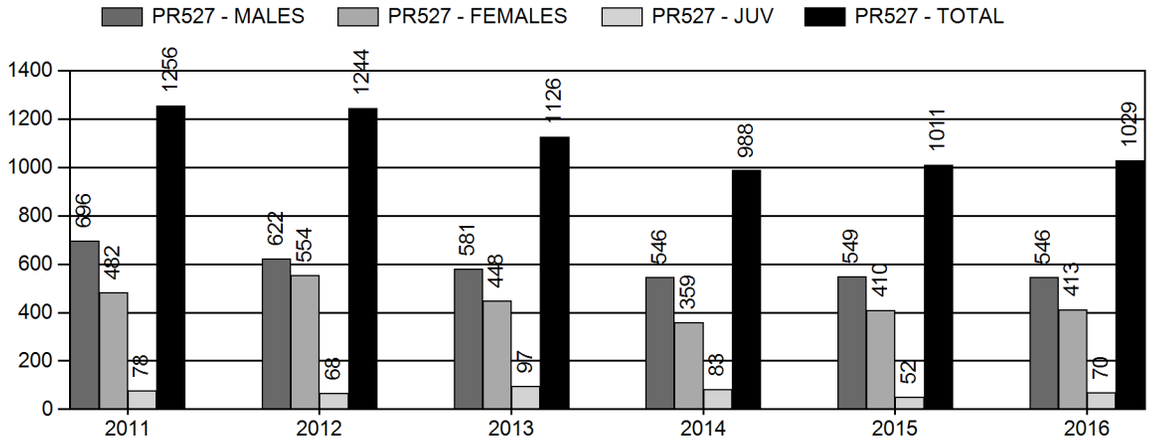
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	7%	8%
Males ≥ 1 year old:	22%	29%
Total:	8%	10%
Proposed change in post-season population:	-2%	-2%

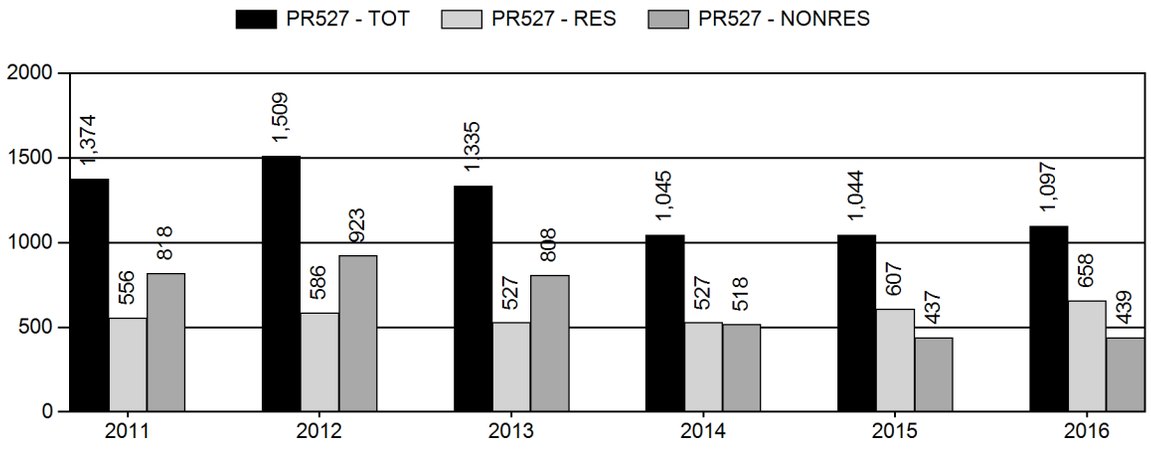
Population Size - Postseason



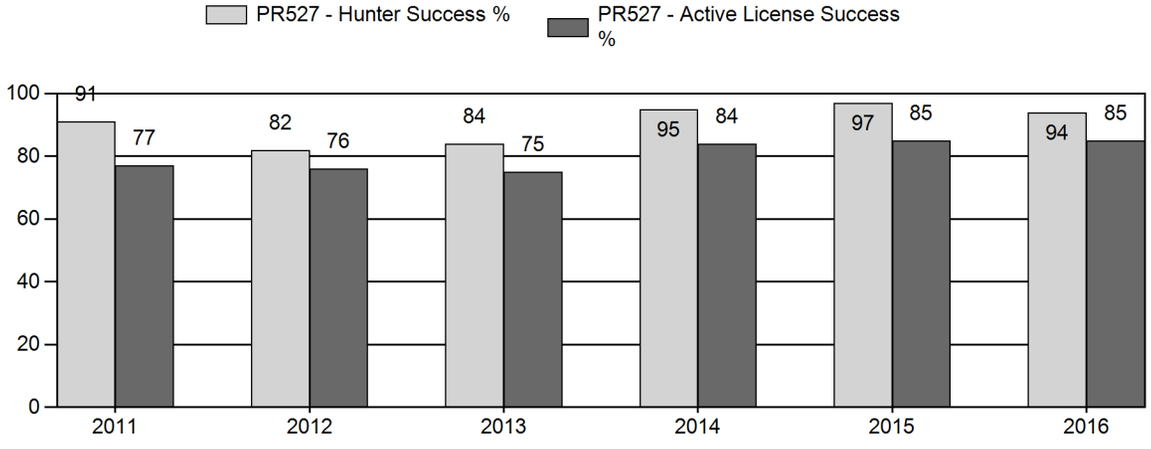
Harvest



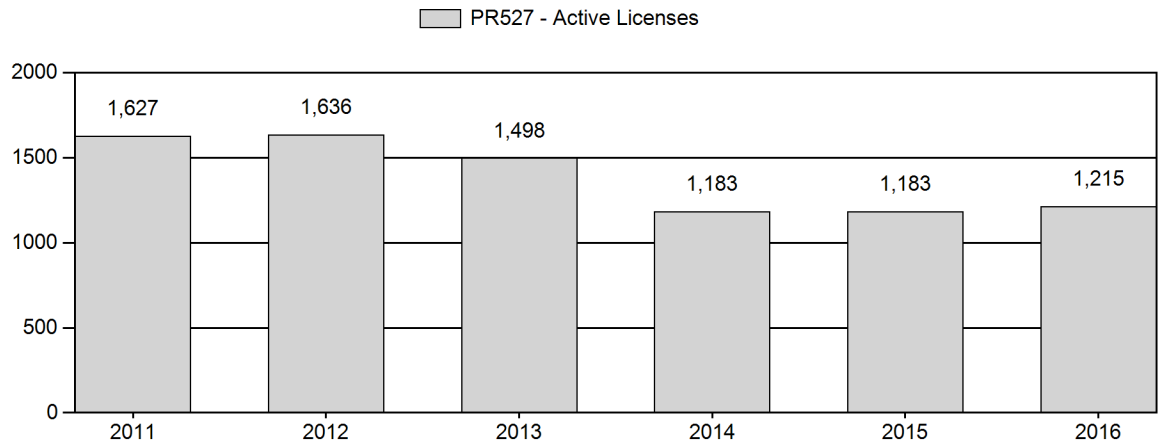
Number of Active Licenses



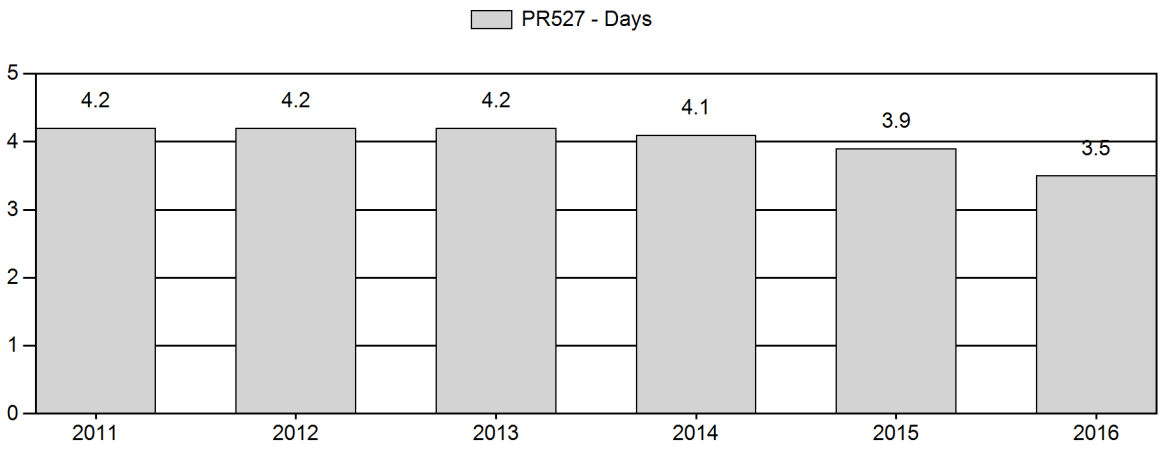
Harvest Success



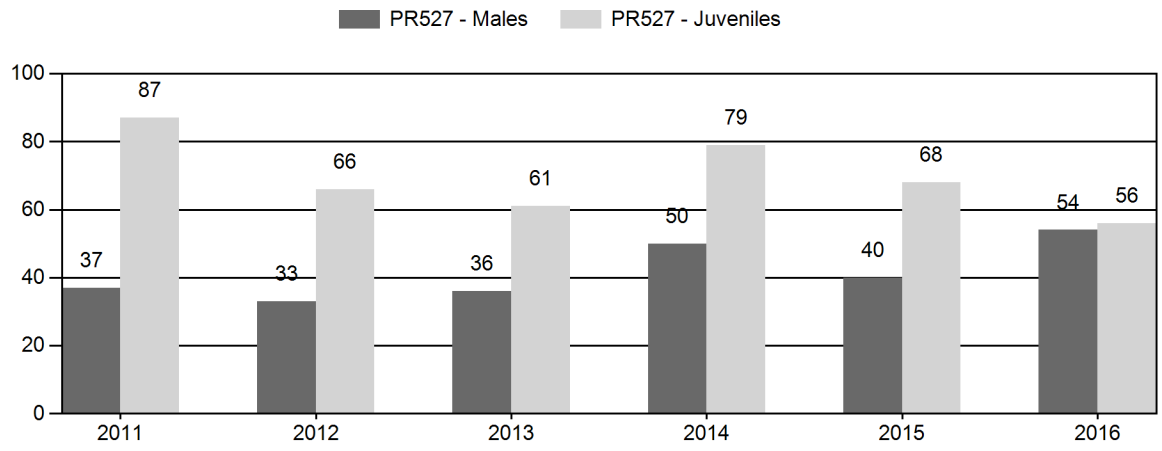
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	11,256	182	353	535	25%	1,000	48%	565	27%	2,100	1,724	18	35	54	± 4	56	± 4	37

2017 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	100	Limited Quota	Doe or fawn
44	1	Sep. 15	Oct. 31	250	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	150	Limited Quota	Doe or fawn
45	1	Sep. 15	Oct. 31	400	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	350	Limited Quota	Doe or fawn
37	Archery	Aug. 15	Sept. 19			Refer to Section 2 of this Chapter
44,45	Archery	Aug. 15	Sept. 14			Refer to Section 2 of this Chapter

Hunt Area	License Type	Changes from 2016
37	6	+25
44	1	+100
45	1	+50
TOTAL	**1**	**+150**
	6	**+25**
HERD UNIT TOTAL		**+175**

Management Evaluation
Current Postseason Population Management Objective: 14,000 (11,200 – 15,800)
Management Strategy: Recreational
2016 Postseason Population Estimate: ~ 11,300
2017 Postseason Population Estimate: ~ 11,000
2016 Hunter Satisfaction: 90% Satisfied, 6% Neutral, 4% 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 2016 post-season population estimate was approximately 11,300 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 reader is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat
Forage availability continued to improve in 2016 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.

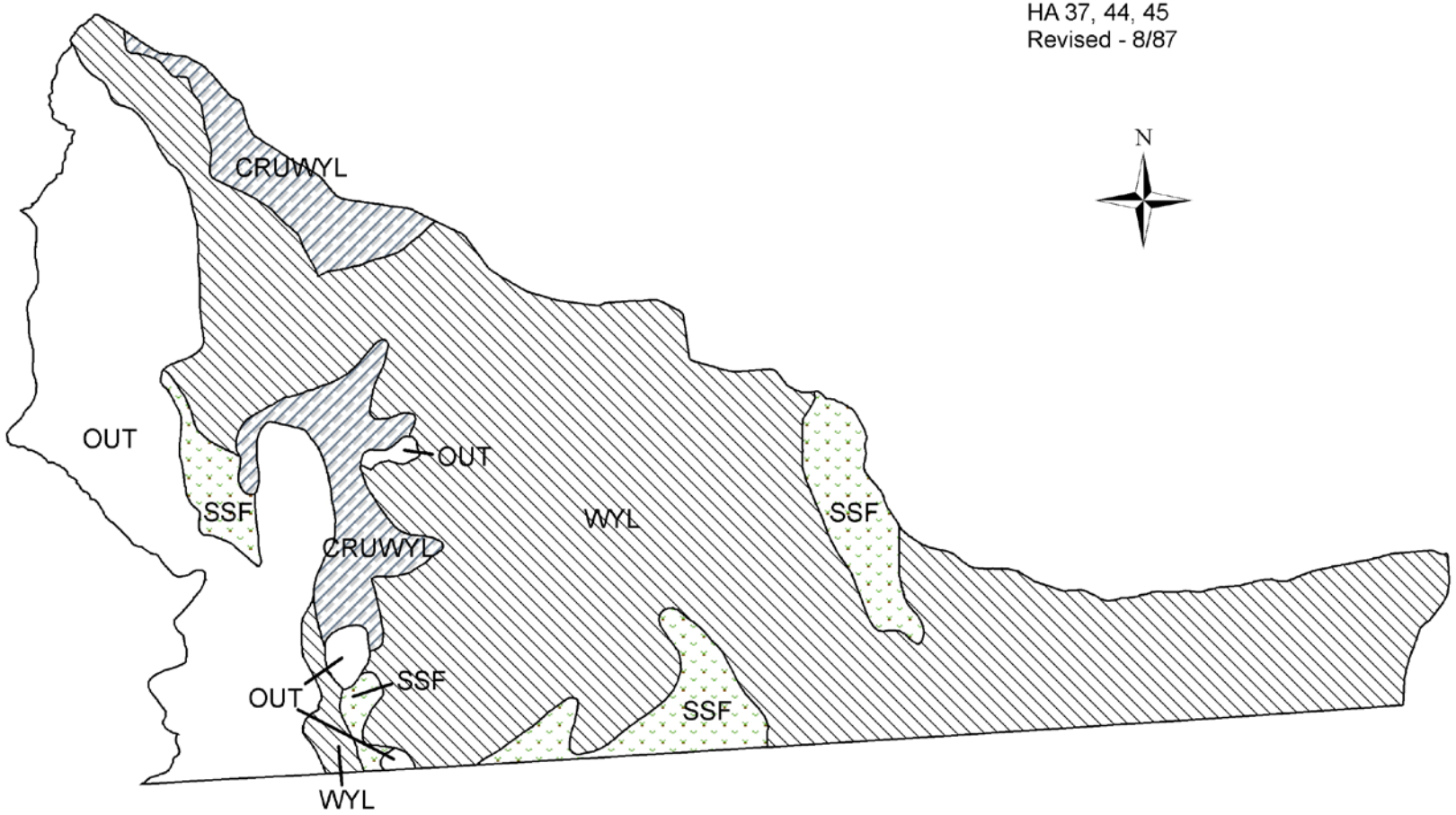
Field Data
A total of 2,100 pronghorn were classified, exceeding the estimated classification objective of 1700. Classification routes have been standardized so that some inference can be made from year to year classifications; in 2 of the 3 hunt areas we saw a decline in numbers. Fawn production in 2016 was 56:100 does, 12 fawns: 100 less than in 2015 and 22 fawns: 100 less than 2014. This is perplexing considering hunt area 43 is only separated by an interstate and has fawn ratios over 90:100 does. Buck ratios increased from 40 bucks:100 does in 2015 to 53 bucks: 100 does in 2016.

Harvest Data
Hunter success continues to remain high at 94% in 2016, and hunter effort decreased slightly to 3.5 days to harvest. The hunter satisfaction survey showed 90% 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 2016, 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, causing more residents to draw their second and third choices.

Population
The "Constant Juvenile – Constant Adult Survival 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 at 11,300 and within 20% of 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. The E band estimates are too high and violates the first assumption of the line transect (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. 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. With an increased buck population, we propose increasing Type 1 licenses in all 3 hunt areas accordingly. If we attain the projected harvest of 1,200 pronghorn and have fawn ratios near 70 to 75, the population will remain near the objective. We predict a 2017 post-season population of approximately 11,000 pronghorn.

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



2016 - JCR Evaluation Form

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

HERD: PR528 - ELK MOUNTAIN

HUNT AREAS: 50
PREPARED BY: WILL SCHULTZ

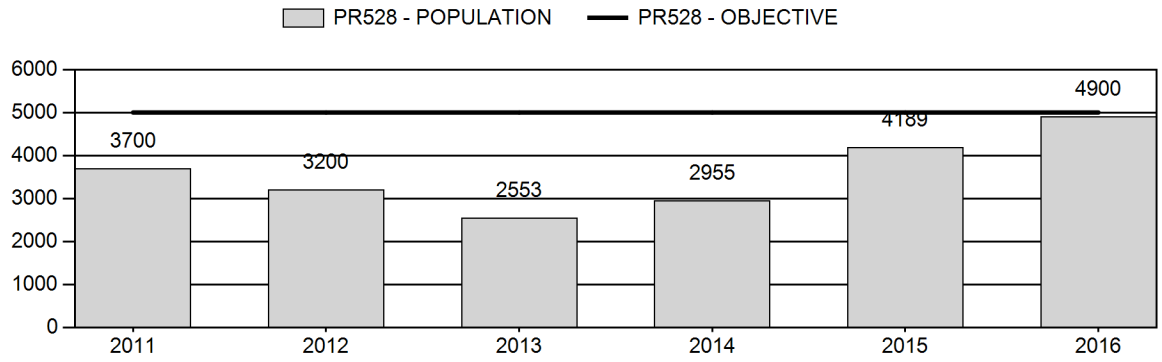
	2011 - 2015 Average	2016	2017 Proposed
Population:	3,319	4,900	4,500
Harvest:	644	282	360
Hunters:	712	309	400
Hunter Success:	90%	91%	90 %
Active Licenses:	757	320	410
Active License Success:	85%	88%	88 %
Recreation Days:	2,432	762	1,100
Days Per Animal:	3.8	2.7	3.1
Males per 100 Females	33	42	
Juveniles per 100 Females	55	48	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-2%
Number of years population has been + or - objective in recent trend:	8
Model Date:	02/16/2017

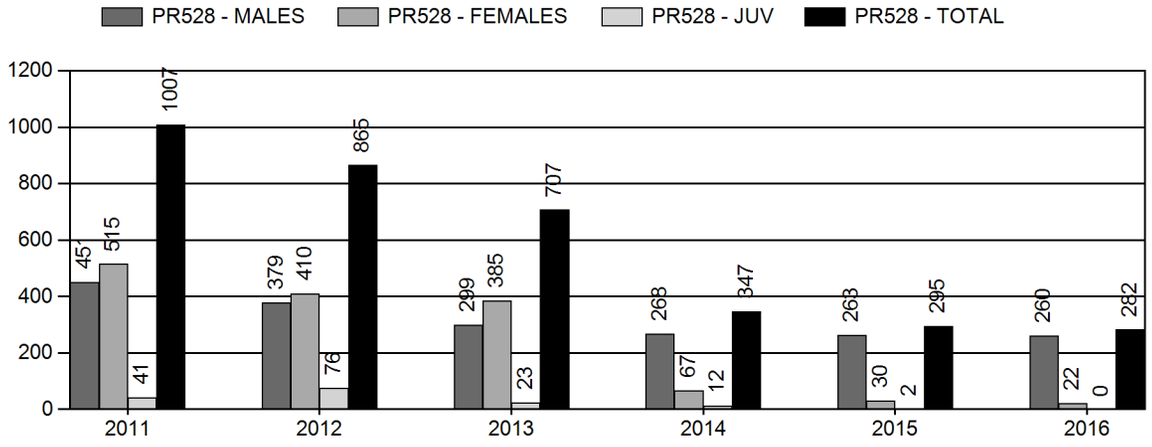
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	0.01%	0.01%
Males ≥ 1 year old:	42%	30%
Total:	-6%	-6%
Proposed change in post-season population:	7%	-5%

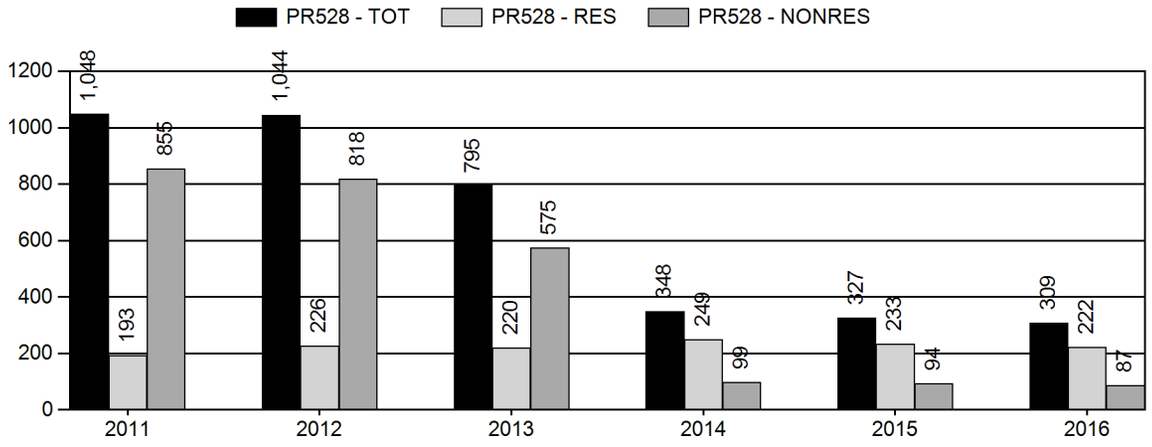
Population Size - Postseason



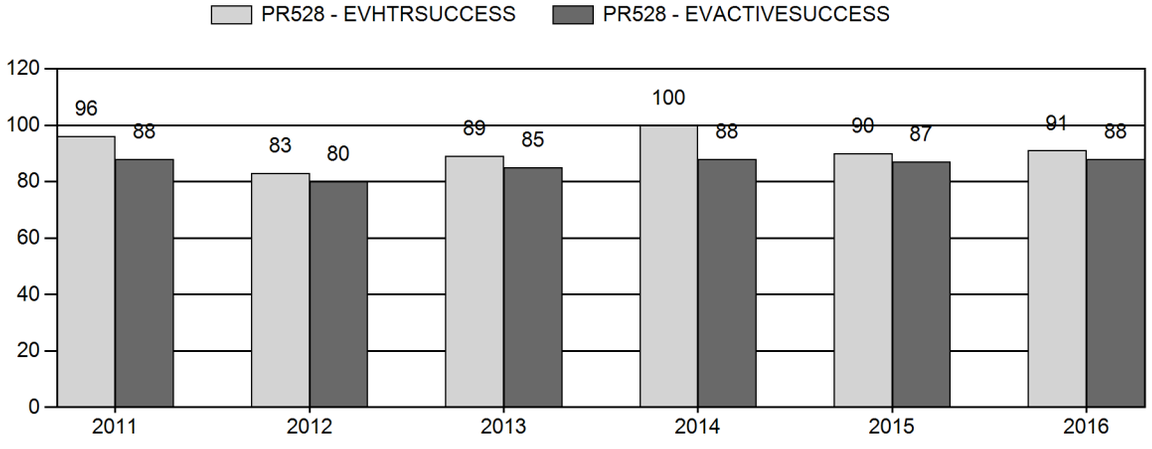
Harvest



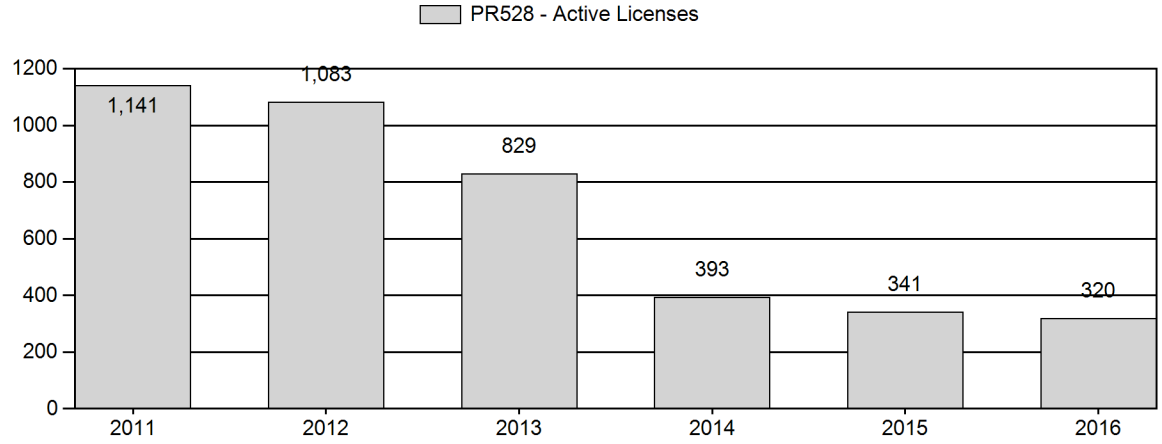
Number of Active Licenses



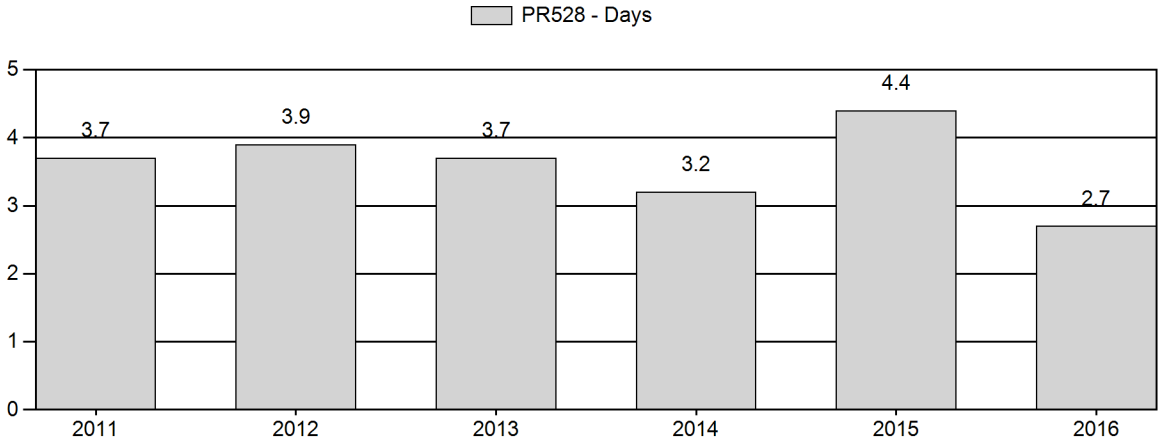
Harvest Success



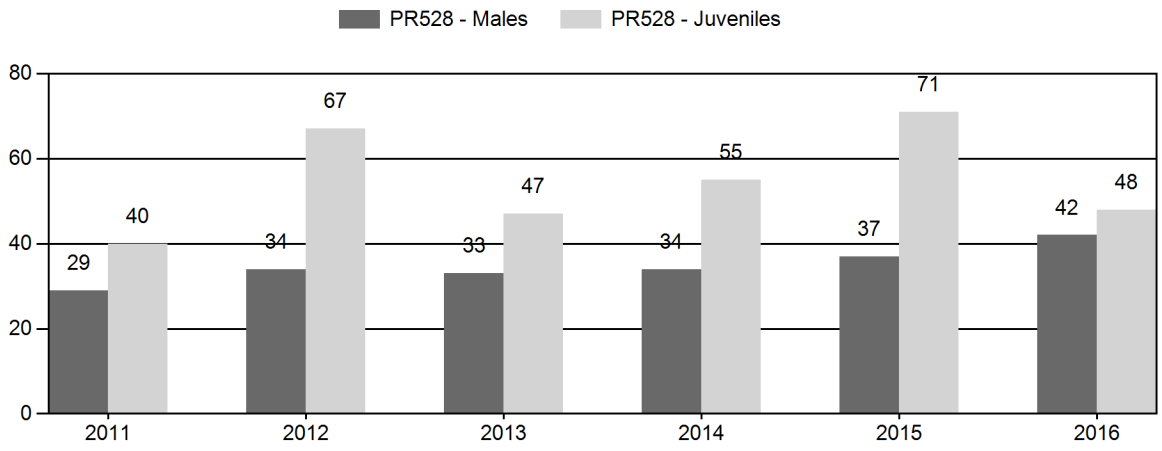
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,200	80	83	163	22%	391	53%	189	25%	743	1,459	20	21	42	± 6	48	± 7	34

2017 HUNTING SEASON RECOMMENDATIONS
ELK MOUNTAIN PRONGHORN (PR528)

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
50	1	Sep. 16	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 16	Oct. 31	150	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 2016
50	6	+125
Herd Unit Total	**6**	**+125**

Management Evaluation

Current Postseason Population Management Objective: 5,000 (4,000 – 6,000)
Management Strategy: Recreational
2016 Postseason Population Estimate: 4,900
2017 Proposed Postseason Population Estimate: 4,500
2016 Hunter Satisfaction: 87% Satisfied, 11% Neutral, 2% Dissatisfied

Pronghorn in the Elk Mountain herd unit are managed toward a postseason population 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 sagebrush habitat in this area.

Weather

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration's (NOAA) climatic Division 10 (Upper Platte), https://www.ncdc.noaa.gov/cag/ to illustrate weather conditions thus far, during bio-year 2016 (Figures 1 and 2). These figures also include data from January - May of bio-year 2015 to describe the weather conditions immediately preceding bio-year 2016. Monthly mean temperatures in bio-year 2016 were slightly warmer than the 50-year monthly means during some months but otherwise similar to the 50-year monthly means. Precipitation in April of 2016, primarily received in the form of very moist snow was 174% of the 50-year monthly mean. Following the wetter than average spring of bio-year of 2015, the summer of bio-year 2016 was drier than average. Otherwise, relatively favorable weather conditions were experienced in Division 10 throughout the remainder of bio-year 2016.

Figure 1. January 2016 - January 2017 mean monthly temperatures and 50-year monthly means for NOAA climatic Division 10, Wyoming.

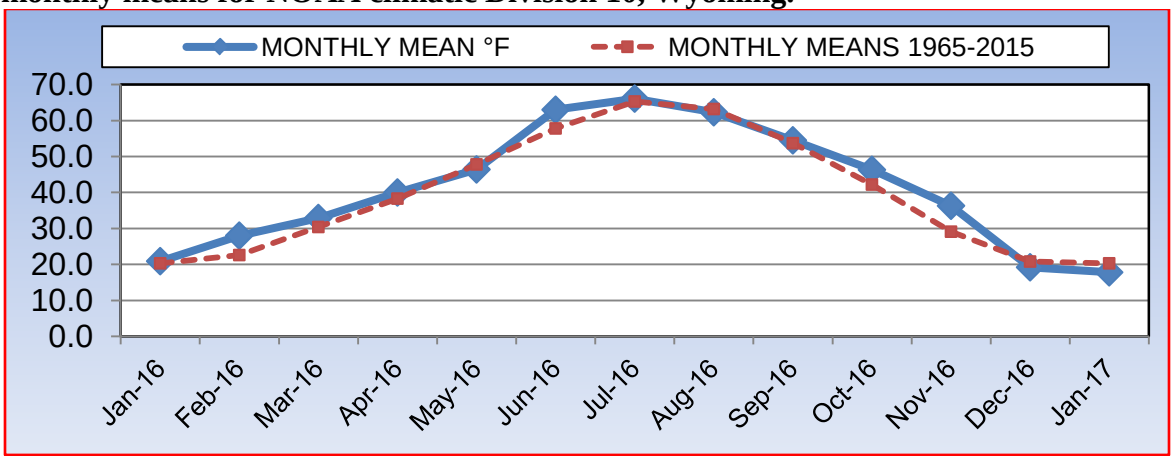
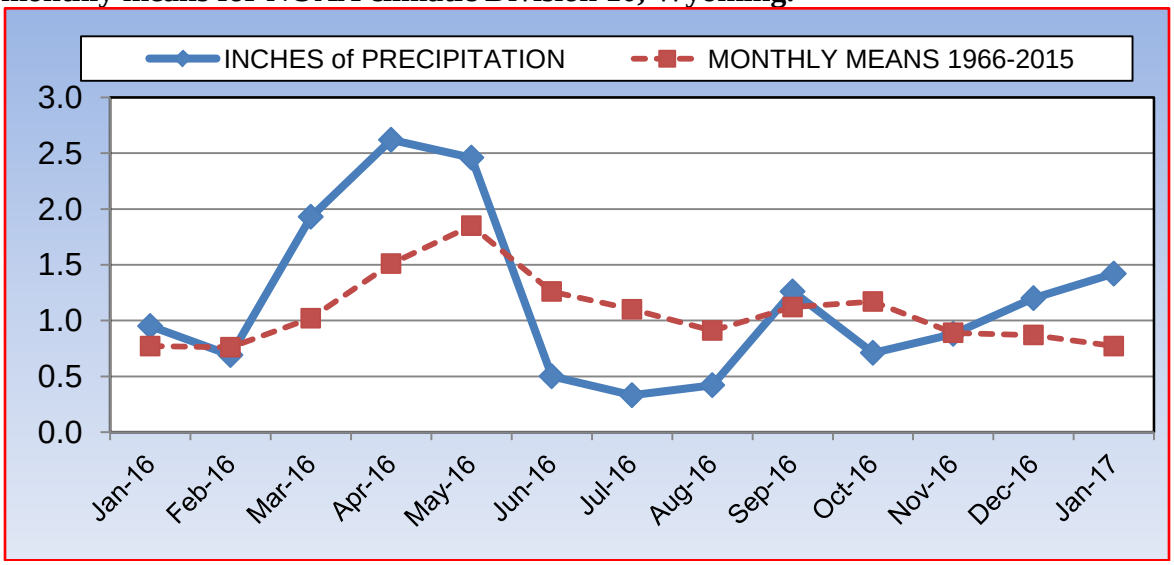


Figure 2. January 2016 - January 2017 mean monthly precipitation and 50-year monthly means for NOAA climatic Division 10, Wyoming.



Habitat

Positive trends in habitat conditions were observed in bio-year 2016 due to adequate amounts of late spring precipitation being 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. Most shrub-steppe habitat in this herd unit is decadent and in need of treatments designed to improve the nutritional value of sagebrush and other plants.

Field Data

Preseason ratios for this herd were 42 bucks and 48 fawns/100does in 2016. Buck ratios increased and fawn ratios decreased in comparison the 2015 classification. 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 2016 harvest survey indicated a total of 282 pronghorn were harvested which was a decrease of 4% from 2015. Overall harvest success increased 1% to 91% for 309 active licensed hunters in 2016. The days/pronghorn decreased from 4.4 in 2015, to 2.7 days/harvest in 2016. The increase in harvest success and decrease in days/harvest was attributed to the relatively cooler weather during the beginning of the season making hunting conditions more favorable.

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 2016. 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. We intend to conduct a line-transect survey in this herd unit in 2018. A portion of the Elk Mountain herd unit was used 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

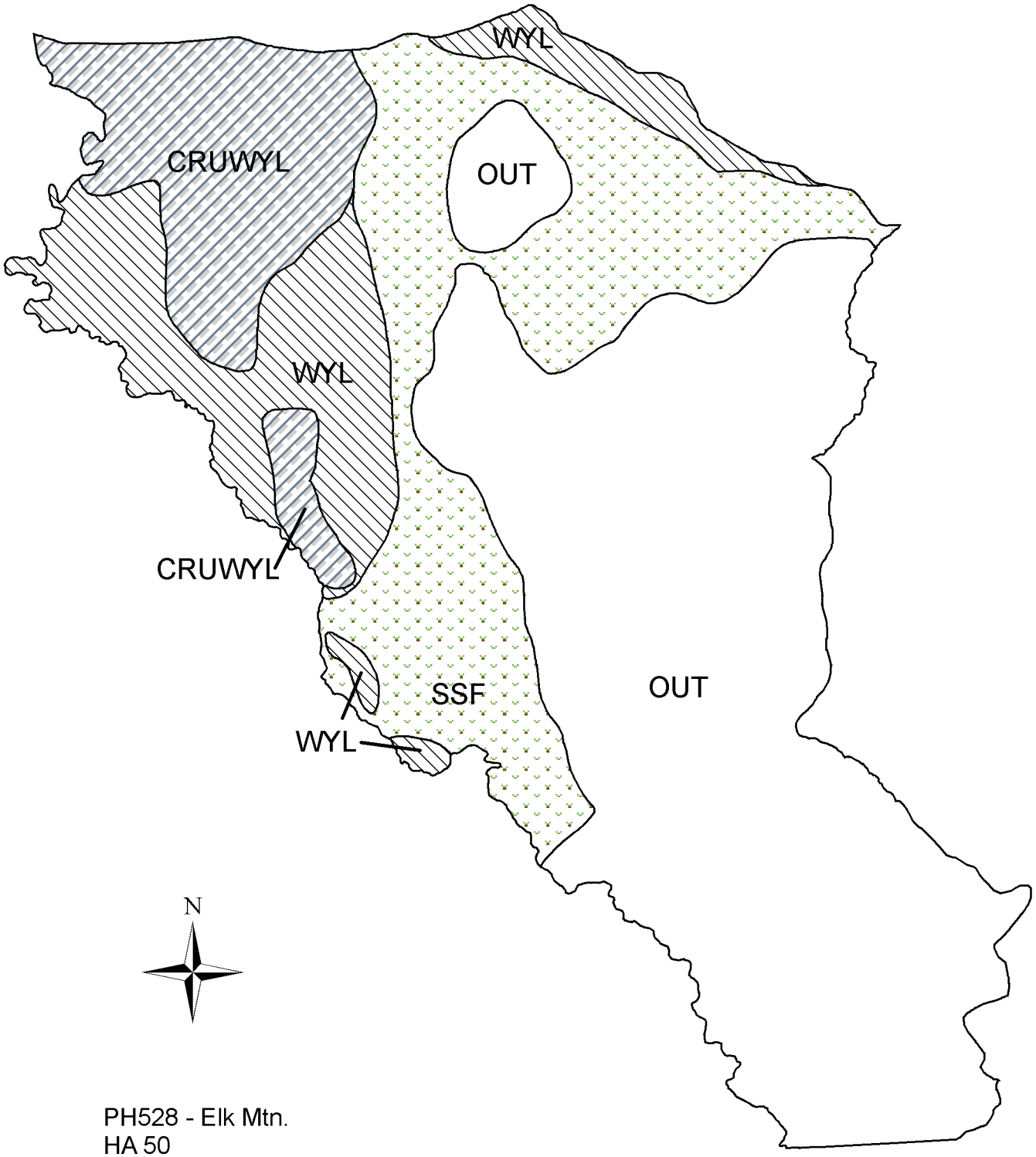
The Type 6 license numbers were increased to begin stabilizing this population as it appeared we have reached the management objective for this herd unit. The popular muzzleloader only season continued to be offered in 2017.

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

2016 - JCR Evaluation Form

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

HERD: PR529 - BIG CREEK

HUNT AREAS: 51
PREPARED BY: WILL SCHULTZ

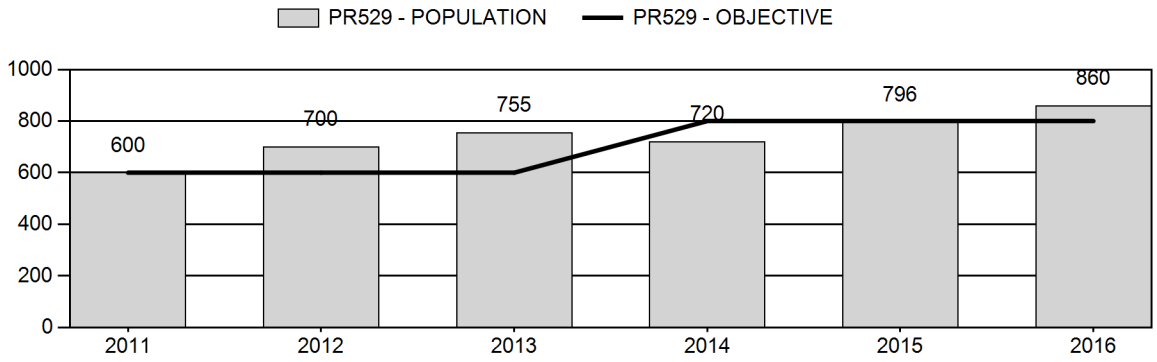
	2011 - 2015 Average	2016	2017 Proposed
Population:	714	860	700
Harvest:	56	80	180
Hunters:	54	79	180
Hunter Success:	104%	101%	100%
Active Licenses:	65	94	200
Active License Success:	86%	85%	90 %
Recreation Days:	201	242	600
Days Per Animal:	3.6	3.0	3.3
Males per 100 Females	50	59	
Juveniles per 100 Females	52	56	

Population Objective (± 20%) :	800 (640 - 960)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	8%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/16/2017

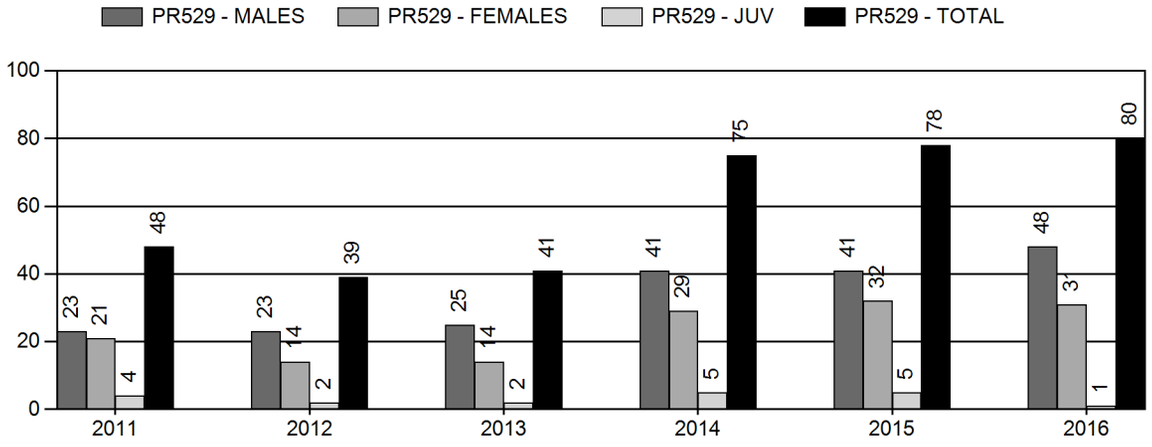
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	8%	8%
Males ≥ 1 year old:	23%	55%
Total:	11%	21%
Proposed change in post-season population:	2%	-21%

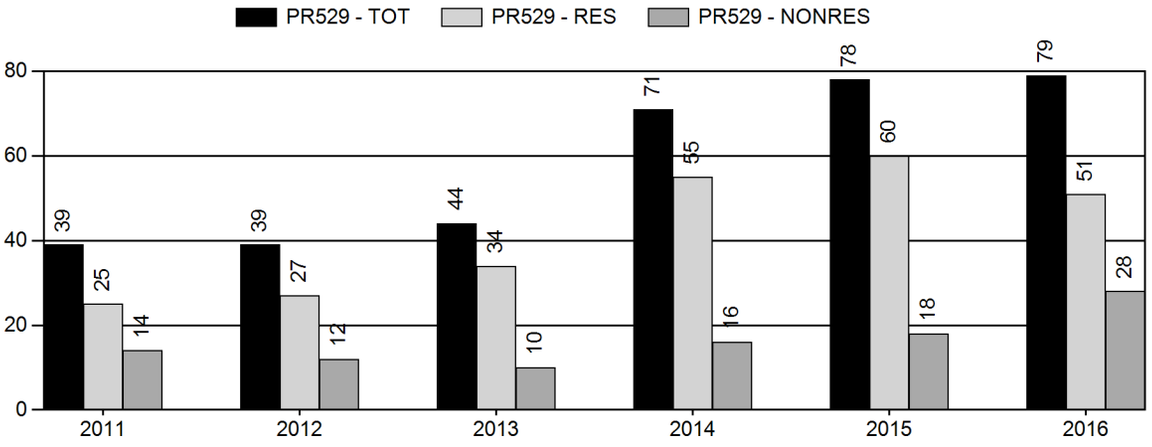
Population Size - Postseason



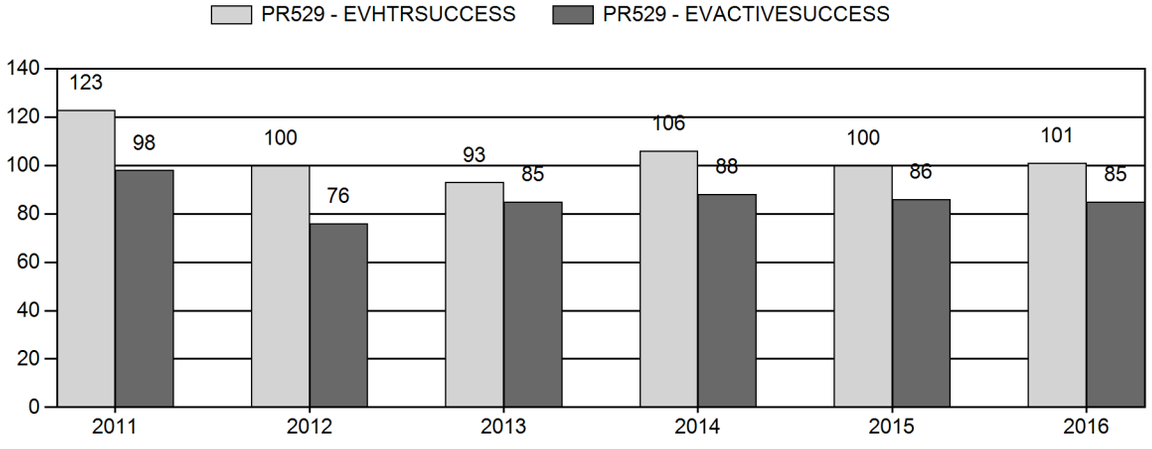
Harvest



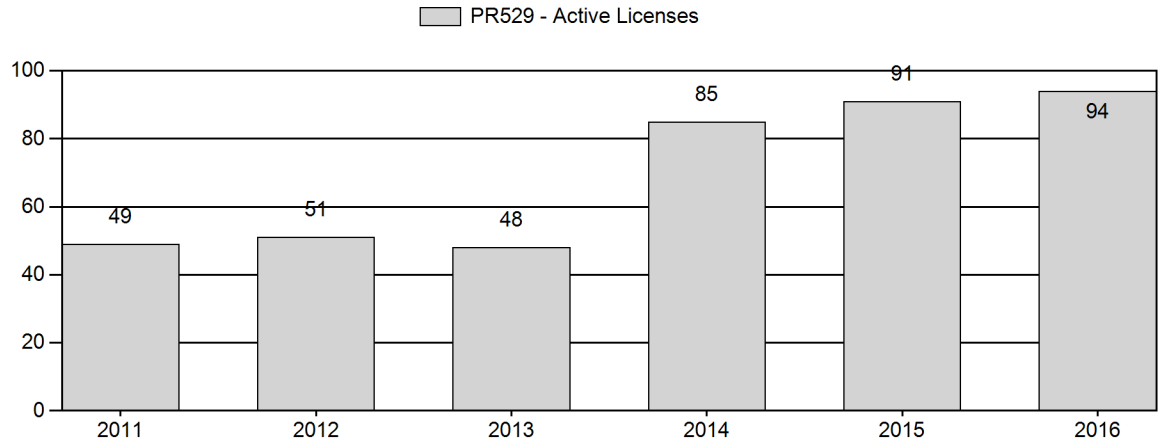
Number of Active Licenses



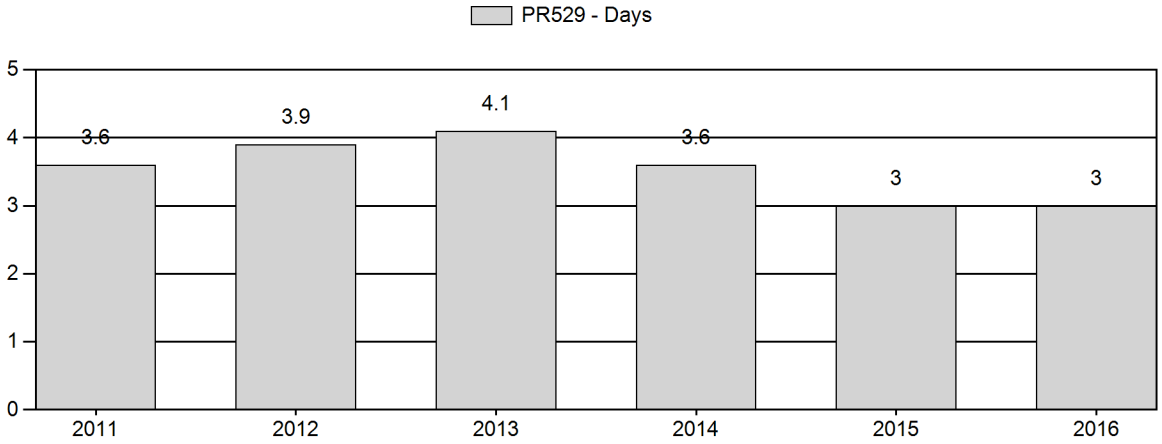
Harvest Success



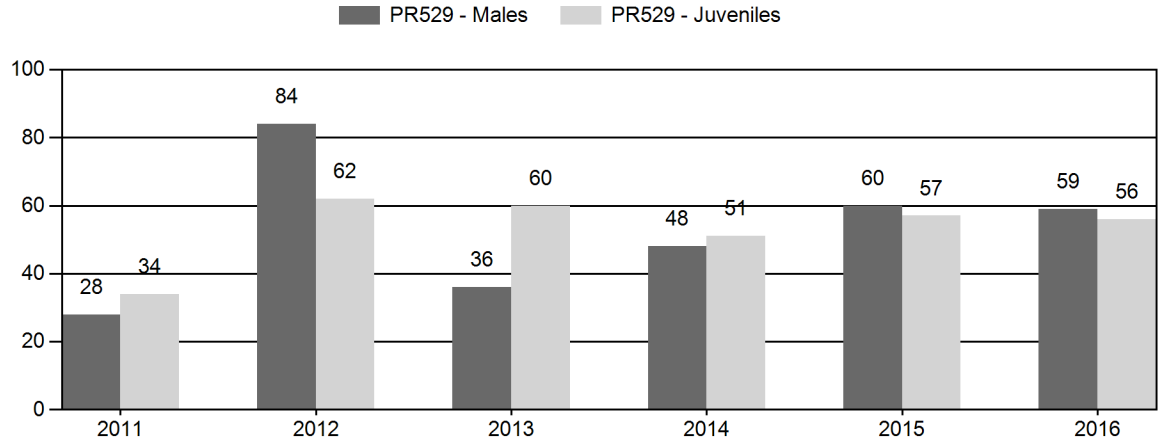
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2011 - 2016 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	950	61	123	184	27%	311	46%	175	26%	670	657	20	40	59	± 5	56	± 5	35

2017 HUNTING SEASON RECOMMENDATIONS
BIG CREEK PRONGHORN (PR529)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
51	1	Sep. 16	Nov. 14	75	Limited quota	Any antelope
	6	Aug. 15	Sep. 15	150	Limited quota	Doe or fawn valid on private land
	6	Sep. 16	Nov. 14		Limited quota	Doe or fawn valid in the entire area

Hunt Area	License Type	Quota change from 2016
51	1	+25
51	6	+100
Herd Unit Total	**1**	**+25**
	6	**+100**

Management Evaluation
Current Postseason Population Management Objective: 800 (640 – 960)
Management Strategy: Recreational
2016 Postseason Population Estimate: 860
2017 Proposed Postseason Population Estimate: 700
2016 Hunter Satisfaction: 89% Satisfied, 11% Neutral, 0% 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 unit is managed as a recreational management strategy herd unit. 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 can be an issue when pronghorn numbers are high. 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. Rural residential development of sagebrush habitat in the Trail Run subdivision continues.

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

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration's (NOAA) climatic Division 10 (Upper Platte), https://www.ncdc.noaa.gov/cag/ to illustrate weather conditions thus far, during bio-year 2016 (Figures 1 and 2). These figures also include data from January - May of bio-year 2015 to describe the weather conditions immediately preceding bio-year 2016. Monthly mean temperatures in bio-year 2016 were slightly warmer than the 50-year monthly means during some months but otherwise similar to the 50-year monthly means. Precipitation in April of 2016, primarily received in the form of very moist snow was 174% of the 50-year monthly mean. Following the wetter than average spring of bio-year of 2015, the summer of bio-year 2016 was drier than average. A period of increased snowfall and severe temperatures was experienced during January of 2017, followed by above average temperatures and drier conditions in February. This provided relief for pronghorn as much of their winter range melted off. Otherwise, relatively favorable weather conditions were experienced in Division 10 throughout the remainder of bio-year 2016.

Figure 1. January 2016 - January 2017 mean monthly temperatures and 50-year monthly means for NOAA climatic Division 10, Wyoming.

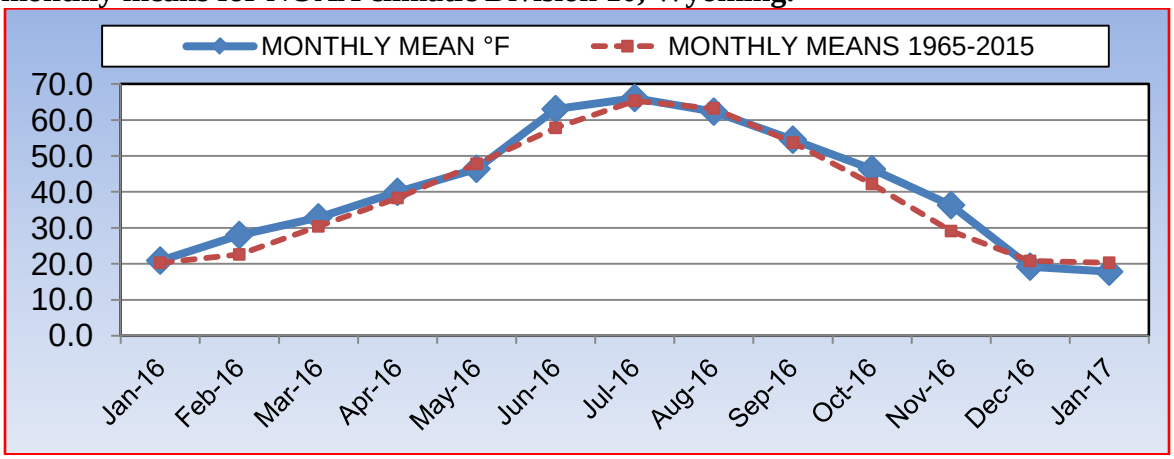
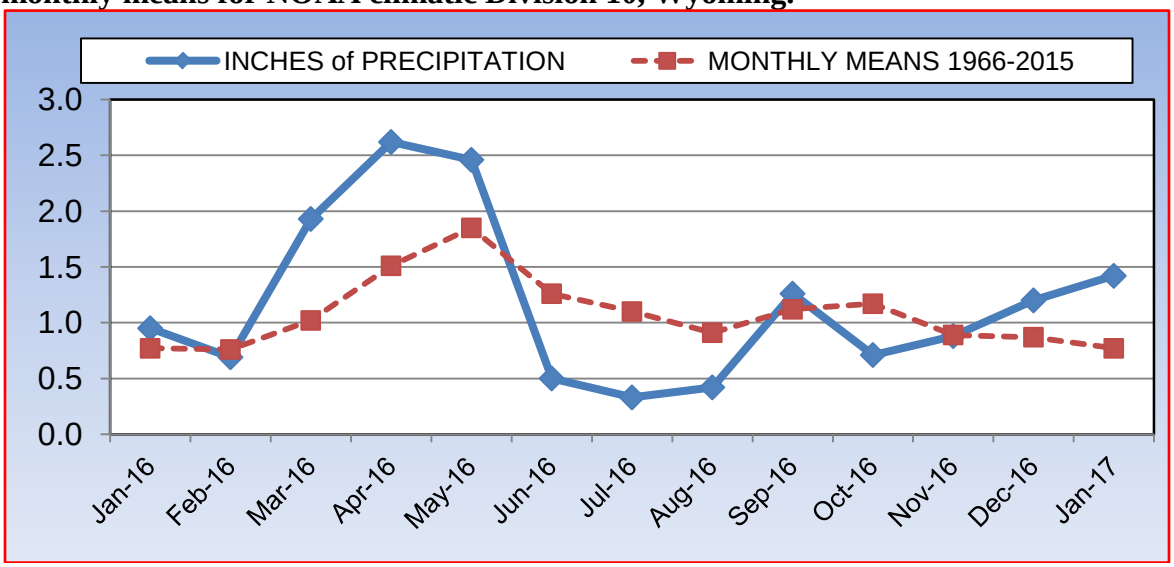


Figure 2. January 2016 - January 2017 mean monthly precipitation and 50-year monthly means for NOAA climatic Division 10, Wyoming.



Habitat

Positive trends in habitat conditions were observed in bio-year 2016 due to adequate amounts of late spring precipitation being 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. Most shrub-steppe habitat in this herd unit is decadent and in need of treatments designed to improve the nutritional value of shrubs and other vegetation.

Field Data

The 2016 preseason ratios were 59 bucks and 56 fawns per 100 does produced from an adequate sample of 670 pronghorn obtained through ground surveys. 2016 fawn ratios had decreased from 57 fawns/100 does in 2015, to 56 fawns/100 does in 2016. This decrease was attributed to the stressful spring weather does experienced during the latter stage of pregnancy.

Harvest Data

The harvest survey data for the 2016 hunting season indicated a total of 80 pronghorn; 48 bucks, 31 does, and 1 fawn were harvested with an overall harvest success rate of 101%. 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 2016, 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 previous 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 past preseason classification surveys and the likely violation of an assumption that this is a closed population. Interstate movement of pronghorn complicates monitoring and subsequent management activities in this herd unit.

Management Summary

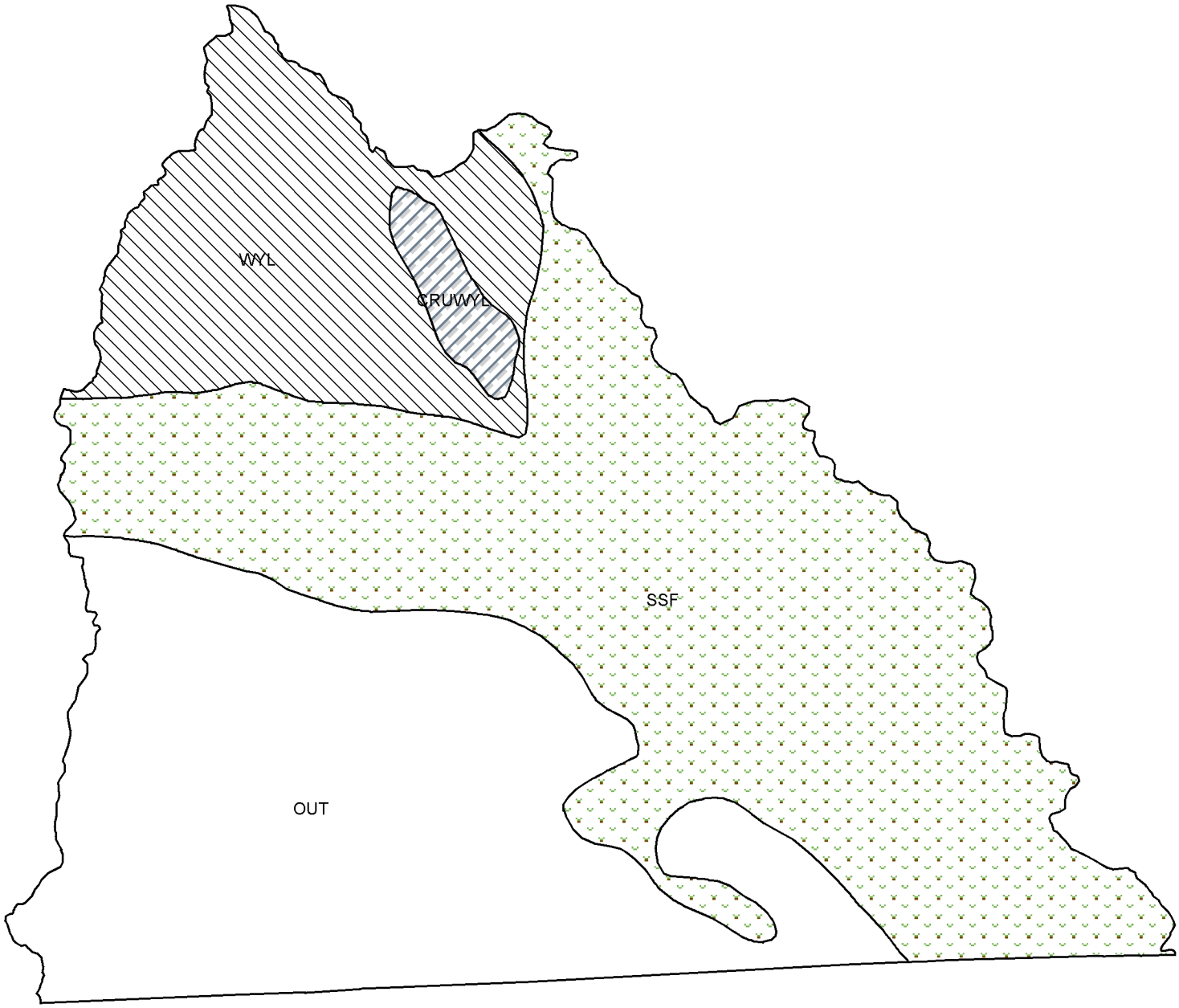
Both Type 1 and Type 6 licenses were increased to 100 each to stabilize this herd at, or slightly below, the population objective in 2017. Landowner comments indicate pronghorn numbers have reached their level of tolerance also.

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