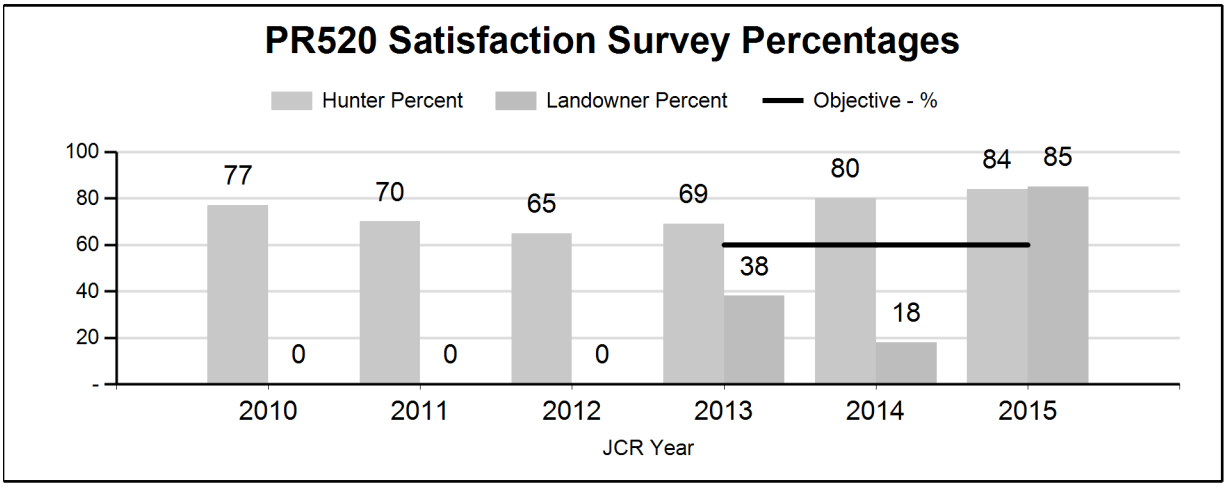
2015 - JCR Evaluation Form

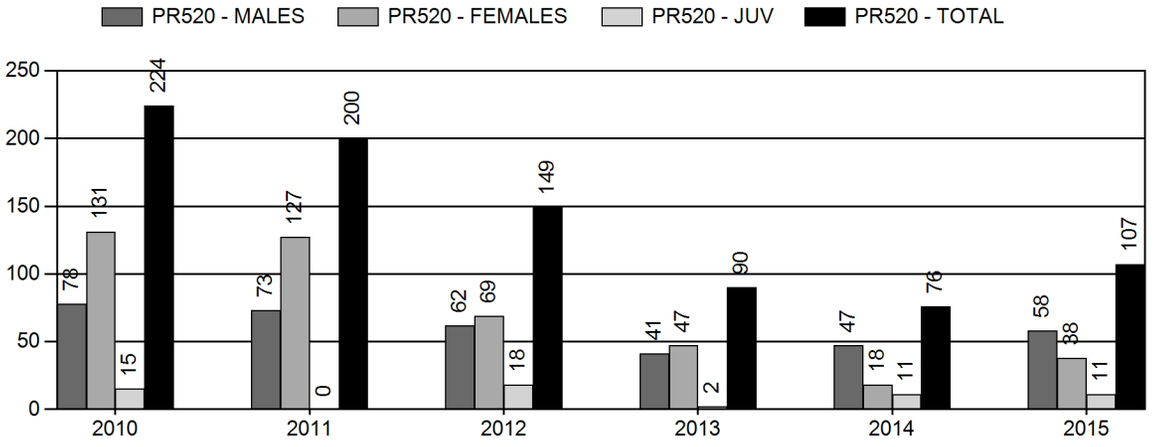
SPECIES: Pronghorn
PERIOD: 6/1/2015 - 5/31/2016
HERD: PR520 - CHALK BLUFFS
HUNT AREAS: 111
PREPARED BY: MARTIN HICKS

	2010 - 2014 Average	2015	2016 Proposed
Hunter Satisfaction Percent	72%	84%	85%
Landowner Satisfaction Percent	29%	85%	85%
Harvest:	148	107	100
Hunters:	207	109	100
Hunter Success:	71%	98%	100%
Active Licenses:	238	139	140
Active License Success:	62%	77%	71%
Recreation Days:	994	582	580
Days Per Animal:	6.7	5.4	5.8
Males per 100 Females:	22	17	
Juveniles per 100 Females	42	49	

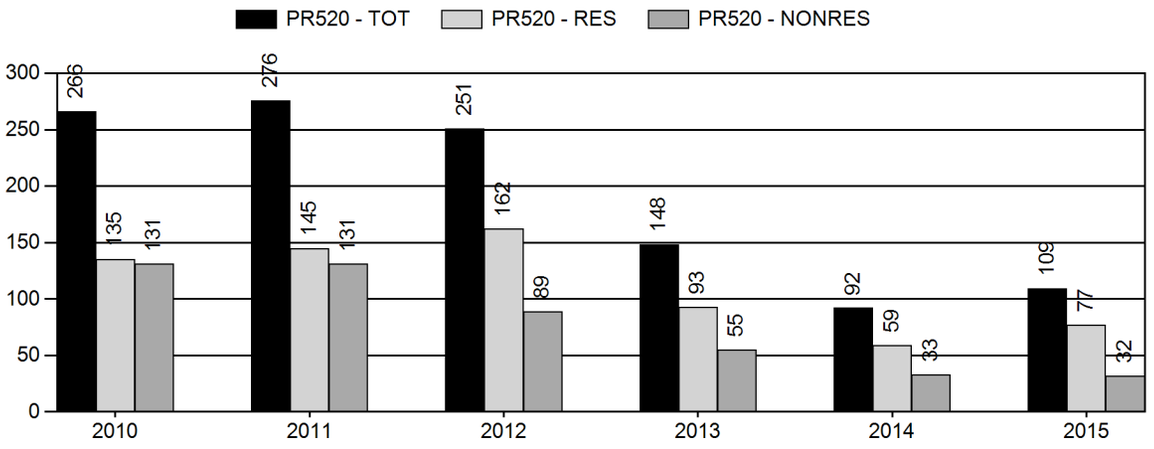
Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	24%
Number of years population has been + or - objective in recent trend:	2



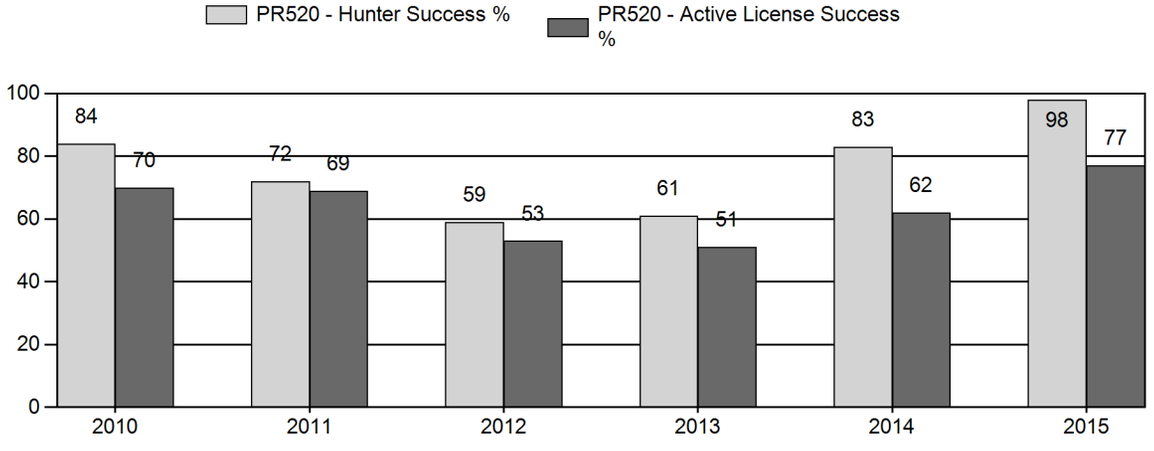
Harvest



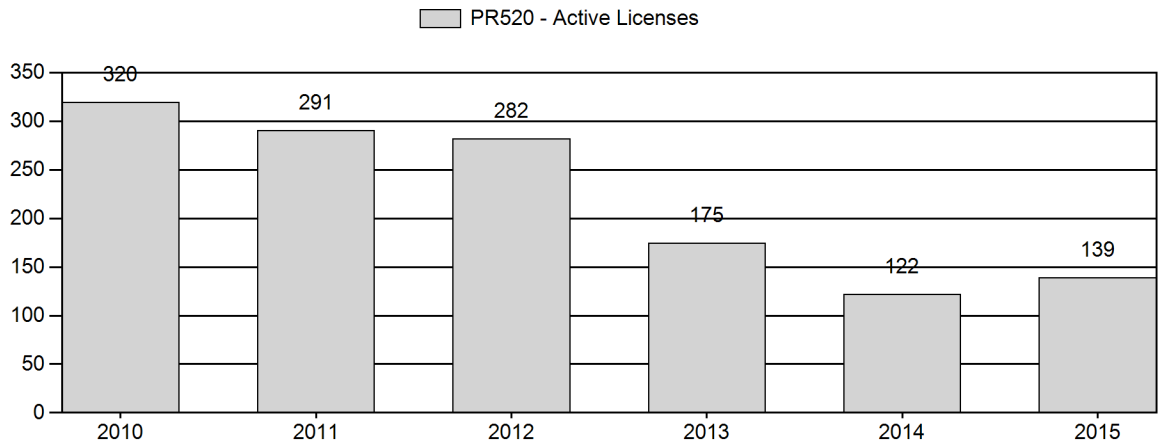
Number of Hunters



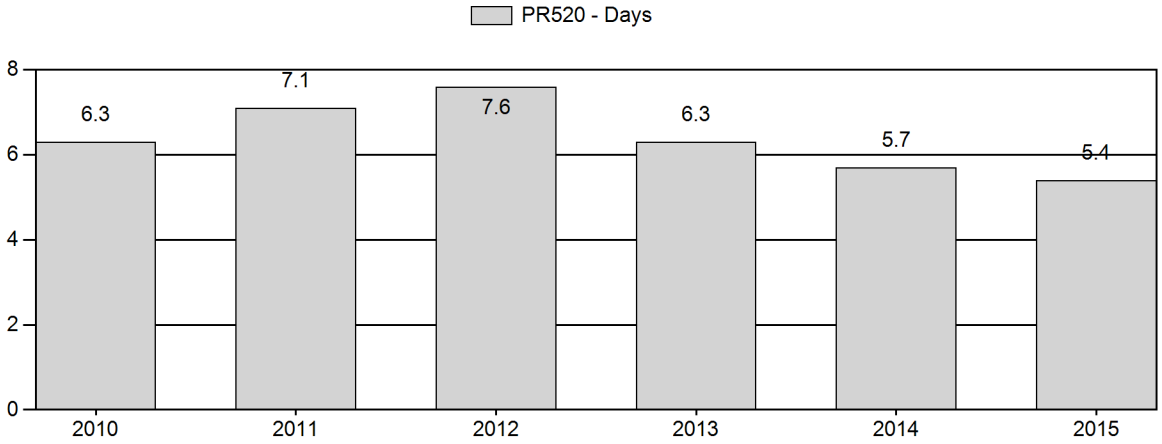
Harvest Success



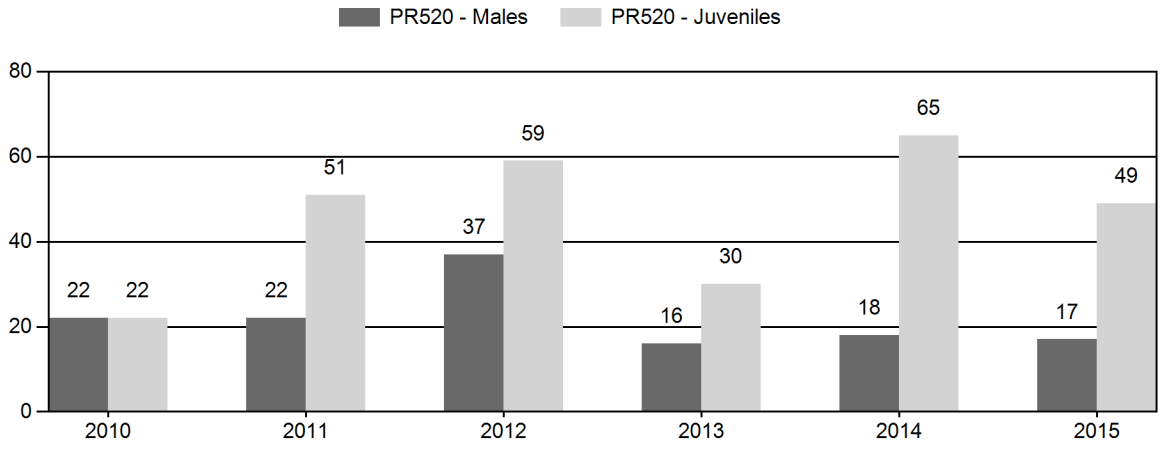
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2016 HUNTING SEASONS
CHALK BLUFFS PRONGHORN HERD (520)

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

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

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

Management Evaluation
Current Hunter/Landowner Satisfaction Management Objective: Landowner and hunter satisfaction; Target goal ≥ 60%
Management Strategy: Private Land
2015 Hunter Satisfaction: 84% Satisfied, 7% Neutral, 9% Dissatisfied
2015 Landowner Satisfaction Estimate: 85% (44% response)
Most Recent 3-year Running Average Hunter Satisfaction Estimate: 77%
Most Recent 3-year Running Average Landowner Satisfaction Estimate: 47%

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

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

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

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

Weather

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

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant specie.
The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species.

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

Field and Harvest Data

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

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

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

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

Management Summary

The opening date will remain the same at September 20 with no change in Type 1 and Type 6 license numbers. Landowners are still in favor of the late season hunt from November 15 – December 31 to address any damage concerns. Based on past seasons we predict a harvest of 50 bucks, 20 does and10 fawns for a total of 80 pronghorn.

Appendix A

PH520 Landowner Satisfaction Survey

Please indicate your satisfaction level with the current pronghorn population:

15.4%84.6%

1-Above Desired Levels 0

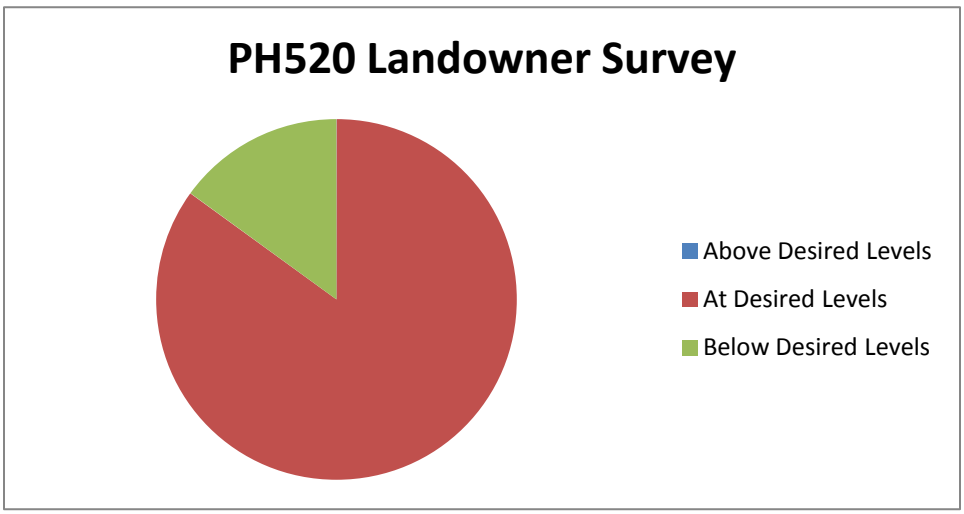
2- At or About at Desired Levels 11

3- Below Desired Levels 2

1-Above Desired Levels 0%

2- At or About at Desired Levels 85%

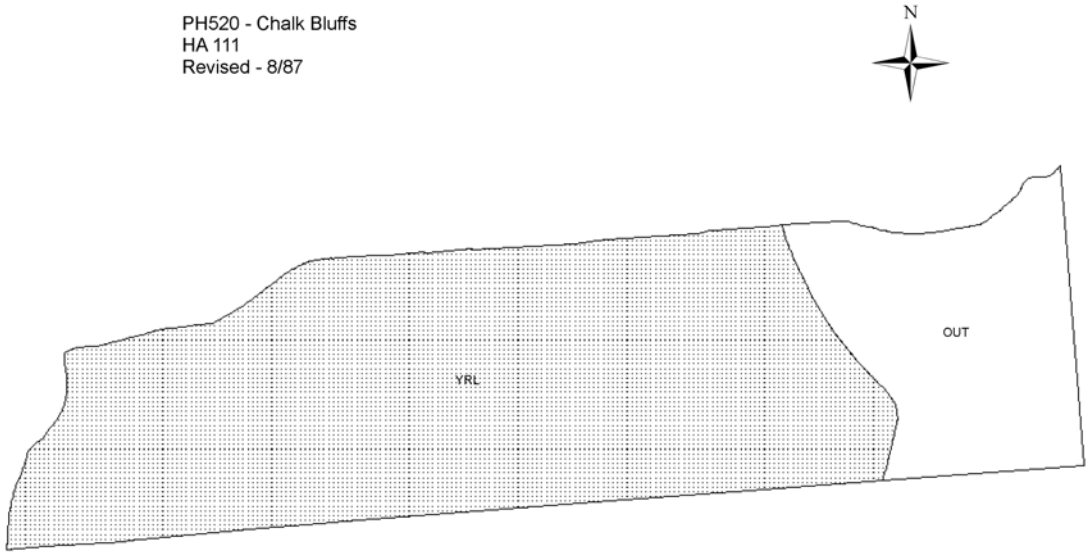
3- Below Desired Levels 15%



Additional Comments

Last 2 years oil pipeline put on ranch no pronghorn population. Since 2010 yr, oil mule and all of their trucks-no pronghorn population on ranch. Can not answer survey till activity dies down!!
The only problem we have people come out just before sun down and want to get out and hunt. also they are not hunters they are shooters.
Oil and gas operations have really moved the population. THought the antelope would get use to the traffic-noise-fearing-but NOT
This doesn't really concern me I don't hunt and I don't live over there.-Janet
would like to see the herd have a 50% increase over the next few years.
Close to desired-maybe a little below
used to see quite a few. now hardly see any

PH520 - Chalk Bluffs
HA 111
Revised - 8/87



2015 - JCR Evaluation Form

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

HERD: PR521 - HAWK SPRINGS

HUNT AREAS: 34
PREPARED BY: MARTIN HICKS

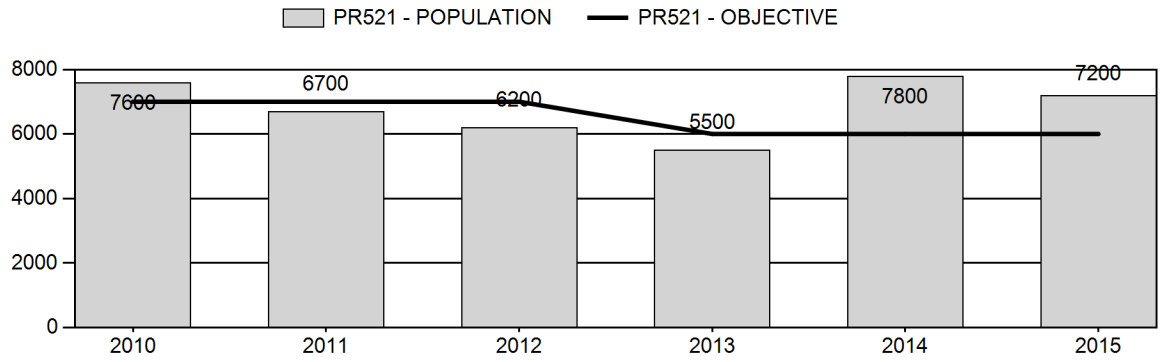
	2010 - 2014 Average	2015	2016 Proposed
Population:	6,760	7,200	6,400
Harvest:	1,098	1,320	1,520
Hunters:	1,208	1,469	1,775
Hunter Success:	91%	90%	86%
Active Licenses:	1,387	1,487	1,785
Active License Success:	79%	89%	85 %
Recreation Days:	4,888	4,039	5,000
Days Per Animal:	4.5	3.1	3.3
Males per 100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

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

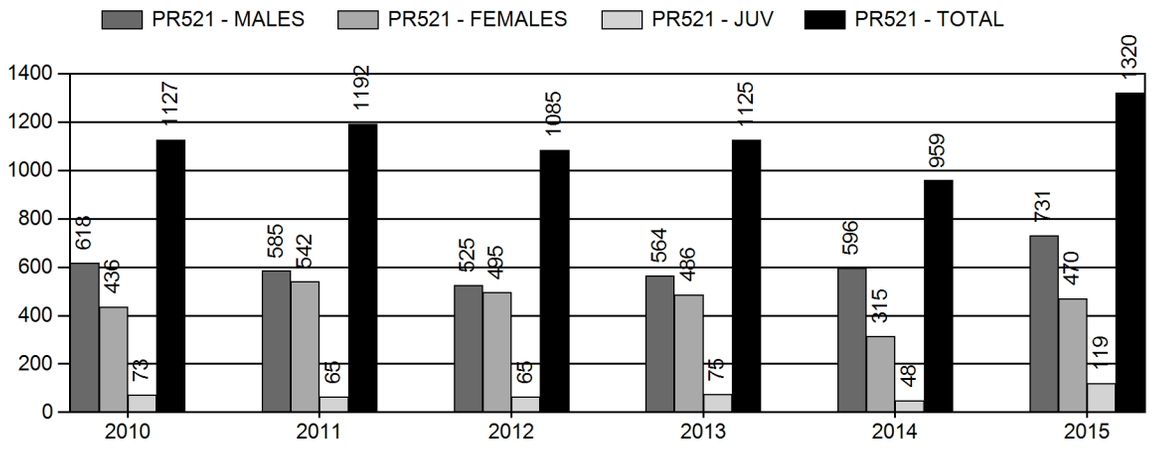
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

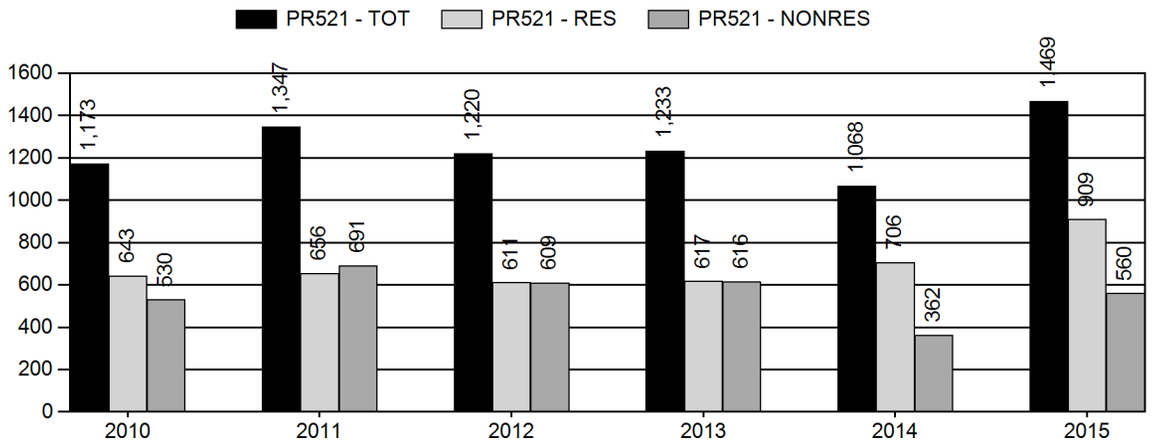
Population Size - Postseason



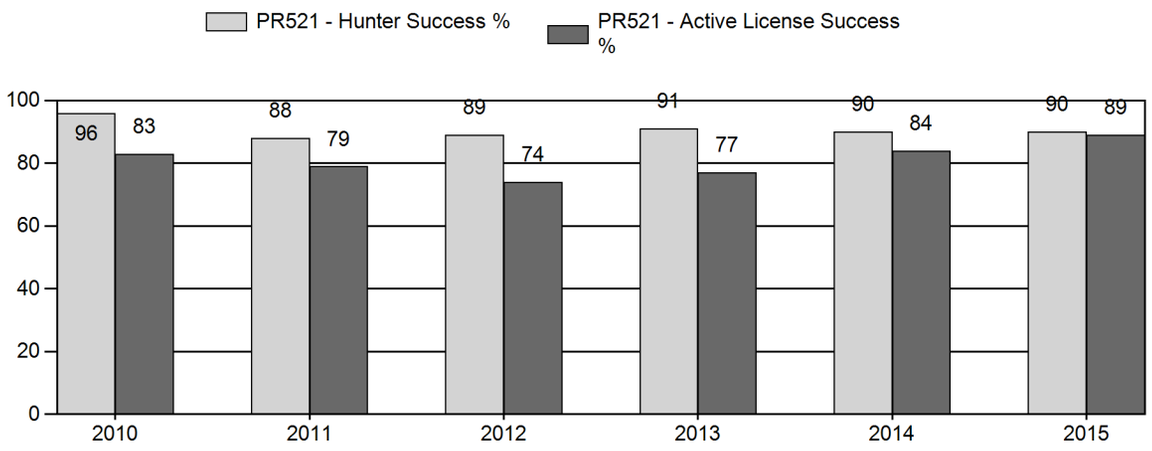
Harvest



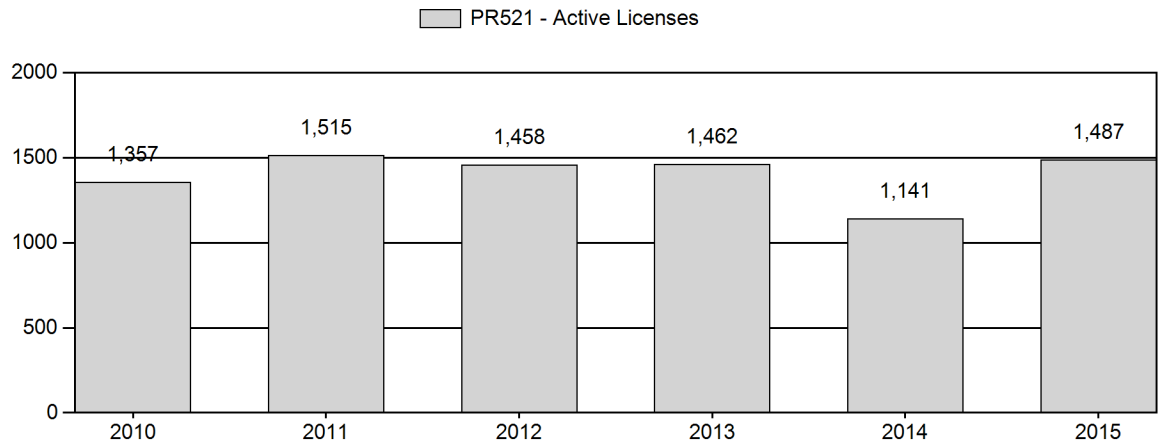
Number of Hunters



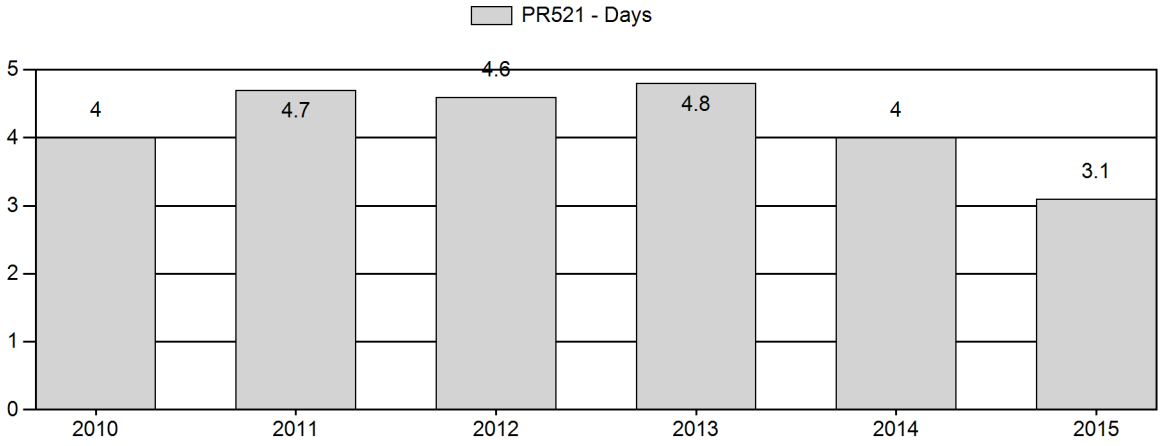
Harvest Success



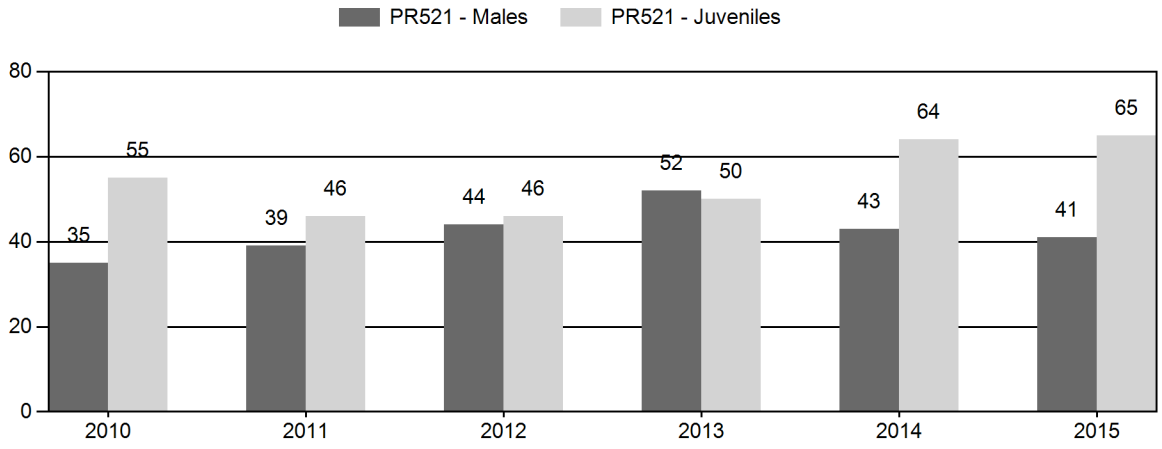
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR521 - HAWK SPRINGS

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

2016 HUNTING SEASON
HAWK SPRINGS PRONGHORN HERD (PR521)

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

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

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

Management Evaluation
Current Management Objective: 6,000 (4,800-7,200)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~7,200
2016 Proposed Postseason Population Estimate: ~6,400
2015 Hunter Satisfaction: 87% satisfied, 9% Neutral, 4% Dissatisfied

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

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

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

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

Weather

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

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant specie. This herd unit is comprised of a mix of native rangelands, CRP, dryland and irrigated croplands.

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

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

In Summer 2015, population biologists and habitat managers began working together to modify habitat monitoring techniques utilized statewide and to improve overall consistency among the

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

Field Data

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

Harvest Data

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

Population

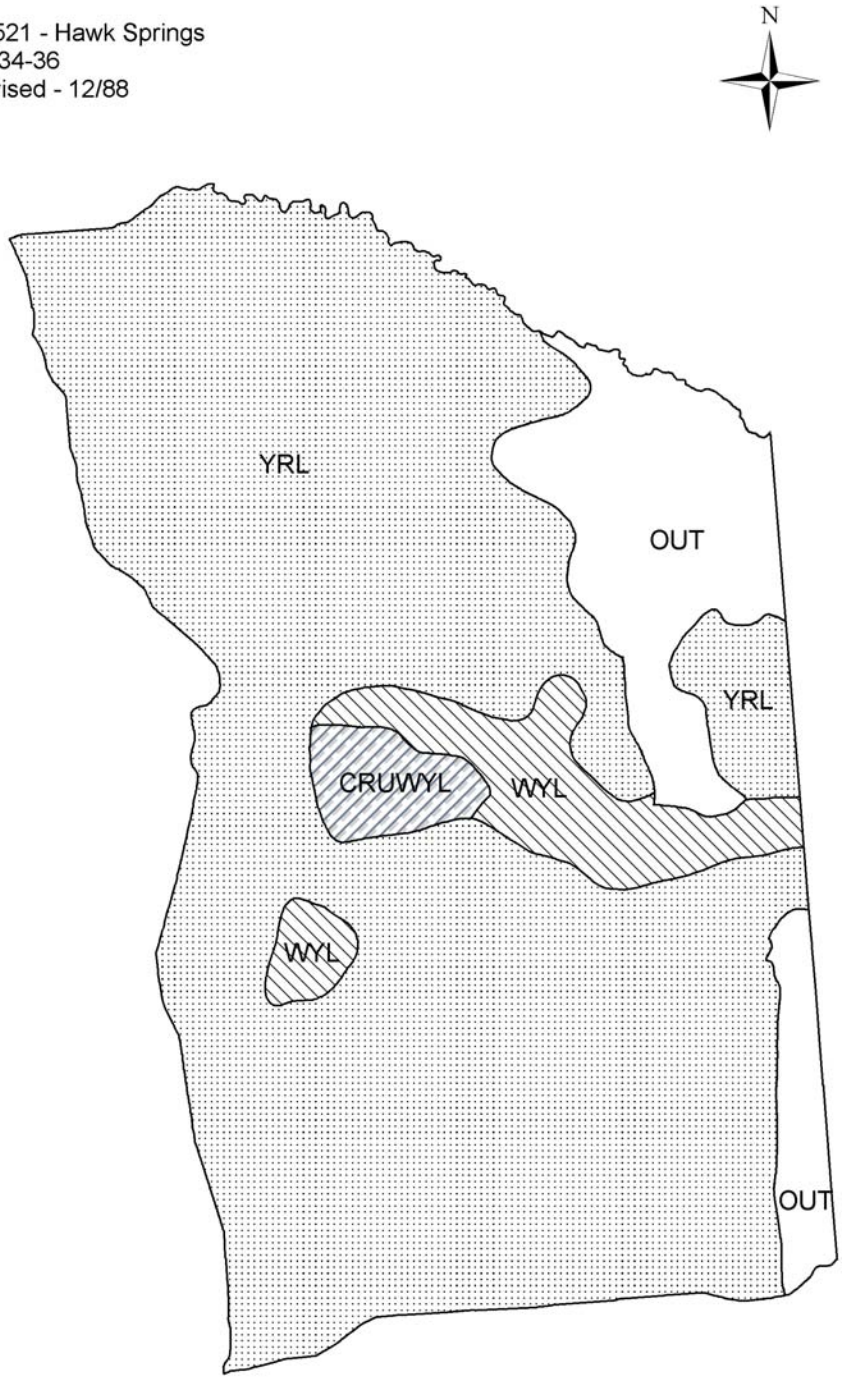
The "Constant Juvenile – Constant Adult Survival" (CJ,CA) spreadsheet model was chosen for the post season population estimate of this herd. The model did have the lowest AIC score, and the population estimate appears reasonable. The line-transect in 2007 was ignored because it doubled the population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

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

Management Summary

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

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



2015 - JCR Evaluation Form

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

HERD: PR522 - MEADOWDALE

HUNT AREAS: 11
PREPARED BY: MARTIN HICKS

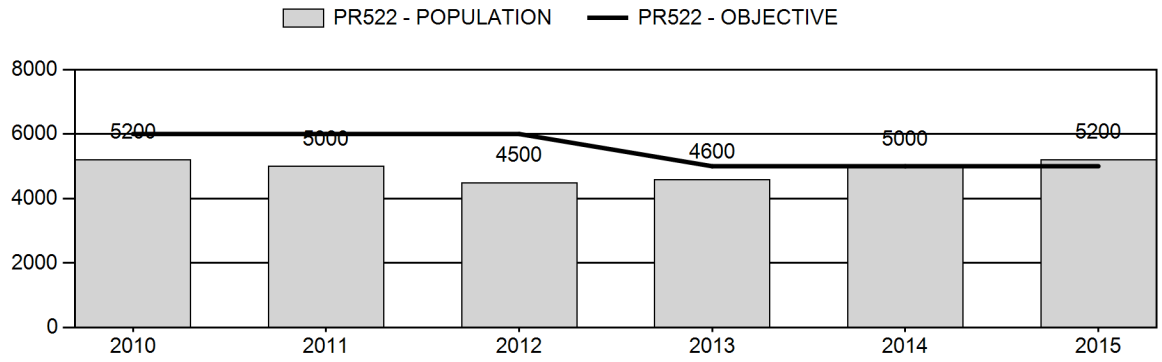
	2010 - 2014 Average	2015	2016 Proposed
Population:	4,860	5,200	5,500
Harvest:	509	447	470
Hunters:	564	479	480
Hunter Success:	90%	93%	98%
Active Licenses:	634	535	535
Active License Success:	80%	84%	88%
Recreation Days:	1,841	1,458	1,500
Days Per Animal:	3.6	3.3	3.2
Males per 100 Females	36	46	
Juveniles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

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

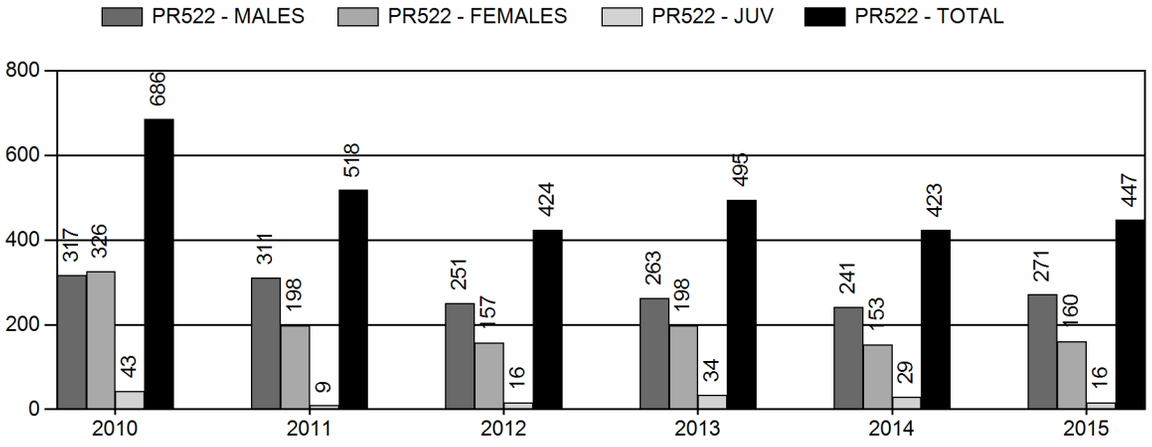
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

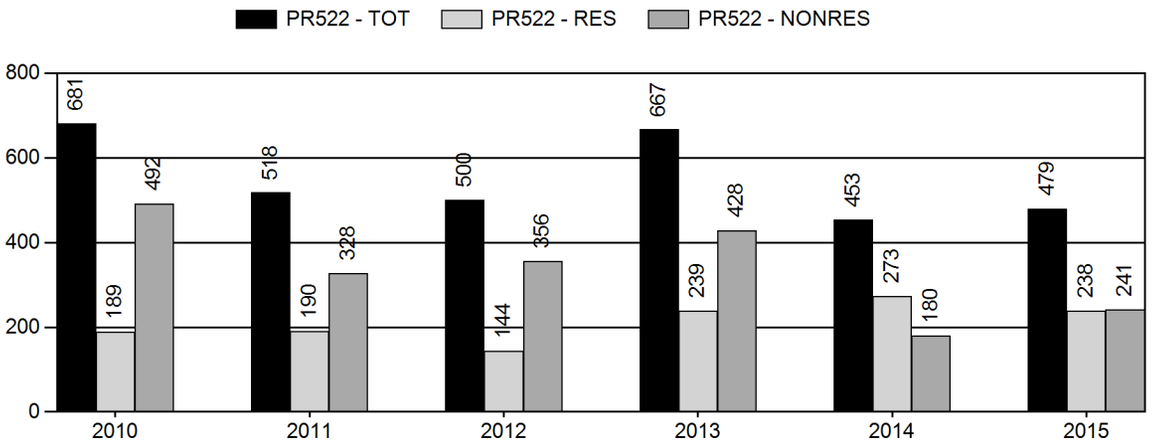
Population Size - Postseason



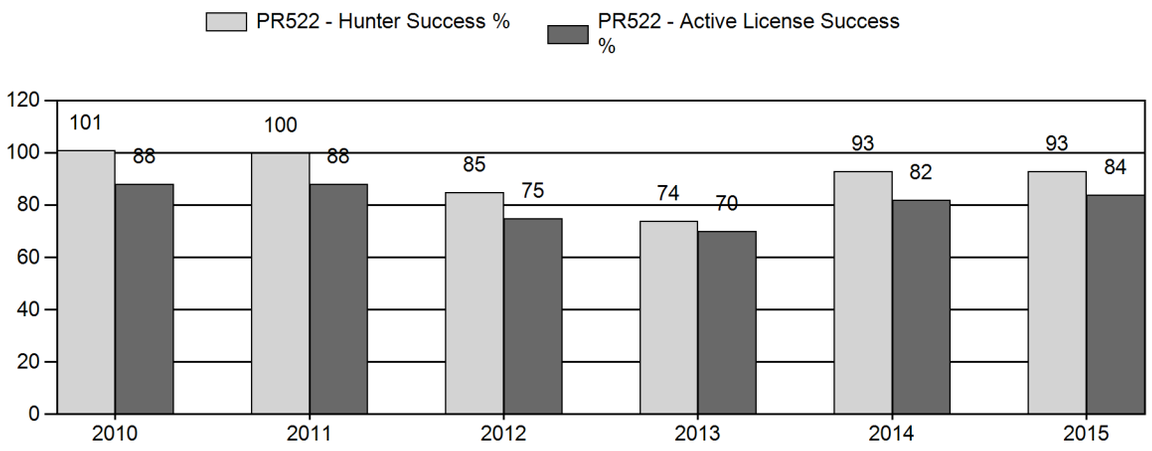
Harvest



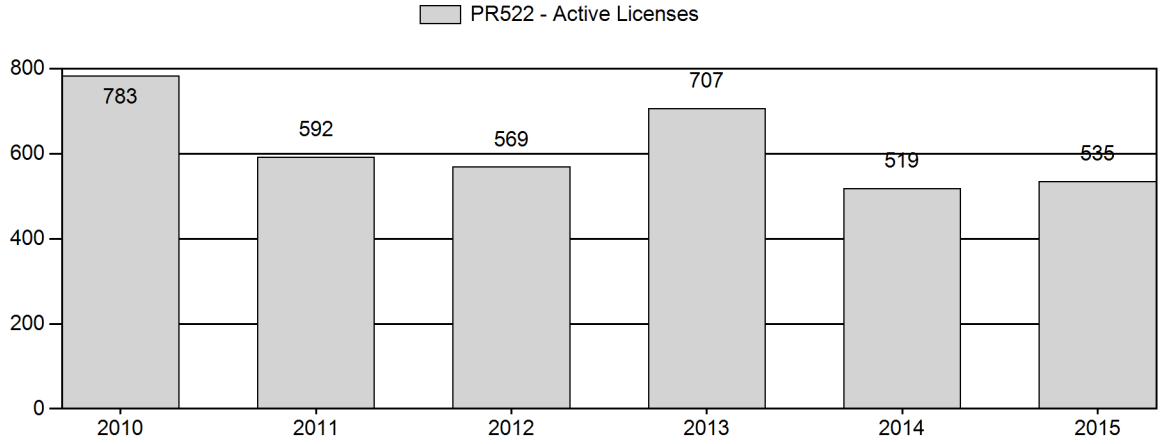
Number of Hunters



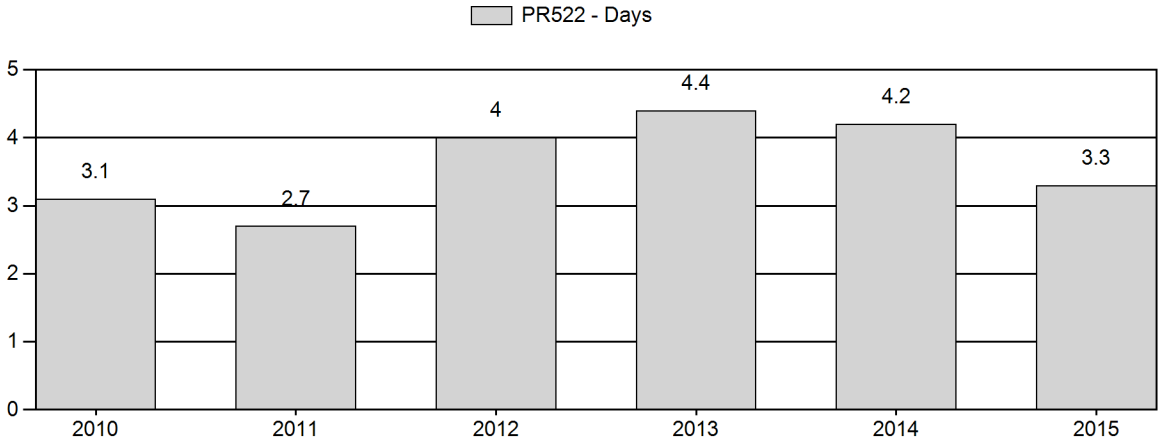
Harvest Success



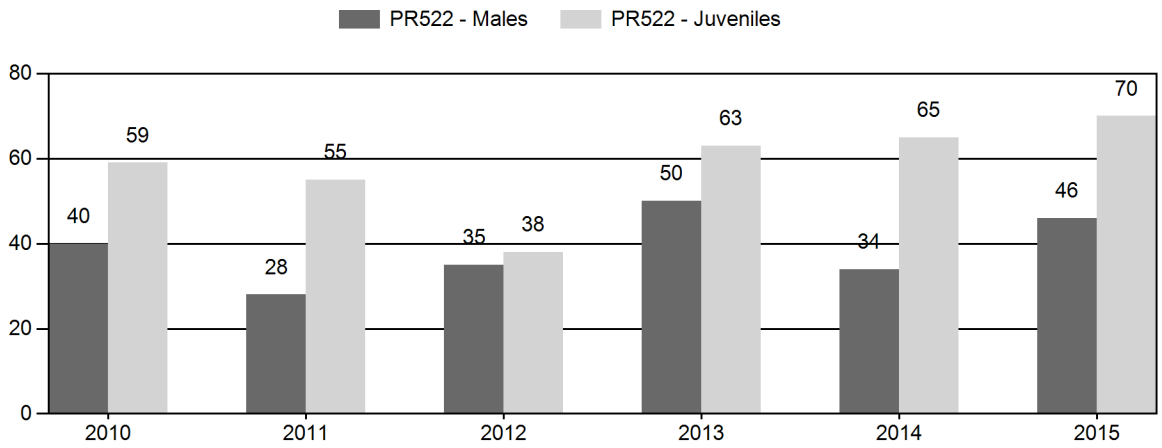
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR522 - MEADOWDALE

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

2016 HUNTING SEASONS
MEADOWDALE PRONGHORN HERD (PR522)

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

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

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

Management Evaluation
Current Management Objective: 5,000 (4,000-6,000)
Management Strategy: Recreational
2015 Post-season Population Estimate: ~5,200
2016 Proposed Post-season Population Estimate: ~5,500
2015 Hunter Satisfaction: 87% Satisfied, 11% Neutral, 2% Dissatisfied

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

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

Weather
Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were above average at all elevations throughout southeast Wyoming. No significant prolonged periods of extreme heat or cold temperatures were observed, or extreme or prolonged periods of snow loading in lower elevation winter ranges. Timing of precipitation and amounts received

during key growth periods for cool season grasses and preferred transitional range and winter range shrub species was excellent. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Weather patterns most likely had a positive influence on all big game species. For specific meteorological information for the Meadowdale herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/.

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant species.

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

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

Field Data

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

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

Harvest Data

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

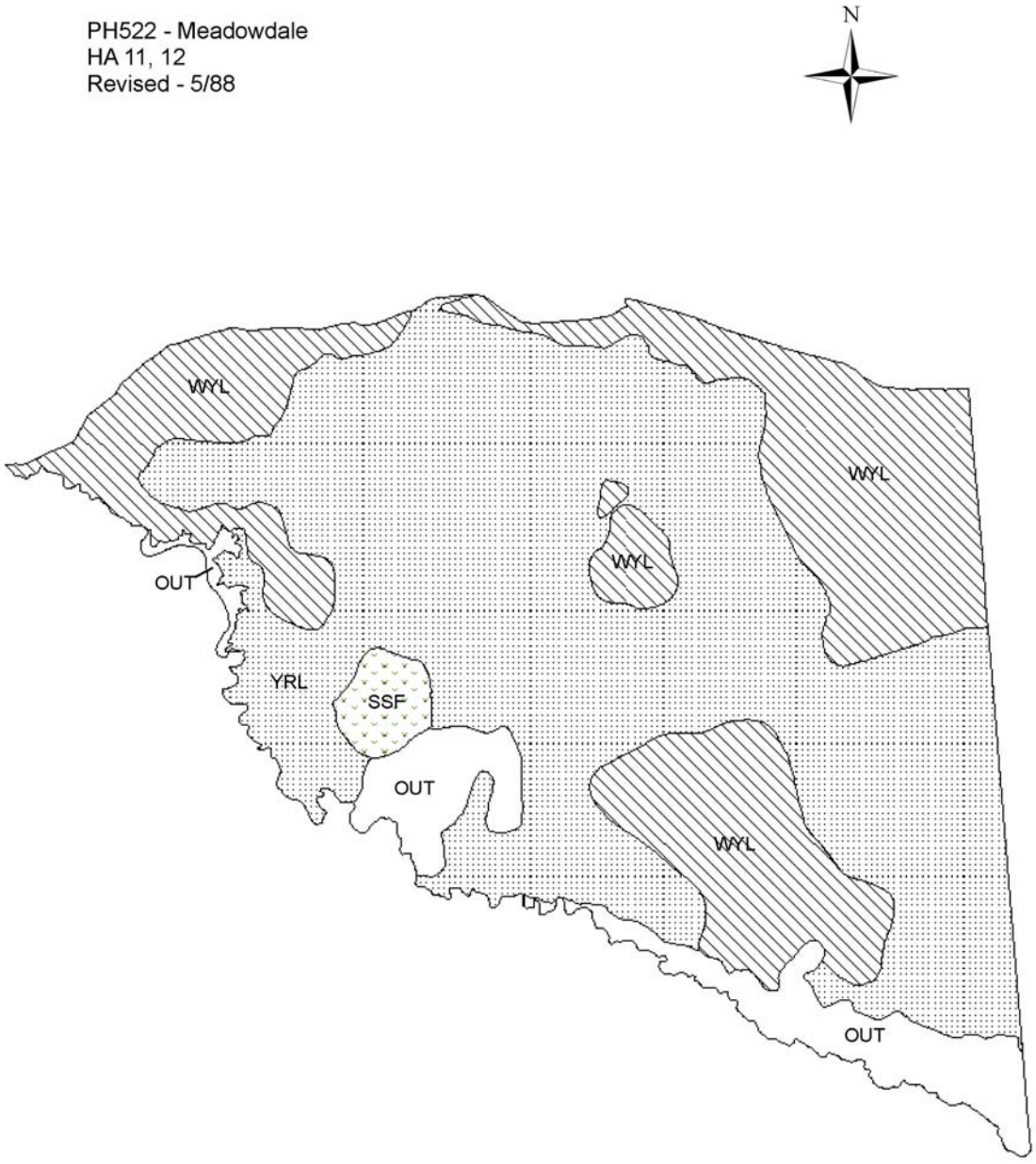
Population

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

Management Summary

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

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



2015 - JCR Evaluation Form

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

HERD: PR523 - IRON MOUNTAIN

HUNT AREAS: 38
PREPARED BY: LEE KNOX

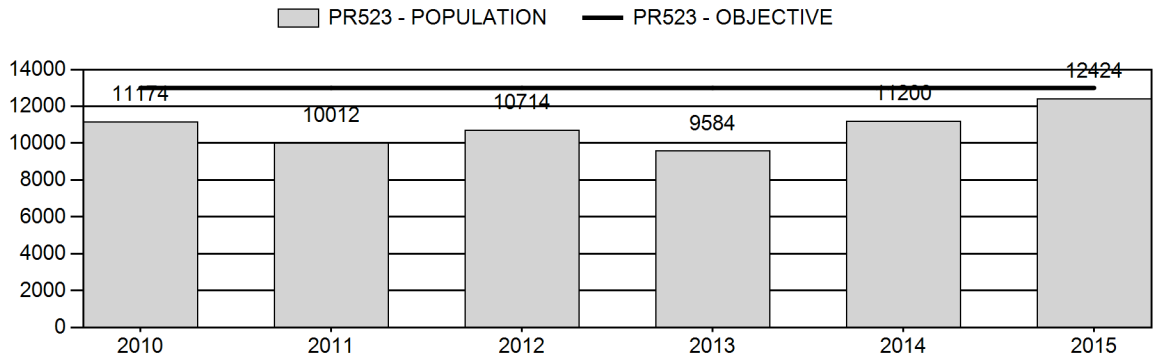
	2010 - 2014 Average	2015	2016 Proposed
Population:	10,537	12,424	13,521
Harvest:	1,514	1,443	1,753
Hunters:	1,690	1,675	1,900
Hunter Success:	90%	86%	92 %
Active Licenses:	1,881	1,727	2,000
Active License Success:	80%	84%	88 %
Recreation Days:	5,714	5,951	6,000
Days Per Animal:	3.8	4.1	3.4
Males per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

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

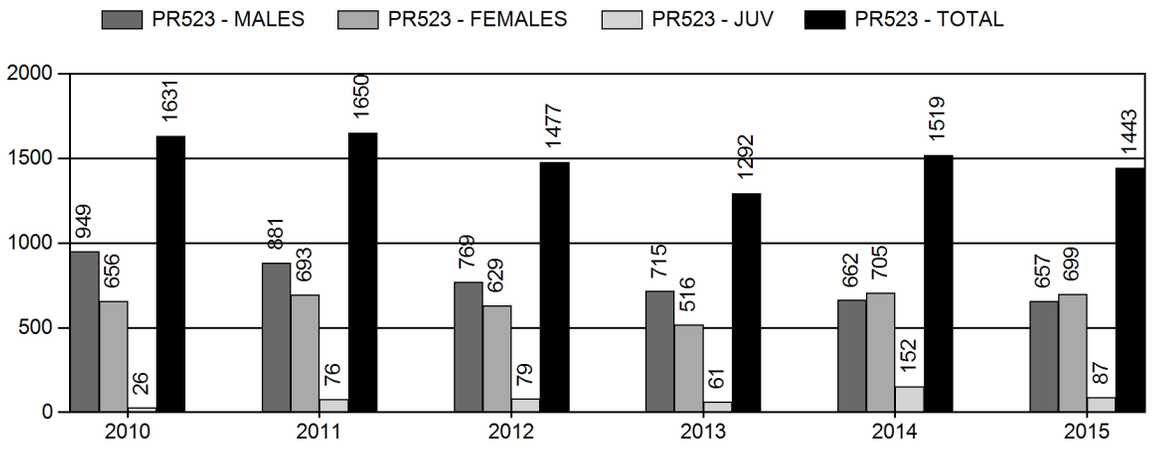
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

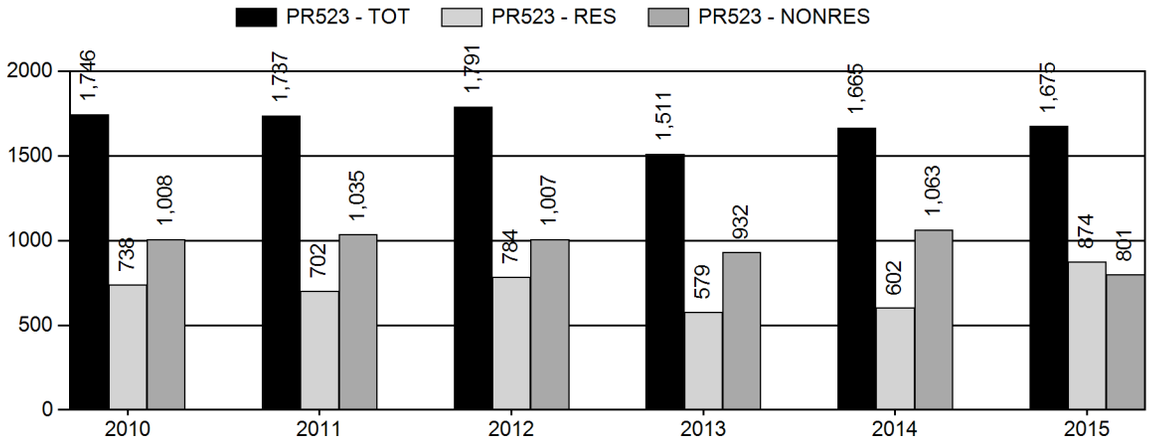
Population Size - Postseason



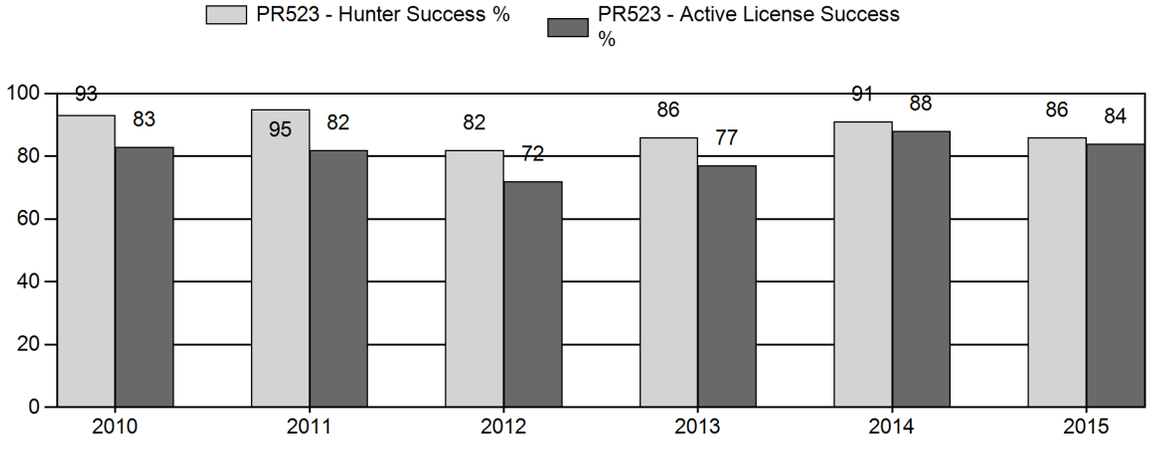
Harvest



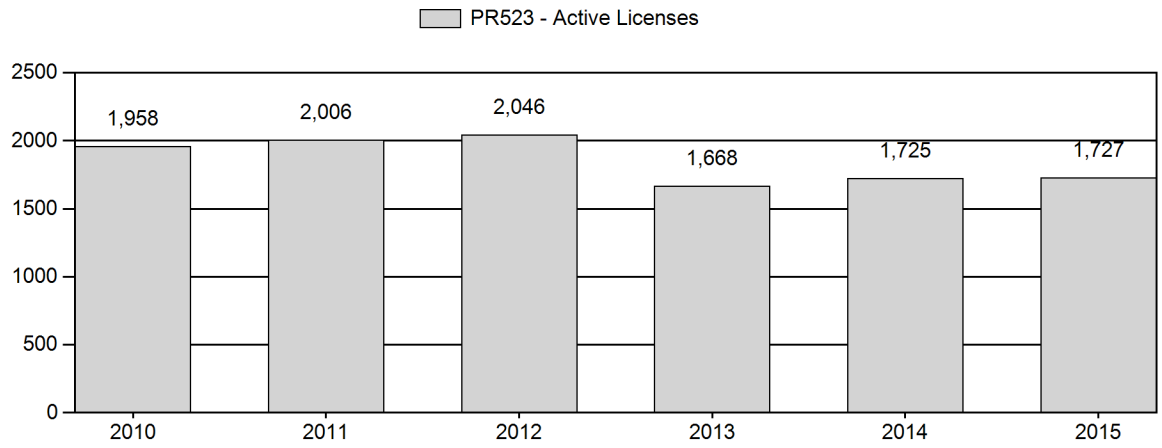
Number of Hunters



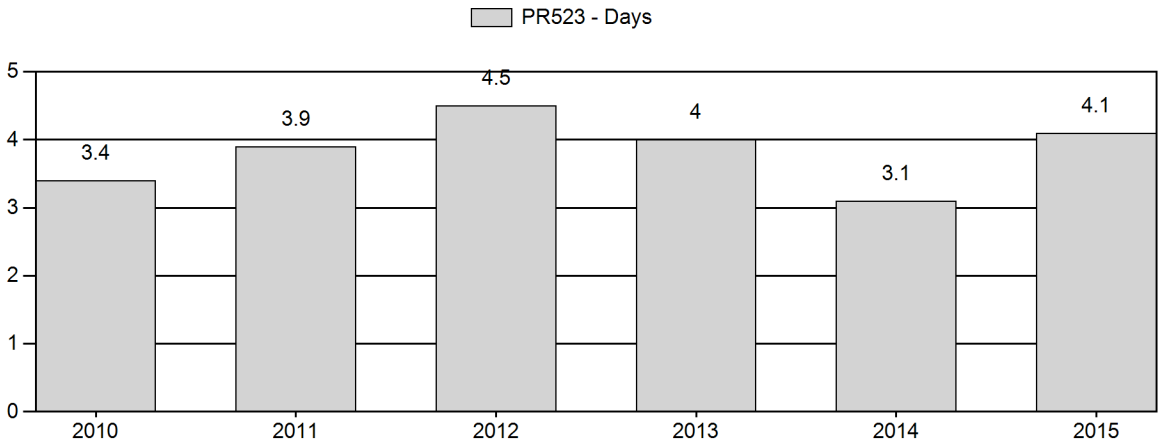
Harvest Success



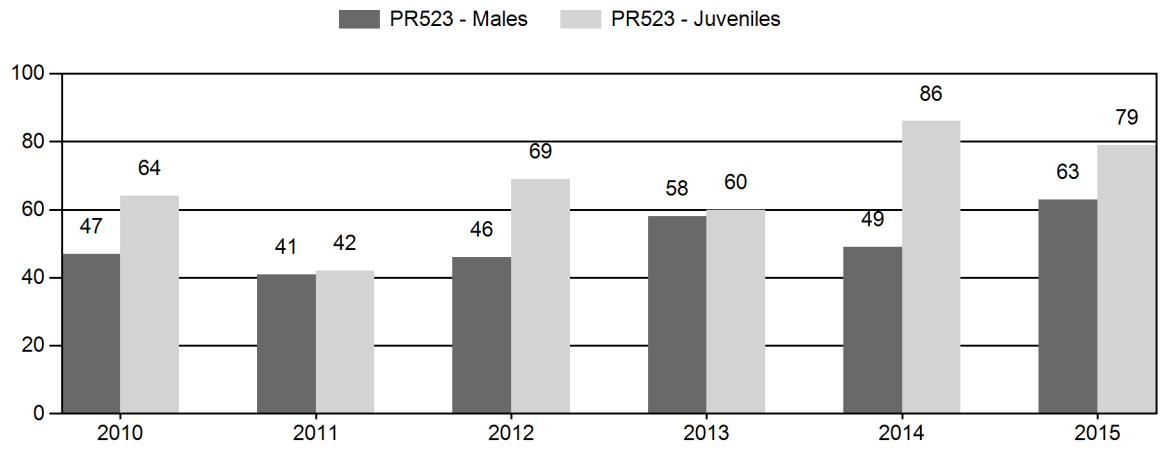
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

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

2016 HUNTING SEASONS
IRON MOUNTAIN PRONGHORN (PR523)

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

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

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

Management Evaluation

Current Postseason Population Management Objective: 13,000 (10,400-15,600)
Management Strategy: Recreational
2015 Postseason Population Estimate: 12,400
2016 Proposed Postseason Population Estimate: 13,500
2015 Hunter Satisfaction: 89% Satisfied, 9% Neutral, 2% Dissatisfied

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

Herd Unit Issues

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

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

Habitat
Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early season growing conditions were optimal, late summer and fall precipitation were lacking. A significant die-off of big sagebrush and antelope bitterbrush did occur in portions of the Laramie Range due to a rapid freeze event that occurred in November 2014. The die-off was widespread, from the Front Range of Colorado to the Eastern Plains of Montana. The severity of the die-off is unknown at this time, and whether or not the shrubs will recover. Affected shrubs did not show any significant signs of re-sprouting in summer 2015. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant specie.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species. In summer 2015, population biologists and habitat managers began working together to modify habitat monitoring techniques utilized statewide and to improve overall consistency among the regions. Identification of key herd units per big game species, assessing habitats through landscape scale inventory methods versus monitoring a handful of permanent monitoring sites, assessing habitats in all seasonal ranges (summer, transition, winter), and development of correlations to amounts of and timing of precipitation will help improve the overall value of data collected and result in our abilities to more strongly correlate management decisions for populations based off habitat conditions.

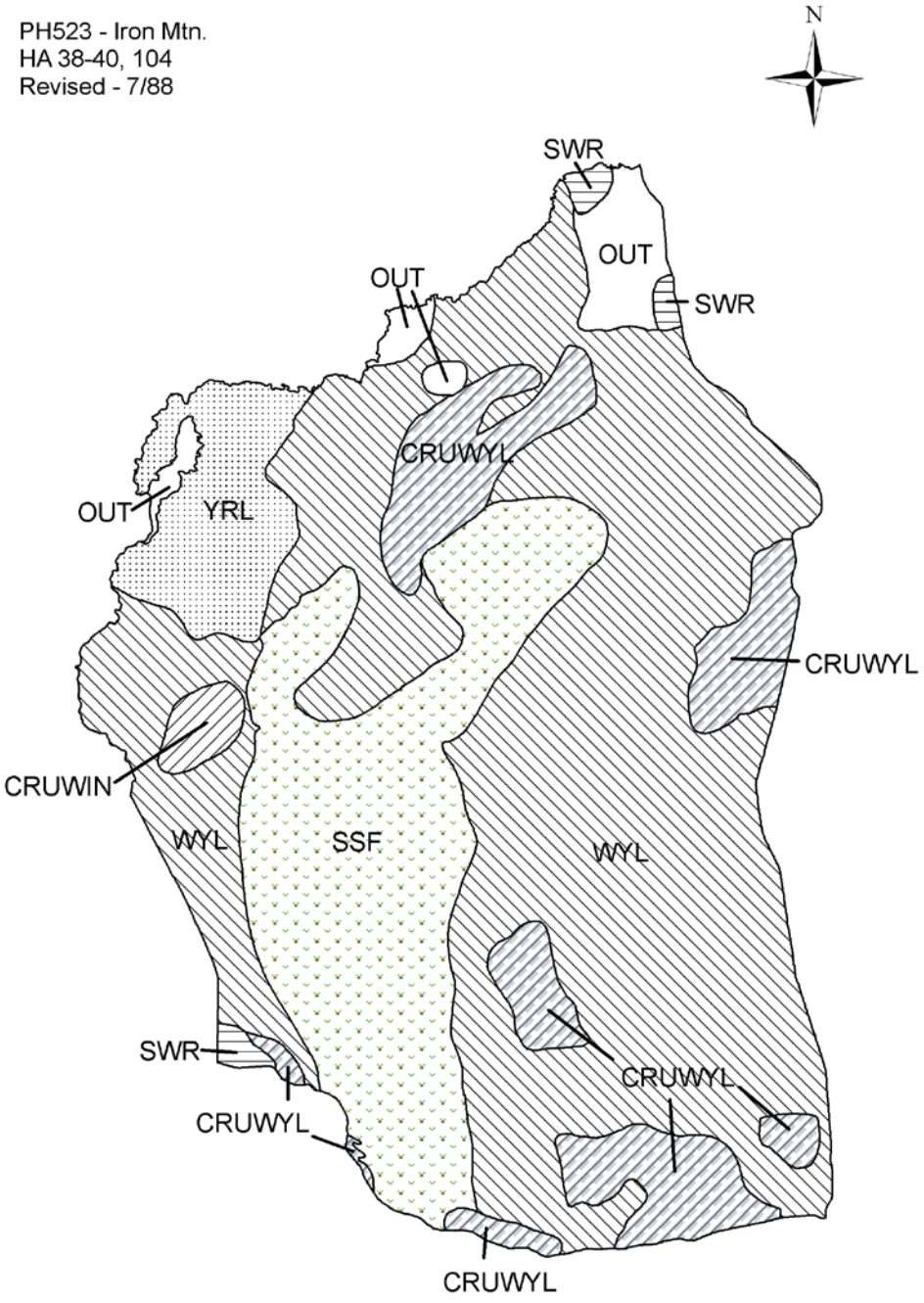
Field Data
A total of 1,641 pronghorn were classified, which is below the recommended classification objective of 3,000. Fawn ratios were 79:100 does which is a decline from 2014 but above the 5 year average of 71:100 and expected after the excellent amount of spring/summer forage. The buck ratio increased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

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

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

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

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



2015 - JCR Evaluation Form

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

HERD: PR524 - DWYER

HUNT AREAS: 103
PREPARED BY: MARTIN HICKS

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

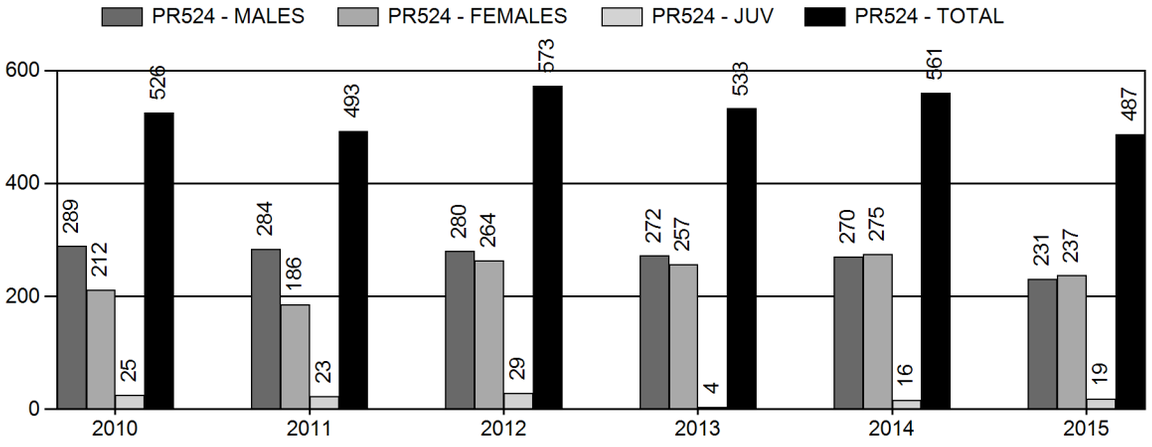
Population Objective (± 20%) :	4000 (3200 - 4800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	35%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/18/2016

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

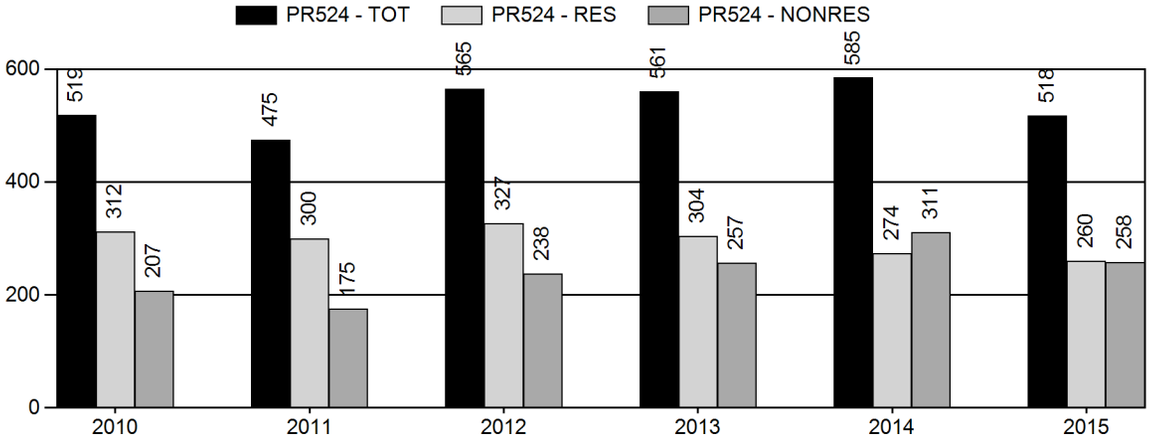
	JCR Year	Proposed
Females ≥ 1 year old:	8.8%	10.9%
Males ≥ 1 year old:	16.3%	18.2%
Juveniles (< 1 year old):	1.3%	2.5%
Total:	8.1%	10%
Proposed change in post-season population:	+8%	+8%

Population Size - Postseason

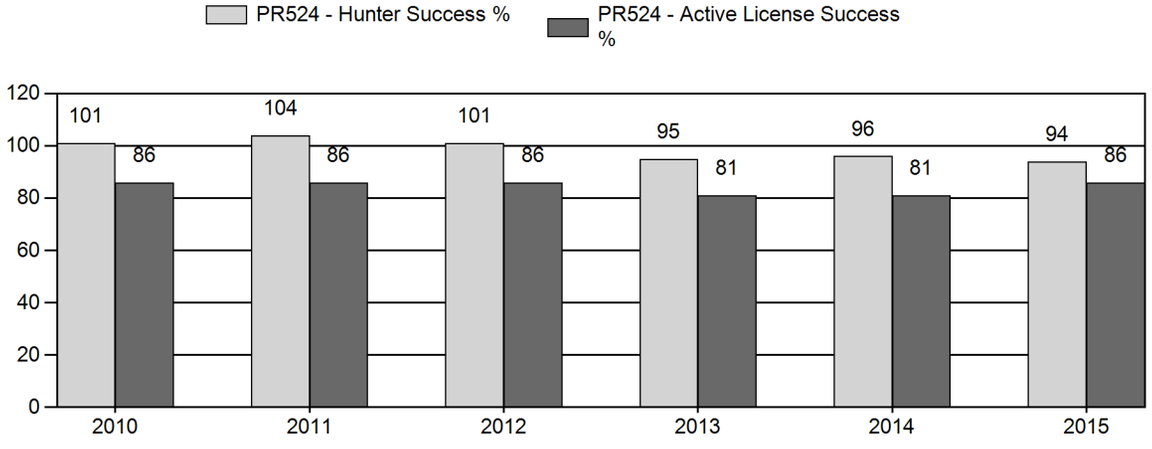
Harvest



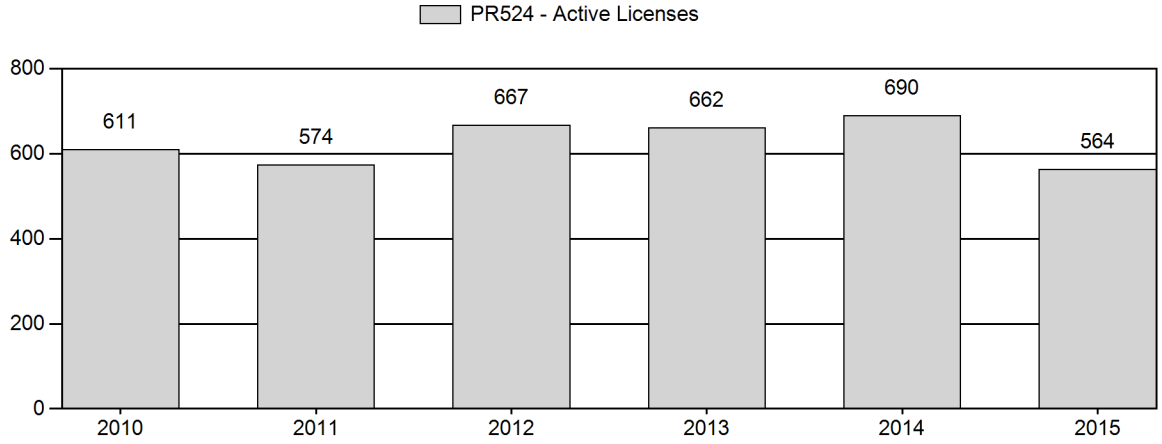
Number of Hunters



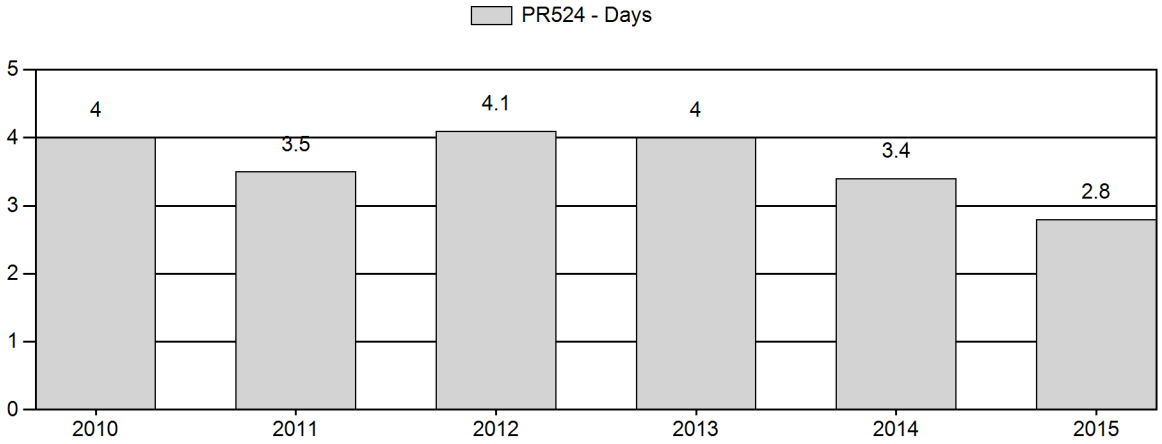
Harvest Success



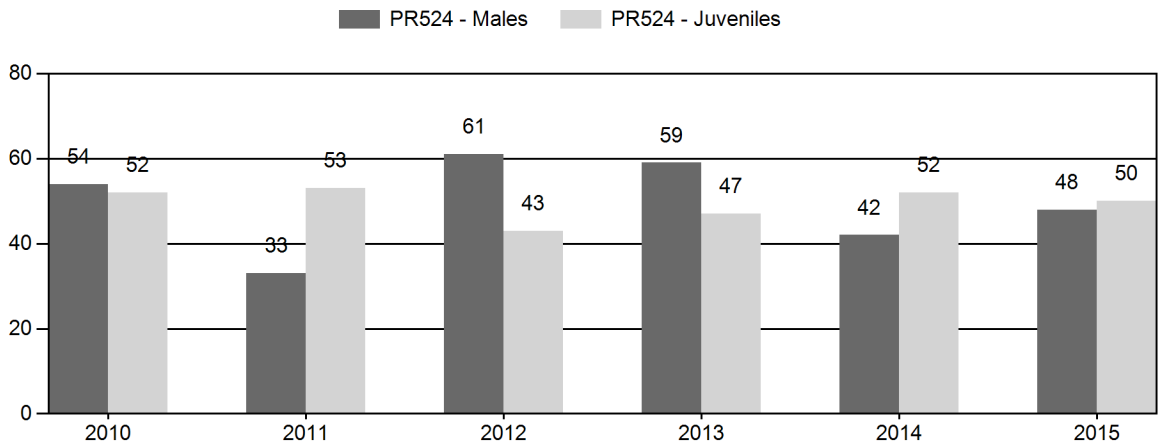
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR524 - DWYER

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

2016 HUNTING SEASONS
DWYER PRONGHORN HERD (524)

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

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

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

Management Evaluation
Current Management Objective: 4000 (3,200-4,800)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~5,400
2016 Proposed Post-season Population Estimate: ~5,600
2015 Hunter Satisfaction: 89% Satisfied, 8% Neutral, 3% Dissatisfied

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

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

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

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

Weather

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

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early season growing conditions were optimal, late summer and fall precipitation were lacking. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant species.

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

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

Field Data

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

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

Harvest Data

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

Population

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

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

Management Summary

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

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

Appendix A

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

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

Measurement Units

Density: Numbers/Sq. miles
ESW: meters

Component Percentages of Var(D)

Detection probability : 55.1
Encounter rate : 37.2
Cluster size : 7.7

Estimation Summary - Encounter rates

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

Estimation Summary - Detection probability

	Estimate	%CV	df	95% Confidence Interval	
Half-normal/Cosine					
m	2.0000				
LnL	-573.83				
AIC	1151.7				
AICc	1151.7				
BIC	1159.4				
Chi-p	0.18013E-03				
f(0)	0.71806E-02	8.72	356.00	0.60514E-02	0.85206E-02
p	0.67604	8.72	356.00	0.56972	0.80219

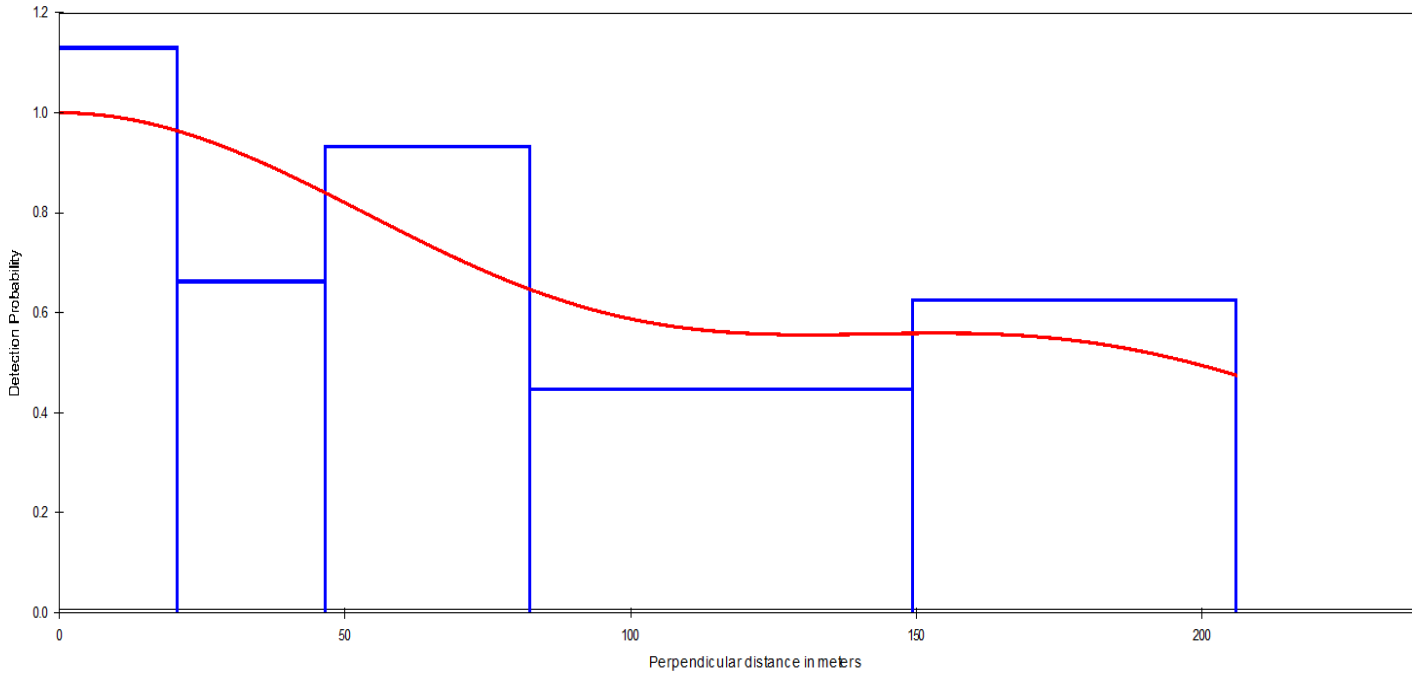
ESW 139.26 8.72 356.00 117.36 165.25

Estimation Summary - Expected cluster size

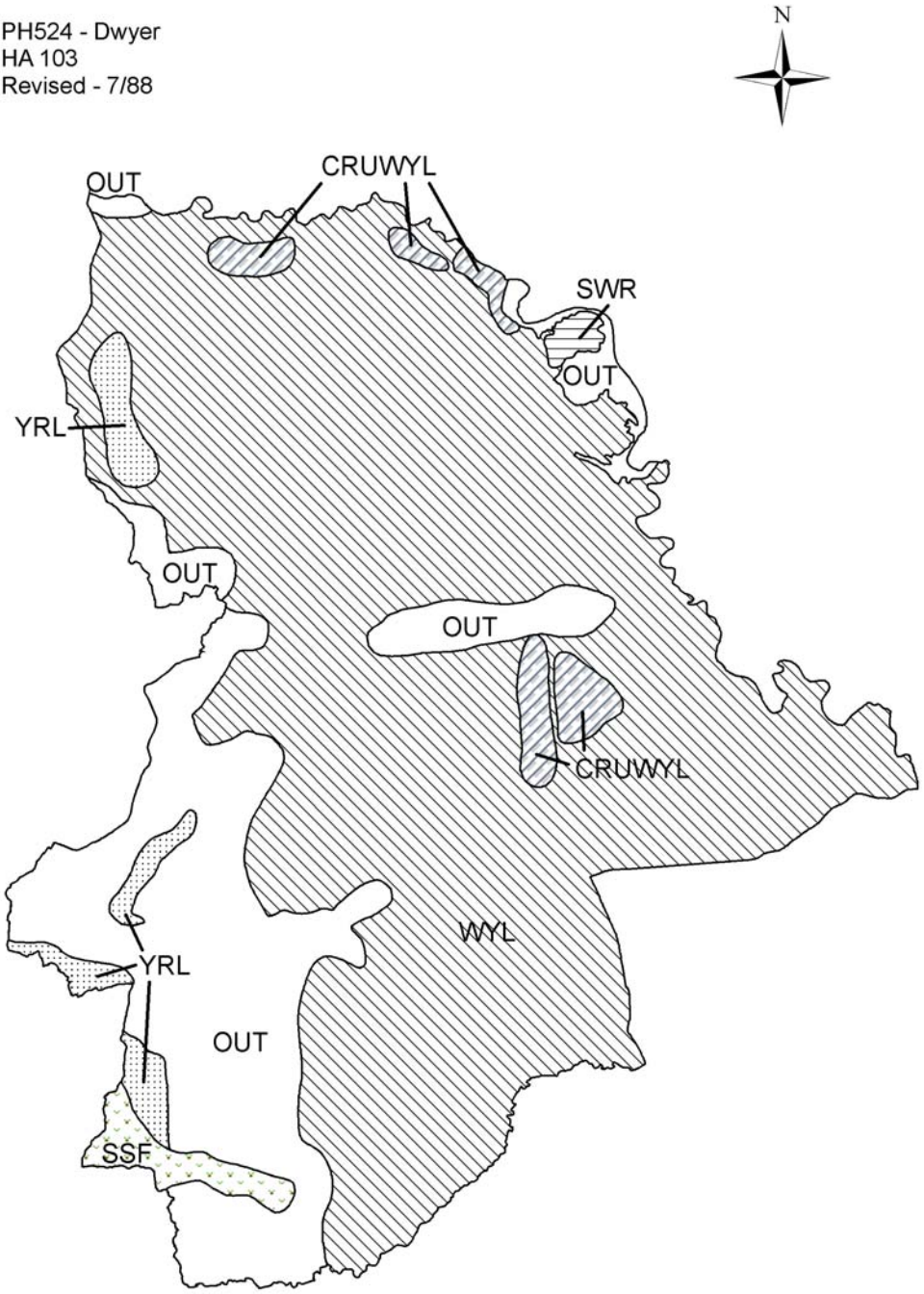
	Estimate	%CV	df	95% Confidence Interval	
Average cluster size					
	1.7402	5.86	357.00	1.5511	1.9524
Half-normal/Cosine					
r	-0.10126				
r-p	0.27803E-01				
E(S)	1.4649	3.26	356.00	1.3740	1.5617

Estimation Summary - Density&Abundance

	Estimate	%CV	df	95% Confidence Interval	
Half-normal/Cosine					
DS	5.2216	11.28	220.66	4.1836	6.5171
D	7.6489	11.74	257.85	6.0747	9.6311
N	5752.0	11.74	257.85	4568.0	7243.0



PH524 - Dwyer
HA 103
Revised - 7/88



2015 - JCR Evaluation Form

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

HERD: PR525 - MEDICINE BOW

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

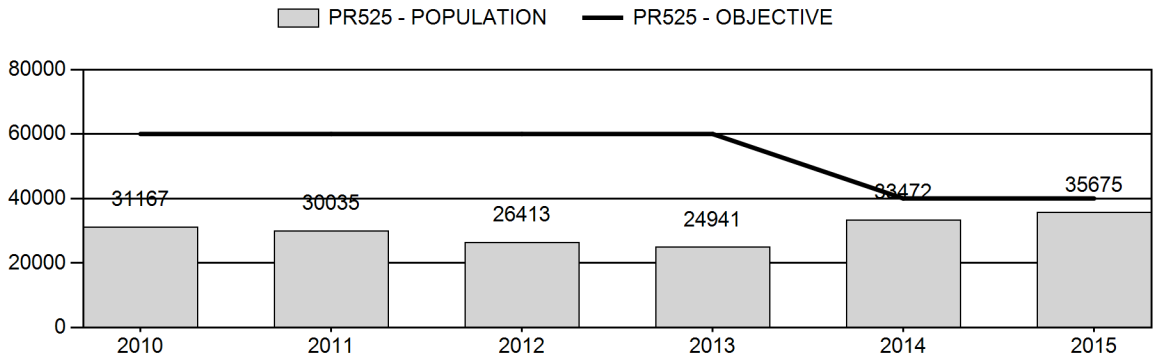
	2010 - 2014 Average	2015	2016 Proposed
Population:	29,206	35,675	39,200
Harvest:	5,417	2,139	2,200
Hunters:	6,054	2,270	2,300
Hunter Success:	89%	94%	96 %
Active Licenses:	6,711	2,487	2,500
Active License Success:	81%	86%	88 %
Recreation Days:	19,759	6,626	6,600
Days Per Animal:	3.6	3.1	3
Males per 100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

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

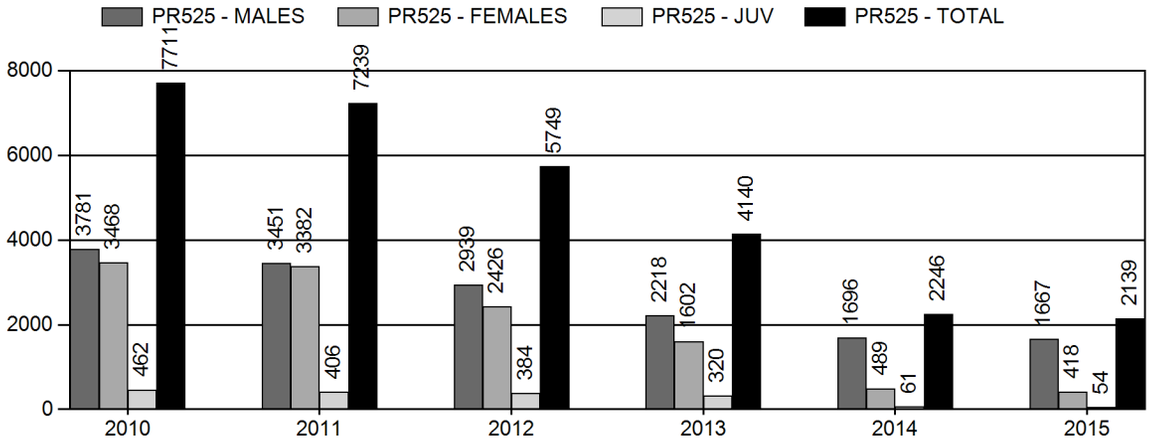
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

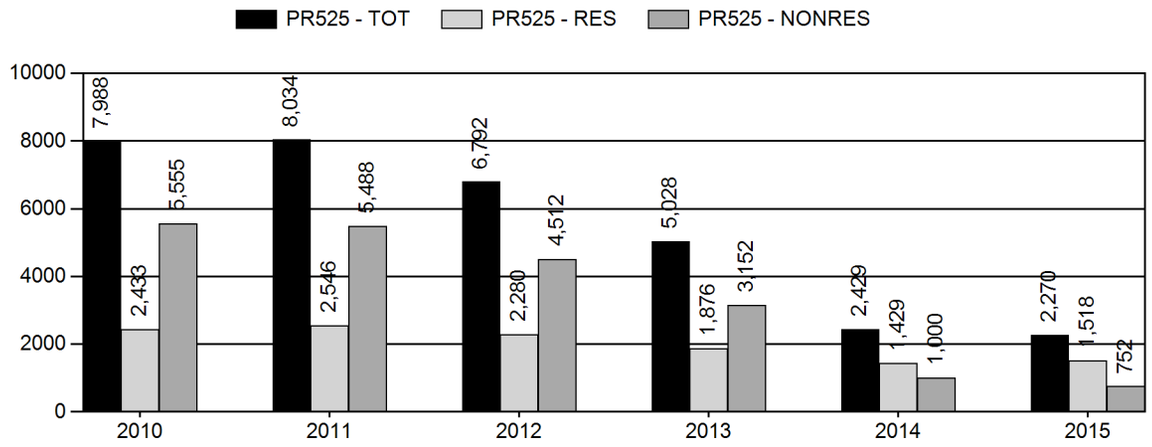
Population Size - Postseason



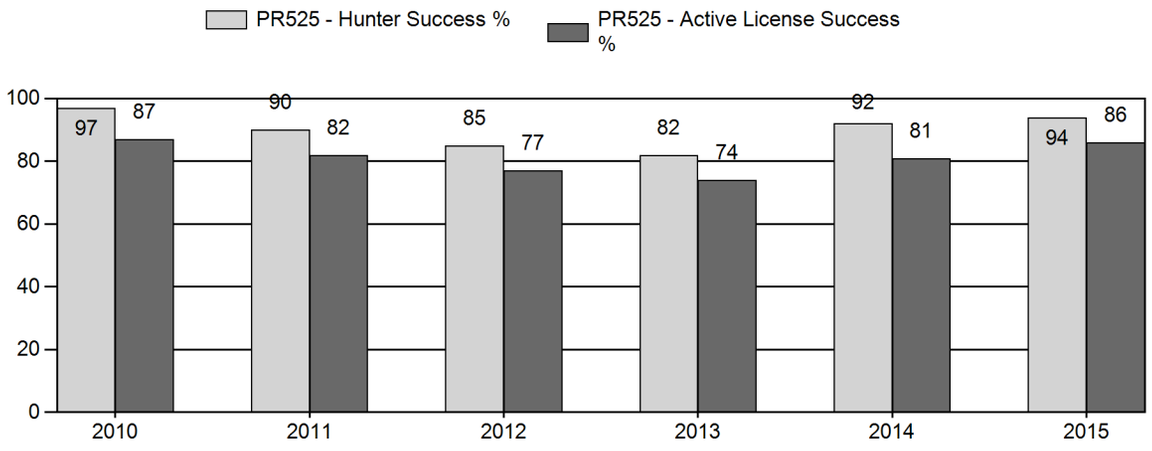
Harvest



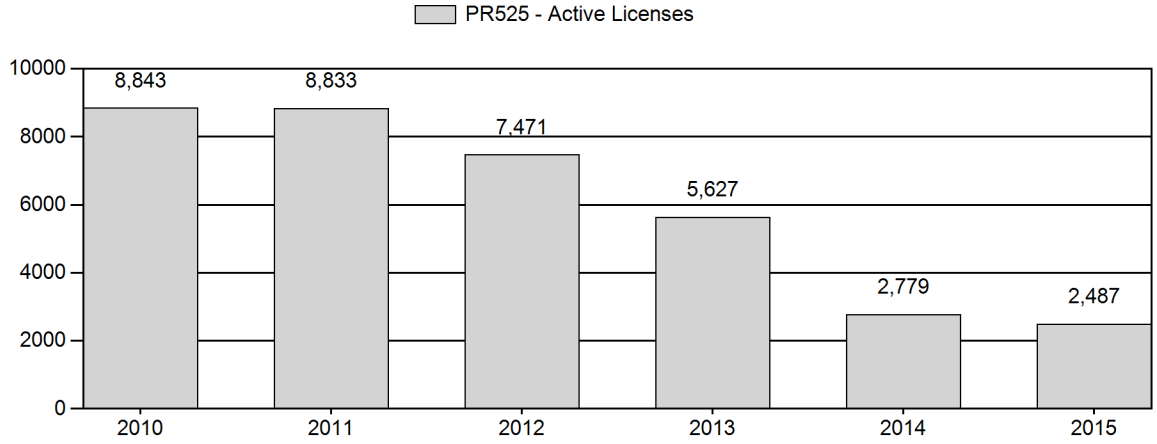
Number of Hunters



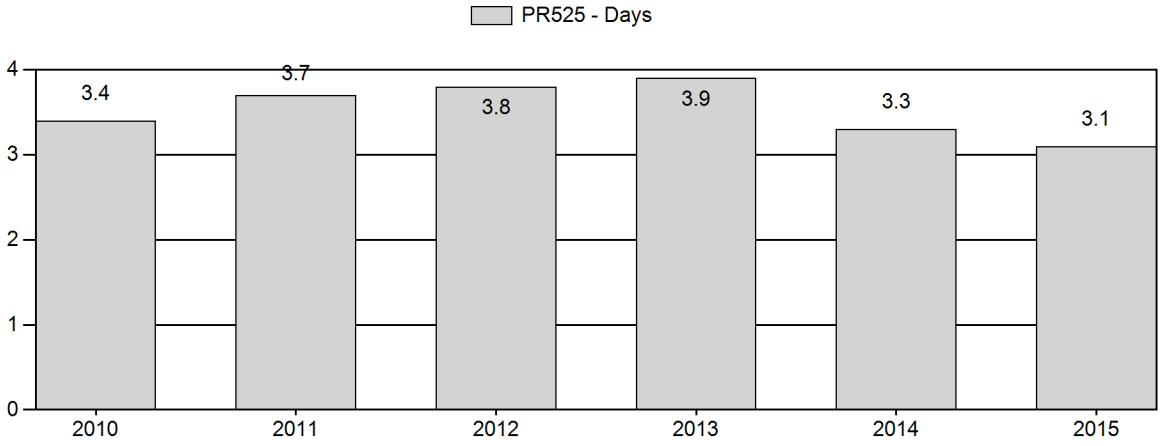
Harvest Success



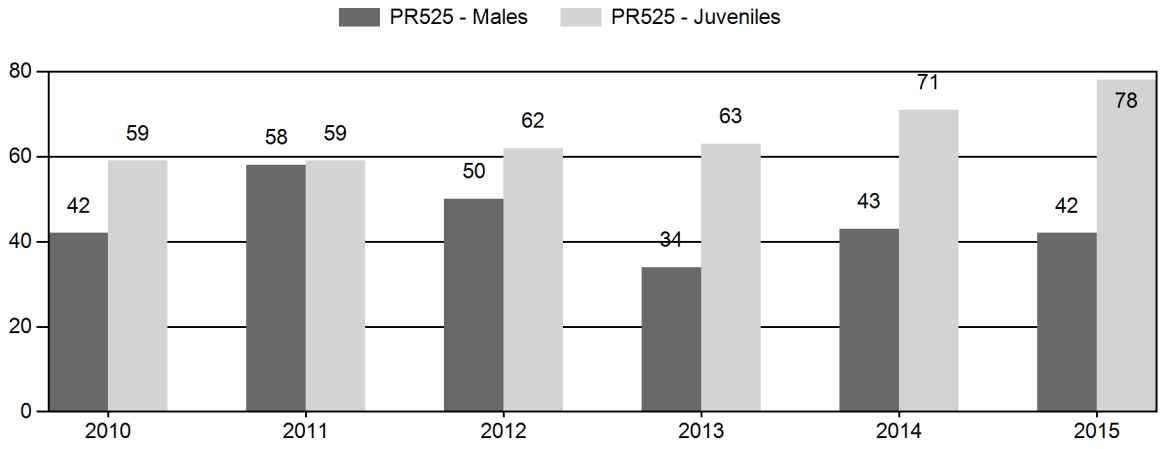
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

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

2016 HUNTING SEASONS
MEDICINE BOW PRONGHORN (PR525)

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

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

Management Evaluation

Current Postseason Population Management Objective: 40,000 (32,000 – 48,000)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~ 35,700
2016 Proposed Postseason Population Estimate: ~ 39,300
2015 Hunter Satisfaction: 89% Satisfaction, 6% Neutral, 5% Dissatisfied

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

Herd Unit Issues

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

Weather

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

Habitat

Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early season growing conditions were optimal, late summer and fall precipitation were lacking. The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species.

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

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

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

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

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

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

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

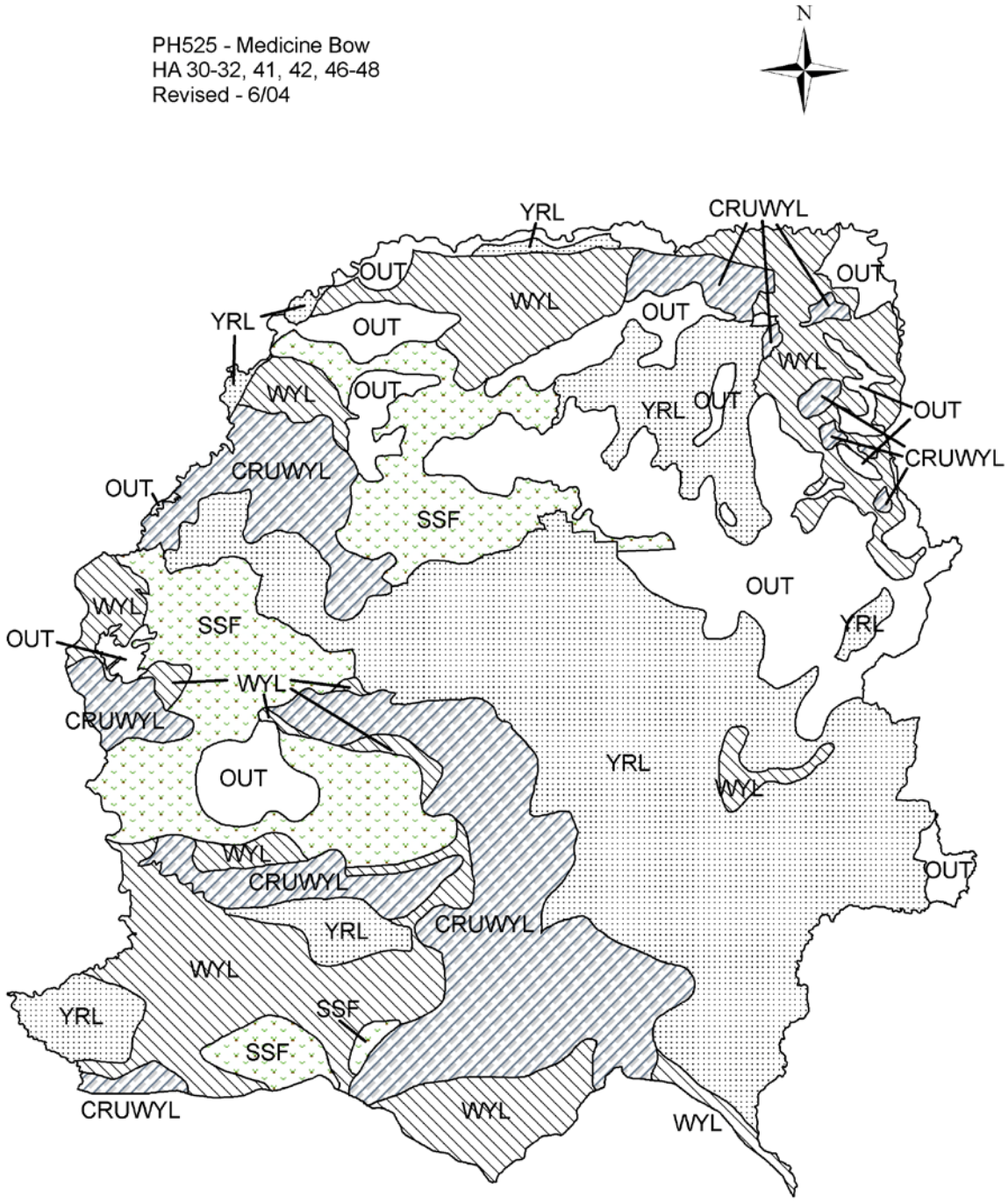
Management Summary
If the projected harvest of 2,200 is attained, and the average fawn ratio of 70 fawns: 100 does is maintained, the population is estimated to increase to near 40,000. If we have another year of good spring/summer forage, the population will increase even more substantially. License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

Bibliography of Herd Specific Studies

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

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

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



2015 - JCR Evaluation Form

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

HERD: PR526 - COOPER LAKE

HUNT AREAS: 43
PREPARED BY: LEE KNOX

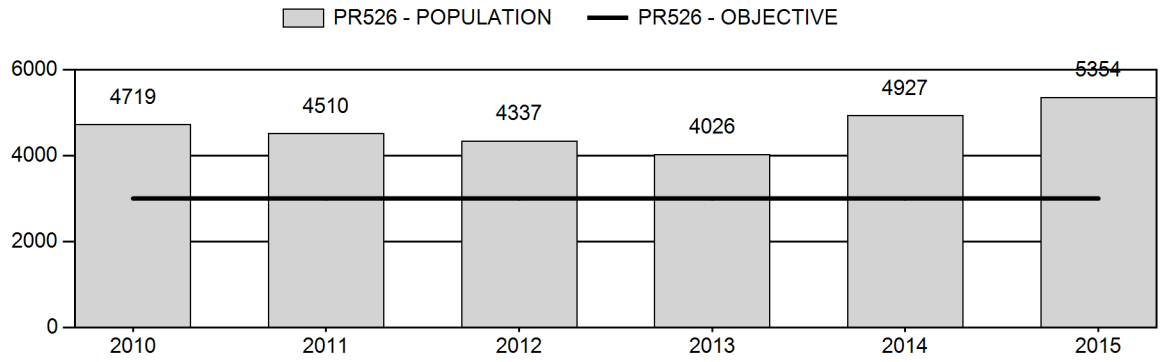
	2010 - 2014 Average	2015	2016 Proposed
Population:	4,504	5,354	5,000
Harvest:	666	635	780
Hunters:	734	685	800
Hunter Success:	91%	93%	98 %
Active Licenses:	792	755	900
Active License Success:	84%	84%	87 %
Recreation Days:	2,328	2,743	2,500
Days Per Animal:	3.5	4.3	3.2
Males per 100 Females	42	49	
Juveniles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

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

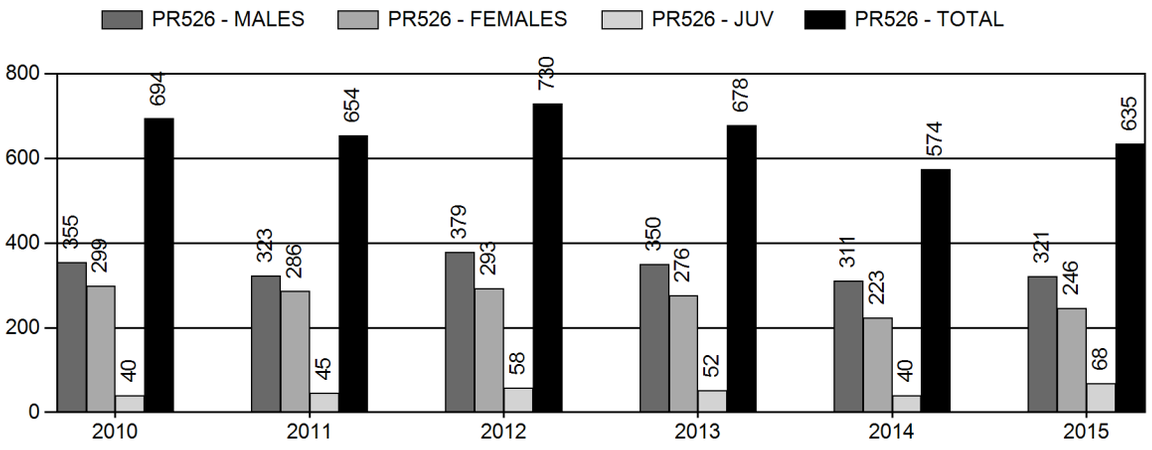
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

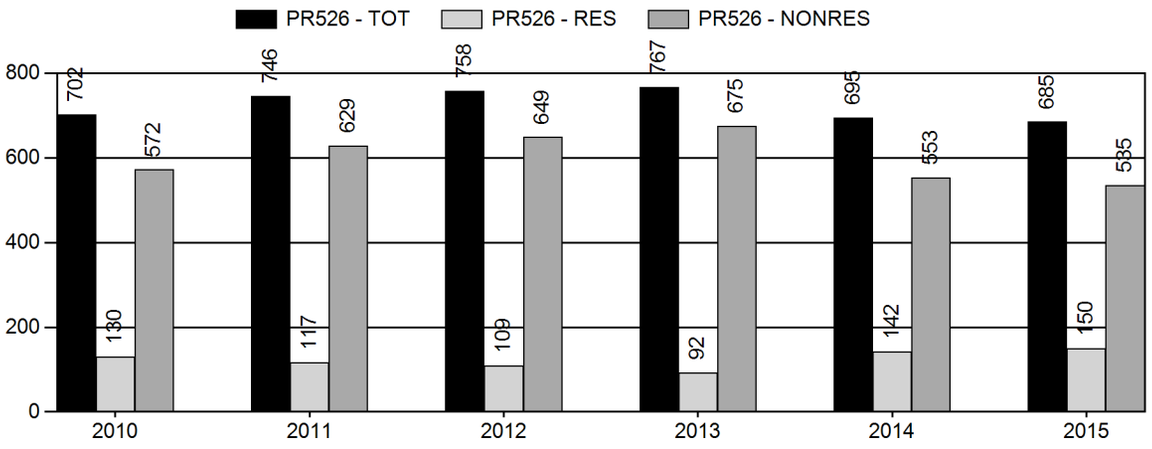
Population Size - Postseason



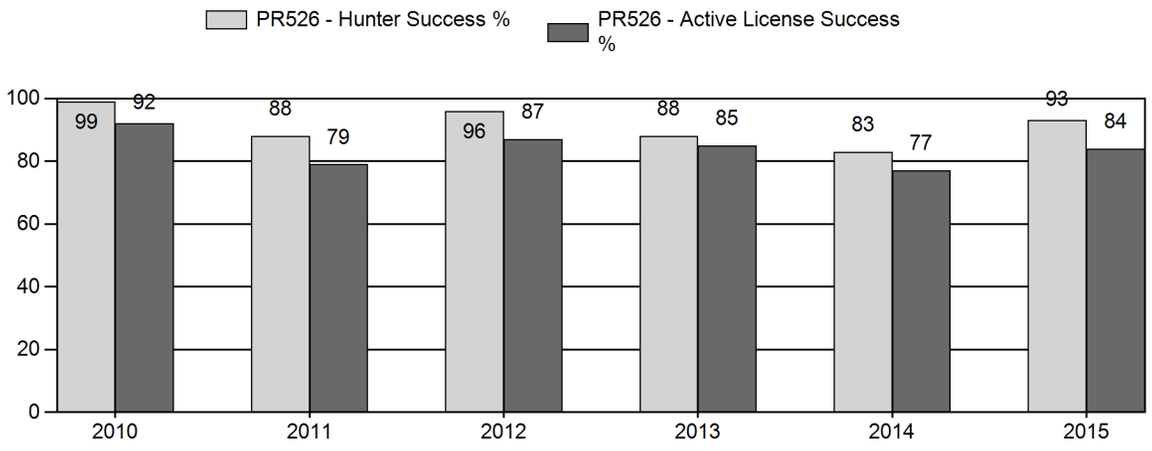
Harvest



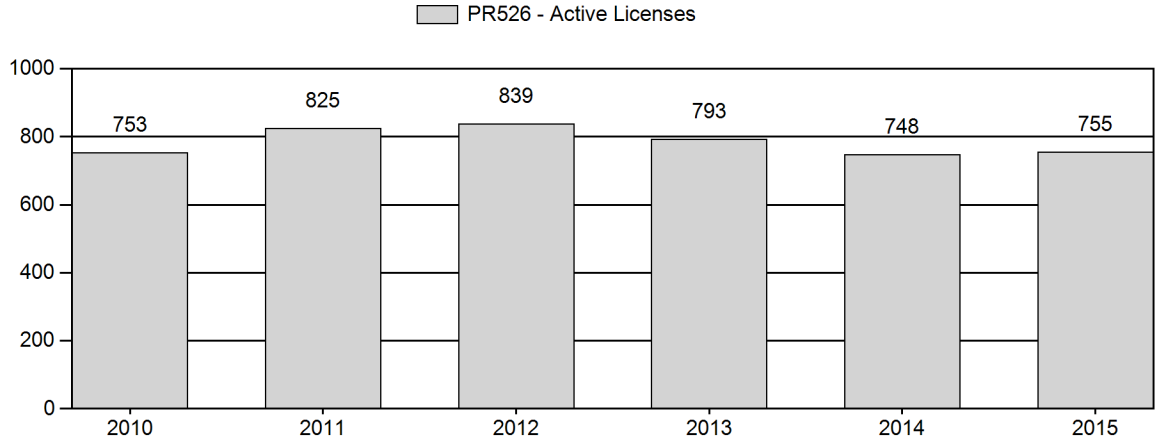
Number of Hunters



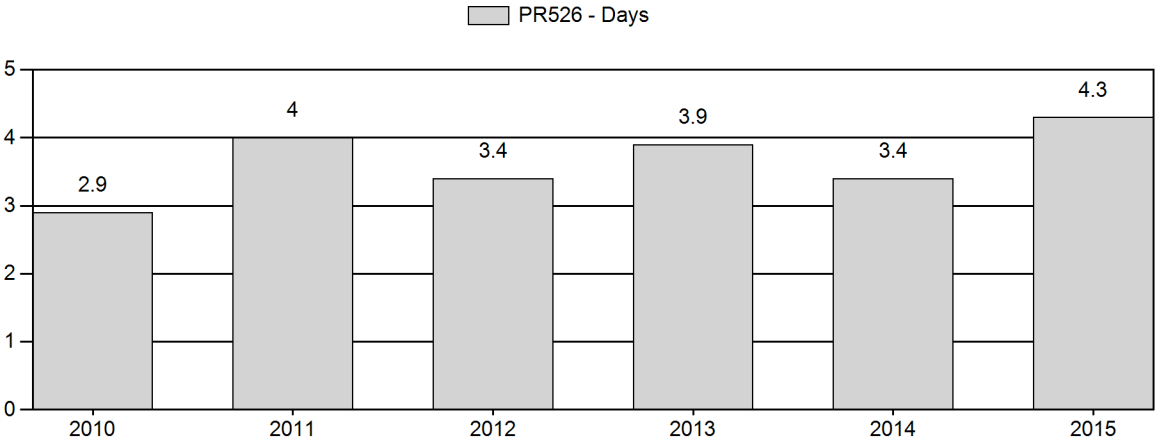
Harvest Success



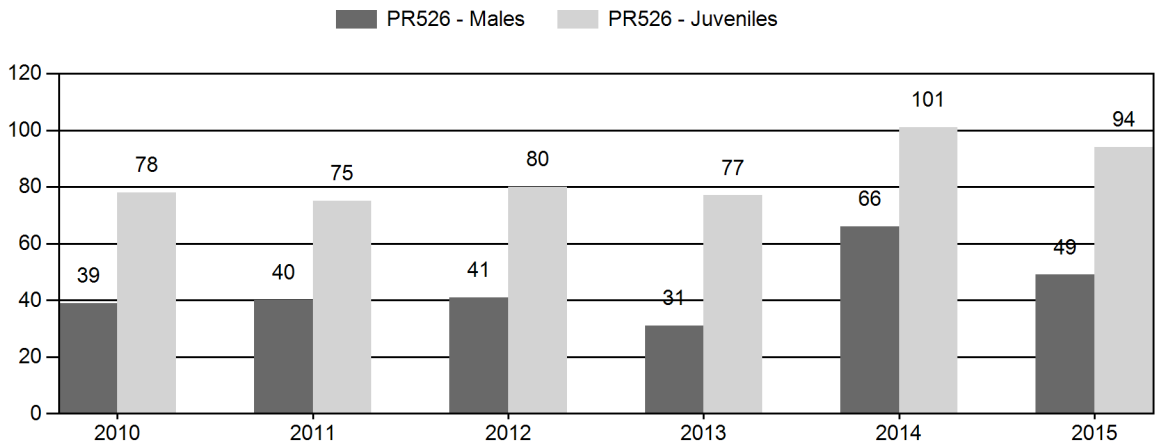
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

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

2016 HUNTING SEASONS
COOPER LAKE PRONGHORN (PR526)

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

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

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

Management Evaluation
Current Postseason Population Management Objective: 3,000 (2,400-3,600)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~ 5,300
2016 Proposed Postseason Population Estimate: ~ 5,000
2015 Hunter Satisfaction: 90% Satisfied, 5% Neutral, 5% Dissatisfied

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

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

Weather
Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts

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

Habitat

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

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

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

Field Data

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

Harvest Data

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

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

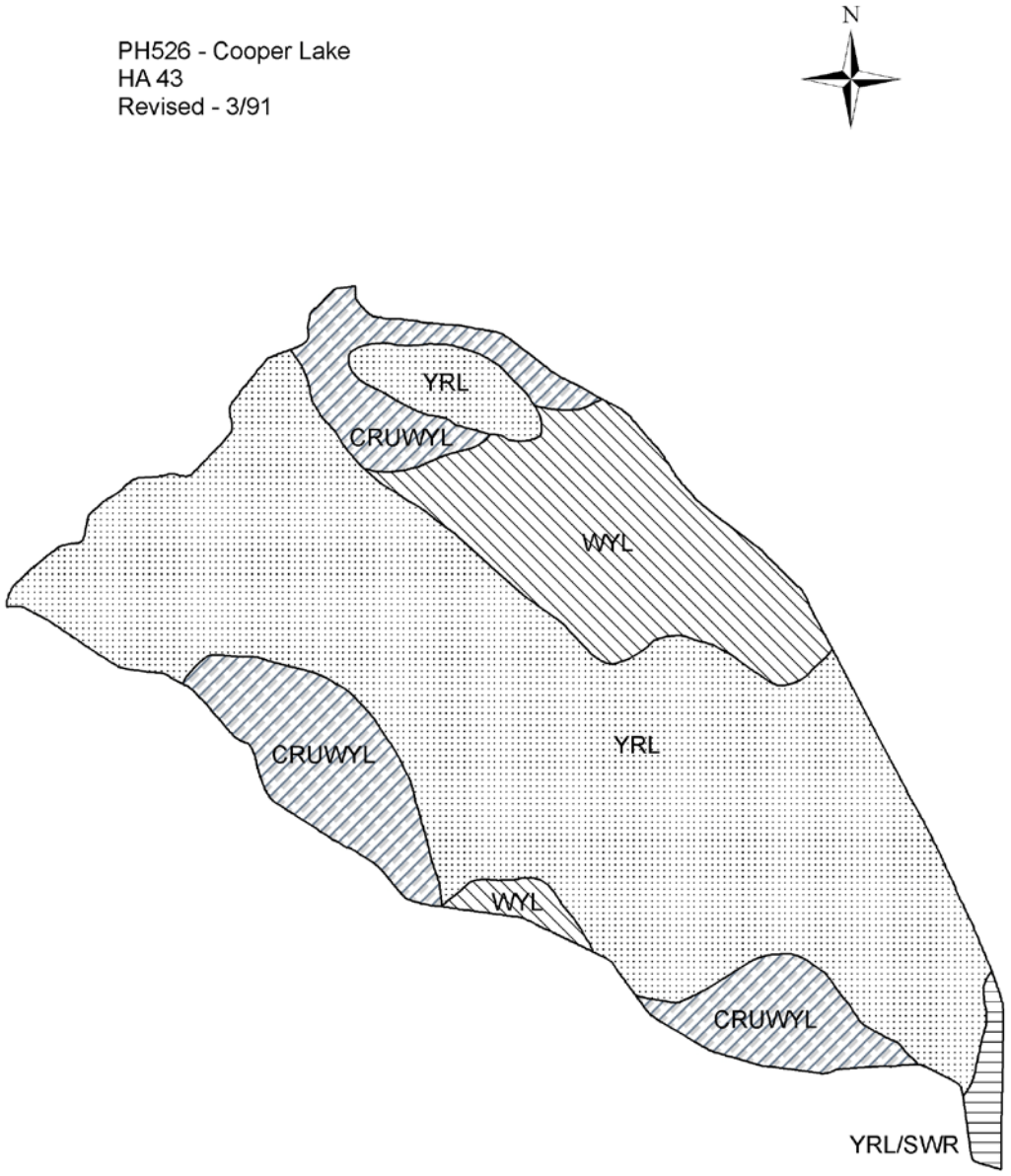
Population

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

Management Summary

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

PH526 - Cooper Lake
HA 43
Revised - 3/91



2015 - JCR Evaluation Form

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

HERD: PR527 - CENTENNIAL

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

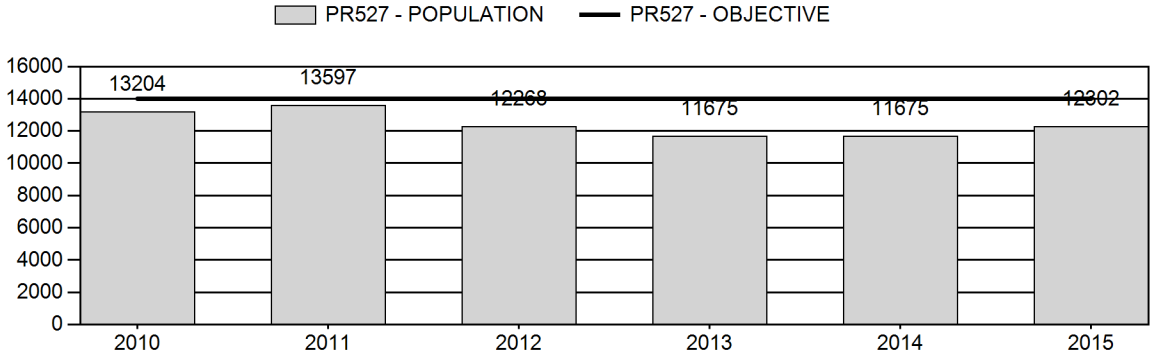
	2010 - 2014 Average	2015	2016 Proposed
Population:	12,484	12,302	12,000
Harvest:	1,189	1,011	1,000
Hunters:	1,374	1,044	1,050
Hunter Success:	87%	97%	95%
Active Licenses:	1,547	1,183	1,200
Active License Success:	77%	85%	83%
Recreation Days:	5,078	3,908	3,900
Days Per Animal:	4.3	3.9	3.9
Males per 100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

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

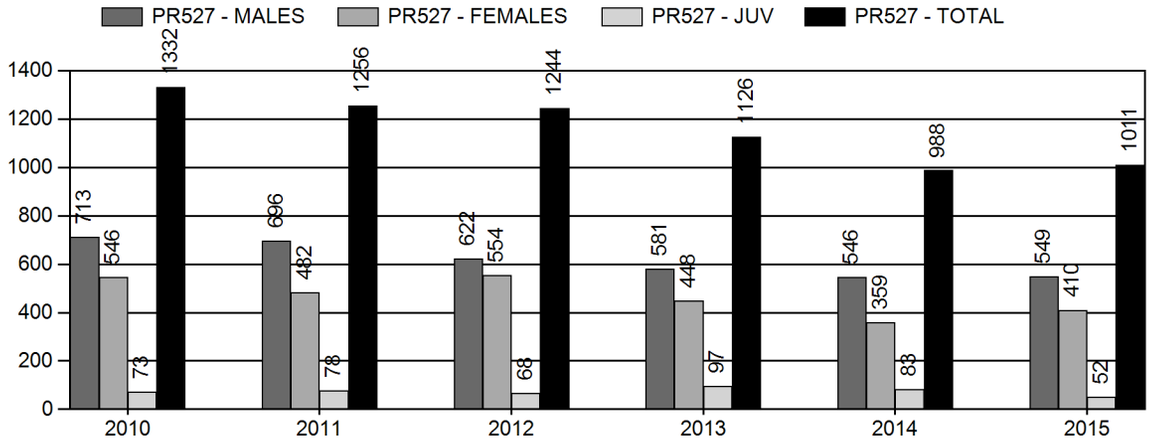
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

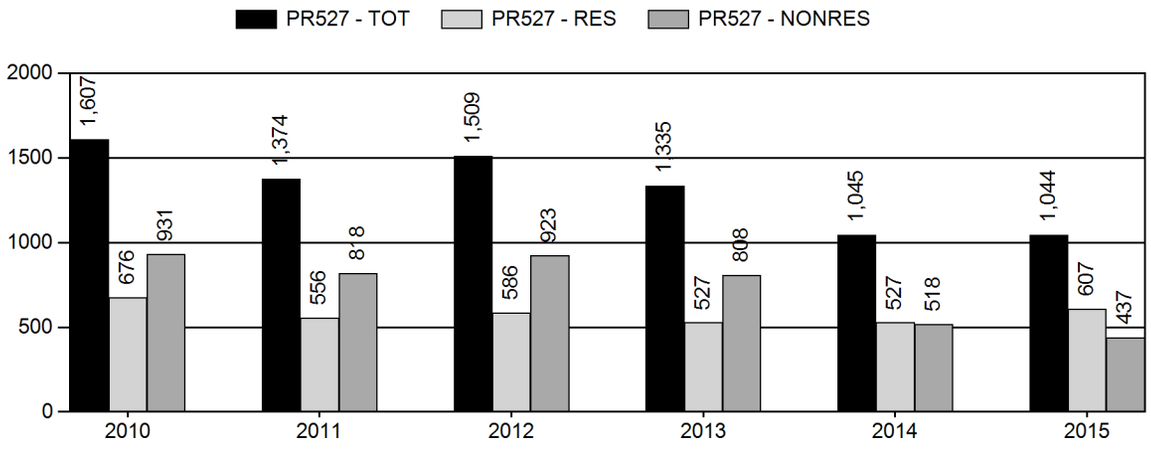
Population Size - Postseason



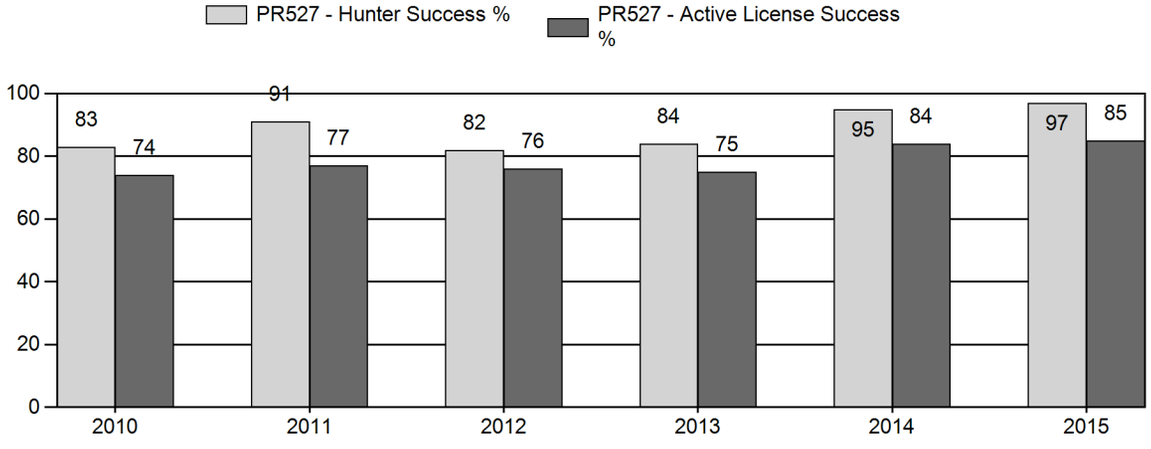
Harvest



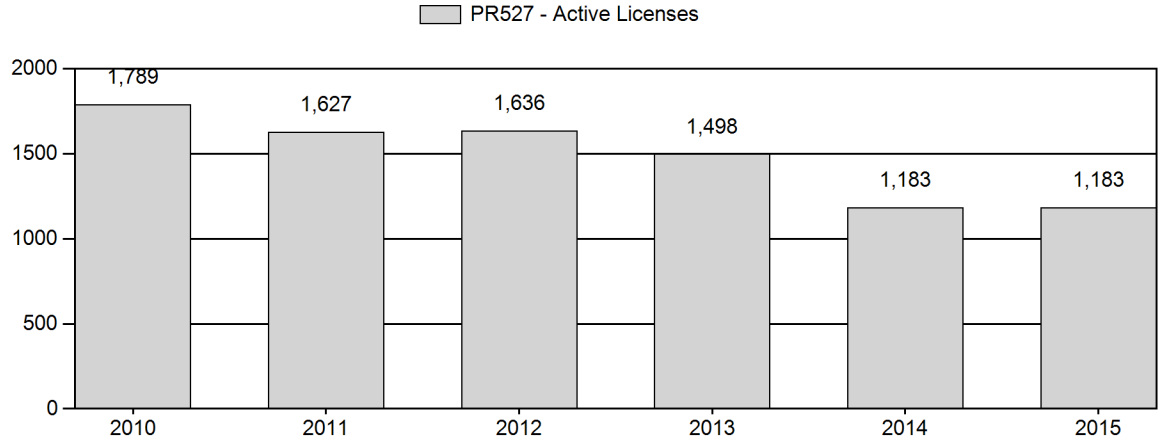
Number of Hunters



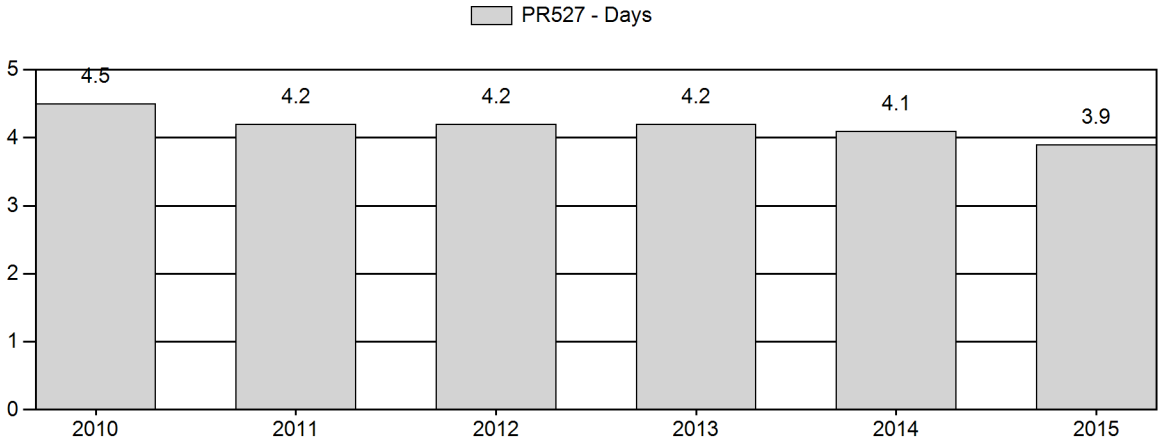
Harvest Success



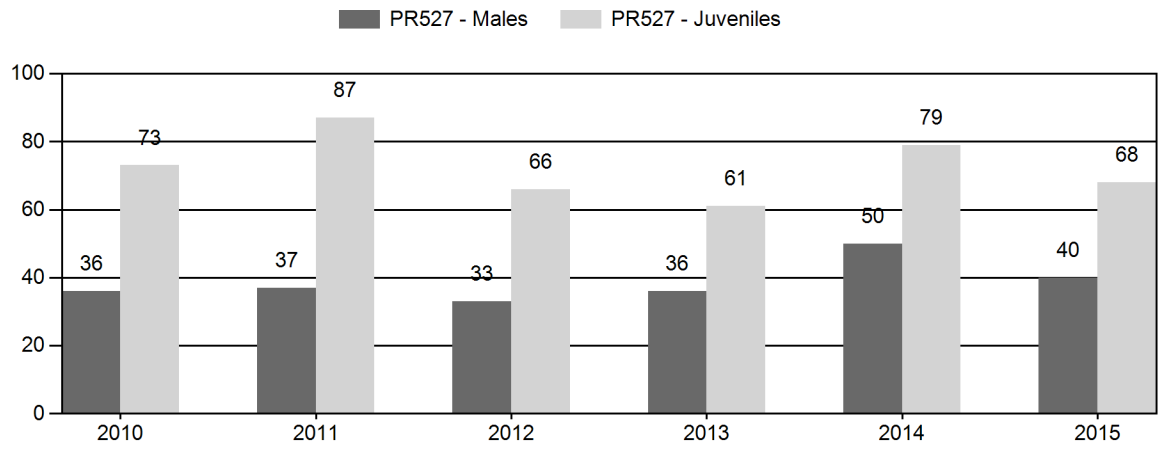
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

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

2016 HUNTING SEASONS
CENTENNIAL PRONGHORN (PR527)

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

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

Management Evaluation
Current Postseason Population Management Objective: 14,000 (11,200 – 15,800)
Management Strategy: Recreational
2015 Postseason Population Estimate: ~ 12,300
2016 Postseason Population Estimate: ~ 12,000
2015 Hunter Satisfaction: 93% Satisfied, 6% Neutral, 1% Dissatisfied

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

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

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

Habitat
Forage availability continued to improve in 2015 with an increase in amounts of precipitation received and the timeliness of when it was received. Precipitation received in April, May, and early June resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early season growing conditions were optimal, late summer and fall precipitation were lacking Residential development / subdivisions continue to fragment seasonal ranges in this herd unit. New fences that are often associated with subdivisions can have impacts on migratory movements of pronghorn, and may limit their ability to traverse to key wintering areas.
The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game species.
In summer 2015, population biologists and habitat managers began working together to modify habitat monitoring techniques utilized statewide and to improve overall consistency among the regions. Identification of key herd units per big game species, assessing habitats through landscape scale inventory methods versus monitoring a handful of permanent monitoring sites, assessing habitats in all seasonal ranges (summer, transition, winter), and development of correlations to amounts of and timing of precipitation will help improve the overall value of data collected and result in our abilities to more strongly correlate management decisions for populations based off habitat conditions.

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

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

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

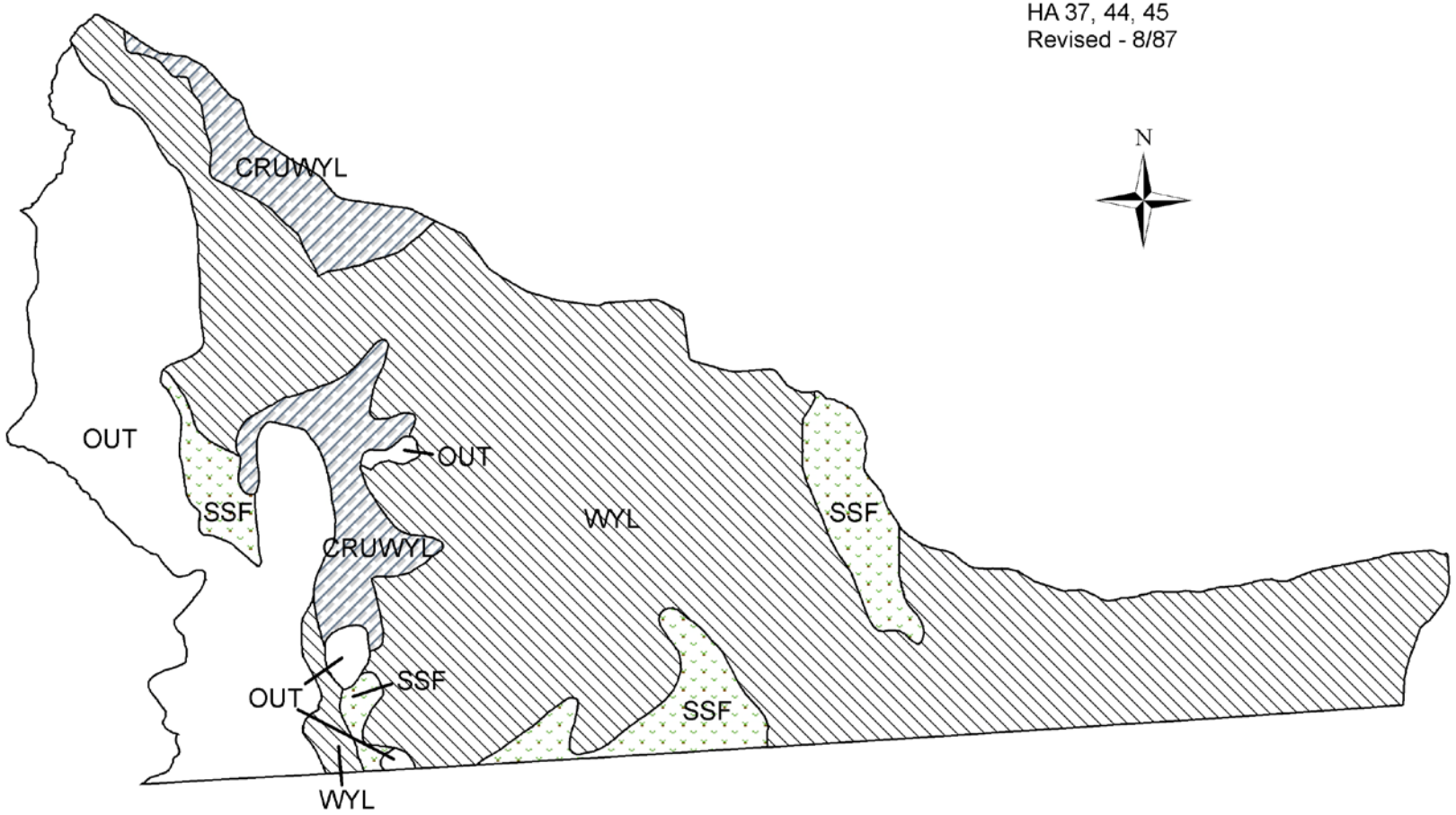
Population

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

Management Summary

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

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



2015 - JCR Evaluation Form

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

HERD: PR528 - ELK MOUNTAIN

HUNT AREAS: 50
PREPARED BY: WILL SCHULTZ

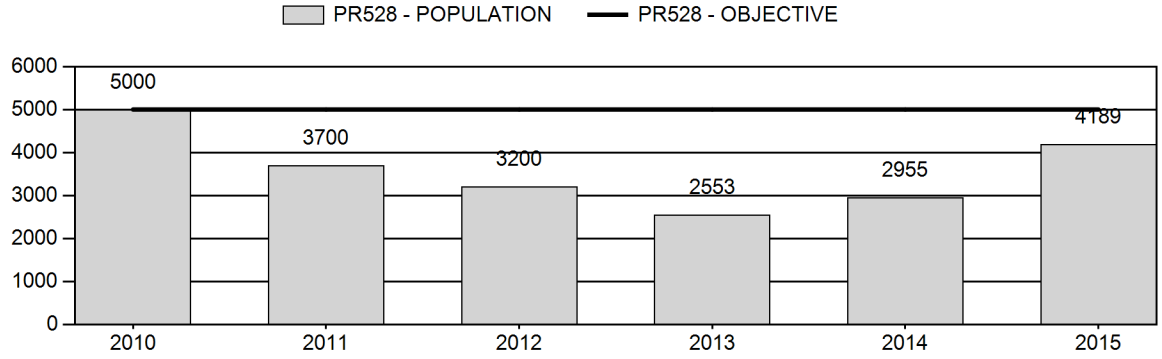
	2010 - 2014 Average	2015	2016 Proposed
Population:	3,482	4,189	4,500
Harvest:	781	295	300
Hunters:	863	327	375
Hunter Success:	90%	90%	80%
Active Licenses:	921	341	375
Active License Success:	85%	87%	80%
Recreation Days:	2,915	1,303	4
Days Per Animal:	3.7	4.4	0.0
Males per 100 Females	36	37	
Juveniles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

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

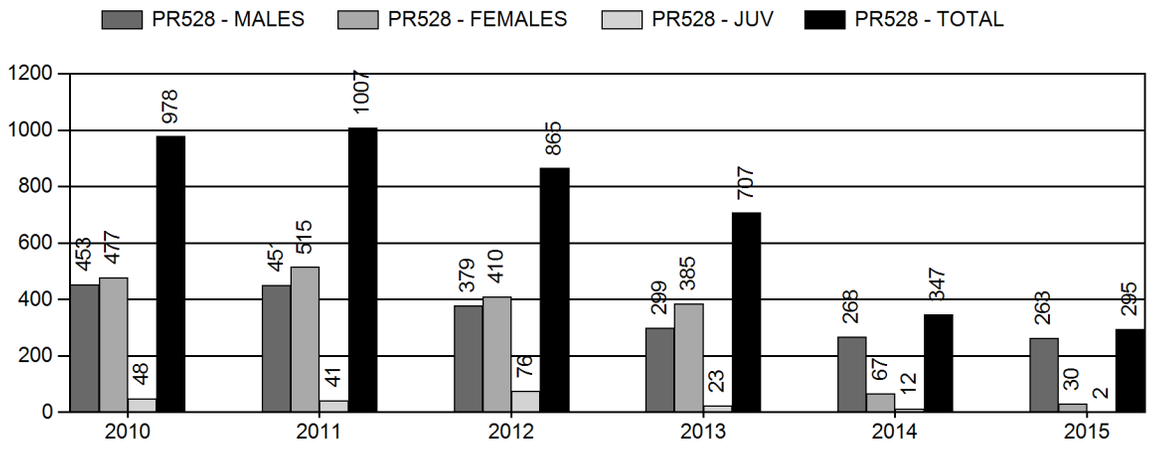
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

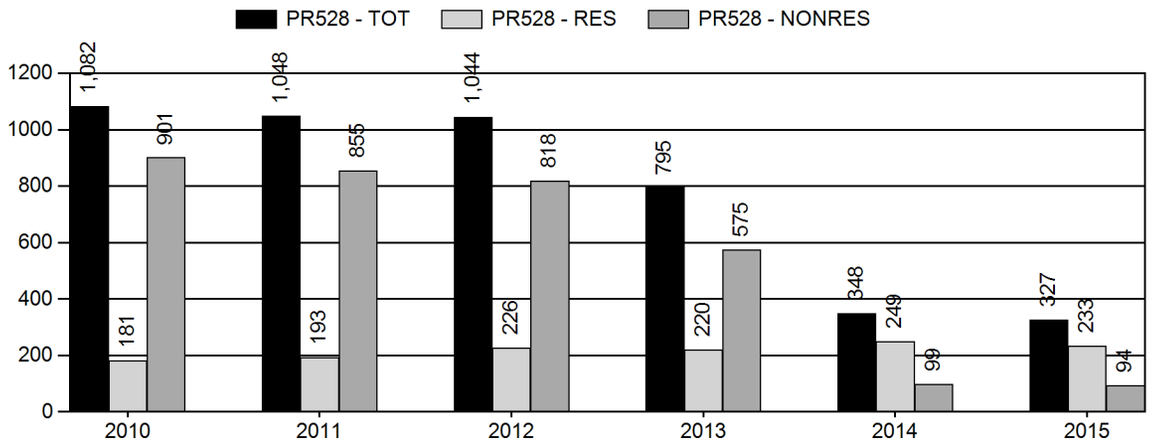
Population Size - Postseason



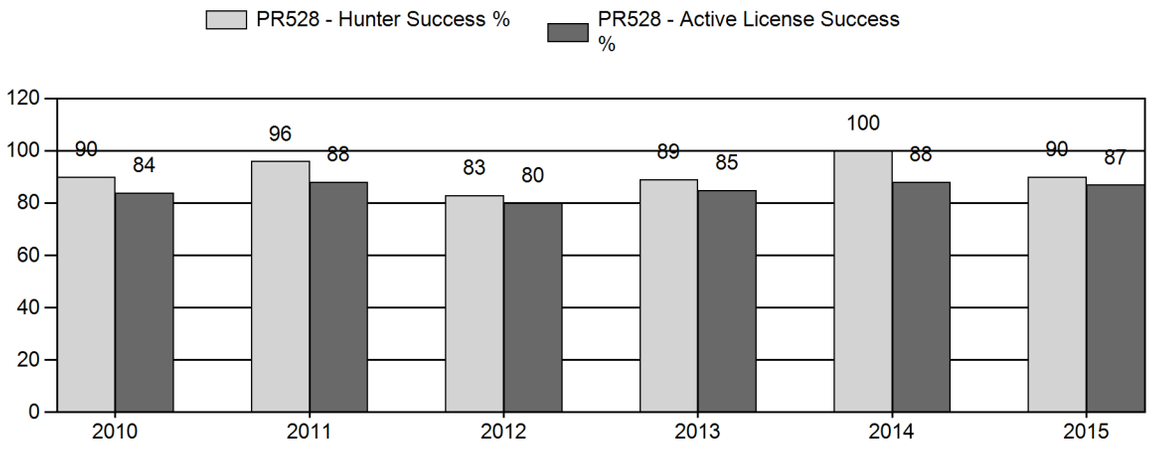
Harvest



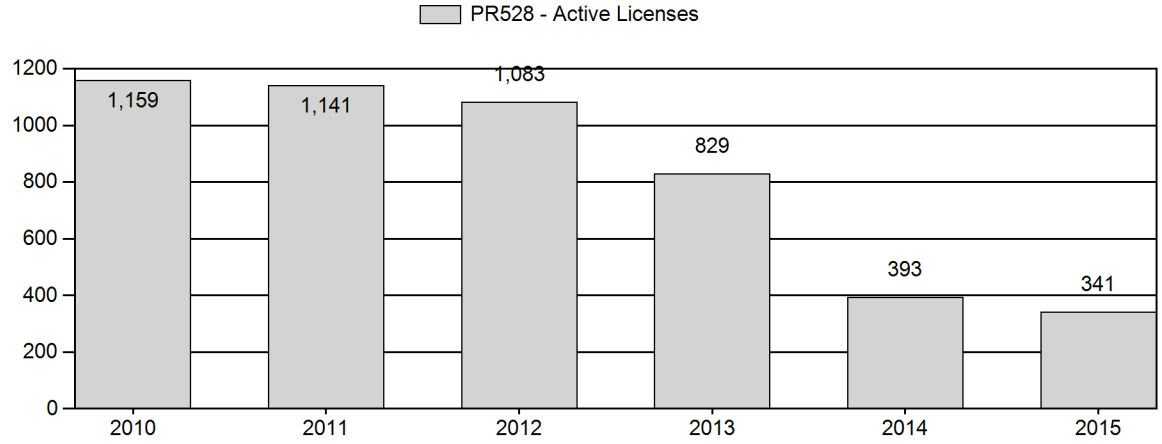
Number of Hunters



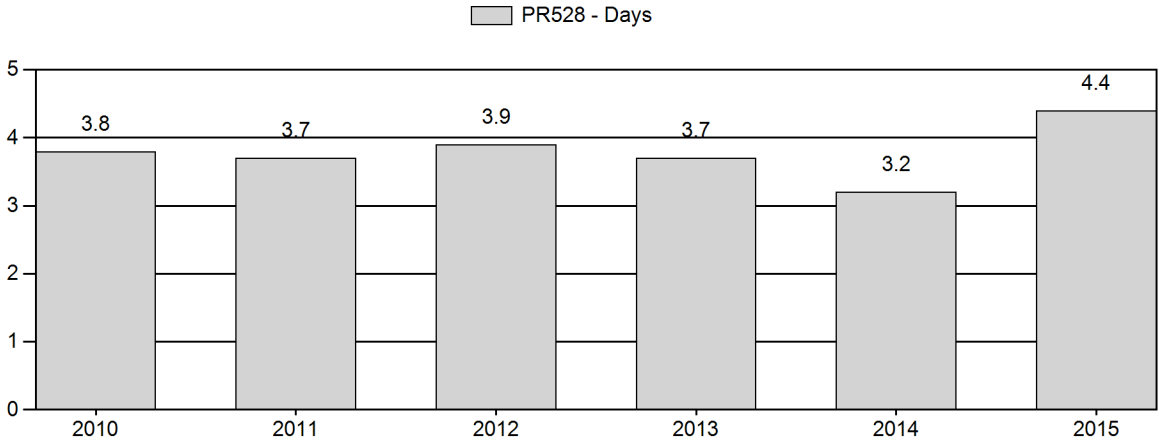
Harvest Success



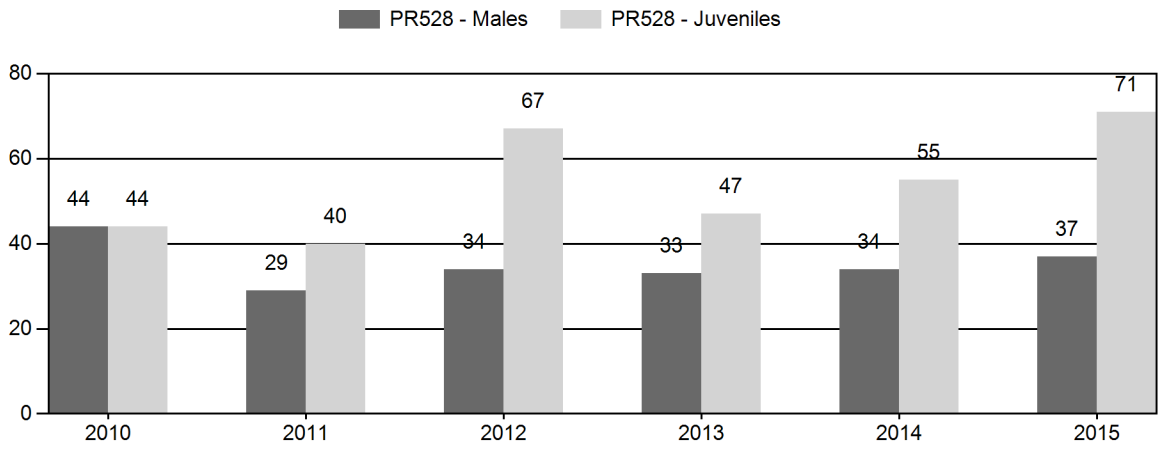
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

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

2016 HUNTING SEASONS
ELK MOUNTAIN PRONGHORN (PR528)

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

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

Management Evaluation

Current Postseason Population Management Objective: 5,000 (4,000 – 6,000)
Management Strategy: Recreational
2015 Postseason Population Estimate: 4,200
2016 Proposed Postseason Population Estimate: 4,500
2015 Hunter Satisfaction: 92% Satisfied, 6% Neutral, 2% Dissatisfied

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

Herd Unit Issues

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

Weather

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

Habitat

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

Field Data

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

Harvest Data

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

Population

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

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

We rated this model as fair, and biologically defensible in our evaluation. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model (Morrison 2012).

Management Summary

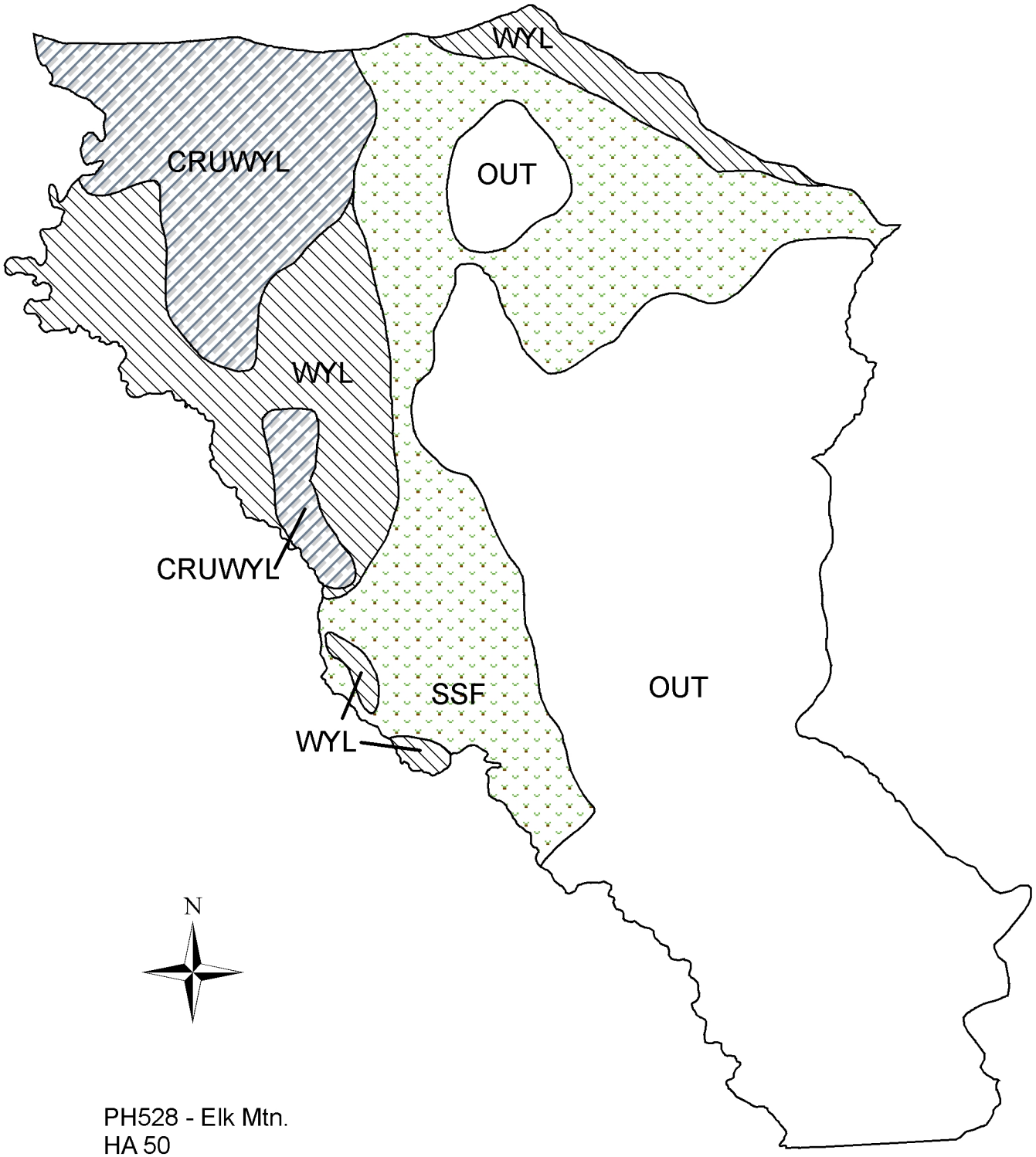
The reduced numbers for the Type 6 license numbers were maintained again for the 2015 season. Liberal seasons in the recent past and severe winters have reduced pronghorn numbers in this herd unit during the past 5 years. The decreased license numbers will assist in increasing the population toward the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

Literature Cited

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

Bibliography of Herd Specific Studies

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



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

2015 - JCR Evaluation Form

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

HERD: PR529 - BIG CREEK

HUNT AREAS: 51
PREPARED BY: WILL SCHULTZ

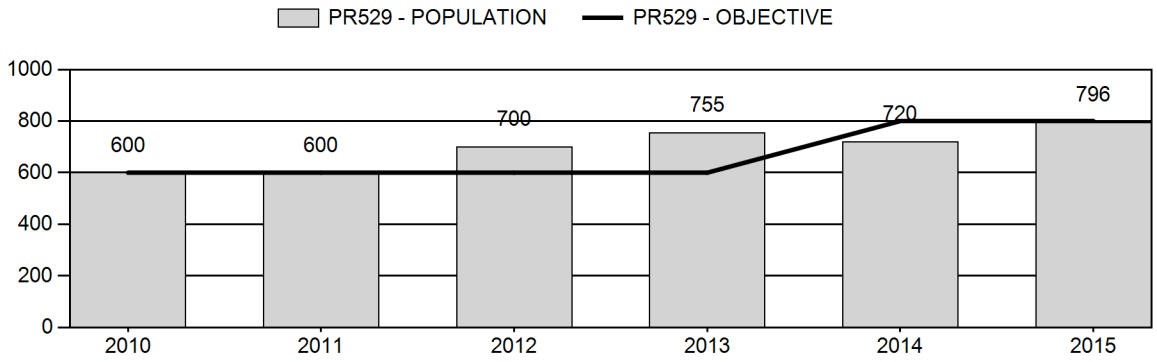
	2010 - 2014 Average	2015	2016 Proposed
Population:	675	796	800
Harvest:	55	78	100
Hunters:	55	78	100
Hunter Success:	100%	100%	100 %
Active Licenses:	64	91	100
Active License Success:	86%	86%	100 %
Recreation Days:	193	235	300
Days Per Animal:	3.5	3.0	3
Males per 100 Females	42	60	
Juveniles per 100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

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

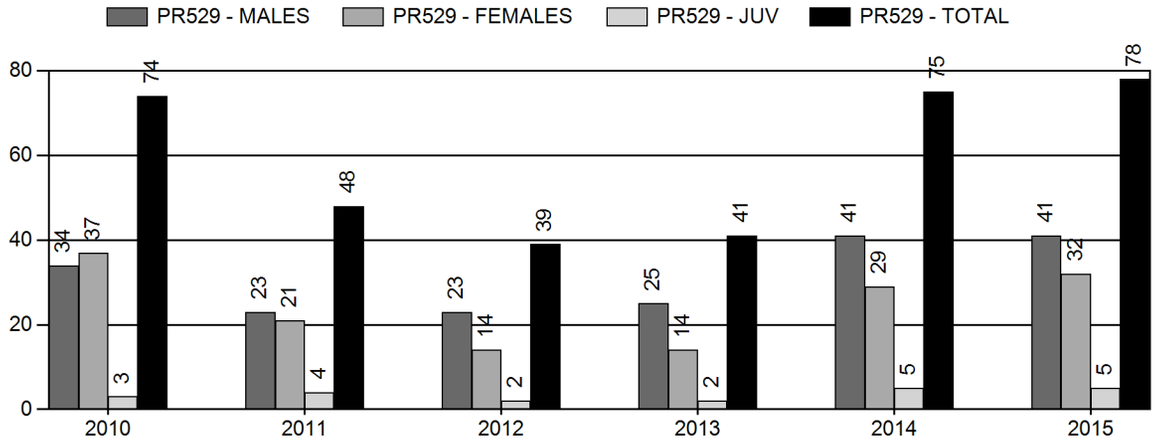
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

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

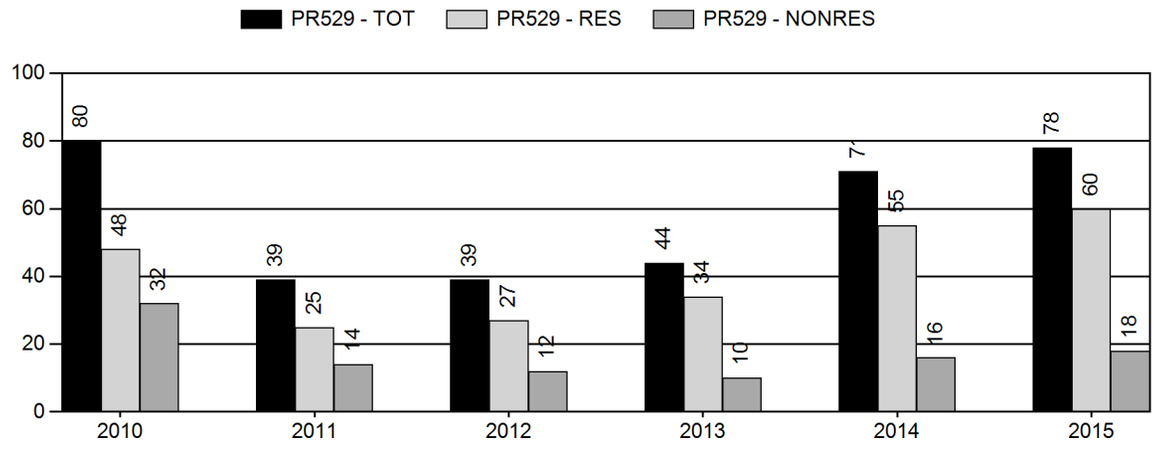
Population Size - Postseason



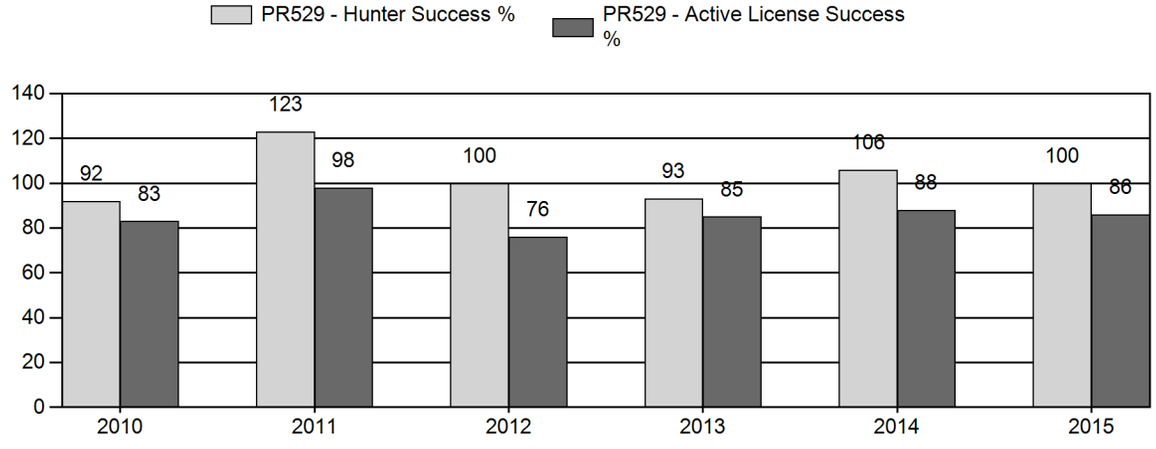
Harvest



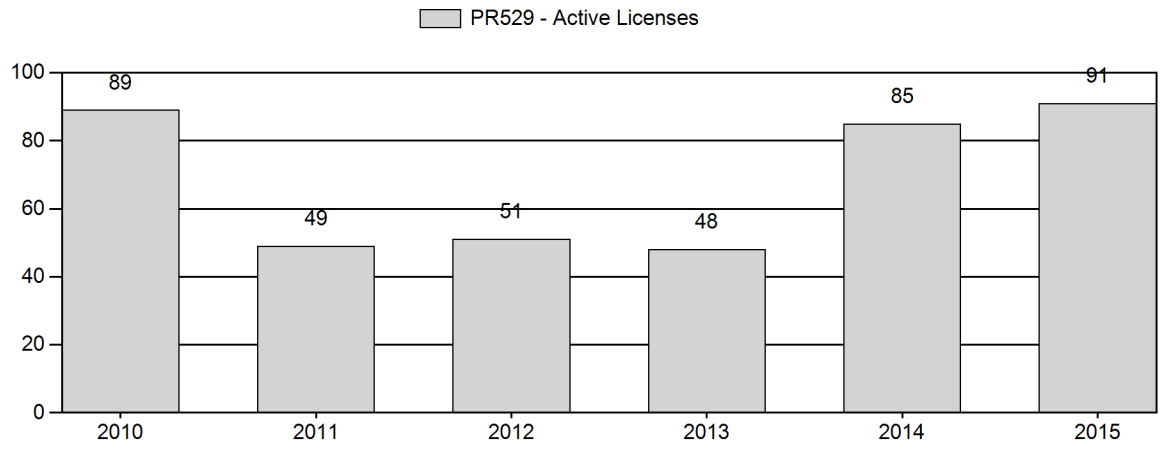
Number of Hunters



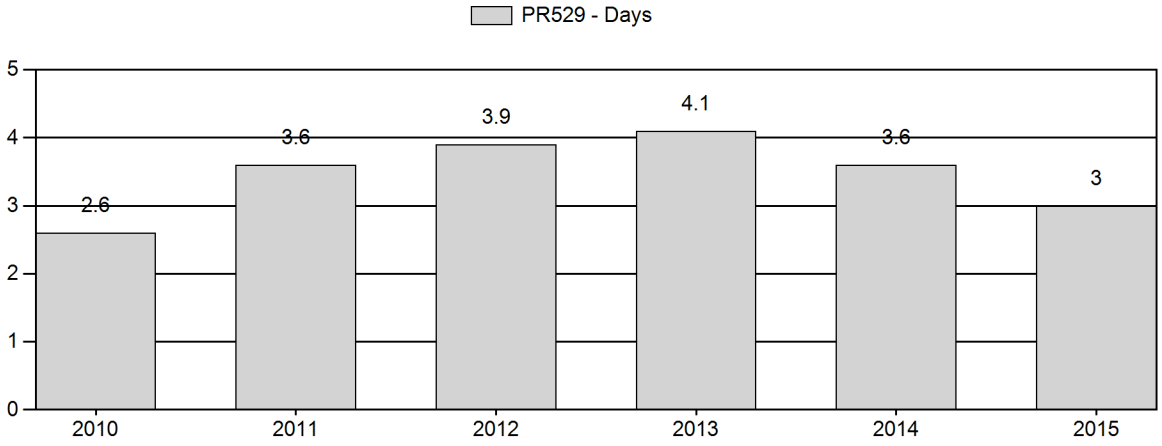
Harvest Success



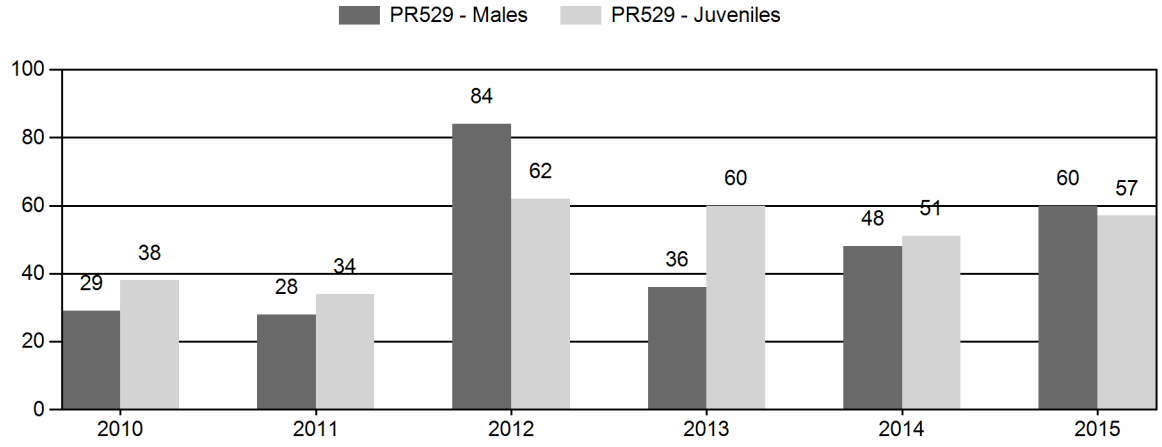
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2010 - 2015 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

		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
2010	700	13	49	62	17%	214	60%	82	23%	358	361	6	23	29	± 5	38	± 6	30
2011	650	15	33	48	17%	170	62%	57	21%	275	446	9	19	28	± 6	34	± 6	26
2012	750	32	60	92	34%	110	41%	68	25%	270	441	29	55	84	± 16	62	± 13	34
2013	800	8	43	51	18%	141	51%	84	30%	276	503	6	30	36	± 8	60	± 11	44
2014	802	42	87	129	24%	271	50%	137	26%	537	501	15	32	48	± 5	51	± 5	34
2015	882	58	91	149	28%	248	46%	141	26%	538	561	23	37	60	± 6	57	± 6	36

2016 HUNTING SEASONS
BIG CREEK PRONGHORN (PR529)

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

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

Management Evaluation

Current Postseason Population Management Objective: 800 (640 – 960)
Management Strategy: Recreational
2015 Postseason Population Estimate: 800
2016 Proposed Postseason Population Estimate: 810
2015 Hunter Satisfaction: 89% Satisfied, 9% Neutral, 2% Dissatisfied

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

Herd Unit Issues

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

Weather

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

Habitat

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

Field Data

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

Harvest Data

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

Population

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

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

Management Summary

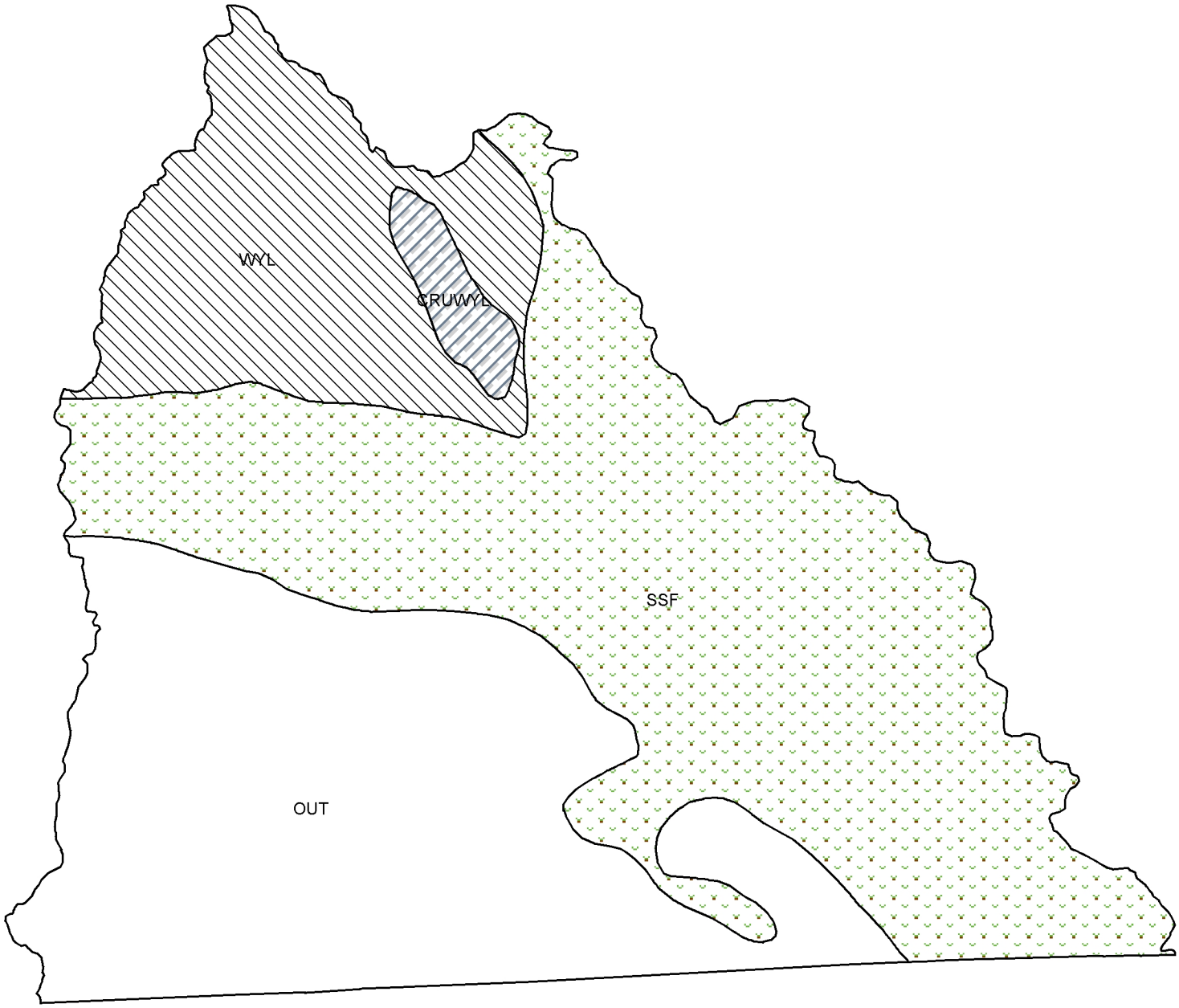
A total of 50 Type 1 and 50 Type 6 licenses were maintained in 2016 for the Big Creek herd unit. The postseason population estimate was at the management object for 2015 and predicted to be maintained at that level in 2016 with the prescribed hunting season. Interstate movement of pronghorn complicates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

Literature Cited

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

Bibliography of Herd Specific Studies

None.



PH529 - Big Creek
HA 51
Revised - 7/87