

2017 - JCR Evaluation Form

SPECIES: Pronghorn

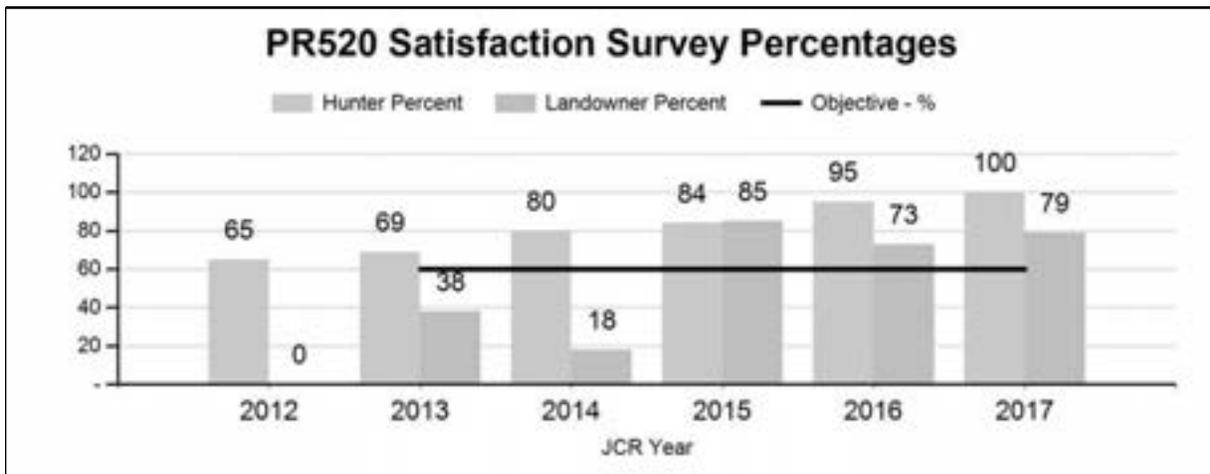
PERIOD: 6/1/2017 - 5/31/2018

HERD: PR520 - CHALK BLUFFS

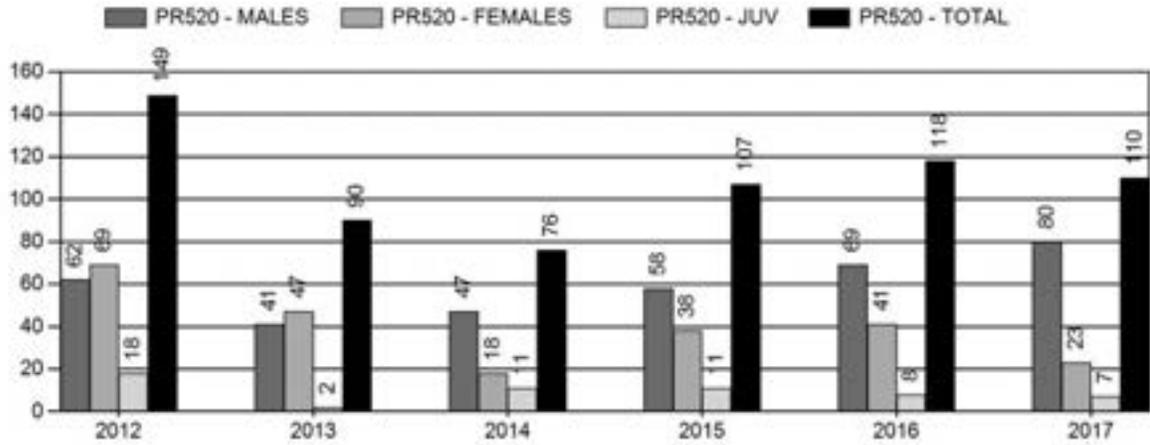
HUNT AREAS: 111

PREPARED BY: BRYAN LAMONT

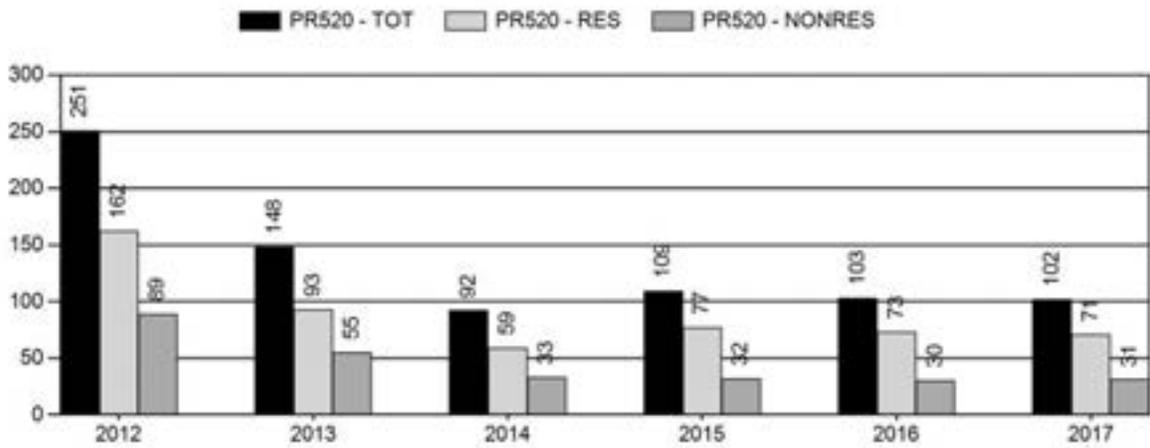
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Hunter Satisfaction Percent	77%	100%	85%
Landowner Satisfaction Percent	56%	79%	85%
Harvest:	108	110	150
Hunters:	141	102	130
Hunter Success:	77%	108%	115%
Active Licenses:	171	124	154
Active License Success:	63%	89%	97%
Recreation Days:	624	318	450
Days Per Animal:	5.8	2.9	3
Males per 100 Females:	26	28	
Juveniles per 100 Females	57	62	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			30%
Number of years population has been + or - objective in recent trend:			4



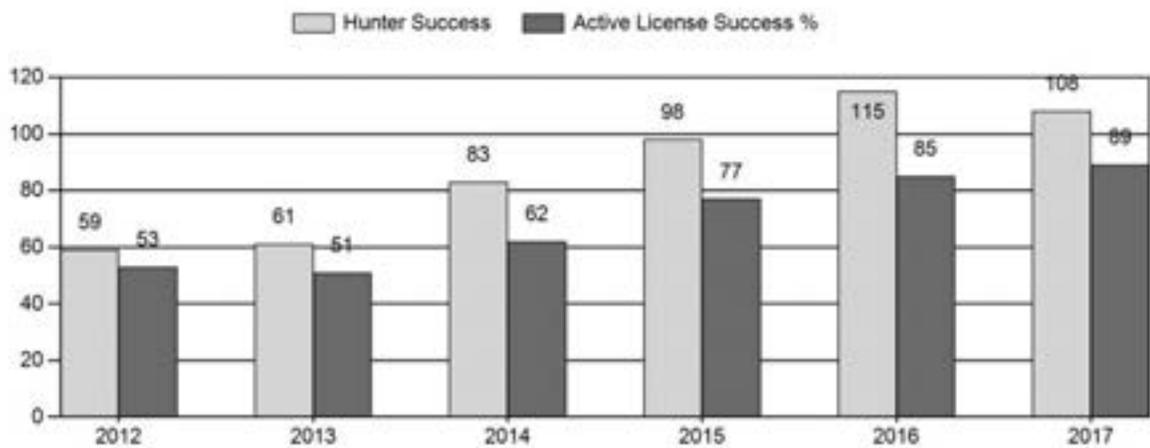
Harvest



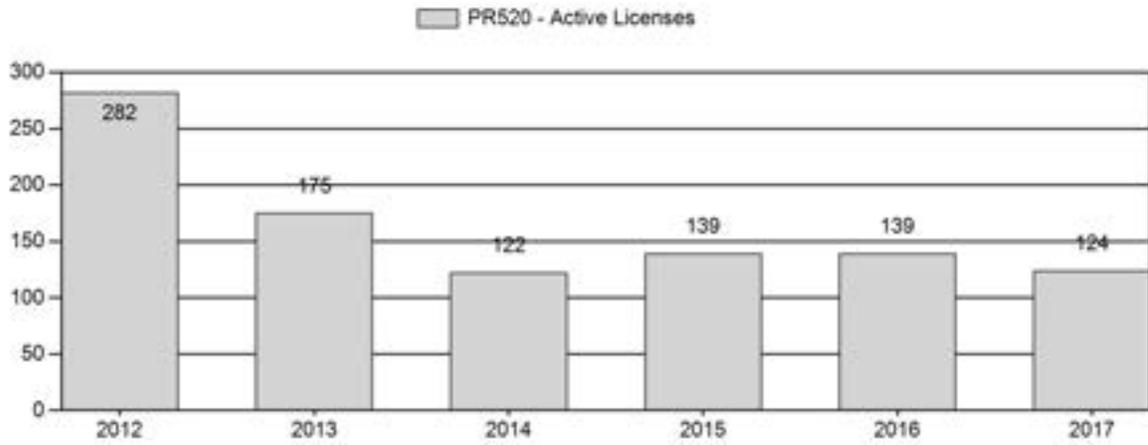
Number of Active Licenses



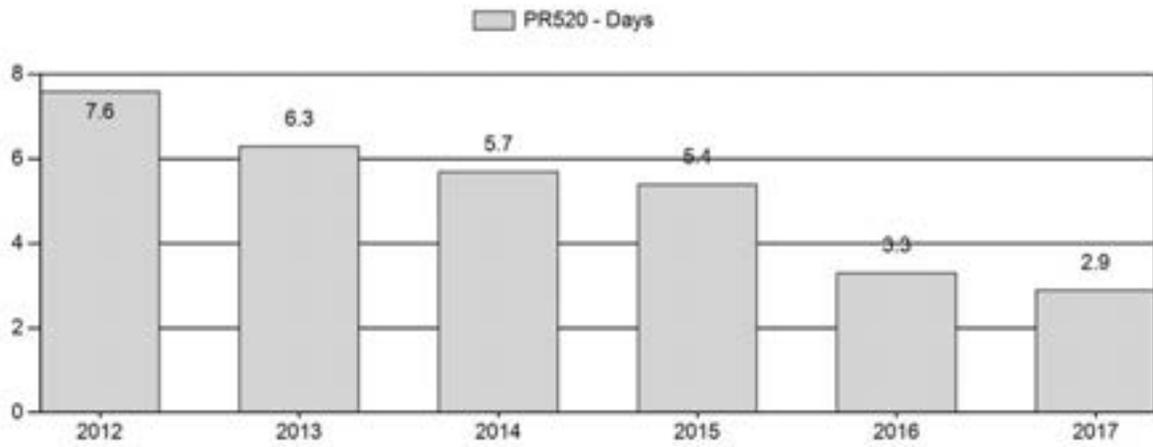
Harvest Success



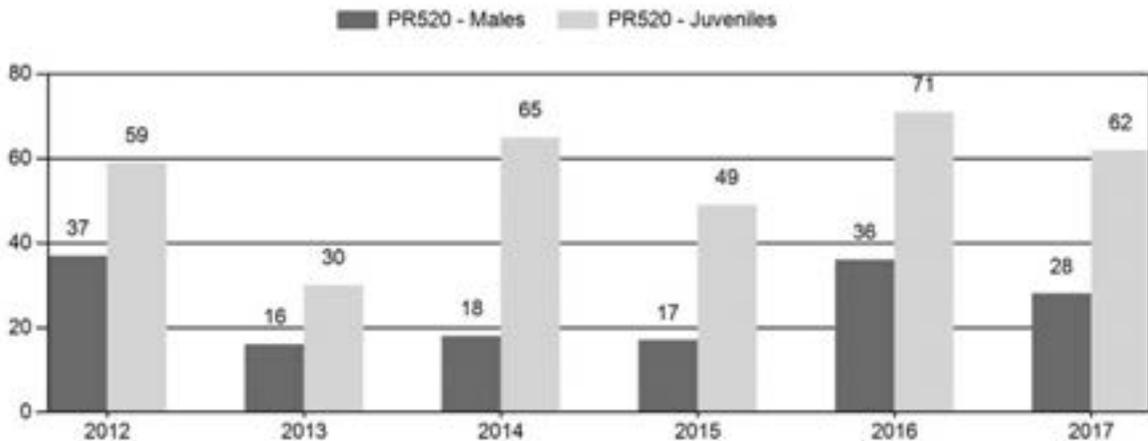
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR520 - CHALK BLUFFS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	0	4	11	15	19%	41	51%	24	30%	80	285	10	27	37	± 0	59	± 0	43
2013	0	0	11	11	11%	69	68%	21	21%	101	357	0	16	16	± 0	30	± 0	26
2014	0	2	7	9	10%	49	54%	32	36%	90	0	4	14	18	± 0	65	± 0	55
2015	0	3	10	13	10%	75	60%	37	30%	125	283	4	13	17	± 0	49	± 0	42
2016	0	26	23	49	17%	138	48%	98	34%	285	367	19	17	36	± 0	71	± 0	52
2017	0	10	26	36	15%	129	53%	80	33%	245	367	8	20	28	± 0	62	± 0	48

**2018 HUNTING SEASONS
CHALK BLUFFS PRONGHORN (PR520)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
111	1	Sept. 20	Oct. 14	150	Limited quota	Any antelope
111	1	Oct. 15	Dec. 31		Limited quota	Doe or fawn
111	6	Sept. 20	Dec.31	100	Limited quota	Doe or fawn
Archery		Aug. 15	Sept. 19			Refer to Section 3 in Antelope Regulations

Hunt Area	Type	Change from 2017
111	1	+50
111	6	+50
Herd Unit Totals	1 & 6	+100

Management Evaluation

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

Management Strategy: Private land

2017 Hunter Satisfaction Estimate: 100%

2017 Landowner Satisfaction Estimate: 79% (48% response; minimum of 25% required)

Most Recent 5-Year Average Hunter Satisfaction Estimate: 86%; **3-Year:** 93%

Most recent 5-Year Average Landowner Satisfaction Estimate: 60%; **3-Year:** 80%

Herd Unit Issues

Historically, the management objective for the Chalk Bluffs Pronghorn Herd Unit was a numeric post-season population objective. Starting in the 2013 season, this was changed to a landowner and hunter satisfaction based objective with a private land management strategy. This change reflects public involvement during the 2013 herd objective review process. Currently, we do not generate a post-season population estimate for the following reasons: 1) open population with Colorado and Nebraska, 2) restricted access due to urban encroachment and industrial gas development, which constrains our ability to influence harvest, 3) herd unit comprised of predominantly private land. 4) poor classification data, which continues to be well below the adequate sample size and, 5) no reliable working model (i.e. low sample size for classification, no juvenile or adult mortality estimates, etc.). The expansion of oil, gas and rural development has become an increasing problem in the past 5 years. It appears this development shifted pronghorn movement and habitat occupation.

Weather

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

were above average at all elevations throughout southeast Wyoming during spring months and then became dry and hot from July through November. Timing of precipitation and amounts received during key growth periods for cool season grasses and preferred transitional range and winter range shrub species was good. While early season growing conditions were optimal, late summer and fall precipitation was 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 in 2017 was similar to 2016, with an increase in the amount of precipitation received and the timeliness of when it was received. Precipitation received in April and May resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. However, precipitation events decreased and temperatures increased as the summer progressed, resulting in drier than normal conditions from July through August. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500 feet. The presence of cheatgrass constrains habitat managers by 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 influence population management for big game species.

Field Data

Due to our inability to adequately collect field data (i.e. classification data) for this herd, there is little confidence in age/sex ratios derived from classification data. The number of pronghorn classified each August is always well below the adequate sample size needed to generate a reliable population estimate. Typically, the majority of the Chalk Bluffs pronghorn herd remains in Colorado during survey time, so it is difficult to infer any population parameters. Managers will continue to primarily utilize classification data to provide hunters anecdotal information (e.g. distribution, buck quantity and quality) for the upcoming hunting season, but not to establish a population estimate.

In the adjacent Hawk Springs Herd Unit, fawn ratios in 2017 remained about the same as the previous 5-year average, but were slightly down from 2014 and 2015 ratios. The Hawk Springs herd has experienced a slight increase in the population, and it is expected the same is true for the Chalk Bluffs herd unit. However, without a reliable population estimate, continued interstate movement with Colorado, and an increase in industrial and residential expansion, license numbers will remain relatively conservative, while continuing to provide opportunity for hunters.

Harvest Data

Type 1 license success in 2017 (96%) increased compared to 2016 (84%), and was well above the 5-year average of 63%. Effort in 2017 (2.8 days/harvest) was similar to 2016 (2.9 days/harvest), but dropped drastically compared to 2015 (6.5 days/harvest), and was slightly lower than the five-year state-wide effort of 3.9 days/harvest. The increase in Type 1 hunter success and decrease in hunter effort was most likely the result of increased pronghorn movement from Colorado into Wyoming.

Type 6 license success in 2017 (75%) was slightly lower than 2016 (81%), but significantly higher than the five-year average (61%). Type 6 license effort in 2017 (3.4 days/harvest) was slightly lower than 2016 (4.2 days/harvest), significantly lower than the five-year average (5.7 days/harvest) and comparable to the five-year state-wide effort (3.9 days/harvest).

There could be several possibilities for the increase in overall hunter success and decreased effort required to harvest: 1) the population increased, and/or 2) there was increased movement into Wyoming from Colorado, and/or 3) landowner's may have provided increased access, and/or 4) hunters may have waited later in the season (Nov/Dec) to harvest, presumably when increased numbers of pronghorn moved into Wyoming from Colorado and access was easier to obtain.

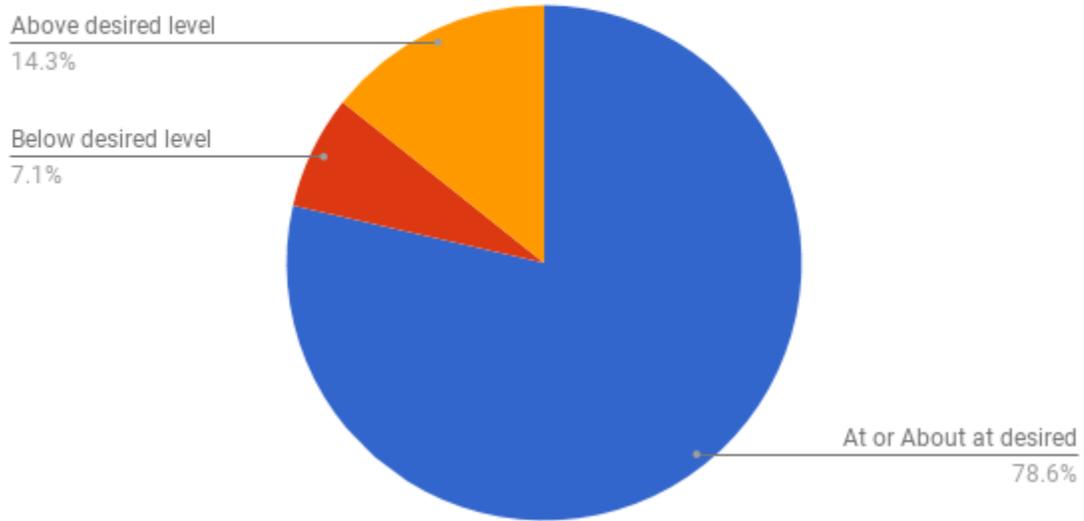
Management Summary

As a result of an increase in overall hunter success, decrease in hunter effort, and a continued high level of hunter and landowner (Appendix A) satisfaction, there will be an increase of 50 Type 1 and 6 licenses, for a total increase of 100 licenses for the 2018 hunting season.

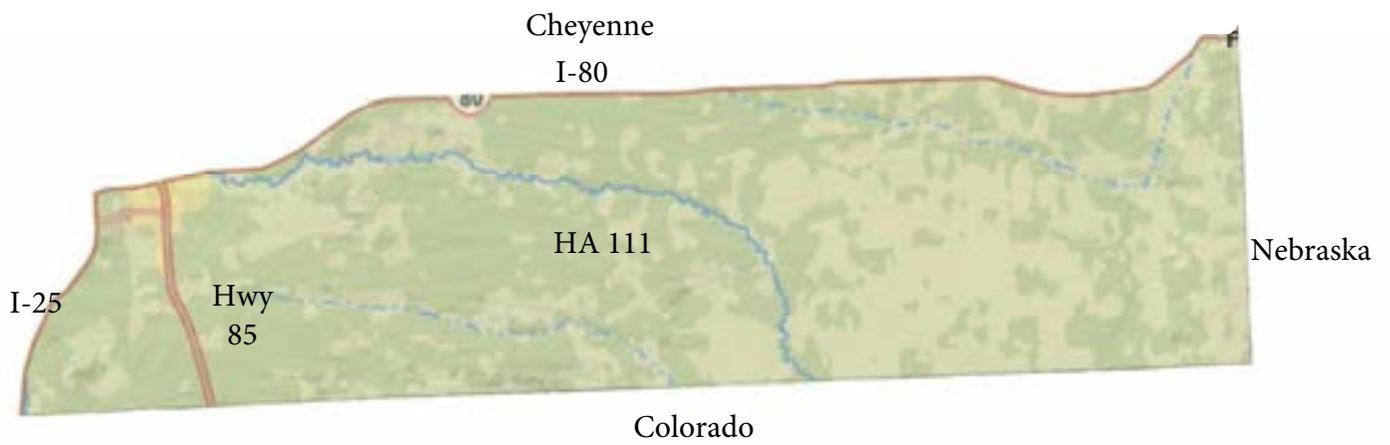
Landowners continue to be in favor of the late season hunt from November 15 – December 31 to address any damage concerns, although, to simplify the date structure, we will eliminate the gap between October 15th and November 15th and allow the season to begin on September 20th and end on December 31st for both Type 1 and 6 licenses. Type 1 license limitations will continue to be in place to allow “any antelope” hunting from September 20th- October 14th, and then “doe or fawn” hunting from October 15th-December 31st. Type 6 license date structure will allow “doe or fawn” hunting from September 20th–December 31st. Based on harvest data from past seasons, and an increase in both Type 1 and 6 licenses for the 2018 hunting season, we predict a 2018 harvest of 80 bucks, 60 does, and 20 fawns, for a total harvest of 160 pronghorn.

Appendix A

Please indicate your satisfaction level with the current pronghorn (PR520) population for Hunt Area 111



PR520 Chalk Bluffs Pronghorn Herd
HA111



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR521 - HAWK SPRINGS

HUNT AREAS: 34

PREPARED BY: MARTIN HICKS

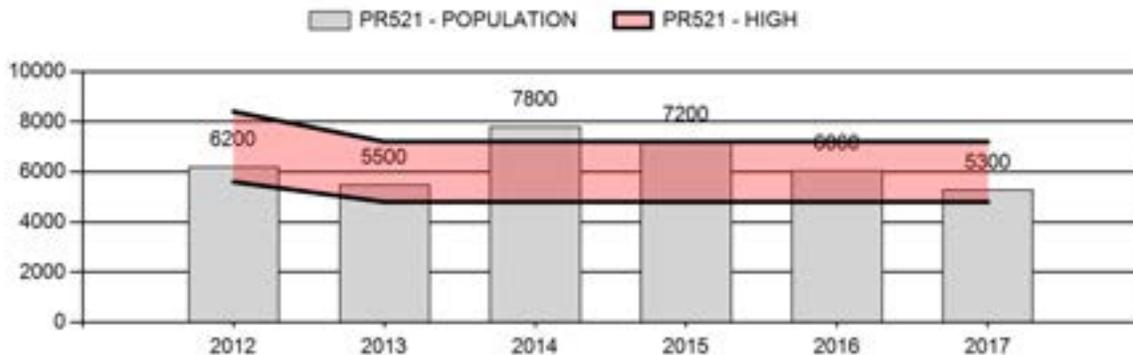
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	6,552	5,300	4,800
Harvest:	1,132	1,162	1,045
Hunters:	1,300	1,584	1,440
Hunter Success:	87%	73%	73%
Active Licenses:	1,421	1,613	1,460
Active License Success:	80%	72%	72%
Recreation Days:	4,563	6,141	5,000
Days Per Animal:	4.0	5.3	4.8
Males per 100 Females	45	44	
Juveniles per 100 Females	52	42	

Population Objective ($\pm 20\%$) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-11.7%
Number of years population has been + or - objective in recent trend:	0
Model Date:	02/06/2018

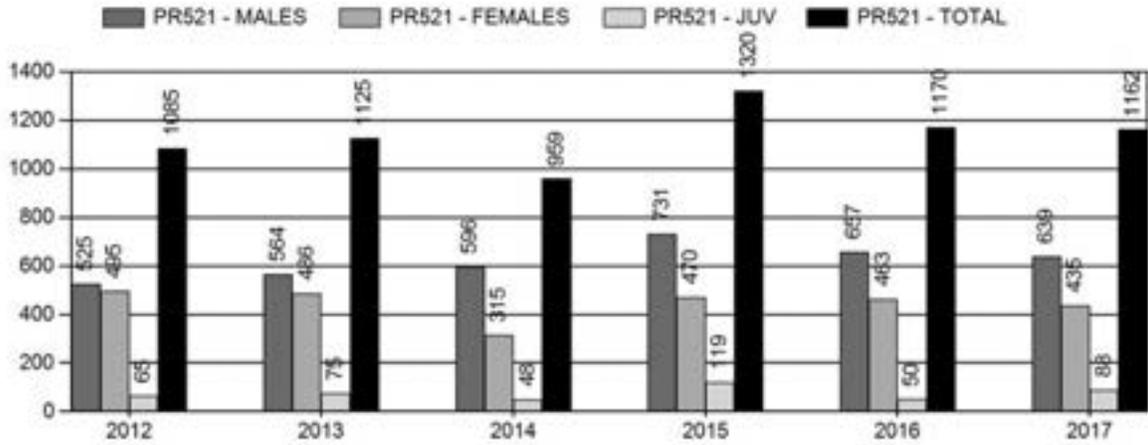
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	12%	11%
Males ≥ 1 year old:	55%	72%
Total:	17%	17%
Proposed change in post-season population:	-13%	-10%

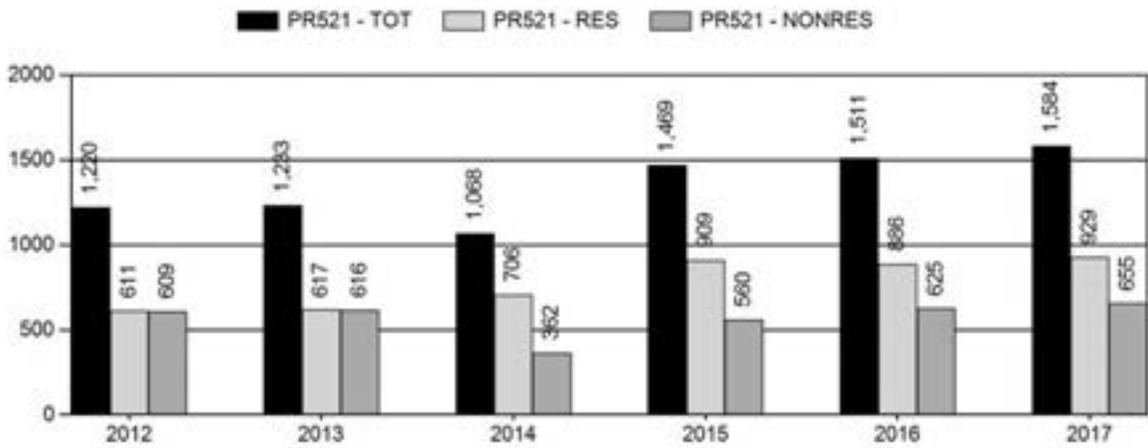
Population Size - Postseason



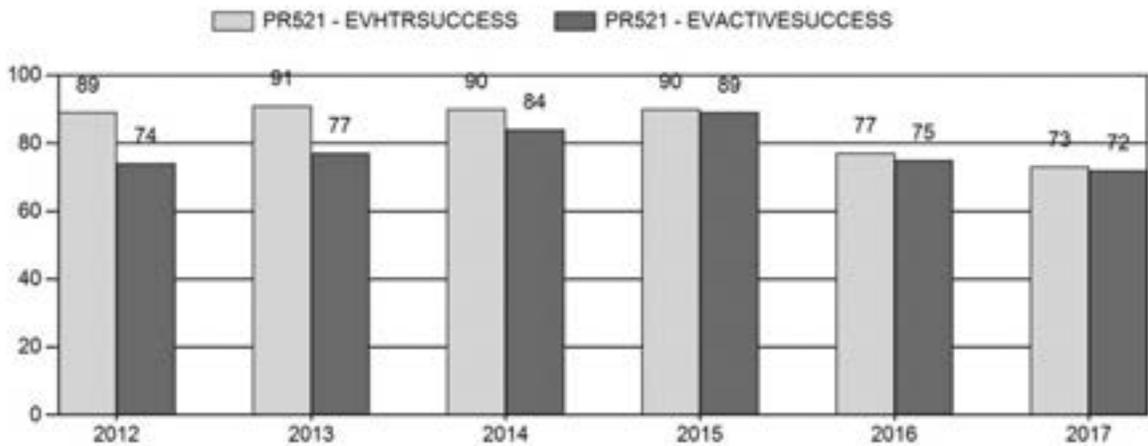
Harvest



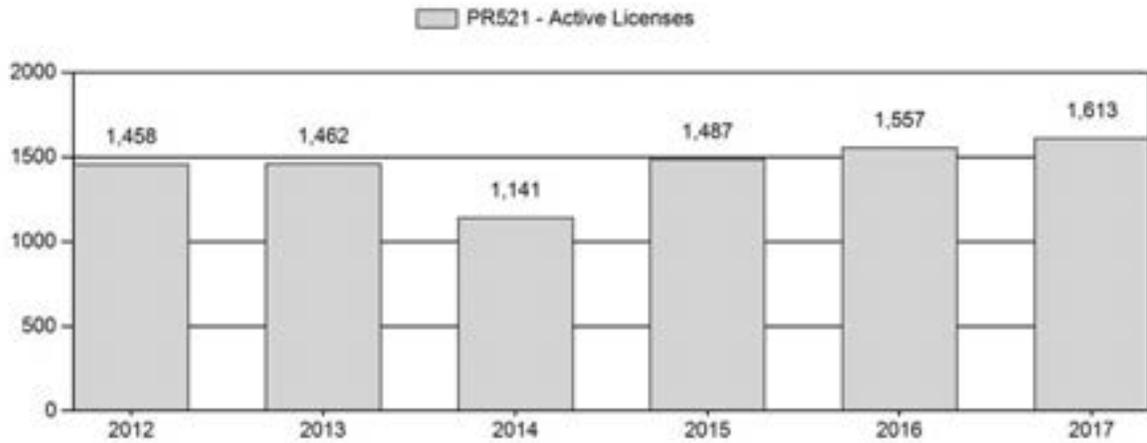
Number of Active Licenses



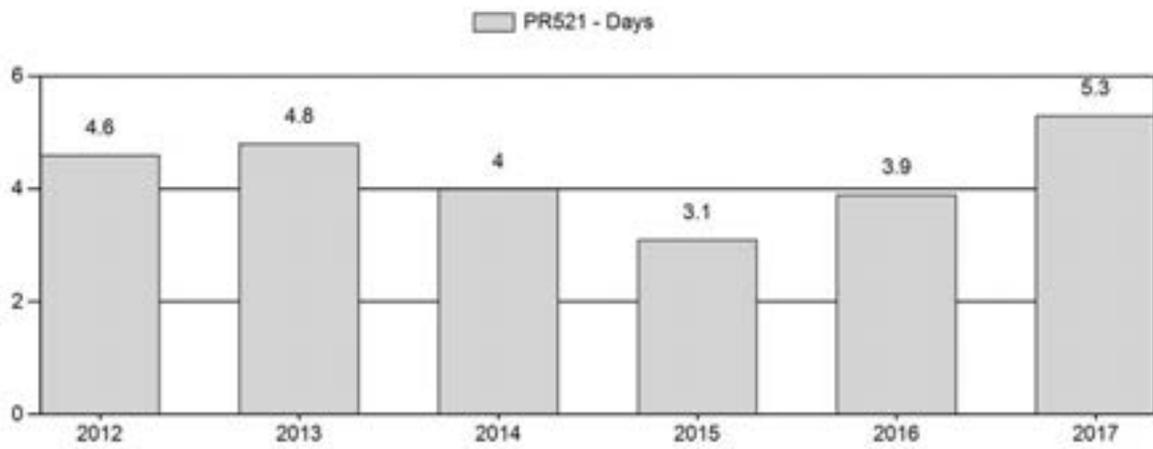
Harvest Success



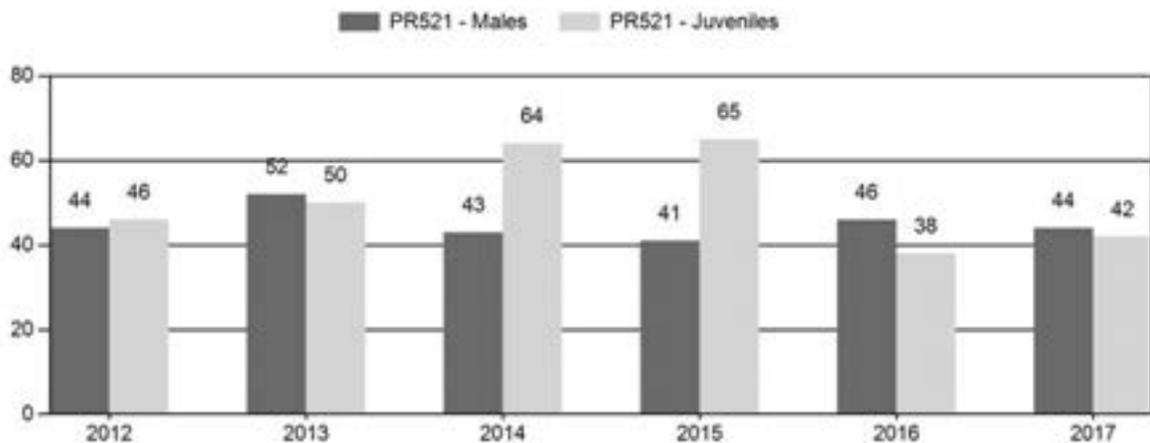
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR521 - HAWK SPRINGS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Int	100 Fem	100 Int	100 Adult
2012	7,400	94	132	226	23%	517	53%	240	24%	983	1,297	18	26	44	± 5	46	± 6	32
2013	6,800	88	201	289	26%	558	50%	279	25%	1,126	1,184	16	36	52	± 6	50	± 6	33
2014	8,800	59	155	214	21%	498	48%	317	31%	1,029	1,151	12	31	43	± 5	64	± 7	45
2015	8,600	117	179	296	20%	729	49%	472	32%	1,497	1,849	16	25	41	± 4	65	± 6	46
2016	7,300	126	194	320	25%	696	54%	262	21%	1,278	1,243	18	28	46	± 5	38	± 4	26
2017	6,600	76	187	263	24%	603	54%	251	22%	1,117	1,409	13	31	44	± 5	42	± 5	29

**2018 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	700	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 2017
34	1	0
34	6	-200
Total		-200

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: ~5,300

2018 Proposed Postseason Population Estimate: ~4,800

2017 Hunter Satisfaction: 77% satisfied, 12% Neutral, 11% Dissatisfied

Herd Unit Issues

The management objective for the Hawk Springs Herd Unit is a post-season population objective of 6,000 pronghorn. The objective was changed in 2014 from 7,000 to 6,000 and Hunt Areas 34-36 were combined into Hunt Area 34. These changes were a direct result of the herd unit objective review process in 2013. The management strategy is recreational management with a pre-season buck ratio range of 30-59 bucks:100 does.

The 2017 post-season population estimate was approximately 5,300 pronghorn putting the population 12% below 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 past two biological years have seen a dramatic decrease in fawn production which, coupled with liberal doe seasons, has moved this population towards the lower end of the objective.

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 average at all elevations throughout southeast Wyoming during spring months then became dry and hot from July through November, which is the typical pattern. However, there was one major hail storm that hit along the Interstate Highway 25 corridor in early June that most likely resulted in higher than average fawn mortality. This became evident when pre-season classifications were done in August results indicated fawn production was 20% below the five-year average. 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

Based on spring precipitation levels, forage availability was similar to past years that experienced average weather conditions. 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. Consequently this data should not heavily influence population management for any particular big game species.

Field Data

The Hawk Spring Pronghorn Herd Unit has experienced a steady decline in population since 2014 as a result of increased harvest on the female segment of the population and average to below average fawn production (5-year average 51 fawns:100 does). Doe/fawn license issuance has fluctuated around 800 licenses for the past 5 years with the intent to bring the population towards objective. The 2017 preseason buck ratios of 44 bucks:100 does were slightly lower compared to 2016 (46 bucks:100 does) and similar to the 5-year average (45 bucks:100 does)

but still within the upper recreational management range of 20-59 bucks:100 does. However, poor fawn production in 2016 resulted in 2017 yearling bucks ratios (13 yearling bucks:100 does) below the five-year average of 16 yearling buck:100 does). Adult buck ratios are anticipated to decrease in subsequent years given poor fawn recruitment in 2016 and 2017. Type 1 licenses remained at 1,000 for the 2017 season to take advantage of the surplus bucks, however, the number of active licenses in 2017 decreased slightly compared to 2016 and were well below the number of hunter's that went to the field in 2015 when there were 100 fewer Type 1 licenses, which suggests the hunter saturation points has been reached. The sample size for field check tooth data collected in the field was too small to provide any relevancy for population parameters. Of the hunters surveyed in 2017, 77% were satisfied with their hunt, a decrease from 2016's level of 88%. Based on comments in the field during the 2017 hunting season hunters had difficulty finding pronghorn on accessible property, particularly lands enrolled into the Department's Access Yes program compared to previous years

Harvest Data

Active license success of 72% in 2017 decreased compared to 2016 (75%) and the five-year average of 80%. Hunter effort of 5.3 days per harvest was up from 2016 (3.9 days per harvest) and the five-year average of 4.0 days per harvest. Access is still difficult to obtain in the southern portion of the herd unit. In the past, the Nimmo HMA and over several thousand acres of private land enrolled into walk-in areas has been enough to maintain adequate success. However, based on conversations in the field and department personnel observations pronghorn densities were down on Access Yes properties and state land. These trends in the harvest data, decrease in success and in increase in effort, supports population simulations that the herd continues to slowly decrease.

Population

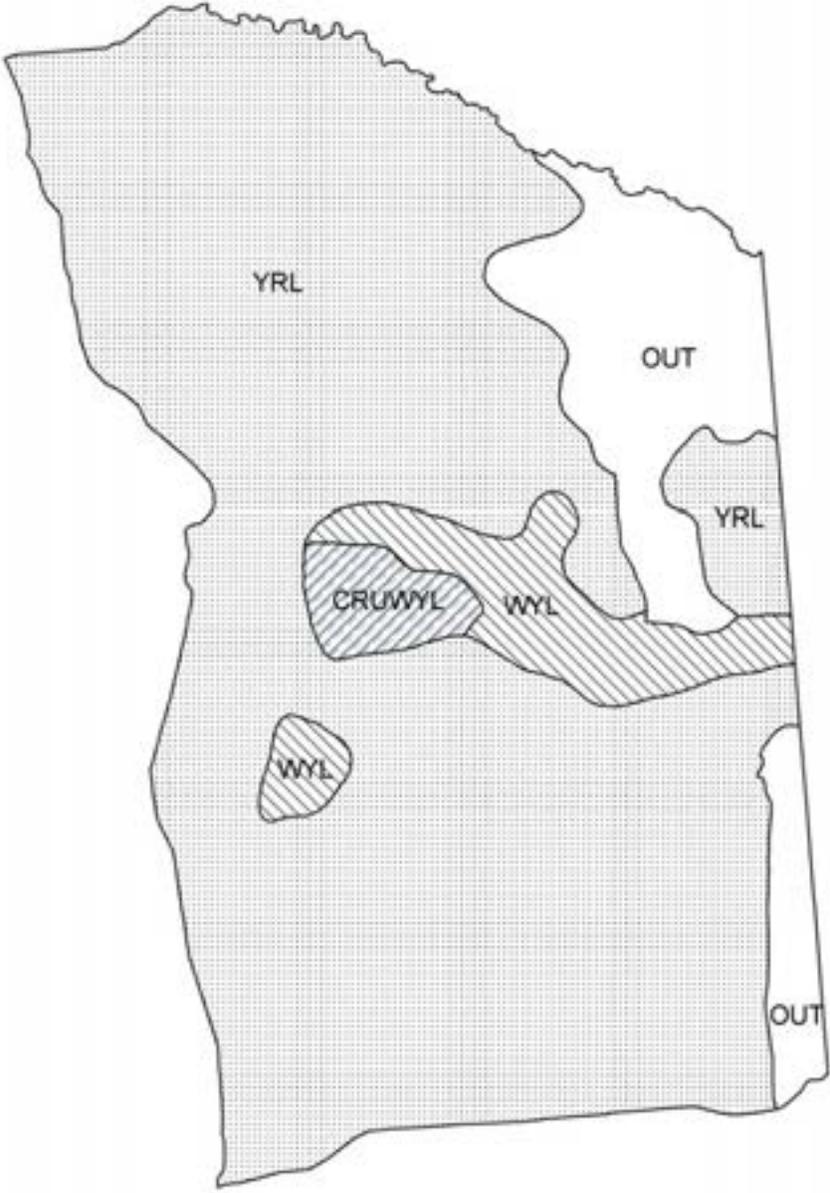
The "Constant Juvenile – Constant Adult Survival" (CJ,CA) spreadsheet model was chosen for the post season population estimate of this herd. Until survival data has been collected it will likely remain the model of choice. The model did have the lowest AIC score, and the population estimate appears reasonable. The line-transect in 2007 was ignored because it doubled the population in three years and given poor fawn recruitment this is biologically improbable. A line-transect is scheduled for the end of the 2017 biological year. The independent estimates of 2001 and 2003 are similar to model estimates, which the model does run through. The model has predicted a decreasing trend since 2007; given poor fawn production in 2016 and 2017 and consistent harvest of around 450 doe pronghorn, this seems plausible. WGFD personnel observations indicate that pronghorn densities would support this trend, particularly the central and southern portions of the herd unit (basically old Hunt Areas 35 and 36). Trends in harvest statistics (decrease in success, and an increase in effort) suggest the population is declining. The model is trying to align with a slowly decreasing buck ratio which forces the model to simulate a decreasing population. With an increase in harvest and a decline in buck ratios this appears plausible. This model is ranked fair since the only data available is harvest and classification data and the most recent LT estimate is from back in 2003.

Management Summary

The 2018 season is designed to maintain not only the population within the objective but maintain buck ratios within the recreational management range as well. There will be 1,000

Type 1 and 700 Type 6 licenses available to achieve this goal. Given previous harvest rates and the 1,700 licenses available we expect to harvest approximately 1,000 pronghorn, resulting in a post-season population estimate of 4,800 pronghorn.

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



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR522 - MEADOWDALE

HUNT AREAS: 11

PREPARED BY: MARTIN HICKS

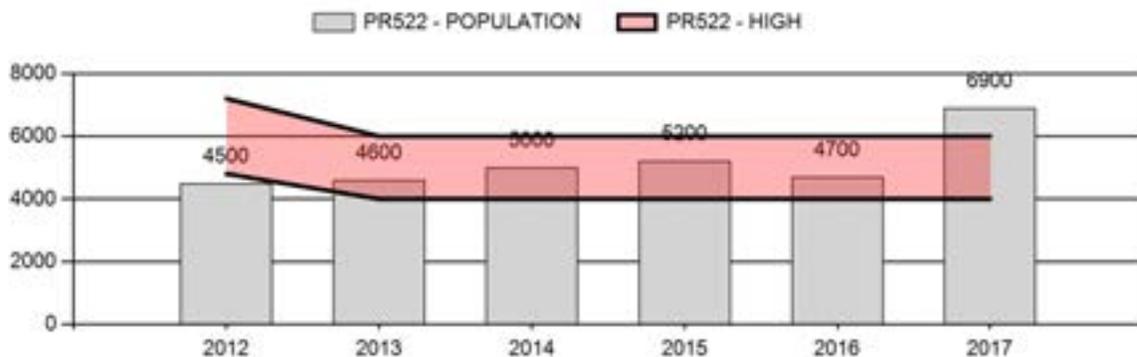
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	4,800	6,900	7,000
Harvest:	450	610	725
Hunters:	520	667	745
Hunter Success:	87%	91%	97 %
Active Licenses:	576	725	865
Active License Success:	78%	84%	84 %
Recreation Days:	1,726	2,408	3,000
Days Per Animal:	3.8	3.9	4.1
Males per 100 Females	43	41	
Juveniles per 100 Females	56	44	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	38%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/07/2018

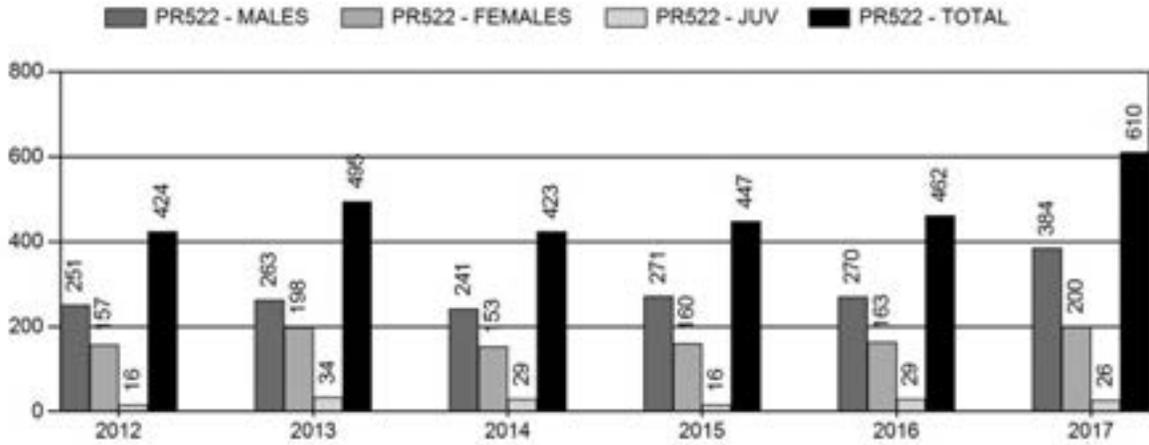
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	5%	7%
Males ≥ 1 year old:	23%	29%
Total:	8%	9%
Proposed change in post-season population:	-5%	+3%

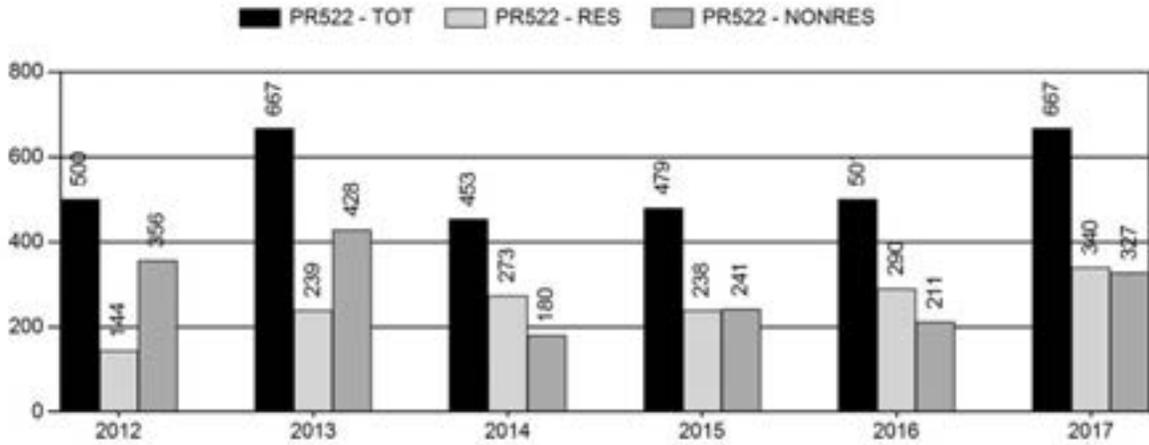
Population Size - Postseason



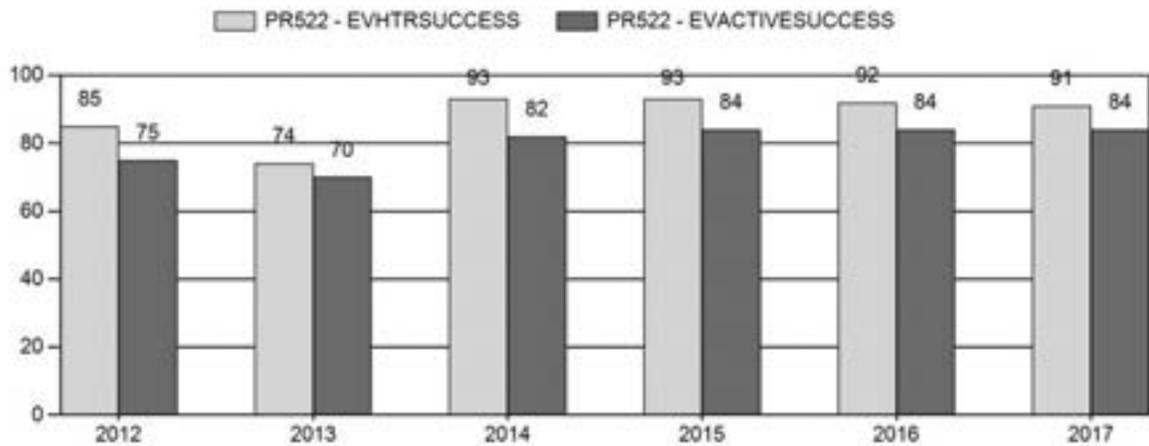
Harvest



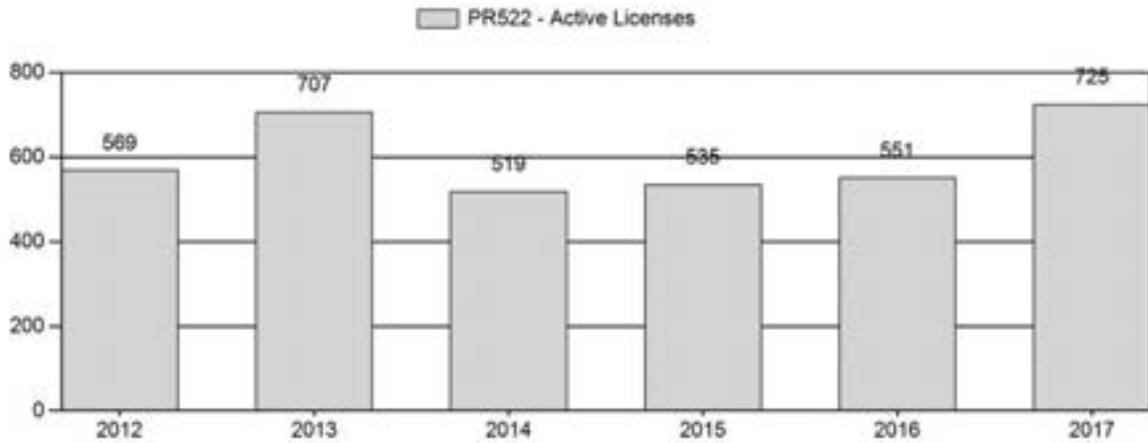
Number of Active Licenses



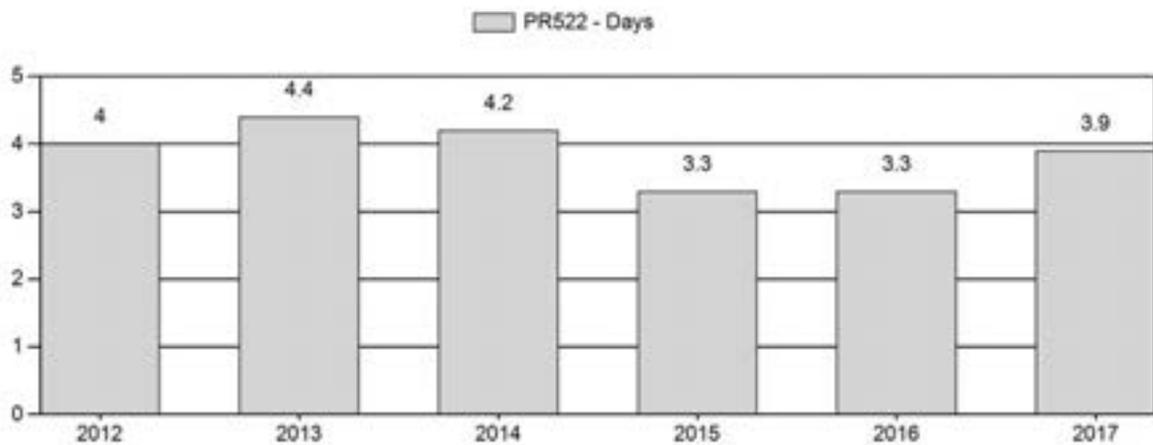
Harvest Success



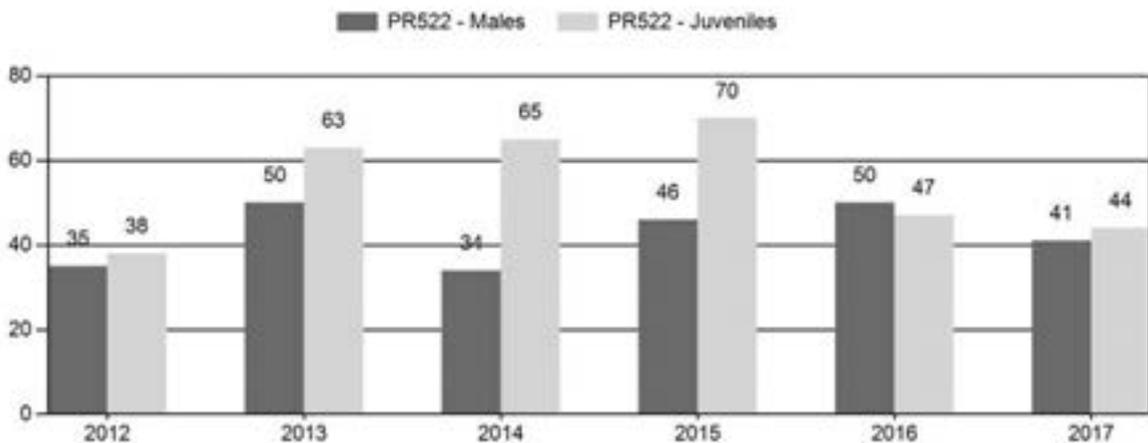
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR522 - MEADOWDALE

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	4,900	62	133	195	20%	553	58%	211	22%	959	838	11	24	35	± 4	38	± 5	28
2013	5,100	60	139	199	23%	402	47%	252	30%	853	1,154	15	35	50	± 6	63	± 8	42
2014	5,400	49	169	218	17%	637	50%	411	32%	1,266	1,327	8	27	34	± 4	65	± 6	48
2015	5,600	104	165	269	21%	590	46%	412	32%	1,271	1,441	18	28	46	± 5	70	± 6	48
2016	5,100	142	251	393	25%	786	51%	368	24%	1,547	1,330	18	32	50	± 4	47	± 4	31
2017	7,600	48	158	206	22%	508	54%	223	24%	937	1,468	9	31	41	± 5	44	± 5	31

**2018 HUNTING SEASONS
MEADOWDALE PRONGHORN HERD (PR522)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
11	1	Oct. 1	Oct. 31	550	Limited quota	Any antelope
11	6	Oct. 1	Oct. 31	400	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 2017
11	1	+100
11	6	+100

Management Evaluation

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

Management Strategy: Recreational

2017 Post-season Population Estimate: ~6,900

2018 Proposed Post-season Population Estimate: ~7,000

2017 Hunter Satisfaction: 92% Satisfied, 3% Neutral, 5% Dissatisfied

Herd Unit Issues

The management objective for the Meadowdale Pronghorn Herd Unit of 6,000 was decreased to 5,000 as a result of internal and public input received during the 2013 herd objective review process. The management strategy is recreational management, which is a 30-59 buck:100 doe range.

The 2017 post-season population estimate was approximately 6,900 pronghorn based on trying to simulate the population through the 2016 line-transect density estimate of 8,000. Previous population model estimates fluctuated around 5,000 pronghorn. In order to produce a reliable model the population was simulated for the past 15 years to include the previous line-transect that was completed in June of 2003, which resulted in an estimate of 5,800 pronghorn.

The northern portion of the herd unit continues to have the highest densities of pronghorn resulting in more acres of private lands enrolled into the Access Yes walk-in hunting program as well as landowners allowing access, particularly during the doe/fawn season.

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were average at all elevations throughout southeast Wyoming during spring months, then became dry and hot from July through November, which is the typical pattern. However, there was one major hail storm that hit along the southwest portion of the herd unit that most likely resulted in higher than average fawn mortality. This became evident when pre-season classifications were done in August and results indicated fawn production was 22% below the five-year average. 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 was most likely similar to past years with average spring precipitation. Cheatgrass continues to be a major threat to native rangelands and big game ranges, particularly at all elevations below 6,500'. Its presence ties the hands of habitat managers limiting habitat enhancement options, and may result in reduced carrying capacities of rangelands if it is the predominant specie. This herd unit is comprised of a mix of native rangelands, CRP, dryland and irrigated croplands.

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

Field Data

The Meadowdale population had been tracking around 5,000 pronghorn for the past 7 years. However, the 2016 line-transect density estimate of 8,000 suggests the population was increasing in recent years, but most likely not as rapid as the model would suggest. Fawn production in 2016 (47 fawns:100 does) and 2017 (44 fawns:100 does) was well below their respective five-year averages of 58 and 56 fawns:100 does and well below levels needed to increase a population. Buck to doe ratios have fluctuated from a low of 34:100 to a high of 50:100 within the past 5 years. Above average fawn ratios in 2014 and 2015 help to increase buck ratios in 2015 and 2016, but the poor fawn production in 2016 and 2017 will result in fewer older age class bucks in the field in the coming years. That was evident with a decrease in yearling buck ratios in 2017 (9 bucks:100 does) compared to the five-year average of 14 yearling bucks:100 does. However, the data needs to be interpreted with some caution given the sample size was 36% below the 90% CI. During ground classification in August conditions were hot and dry with poor background cover which may explain the sudden decline in sample size. The sample size has been met only two out the past six years of surveys. Isolated hail events, along with average spring precipitation followed up by hot, dry conditions most likely resulted in an increase in fawn mortality. To improve sample size additional ground routes will be added in 2018.

Harvest Data

The 2017 active license success rate of 84 % was higher than the five-year average of 79%, but the same as the 2016 success. Effort in 2017 was 3.9 days per harvest which was similar to the five-year average of 3.8 days per harvest, but slightly higher than the 2016 effort of 3.3 days per harvest. The recent 2016 line-transect density estimate indicates this population has increased by

40% since the last LT estimate in 2003. Harvest statistics (stable success and effort) for the past six years do not support the increase, more likely they are an indicator of a stable population. However, the trends in harvest statistics could also be a issue of limited access. License numbers did increase last year based in part on access opening up in the northern portion of the herd unit and buck ratios that were in the upper management level. The hunter satisfaction survey showed that 92% of the hunters were satisfied or very satisfied with their hunt. Based on positive comments received from the field and the amount of opportunity of access through the Department's Access Yes program the survey seems plausible.

Population

The "Constant Juvenile – Constant Adult Survival" (CJCA) spreadsheet model was chosen to use for the post-season population estimate of this herd and until there is survival data specifically for this herd unit will remain the model of choice. This model did have the lowest AIC score, the best fit and the population estimate appears reasonable. We conducted line-transects (LT) in 1996, 1998, 2000 and 2003 and 2016. To have a better fit and more reliable population estimate the spreadsheet model was retrofitted to try and run through the 2003 and 2016 end-of-the-year line transect density estimate. Based on relatively consistent harvest regimes and classification surveys this population has been fluctuating around 5,000 pronghorn for the past 7 years. (2016 post-season estimate: 4,600 pronghorn) and has not experienced a significant increase or decrease in the past 5 years. This model is ranked fair given it has 15 years of classification data and a LT that was done for the 2016 biological year. It is recommended to follow up with another LT within the next five years to improve population simulations and density estimates. The model also aligns well with male ratios. 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.

The 2016 line-transect calculated a density estimate of 8,000 pronghorn with a percent coefficient of variation (CV) of 9.14. According to Guenzel (1997) $CVs \leq 15\%$ are considered good. Distance selected the Uniform Model with a cosine adjustment for the best model based on the lowest AIC score. The shape of the histogram appears reasonable, with a "shoulder" near the line then somewhat declines. The line transect met the three basic assumptions to provide a reasonable population estimate (Buckland et al. 1993); pronghorn were seen on the line, pronghorn did not move before they were detected and distances and angles to pronghorn were measured exactly. The 28% increase in population between 2003 and 2016 is plausible. This is not a true closed population; irrigated alfalfa fields south of US Hwy 20 are a major attractant for Cheyenne River pronghorn herd to the north so immigration does happen.

Management Summary

The 2017 season is designed to increase harvest on the female segment of the population to bring the population down and offer enough opportunity for the male segment of the population to maintain adequate buck ratios within the recreational parameters. In addition to the land enrolled into the Walk-In Area program, additional private land acres opened up for both and doe and buck harvest so the Type 1 and Type 6 licenses will increase by 100. However, access is still limited throughout the southern two thirds of the herd unit, and below average fawn ratios are of a concern. A slow increase in licenses should gradually bring the population within 20% of the objective. Given previous harvest rates we expect to attain a harvest of around 725 pronghorn.

We predict a 2018 post-season population estimate of 7,000 pronghorn, 29% above the objective of 5,000.

Literature cited:

Buckland, S.T., D.R. Anderson, K.P. Burnham and J.L. Laake. 1993. Distance sampling: estimating abundance of biological populations. Chapman and Hall, New York. 446pp.

Guenzel, R.J. 1997. Estimating Pronghorn Abundance Using Aerial Line Transect Surveys. Wyoming Game and Fish Department, Cheyenne, 174 pp.

Density Estimates/Global

Effort : 2051.345
 # samples : 70
 Width : 204.0000
 Left : 0.00000000
 # observations: 438

Model 2

Uniform key, $k(y) = 1/W$
 Cosine adjustments of order(s) : 1

Parameter	Point Estimate	Standard Error	Percent Coef. of Variation	95% Percent Confidence Interval
DS	3.0132	0.26216	8.70	2.5378 3.5777
E(S)	1.5553	0.43320E-01	2.79	1.4725 1.6428
D	4.6864	0.42812	9.14	3.9145 5.6105
SN	8070.0	737.21	9.14	6741.0 9661.0

Measurement Units

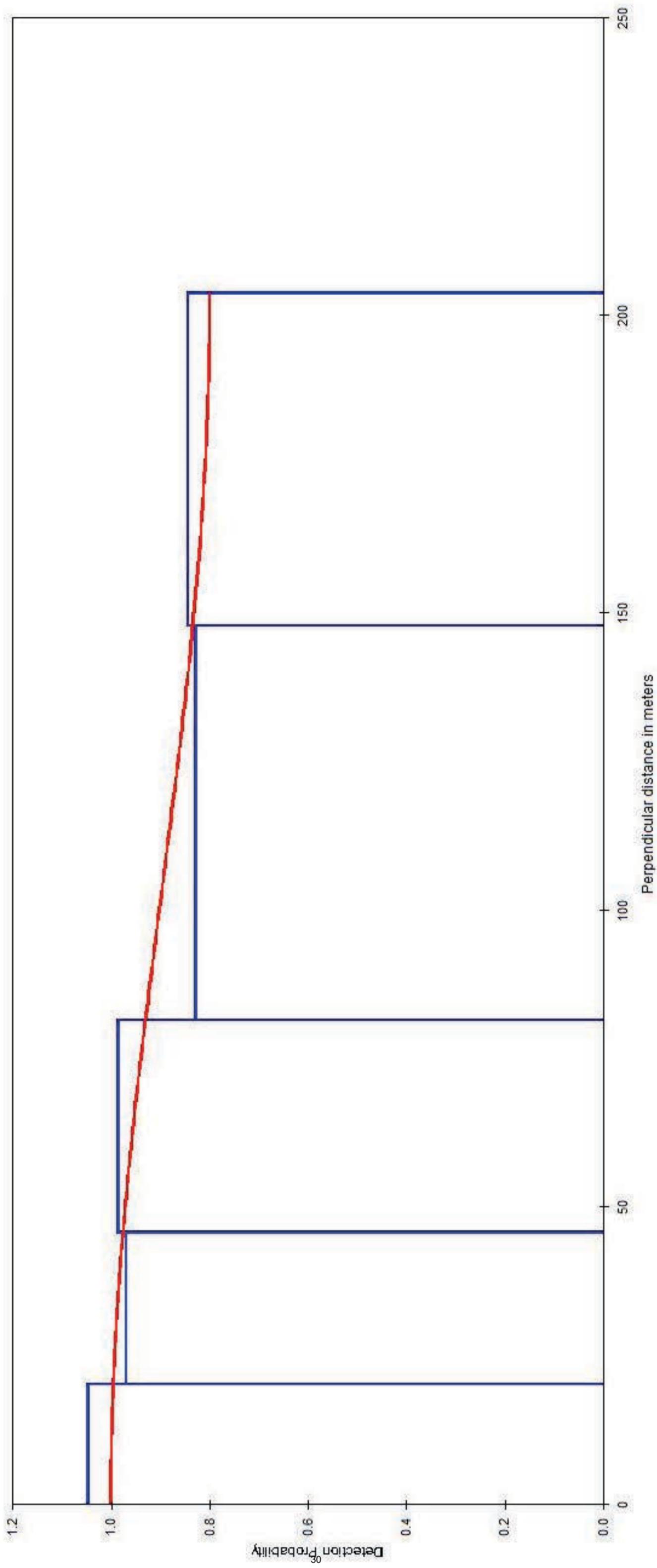
Density: Numbers/Sq. miles
 ESW: meters

Component Percentages of Var(D)

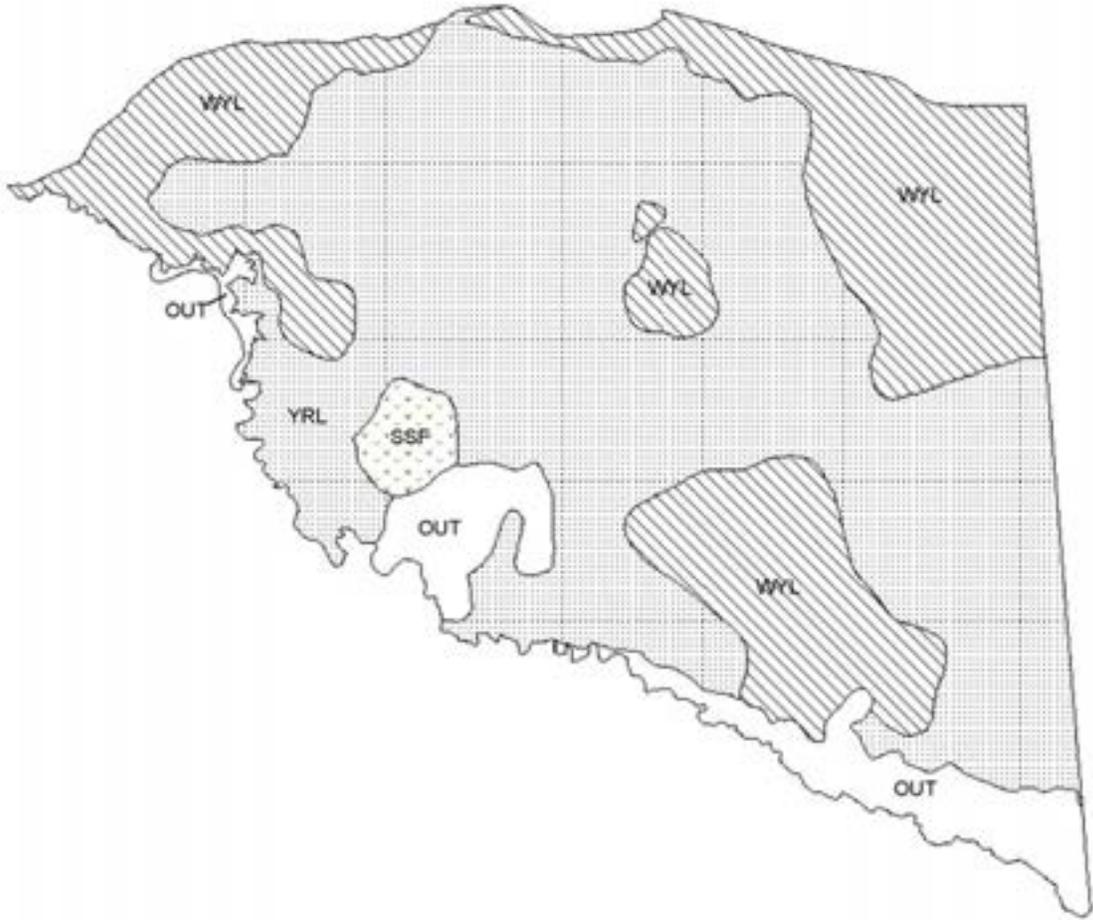
Detection probability : 47.1
 Encounter rate : 43.6
 Cluster size : 9.3



Detection Fct/Global/Plot: Detection Probability



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



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR523 - IRON MOUNTAIN

HUNT AREAS: 38

PREPARED BY: LEE KNOX

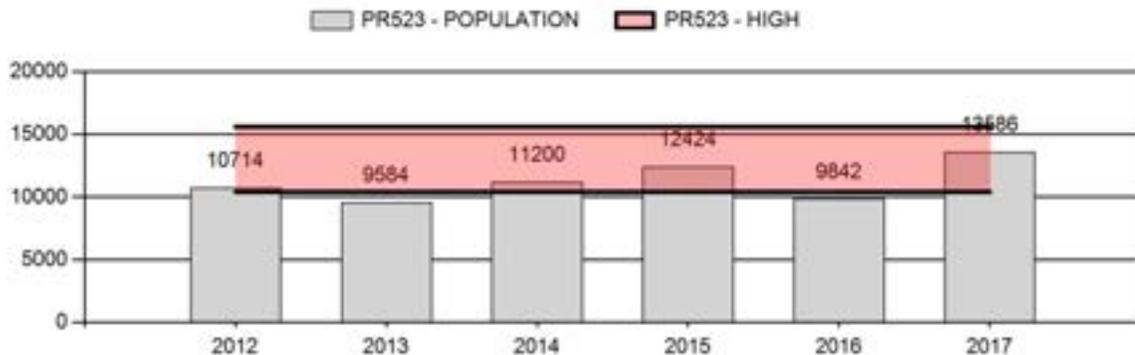
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	10,753	13,586	12,641
Harvest:	1,522	1,542	1,150
Hunters:	1,729	1,938	1,900
Hunter Success:	88%	80%	61 %
Active Licenses:	1,843	1,977	1,400
Active License Success:	83%	78%	82 %
Recreation Days:	5,607	9,202	5,500
Days Per Animal:	3.7	6.0	4.8
Males per 100 Females	52	53	
Juveniles per 100 Females	70	62	

Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	5%
Number of years population has been + or - objective in recent trend:	20
Model Date:	02/12/2018

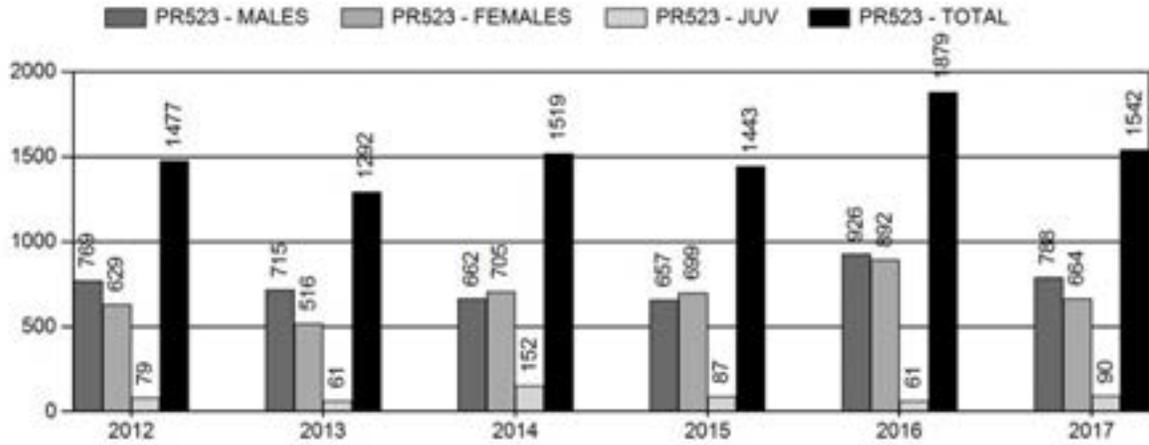
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	15%	8%
Males ≥ 1 year old:	21%	21%
Total:	10%	8%
Proposed change in post-season population:	2%	2%

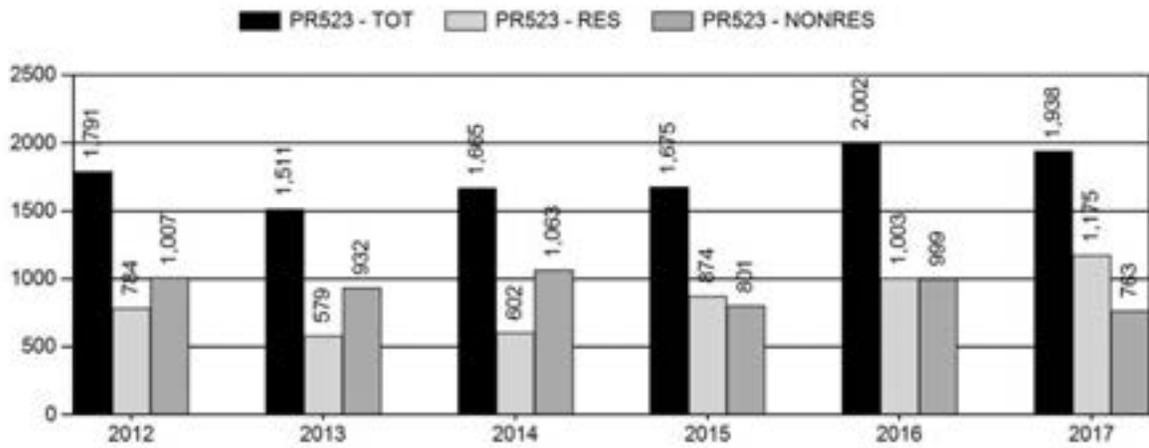
Population Size - Postseason



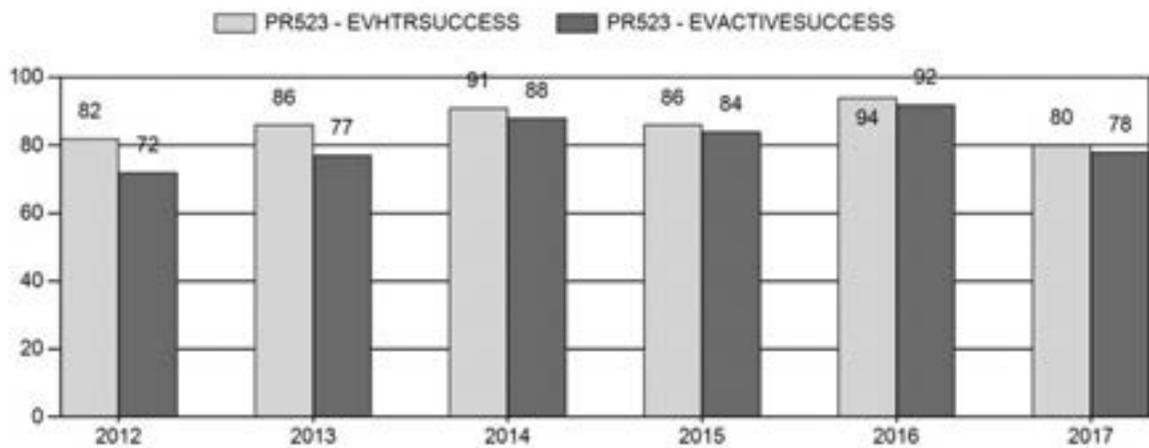
Harvest



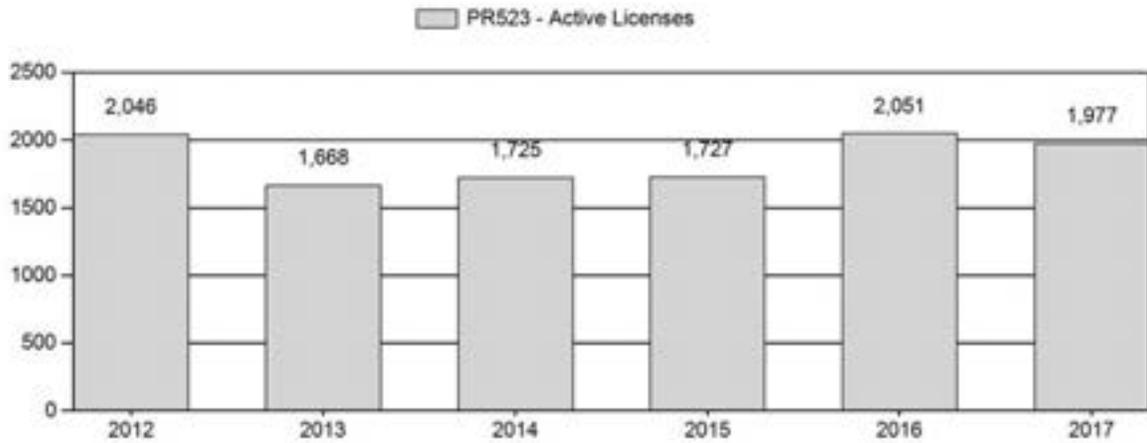
Number of Active Licenses



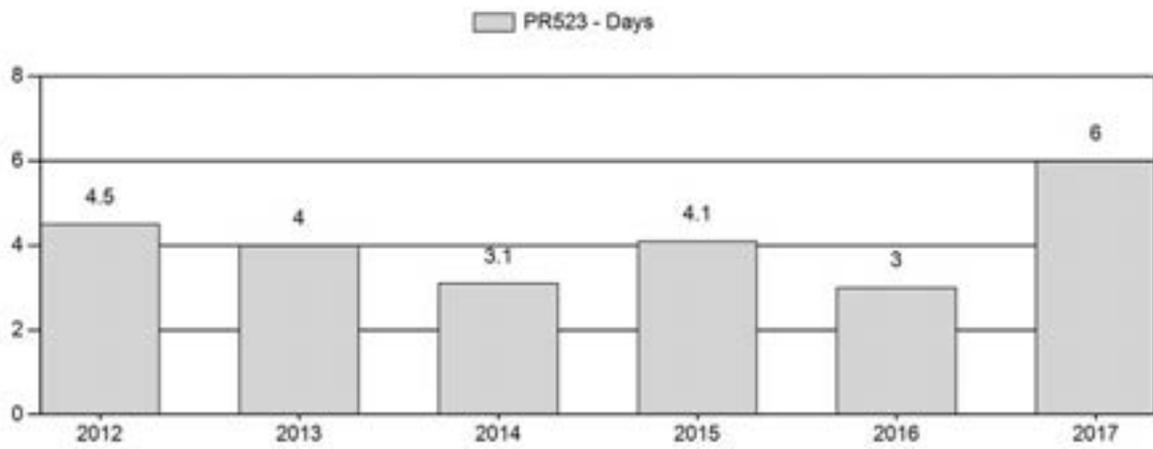
Harvest Success



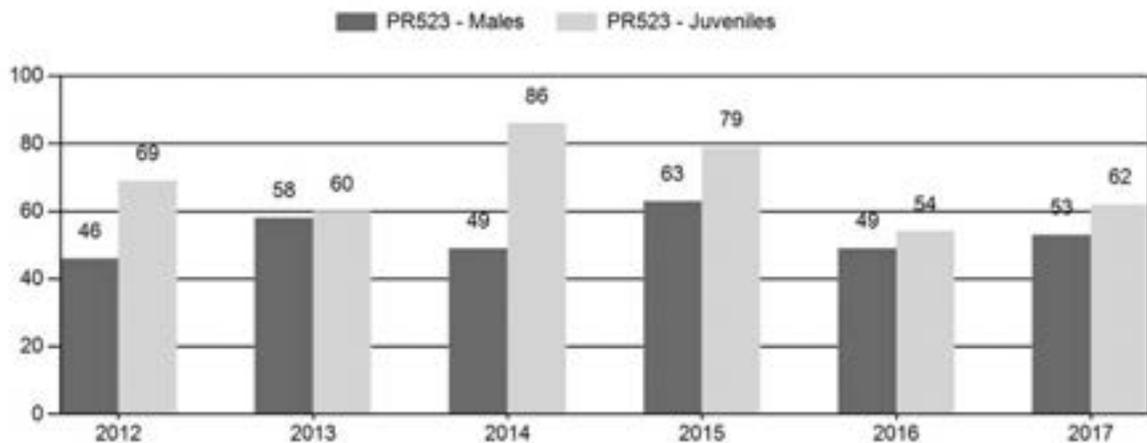
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	12,359	100	260	360	21%	789	47%	547	32%	1,696	2,355	13	33	46	± 4	69	± 6	48
2013	11,005	120	233	353	27%	608	46%	364	27%	1,325	1,987	20	38	58	± 6	60	± 6	38
2014	12,870	145	276	421	21%	861	43%	737	37%	2,019	2,094	17	32	49	± 4	86	± 6	57
2015	14,011	212	217	429	26%	676	41%	536	33%	1,641	3,021	31	32	63	± 6	79	± 7	49
2016	11,909	162	259	421	24%	862	49%	463	27%	1,746	1,586	19	30	49	± 4	54	± 5	36
2017	15,282	157	387	544	25%	1,019	46%	630	29%	2,193	2,080	15	38	53	± 4	62	± 5	40

**2018 HUNTING SEASONS
IRON MOUNTAIN PRONGHORN (PR523)**

Hunt Area	Type	Date of Seasons		Quota	License	Limitations
		Opens	Closes			
38	1	Oct. 5	Oct. 31	1,250	Limited Quota	Any antelope
	6	Oct. 5	Oct. 31	800	Limited Quota	Doe or fawn
		Nov. 1	Dec. 31			Unused Area 38 Type 1 and Type 6 licenses valid for doe or fawn
	Archery	Aug. 15	Oct. 4			Refer to Section 2 of this Chapter

Area	License Type	Quota change from 2017
38	6	-250
Herd Unit Total	6	-250

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: 13,600

2018 Proposed Postseason Population Estimate: 12,600

2017 Hunter Satisfaction: 84% Satisfied, 10% Neutral, 6% Dissatisfied

The management objective for the Iron Mountain pronghorn herd unit is a post-season population of 13,000 pronghorn. The management strategy is recreational management that requires a pre hunt ratio of 30 to 59 bucks: 100 does. The objective and management strategy were last revised in 2014.

Herd Unit Issues

The Iron Mountain Pronghorn herd unit includes Hunt Area 38. The herd unit is predominately privately owned lands with traditional agricultural uses. Limited public access deterred hunters in the past, and licenses would go unsold. However, recently both resident and nonresident interest increased in hunting pronghorn Hunt Area 38, and licenses now sell out. The 2017 post-season population estimate was 13,600 with the population slightly declining. We no longer conduct line transect surveys in this herd unit due to rugged terrain and erratic winds causing poor survey conditions.

Weather

Timing and quantity of precipitation was excellent during key growth periods for cool season grasses and preferred transitional range and winter range shrub species. While early season growing conditions were optimal, late summer and fall precipitation was lacking. The extreme cold and high winds experienced in early winter, as well as hot dry conditions in midsummer, likely increased the mortality in the younger cohort. The following link provides specific meteorological information for the Iron Mountain herd unit: <http://www.ncdc.noaa.gov/cag/>.

Habitat

Forage availability continued to improve in 2017, 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, as well as 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 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 should not heavily influence population management for any particular big game species.

Field Data

A total of 2,200 pronghorn were classified, meeting the estimated classification sample size of 2,100. Fawn ratios increased in 2017 to 62:100 does, near the 10 year average of 64:100 does. However, fawn ratios on the east side of the herd unit remain 20 fawns per 100 does lower than the west side of the herd unit. The buck ratio increased to 53:100 does, slightly above the 10 year average of 51:100 does. The hunter satisfaction survey showed a decrease in hunter satisfaction by 12% from 2016 to 2017.

Harvest Data

Hunter success decreased in both license types. Type 1 licenses decreased by 10% and type 6 licenses decreased by 17%. Hunter effort increased by three days for both license types, a 50% increase in days to harvest. This herd has typically been a low priority area for resident hunters due to lack of public access and many of the licenses are purchased by nonresidents, typically 60% - 65% of the license holders. In 2017, nonresidents accounted for 39% of the licenses due to an increase in resident license holders, mainly in the Type 1 licenses. License issuance was the same from 2013 through 2015. Type 6 license issuance increased in 2016. In 2013, there were 728 licenses leftover after the draw, in 2014 there were 230, and in 2015-2017 there were no leftover licenses available.

Population

The “Constant Juvenile – Constant Adult Survival Rate (CJCA)” spreadsheet model was chosen to use for the post-season population estimate of this herd. Because of issues with the herd data, the simplest model that relied on the fewest assumptions was determined to be the one that would provide the best population estimate. The model estimates the Iron Mountain pronghorn herd is declining. The 2017 post season population estimate is 13,600, and within 20% of the population objective. This is a poor model due to ratio data prior to 2000 being of poor quality, we are unable to survey the entire area, and we do not have adult and juvenile survival data for this herd unit. This model is not biologically defensible. We no longer conduct line transect surveys in this herd unit due to rugged terrain and erratic winds creating poor survey conditions.

Management Summary

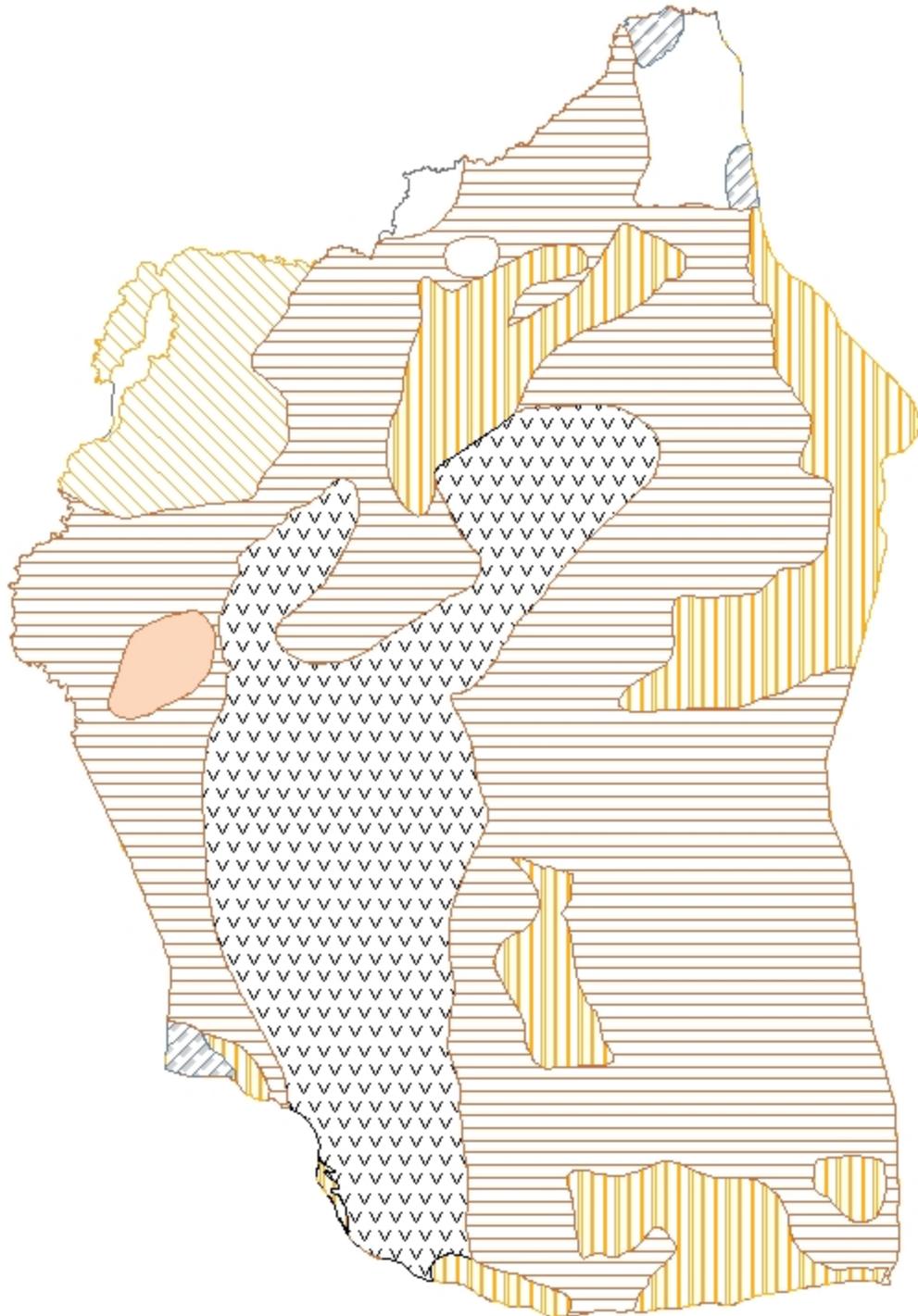
The past 10 years, we have maintained a liberal license quota in the Iron Mountain herd unit to bring down and approximate the population near the objective. We cannot strictly rely on the model given it is of poor quality. We are seeing declines in hunter success and a large increase in hunter effort. Landowners report less pronghorn on their property. The east side of the herd unit provides the majority of the hunting opportunity and we have seen poor fawn ratios there the past few years. Type 6 doe fawn licenses will be decreased by 450 licenses. Type 1 license issuance will remain status quo, and we will maintain the extended season to address crop damage later in the year.

Legend

Pronghorn (PH523) Iron Mountain
HA 38
Revised 1988

RANGE

-  CRUWIN
-  CRUWYL
-  OUT
-  SSF
-  SWR
-  WYL
-  YRL



2017 - JCR Evaluation Form

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

PERIOD: 6/1/2017 - 5/31/2018
 PREPARED BY: MARTIN HICKS

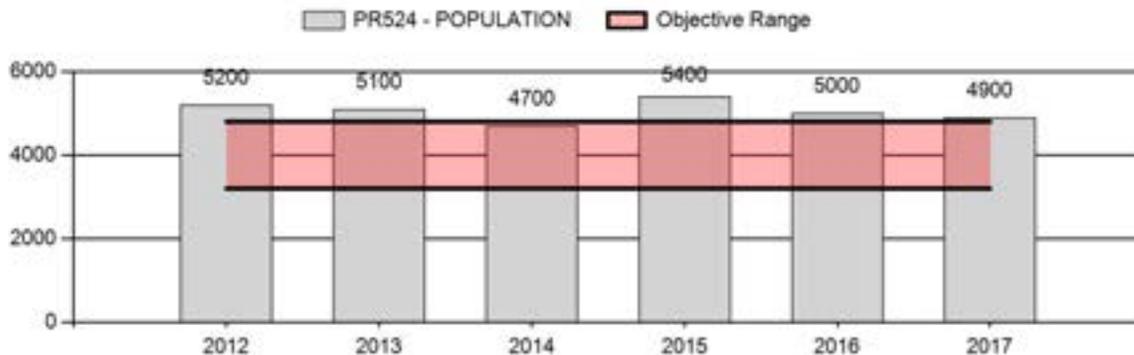
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	5,080	4,900	4,400
Harvest:	577	765	685
Hunters:	601	928	770
Hunter Success:	96%	82%	89 %
Active Licenses:	682	988	800
Active License Success:	85%	77%	86 %
Recreation Days:	2,026	3,266	2,500
Days Per Animal:	3.5	4.3	3.6
Males per 100 Females	49	56	
Juveniles per 100 Females	46	38	

Population Objective (± 20%) : 4000 (3200 - 4800)
 Management Strategy: Recreational
 Percent population is above (+) or below (-) objective: 22%
 Number of years population has been + or - objective in recent trend: 10
 Model Date: 02/06/2018

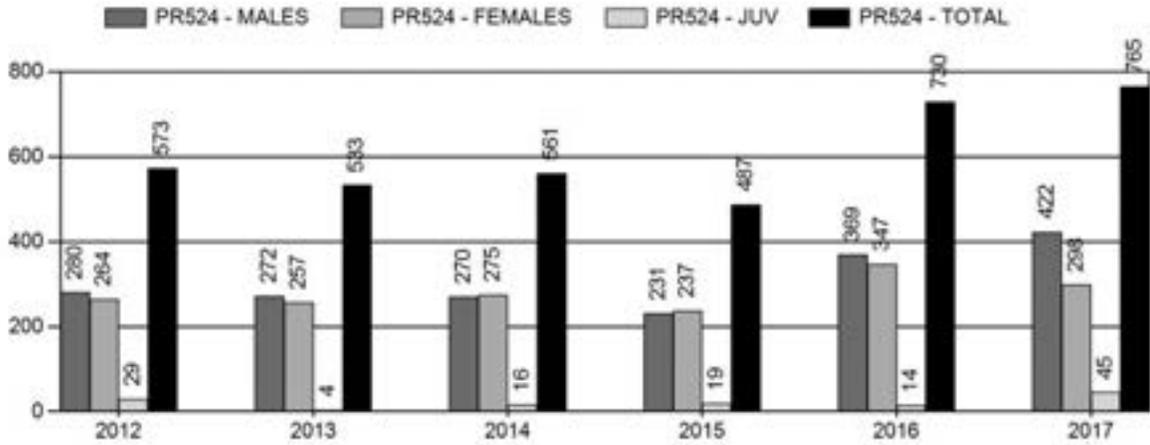
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	11%	10%
Males ≥ 1 year old:	28%	35%
Total:	13%	13%
Proposed change in post-season population:	-2%	-13%

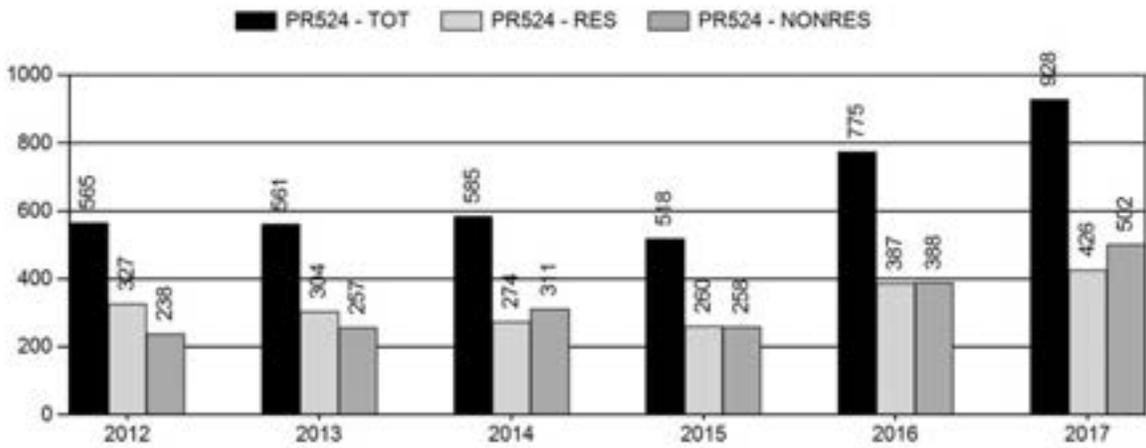
Population Size - Postseason



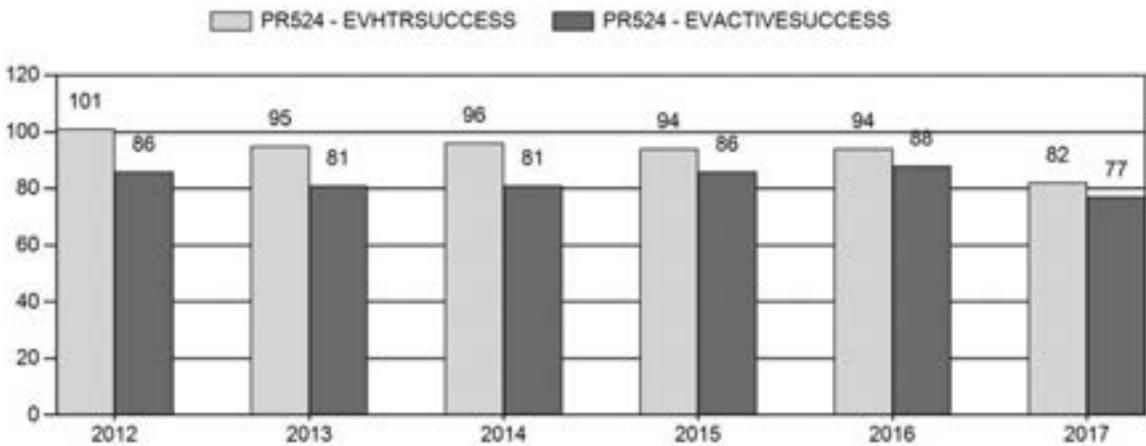
Harvest



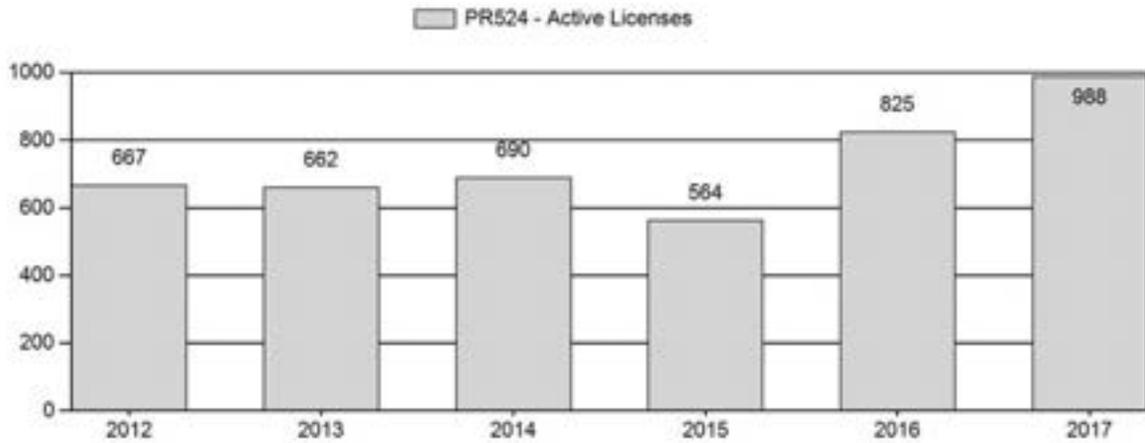
Number of Active Licenses



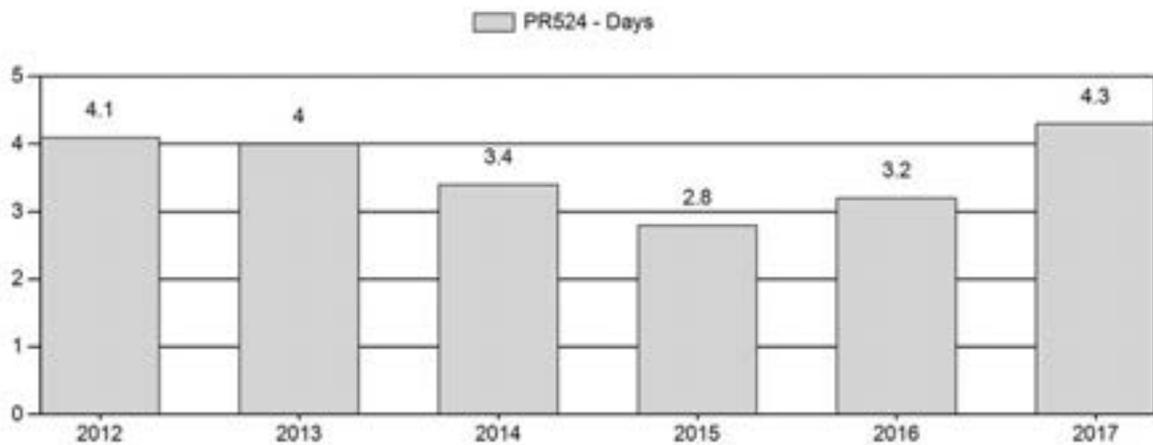
Harvest Success



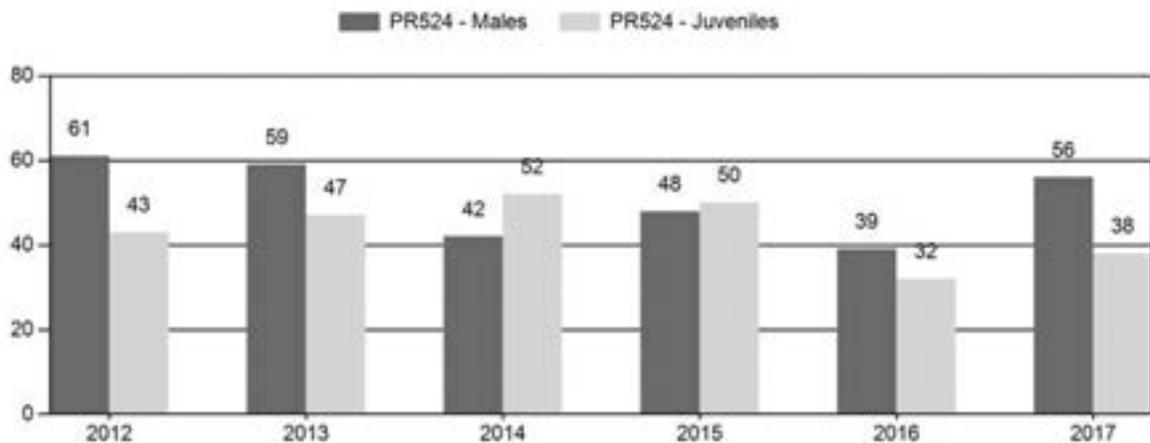
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR524 - DWYER

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	5,800	93	106	199	30%	326	49%	140	21%	665	1,224	29	33	61	± 8	43	± 7	27
2013	5,700	105	221	326	29%	552	49%	258	23%	1,136	1,146	19	40	59	± 6	47	± 5	29
2014	5,400	68	167	235	21%	566	52%	295	27%	1,096	1,362	12	30	42	± 5	52	± 5	37
2015	5,900	88	137	225	24%	466	50%	234	25%	925	1,091	19	29	48	± 6	50	± 6	34
2016	5,800	60	104	164	23%	416	58%	135	19%	715	1,257	14	25	39	± 6	32	± 5	23
2017	5,700	123	187	310	29%	553	52%	209	19%	1,072	1,072	22	34	56	± 6	38	± 5	24

**2018 HUNTING SEASONS
DWYER PRONGHORN HERD (524)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
103	1	Oct. 5	Oct. 31	575	Limited quota	Any antelope
	6	Oct. 5	Dec. 31	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 2017
103	1	0
103	6	-100
Total		-100

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: ~4,900

2018 Proposed Post-season Population Estimate: ~4,400

2017 Hunter Satisfaction: 81% Satisfied, 9% Neutral, 10% Dissatisfied

Herd Unit Issues

The management objective for the Dwyer Pronghorn Herd Unit is a post-season population objective of 4,000 pronghorn. The management strategy is recreational management with a 30-59 buck:100 doe ratio range. The herd objective and management strategy was reviewed in 2014 and to the decision was made to maintain the same population objective of 4,000 pronghorn and maintain recreational management.

There has been little urban and industrial development within this herd unit. The herd unit is comprised of 90% private land and some accessible state land. Land use is comprised of native range land, irrigated and dry land agriculture fields, and land enrolled into the Conservation Reserve Program (CRP). The majority of access is in the northern portion of the herd unit via the PLPW program and private land opened up address damage situations.

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were average at all elevations throughout southeast Wyoming during spring months then became dry and hot from July through November, which is the typical pattern. However, there was one major hail storm that hit along the southeast portion of the herd unit that most likely resulted in

higher than average fawn mortality. This became evident when pre-season classifications were done in August and results indicated fawn production was 22% below the five-year average. 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 was most likely similar to past years with average spring precipitation. 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, dryland and irrigated croplands.

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

Field Data

Based on the 2014 line-transect density estimate of 5,400, the previous 5 years of population data was retrofitted to reflect population trends that are anchored to the 2014 end-of-the-year line-transect density estimate of 5,400 pronghorn. The model simulates a population that from 2012-2017 fluctuated around 5,000 pronghorn. The sample size for pre-season classifications was met in 2017 but has not been met in the past 6 years, so herd composition data should be interpreted with caution. Fawn ratios have fluctuated around 43 fawns:100 does from 2012-2017, which is a level that does not grow. In 2017 fawn ratios (38 fawns:100 does) increased slightly from a ten year low of 32 fawns:100 does in 2016, but still well below production needed to increase a herd. Buck ratios have fluctuated from a low of 39:100 to a high of 61:100 from 2012-2017 are well within recreational management levels. In 2017 buck ratios (56 bucks:100 does) increased compared to 2016 (32 bucks:100 does) and above the five-year average of 49 bucks:100 does. Buck ratios continue to be 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 (77%) in 2017 decreased compared to 2016 (88%) and the five-year average (84%). Effort (4.3 days per harvest) increased compared to 2016 (3.2 days per harvest) and the five-year average of 3.5 days per harvest. Based on field conversations, hunters had a difficult time finding pronghorn on accessible lands. Typically they would concentrate along Fish Creek which has the largest amount of public access, but in 2017 they appeared to have been redistributed to irrigated fields to the south, which have limited access. This was apparent based on the hunter satisfaction survey which showed that 81% of the hunters were either satisfied or very satisfied with their hunt, which was a drastic decrease compared to 2016 (90%).

Population

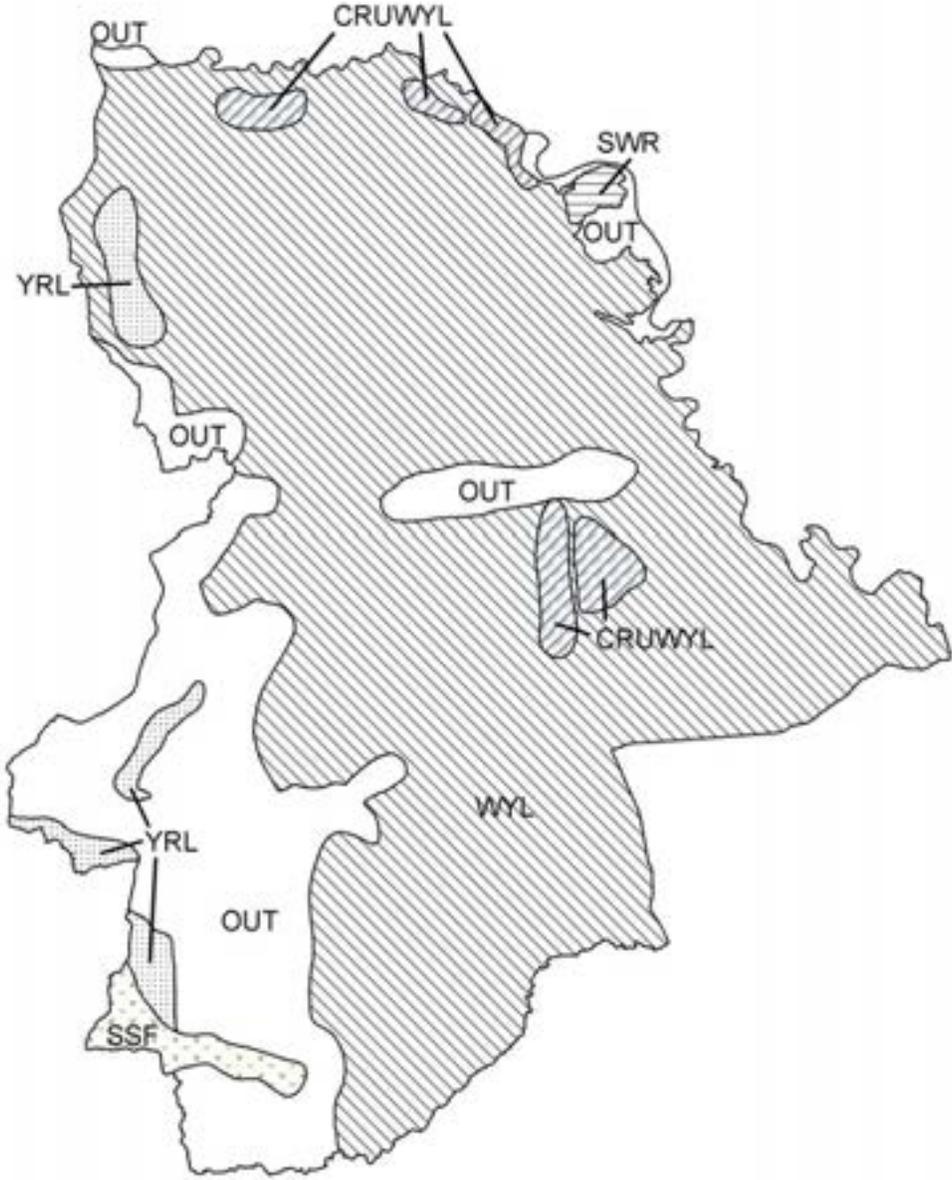
The “Time Specific Juvenile- Constant Adult Survival” (TSJ, CA) spreadsheet model was chosen over the simpler Constant Juvenile-Constant Adult (CJ,CA) model, and resulted in a post-season population of 4,900 pronghorn. The simpler CJ,CA model tries to run through the previous LT’s and underestimates 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 simulated years.

Management Summary

Buck ratios continue to be at the upper end of the recreational management level, but harvest statistics indicate there were fewer bucks available in the field compared to previous years, so there is a concern of bucks available to the public. Because of those concerns and a decline in harvest statistics, Type 1 licenses will remain the same. Previous harvest efforts on the female segment of the population coupled with poor fawn production warrants a decrease in Type 6 licenses, so licenses will decrease by 100, bringing the Type 6 licenses down to 450.

If the projected harvest of 685 pronghorn is attained coupled with normal fawn recruitment the pronghorn population will slightly decrease to 4,400, 10% above the objective of 4,000.

PH524 - Dwyer
HA 103
Revised - 7/88



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR525 - MEDICINE BOW

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

PREPARED BY: LEE KNOX

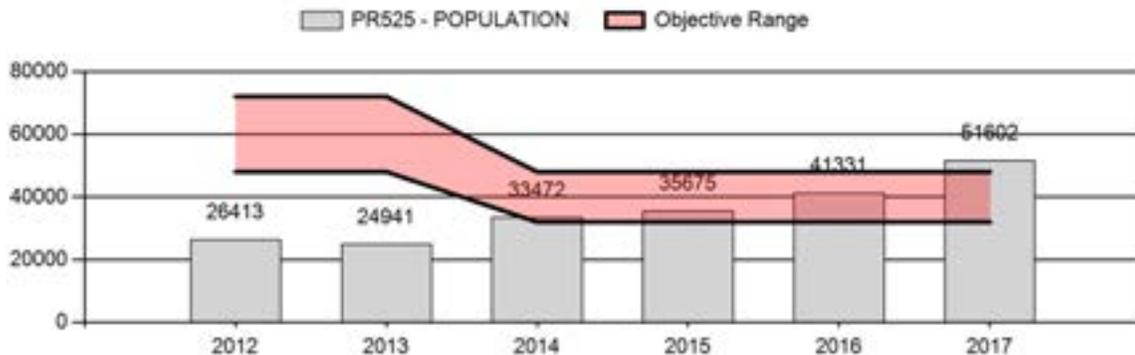
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	32,366	51,602	49,808
Harvest:	3,317	2,840	3,590
Hunters:	3,792	3,135	4,000
Hunter Success:	87%	91%	90 %
Active Licenses:	4,209	3,428	4,300
Active License Success:	79%	83%	83 %
Recreation Days:	11,843	8,735	11,000
Days Per Animal:	3.6	3.1	3.1
Males per 100 Females	43	55	
Juveniles per 100 Females	68	71	

Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	29%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/15/2018

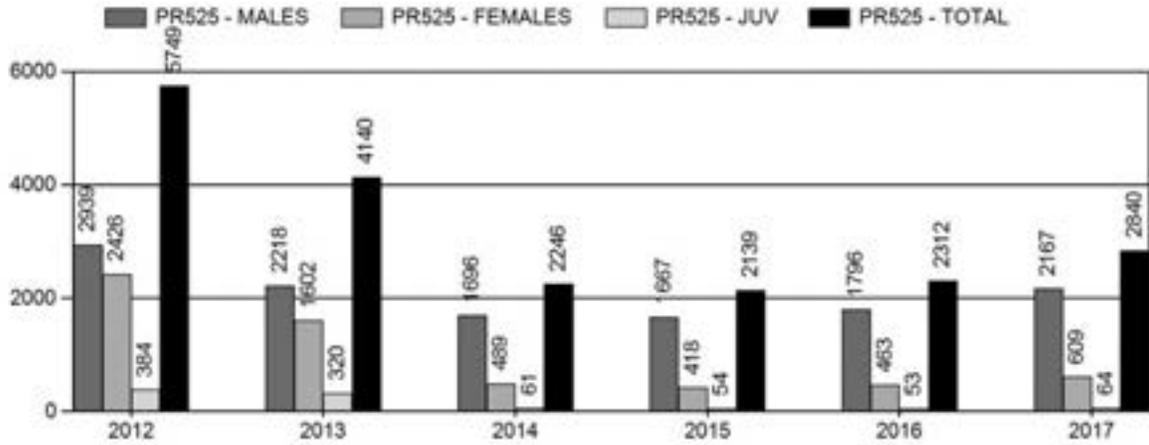
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3%	5%
Males ≥ 1 year old:	18%	23%
Total:	5%	7%
Proposed change in post-season population:	2%	4%

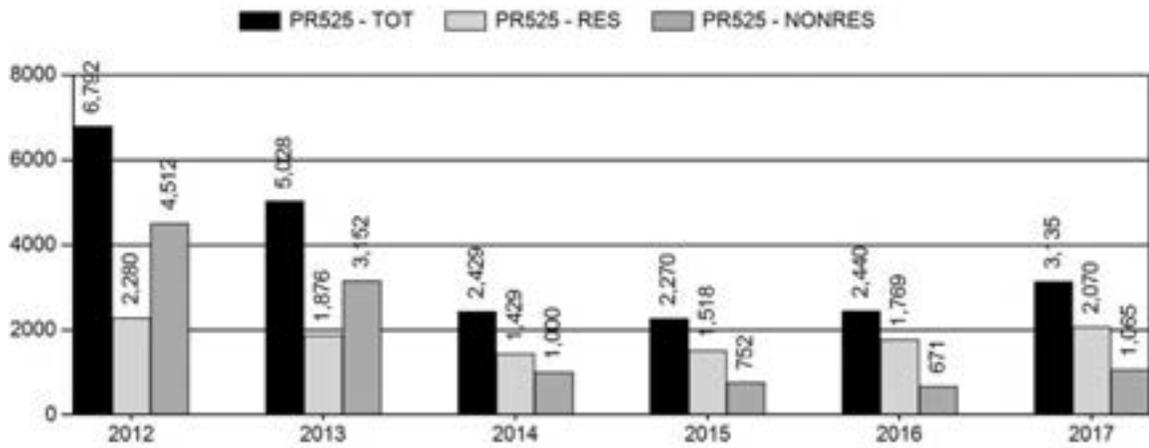
Population Size - Postseason



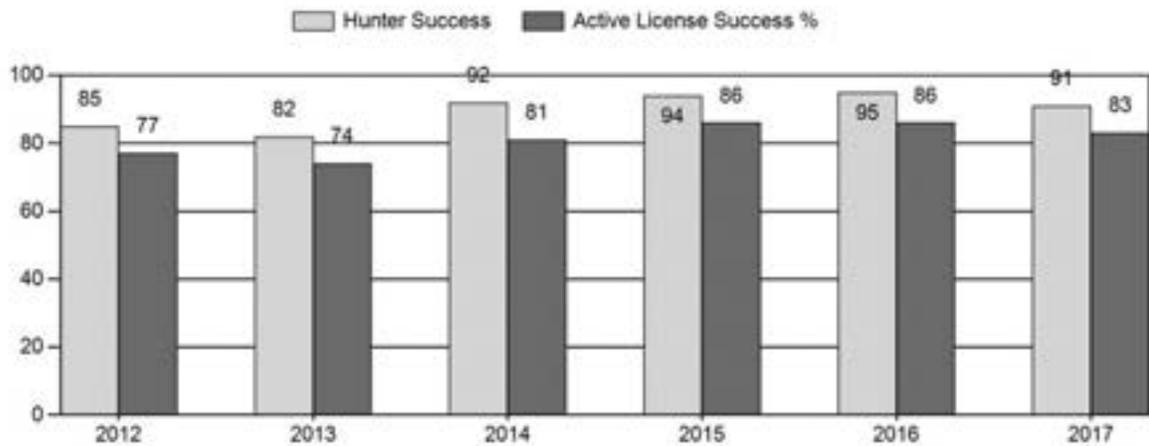
Harvest



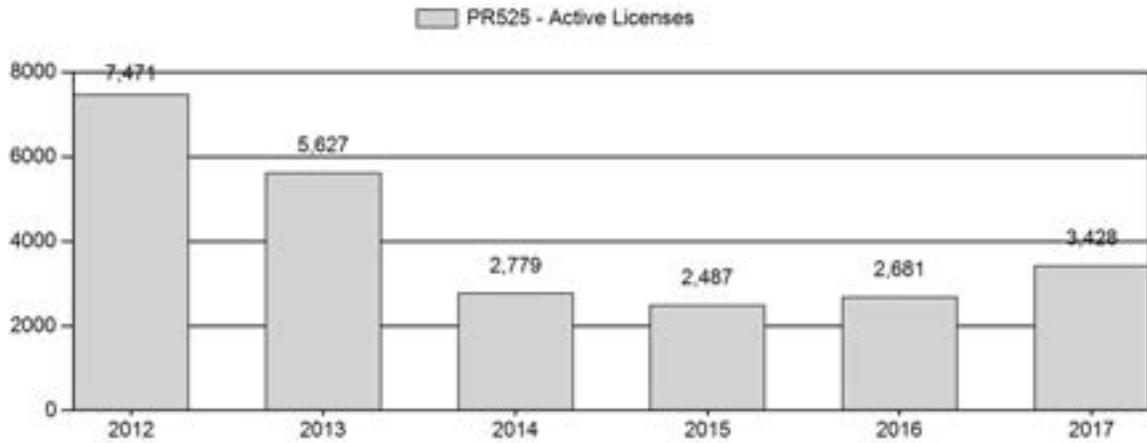
Number of Active Licenses



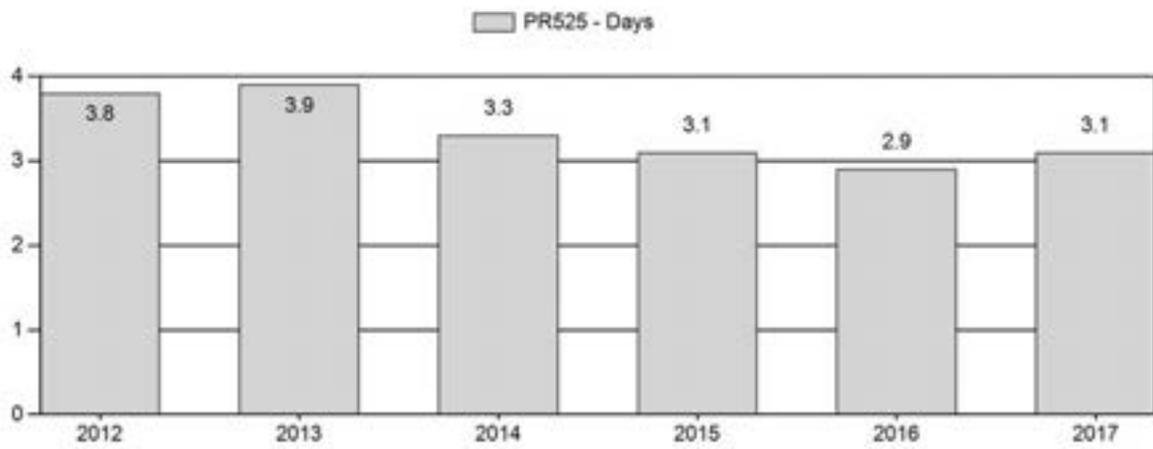
Harvest Success



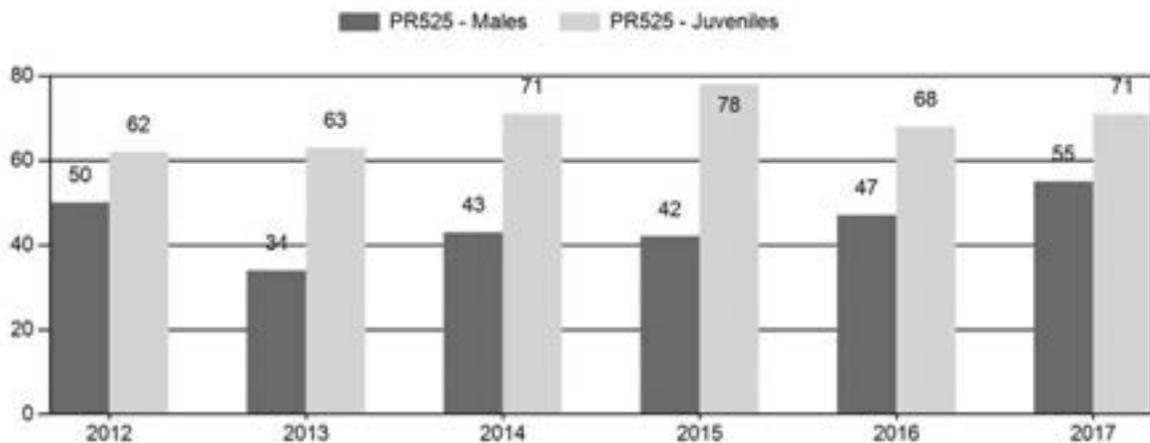
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	43,874	614	806	1,420	22%	3,007	46%	2,046	32%	6,473	2,492	20	27	47	±2	68	±3	46
2017	54,726	516	996	1,512	24%	2,764	44%	1,962	31%	6,238	2,807	19	36	55	±3	71	±3	46

**2018 HUNTING SEASONS
MEDICINE BOW PRONGHORN (PR525)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
30	1	Oct. 5	Oct. 31	500	Limited quota	Any antelope
	6	Oct. 5	Oct. 31	100	Limited quota	Doe or fawn
31	1	Sep. 25	Oct. 31	200	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	100	Limited quota	Doe or fawn
32	1	Sep. 25	Oct. 31	500	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	300	Limited quota	Doe or fawn
	7	Sep. 25	Oct. 31	75	Limited quota	Doe or fawn valid on private land
42	1	Sep. 25	Oct. 31	600	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	250	Limited quota	Doe or fawn
46	1	Sep. 25	Oct. 31	200	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	250	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	150	Limited quota	Doe or fawn
47	1	Sep. 25	Oct. 31	500	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	350	Limited quota	Doe or fawn
48	1	Sep. 25	Oct. 31	150	Limited quota	Any antelope
	2	Oct. 5	Oct. 31	150	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	50	Limited quota	Doe or fawn
30,	Archery	Aug. 15	Oct. 4			Refer to Section 2 of this Chapter
31, 32, 42, 46, 47, 48	Archery	Aug. 15	Sept. 24			Refer to Section 2 of this Chapter

Hunt Area	License Type	Changes from 2017
31	1	+50
	6	+50
32	1	+100
	6	+100
	7	+25
42	1	+100
	6	+100
46	1	+50
	2	+50
	6	+75
47	1	+100

	2	+50
	6	+100
Herd Unit Total	1	+400
	2	+100
	6	+425
	7	+25

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: ~ 51,600

2018 Proposed Postseason Population Estimate: ~ 49,800

2017 Hunter Satisfaction: 89% Satisfaction, 9% Neutral, 2% 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 prescribes for a buck ratio of 30 to 59:100 does. The objective and management strategy were last revised in 2014.

Herd Unit Issues

The Medicine Bow herd unit includes hunt areas 30, 31, 32, 42, 46, 47, and 48. These hunt areas vary between predominantly public lands and exclusively privately owned lands. Large scale wind farms and coal mining within this herd may be negatively impacting habitat and productivity. More wind farms are proposed. The population saw a large decline from a high of 50,000 in 2004 to 25,000 in 2013. Most recently, the population has been increasing to the current estimate of 51,600. In the early 2000s, the Department was trying to reduce the population to try and prevent irreparable habitat damage in the Shirley Basin and Bates Hole areas. At the same time, this herd was hit hard by harsh winters, drought, and disease, causing the herd to decline below 30,000 pronghorn. The herd objective was last reviewed in 2014; the herd objective was decreased from 60,000 to 40,000 pronghorn post season. This will still allow the herd to increase, and at the same time manage for a more sustainable population in line with habitat.

Weather

Timing and quantity of precipitation was excellent during key growth periods for cool season grasses and preferred transitional range and winter range shrub species. While early season growing conditions were optimal, late summer and fall precipitation was lacking. The extreme cold and high winds experienced in early winter, as well as hot dry conditions in midsummer, likely increased the mortality in the younger cohort in parts of the herd unit. The following link provides specific meteorological information for the Medicine Bow herd unit: <http://www.ncdc.noaa.gov/cag/>.

Habitat

Forage availability continued to improve in 2017, 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. Data should not heavily influence population management for any particular big game species.

Field Data

A total of 6,238 pronghorn were classified in 2017, exceeding the estimated classification objective of 2,807. Classification methods were changed from aerial to ground in 2013 due to budget constraints. Buck ratios increased for the third straight year to 55 bucks: 100 does, 8 bucks: 100 does above the 10 year average of 47 bucks: 100 does. Yearling bucks remained similar to the previous 4 years at 19 bucks: 100; however, the adult buck ratio was the highest in 6 years at 36 bucks: 100 does. Fawn ratios continue to remain above the 10 year average of 66:100, at 71 fawns: 100 does in 2017. The hunter satisfaction survey shows 89% of hunters were either satisfied or very satisfied with their hunt and 9% remaining neutral, comparable to past years.

Harvest Data

Hunter success remains high at 91%. Hunter effort for the herd unit continues to remain near 3 days to harvest. We expected to have high success and lower effort with the current license issuance and a growing population. Total harvest increased from 2,300 in 2016 with 2,400 active licenses, to 2,800 pronghorn with 3,400 licenses in 2017, a far cry from harvest in 2010 of 7,700 pronghorn and 8,900 active licenses.

Population

The spreadsheet model for this herd indicates the population is increasing with a post hunt population of 51,600. This estimate was derived using the Time-Specific Juvenile and Constant Adult Survival model which had a AIC score of 285 and a best fit score of 173. The last line transect was conducted end of bio year 2015 and estimated a postseason population of 36,250 with a standard error of 4,300. The model is of good quality. The 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 quality data available for all years in model, and there is juvenile and adult survival estimates with standard errors available from two studies, (Grogan et al and Taylor, 2014).

Management Summary

If the projected harvest of 3,600 is attained, using the 10 year average fawn ratio of 70 fawns: 100 does, the modeled population is predicted to start slowly declining. An increase of 950 licenses (500 full price and 450 reduced price licenses) will be allocated through hunt areas 42, 46, 47, and 31, and 32 where we have seen the largest population growths. Populations in hunt areas 30 and 48 have been slower to rebound, and do not warrant a license increase at this time.

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



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR526 - COOPER LAKE

HUNT AREAS: 43

PREPARED BY: BRYAN LAMONT

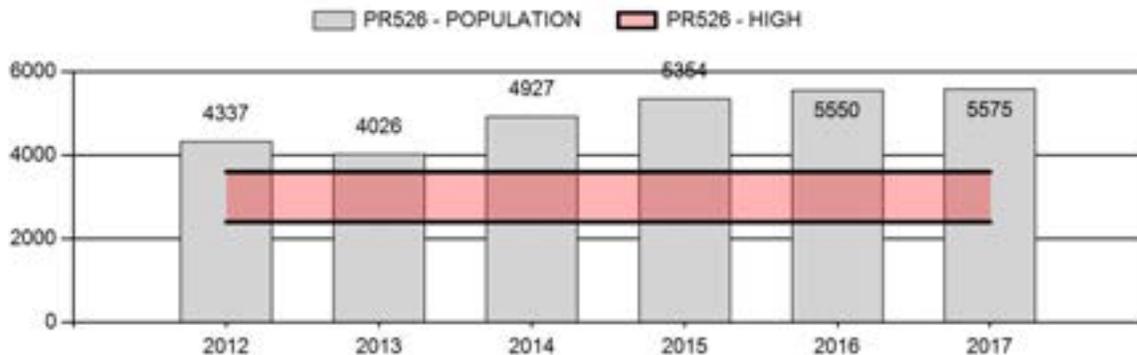
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	4,839	5,575	5,500
Harvest:	685	841	900
Hunters:	758	935	1,000
Hunter Success:	90%	90%	90%
Active Licenses:	812	1,020	1,150
Active License Success:	84%	82%	78%
Recreation Days:	2,393	3,095	3,000
Days Per Animal:	3.5	3.7	3.3
Males per 100 Females	51	67	
Juveniles per 100 Females	89	77	

Population Objective (\pm 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	86%
Number of years population has been + or - objective in recent trend:	21
Model Date:	02/05/2018

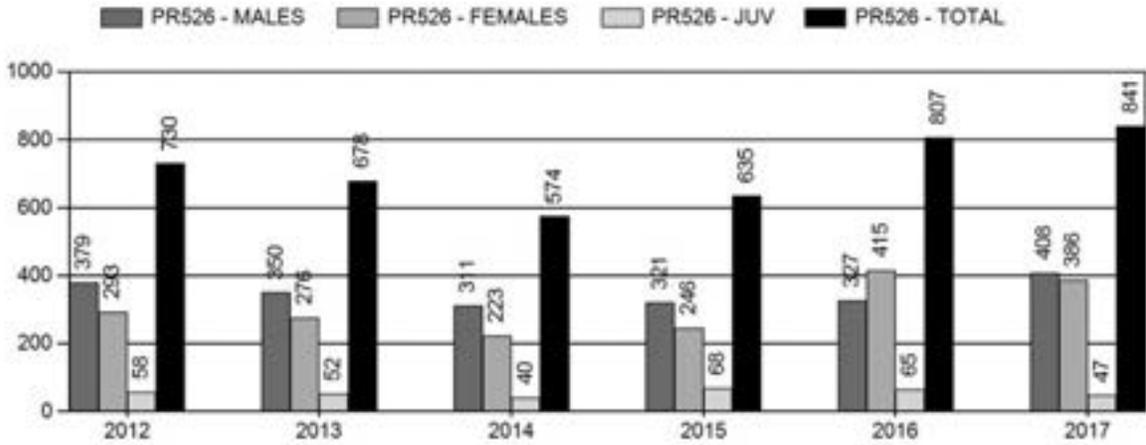
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	18%	18%
Males \geq 1 year old:	28%	28%
Total:	13%	13%
Proposed change in post-season population:	-15%	-15%

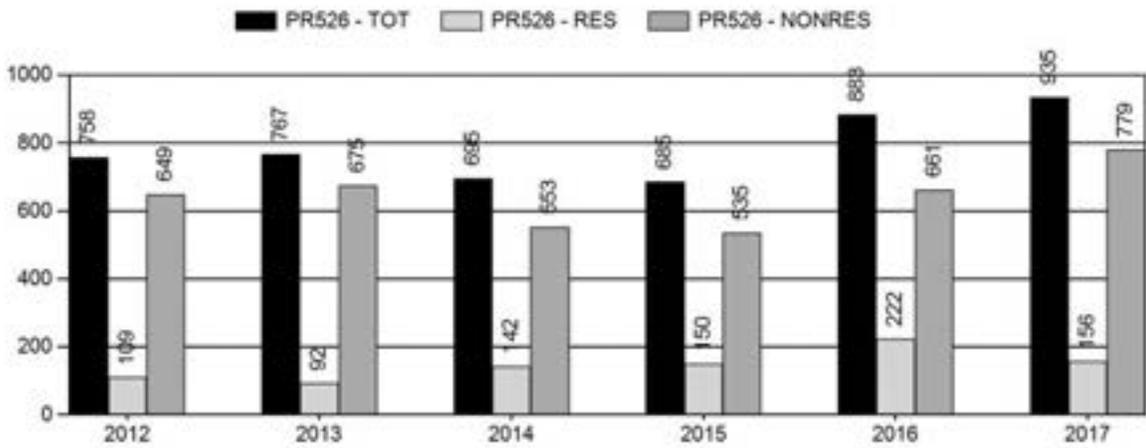
Population Size - Postseason



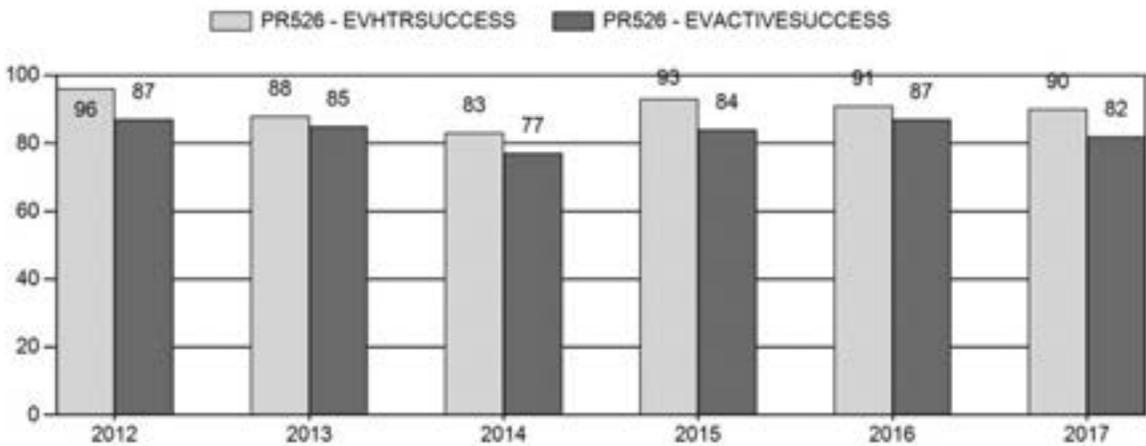
Harvest



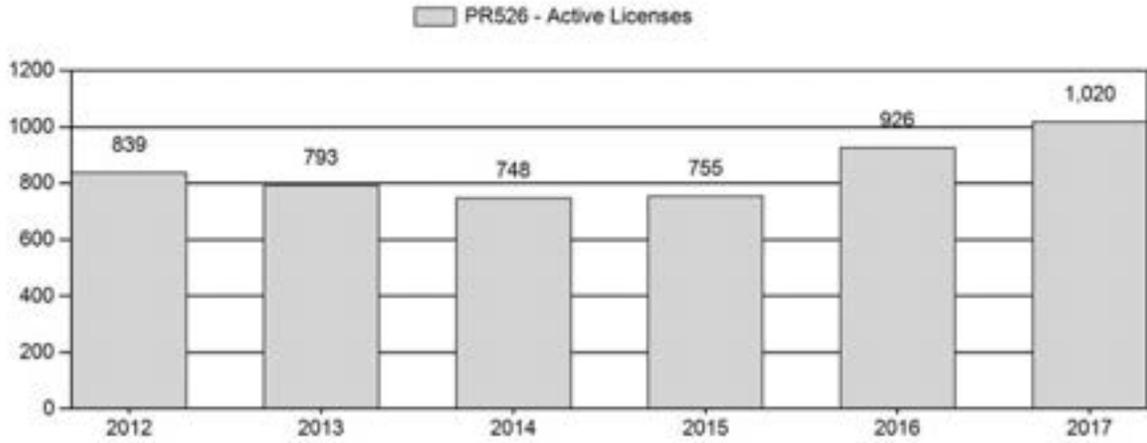
Number of Active Licenses



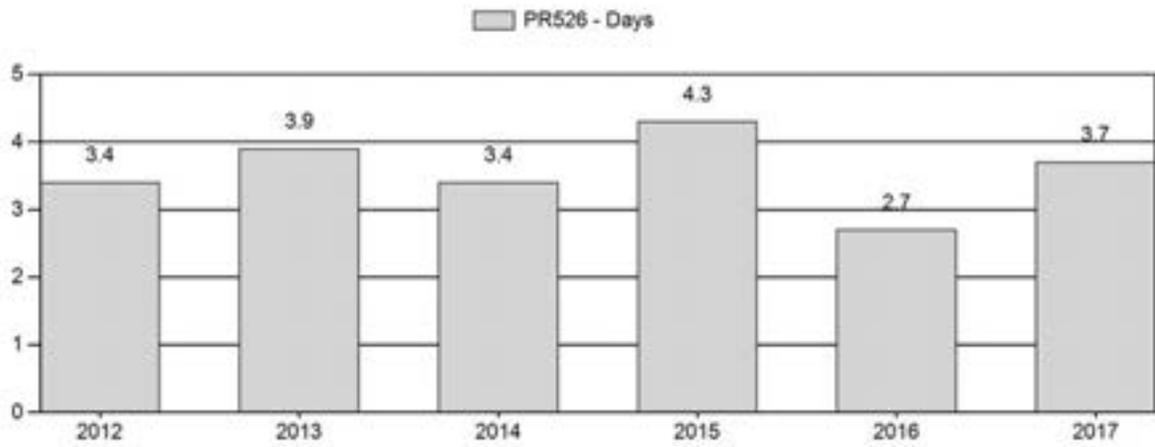
Harvest Success



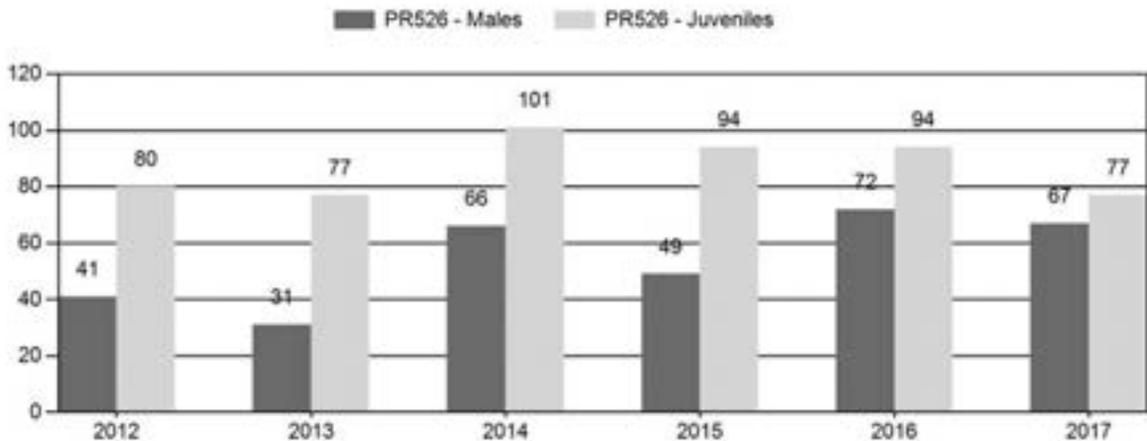
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	6,367	109	139	248	27%	345	38%	324	35%	917	2,878	32	40	72	± 9	94	± 11	55
2017	6,500	135	243	378	27%	564	41%	437	32%	1,379	2,904	24	43	67	± 7	77	± 7	46

**2018 HUNTING SEASONS
COOPER LAKE PRONGHORN (PR526)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
43	1	Sept. 15	Oct. 31	600	Limited quota	Any antelope
43	6	Sept. 15	Oct.31	700	Limited quota	Doe or fawn
Archery		Aug. 15	Sept. 14			Refer to Section 3 of the Antelope Regulations

Hunt Area	Type	Change from 2017
43	1	+100
43	6	+100
Herd Unit Totals	1 & 6	+200

Management Evaluation

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

Management Strategy: Recreational

2017 Post-Season Population Estimate: ~5,600

2018 Proposed Post-Season Population Estimate: ~5,500

2017 Hunter Satisfaction: 56% Very Satisfied, 36.6% Satisfied, 5.7% Neutral, 0% Dissatisfied, 1.6% Very 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 4,307 in 2013 to the current population estimate of 5,575. The latest line transect survey was conducted in 2013, estimating 8,953 pronghorn with an estimated standard error of 1,603. The Cooper Lake herd resides predominately within private lands as a result of increased urban sprawl near Laramie and large working ranches within the herd unit. A wind farm exists within the western portion of the herd unit and an additional wind farm is currently under review for possible development. Limited public access has hindered efforts to decrease the population of this herd through harvest. Currently, most public hunting is limited to the Diamond Lake and Laramie River Hunter Management Areas. Field staff documented Epizootic Hemorrhagic Disease (EHD) in the herd unit in 2012 and 2013, and this herd unit experienced a significant drought in 2012.

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, nor 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 good. A snow storm in late May provided timely moisture for growing conditions. While early season growing conditions were optimal, late summer was drier, returning to increased moisture in early fall. Early spring and fall weather patterns most likely had a positive influence on all big game species. For specific meteorological information for the Cooper Lake herd unit, the reader is referred to the following link: <http://www.ncdc.noaa.gov/>.

Habitat

Forage availability continued to improve in 2017, with an increase in the amount of precipitation received and the timeliness of when it was received. Precipitation received in April and late May resulted in excellent growth of cool season grasses and forbs, and above average leader growth on preferred key shrubs. While early spring and fall season growing conditions were optimal, late summer precipitation was lacking. The limited number of habitat transects established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and, consequently, influence population management for big game species.

Field Data

In 2017, a total of 1,379 pronghorn were classified in the Cooper Lake pronghorn unit, which is well below the required estimated sample size of 2,904 needed to generate reliable population estimates. Since 2006, classification samples have been below the required estimated sample sizes. As a result of continued low sample sizes, in 2013, pre-season classification routes were established to enable inference to be made between classification samples from one year to the next. Increasing the length of classification routes may be necessary if required sample sizes are to be met. Fawn ratios remain high at 77 fawns:100 does, although this was a drop from 2015 and 2016, with both years at 94 fawns:100 does. Buck ratios decreased in yearling bucks (24:100), but increased in adult bucks (43:100) for a total buck ratio of 67:100 does. The total buck ratio in 2017 was a slight decrease from 2016 (72:100), but still well above the previous 5 year average (52:100). The continuation of high juvenile and buck ratios suggests that the Cooper Lake herd remains very productive and offers additional opportunities for increased harvest.

Harvest Data

In 2017, 1,100 licenses (500 Type 1 and 600 Type 6) were issued, with non-residents accounting for 81% of the licenses sold and all licenses were sold in the initial draw. Hunter success for the Cooper Lake herd remains high (Type 1- 90% and Type 6- 76%), and 93% of hunters were either

satisfied or very satisfied with their hunt. Type 1 license success in 2017 (90%) was similar to 2016 (91%) and the previous 5-year average (88%). Type 1 license effort in 2017 (3.2 days/harvest) was similar to 2016 (2.9 days/harvest), and slightly lower than the previous five-year state-wide effort (3.9 days/harvest). Type 6 license success in 2017 (76%) was lower than 2016 (85%) and the previous five-year average (81%). Type 6 license effort in 2017 (4.2 days/harvest) was higher than 2016 (2.8 days/harvest) and the previous five-year average (3.8 days/harvest), and comparable to the previous five-year state-wide effort (3.9 days/harvest).

The Cooper Lake pronghorn herd continues to provide hunters with an excellent opportunity to harvest a pronghorn. Continued high hunter success and low effort are likely the result of: 1) adequate access due to the Diamond Lake and Laramie River Hunter Management Areas 2) continued high juvenile and buck ratios and 3) timely moisture, providing excellent growing season conditions for key vegetation, leading to high juvenile and adult survival.

Population

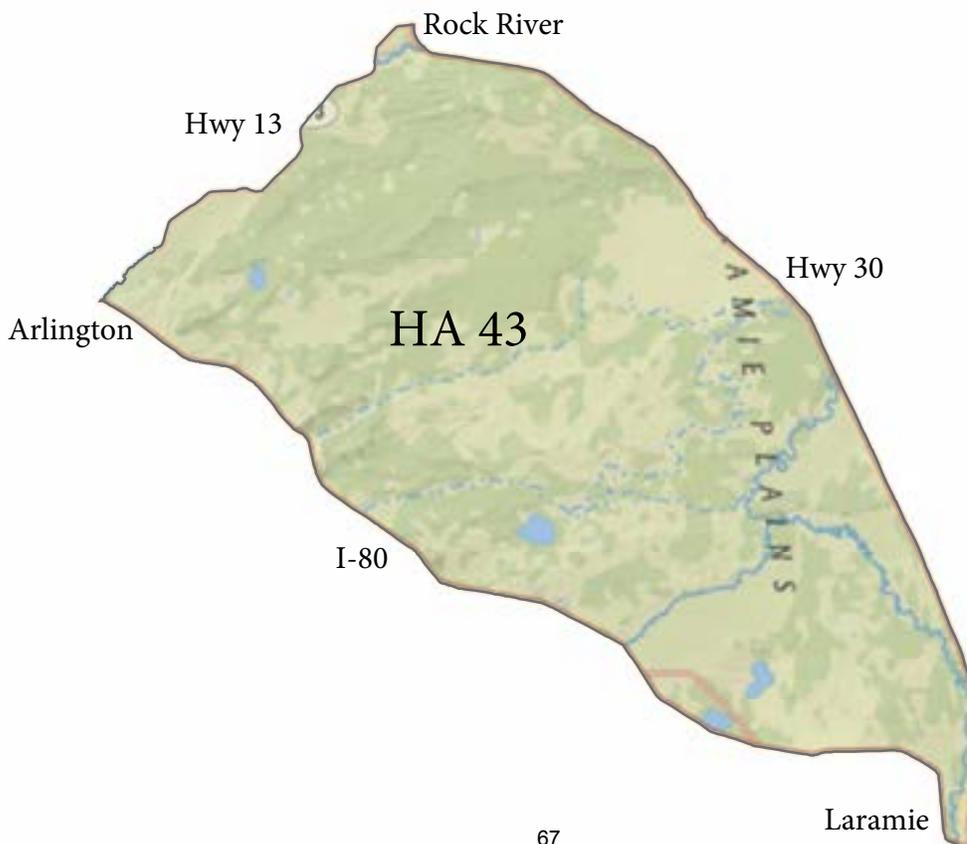
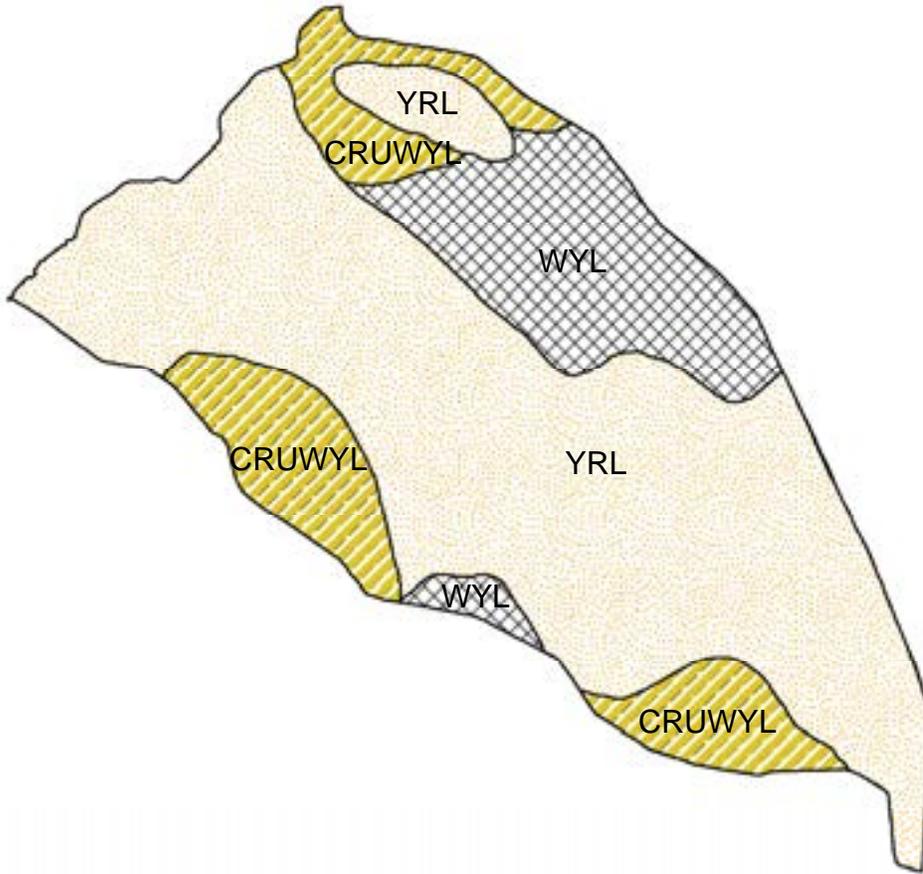
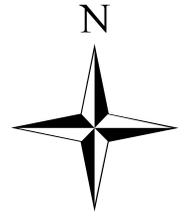
The population model estimates the Cooper Lake herd near 5,575 pronghorn, and predicts it will remain stable to slightly declining to 5,320 in 2018. The Constant Juvenile-Constant Adult Mortality Rate (CJCA) spreadsheet model was used to generate the post-season population estimate for this herd. This model resulted in the lowest AICc score of the three models analyzed, and the post-hunt population estimate trends moderately well with line transect (LT) surveys conducted in 1999, 2002, and 2006. In June of 2013, a LT was conducted that estimated an end of bio-year population 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 of the line transect model. As a result of ratio data that is considered highly biased due to poor sample size, and the lack of adult and juvenile survival data for this herd, this population model (CJCA) would be described as a “poor” model and is not biologically defensible.

Management Summary

The Cooper Lake herd is very productive and has recovered quickly from the 2012 drought and EHD event. The current population estimate (~5,575) is well above the post-season population management objective (3,000) and remaining stable, even with a 2016 increase in Type 1 licenses (n=100). Buck ratios (67:100) continue to be above recreational management and fawns ratios (77:100) remain high, although this is a decrease from the previous three years. Continued high hunter success, low hunter effort, good fawn production, high buck ratios, and landowner observations suggests the Cooper Lake pronghorn population continues to increase. Landowners would like the department to continue to make a concerted effort to manage the Cooper Lake pronghorn herd closer to the population management objective (3,000), therefore, Type 1 and 6 licenses will be increased by 100, for a total license increase of 200 for the 2018 hunting season. The license increase is an effort to increase opportunity, reduce buck ratios, and to reduce the

overall population closer to the population management objective. These license increases have the potential to result in hunter crowding issues. To address these concerns, we will attempt to expand the HMA program to additional properties within the Cooper Lake Herd Unit.

PR526 Cooper Lake Pronghorn
HA43



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR527 - CENTENNIAL

HUNT AREAS: 37, 44-45

PREPARED BY: LEE KNOX

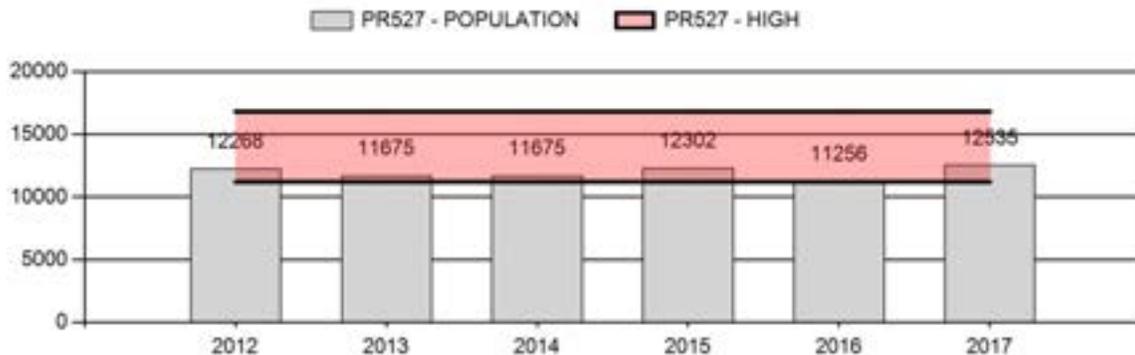
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	11,835	12,535	12,684
Harvest:	1,080	1,042	1,024
Hunters:	1,206	1,181	1,150
Hunter Success:	90%	88%	89 %
Active Licenses:	1,343	1,320	1,245
Active License Success:	80%	79%	82 %
Recreation Days:	4,319	4,071	4,000
Days Per Animal:	4.0	3.9	3.9
Males per 100 Females	42	40	
Juveniles per 100 Females	67	52	

Population Objective (± 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-10.5%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/12/2018

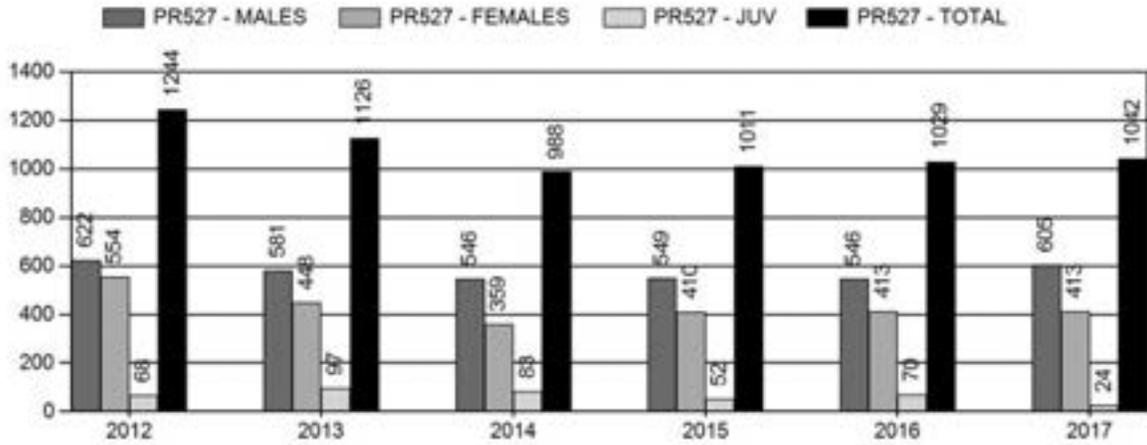
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	8%	8%
Males ≥ 1 year old:	29%	29%
Total:	10%	10%
Proposed change in post-season population:	-2%	-1%

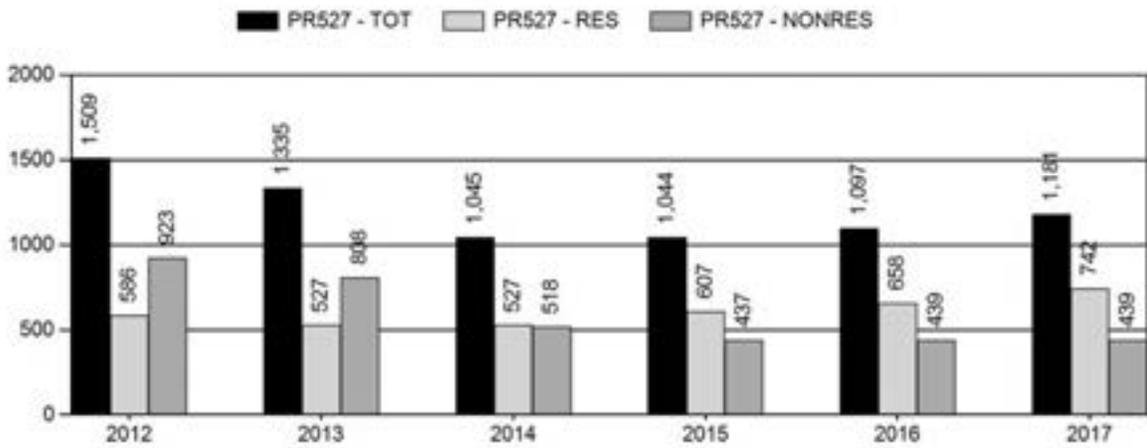
Population Size - Postseason



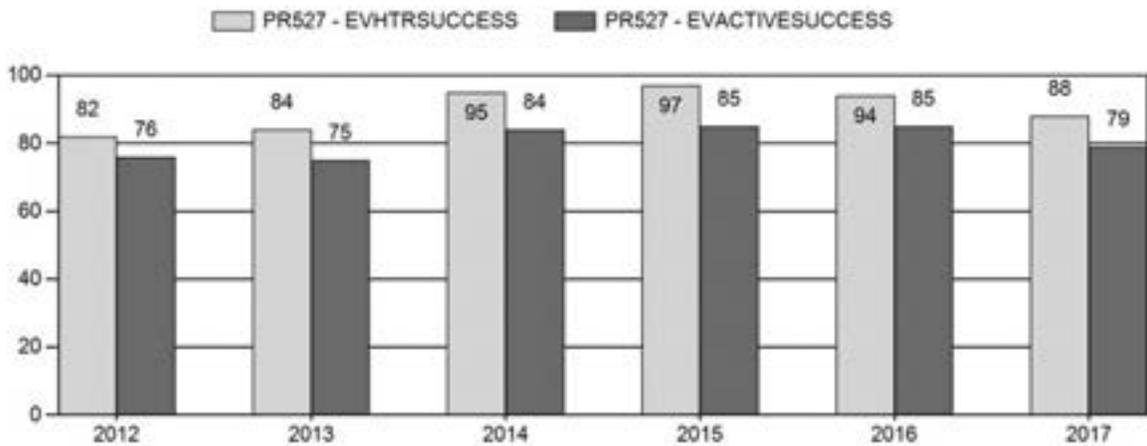
Harvest



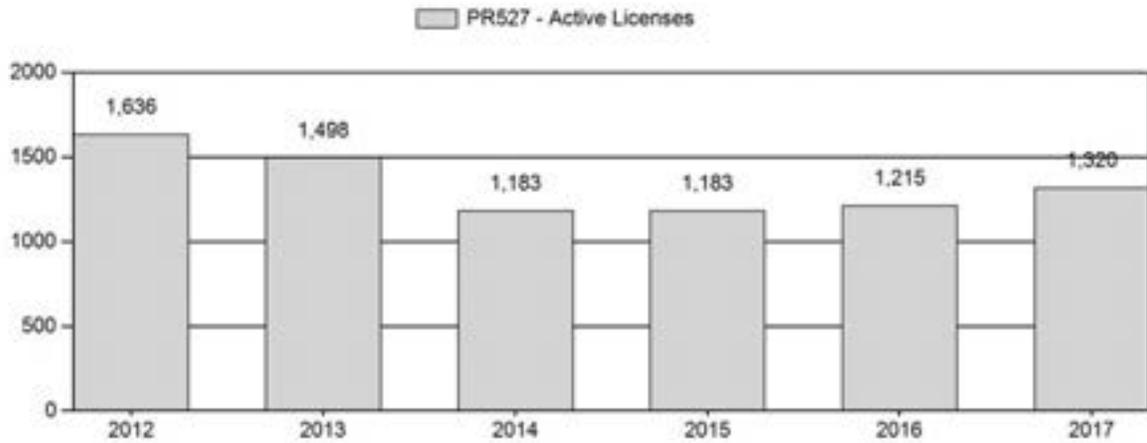
Number of Active Licenses



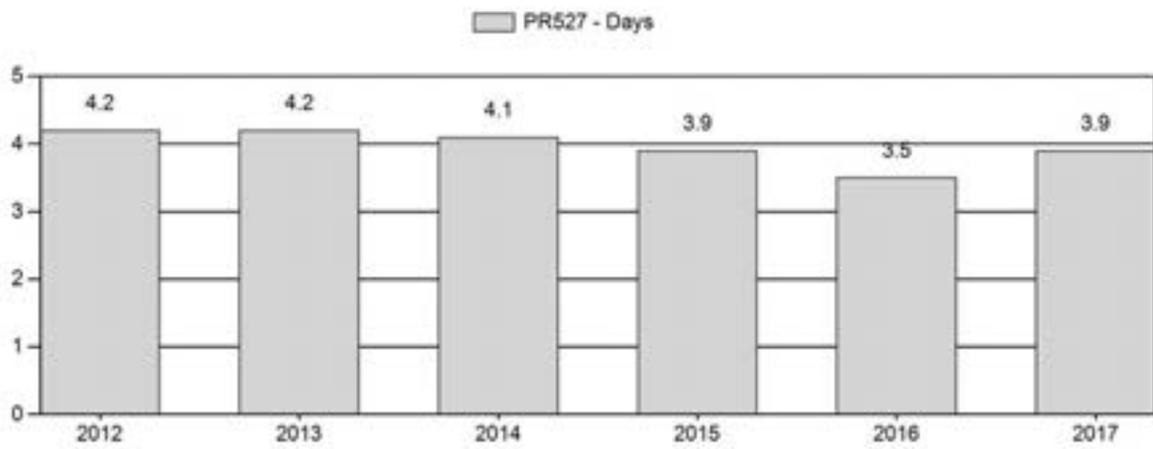
Harvest Success



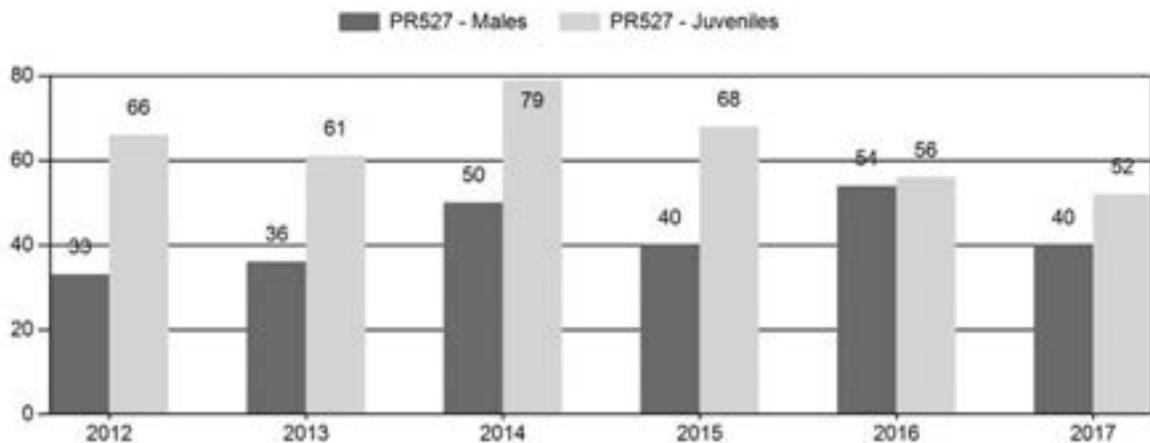
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	12,388	182	353	535	25%	1,000	48%	565	27%	2,100	1,724	18	35	54	± 4	56	± 4	37
2017	13,681	107	284	391	21%	972	52%	508	27%	1,871	2,039	11	29	40	± 4	52	± 4	37

**2018 HUNTING SEASONS
CENTENNIAL PRONGHORN (PR527)**

Hunt Area	Type	Date of Seasons		Quota	License	Limitations
		Opens	Closes			
37	1	Sep. 20	Oct. 14	150	Limited Quota	Any antelope
	6	Sep. 20	Oct. 14	25	Limited Quota	Doe or fawn
44	1	Sep. 15	Oct. 31	300	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	150	Limited Quota	Doe or fawn
45	1	Sep. 15	Oct. 31	400	Limited Quota	Any antelope
	6	Sep. 15	Oct. 31	350	Limited Quota	Doe or fawn
37	Archery	Aug. 15	Sept. 19			Refer to Section 2 of this Chapter
44,45	Archery	Aug. 15	Sept. 14			Refer to Section 2 of this Chapter

Hunt Area	License Type	Changes from 2017
37	1	-75
37	6	-75
44	1	+50
Herd Unit Totals	1	-25
	6	-75

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: ~ 12,500

2018 Postseason Population Estimate: ~ 12,700

2017 Hunter Satisfaction: 87% Satisfied, 8% Neutral, 5% Dissatisfied

The management objective for the Centennial pronghorn herd unit is a post-season population of 14,000 pronghorn. The management strategy is recreational management that requires a pre-hunt ratio of 30 to 59 bucks: 100 does. The objective and management strategy were last revised in 2013.

Herd Unit Issues

The Centennial pronghorn herd unit includes hunt areas 37, 44, and 45. The herd unit is predominately privately owned, with limited accessible public lands. Most public hunting opportunity is limited to the five Hunter Management Areas (HMA) located in the herd unit. Interstate animals further complicate management of this herd unit. There is significant population 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. The 2017 post-season population estimate was approximately 12,500 pronghorn, with the population trending near objective.

Weather

Timing and quantity of precipitation was excellent during key growth periods for cool season grasses and preferred transitional range and winter range shrub species. While early season growing conditions were optimal, late summer and fall precipitation was lacking. The extreme cold and high winds experienced in early winter, as well as hot dry conditions in midsummer, likely increased the mortality in the younger cohort. The following link provides specific meteorological information for the Centennial herd unit: <http://www.ncdc.noaa.gov/cag/>.

Habitat

Due to the timing of, and an increase in precipitation, forage availability continued to improve in 2017. 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 was 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. Data should not heavily influence population management for any particular big game species.

Field Data

A total of 1,871 pronghorn were classified, just short of the estimated classification objective of 2,039. Fawn production was poor again this year and well below the ten year average of 70 fawns: 100 does. The decline in fawns the past two years can likely be attributed to extreme cold in early winter, as well as extremely dry conditions during midsummer. Both yearling and adult bucks also declined in 2017. Total bucks in 2017 decline by 14 bucks: 100 does from the 2016 estimate of 54 bucks: 100 does. However the decline was only 3 bucks per 100 does less than the 10 year average of 43 bucks: 100 does, and falls in the middle of recreational management guidelines.

Harvest Data

Hunter success in 2017 remains high at 88%. Hunter effort increased slightly, but remains below the ten year average of four days to harvest. The hunter satisfaction survey showed 87% of hunters were satisfied or very satisfied with their hunt, 8% of respondents were neutral. Overall the current season structure and license issuance is working well, insomuch as it is reflected in the high hunter success and satisfaction. This herd unit is popular with nonresidents who accounted for 37% of the licenses in 2017. Resident interest in this herd has increased, claiming more of their allocation of licenses, but this is most likely an effect of the statewide decrease in license issuance that occurred in 2014 that shifted residents to hunt areas with better draw odds.

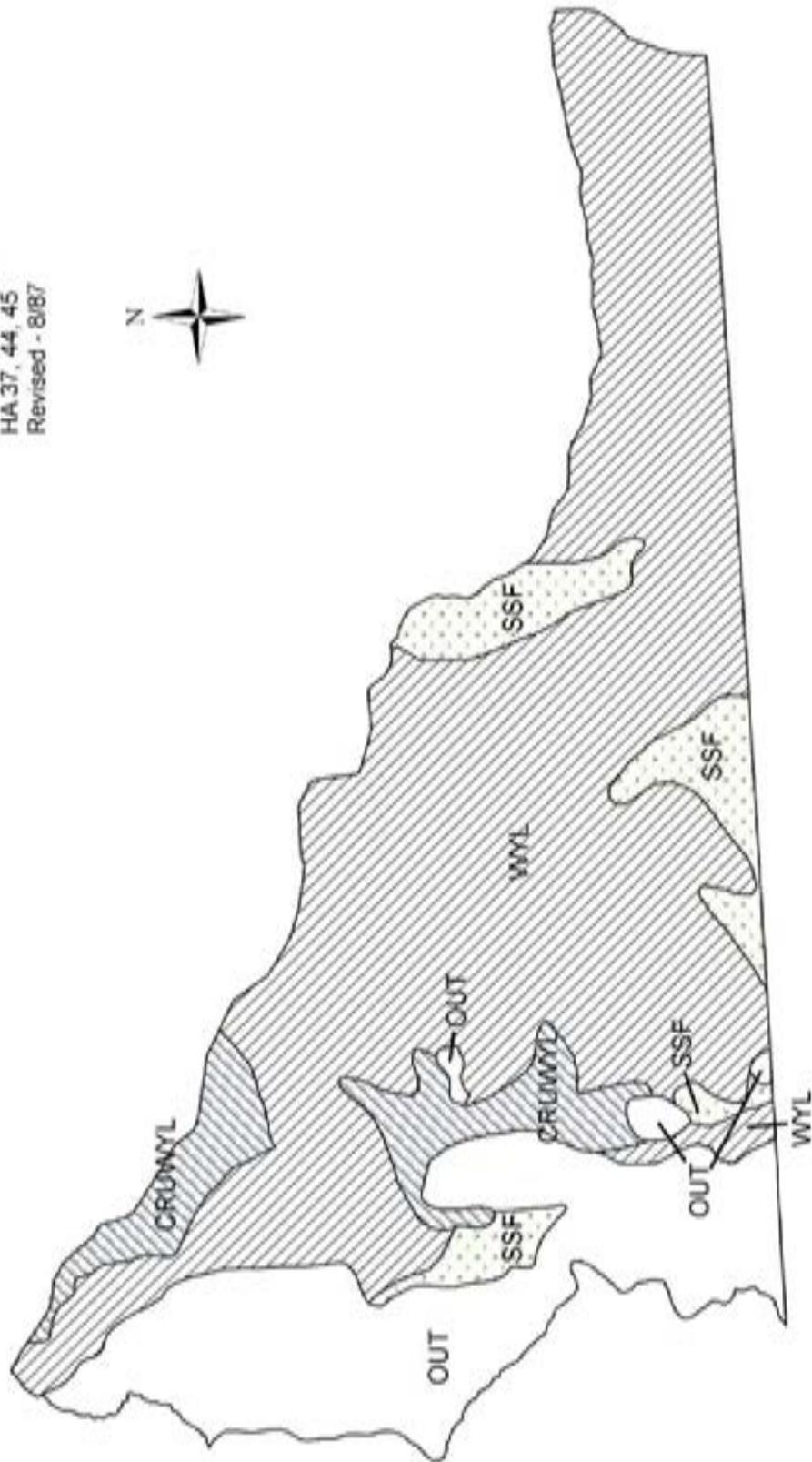
Population

The “Constant Juvenile – Constant Adult Survival Rate (CJCA)” spreadsheet model was chosen to use for the post-season population estimate of this herd. This model did not have the lowest relative Akaike information criterion (AIC) score, but had the most reasonable population estimate. Because of varying quality of classification data, the simplest model that relied on the fewest assumptions was determined to be the one that would provide the best population estimate. The model estimates the Centennial pronghorn herd has slowly decreased in number since 2004 when the population was estimated at 18,000. The 2017 post season population estimate is 12,500, and within 20% of the population objective. This is a poor model due to ratio data prior to 2000 being of poor quality, we are unable to survey the entire area, there is significant interchange with populations in Colorado, and we do not have adult and juvenile survival data for this herd unit. This model is not biologically defensible. We conducted a line transect survey for this herd at the end of bio year 2013, which estimated 21,000 pronghorn with a standard error of 3,300. The confidence interval (CI) is between 15,400 and 28,700 pronghorn, too wide of an estimate to have any influence on the population model. The E band was estimated higher than the other bands in the histogram, which violates the first assumption of the line transect (LT) survey.

Management Summary

The 2017 post-season population estimate is within 20% of the population objective. Current season dates are working well to provide more opportunity and spread out hunting pressure. Hunt Area 37 continues to have poor buck and fawn ratios for unknown reasons. There are currently no damage concerns within the hunt area, so we will be reducing both Type 1 and Type 6 licenses accordingly. The Hunt Area 44 buck ratio falls above recreational management guidelines at 65 bucks: 100 does. Type 1 licenses will be increased by 50 to provide more opportunity. If we attain the projected harvest of 1,000 pronghorn and have a fawn ratio near the three year average of 64, the population will continue to approximate the objective. We predict a 2018 post-season population of approximately 12,700 pronghorn.

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



2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR528 - ELK MOUNTAIN

HUNT AREAS: 50

PREPARED BY: WILL SCHULTZ

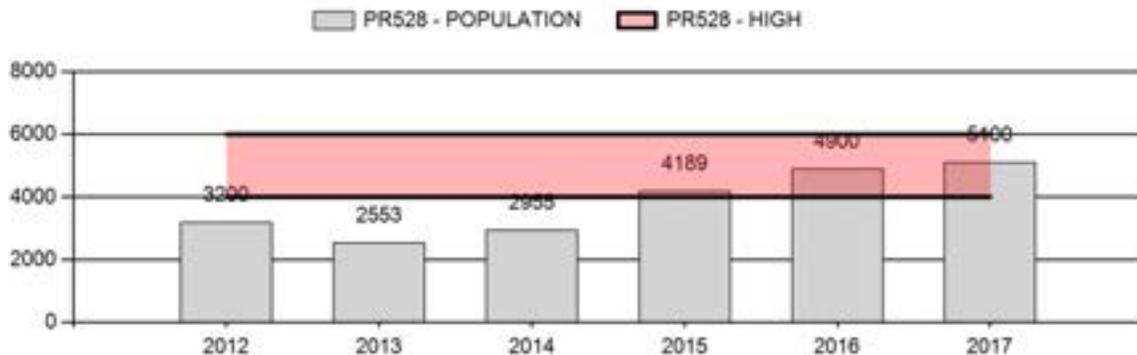
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	3,559	5,100	5,400
Harvest:	499	363	375
Hunters:	565	373	373
Hunter Success:	88%	97%	101 %
Active Licenses:	593	426	425
Active License Success:	84%	85%	88 %
Recreation Days:	1,843	1,226	1,400
Days Per Animal:	3.7	3.4	3.7
Males per 100 Females	36	61	
Juveniles per 100 Females	59	46	

Population Objective (\pm 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	2%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/12/2018

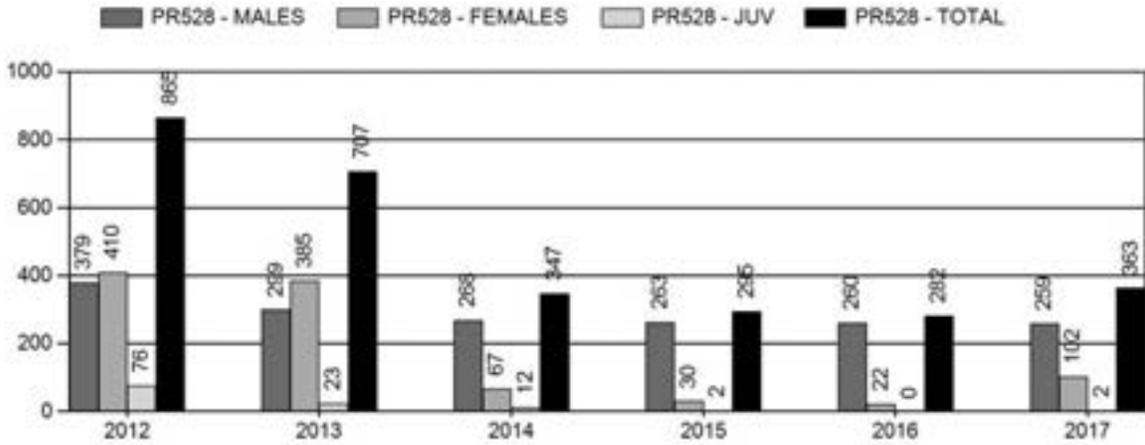
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	0.01%	4%
Males \geq 1 year old:	30%	25%
Total:	-6%	10%
Proposed change in post-season population:	-5%	-7%

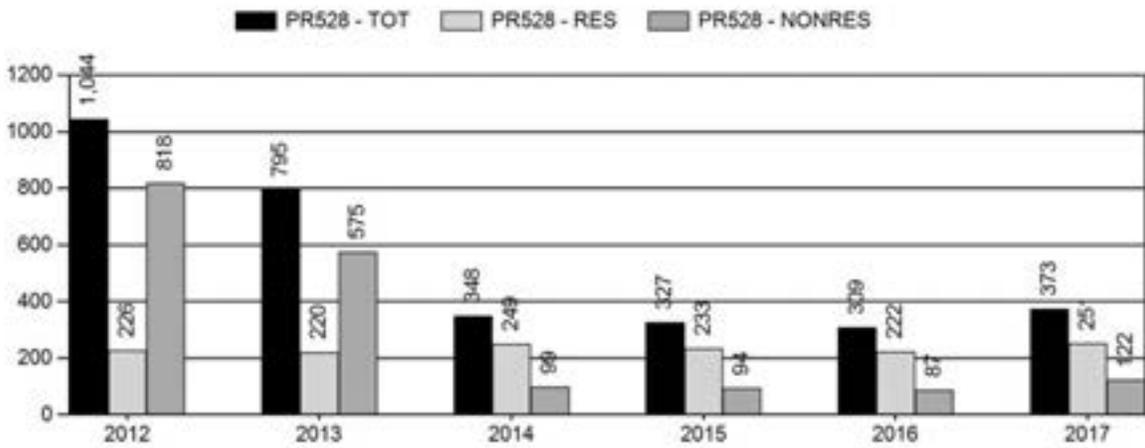
Population Size - Postseason



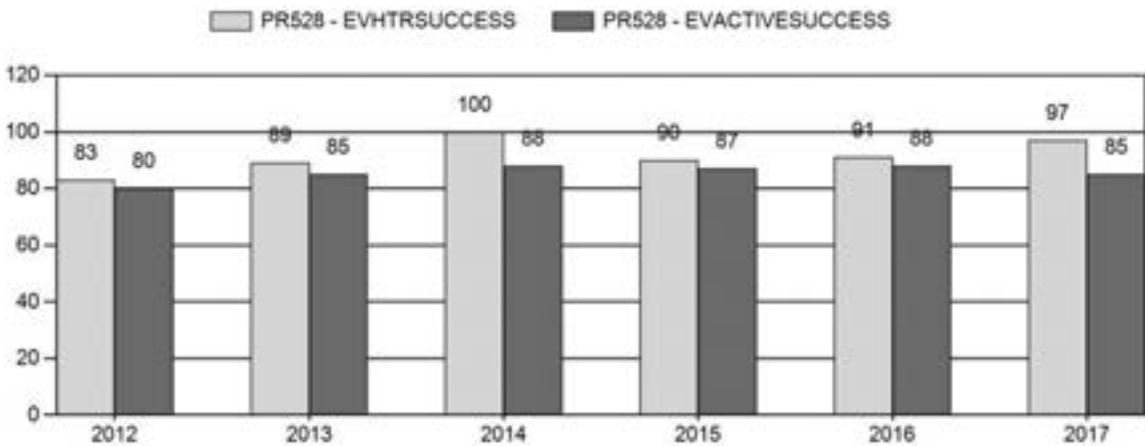
Harvest



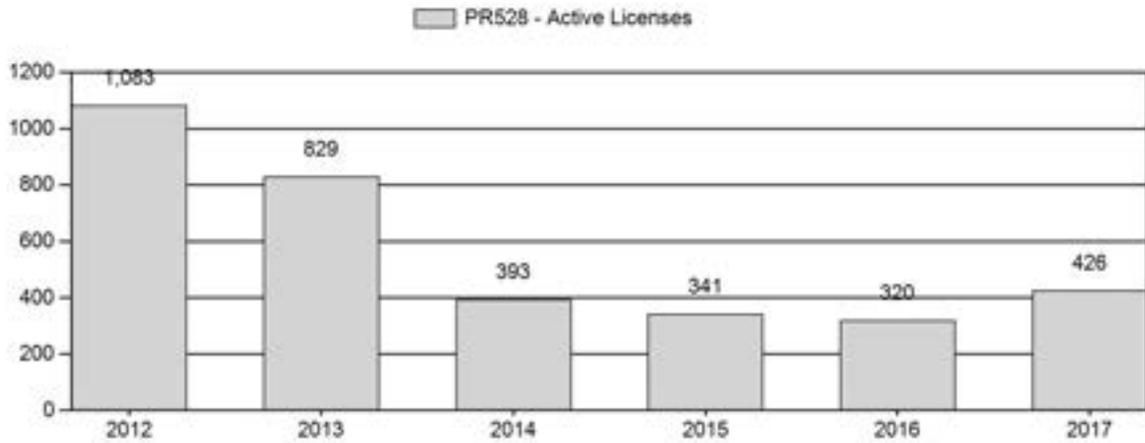
Number of Active Licenses



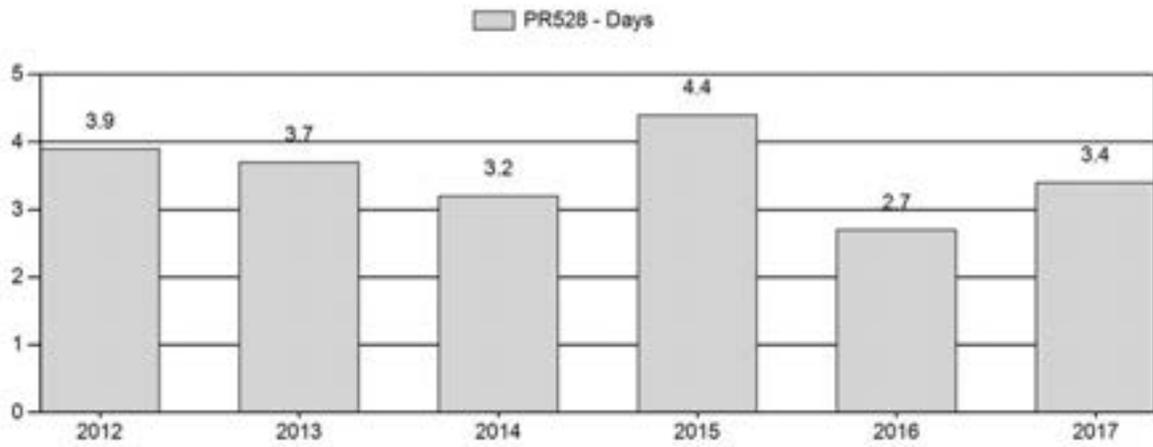
Harvest Success



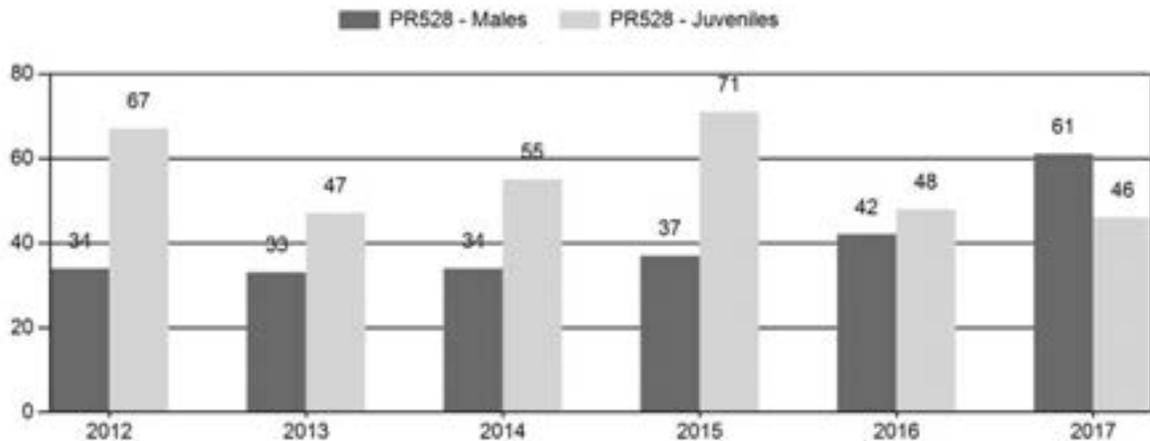
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	4,200	73	115	188	17%	545	50%	367	33%	1,100	1,098	13	21	34	± 4	67	± 6	50
2013	3,331	75	95	170	18%	510	55%	239	26%	919	1,000	15	19	33	± 4	47	± 5	35
2014	3,337	64	111	175	18%	511	53%	280	29%	966	1,021	13	22	34	± 4	55	± 6	41
2015	4,502	118	108	226	18%	612	48%	437	34%	1,275	1,153	19	18	37	± 4	71	± 6	52
2016	5,200	80	83	163	22%	391	53%	189	25%	743	1,459	20	21	42	± 6	48	± 7	34
2017	5,500	157	152	309	30%	503	48%	230	22%	1,042	1,426	31	30	61	± 7	46	± 5	28

**2018 HUNTING SEASON RECOMMENDATIONS
ELK MOUNTAIN PRONGHORN (PR528)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
50	1	Sep. 16	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 16	Oct. 31	150	Limited quota	Doe or fawn
	0	Sep. 1	Sep. 15	50	Limited quota	Any antelope, muzzle-loading firearms only
	Archery	Aug. 15	Aug. 31			Refer to license type and limitations in Section 3 of Chapter 5

Hunt Area	License Type	Quota change from 2017
Herd Unit Total		None

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: 5,100

2018 Proposed Postseason Population Estimate: 5,400

2017 Hunter Satisfaction: 92% Satisfied, 4% Neutral, 4% Dissatisfied

Pronghorn in the Elk Mountain herd unit are managed toward a postseason population objective of 5,000. The population was estimated using a spreadsheet model developed in 2012 and updated in 2017. The herd is managed for recreational opportunity. The management objective was reviewed in 2014 and retained at a postseason population 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. However, for the past 10-years Elk Mountain Ranch has provided pronghorn hunting opportunities on two large Hunter Management Areas. The Pennock and Wick Wildlife Habitat Management Areas also provide hunters with hunting access. Much of the herd unit’s sagebrush ecosystem remains intact.

However, increased agricultural, energy, and residential development does threaten sagebrush habitat in this area.

Weather

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration (NOAA) climatic Division 10 (Upper Platte), <https://www.ncdc.noaa.gov/cag/> to illustrate weather conditions thus far, during bio-year 2017 (Figures 1 and 2). These figures also include data from January - May of bio-year 2016 to describe the weather conditions immediately preceding bio-year 2017. Monthly mean temperatures in the winter months of bio-year 2016 and 2017 were slightly warmer than the 50-year monthly means but otherwise temperatures were similar to the 50-year monthly means. Precipitation in the latter part of bio-year 2016, primarily received in the form of snow, was stressful for pronghorn in this herd unit. The summer of bio-year 2017 was drier than the 50-year average. Otherwise, relatively favorable weather conditions were experienced in Division 10 throughout the remainder of bio-year 2017.

Figure 1. January 2017 - January 2018 mean monthly temperatures and 50-year monthly means for NOAA climatic Division 10, Wyoming.

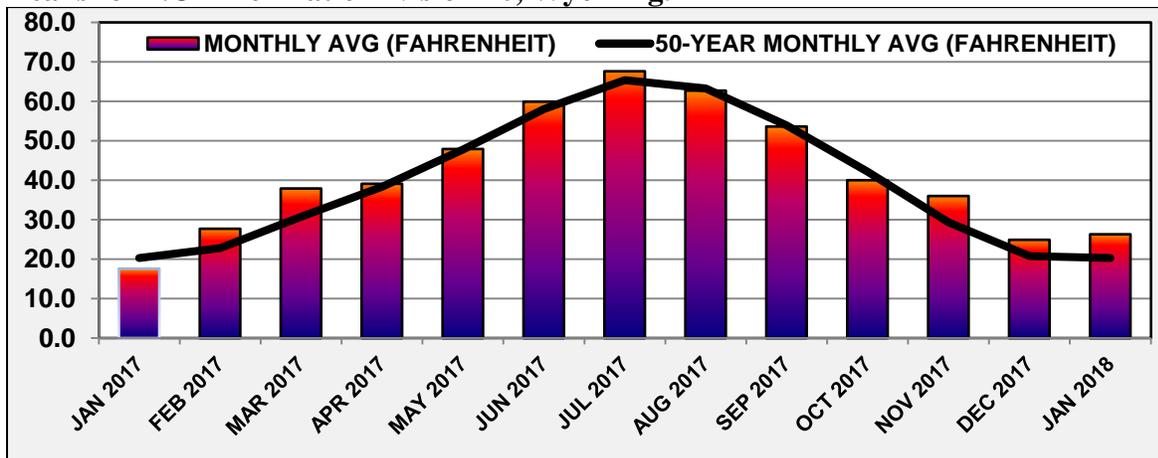
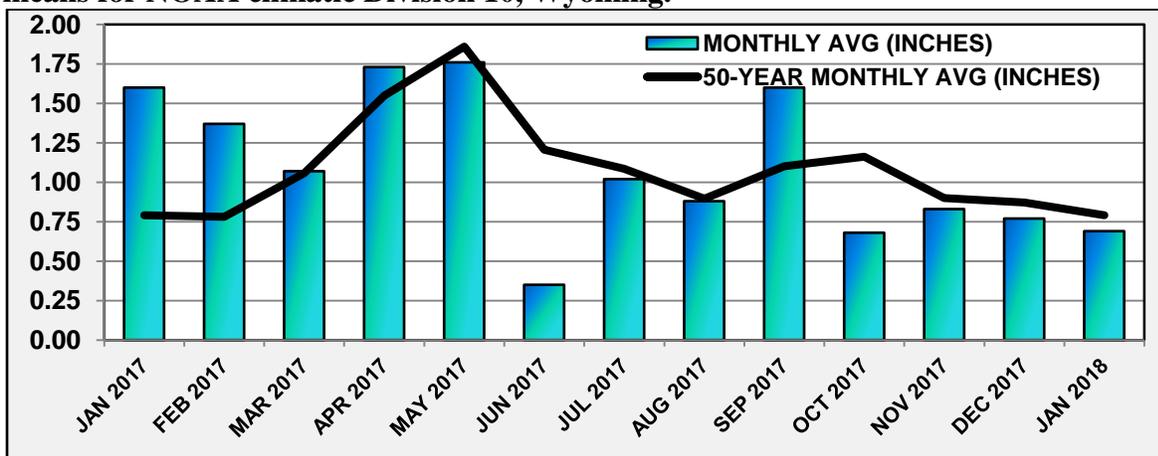


Figure 2. January 2017 - January 2018 mean monthly precipitation and 50-year monthly means for NOAA climatic Division 10, Wyoming.



Habitat

Positive trends in habitat conditions were observed in bio-year 2017 due to adequate amounts of early spring precipitation being received in this herd unit. The limited number of habitat transects that have been established within this herd unit do not provide sufficient data to make reliable inferences about habitat quantity or quality. Most shrub-steppe habitat in this herd unit is decadent and in need of treatments designed to improve the nutritional value of sagebrush and other plants.

Field Data

Preseason ratios for this herd were 61 bucks and 46 fawns/100 does in 2017. Buck ratios increased and fawn ratios decreased in comparison the 2016 classification. The buck ratio was 29% greater than the ratio observed in 2016. This significantly greater buck ratio may have been caused by sampling biases which are difficult to overcome when conducting classifications from the ground along public roads. Severe winter weather conditions in late bio-year 2016 may have contributed to the observed reduction in the 2017 fawn ratios.

Harvest Data

The 2017 harvest survey indicated a total of 363 pronghorn were harvested which was a increase of 22% from 2016. Overall harvest success increased 6% to 97% for 372 active licensed hunters in 2017. The days/pronghorn increased from 2.7 in 2016, to 3.4 days/harvest in 2017. The increases in harvest success and in days/harvest were attributed to the increased number of Type 6 licenses allocated in 2017.

Population

Spreadsheet model estimates indicated the Elk Mountain herd is currently slightly above the management objective of 5,000 pronghorn. The CJ, CA model was selected again in 2017 to develop a postseason population estimate of 5,100 pronghorn for the Elk Mountain herd unit. The model's population estimates are plausible and match trends in harvest and preseason classifications. The model's end-of-year estimates are less than the corresponding year Line-Transect survey density estimates conducted in 2007, 2010, and 2012.

We 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

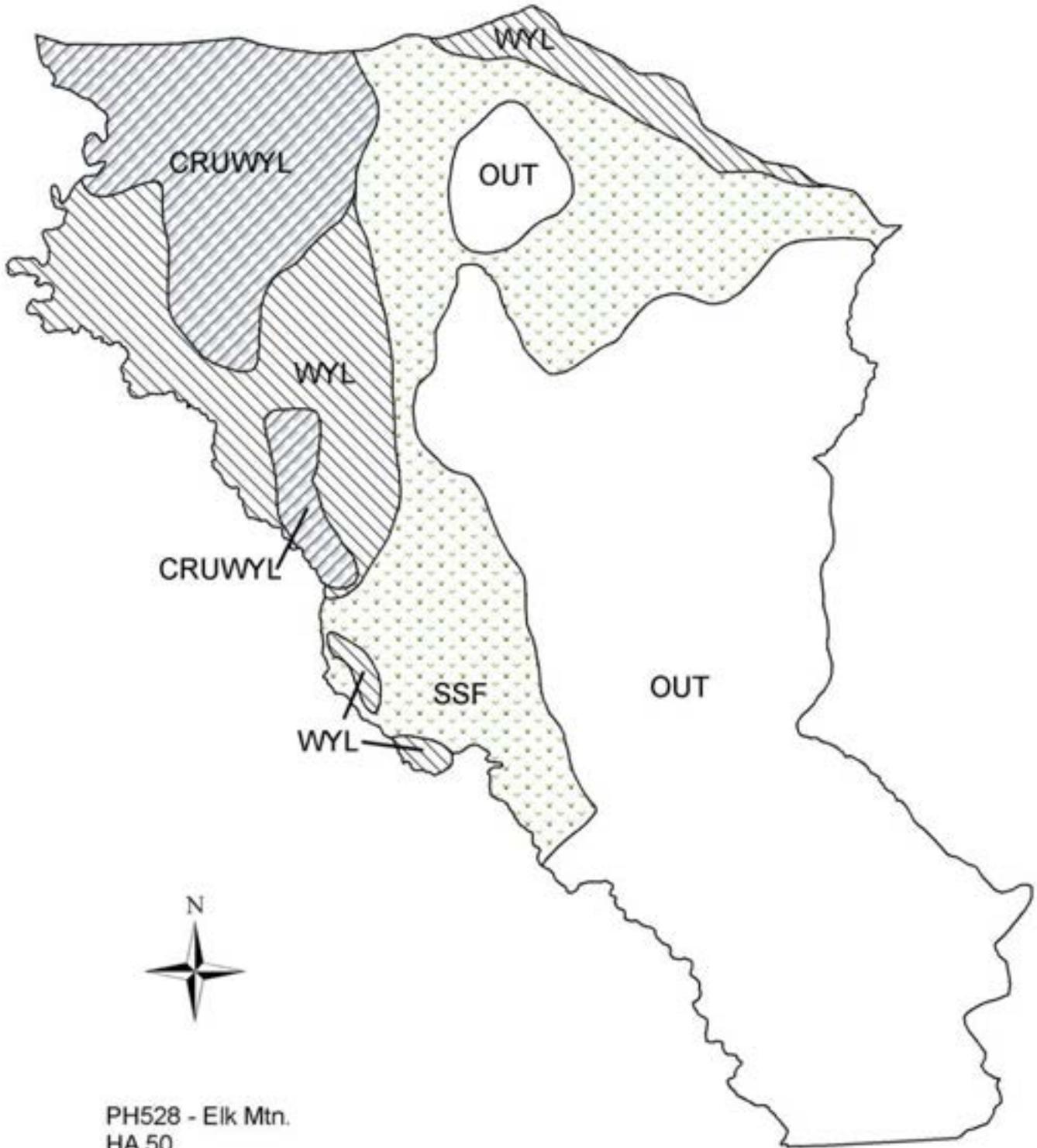
The license numbers will be maintained at the same level as they were last year. This rate of harvest should allow for stabilizing pronghorn numbers in this herd unit. The popular muzzleloader only season will continue to be offered in 2018.

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

2017 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2017 - 5/31/2018

HERD: PR529 - BIG CREEK

HUNT AREAS: 51

PREPARED BY: WILL SCHULTZ

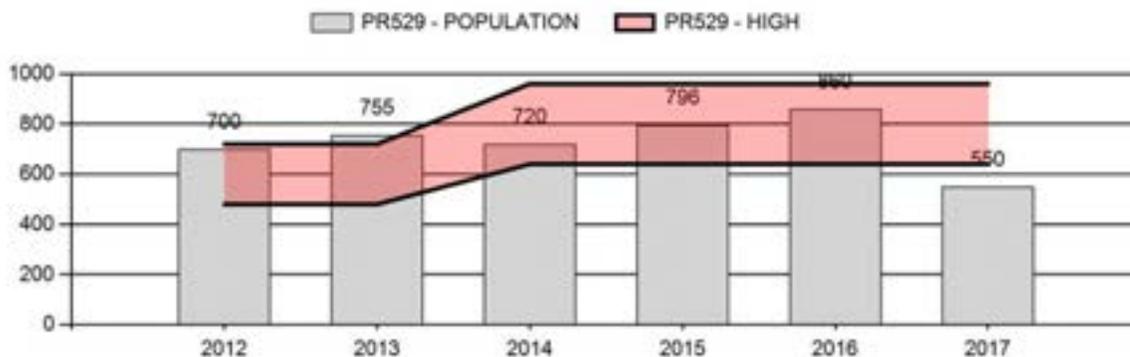
	<u>2012 - 2016 Average</u>	<u>2017</u>	<u>2018 Proposed</u>
Population:	766	550	400
Harvest:	63	185	185
Hunters:	62	172	172
Hunter Success:	102%	108%	108 %
Active Licenses:	74	202	200
Active License Success:	85%	92%	92 %
Recreation Days:	214	587	600
Days Per Animal:	3.4	3.2	3.2
Males per 100 Females	56	57	
Juveniles per 100 Females	56	42	

Population Objective ($\pm 20\%$) :	800 (640 - 960)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-31.2%
Number of years population has been + or - objective in recent trend:	2
Model Date:	02/12/2018

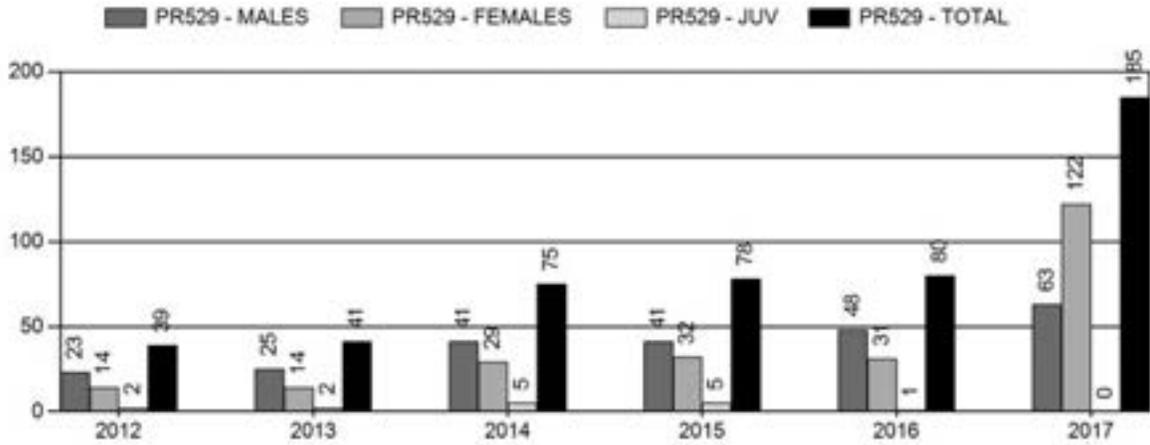
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	35%	50%
Males ≥ 1 year old:	38%	61%
Total:	27%	54%
Proposed change in post-season population:	-32%	-37%

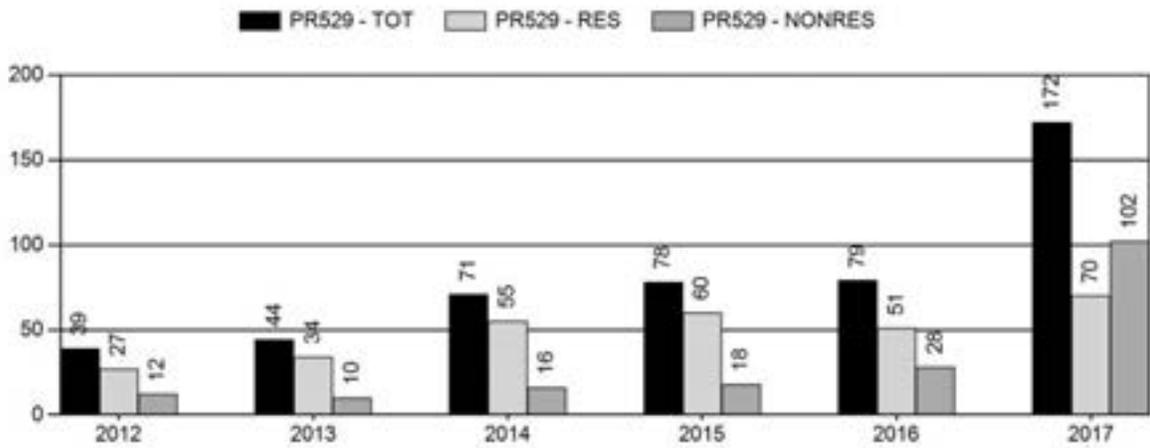
Population Size - Postseason



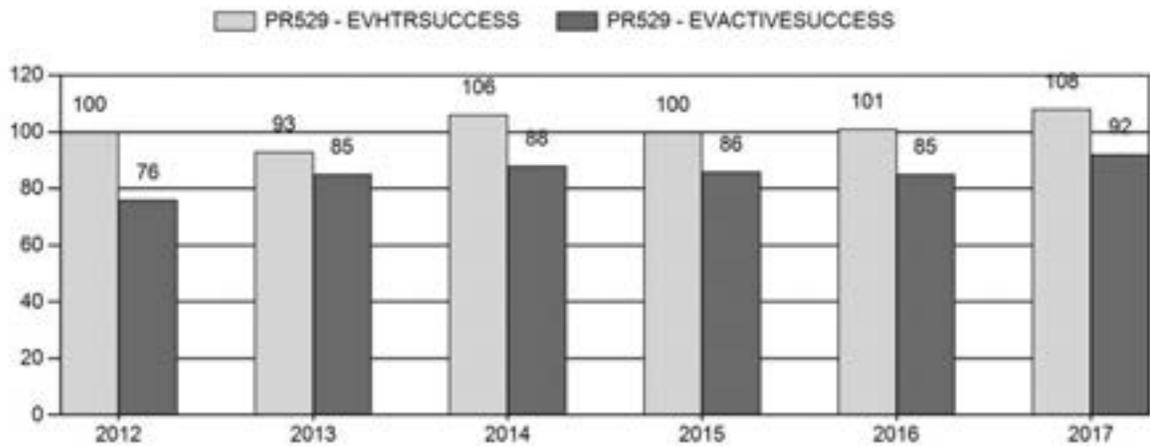
Harvest



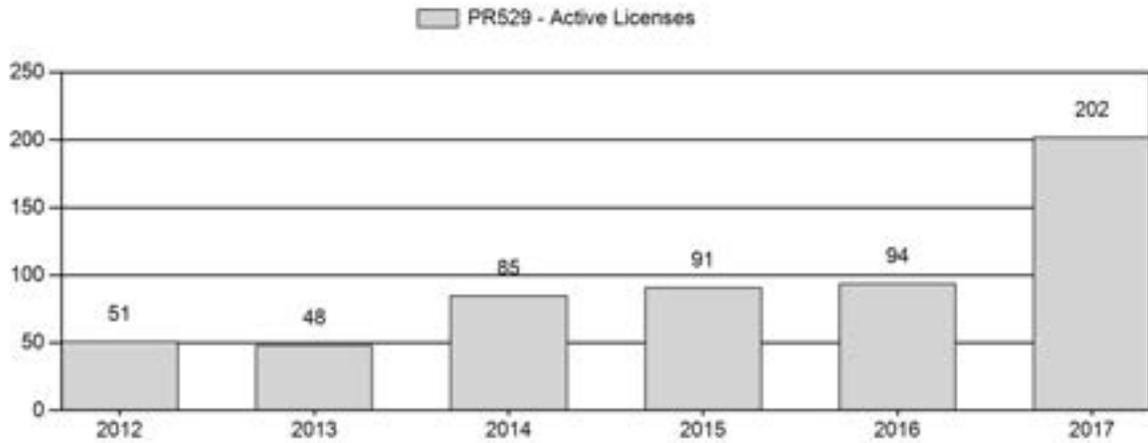
Number of Active Licenses



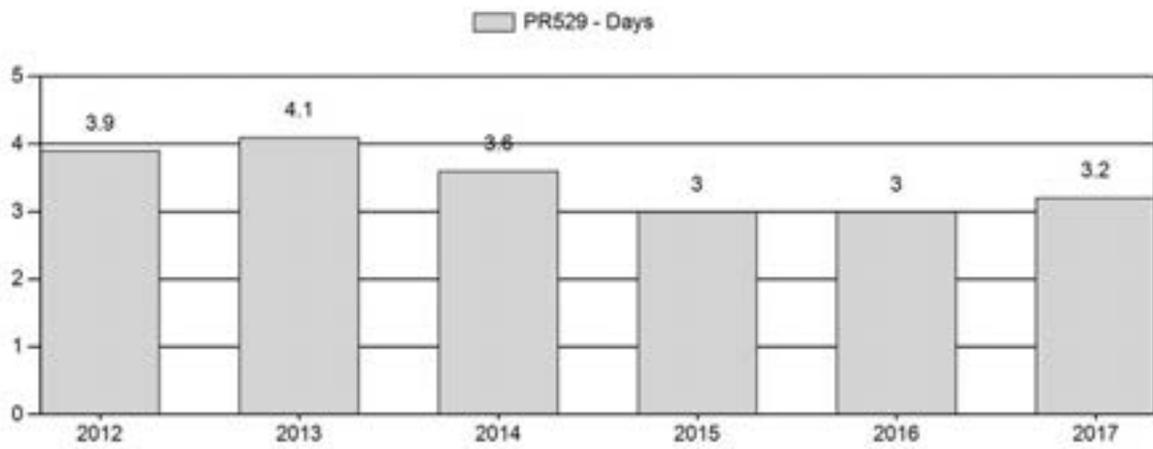
Harvest Success



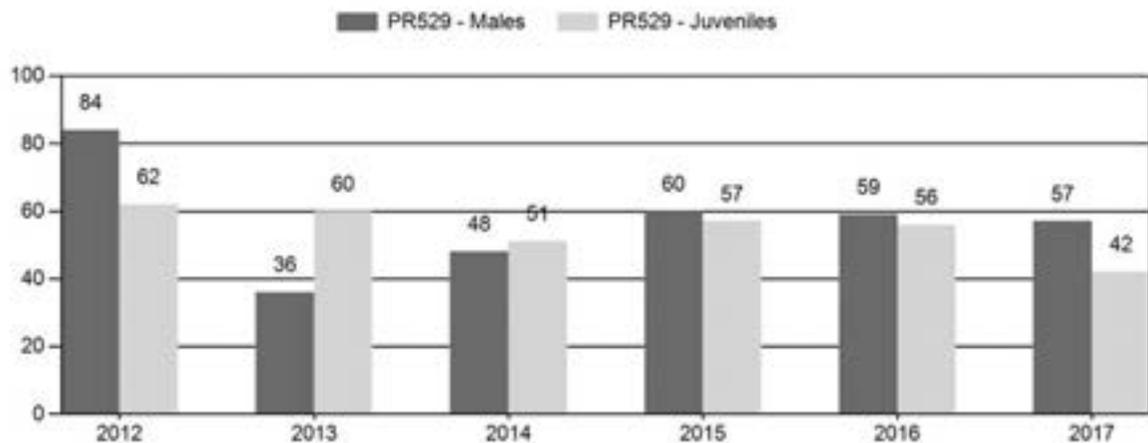
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2012 - 2017 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2012	750	32	60	92	34%	110	41%	68	25%	270	441	29	55	84	± 16	62	± 13	34
2013	800	8	43	51	18%	141	51%	84	30%	276	503	6	30	36	± 8	60	± 11	44
2014	802	42	87	129	24%	271	50%	137	26%	537	501	15	32	48	± 5	51	± 5	34
2015	882	58	91	149	28%	248	46%	141	26%	538	561	23	37	60	± 6	57	± 6	36
2016	950	61	123	184	27%	311	46%	175	26%	670	657	20	40	59	± 5	56	± 5	35
2017	0	48	114	162	29%	285	50%	120	21%	567	435	17	40	57	± 0	42	± 0	27

**2018 HUNTING SEASON RECOMMENDATIONS
BIG CREEK PRONGHORN (PR529)**

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
51	1	Sep. 16	Nov. 14	75	Limited quota	Any antelope
	6	Aug. 15	Sep. 15	150	Limited quota	Doe or fawn valid on private land
	6	Sep. 16	Nov. 14		Limited quota	Doe or fawn valid in the entire area
	Archery	Aug. 15	Sep. 15			Refer to license type and limitations in Section 3 of Chapter 5

Hunt Area	License Type	Quota change from 2017
51		None

Management Evaluation

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

Management Strategy: Recreational

2017 Postseason Population Estimate: 550

2018 Proposed Postseason Population Estimate: 400

2017 Hunter Satisfaction: 94% Satisfied, 4% 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 2017. The herd unit is managed as a recreational management herd unit. The management objective was reviewed in 2014 and increased to a postseason population estimate of 800 pronghorn.

Herd Unit Issues

Pronghorn damage to alfalfa crops can be an issue when pronghorn numbers are high. Access is difficult except for on those private lands receiving damage. Recent changes in land use have been observed in this herd unit. Several sections of abandoned wheat fields have been converted into cattle pastures which have been grazed intensively. Rural residential development of sagebrush habitat in the Trail Run subdivision continues. In the past this area provided

pronghorn with seasonal habitat and the observed changes in land use appear to be displacing pronghorn into other areas.

Weather

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration (NOAA) climatic Division 10 (Upper Platte), <https://www.ncdc.noaa.gov/cag/> to illustrate weather conditions thus far, during bio-year 2017 (Figures 1 and 2). These figures also include data from January - May of bio-year 2016 to describe the weather conditions immediately preceding bio-year 2017. Monthly mean temperatures in the winter months of bio-year 2016 and 2017 were slightly warmer than the 50-year monthly means but otherwise temperatures were similar to the 50-year monthly means. Precipitation in the latter part of bio-year 2016, primarily received in the form of snow, was stressful for pronghorn in this herd unit. The summer of bio-year 2017 was drier than the 50-year average. Otherwise, relatively favorable weather conditions were experienced in Division 10 throughout the remainder of bio-year 2017.

Figure 1. January 2017 - January 2018 mean monthly temperatures and 50-year monthly means for NOAA climatic Division 10, Wyoming.

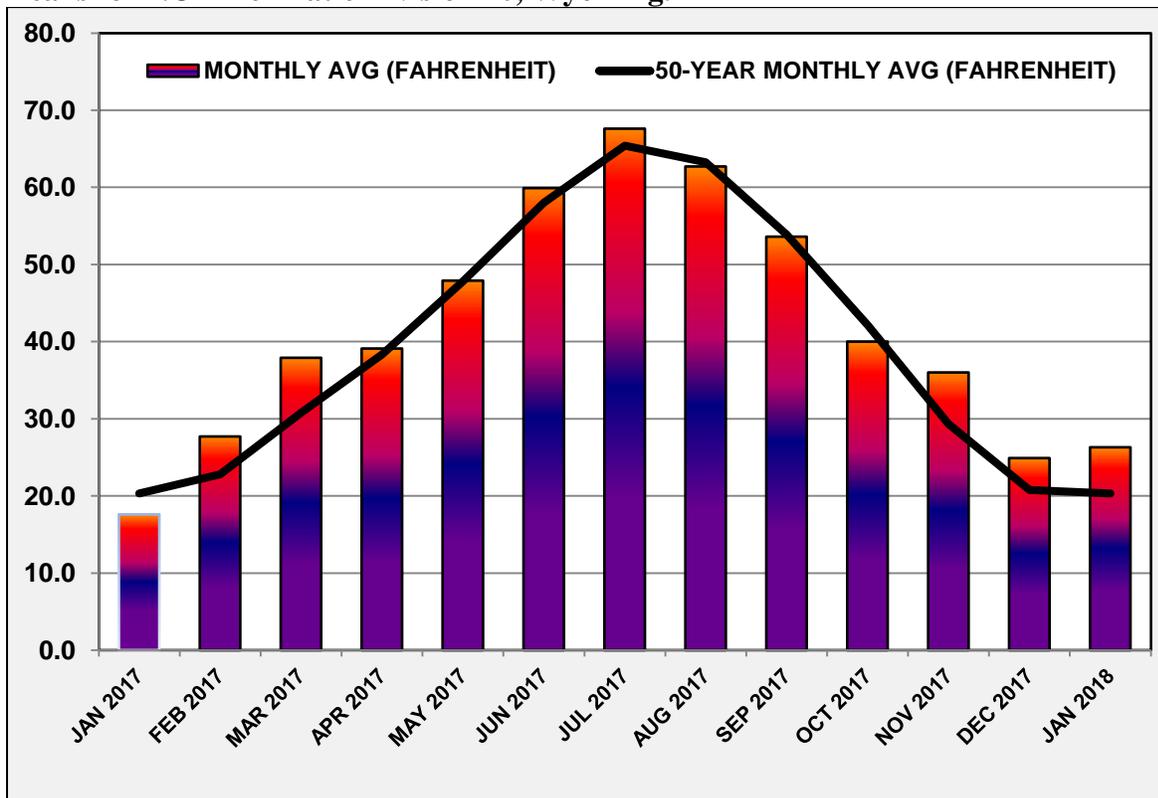
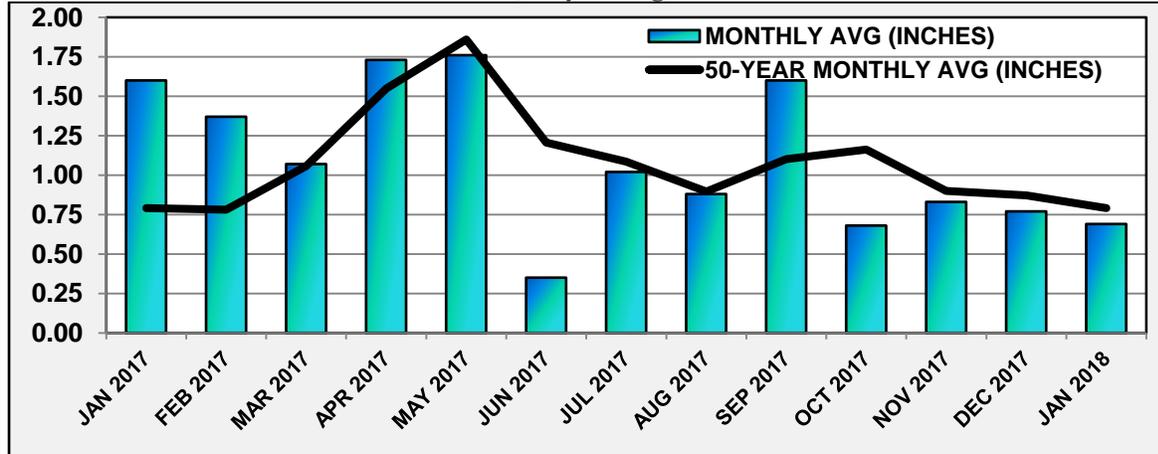


Figure 2. January 2017 - January 2018 mean monthly precipitation and 50-year monthly means for NOAA climatic Division 10, Wyoming.



Habitat

Positive trends in habitat conditions were observed in bio-year 2017 due to adequate amounts of early spring precipitation being received in this herd unit. The limited number of habitat transects that have been established within this herd unit do not provide sufficient data to make reliable inferences about habitat quantity or quality. Most shrub-steppe habitat in this herd unit is decadent and in need of treatments designed to improve the nutritional value of sagebrush and other plants.

Field Data

The 2017 preseason ratios were 57 bucks and 42 fawns per 100 does produced from an adequate sample of 567 pronghorn obtained through ground surveys. 2017 fawn ratios had decreased from 56 fawns/100 does in 2016, to 42 fawns/100 does in 2017. This decrease in fawn ratios was attributed to the stressful winter weather pronghorn experienced during January of 2017.

Harvest Data

The harvest survey data for the 2017 hunting season indicated a total of 185 pronghorn; 63 bucks, 122 does, and 0 fawns were harvested with an overall harvest success rate of 108%. 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 2017, the CJ, CA spreadsheet model was selected again for the Big Creek herd unit because it produced the lowest AICc score. The postseason population estimate of 550 pronghorn from this model was considered to be plausible but perhaps underestimating the true number of pronghorn in this herd unit. The end of year density estimates developed from previous line-transect density surveys appeared to overestimate actual pronghorn abundance in this herd unit. Small sample sizes and interstate movements of pronghorn for this herd unit may produce bias in line-

transect survey estimates for this herd unit. However, completing a in line-transect survey for this herd unit should become a priority in the near future. We rated this model as poor, and not biologically defensible in our evaluation. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model (Morrison 2012). The poor rating was primarily due to inadequate sample sizes for past preseason classification surveys and the likely violation of an assumption that this is a closed population. Interstate movement of pronghorn complicates monitoring and subsequent management activities in this herd unit.

Management Summary

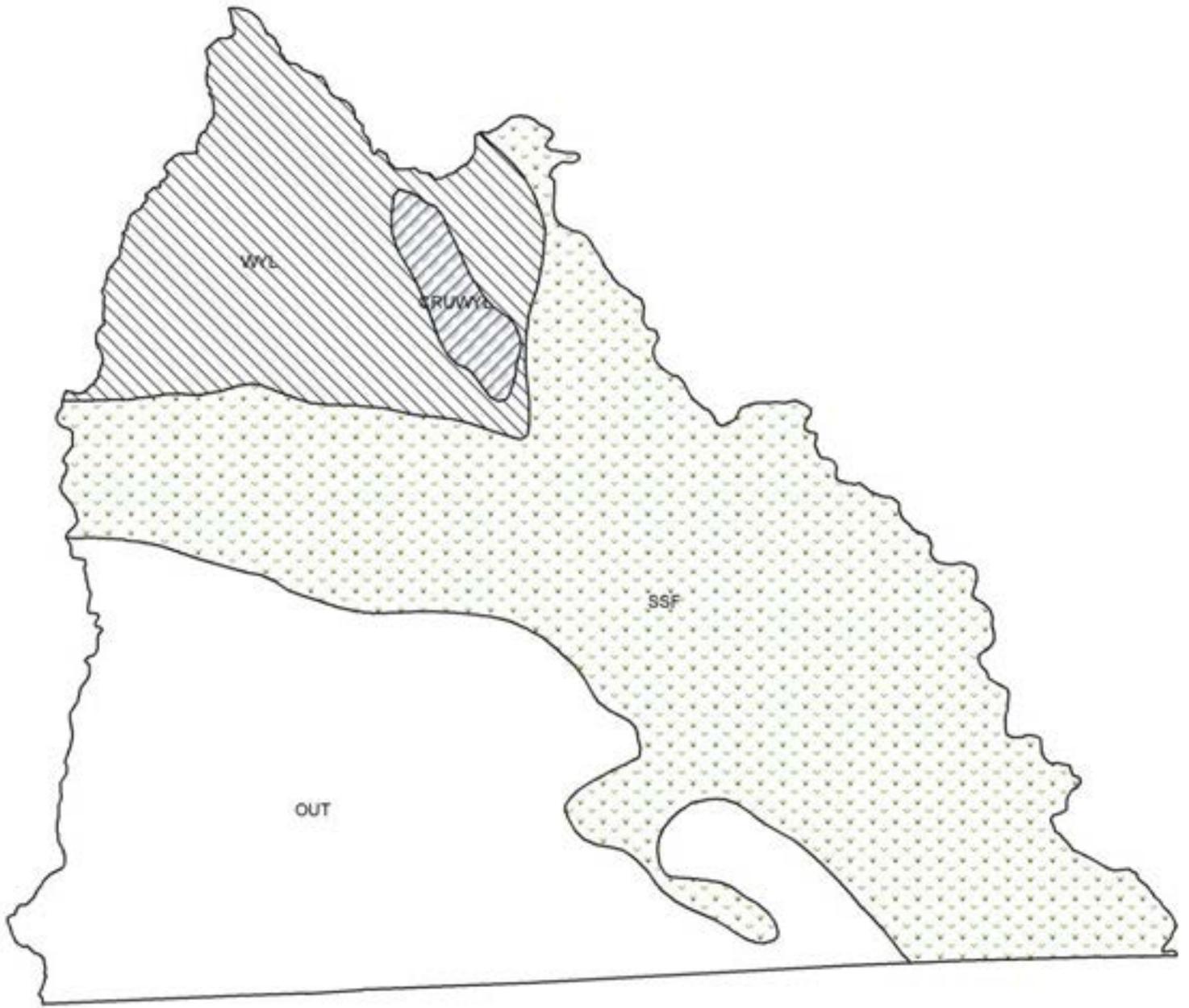
Licenses were maintained at the same number offered in 2017 to provide continued harvest opportunities for bucks and to address damage to alfalfa fields in the western part of the herd unit. This level of harvest should stabilize the population at, or slightly below, the population objective.

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.



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