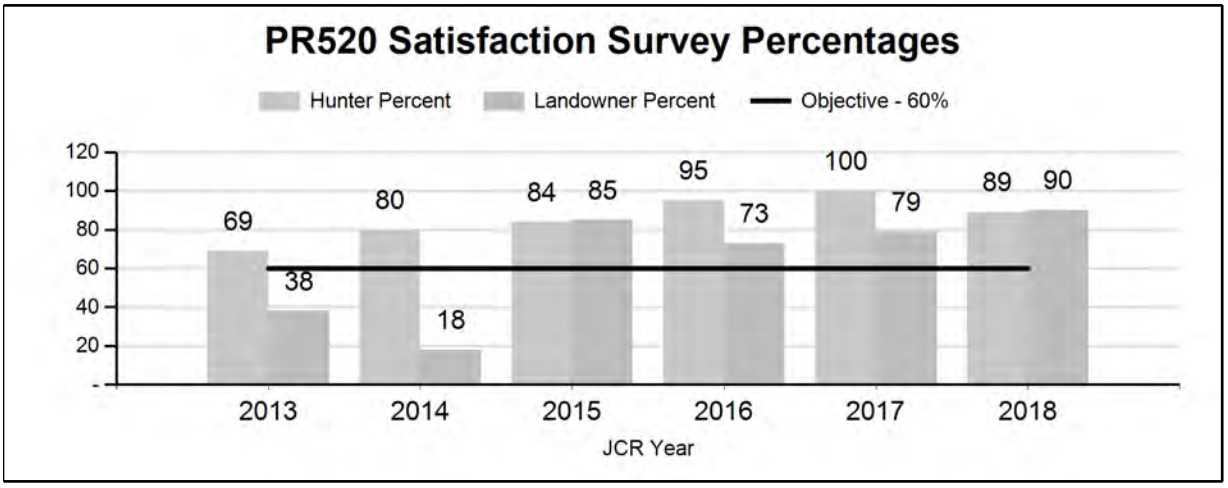
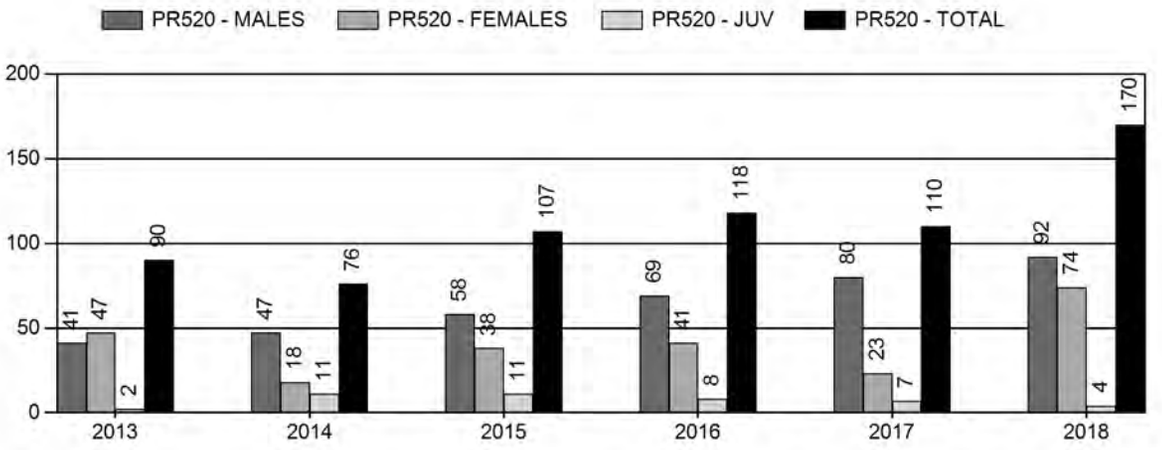
2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019
HERD: PR520 - CHALK BLUFFS
HUNT AREAS: 111
PREPARED BY: MARTIN HICKS

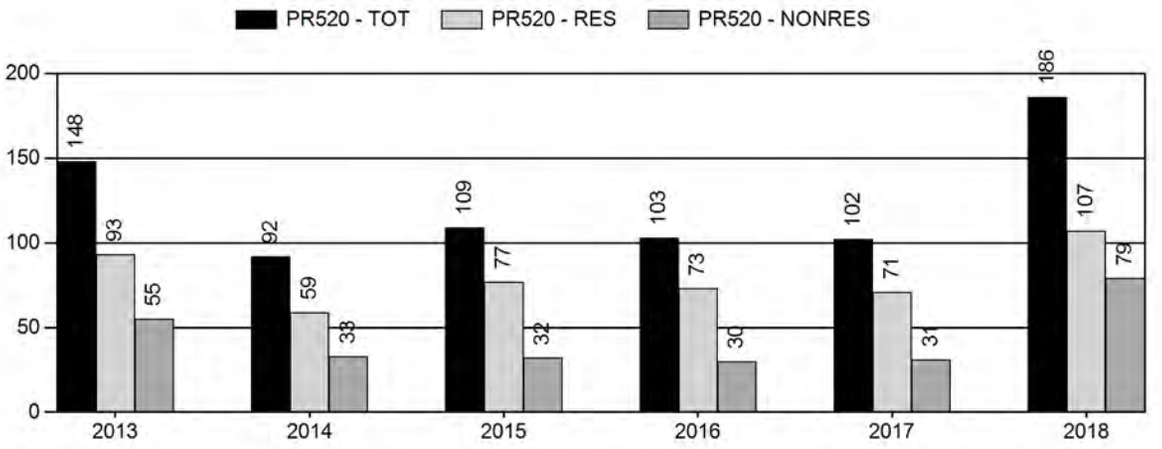
	2013 - 2017 Average	2018	2019 Proposed
Hunter Satisfaction Percent	85%	89%	85%
Landowner Satisfaction Percent	61%	90%	85%
Harvest:	100	170	150
Hunters:	111	186	180
Hunter Success:	90%	91%	83%
Active Licenses:	140	218	215
Active License Success:	71%	78%	70%
Recreation Days:	460	503	500
Days Per Animal:	4.6	3.0	3.3
Males per 100 Females:	26	67	
Juveniles per 100 Females	58	79	
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:			5



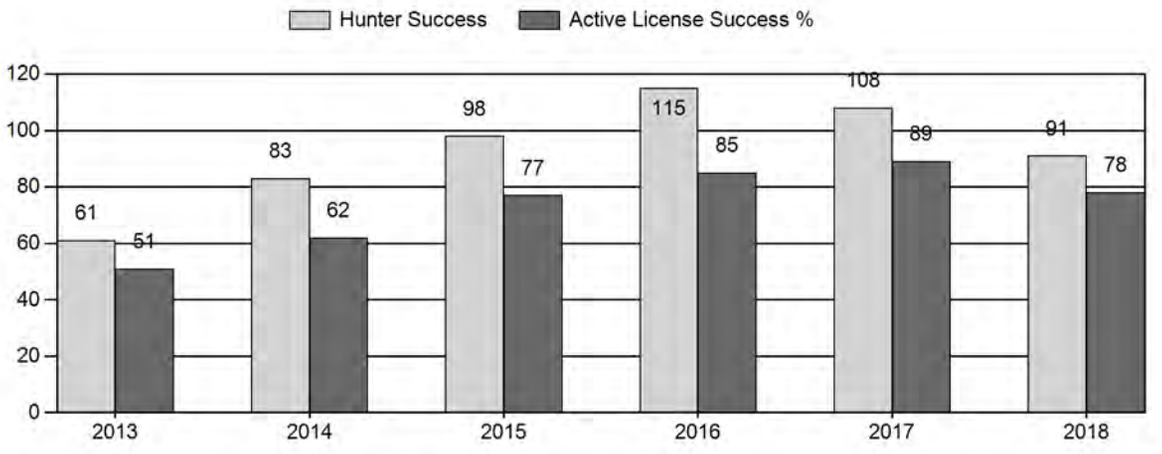
Harvest



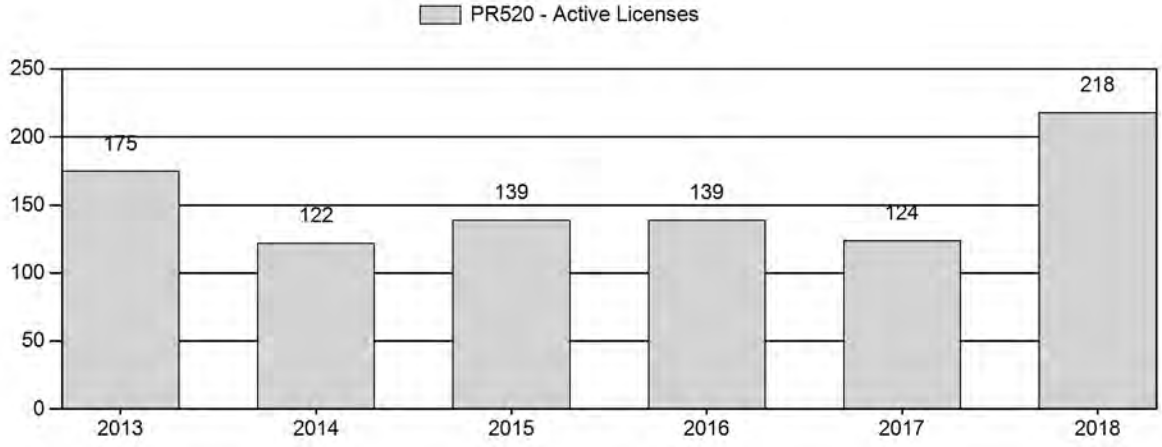
Number of Active Licenses



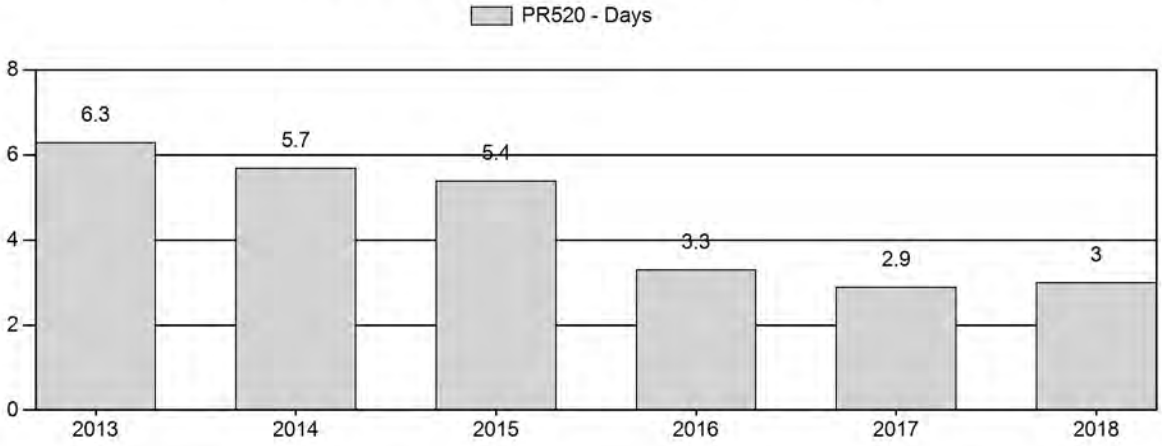
Harvest Success



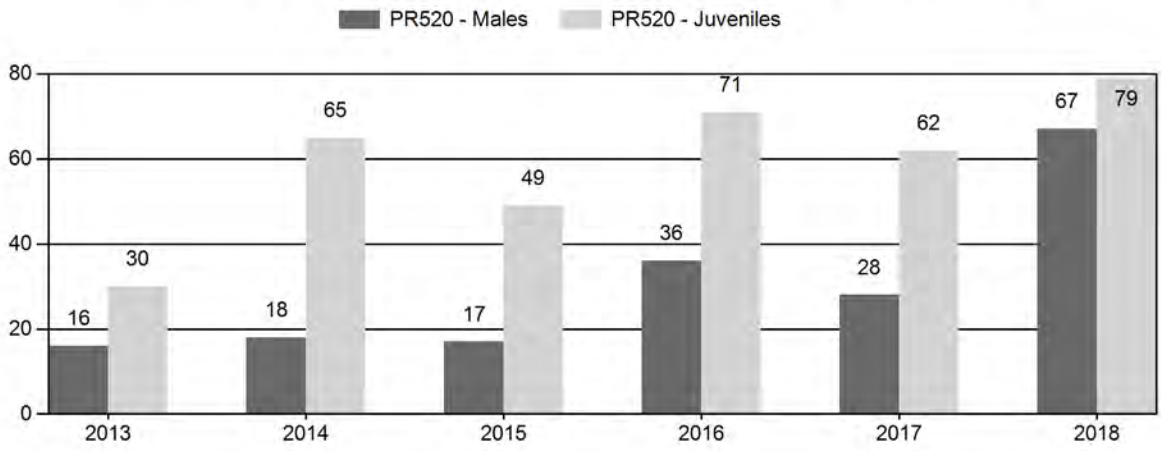
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR520 - CHALK BLUFFS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	0	30	52	82	27%	122	41%	96	32%	300	313	25	43	67	± 0	79	± 0	47

2019 HUNTING SEASONS
CHALK BLUFFS PRONGHORN (PR520)

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
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 2018
111	1	0
111	6	0
Herd Unit Totals	**1 & 6**	**0**

Management Evaluation

Current Hunter/Landowner Satisfaction Management Objective: Landowner and Hunter satisfaction; Target goal ≥ 60%
Management Strategy: Private land
2018 Hunter Satisfaction Estimate: 89%
2018 Landowner Satisfaction Estimate: 87% (28% response; minimum of 25% required)
Most Recent 5-Year Average Hunter Satisfaction Estimate: 89%; **3-Year:** 94%
Most recent 5-Year Average Landowner Satisfaction Estimate: 69%; **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 average at all elevations throughout southeast Wyoming during spring months, then became dry and hot from July through November, which is the typical pattern. For specific meteorological information for the Chalk Bluffs herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/

Habitat
Forage availability was 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
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 2018 were slightly below the 5-year average, but well below levels needed to sustain a population. The Hawk Springs herd has experienced a decrease 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 2018 (81%) decreased compared to 2017 (93%), and was above the 5-year average of 75%. Effort in 2018 for the Type 1 license (3.1 days/harvest) was similar to 2017 (2.8 days/harvest), but well below the 5-year average of 4.9 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 2018 (74%) was similar to 2017 (75%), but significantly higher than the five-year average (68%). Type 6 license effort in 2018 (2.7 days/harvest) was slightly lower than 2017 (3.4 days/harvest), significantly lower than the five-year average (4.4 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

Hunters and landowners (Appendix A) are satisfied with current pronghorn numbers and as a result there will not be any changes for the 2019 season. Based on harvest data from past seasons, we predict a 2019 harvest of 85 bucks, 60 does, and 5 fawns, for a total harvest of 150 pronghorn.

Appendix A

QUESTIONS 8

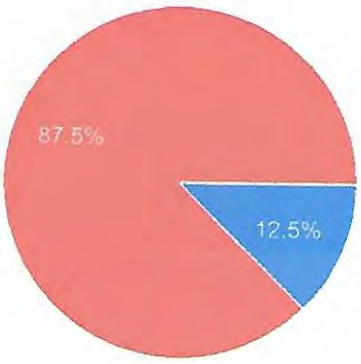
8 responses

SUMMARY | INDIVIDUAL

Accepting responses

lease indicate your level with the current pronghorn population

responses



- Above Desired Levels
- At or About at Desired Levels
- Below Desired Levels

omments

response

Very few goats and few hunters which is good as I can't redeem my coupons any more anyway and to the fact I have no desire to be registered vendor for the State of Wyoming just so I can sash in a wildlife coupon.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR521 - HAWK SPRINGS

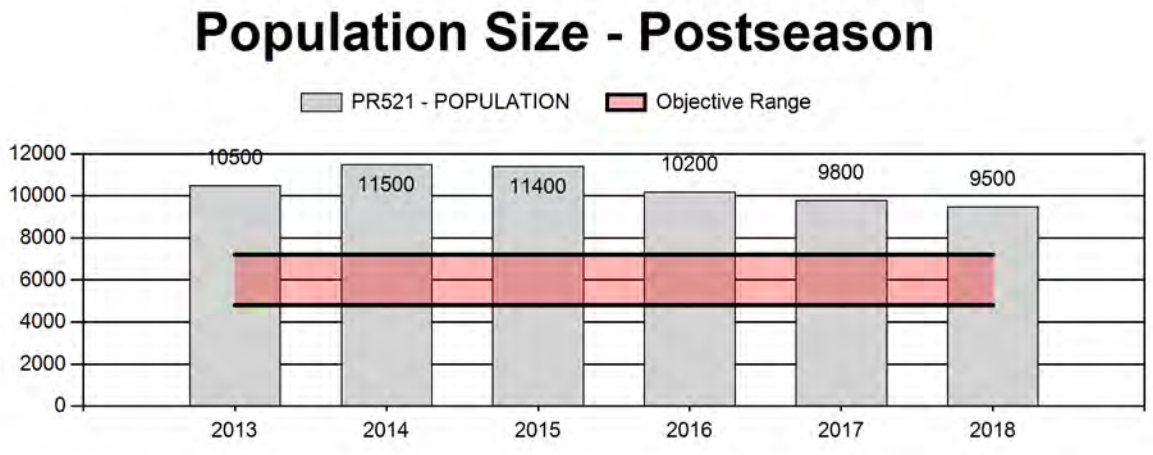
HUNT AREAS: 34
PREPARED BY: MARTIN HICKS

	2013 - 2017 Average	2018	2019 Proposed
Population:	10,680	9,500	8,800
Harvest:	1,147	1,107	1,100
Hunters:	1,373	1,248	1,250
Hunter Success:	84%	89%	88 %
Active Licenses:	1,452	1,320	1,320
Active License Success:	79%	84%	83 %
Recreation Days:	4,784	3,757	3,700
Days Per Animal:	4.2	3.4	3.4
Males per 100 Females	45	47	
Juveniles per 100 Females	51	44	

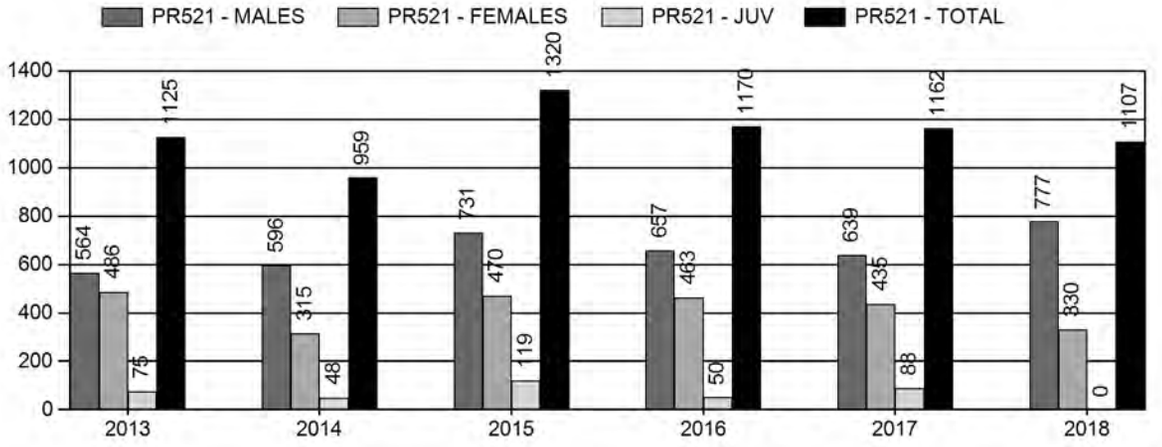
Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	58%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/16/2019

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

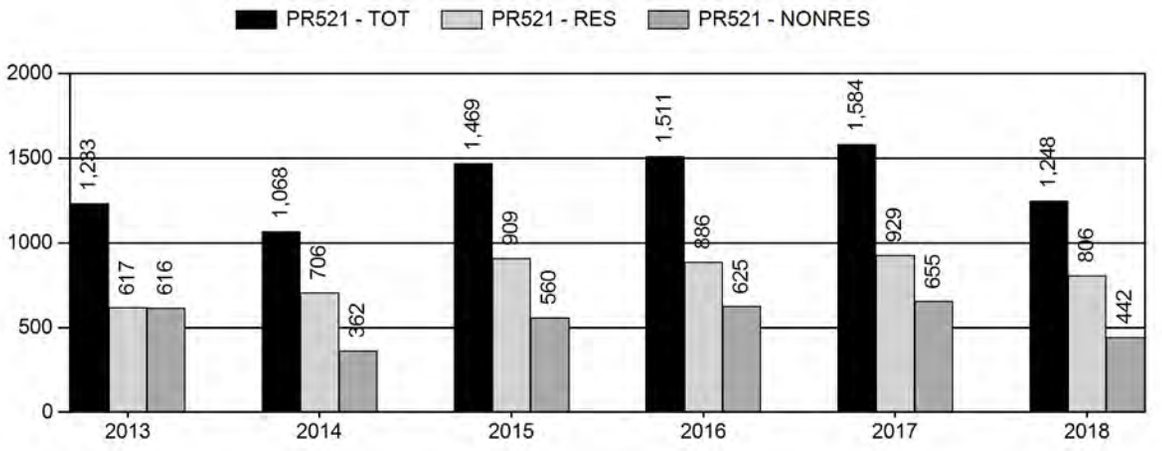
	JCR Year	Proposed
Females ≥ 1 year old:	6.3%	6.3%
Males ≥ 1 year old:	36%	39%
Total:	10%	11%
Proposed change in post-season population:	-5%	-8%



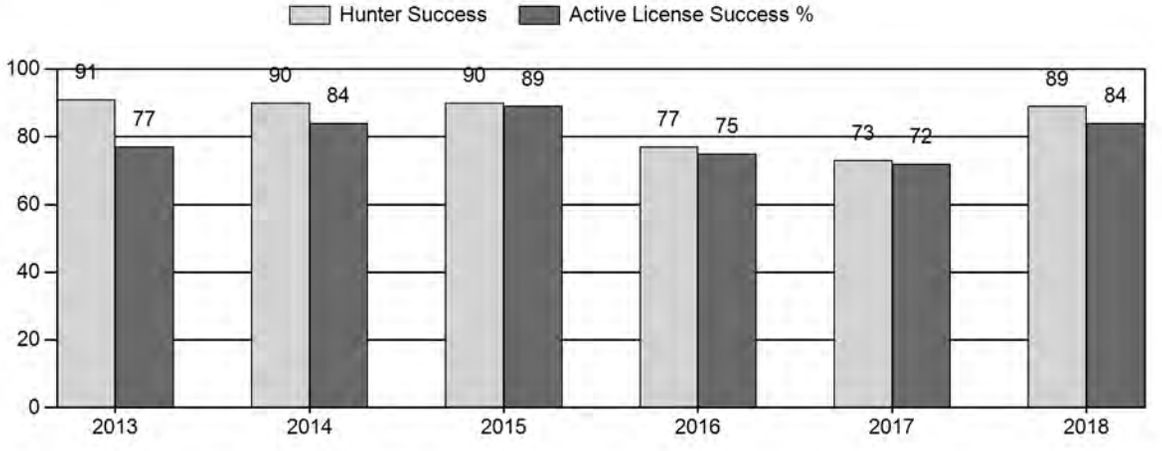
Harvest



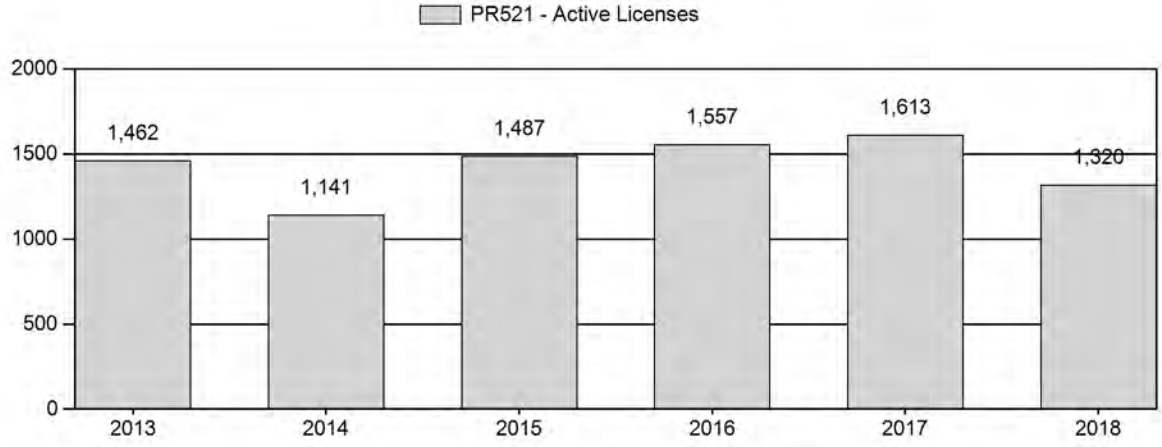
Number of Active Licenses



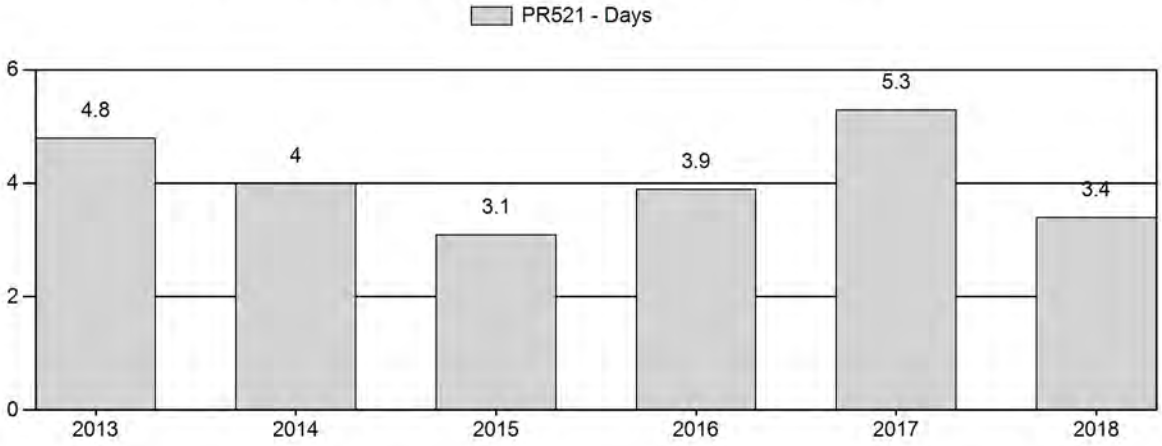
Harvest Success



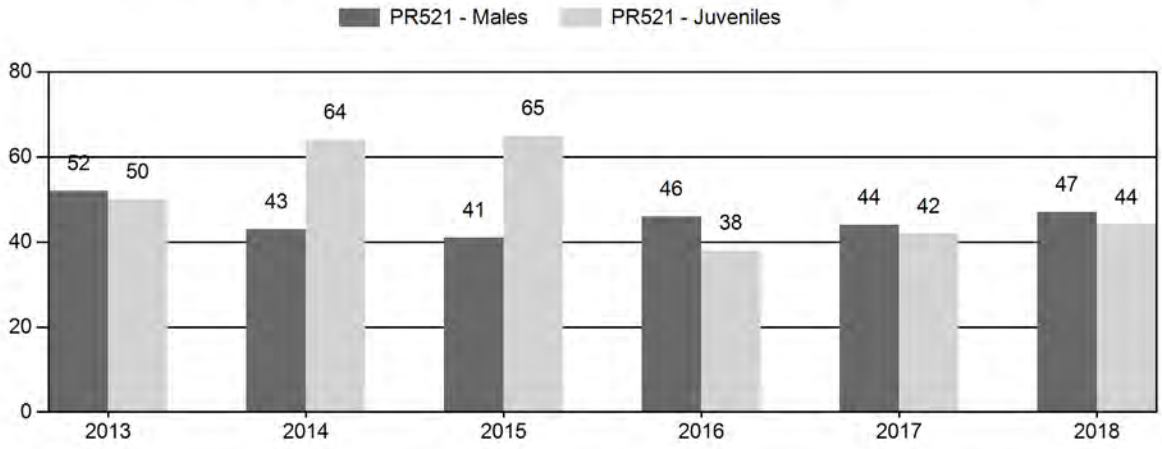
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR521 - HAWK SPRINGS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	11,600	88	201	289	26%	558	50%	279	25%	1,126	1,184	16	36	52	± 6	50	± 6	33
2014	12,500	59	155	214	21%	498	48%	317	31%	1,029	1,151	12	31	43	± 6	64	± 7	45
2015	12,800	117	179	296	20%	729	49%	472	32%	1,497	1,849	16	25	41	± 4	65	± 6	46
2016	11,500	126	194	320	25%	696	54%	262	21%	1,278	1,243	18	28	46	± 5	38	± 4	26
2017	11,000	76	187	263	24%	603	54%	251	22%	1,117	1,409	13	31	44	± 5	42	± 5	29
2018	10,700	82	149	231	25%	490	52%	218	23%	939	1,227	17	30	47	± 6	44	± 6	30

2019 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 2018
34	1	0
34	6	0
Total		**0**

Management Evaluation
Current Management Objective: 6,000 (4,800-7,200)
Management Strategy: Recreational
2018 Postseason Population Estimate: ~9,500
2019 Proposed Postseason Population Estimate: ~8,800
2018 Hunter Satisfaction: 80% satisfied, 16% Neutral, 4% Dissatisfied

Herd Unit Issues
The management objective for the Hawk Springs Herd Unit is a post-season population objective of 6,000 pronghorn. The objective was changed in 2014 from 7,000 to 6,000 and Hunt Areas 34-36 were combined into Hunt Area 34. 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 2018 post-season population estimate was approximately 9,500 pronghorn after incorporating the 2018 end-of-the-year density estimated of 15,000 pronghorn, which was derived from the line-transect survey method. This puts the population well above the objective of 6,000 pronghorn and double the prior population estimate of 4,800. The quality of the line transect was subject based on the number of pronghorn misidentified in the A band but it did produce a percent coefficient of variation (CV) of 13.75. According to Guenzel (1997) CVs≤15% are considered good. However, given poor fawn production, poor habitat conditions, and loss of habitat this estimate is somewhat subject to interpretation and results should be taken

with caution. Population estimates for the five prior years were adjusted to account for the new density estimate.

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

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

Weather

Weather in this herd unit was relatively normal during the past bio-year. Precipitation amounts were average at all elevations throughout southeast Wyoming during spring months, then became dry and hot from July through November, which is the typical pattern. These patterns are starting to demonstrate a negative effect on fawn survival, based on pre-season classification surveys. Production in 2017 and 2018 was 21% and 16% below their respective five-year averages. For specific meteorological information for the Hawk Springs herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/

Habitat

Forage availability 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 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 44 fawns:100 does). Doe/fawn license issuance has fluctuated around 800 licenses for the past 5 years but were reduced by 100 to account for poor recruitment. The 2018 preseason buck ratio of 47 Bucks:100 Does was slightly higher compared to 2017 (44 Bucks:100 Does) and the 5-year average (45 Bucks:100 Does) and still within the upper recreational management range of 20-59 Bucks:100 Does. It was anticipated to see a decrease in yearling buck ratios in 2018 (17 Yearling Bucks:100 Does) based on poor fawn survival in 2017 but to the contrary they increased in 2018 when compared to 2017 (13 Yearling

Bucks:100 Does) and they were slightly higher than the five-year average of 15 Yearling Buck:100 Does. To accommodate observed buck ratios the model has been predicting adult survival rates on the upper level of the model's recommended range. For whatever reason once a fawn reaches one year of age they have a high probability of living to two years of age. Type 1 licenses remained at 1,000 for the 2018 season to take advantage of the surplus bucks. 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 2018, 80% were satisfied with their hunt, a slight increase from 2017's level of 77%. Based on comments in the field during the 2018 hunting season some hunters had a great hunt with no problem harvesting a pronghorn and other raised concerns about not enough pronghorn on accessible lands. This herd unit will continue to present problems for access as Southeast Wyoming's population expands.

Harvest Data

Active license success of 84% in 2018 increased compared to 2017 (72%) and the five-year average of 80%. Hunter effort of 3.4 days per harvest decreased significantly compared to 2017 (5.3 days per harvest) and was lower than the five-year average of 4.2 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. Trends in the harvest data, indicate there were more pronghorn available in 2018 than previous years. Given poor fawn production but high adult survival this may be somewhat of the case but probably more of a factor of pronghorn available on accessible lands, in other words they were in the right place at the right time.

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 2018 end-of-the-year density estimate derived from Distance sampling provided somewhat of a new anchor point for the model, which simulates a population substantially higher than previously derived prior to the new LT estimate of 15,000 pronghorn. Even with the new population the model still predicts a decreasing trend since 2014; given poor fawn production from 3016-2018 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). 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 is trying to align with the 2018 line transect.

The 2018 line-transect calculated a density estimate of 15,000 pronghorn with a percent coefficient of variation (CV) of 13.75. According to Guenzel (1997) CVs$\leq$15% are considered good. Distance selected the Uniform Cosine Model after the A and B bands were combined to adjust for the high detection of the A band and the sudden drop to the B band. After this adjustment the shape of the histogram appears reasonable, with a "shoulder" near the line then somewhat declines. However, the line transect only met one out of the three basic assumptions to provide a reasonable population estimate (Buckland et al. 1993); distances and angles to

pronghorn were measured exactly, the other two assumptions it did not meet were pronghorn were seen on the line and pronghorn did not move before they were detected. Based on the high detection of the A band and sudden drop in the B band it was apparent that observers were misidentifying which band pronghorn were in as the plane flew over. This is somewhat concerning for the final estimate but by combining the A and B bands adjusts for the misclassification. The big question is whether the 300% increase in population is accurate? For managers that have been comfortable with a population running within the objective it is difficult to except. Managers continue to be surprised when LT estimates are greater than what the population was simulated regardless if POP II or the new Spreadsheet Model was used to simulate a population estimate. The question is how to manage the herd based on the new information. In this case, increasing licenses has already proven to be difficult based on the lack of access. For now we will do the best we can with what we know and what we can accomplish. By maintaining an adequate number of buck and doe licenses for the public which provides opportunity as well as addressing damage is the best we can do at this time to bring the population towards objective. A drastic increase in Type 1 and Type 6 licenses reduce success, increase effort, decrease hunter satisfaction, upset landowners and divide managers. A slow and steady approach to bring down the population is far more practical at this time to achieve management goals.

Management Summary

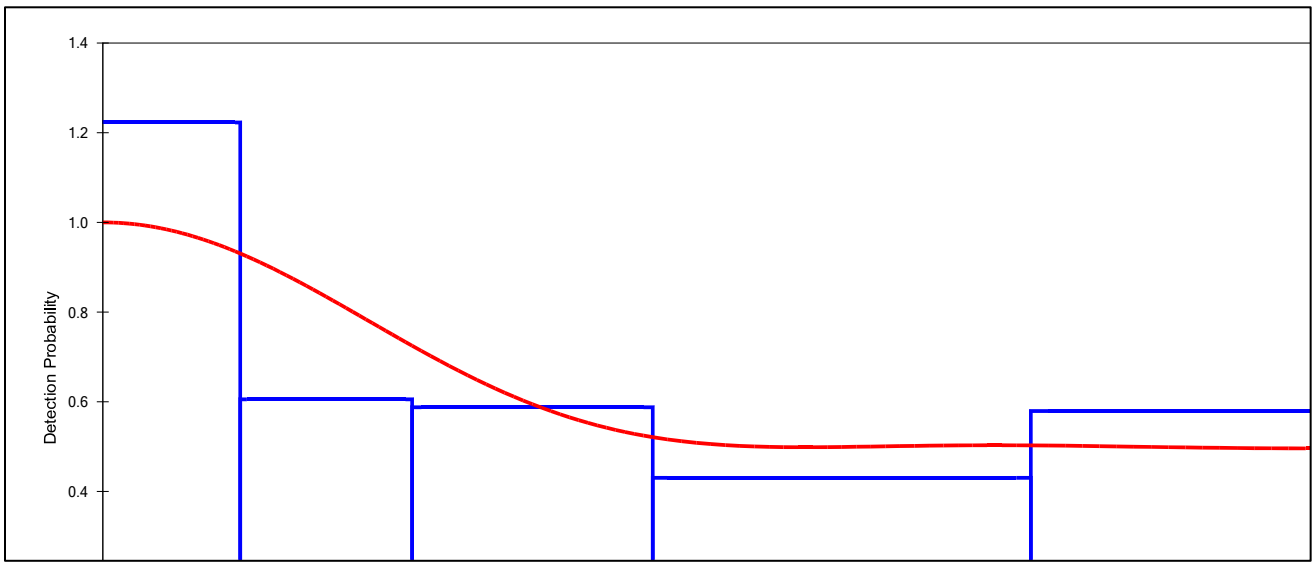
The 2019 season is designed to provide opportunity and slowly bring the population down towards objective. There will be 1,000 Type 1 and 700 Type 6 licenses available to achieve this goal. Given previous harvest rates and the 1,700 licenses available we expect to harvest approximately 1,100 pronghorn, resulting in a post-season population estimate of 8,800 pronghorn.

Literature cited:

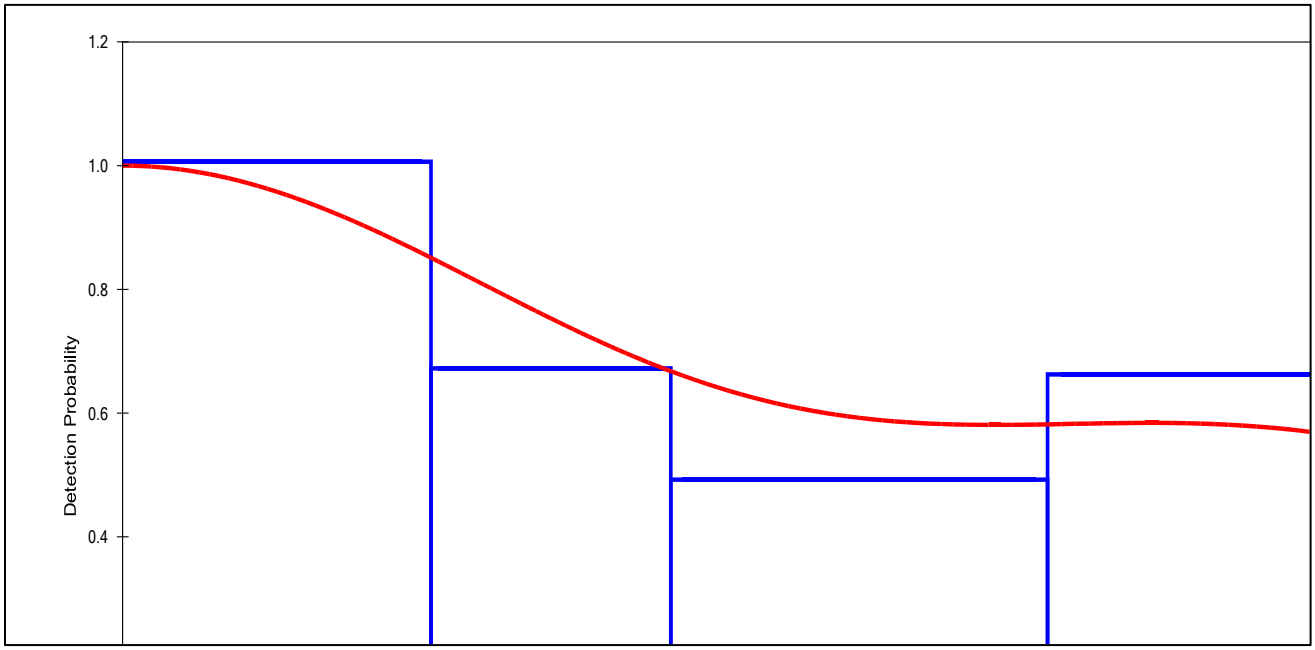
Buckland, S.T., D.R. Anderson, K.P. Burnham and J.L. Laake. 1993. Distance sampling: estimating abundance of biological populations. Chapman and Hall, New York. 446pp.

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

This is the best detection probability plot for the typical 5 distance intervals (Uniform Cosine model).



However, this model was selected to estimate the population. Band A and B were combined because of the high detection probability in the A band from above and the big drop to the B band (Half-normal cosine model).



Here are the estimates.

Point Parameter	Estimate	Standard Error	Percent Coef. of Variation	95% Percent Confidence Interval	
Density	5.6733	0.77994	13.75	4.3306	7.4323
Population Estimate	15,261	2098.0	13.75	11,649	19,993

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR522 - MEADOWDALE

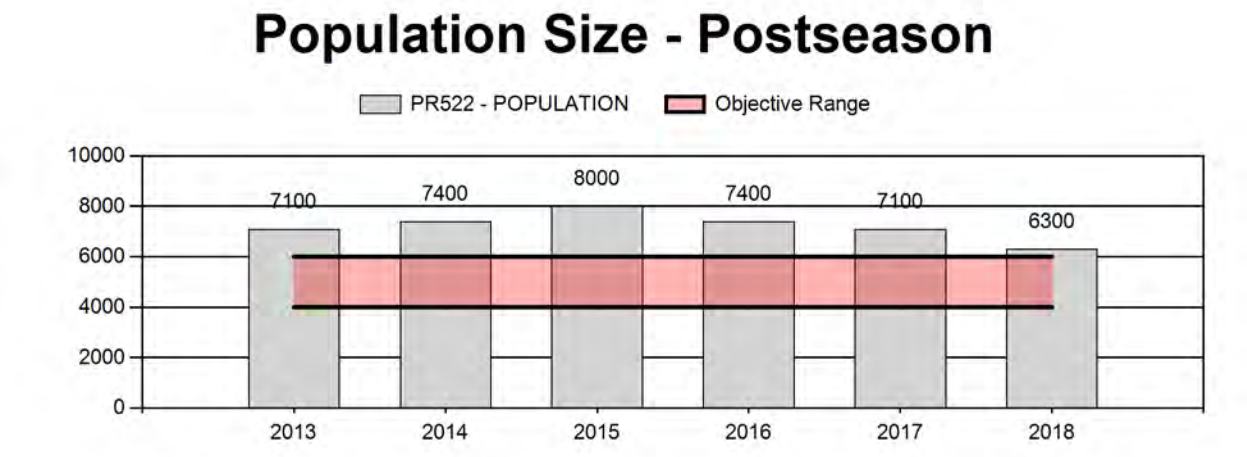
HUNT AREAS: 11
PREPARED BY: MARTIN HICKS

	2013 - 2017 Average	2018	2019 Proposed
Population:	7,400	6,300	6,200
Harvest:	487	826	785
Hunters:	553	900	900
Hunter Success:	88%	92%	87 %
Active Licenses:	607	958	950
Active License Success:	80%	86%	83 %
Recreation Days:	1,868	2,799	3,000
Days Per Animal:	3.8	3.4	3.8
Males per 100 Females	44	38	
Juveniles per 100 Females	57	36	

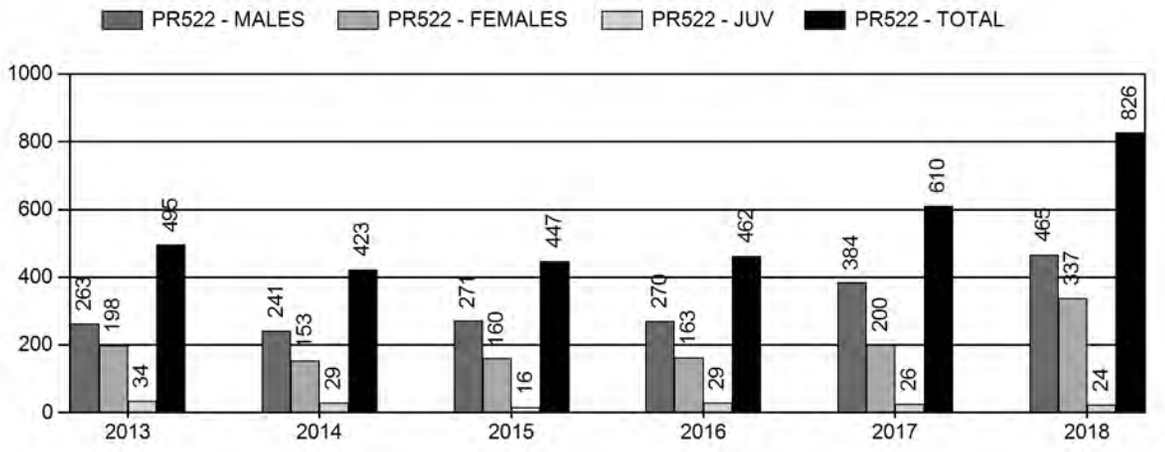
Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	26%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/12/2019

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

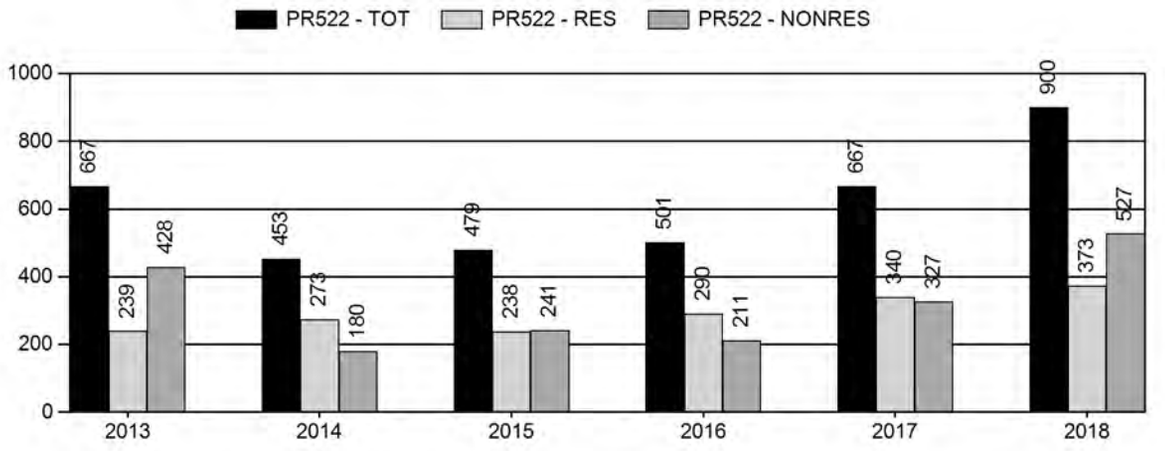
	JCR Year	Proposed
Females ≥ 1 year old:	9.1%	8.7%
Males ≥ 1 year old:	30.2%	36.7%
Total:	11%	11%
Proposed change in post-season population:	-12%	-4%



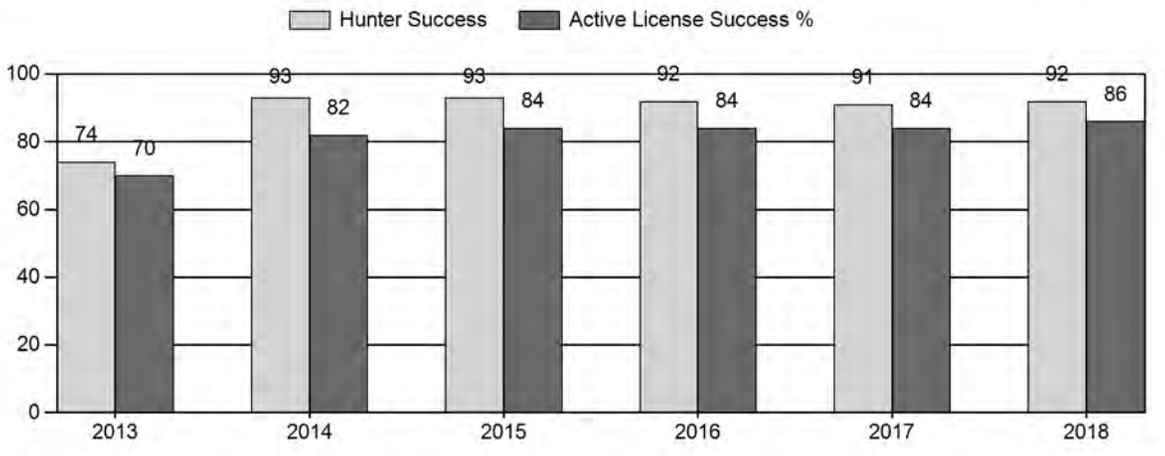
Harvest



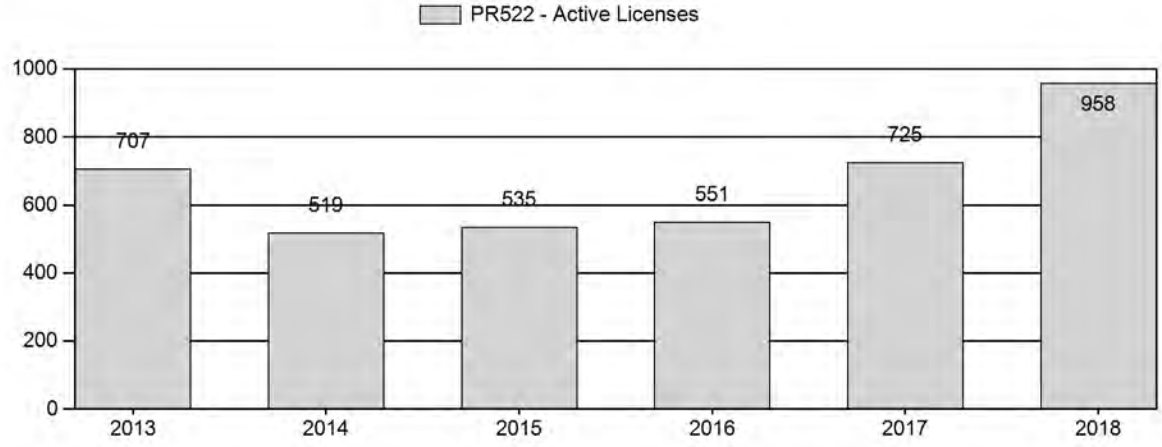
Number of Active Licenses



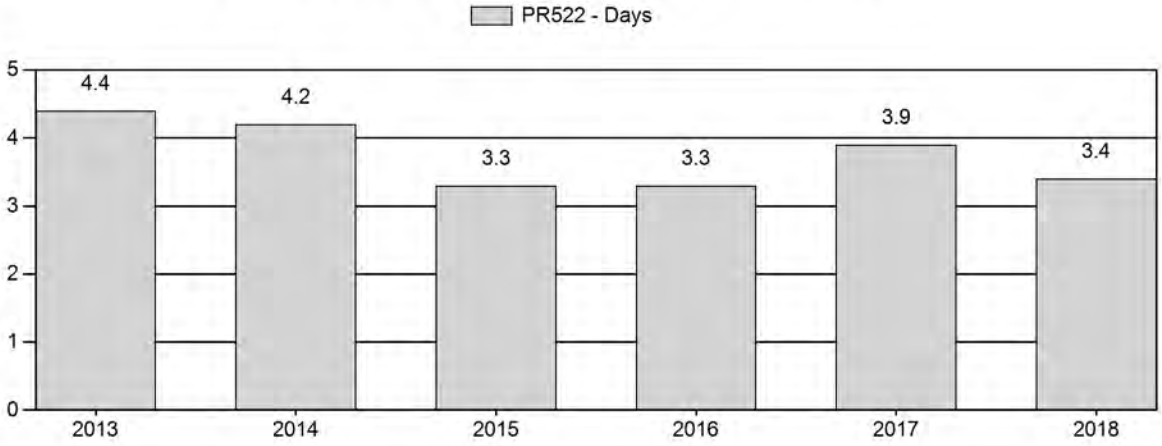
Harvest Success



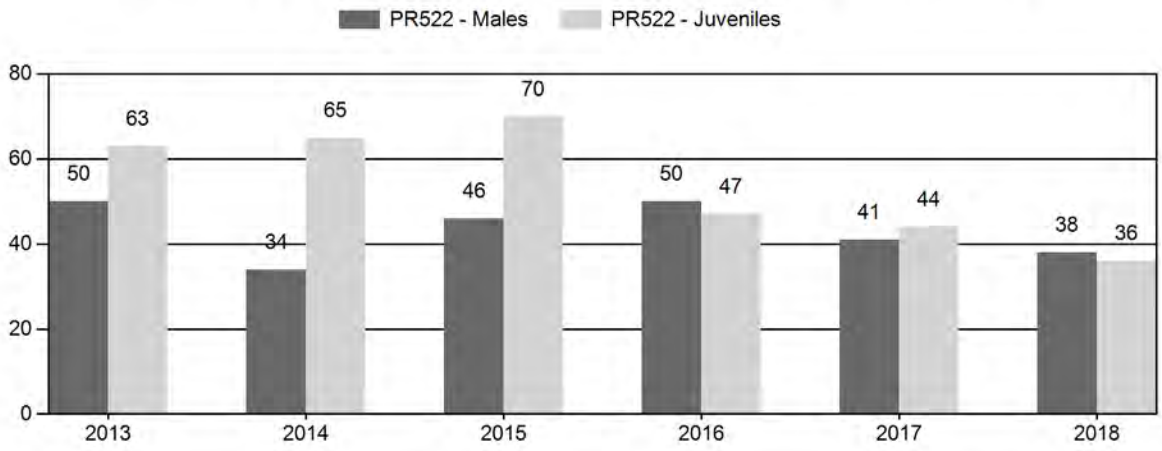
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR522 - MEADOWDALE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2013	7,600	60	139	199	23%	402	47%	252	30%	853	1,154	15	35	50	± 7	63	± 8	42
2014	7,900	49	169	218	17%	637	50%	411	32%	1,266	1,327	8	27	34	± 4	65	± 6	48
2015	8,400	104	165	269	21%	590	46%	412	32%	1,271	1,441	18	28	46	± 5	70	± 7	48
2016	7,900	142	251	393	25%	786	51%	368	24%	1,547	1,330	18	32	50	± 5	47	± 4	31
2017	7,800	48	158	206	22%	508	54%	223	24%	937	1,468	9	31	41	± 5	44	± 5	31
2018	7,200	56	150	206	22%	546	58%	197	21%	949	1,463	10	27	38	± 5	36	± 5	26

2019 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 2018
11	1	0
11	6	0

Management Evaluation
Current Management Objective: 5,000 (4,000-6,000)
Management Strategy: Recreational
2018 Post-season Population Estimate: ~6,300
2019 Proposed Post-season Population Estimate: ~6,200
2018 Hunter Satisfaction: 81% Satisfied, 17% Neutral, 2% Dissatisfied

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

The 2018 post-season population estimate was approximately 6,300 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. These patterns are starting to demonstrate a negative effect on fawn survival, based on pre-season classification surveys. Production in 2017 and 2018 was 22% and 37% below their five-year average respectively. 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 7,500 pronghorn for the past 6 years. The 2016 line-transect density estimate of 8,000 suggests the population was higher than previously thought. To reflect how the population was performing, bio-years 2013-2018 were retrofitted to reflect the independent estimate derived from the 2016 end-of-the-year line transect. Since 2015 the population has been steadily declining as a result of poor fawn survival. Fawn production in 2016 (47 fawns:100 does), 2017 (44 fawns:100 does) and 2018 (36 fawns:100 does) was well below their respective five-year averages of 58, 56 and 58 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 6 years. Above average fawn ratios in 2014 and 2015 help to increase buck ratios in 2015 and 2016, but the poor fawn production from 2016 to 2018 have resulted in fewer older age class bucks in the field in the coming years. As was evident given a recent decline in yearling buck ratios in 2017 (9 yearling bucks:100 does) and 2018 (10 yearling bucks:100 does) compared to their respective five-year averages of 14 and 13 yearling bucks:100 does. However, the data should 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 once 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.

Harvest Data
The 2018 active license success rate of 86 % was higher than the five-year average of 81%, and slightly higher than the 2017 success rate. Effort in 2018 was 3.4 days per harvest which was

lower than the five-year average of 3.8 days per harvest and the 2017 effort of 3.9 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 are somewhat supportive of the increase but there is concern on a continuous population decline if fawn survival does not increase. Harvest statistics for this herd unit can also be a reflection of limited access for the majority of the herd unit. The northern 1/3 portion of the herd does improve for access through the Department's Access Yes program but compared to other herd units in the western half of the state it is still very limited. License issuance did increase in 2018 in part on access opening up in the northern portion of the herd unit and buck ratios that were in the upper management level, which provided an additional 216 harvested pronghorn compared to 2017. The harvest rates on male pronghorn continue to increase as the population decreases in conjunction with poor fawn recruitment. Caution needs to be taken in the future that harvest rates do not exceed recruitment rates as seasons are set in 2020. The hunter satisfaction survey showed that 81% of the hunters were satisfied or very satisfied with their hunt, still within acceptable levels but a decline of 12% compared to 2017. Based on comments received from the field that densities appear to be decreasing in certain portions of the herd unit this is 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. Line-transects (LT) were conducted 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 7,500 pronghorn for the past 6 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.

Management Summary

The 2018 season is designed to maintain 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. Given previous harvest rates we expect to attain a harvest of around 785 pronghorn. We predict a 2019 post-season population estimate of 6,200 pronghorn, 24% above the objective of 5,000.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR523 - IRON MOUNTAIN

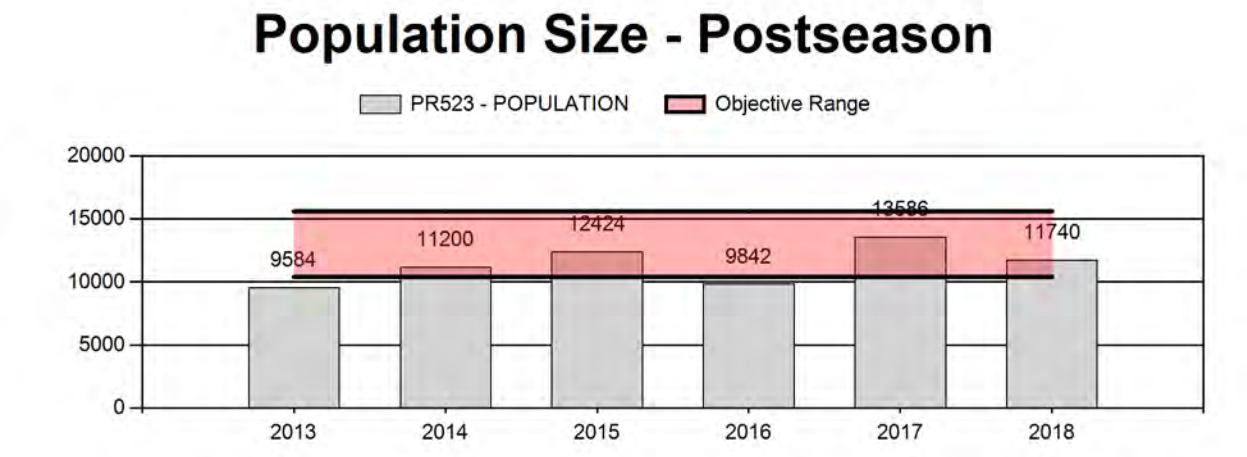
HUNT AREAS: 38
PREPARED BY: LEE KNOX

	2013 - 2017 Average	2018	2019 Proposed
Population:	11,327	11,740	11,184
Harvest:	1,535	1,233	1,220
Hunters:	1,758	1,565	1,500
Hunter Success:	87%	79%	81%
Active Licenses:	1,830	1,645	1,500
Active License Success:	84%	75%	81%
Recreation Days:	6,114	5,833	5,500
Days Per Animal:	4.0	4.7	4.5
Males per 100 Females	54	51	
Juveniles per 100 Females	68	53	

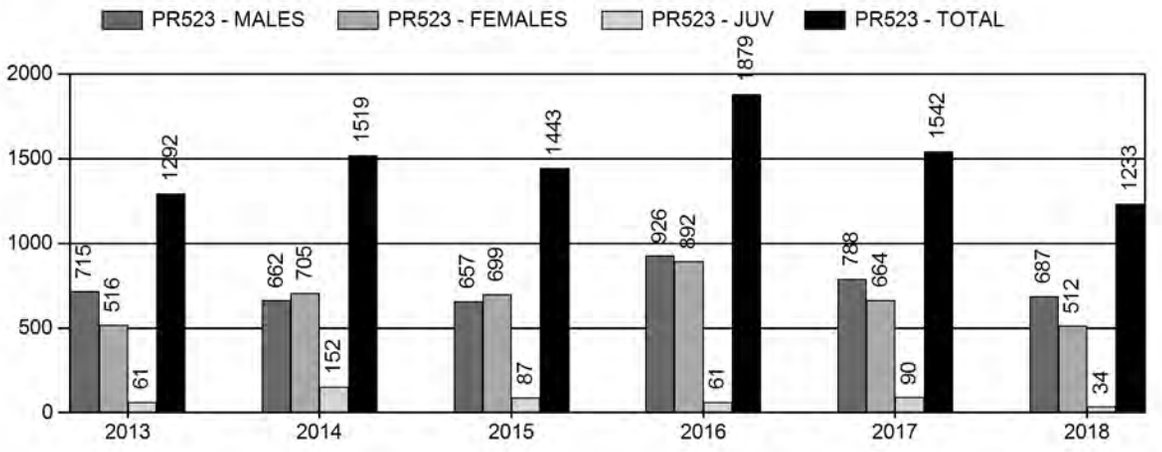
Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-9.7%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/4/2019

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

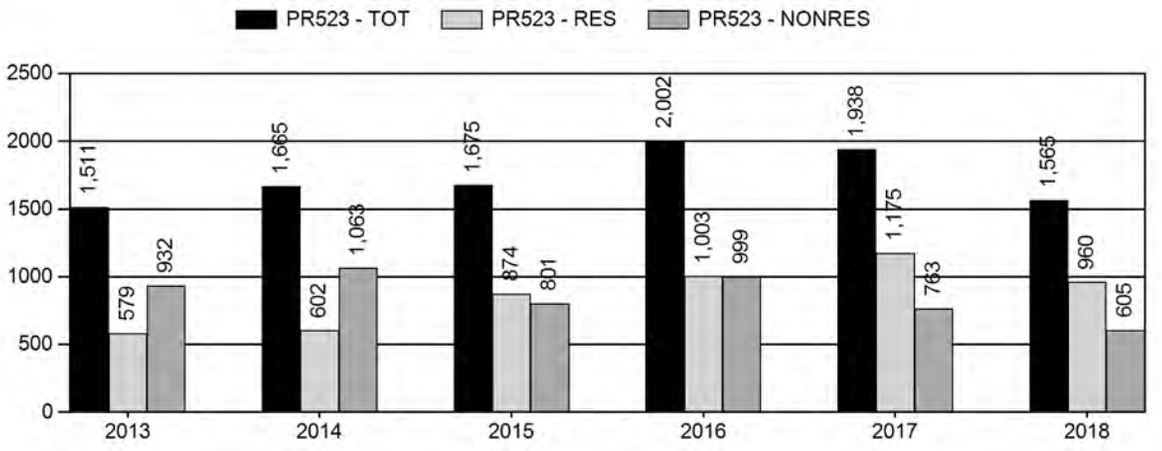
	JCR Year	Proposed
Females ≥ 1 year old:	8.8%	8%
Males ≥ 1 year old:	22%	27%
Total:	6%	6%
Proposed change in post-season population:	12%	5%



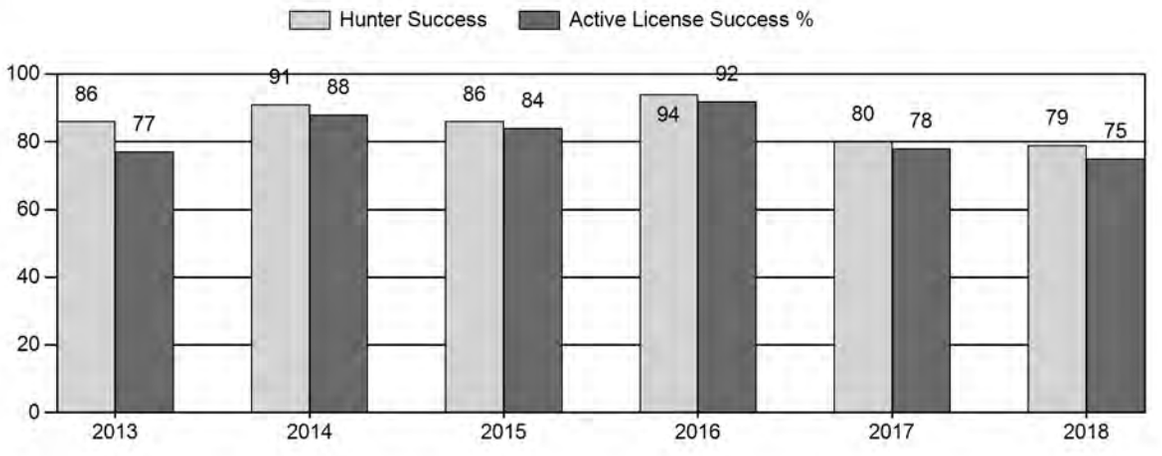
Harvest



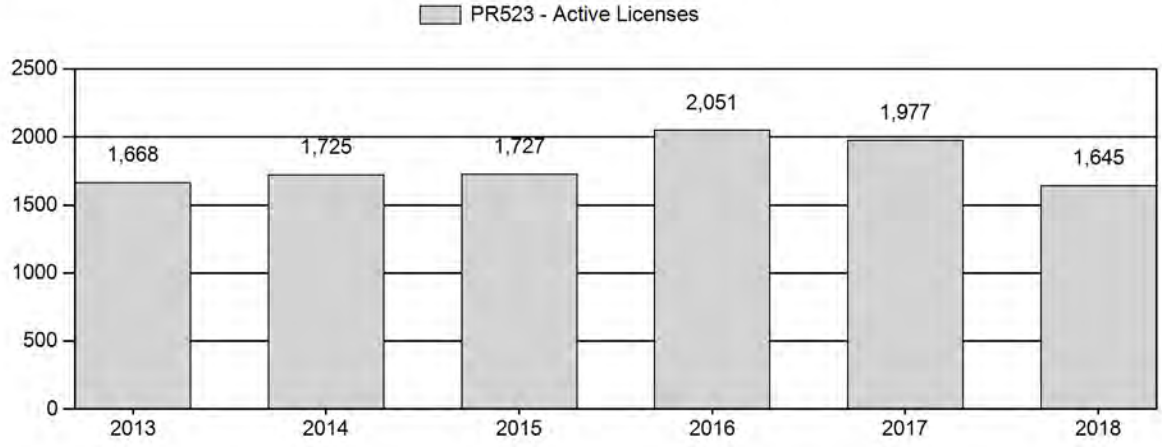
Number of Active Licenses



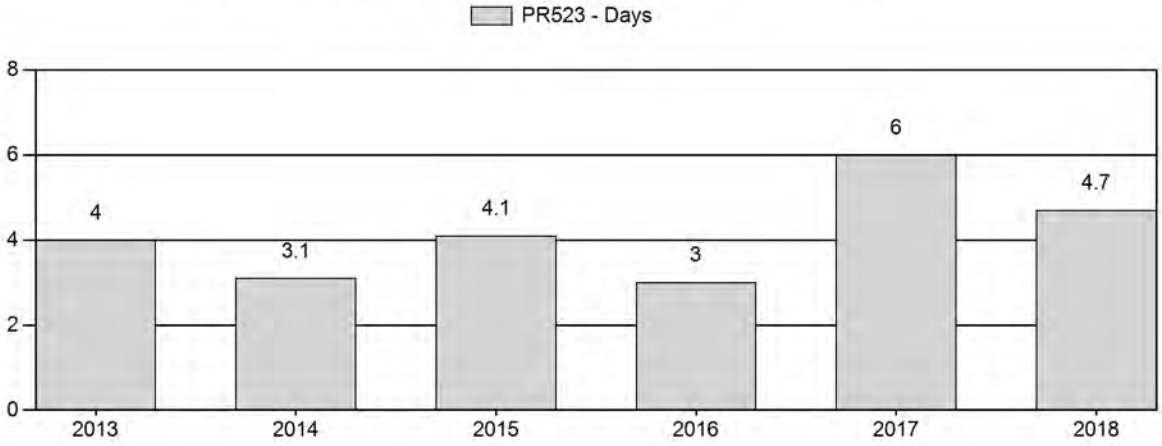
Harvest Success



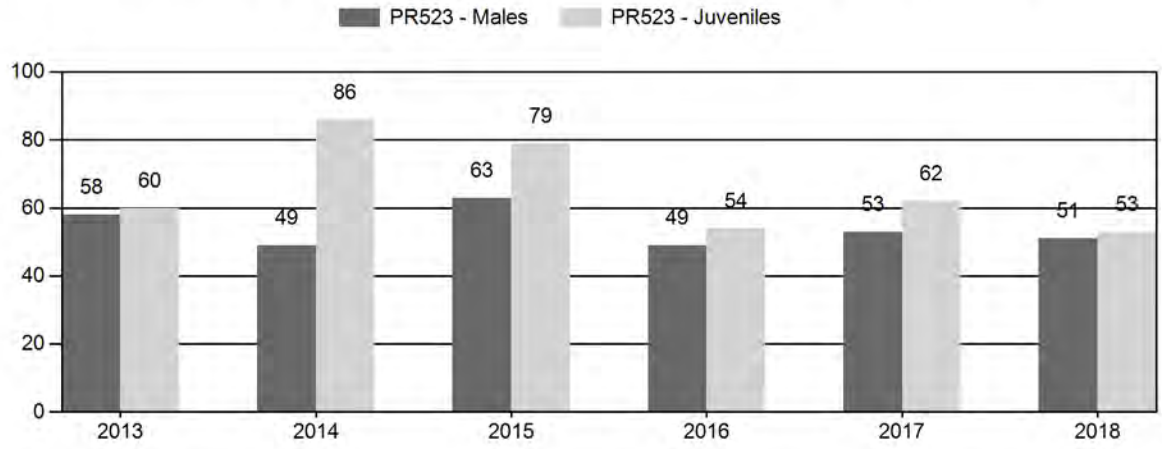
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2014 - 2018 Preseason Classification Summary

for Pronghorn Herd PR523 - IRON MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	13,100	142	296	438	25%	859	49%	451	26%	1,748	1,526	17	34	51	± 5	53	± 5	35

2019 HUNTING SEASONS
IRON MOUNTAIN PRONGHORN (PR523)

Hunt Area	Type	Date of Seasons Opens	Closes	Quota	License	Limitations
38	1	Oct. 5	Oct. 31	1,250	Limited Quota	Any antelope
	6	Oct. 5	Oct. 31	600	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 2018
38	6	-200
Herd Unit Total	**6**	**-200**

Management Evaluation
Current Postseason Population Management Objective: 13,000 (10,400-15,600)
Management Strategy: Recreational
2018 Postseason Population Estimate: 11,700
2019 Proposed Postseason Population Estimate: 11,200
2018 Hunter Satisfaction: 90% Satisfied, 6% Neutral, 4% 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.

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 2018 post-season population estimate was 13,700 with the population declining. We no longer conduct line transect surveys in this herd unit due to rugged terrain and erratic winds causing poor survey conditions.We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2024; however, if the situation arises that a change is needed, we will review and submit an updated proposal.

Weather

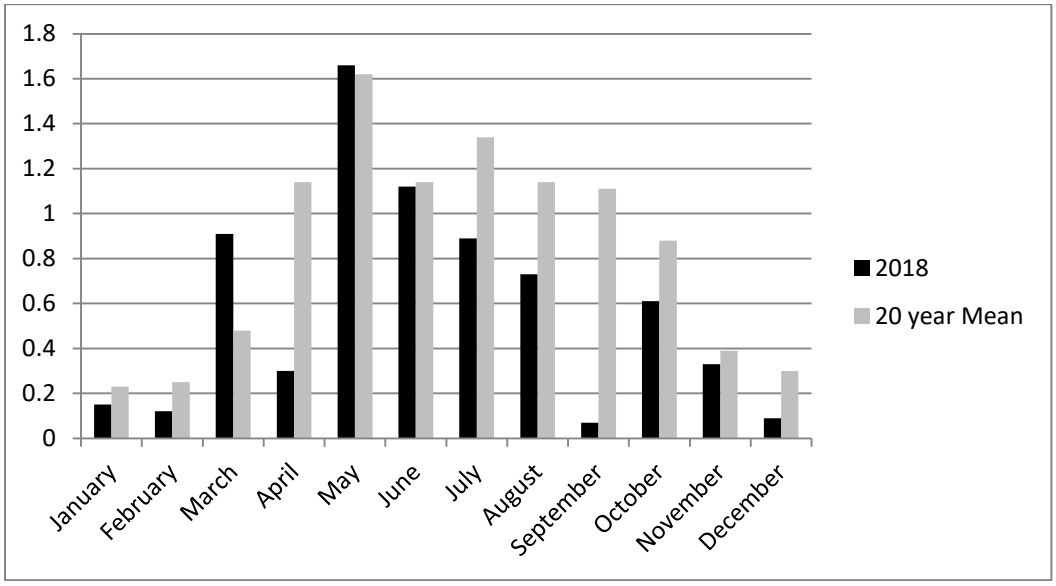


Figure 1**.** Monthly precipitation totals in inches for 2018 and the 20 year mean (1999-2019). Report was created at https://w2.weather.gov/climate/xmacis.php?wfo=cys using data collected at the Laramie Regional Airport.

Precipitation was similar to the 20 year mean 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.

Habitat

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 1,748 pronghorn were classified, meeting the estimated classification sample size of 1,526. Fawn ratios declined in 2018 to 53:100 does, well below the 10 year average of 64:100 does. Fawn ratios have been very low for the past three years, especially on the eastern side of the herd unit, causing a noticeable decline in the population. The buck ratio remains high at

53:100 does, slightly above the 10 year average of 51:100 does. The hunter satisfaction survey showed an increase in hunter satisfaction by 6% from 2017 to 2018.

Harvest Data

Hunter success decreased again in both license types. Type 1 licenses decreased by 4% and type 6 licenses decreased slightly by 2 %. Hunter effort decreased by two days for type 6 licenses and one day in type 1 licenses. 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 2018, nonresidents accounted for 39% of the licenses due to an increase in resident license holders, mainly in the Type 1 licenses. All licenses sold out in the draw, and have been for several years now. However, the percent of active licenses decreased by 10% from 2017 to 2018 for both license types, indicating hunters are having a difficult time finding pronghorn or getting access.

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 2018 post season population estimate is 11,700, 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 reduce the population to reach the desired objective. We cannot strictly rely on the model given it is of poor quality. We are seeing declines in hunter success and high 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 three years. Type 6 doe fawn licenses will be decreased by 200 licenses to address the declining population. It is likely not enough to reverse the population decline, however given concerns with crop damage, it is as much as the landowners will allow. Type 1 license issuance will remain status quo, and we will maintain the extended season to address crop damage later in the year.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR524 - DWYER

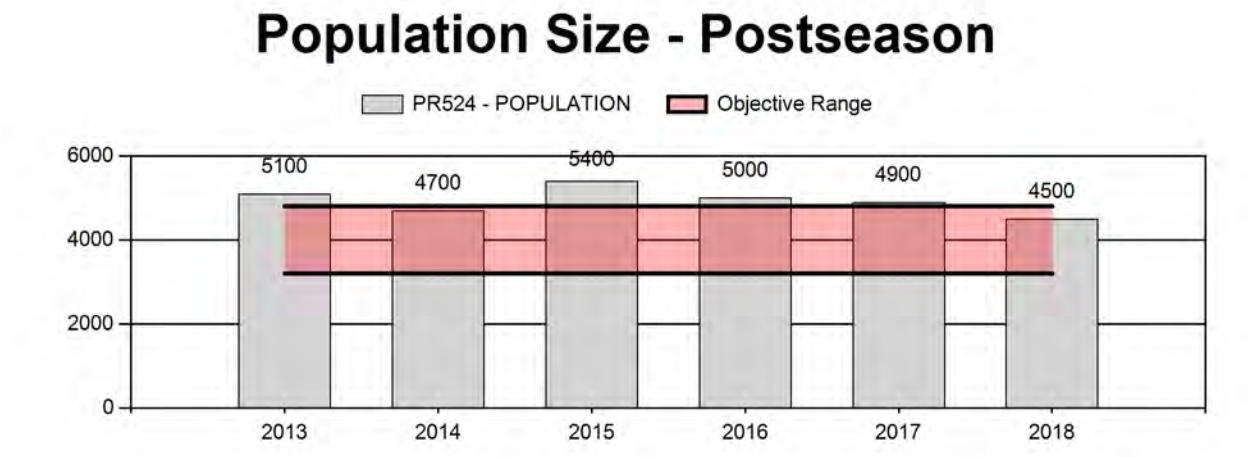
HUNT AREAS: 103
PREPARED BY: MARTIN HICKS

	2013 - 2017 Average	2018	2019 Proposed
Population:	5,020	4,500	3,500
Harvest:	615	787	785
Hunters:	673	833	830
Hunter Success:	91%	94%	95 %
Active Licenses:	746	903	900
Active License Success:	82%	87%	87 %
Recreation Days:	2,207	2,520	2,500
Days Per Animal:	3.6	3.2	3.2
Males per 100 Females	49	39	
Juveniles per 100 Females	44	53	

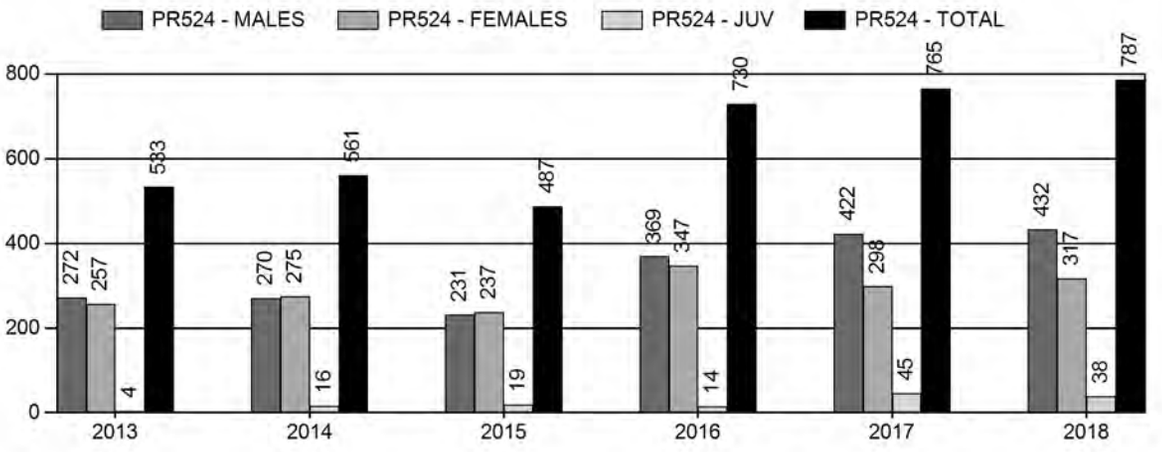
Population Objective (± 20%) :	4000 (3200 - 4800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	12%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/14/2019

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

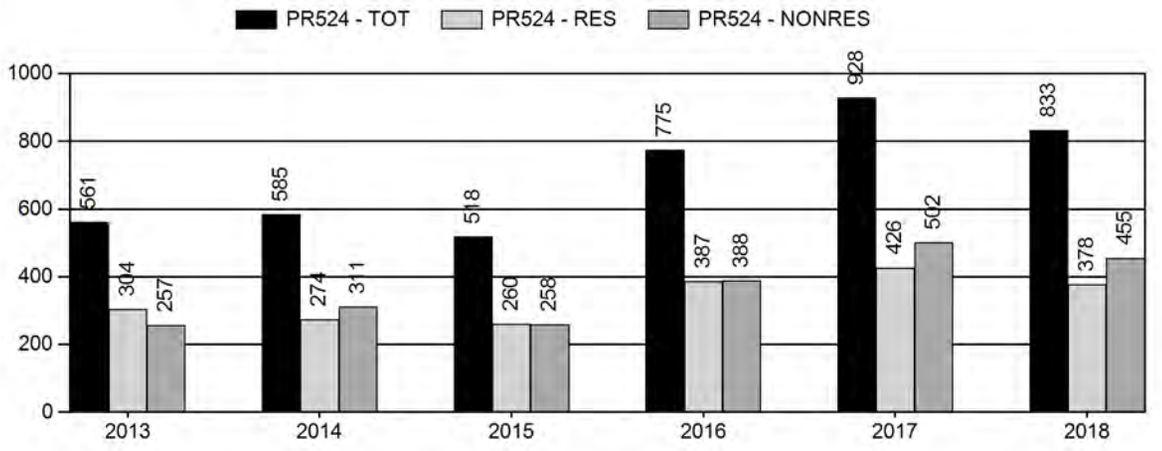
	JCR Year	Proposed
Females ≥ 1 year old:	13%	14%
Males ≥ 1 year old:	36%	46%
Total:	15%	17%
Proposed change in post-season population:	-9%	-25%



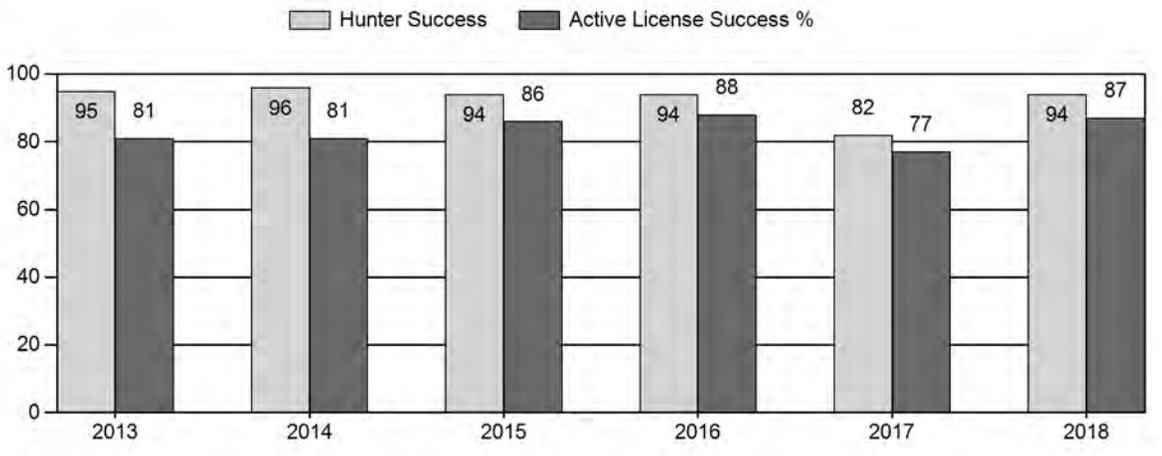
Harvest



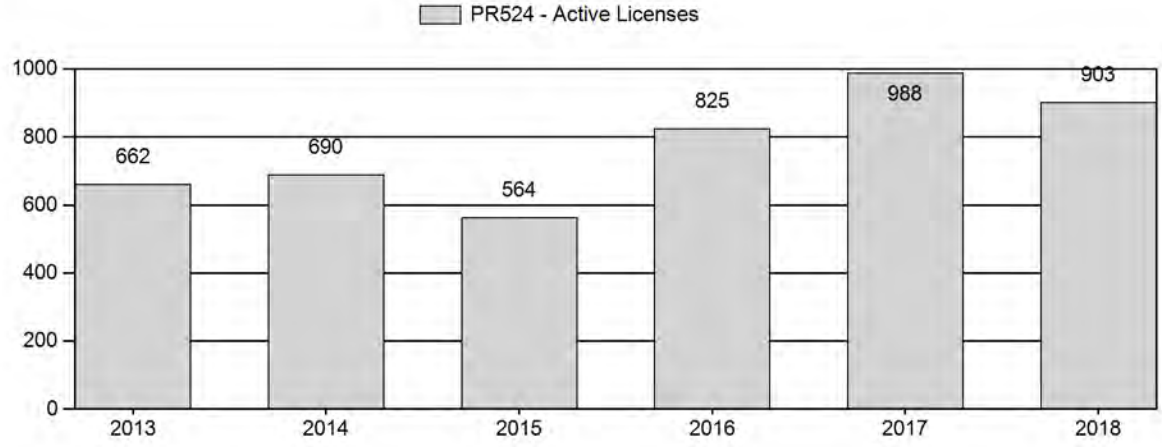
Number of Active Licenses



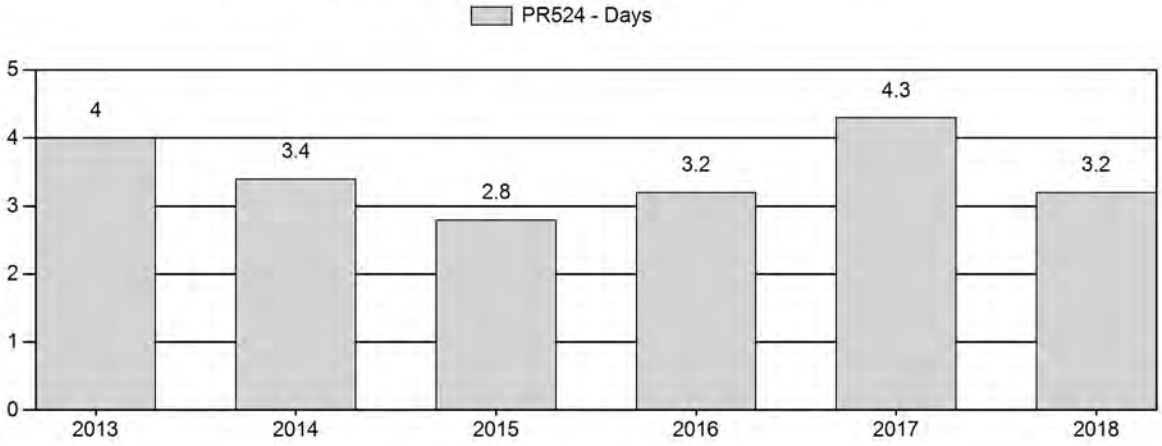
Harvest Success



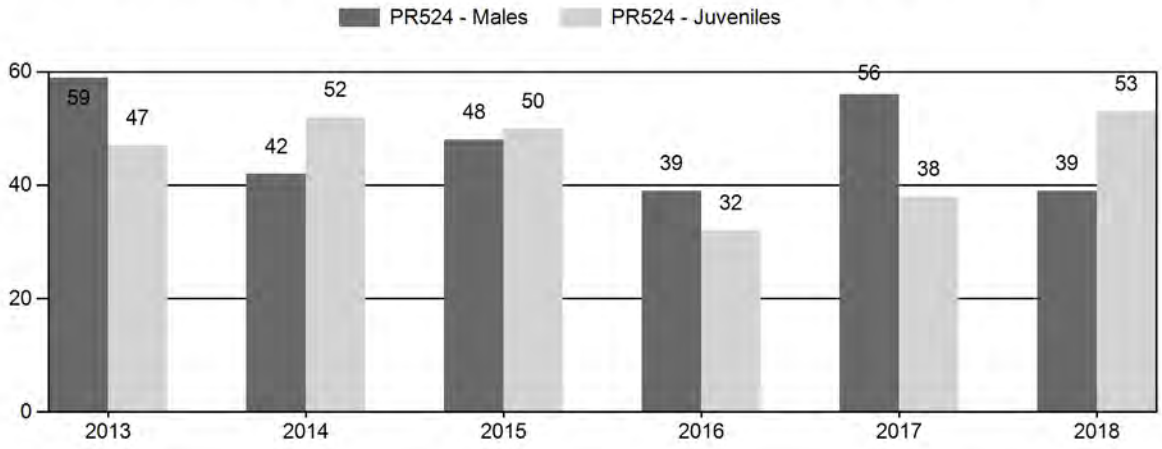
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR524 - DWYER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,300	42	156	198	20%	503	52%	269	28%	970	1,044	8	31	39	± 5	53	± 6	38

2019 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 2018
103	1	0
103	6	0
Total		**0**

Management Evaluation
Current Management Objective: 4000 (3,200-4,800)
Management Strategy: Recreational
2018 Postseason Population Estimate: ~4,500
2019 Proposed Post-season Population Estimate: ~3,500
2018 Hunter Satisfaction: 81% Satisfied, 11% Neutral, 8% 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. The herd objective was reviewed in 2019 and there were no changes.

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. These patterns

are starting to demonstrate a negative effect on fawn survival, based on pre-season classification surveys. Production did increase in 2018, however, it was still well below levels needed to increase a herd. For specific meteorological information for the Hawk Springs herd unit the reviewer is referred to the following link: http://www.ncdc.noaa.gov/cag/

Habitat
Forage availability 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
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 has experienced a steady decline since 2015. The sample size for pre-season classifications was met in 2017 but that was the only time in the previous 6 years, so herd composition data should be interpreted with caution. Fawn ratios have fluctuated around 45 fawns:100 does from 2013-2018, which is a level that does not grow a population. In 2018 fawn ratios (53 fawns:100 does) increased significantly from a low of 38 fawns:100 does in 2017, but still well below production needed to increase a herd. Buck ratios have fluctuated from a low of 39:100 to a high of 59:100 from 2013-2018 and are well within recreational management levels. In 2018 buck ratios (39 bucks:100 does) decreased compared to 2017 (56 bucks:100 does) and below the five-year average of 49 bucks:100 does. Buck ratios continue to fall within the recreation management range, which indicates that the fawns that do survive to adults have high survival rates. There is concern that as a result of consecutive years with poor fawn recruitment buck ratios will start to fall below recreational management levels. Once that happens Type 1 licenses will need to be adjusted, until then the prescribed number of Type 1 licenses does not appear to be reducing opportunities for hunters. Sample size for tooth data collected in the field is too small to infer any population dynamics.

Harvest Data
Active license success (87%) in 2018 increased compared to 2017 (77%) and the five-year average (83%). Effort (3.2 days per harvest) decreased compared to 2017 (4.3 days per harvest) and slightly decreased compared to 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 201 they appeared to have been redistributed to irrigated fields to the south, which have limited

access. So the improvement in harvest statistics was somewhat surprising. Satisfaction remained the same compared to 2017 at 81%.

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 4,500 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 fall within the recreational management level so there is no proposal to decrease the Type 1 license at this time. Previous harvest efforts on the female segment of the population coupled with poor fawn production warranted a decrease in Type 6 licenses in 2018 and it appears this same number will maintain the population within the objective range so a further reduction is not warranted at this time.

We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2024; however, if the situation arises that a change is needed, we will review and submit an updated proposal.

If the projected harvest of 785 pronghorn is attained coupled with normal fawn recruitment the pronghorn population will decrease to 3,500, 12% below the objective of 4,000.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR525 - MEDICINE BOW

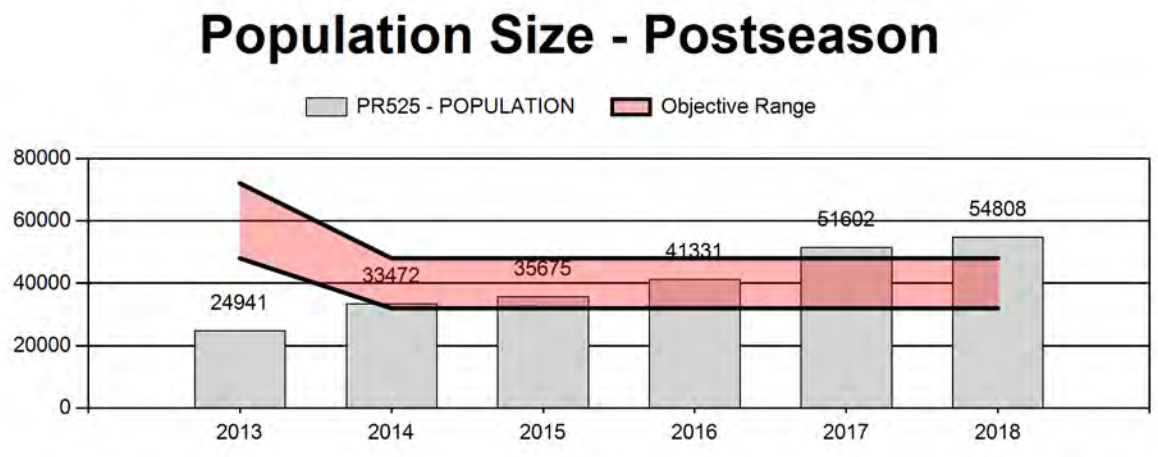
HUNT AREAS: 30-32, 42, 46-48
PREPARED BY: LEE KNOX

	2013 - 2017 Average	2018	2019 Proposed
Population:	37,404	54,808	55,577
Harvest:	2,735	3,636	3,800
Hunters:	3,060	3,823	4,000
Hunter Success:	89%	95%	95%
Active Licenses:	3,400	4,299	4,600
Active License Success:	80%	85%	83%
Recreation Days:	9,166	9,835	9,800
Days Per Animal:	3.4	2.7	2.6
Males per 100 Females	44	56	
Juveniles per 100 Females	70	68	

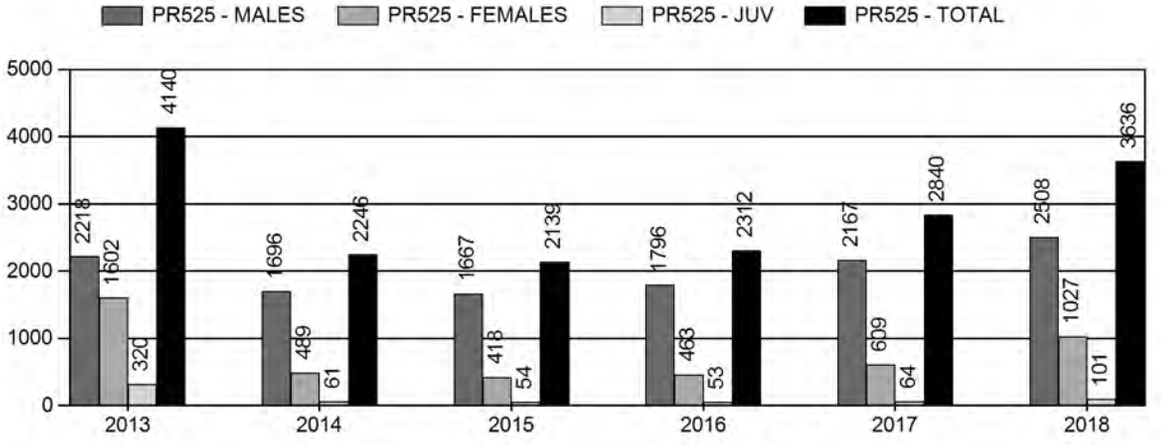
Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	37%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/28/2019

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

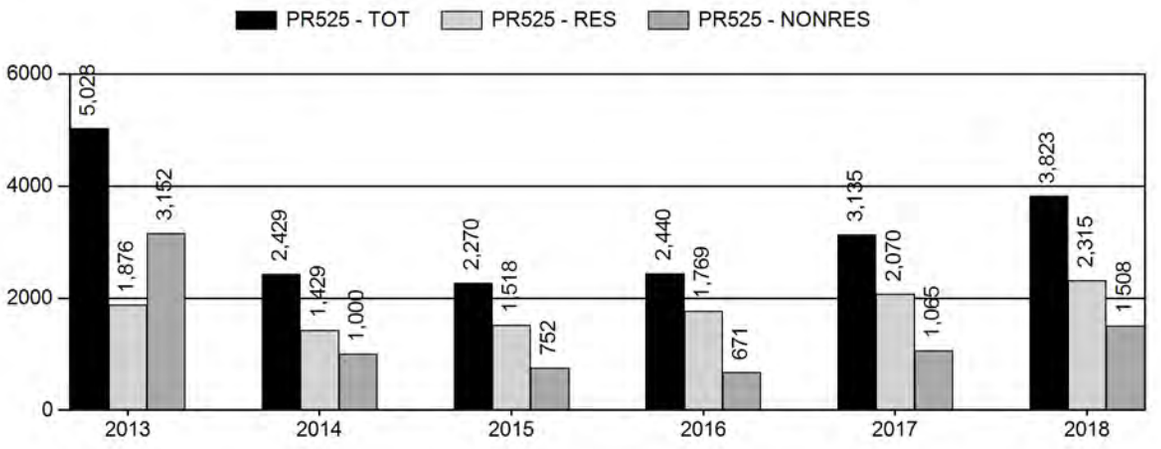
	JCR Year	Proposed
Females ≥ 1 year old:	4%	4%
Males ≥ 1 year old:	19%	19%
Total:	6%	6%
Proposed change in post-season population:	4%	4%



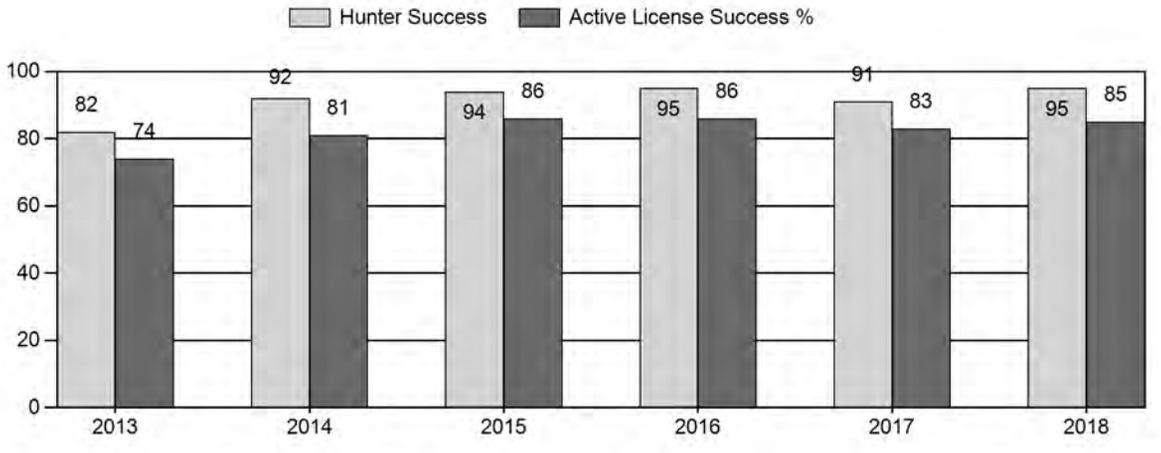
Harvest



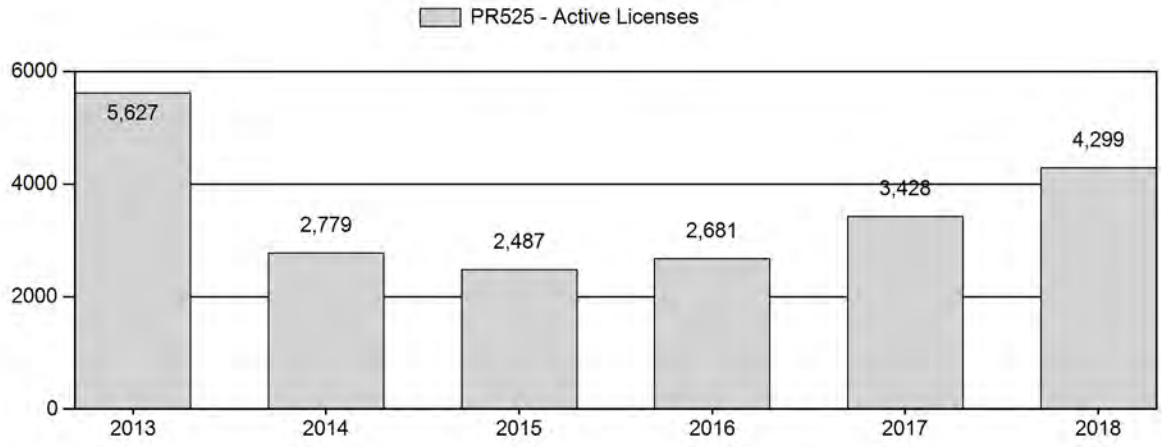
Number of Active Licenses



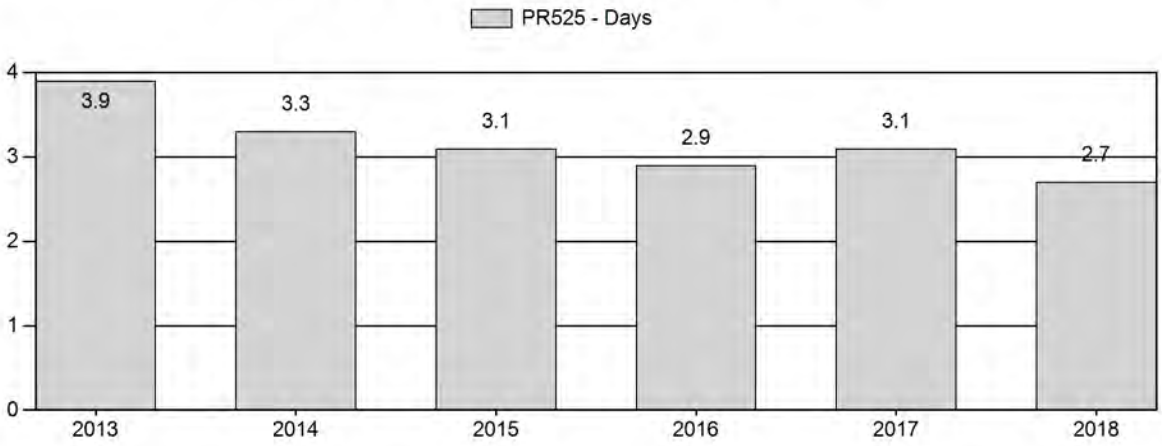
Harvest Success



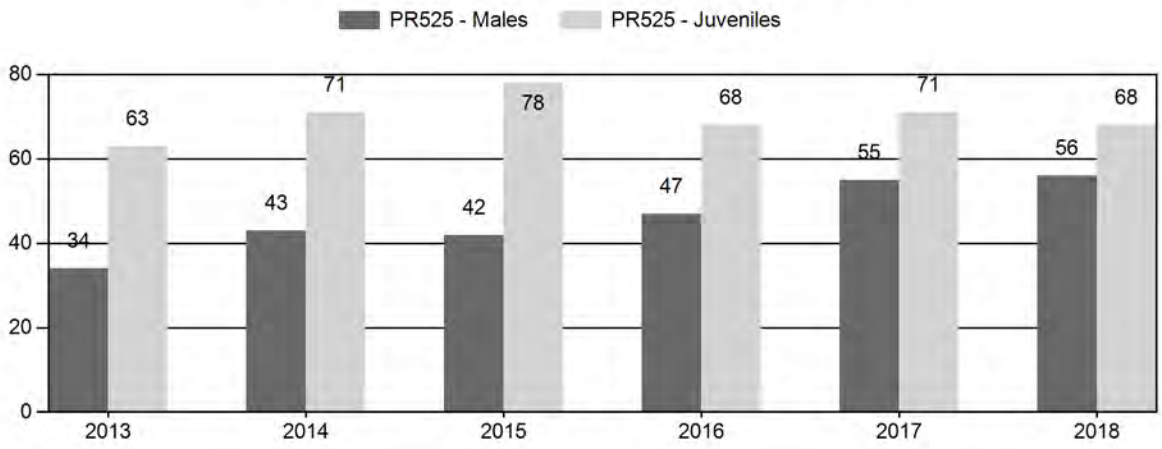
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR525 - MEDICINE BOW

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	58,808	537	1,186	1,723	25%	3,071	45%	2,073	30%	6,867	2,392	17	39	56	± 3	68	± 3	43

2019 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	250	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	200	Limited quota	Doe or fawn
32	1	Sep. 25	Oct. 31	600	Limited quota	Any antelope
	6	Sep. 25	Oct. 31	400	Limited quota	Doe or fawn
	7	Sep. 25	Oct. 31	150	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 2018
31	1	+50
	6	+100
32	1	+100
	6	+100

	7	+75
Herd Unit Total	**1**	**+150**
	2	**0**
	6	**+200**
	7	**+75**
	TOTAL	**+400**

Management Evaluation

Current Postseason Population Management Objective: 40,000 (32,000 – 48,000)
Management Strategy: Recreational
2018 Postseason Population Estimate: ~ 54,800
2019 Proposed Postseason Population Estimate: ~ 54,400
2018 Hunter Satisfaction: 94% Satisfaction, 4% 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 2015.

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. Currently the Wyoming Game and Fish is working with the University of Wyoming Cooperative Unit on studying the impacts wind farms may have on pronghorn in this herd unit. The project is a 6 year study and will be completed in 2024. 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 54,800. We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2024; however, if the situation arises that a change is needed, we will review and submit an updated proposal.

Weather

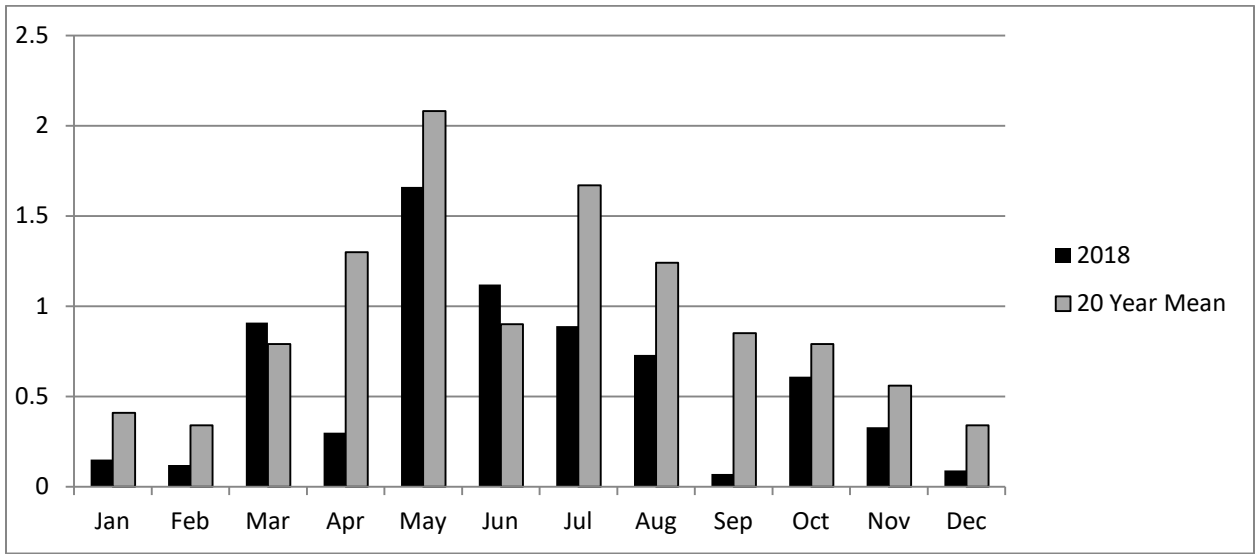


Figure 1. Monthly precipitation totals in inches for 2018 and the 20 year mean (1999-2019). Report was created at https://w2.weather.gov/climate/xmacis.php?wfo=cys using data collected at the Laramie Regional Airport.

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.

Habitat

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 6,867 pronghorn were classified in 2018, exceeding the estimated classification objective of 2,392. Buck ratios increased for the third straight year to 56 bucks: 100 does, 9 bucks: 100 does above the 10 year average of 47 bucks: 100 does. Yearling declined slightly at 17 bucks: 100; however, the adult buck ratio was the highest in 7 years at 39 bucks: 100 does. Fawn ratios continue to remain above the 10 year average of 66:100, at 68 fawns: 100 does in 2018. The hunter satisfaction survey shows 94% of hunters were either satisfied or very satisfied with their hunt, an increase of 11% from 2017, and 4% remaining neutral.

Harvest Data

Hunter success remains high at 95%, an increase of 4% from 2018. 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. Licenses were increased by 950 in 2018, yielding a 28% increase in harvest.

Population

The spreadsheet model for this herd indicates the population is increasing with a post hunt population of 54,800. This estimate was derived using the Time-Specific Juvenile and Constant Adult Survival model which had a AIC score of 275 and a best fit score of 275. 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 three studies including the current research project, (Grogan et al and Taylor, 2014).

Management Summary

If the projected harvest of 3,800 is attained, using the 10 year average fawn ratio of 70 fawns: 100 does, the modeled population is predicted to start slowly declining. Population and harvest data indicate harvest could significantly increase to bring the population estimate in line with the objective. We are hesitant to increase in hunt areas 42, 46, 47, and 48 due to high mortalities from collared does in these hunt areas. Hunt area 30 has had several years of poor fawn ratios and does not warrant an increase at this time. Hunt Area 31 had high buck and fawn ratios as well as high hunter success indicating a robust pronghorn population with in the hunt area and opportunity for an increase in harvest. Type 1 licenses will be increased by 50 and type 6 by 100. We are not seeing as high of mortality in collared does in Hunt Area 32, and we are seeing a noticeable increase in the pronghorn population, warranting an increase in harvest. Hunt Area 32 type 1 licenses will be increased by 100, type 6 licenses by 100 and type 7 licenses by 75.

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.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR526 - COOPER LAKE

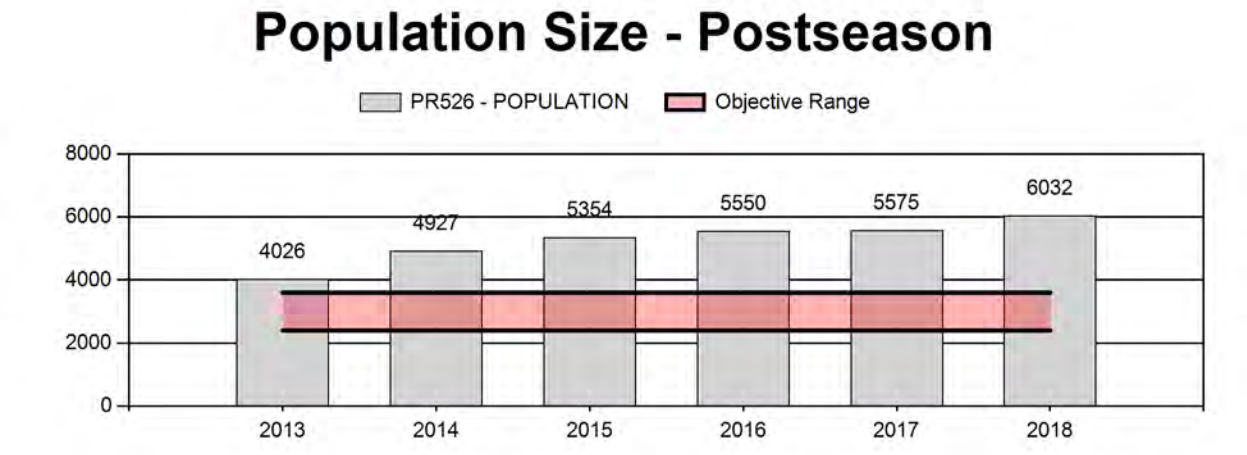
HUNT AREAS: 43
PREPARED BY: LEE KNOX

	2013 - 2017 Average	2018	2019 Proposed
Population:	5,086	6,032	5,757
Harvest:	707	878	1,000
Hunters:	793	1,067	1,200
Hunter Success:	89%	82%	83 %
Active Licenses:	848	1,138	1,300
Active License Success:	83%	77%	77 %
Recreation Days:	2,523	2,944	2,800
Days Per Animal:	3.6	3.4	2.8
Males per 100 Females	57	57	
Juveniles per 100 Females	87	86	

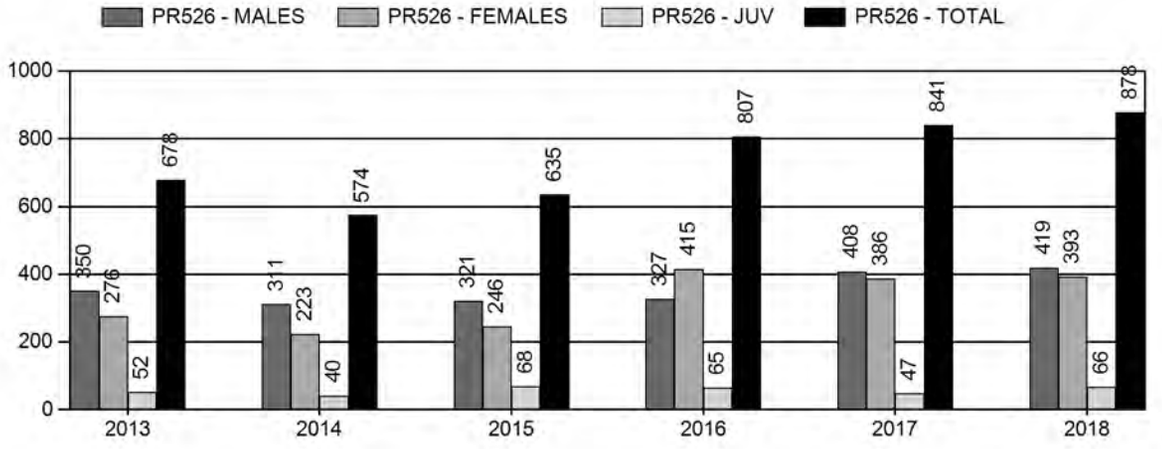
Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	101%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/14/2019

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

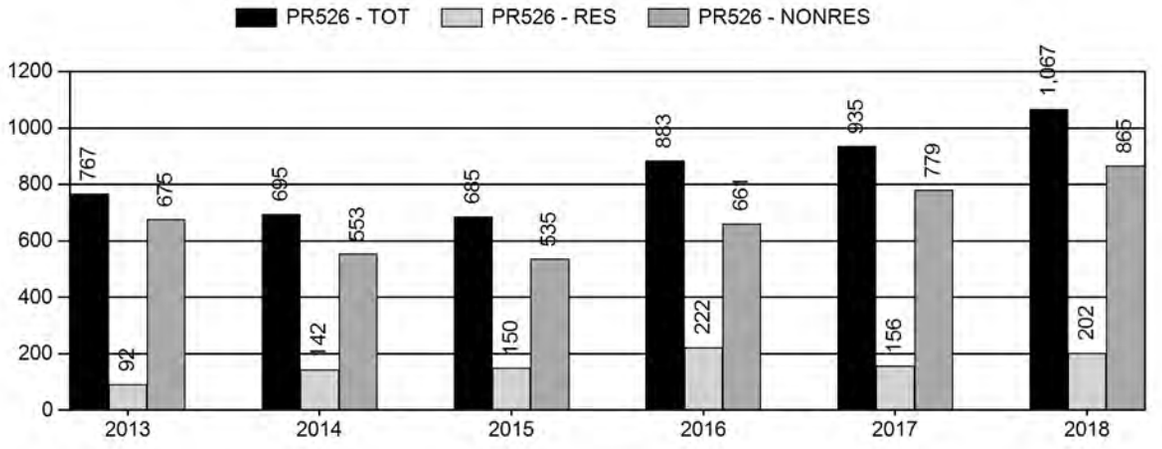
	JCR Year	Proposed
Females ≥ 1 year old:	15%	20%
Males ≥ 1 year old:	28%	20%
Total:	-14.5%	18%
Proposed change in post-season population:	4%	4%



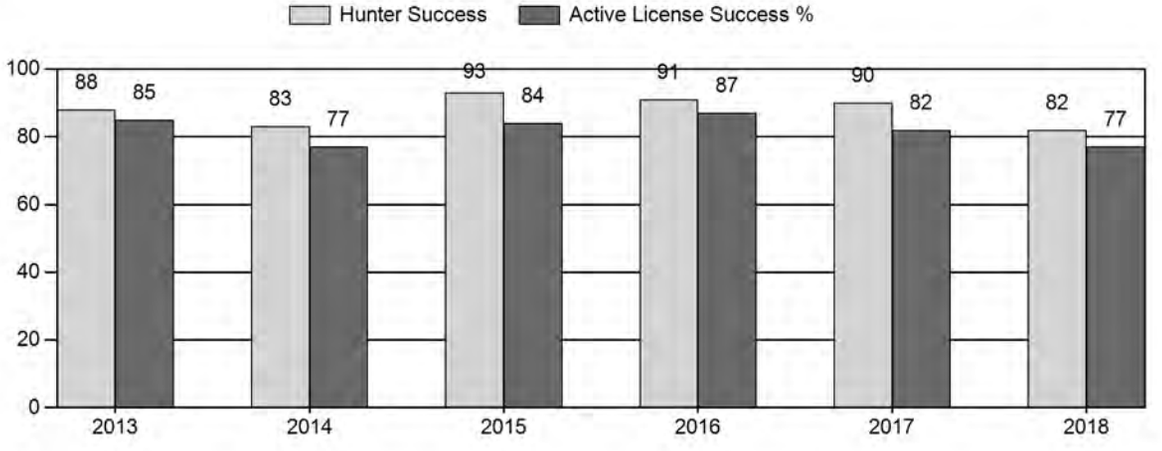
Harvest



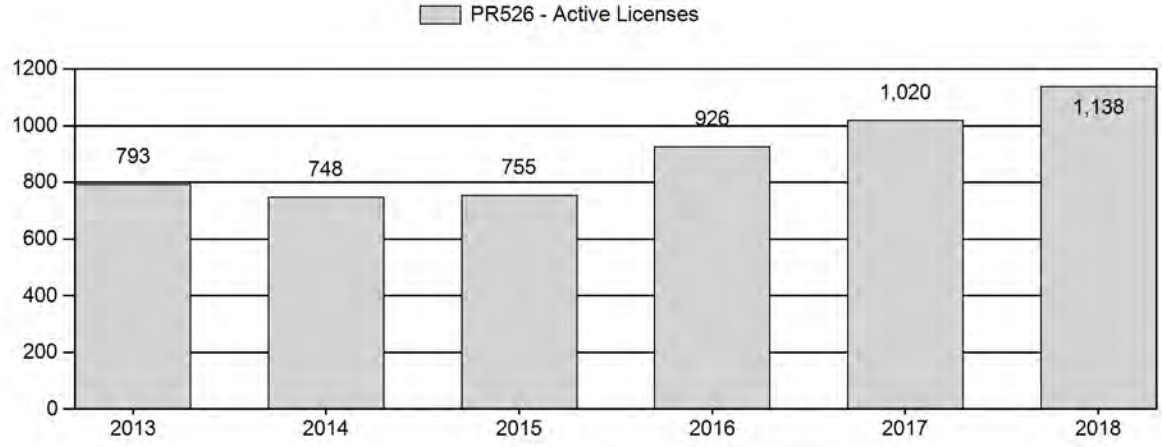
Number of Active Licenses



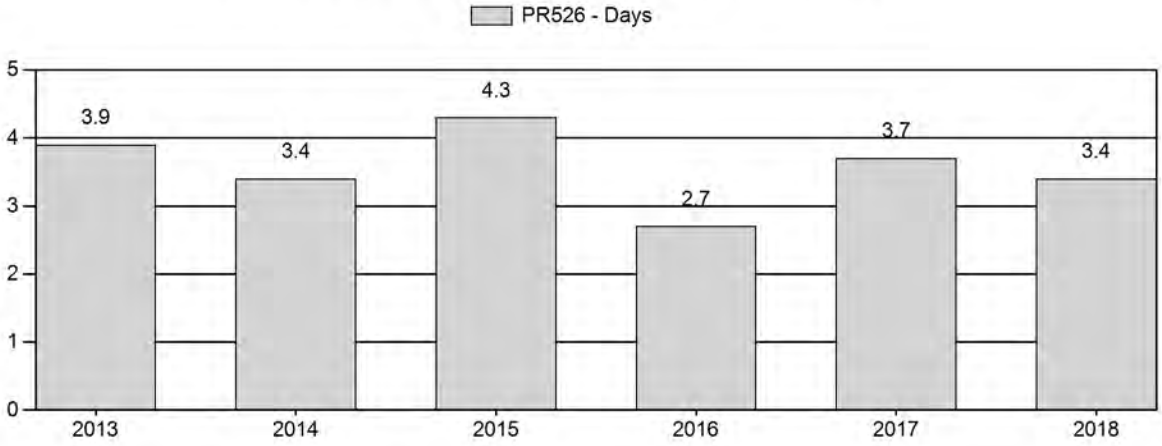
Harvest Success



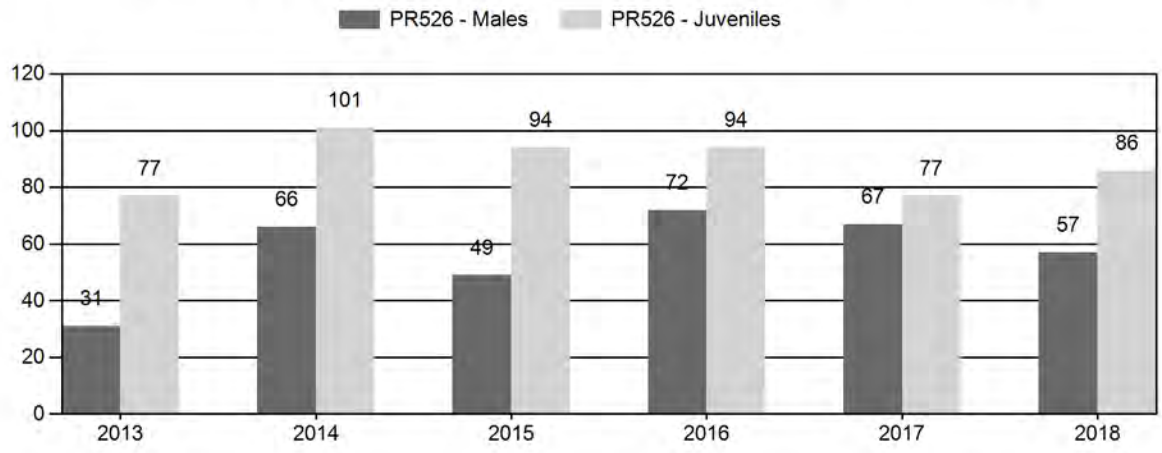
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR526 - COOPER LAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	6,998	52	88	140	23%	246	41%	211	35%	597	1,984	21	36	57	± 9	86	± 13	55

2019 HUNTING SEASONS
COOPER LAKE PRONGHORN (PR526)

Hunt Area	Type	Season Opens	Dates Closes	Quota	License	Limitations
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 2018
43	1	0
43	6	0
Herd Unit Totals	**1 & 6**	**0**

Management Evaluation

Current Post-Season Population Management Objective: 3,000 (2,400-3,600)
Management Strategy: Recreational
2018 Post-Season Population Estimate: ~6,000
2019 Proposed Post-Season Population Estimate: ~5,700
2018 Hunter Satisfaction: 90% **Neutral,** 9% **Dissatisfied,** 1%

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 2018.

Herd Unit Issues

Recent trends show the population increasing from 4,300 in 2013 to the current population estimate of 6,000. The latest line transect survey was conducted in 2013, estimating 8,953 pronghorn with a 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

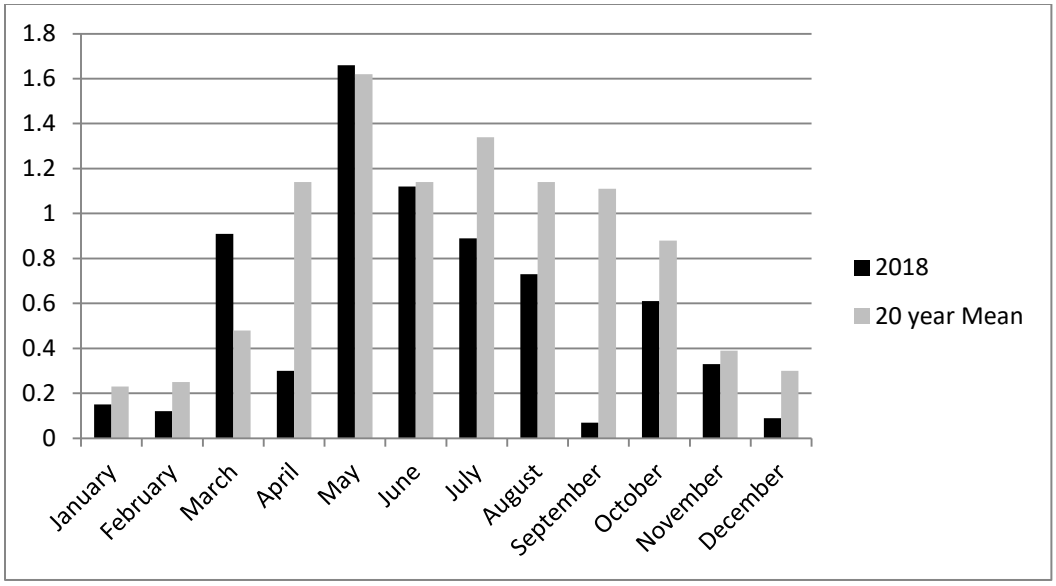


Figure 1. Monthly precipitation totals in inches for 2018 and the 20 year mean (1999-2019). Report was created at https://w2.weather.gov/climate/xmacis.php?wfo=cys using data collected at the Laramie Regional Airport.

Precipitation in 2018 was similar to the 20 year mean 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.

Habitat

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

In 2018, a total of 597 pronghorn were classified in the Cooper Lake pronghorn unit, which is well below the required estimated sample size of 1,984 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. Pronghorn groups were difficult to find due drought conditions. Pronghorn were in large herds, and near what water had not dried up, likely causing us to miss many during classification counts. Fawn ratios increased by 9 fawns: 100 from 2017 to 2018 (86 fawns:100 does), although still high, this was a drop from 2015 and 2016, with both years at 94 fawns:100 does. Buck ratios decreased in both cohorts, but mostly in adult bucks, for a total buck ratio of 57:100 does. The total buck ratio in 2018 is 10 bucks: 100 less than 2017 (67:100), but still

above the previous 10 year average (50:100). 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 2018, 1,300 licenses (600 Type 1 and 700 Type 6) were issued, with non-residents accounting for 81% of the licenses sold and all licenses were sold in the initial draw. The number of active type 1 licenses was 83%, the lowest on record. The number of active type 6 licenses was comparable to past years, however there was a 5% decrease in hunter success, only harvesting an estimated 50 more does than in 2017. Starting in 2016, we have steadily increased licenses in the Cooper Lake herd unit to keep up with the exceptionally high fawn ratios, but harvest is correlated to access. There are two Hunter Management and Access (HMA) areas in the Cooper Lake herd unit. We would not be able to harvest the number of pronghorn we do without them, however we may have surpassed max hunter density for the highest harvest yield.

Population

The population model estimates the Cooper Lake herd near 6,000 pronghorn, and predicts it will remain stable to slightly declining to 5,800 in 2019. 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 of ~6,000 is well above the post-season population management objective (3,000) and remaining stable, even with increased licenses. 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). We are concerned we have reached the threshold for hunters on the two HMAs. We will remain status quo for 2019 and evaluate if there are other ways we can increase harvest, like increasing the number of active licenses or increasing success.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR527 - CENTENNIAL

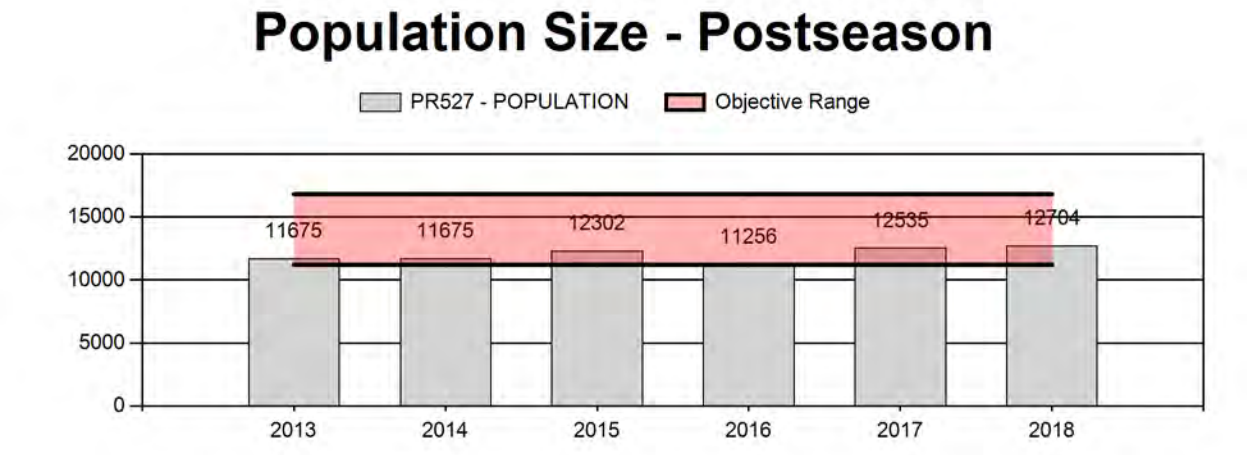
HUNT AREAS: 37, 44-45
PREPARED BY: LEE KNOX

	2013 - 2017 Average	2018	2019 Proposed
Population:	11,889	12,700	12,800
Harvest:	1,039	996	1,000
Hunters:	1,140	1,039	1,100
Hunter Success:	91%	96%	91 %
Active Licenses:	1,280	1,169	1,200
Active License Success:	81%	85%	83 %
Recreation Days:	4,078	3,370	4,000
Days Per Animal:	3.9	3.4	4
Males per 100 Females	44	47	
Juveniles per 100 Females	64	53	

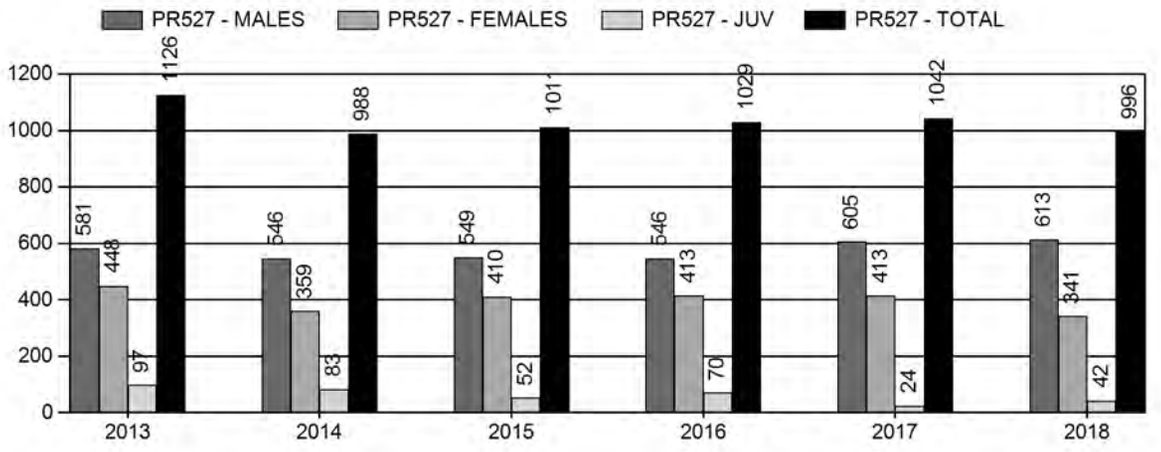
Population Objective (± 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-9.3%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/4/2019

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

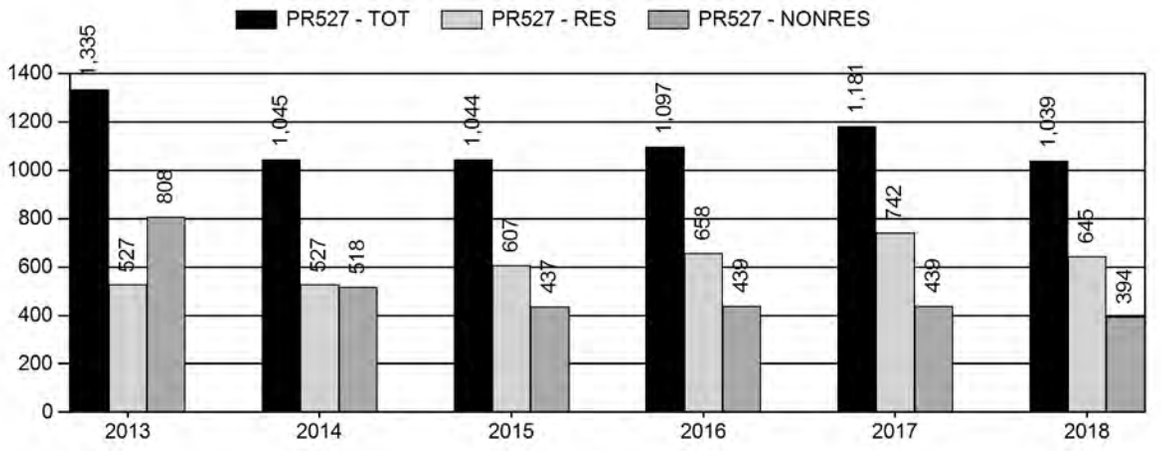
	JCR Year	Proposed
Females ≥ 1 year old:	6%	6%
Males ≥ 1 year old:	21%	21%
Total:	7%	7%
Proposed change in post-season population:	-1%	-1%



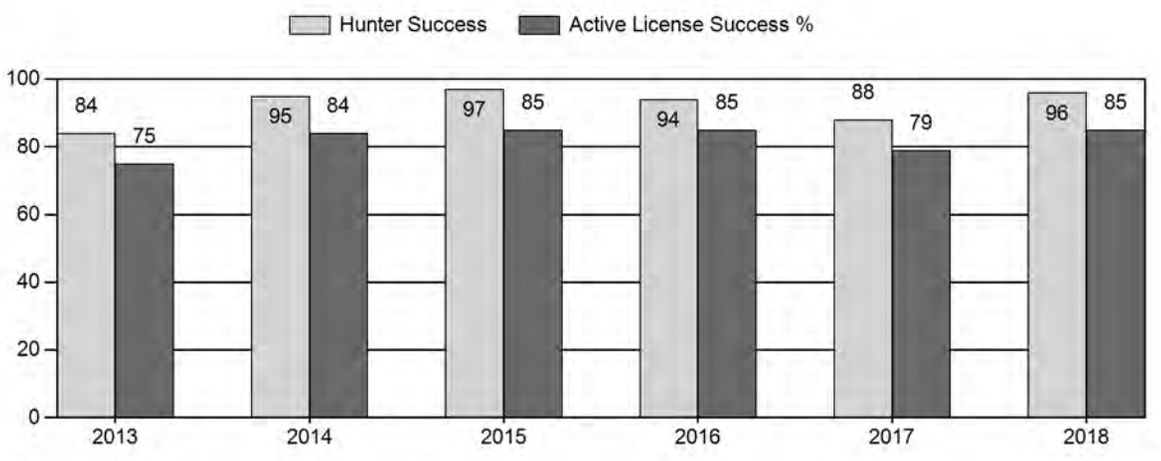
Harvest



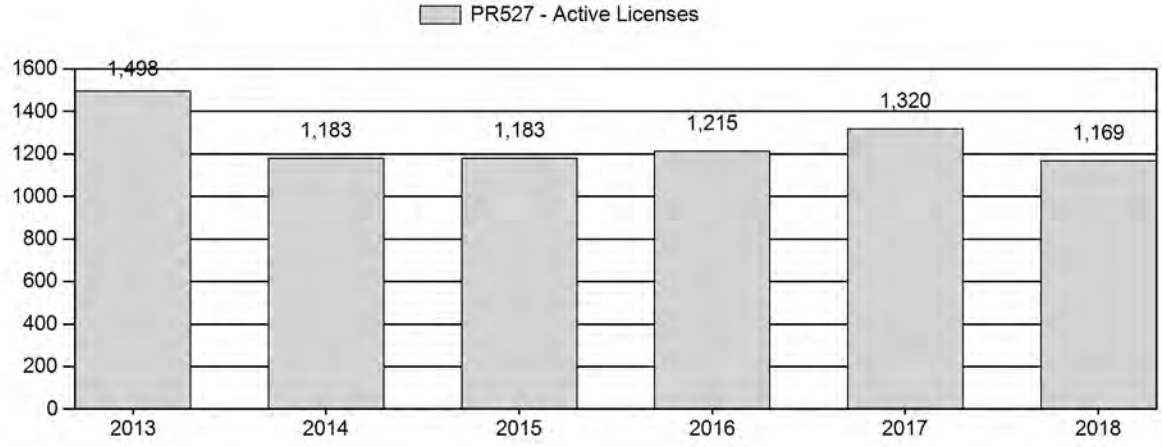
Number of Active Licenses



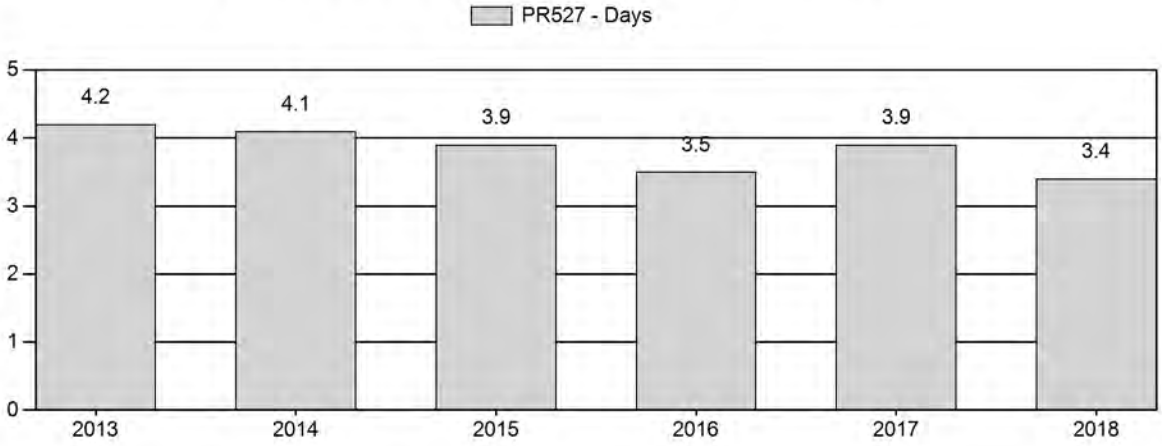
Harvest Success



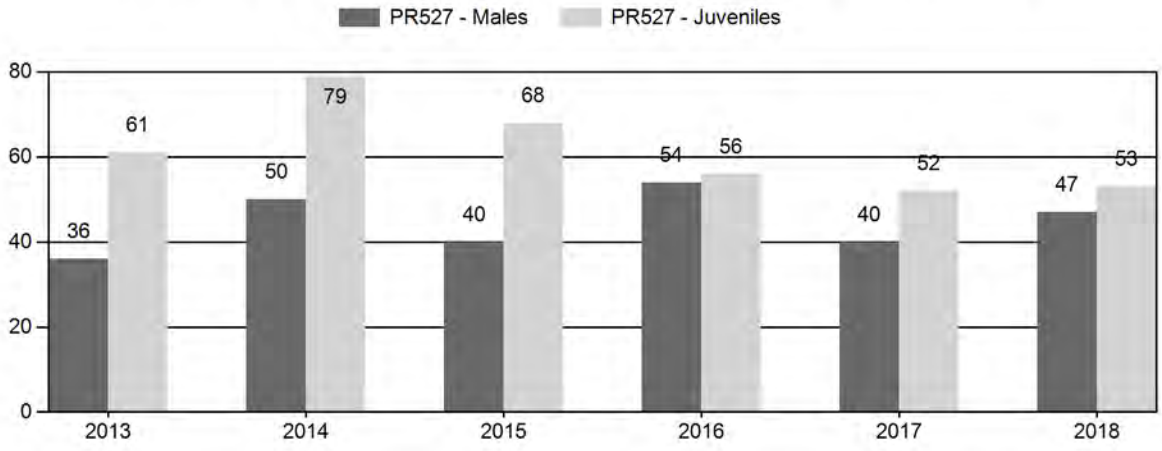
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR527 - CENTENNIAL

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	13,800	124	260	384	23%	823	50%	439	27%	1,646	1,532	15	32	47	± 4	53	± 5	36

2019 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 2018
Herd Unit Totals	**1**	**0**
	6	**0**

Management Evaluation
Current Postseason Population Management Objective: 14,000 (11,200 – 15,800)
Management Strategy: Recreational
2018 Postseason Population Estimate: ~ 12,700
2019 Postseason Population Estimate: ~ 12,800
2018 Hunter Satisfaction: 95% **Satisfied**, 3% **Neutral**, 2% **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 2018.

Herd Unit Issues
The 2018 post-season population estimate was approximately 12,700 pronghorn, with the population trending near objective. The last line transect survey for this herd unit was conducted at the end of bio year 2013, which estimated 13,800 pronghorn with a standard error of 1287. 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 five Hunter Management Areas (HMA). 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.

Weather

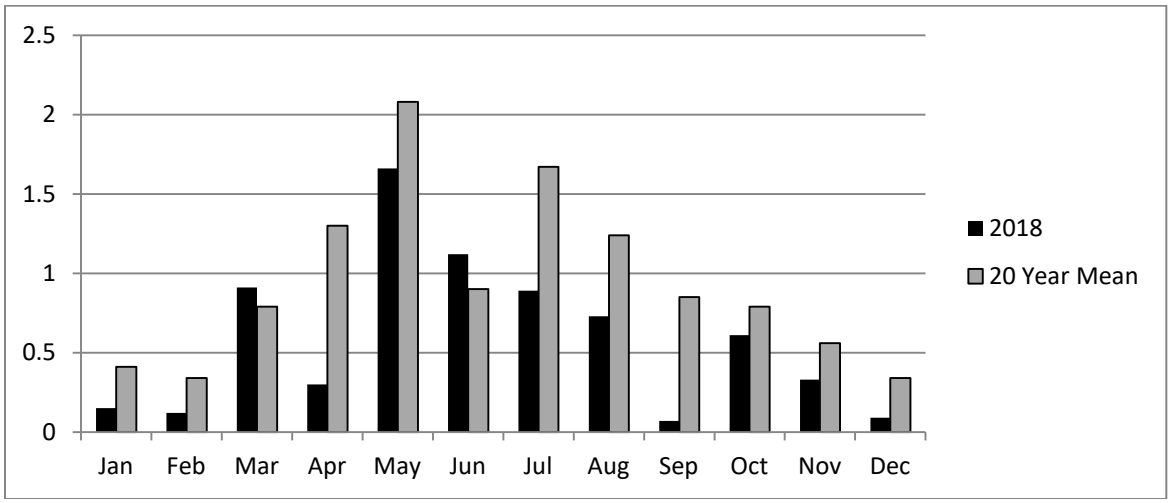


Figure 1**.** Monthly precipitation totals in inches for 2018 and the 20 year mean (1999-2019). Report was created at https://w2.weather.gov/climate/xmacis.php?wfo=cys using data collected at the Laramie Regional Airport.

Precipitation in 2018 was similar to the 20 year mean 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.

Habitat

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 1,646 pronghorn were classified, exceeding the estimated classification objective of 1,532. Fawn production was again poor at 53 fawns: 100 does, and well below the ten year average of 70 fawns: 100 does. Fawn ratios have remained low the past three years, likely weather related. Buck ratios improved to 47 bucks: 100 does, well above the 10 year average of 43 bucks: 100 does, and in the middle of recreational management guidelines.

Harvest Data

Hunter success in 2018 remains high at 96%. Hunter effort decreased slightly, but remains below the ten year average of four days to harvest. The hunter satisfaction survey showed 95% of hunters were satisfied or very satisfied with their hunt, 3% of respondents were neutral. Overall the current season structure and license issuance is working well, it is reflected in the high hunter success and satisfaction. This herd unit is popular with

nonresidents who accounted for 38% of the licenses in 2018. 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. 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 2018 post season population estimate is 12,700, 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 13,800 pronghorn with a standard error of 1287. The 95% confidence interval (CI) is between 11,480 and 16,627 pronghorn.

Management Summary

The 2018 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. 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 12,800 pronghorn.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR528 - ELK MOUNTAIN

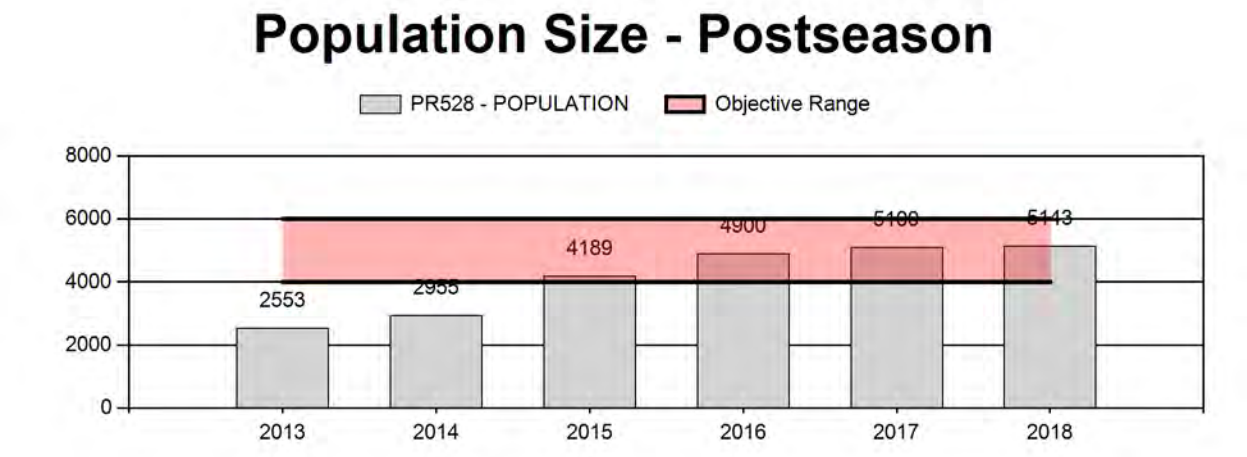
HUNT AREAS: 50
PREPARED BY: TEAL CUFAUDE

	2013 - 2017 Average	2018	2019 Proposed
Population:	3,939	5,143	4,911
Harvest:	399	376	435
Hunters:	430	364	430
Hunter Success:	93%	103%	101%
Active Licenses:	462	429	475
Active License Success:	86%	88%	92%
Recreation Days:	1,407	1,183	1,400
Days Per Animal:	3.5	3.1	3.2
Males per 100 Females	41	35	
Juveniles per 100 Females	54	53	

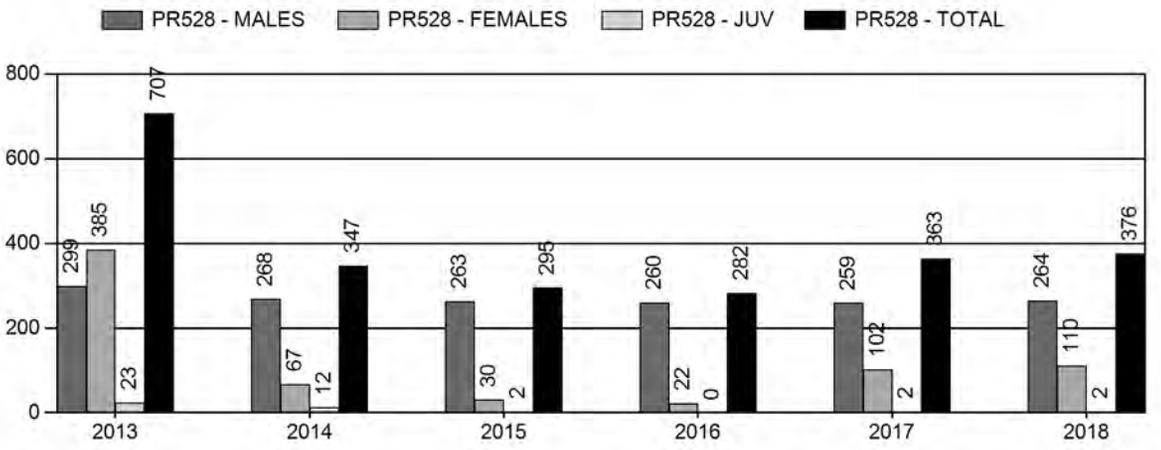
Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	3%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/14/2019

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

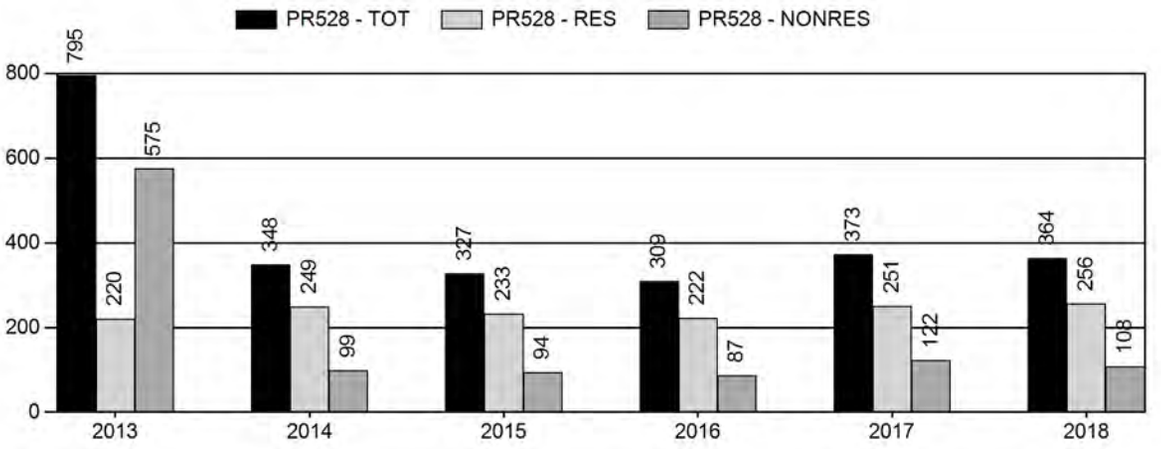
	JCR Year	Proposed
Females ≥ 1 year old:	4%	7%
Males ≥ 1 year old:	25%	38%
Total:	10%	10%
Proposed change in post-season population:	1%	-5%



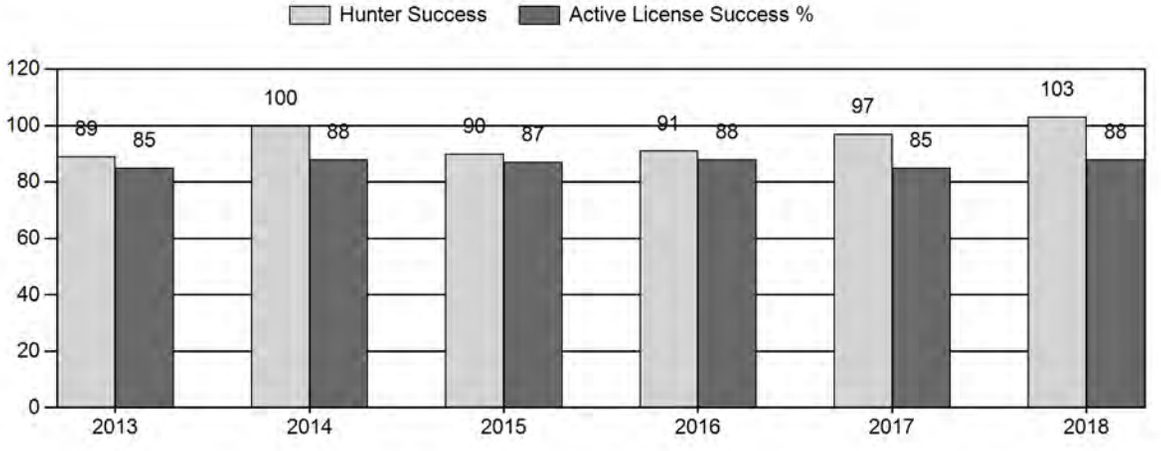
Harvest



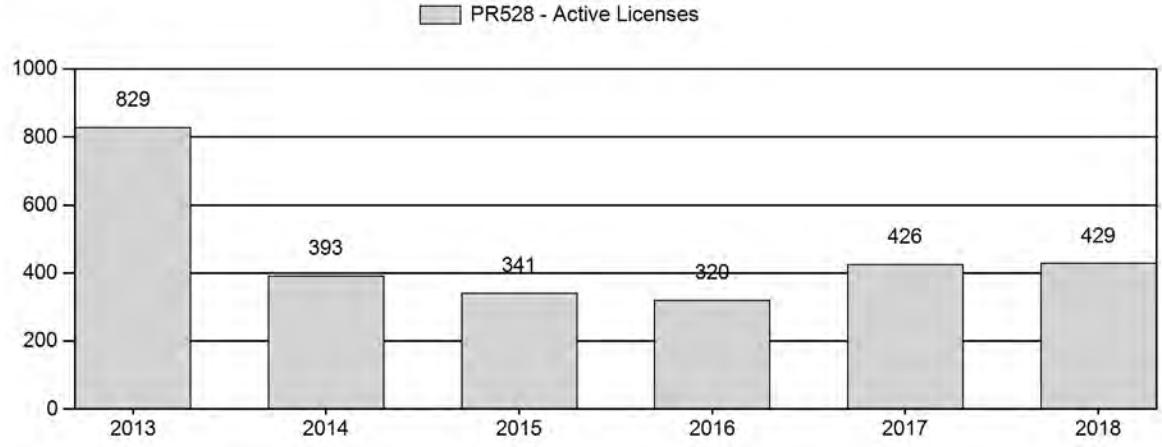
Number of Active Licenses



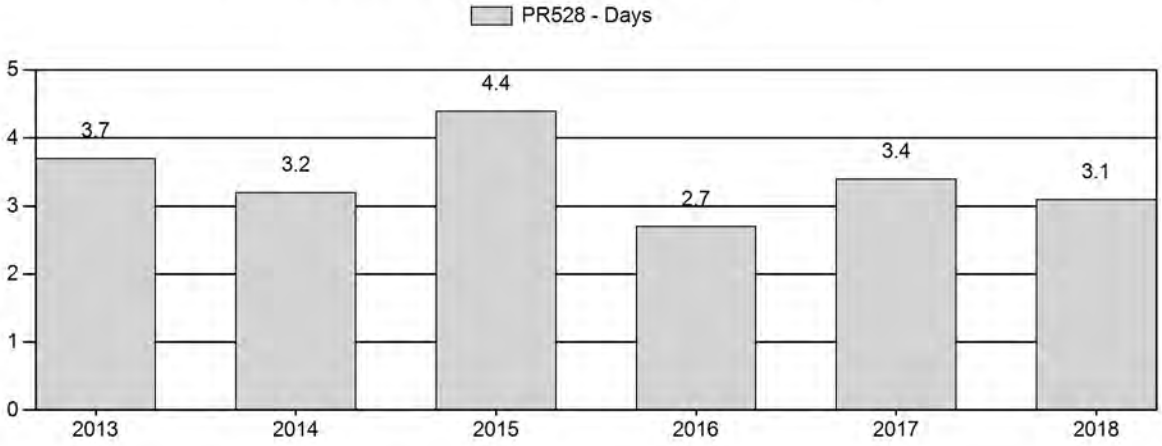
Harvest Success



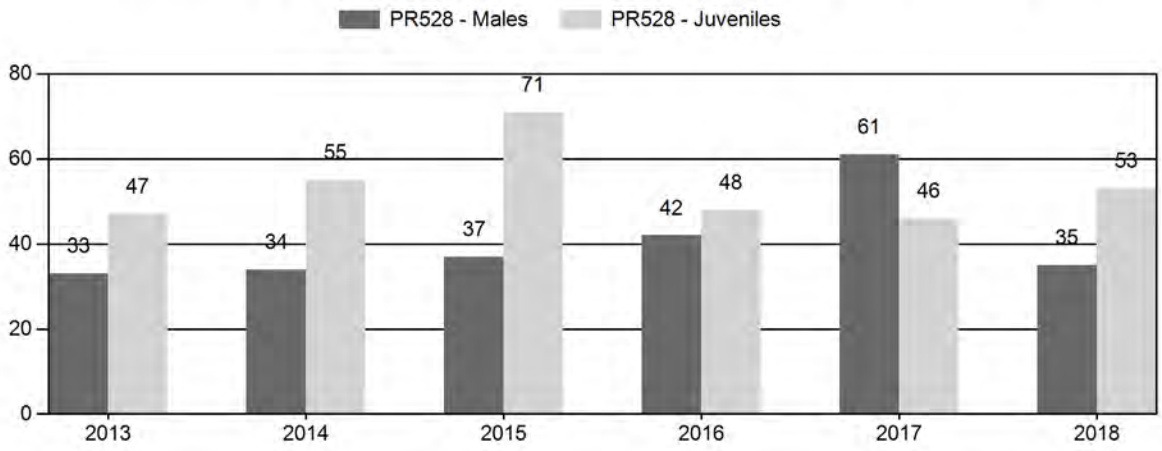
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR528 - ELK MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	5,557	74	111	185	19%	523	53%	276	28%	984	1,209	14	21	35	± 5	53	± 6	39

2019 HUNTING SEASON RECOMMENDATIONS
ELK MOUNTAIN PRONGHORN (PR528)

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
50	1	Sep. 16	Oct. 31	300	Limited quota	Any antelope
	6	Sep. 16	Oct. 31	~~150~~ 200	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 2018
Herd Unit Total	**6**	**+50**

Management Evaluation
Current Postseason Population Management Objective: 5,000 (4,000 – 6,000)
Management Strategy: Recreational
2018 Postseason Population Estimate: 5,100
2019 Proposed Postseason Population Estimate: 4,900
2018 Hunter Satisfaction: 92% Satisfied, 5% Neutral, 3% Dissatisfied

Pronghorn in the Elk Mountain herd unit are managed toward a postseason population objective of 5,000. The Elk Mountain herd unit is classified as a recreational management herd unit. This strategy directs Wyoming Game and Fish Department (WGFD) to manage harvest opportunity to maintain a preseason ratio of 30-59 bucks:100 does in the herd unit. The population was estimated using a spreadsheet model developed in 2012 and updated in 2018.

Herd Unit Issues
The Elk Mountain Pronghorn herd unit occurs entirely within Hunt Area 50, and contains 1,572.6 km^2 of occupied habitat. The occupied habitat consists primarily of sagebrush grassland and mountain shrub habitat types, with irrigated hay meadows occurring on private lands. The land status in this herd unit is predominantly 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 hunting access.

The predominant land use in the herd unit is cattle grazing. Energy and urban development has been minimal in this herd unit. However, conversion of suitable pronghorn habitat to rural residential development has occurred east of the town of Saratoga in recent decades. Although pronghorn can be found throughout suitable habitat year-long, they tend to migrate to lower elevations in the western part of the unit to winter, and migrate to higher elevations in the east to summer. Traditional winter movements to lower elevations to the north have been blocked by US Interstate 80 since its construction in 1967 (Ward et al. 1976). There has been no documented use of the underpasses under US Interstate 80 by pronghorn in this herd unit. The western portion of the herd unit is intersected by Wyoming Highway 130, which impedes the semi-annual migration of these pronghorn.

We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2024; however, if the situation arises that a change is needed, we will review and submit an updated proposal.

Weather

The 2017-18 winter was mild with below average snowpack and was relatively favorable to wildlife. The spring of 2018 was dry, resulting in slow plant growth and green-up of rangelands. The majority of the summer and fall were extremely dry, causing much of the available forage to cure. However, fawn production was similar to past years, most likely due to the availability of agriculture fields that provided female pronghorn the necessary diet needed for lactation. Fortunately, precipitation in October resulted in a late surge of plant growth, which may have provided pronghorn with a valuable boost in nutrition prior to the winter of 2018-19. While there have been several notable snow storms and cold snaps during the winter of 2018-19, there were also periods of warm weather and high winds that melted and drifted snow to expose forage. Fairly average pronghorn survival is expected for the winter of 2018-19.

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration (NOAA), https://w2.weather.gov/climate/xmacis.php?wfo=cys to illustrate weather conditions thus far, during bio-year 2018 (Figures 1 and 2). These figures also include data from January-May of bio-year 2017 to describe the weather conditions immediately preceding bio-year 2018.

Figure 1. January 2018 - January 2019 mean monthly temperatures and 20-year monthly means for Rawlins, Wyoming.

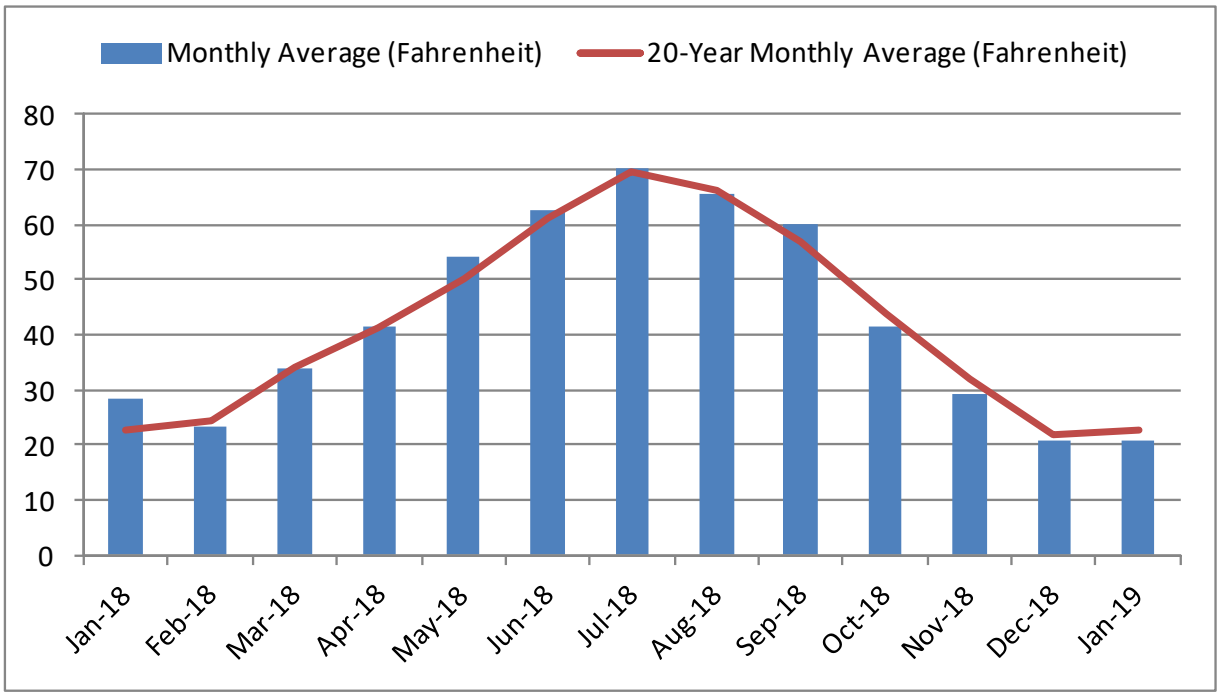
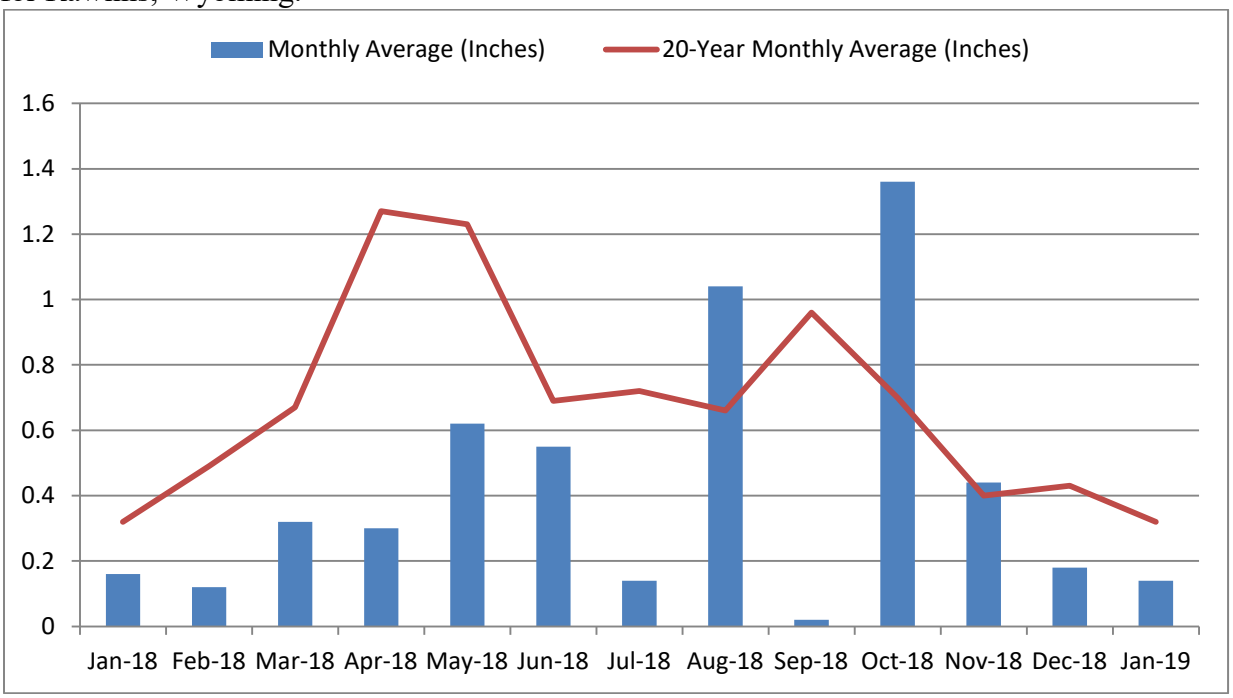


Figure 2. January 2018 - January 2019 mean monthly precipitation and 20-year monthly means for Rawlins, Wyoming.



Habitat
This herd unit has a limited number of established habitat transects to measure production and/or utilization on shrub species that are preferred browse for pronghorn. However, these transects have not provided sufficient data to make reliable inferences about habitat quality. Anecdotal observations indicate growth and moisture during the spring of 2018 was poor, and summer and early fall of 2018 were quite dry and hot. Pronghorn became more concentrated in areas where moisture and green forage persisted during this time period, and may have over browsed preferred plant species in some cases. October precipitation resulted in a late fall green-up of forage that likely benefited pronghorn nutritionally prior to the winter of 2018-19. 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 classification sample size increased in 2018. The total preseason classification sample (n=1003) was below the statistically desired sample size. Due to changes in survey technique in recent years (i.e. changed from aerial to ground surveys), preseason pronghorn sex and age classification survey sample sizes have been less than adequate for producing estimates with acceptable 90% confidence intervals. The preseason buck:doe ratio decreased in 2018 to 35:100, and was below the five-year average. The buck:doe ratio was significantly less than the ratio observed in 2017. The higher buck ratio in 2017 may have been the result of sampling biases which are difficult to overcome when conducting classifications from the ground along public roads. The preseason fawn:doe ratio increased from 46:100 in 2017, to 53:100 in 2018, which is in the normal range for this herd unit.

Seven pronghorn line transect (LT) surveys have been conducted in this herd unit. The most recent LT was conducted in 2012. In 2010, 35 adult female pronghorn were collared in this herd unit and the Medicine Bow herd unit as part of a study examining the response of pronghorn to wind energy development near the Dunlap Ranch wind energy facility north of Medicine Bow. Survival analyses were conducted for these 35 collared pronghorn during winter 2010, winter 2010-11 and winter 2011-12 (Taylor 2014). Density estimates from the LTs and adult survival field estimates (2010 and 2011) were incorporated into the spreadsheet model to improve the population estimate's accuracy.

Harvest Data
The 2018 harvest survey indicated a total of 376 pronghorn were harvested; 264 bucks, 110 does, and 2 fawns. Overall harvest success increased to 103%, above the five-year average success. This high overall harvest success was likely attributed to many of the successful hunters possessing both Type 1 and Type 6 licenses. The average number of days hunted for each pronghorn harvested decreased to 3.1 days, and was below the five-year average (3.5 days). Hunter satisfaction remained high, with 92% of hunters reporting they were satisfied with their hunt.

Population
Spreadsheet model estimates indicated the Elk Mountain herd is currently above the management objective of 5,000 pronghorn. The CJ, CA model was selected again for the Elk Mountain herd unit in 2018. 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. This model is rated 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

In 2019, Type 1 licenses quotas will remain the same as 2018. Type 6 licenses will be conservatively increased (+50) to allow for more doe/fawn harvest in the herd unit. 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 2019.

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.

Ward, A. L., J. J. Cupal, G. A. Goodwin and H. D. Morris. 1976. Effects of highway construction and use on big game populations. Rept. No. FHWA-RD-76-174, Federal Highway Administration, Washington, D.C, USA.

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.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019

HERD: PR529 - BIG CREEK

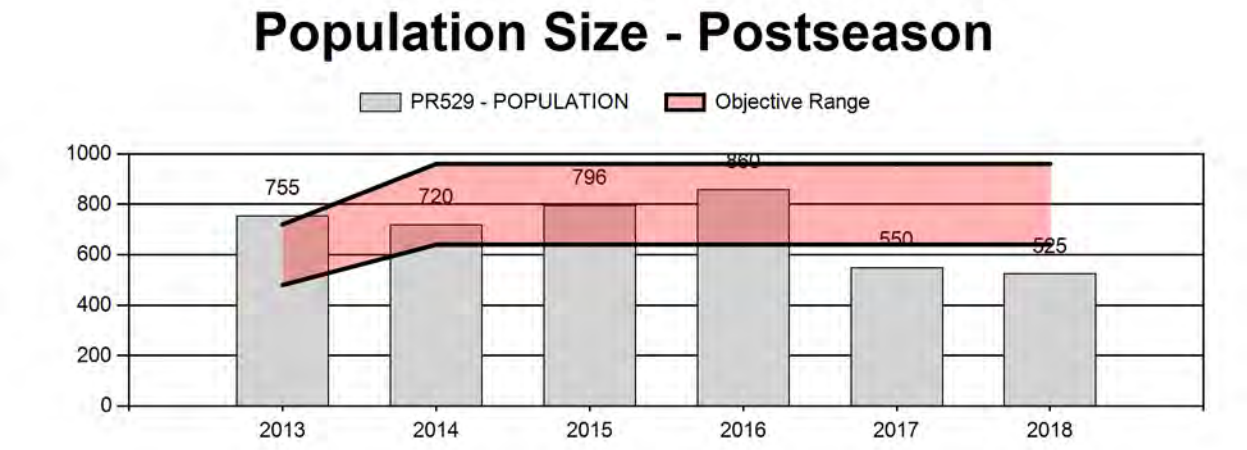
HUNT AREAS: 51
PREPARED BY: TEAL CUFAUDE

	2013 - 2017 Average	2018	2019 Proposed
Population:	736	525	388
Harvest:	92	147	145
Hunters:	89	161	160
Hunter Success:	103%	91%	91 %
Active Licenses:	104	185	175
Active License Success:	88%	79%	83 %
Recreation Days:	301	535	475
Days Per Animal:	3.3	3.6	3.3
Males per 100 Females	54	67	
Juveniles per 100 Females	52	53	

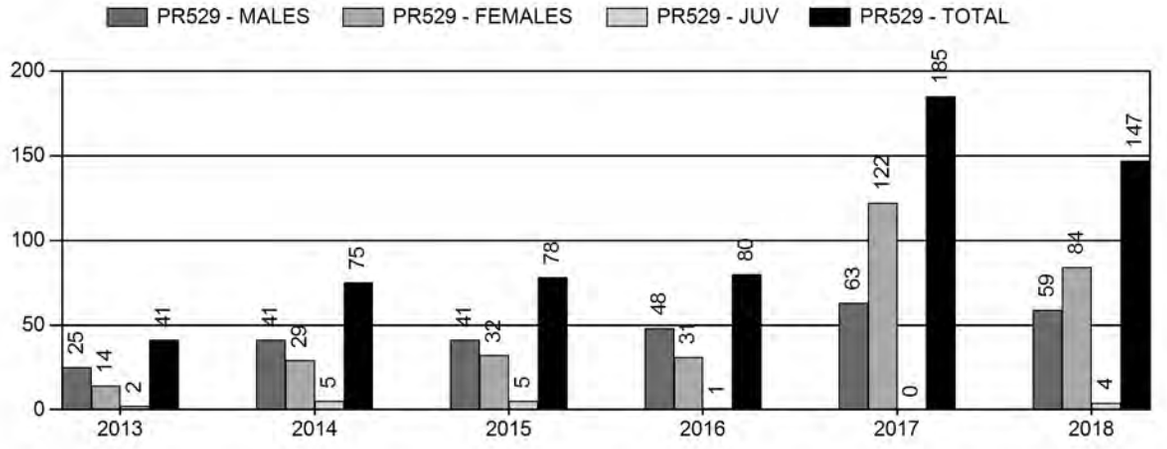
Population Objective (± 20%) :	800 (640 - 960)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-34.4%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/14/2019

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

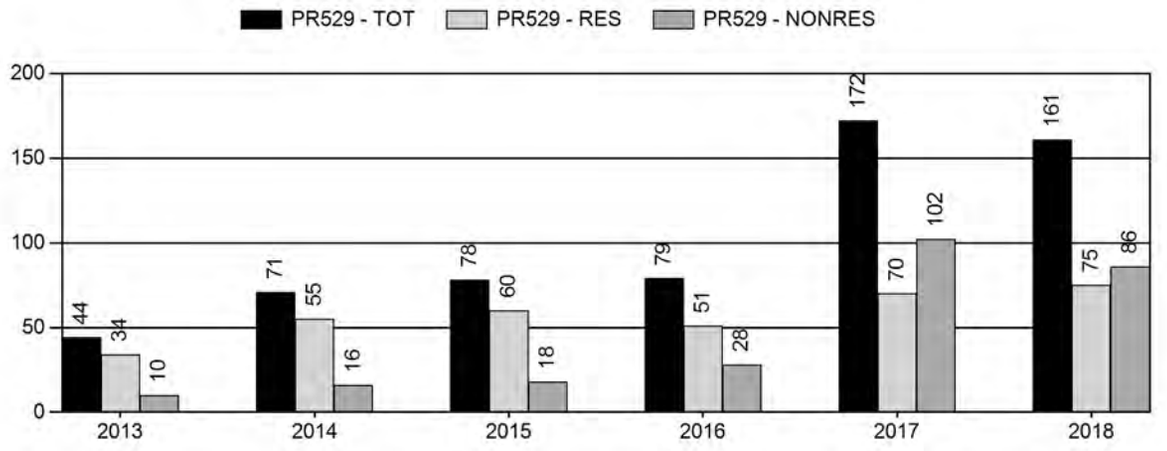
	JCR Year	Proposed
Females ≥ 1 year old:	40%	57%
Males ≥ 1 year old:	50%	71%
Total:	31%	42%
Proposed change in post-season population:	-10%	-35%



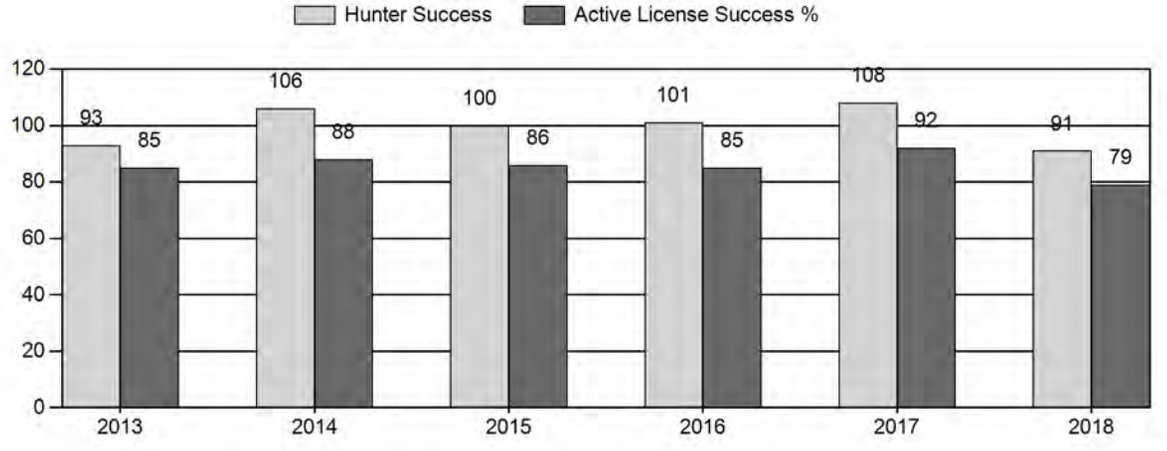
Harvest



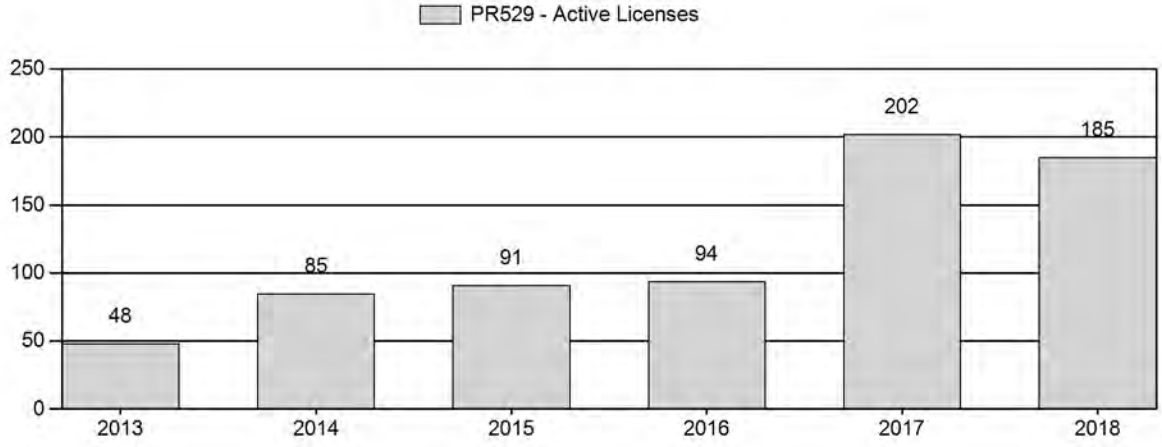
Number of Active Licenses



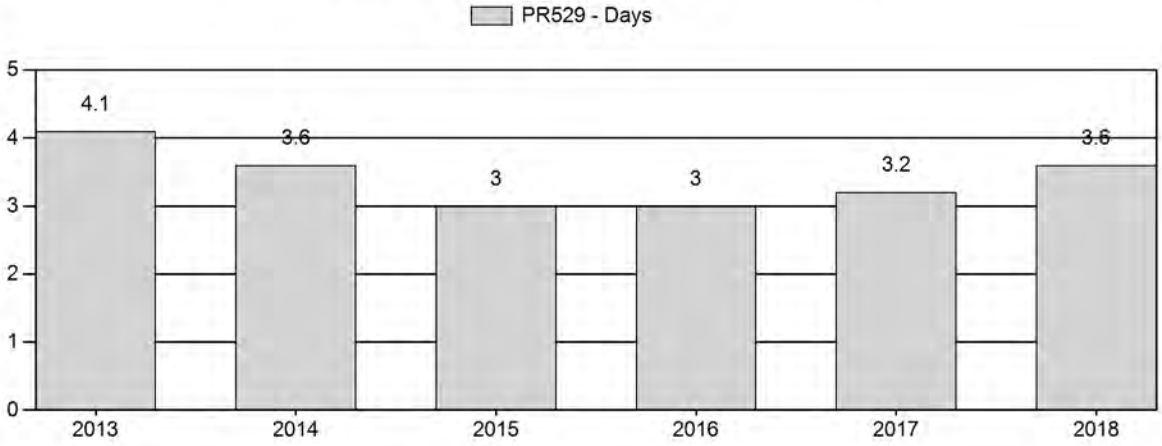
Harvest Success



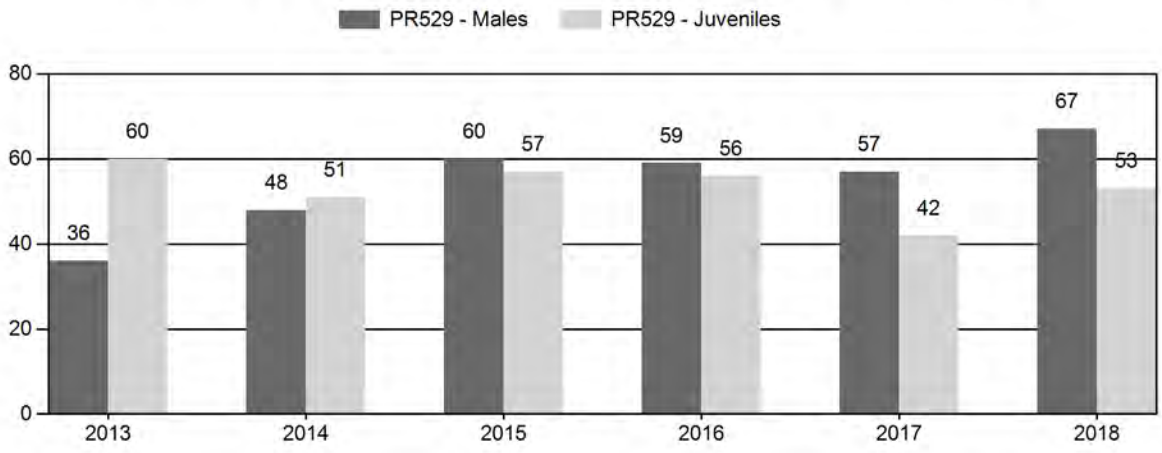
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR529 - BIG CREEK

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
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	750	48	114	162	29%	285	50%	120	21%	567	435	17	40	57	± 5	42	± 4	27
2018	687	45	186	231	31%	344	45%	182	24%	757	546	13	54	67	± 3	53	± 3	32

2019 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 2018
51		**None**

Management Evaluation
Current Postseason Population Management Objective: 800 (640 – 960)
Management Strategy: Recreational
2018 Postseason Population Estimate: 525
2019 Proposed Postseason Population Estimate: 400
2018 Hunter Satisfaction: 90% Satisfied, 3% Neutral, 7% Dissatisfied

Pronghorn in the Big Creek herd unit are managed toward a numeric objective of 800. The Big Creek herd unit is classified as a recreational management herd unit. This strategy directs Wyoming Game and Fish Department (WGFD) to manage harvest opportunity to maintain a preseason ratio of 30-59 bucks:100 does in the herd unit. The population was estimated using a spreadsheet model developed in 2012 and updated in 2018.

Herd Unit Issues
The Big Creek herd unit occurs entirely within Hunt Area 51, and contains 533.8 km^2 of occupied habitat. The occupied habitat consists primarily of sagebrush grassland and mountain shrub habitat types. Agricultural lands consist of irrigated alfalfa and former wheat fields which are being reverted to rangeland. Cattle ranches occupy most of the rangeland in this herd unit. Rural residential development is occurring to the east of the town of Riverside, and in the Baggot Rocks and Skyline areas. In the past these areas provided pronghorn with seasonal habitats and

the observed changes in land use appear to be displacing pronghorn into other areas. Pronghorn damage to alfalfa crops continues to be an issue in this herd unit. Access is difficult except for on those private lands receiving damage.

Pronghorn in this herd unit tend to migrate north to the North Platte River and west to the Encampment River in fall, and return to the south and east in the spring. This herd is considered to be an interstate herd connected to the North Park pronghorn herd of Colorado. During severe winters, many of the North Park pronghorn migrate north into the Big Creek herd unit. During milder winters the North Park pronghorn tend to winter in Colorado. Pronghorn from this herd unit may cross the rivers and enter the Iron Springs and Elk Mountain Pronghorn herd units, particularly during severe winters.

We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status and habitat data included in this document and a change is not warranted at this time. We will review this herd objective again in 2024; however, if the situation arises that a change is needed, we will review and submit an updated proposal.

Weather

The 2017-18 winter had numerous periods of bitter cold, continuing through February, but much of the winter range was open and available. Winter losses were expected to be near average leading into bio-year 2018. The spring of 2018 was dry, resulting in slow plant growth and green-up of rangelands. The majority of the summer and fall were extremely dry, causing much of the available forage to cure. However, fawn production was similar to past years, most likely due to the availability of agriculture fields that provided female pronghorn the necessary diet needed for lactation. Fortunately, precipitation in October resulted in a late surge of plant growth, which may have provided pronghorn with a valuable boost in nutrition prior to the winter of 2018-19. While there have been several notable snow storms and cold snaps during the winter of 2018-19, there were also periods of warm weather and high winds that melted and drifted snow to expose forage. Fairly average pronghorn survival is expected for the winter of 2018-19.

Temperature and precipitation data was obtained for the National Oceanic and Atmospheric Administration (NOAA), https://w2.weather.gov/climate/xmacis.php?wfo=cys to illustrate weather conditions thus far, during bio-year 2018 (Figures 1 and 2). These figures also include data from January-May of bio-year 2017 to describe the weather conditions immediately preceding bio-year 2018.

Figure 1. January 2018 - January 2019 mean monthly temperatures and 20-year monthly means for Rawlins, Wyoming.

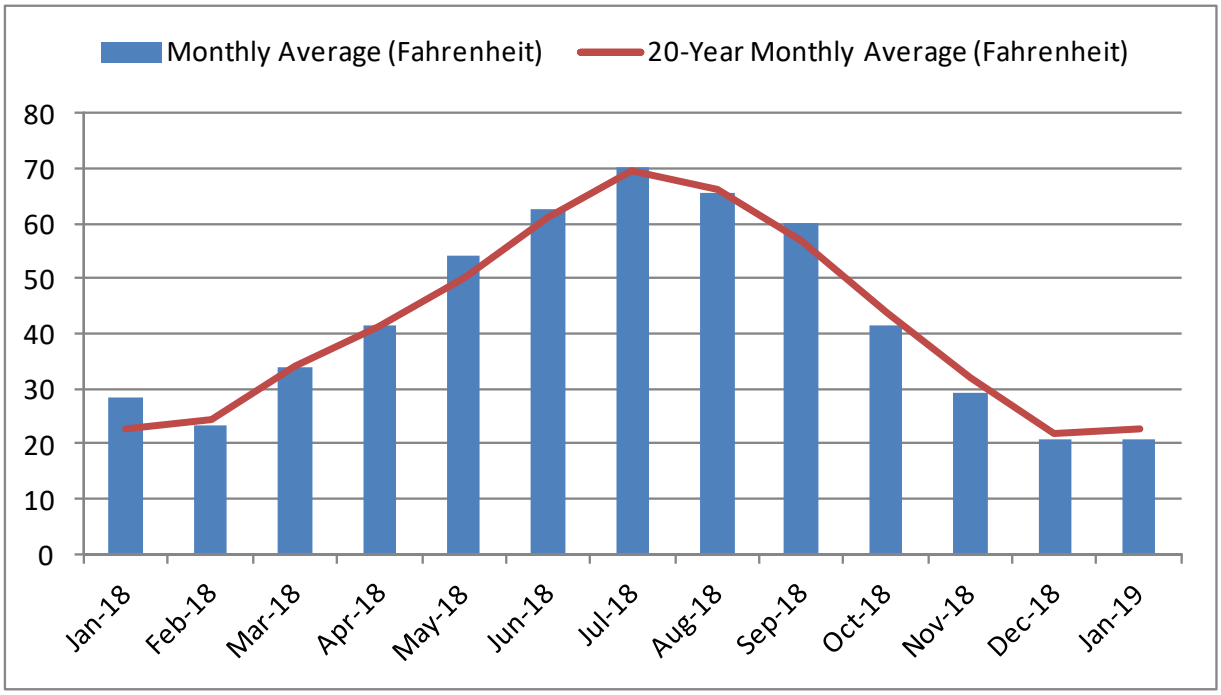
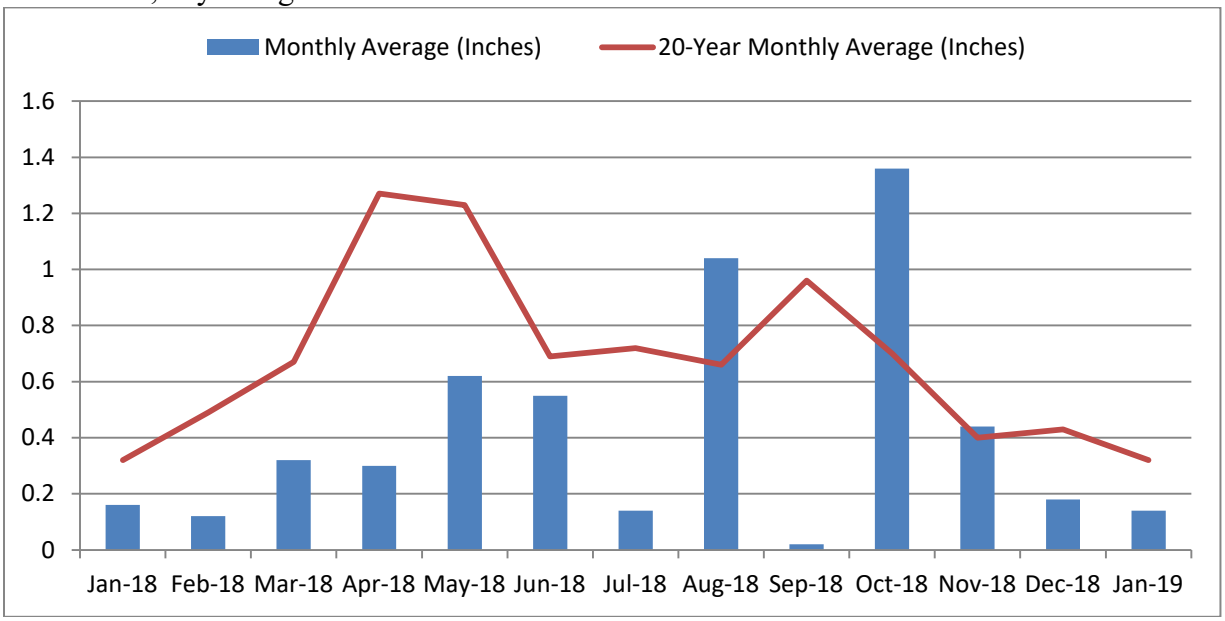


Figure 2. January 2018 - January 2019 mean monthly precipitation and 20-year monthly means for Rawlins, Wyoming.



Habitat
This herd unit has a limited number of established habitat transects to measure production and/or utilization on shrub species that are preferred browse for pronghorn. However, these transects have not provided sufficient data to make reliable inferences about habitat quality. Anecdotal observations indicate growth and moisture during the spring of 2018 was poor, and summer and early fall of 2018 were quite dry and hot. Pronghorn became more concentrated in areas where moisture and green forage persisted during this time period, and may have over browsed preferred plant species in some cases. October precipitation resulted in a late fall green-up of forage that likely benefited pronghorn nutritionally prior to the winter of 2018-19. 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 classification sample size increased in 2018 and was the largest sample (n=757) recorded in this herd unit. Total sample size exceeded the statistically desired sample size. The preseason buck:doe ratio increased in 2018 to 67:100, exceeding the upper limit for recreational management (30-59:100). This increase was predominately in adult bucks, with the 2018 yearling buck:doe ratio actually being less than the five-year average. The preseason fawn:doe ratio increased from 42:100 in 2017, to 53:100 in 2018.

Seven pronghorn line transect (LT) surveys have been conducted in this herd unit. The most recent LT was conducted in 2012. Density estimates from these LTs were incorporated into the spreadsheet model to improve the population estimate's accuracy.

Harvest Data
The 2018 harvest survey indicated a total of 147 pronghorn were harvested; 59 bucks, 84 does, and 4 fawns. Overall hunter success declined to 91% in 2018, and was below the five-year average for this herd unit. Typically hunters in this herd unit have enjoyed 100% overall harvest success. This historically high success rate was attributed to many of the successful hunters possessing both Type 1 and Type 6 licenses. In 2018, Type 1 licensed hunters had a success rate of 87%, and 75% for Type 6 licensed hunters. The average number of days hunted for each pronghorn harvested increased to 3.6, and was slightly above the five-year average (3.4 days). This average may suggest that pronghorn were less available in publically accessible portions of the herd unit in 2018. Hunter satisfaction decreased slightly with 94% of hunters reporting they were satisfied with their hunt in 2017 to 90% in 2018.

Population
In 2018, the "Constant Juvenile-Constant Adult Mortality Rate" (CJCA) spreadsheet model was selected again for the Big Creek herd unit because it produced the lowest AICc score. The population estimate from this model is likely underestimating the true number of pronghorn in this herd unit. The end of year density estimates developed from previous LT surveys appeared to overestimate actual pronghorn abundance in this herd unit. This model was rated 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. Small sample sizes and interstate movements of pronghorn for this herd unit may produce bias in LT survey estimates. However, completing a LT survey for this herd unit should become a priority in the near future.

Management Summary

The increase in Type 6 license quota in 2017 was prescribed to reduce pronghorn numbers towards a more appropriate level in consideration of damage to alfalfa fields in the western part of the herd unit. It was anticipated that these damage concerns would continue in 2019, and as such the Type 6 licenses quota remained the same. Although the population model affords us little opportunity to get an accurate post hunt population estimate, 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