PRONGHORN

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2018 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR309 - PUMPKIN BUTTES

HUNT AREAS: 23

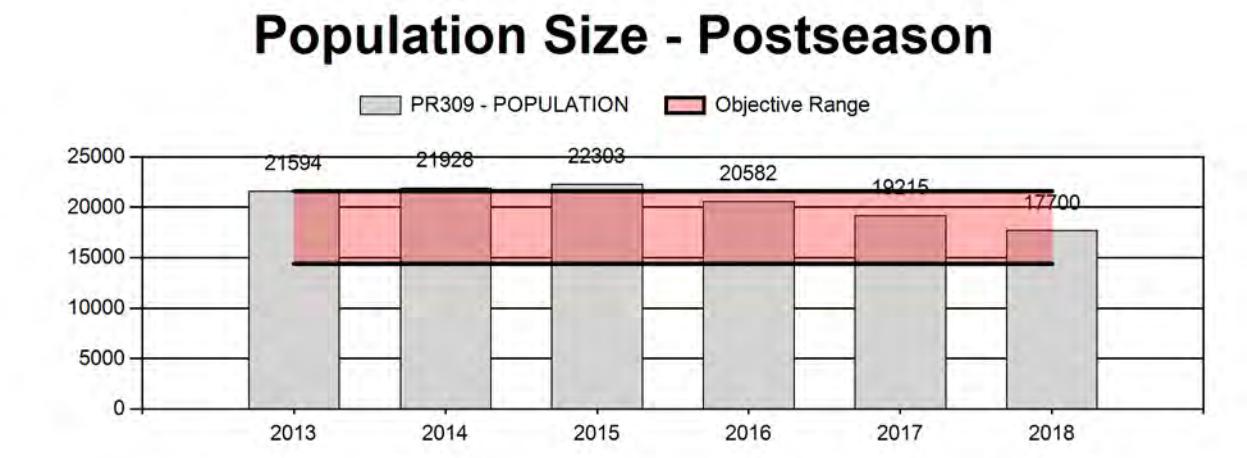
PREPARED BY: ERIKA PECKHAM

	2013 - 2017 Average	2018	2019 Proposed
Population:	21,124	17,700	16,630
Harvest:	2,313	2,571	2,470
Hunters:	2,508	2,636	2,600
Hunter Success:	92%	98%	95 %
Active Licenses:	2,657	2,793	2,800
Active License Success:	87%	92%	88 %
Recreation Days:	8,932	7,389	7,600
Days Per Animal:	3.9	2.9	3.1
Males per 100 Females	47	44	
Juveniles per 100 Females	74	78	

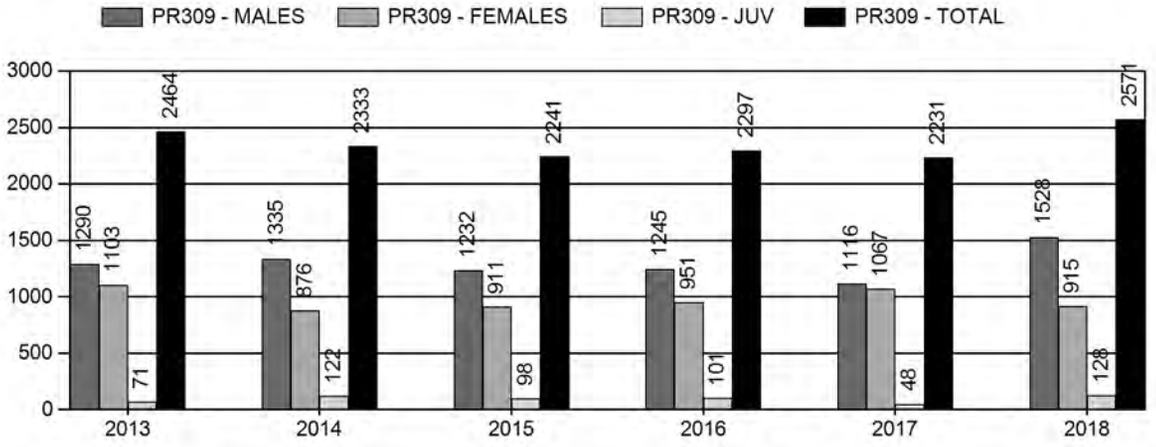
Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-1.7%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/08/2019

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

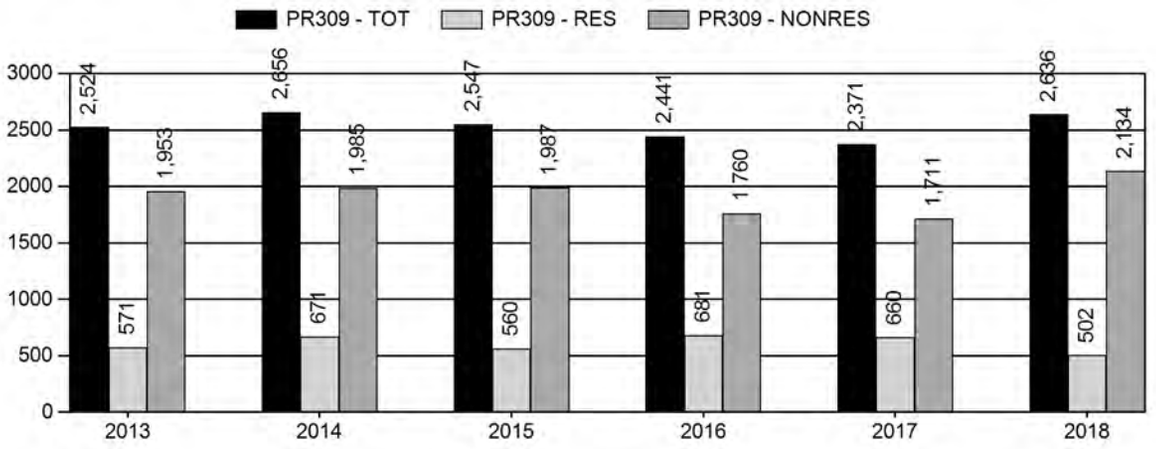
	JCR Year	Proposed
Females ≥ 1 year old:	15.0%	12.2%
Males ≥ 1 year old:	26.3%	36.6%
Total:	12.6%	-14.0%
Proposed change in post-season population:	-12.6%	-6.0%



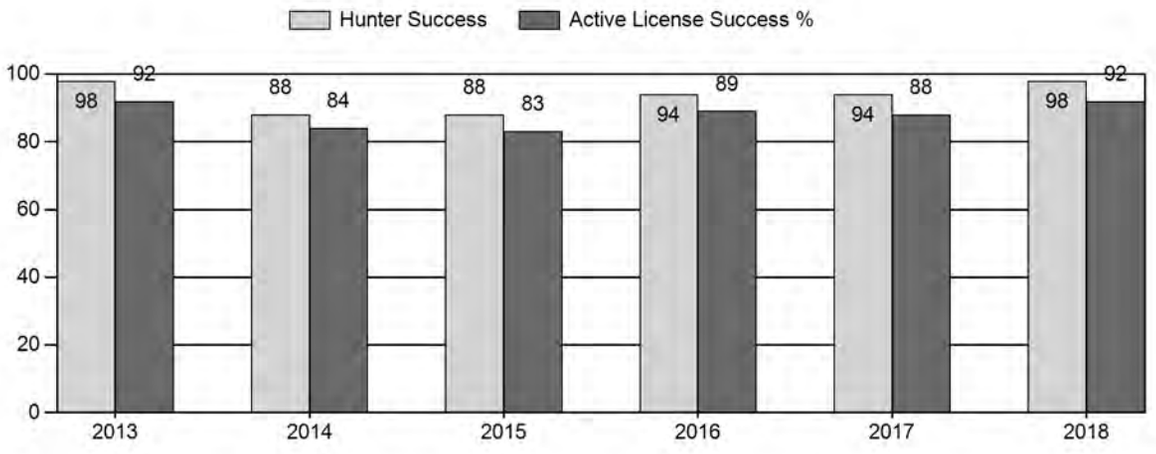
Harvest



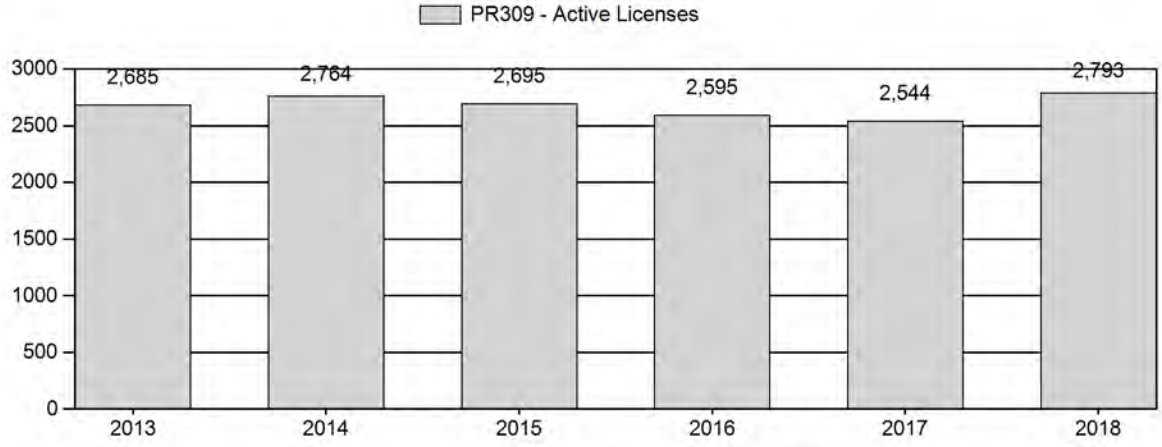
Number of Active Licenses



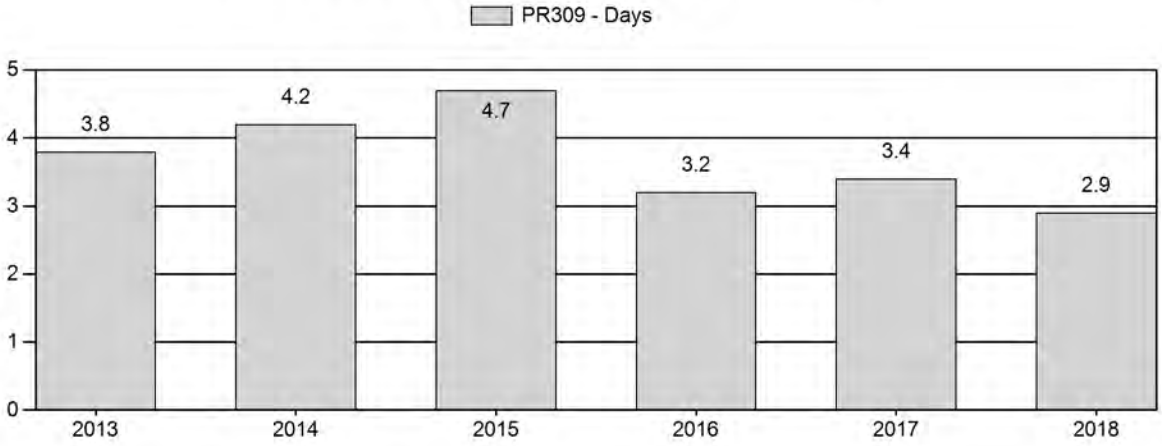
Harvest Success



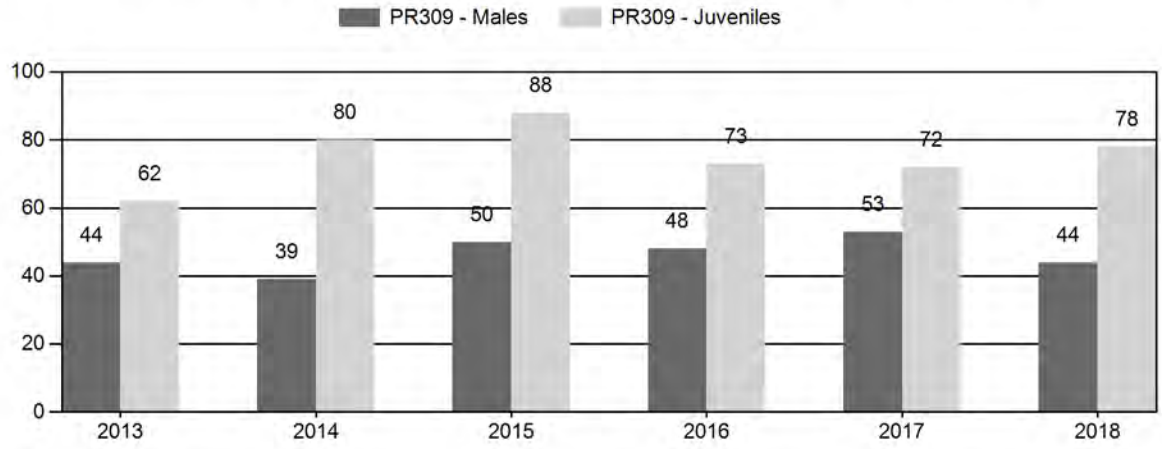
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR309 - PUMPKIN BUTTES

		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	24,305	183	317	500	22%	1,129	49%	695	30%	2,324	2,050	16	28	44	± 4	62	± 5	43
2014	24,494	134	199	333	18%	853	46%	682	37%	1,868	2,097	16	23	39	± 4	80	± 6	58
2015	24,769	239	290	529	21%	1,063	42%	935	37%	2,527	2,866	22	27	50	± 4	88	± 6	59
2016	23,108	281	360	641	22%	1,328	45%	970	33%	2,939	2,976	21	27	48	± 4	73	± 5	49
2017	21,670	267	475	742	23%	1,413	45%	1,013	32%	3,168	2,465	19	34	53	± 4	72	± 4	47
2018	20,520	238	476	714	20%	1,605	45%	1,254	35%	3,573	2,691	15	30	44	± 3	78	± 4	54

2019 HUNTING SEASONS
PUMPKIN BUTTES PRONGHORN HERD (PR309)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
23	1	Oct. 1	Oct. 31	550	Limited quota	Any antelope
23	2	Oct. 1	Oct. 31	1,600	Limited quota	Any antelope valid on private land
23	6	Oct. 1	Oct. 31	400	Limited quota	Doe or fawn
23	7	Oct. 1	Oct. 31	1,200	Limited quota	Doe or fawn valid on private land

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

Hunt Area	Type	Quota change from 2018
23	1	No Change
23	2	+200
23	6	No Change
23	7	+200

Management Evaluation
Current Postseason Population Management Objective: 18,000
Management Strategy: Private Lands
2018 Postseason Population Estimate: ~17,700
2019 Proposed Postseason Population Estimate: ~16,630
2018 Hunter Satisfaction: 93% Satisfied, 5% Neutral, 2% Dissatisfied

Herd Unit Issues

The postseason population objective for the Pumpkin Buttes Pronghorn Herd Unit is 18,000 pronghorn. The management strategy is private lands management. The objective and management strategy were last reviewed and updated in 2015.

The primary issue with achieving adequate harvest in this herd is hunter access, as most of the pronghorn are found on private lands. In 2016, two new license types were added. The Type 2 and Type 7 licenses allow for maximum hunting potential on private land and result in a better

quality hunt on the very limited accessible public lands. Prior to this change, many comments were received from hunters in the field and surveys stating that there were few animals and the limited public land was overcrowded. This new license structure has also decreased the number of reported trespass issues and seems to be working smoothly.

During the early to mid-2000's, extensive coal bed methane development occurred in the herd unit and resulted in a network of roads and other development. Additionally, beginning roughly around 2013, portions of this herd unit experienced increased conventional oil well drilling and production, with many wells transitioning from the planning to development stage. Currently, both CBM and conventional oil has tapered off for the time being. In the southern part of this herd unit there is also uranium mining that is occurring. Although this herd unit has experienced various forms of energy development, it still contains excellent pronghorn habitat.

Weather

Weather throughout 2018 was optimal for overall rangeland conditions. Precipitation was favorable, resulting in good forage availability. The winter of 2018-2019 was fairly mild with minimal amounts of snow as winter commenced. Colder temperatures were experienced as winter progressed, however, there was still an overall lack of snow, allowing animals to access residual forage. Over winter survival was likely not negatively impacted.

The Palmer Drought Index indicates that all months of 2018 experienced "normal" conditions in the Powder River drainage. Additionally, looking at historic temperature information for November and December 2018, mean temperatures were very close to the 30-year normals.

Habitat

This herd unit has high quality pronghorn habitat comprised of wide-open sagebrush (*A. tridentata*) flats. Considerable portions of the sagebrush stands in this area are in good health and provide winter forage and cover for fawns during fawning season. The bulk of this herd unit is designated yearlong habitat. The Powder River delineates the western boundary of this herd unit where rugged topography is not as favorable for pronghorn as opposed to the open sagebrush flats found elsewhere. Consequently, pronghorn are found at lower densities in this area.

There is currently no formal habitat monitoring occurring in this herd unit. Anecdotal observations indicate that drought conditions were not experienced during the 2018 growing season and therefore residual forage was available through the winter of 2018-2019. Some private landowners are spraying sagebrush in the southern portion of this herd unit. Whether their goals are to eradicate or just reduce canopy cover of sagebrush is unknown, but the spraying may influence pronghorn distribution.

Field Data

This herd has the potential for rapid growth as has been seen in years past. Historically there have been years where 80+ fawns per 100 does have been classified, though in the more recent past this has not been the case. In 2018, the fawn to doe ratio was 78 as compared to 72 in 2017 and a five year average of 75. The buck ratio is typically fairly high, which is not uncommon for private land herds. Classifications in 2018 yielded an observed buck ratio of 44, down from 53 in 2017 and below the preceding 5-year average of 47.

Because this is a primarily private land area, a landowner post-season survey is conducted which provides another perspective of the population and hunting seasons. Ninety-two percent of respondents felt that the pronghorn numbers were at a desired level while 93% of hunters reported being either "very satisfied" or "satisfied" with their hunting experience.

Harvest

In 2018, there were 3,350 licenses available, comprised of four license types. These included 550 Type 1 any antelope, 1,400 Type 2 any antelope, valid private lands only, 400 Type 6 doe/fawn licenses and 1,000 Type 7 doe/fawn licenses, valid private land only. Close to 3,230 licenses were sold by the season's close. The Type 2 (92%) and Type 7 (99%) licenses came very close to selling out, but there were a few left at the end of the season. The Type 1 and Type 6 licenses were in high demand and sold out in the draw. The total harvest was the highest for the six-year period, coming in at an estimated 2,571 pronghorn harvested. This was the highest harvest since 2009. Hunter success was 98%, above the five year average of 92%. Hunter success was slightly variable between the Type 1 (82%) and Type 2 (99%) licenses and comparable between the Type 6 (89%) and Type 7 (89%) licenses. Prior to 2016, there were only Type 1 and Type 6 licenses available. In 2016, the separate public and private land licenses were made available with an emphasis on having plenty of private land only licenses available for landowners to have maximum flexibility in management. After two years of assessing the new license structure, favorable hunter success warranted an increase in public land opportunity so license quotas were increased for the 2018 season. The number currently issued seems to strike a good balance between access and the number of people on the ground on the very limited public land. The total number of licenses issued was in line with what the population could support. Overall, comments received from both hunters and landowners were positive over the last three years of this new license structure.

Population

The "Constant Juvenile – Constant Adult Mortality Rate" (CJCA) spreadsheet model was chosen for the post season population estimate (AIC value 151). The model illustrated a peak population in 2006 followed by a declining population. The 2018 post-season population estimate is 17,700 pronghorn.

The last line transect survey was conducted in June of 2016, which resulted in an estimated population of 10,600 pronghorn (end of biological year). It is uncertain why this estimate came out to be so low. Although the standard error is also lower than it has been, it is likely that this estimate is not very accurate as hunter harvest, hunter success, ease of obtaining classification survey sample size, and landowner survey results indicate a much higher population. The 2018 buck harvest and total harvest were the highest since 2010 and 2009, respectively, with very favorable hunter success and hunter effort. The spreadsheet model aligns relatively well to the past line transect estimates. Line transects were flown in 2006 and 2009, with estimates of 32,900 and 18,000, respectively.

Field observations indicate that this population has been trending upwards the last few years. Total number of animal classified began to climb in 2013. Although these numbers are not necessarily statistically significant, as the same routes are driven at the same time of year, it can be useful as overall trend information. Fawn production has been fairly consistent the last few years and

overwinter survival has been favorable based on yearling buck ratios. In this regard, the model predictions are not in line with field observations.

It should also be noted that numerous reports were received and verified of pronghorn dying beginning Mid-April and into May. This was typically one in a herd and they would present with symptoms associated with overconsumption of green grass. The Wyoming State Veterinary Lab came to the area to attempt to assess what the exact cause was. It seems that some years are worse than others for this occurrence and the spring of 2019 seemed to be exceptionally bad throughout portions of this herd unit.

Management Strategy

When pronghorn are at peak numbers it is difficult to achieve adequate harvest because it is predominantly private land, most of which is outfitted under conservative management strategies. It is important to have ample licenses available to address this concern. As public land is extremely limited, the dual license types work well. These multiple license types allow for liberal harvest on private lands and limit overcrowding on limited public lands. Overall, hunter success was high and days per harvest were relatively low. As both the Type 2 and Type 7 private land licenses have been very close to selling out the last couple of years, an increase in these licenses quotas was warranted. The idea behind the license type split is to allow maximum harvest on private lands.

The traditional season has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. The majority (92%) of landowners that responded to the survey indicated that they feel pronghorn numbers are at an acceptable level. According to the model, field observations and data, this population peaked in 2006 at about 31,000 animals.

If the projected harvest of 2,470 pronghorn is achieved and fawn recruitment is average, this population is predicted to slightly decrease.

2018 - JCR Evaluation Form

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

HERD: PR318 - CRAZY WOMAN

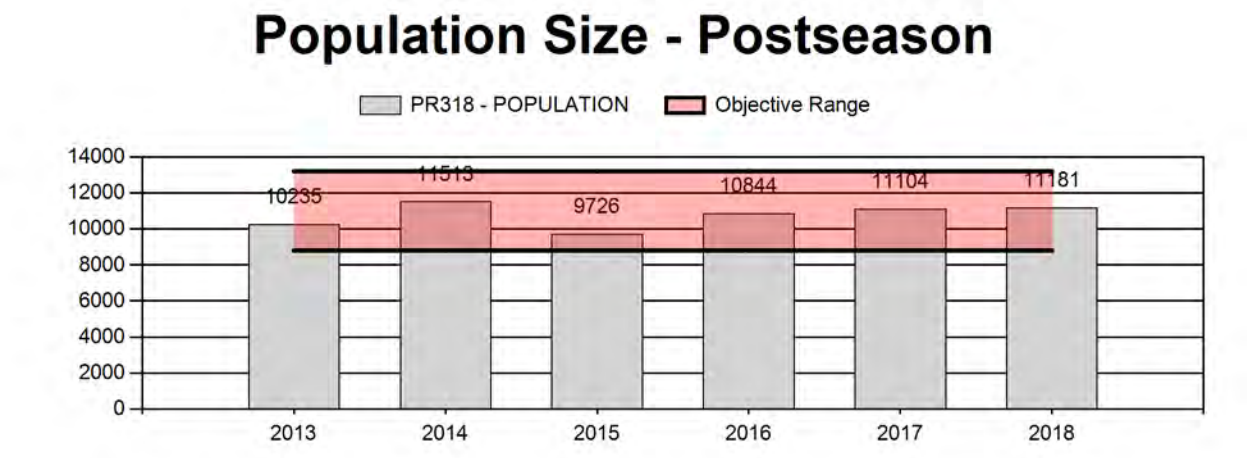
HUNT AREAS: 22, 113
PREPARED BY: CHEYENNE STEWART

	2013 - 2017 Average	2018	2019 Proposed
Population:	10,684	11,181	12,618
Harvest:	1,748	1,797	1,718
Hunters:	1,936	1,839	1,850
Hunter Success:	90%	98%	93 %
Active Licenses:	2,109	2,021	2,000
Active License Success:	83%	89%	86 %
Recreation Days:	6,743	5,746	6,000
Days Per Animal:	3.9	3.2	3.5
Males per 100 Females	51	48	
Juveniles per 100 Females	84	69	

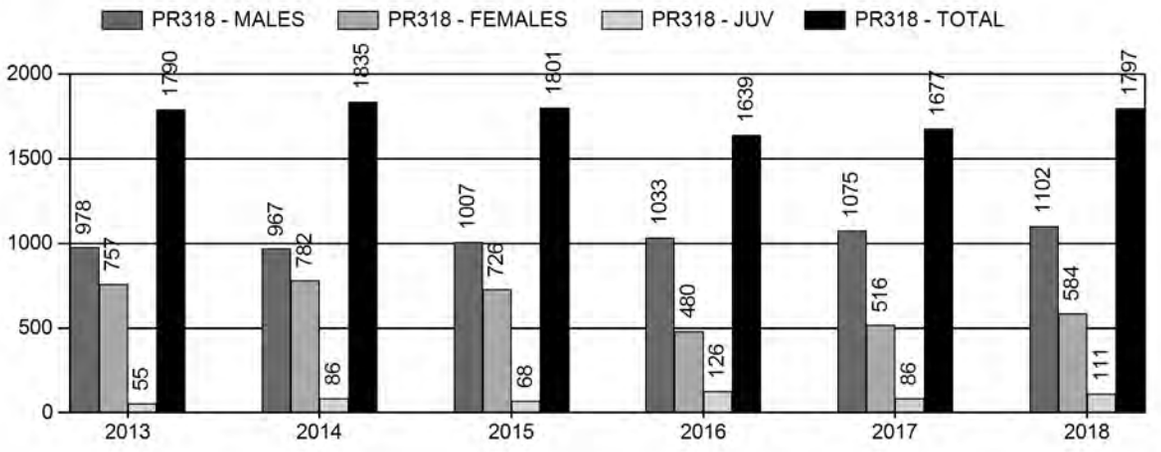
Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	2%
Number of years population has been + or - objective in recent trend:	0
Model Date:	2/6/2019

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

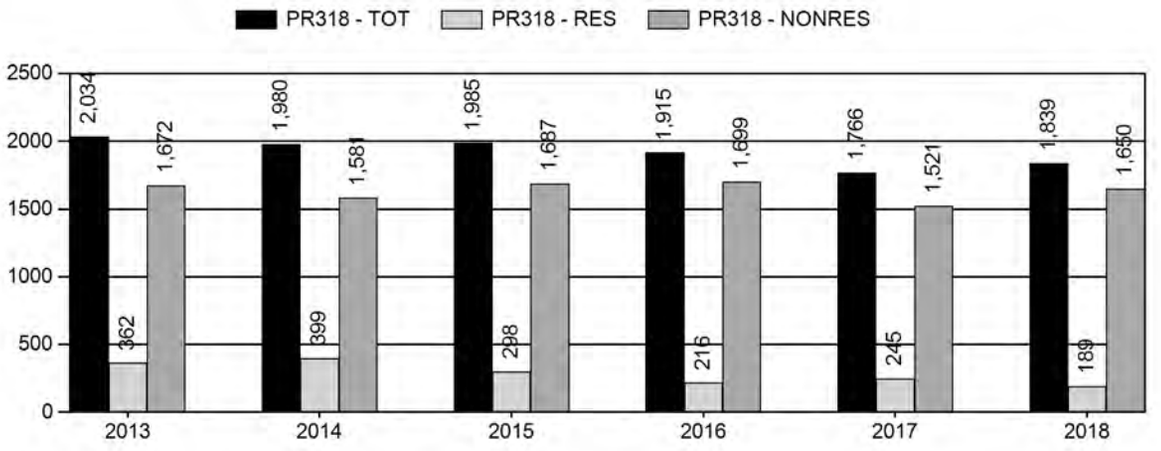
	JCR Year	Proposed
Females ≥ 1 year old:	10%	8%
Males ≥ 1 year old:	37%	37%
Total:	14%	12%
Proposed change in post-season population:	+1%	+11%



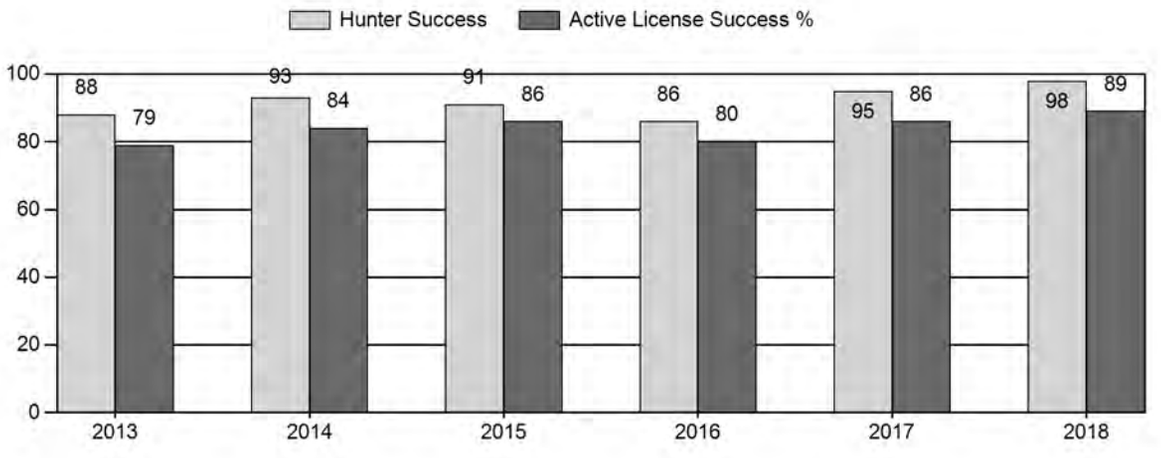
Harvest



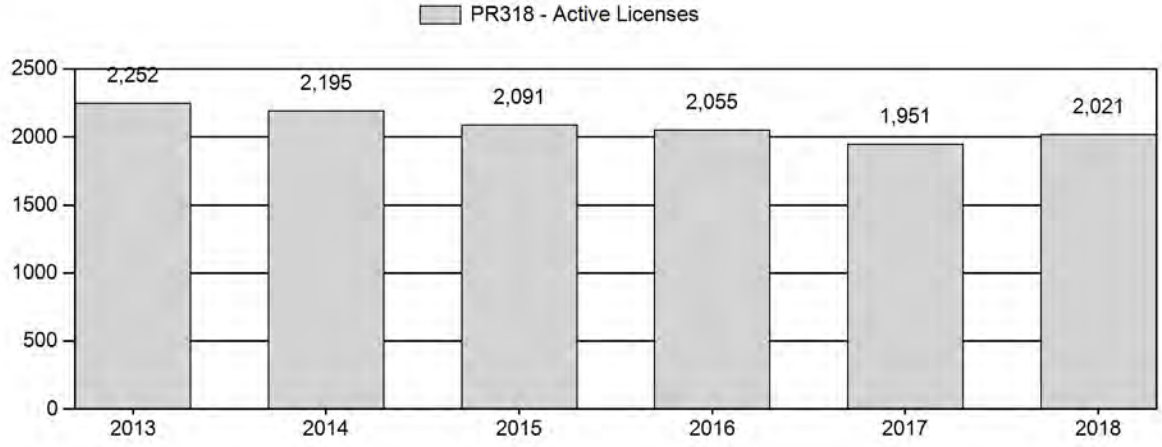
Number of Active Licenses



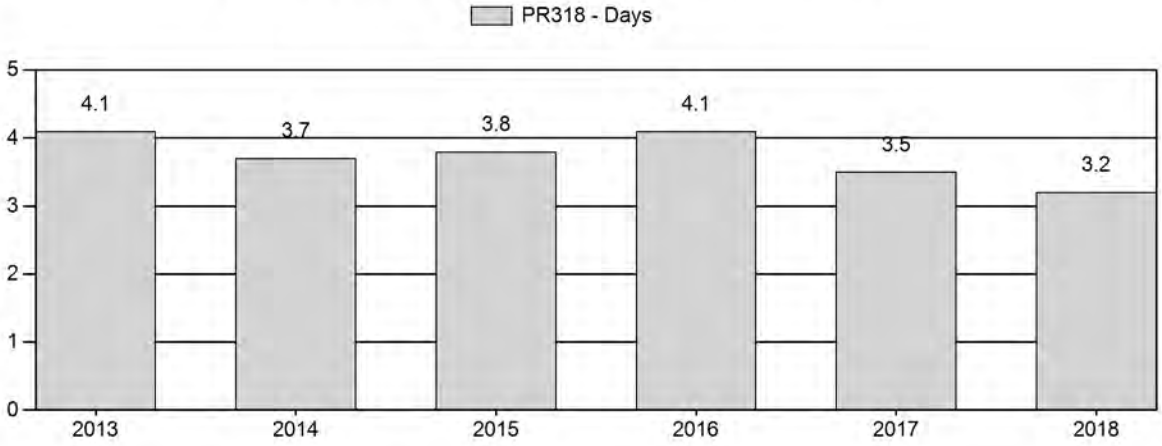
Harvest Success



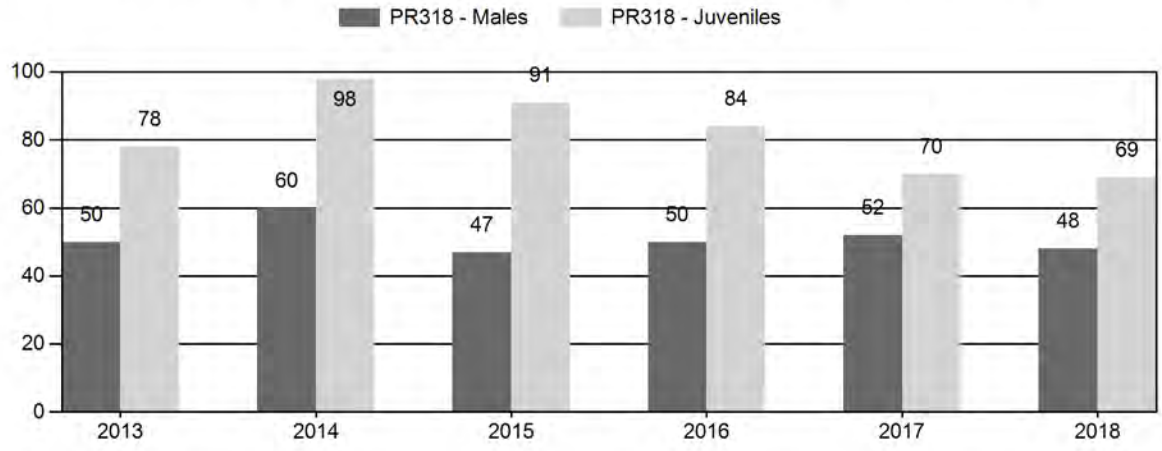
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR318 - CRAZY WOMAN

		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	12,204	64	344	408	22%	818	44%	635	34%	1,861	2,745	8	42	50	± 5	78	± 6	52
2014	13,531	124	321	445	23%	743	39%	727	38%	1,915	3,790	17	43	60	± 5	98	± 8	61
2015	11,707	173	294	467	20%	989	42%	901	38%	2,357	3,311	17	30	47	± 4	91	± 6	62
2016	12,647	161	364	525	21%	1,044	43%	879	36%	2,448	2,874	15	35	50	± 4	84	± 6	56
2017	12,949	157	291	448	23%	868	45%	610	32%	1,926	0	18	34	52	± 5	70	± 6	46
2018	13,157	132	365	497	22%	1,044	46%	718	32%	2,259	3,097	13	35	48	± 4	69	± 5	47

2019 HUNTING SEASONS

CRAZY WOMAN PRONGHORN HERD (PR318)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
22	1	Oct. 1	Oct. 31	1000	Limited quota	Any antelope
22	6	Sept. 1	Sept. 30	600	Limited quota	Doe or fawn valid on private land north of Crazy Woman Creek
22	6	Oct. 1	Oct. 31		Limited quota	Doe or fawn valid in the entire area
113	1	Oct. 1	Oct. 31	175	Limited quota	Any antelope
113	2	Oct. 11	Oct. 31	175	Limited quota	Any antelope
113	6	Oct. 1	Oct. 31	200	Limited quota	Doe or fawn

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
22, 113	Aug. 15	Sep. 30

SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2018
22	1	No change
	6	No change
113	1	No change
	2	No change
	6	No change
Herd Unit Total		**No change**

Management Evaluation
Current Postseason Population Management Objective: 11,000
Management Strategy: Recreational
2018 Postseason Population Estimate: ~11,181
2019 Proposed Postseason Population Estimate: ~12,618
2018 Hunter Satisfaction: 89% Satisfied

Herd Unit Issues

The Crazy Woman Pronghorn Herd Unit consists of hunt areas 22 and 113 and is managed by the Buffalo Wildlife Biologist. The management objective is a post-season objective of 11,000 pronghorn, which was increased from 7,000 during the 2013 herd unit review. No changes were

made when the herd unit was last reviewed in 2018. The management strategy is recreation management, with the goal of a pre-hunt buck:doe ratio of 30 – 59 bucks:100 does.

Hunt area 22 is predominantly private land with limited public land hunting opportunities. Access for hunting is largely determined by landowners. Increased outfitter leasing of ranches typically results in more restrictive access. Area 113 contains a large amount of inaccessible public land. Even with the expansive outfitting industry, at the herd unit level hunters are finding hunting opportunity and surprisingly good success. This may be due in part to GPS technology that allows hunters to readily identify public and private land boundaries.

Weather

Weather conditions are summarized Natural Resources Conservation Services Applied Climate Information System (www.wcc.nrcs.usda.gov) data from the Kaycee, Buffalo, and Midwest stations (Station IDs 5055, 1165, and 6195, respectively) for precipitation and the Palmer Drought Index (www.ncdc.noaa.gov) from Climate Division 5 (Powder, Little Missouri and Tongue drainages) for drought conditions. Long-term temperature data is lacking for the area.

Precipitation patterns vary greatly throughout the herd unit. The start of the biological year (June 2018) varied from dryer conditions (76% of average precipitation) in the northern portion of the unit to very wet conditions in the southern portion of the unit (297%). Summer (July - Sept) precipitation patterns were the opposite, with dry conditions in Kaycee (58%) and slightly above average conditions in Buffalo (110%). Fall (Oct – Dec) had slightly greater than average precipitation (109-119%) at all sites. Winter (Jan – Apr) was dry in Buffalo (81%) and Midwest (46%) with higher than average precipitation in Kaycee (130%). Throughout the herd unit, colder than average temperatures persisted in February. Generally, 2018 was an average year for weather patterns, with drier conditions in the southern portion of the herd unit. The winter prior to the 2018 biological year (Jan – Mar 2018) had greater than average precipitation (123-152%) in Buffalo and Kaycee, with lower than average precipitation in Midwest (87%), and was followed by an average spring (Apr – May) in Buffalo and Kaycee in contrast to Midwest which had 132% of average precipitation. Local weather conditions were corroborated by the broader-scale climate data, which classified all of 2018 as having “mid-range” climate conditions.

Habitat

The Crazy Woman herd unit includes a combination of sagebrush grassland and grassland habitat. Topography ranges from large valleys to small drainages and breaks. Water is widely available due to livestock operations maintaining water sources for cattle and sheep. There are no established habitat transects in this herd unit. The average weather conditions in 2018 produced average forage growth. Productivity often varies on a north-south gradient in the herd unit, with some slight differences due to varying winter and spring precipitation patterns along that gradient.

Precipitation patterns in 2018 may have resulted in depressed forage quality, which in conjunction with cold February 2019 temperatures could have negative impacts on fawn recruitment and adult winter survival. We have not, however, observed major winter die-offs and do not expect to see population level impacts.

Field Data

The pre-season classification was conducted in September of 2018 via ground classifications and resulted in 2,259 pronghorn being classified. The sample size was short of the 3,097 classification objective. Since converting from aerial classification surveys to ground surveys, attaining adequate sample sizes has proved difficult. We have not reached the classification objective since 2010.

Classifications in 2018 yielded a fawn:doe ratio of 69:100. Fawn production was lower in 2017 (70:100) and 2018 than it has been in the previous 7 years (≥76:100 since 2010). The lower fawn ratio in 2017 was attributed to low sample size and personnel turnover during classifications. The 2018 ratio varied drastically between hunt areas 22 (79:100) and 113 (34:100), with only 466 pronghorn classified in hunt area 113. Access is difficult to classify in hunt area 113 and similar to 2017, the low fawn ratio is likely due to low sample size of pronghorn classified in area 113.

The 2018 buck:doe ratio at the herd unit level was 48:100 which is slightly lower than the previous five-year average of 52:100 from 2013 – 2017. The buck ratio in hunt area 22 (45:100) was lower than that observed in hunt area 113 (56:100). The buck:doe ratios across the herd unit and within each hunt area is within the objective of 30 – 59 bucks:100 does.

Twenty-two landowners responded to the postseason landowner survey. Most landowners responded that pronghorn were at desired levels (59%), while 32% believe that pronghorn numbers are above desired levels. The number of landowner surveys indicating that pronghorn are above desired levels has been increasing since 2015, while those indicating that pronghorn are below desired levels have been decreasing over the same period. This provides some indication that this population has been increasing over the last three years.

Harvest Data

Total harvest (1,797) increased slightly from 2017 (1,677) and is very similar to the previous five-year average (1,748 from 2013 – 2017). Hunter success (98%) and active license success (89%) were higher than they have been since 2012. The addition of 25 Type 1 and 25 Type 2 tags in hunt area 113 appears to have provided some additional opportunity without diminishing hunter satisfaction or success. Hunter effort remains lower (3.2 days per animal harvested) than it has been since 2011. All licenses sold out in the draw.

Hunter satisfaction was extremely high, with 88% and 90% satisfied or very satisfied in hunt areas 22 and 113, respectively. These rates are surprising, given the crowding on limited public lands. Multiple hunter comments complained about the lack of access to landlocked public lands and crowding on public lands. This is a theme of hunter comments every year. We also received complaints about illegal off-road vehicle use on Bureau of Land Management property, which Wyoming Game and Fish does not enforce. The high satisfaction rates can, however be explained by the high hunter success rates. Use of GPS and phone technology with land ownership maps may be increasing hunter success on public lands by improving their ability to navigate to small and dispersed sections of public lands. We do not know how the satisfaction rates and success rates vary between public and private land hunters.

Population

We used integrated population models, referred to as Excel Spreadsheet Models, based on White and Lebow (2002) to estimate the pronghorn population. Model parameters and input follow the "User's Guide: Spreadsheet Model for Ungulate Population Data" (Morrison 2012).

The semi-constant juvenile/semi-constant adult (SCJ/SCA) model out-performed the other models and produced the lowest AIC value (76). Line transect data collected in 2003, 2005, 2010, and 2014 informed the model. A June 2016 line transect survey produced a very high estimate that was considered unreliable due to poor distribution of observed groups through the distance bands. Therefore, that estimate has not been incorporated into the model.

The 2018 post-season population estimate of 11,181 pronghorn maintains this population at objective of 11,000 pronghorn. The model estimate indicates the population has been at objective since 2013, which coincides with the 2013 decision to increase the population objective from 7,000 to 11,000 pronghorn. The population estimates show a stable population over the last three years and a predicted population increase in 2019, however the low fawn ratios observed in 2018 are more likely to result in a stable and not increasing population in 2019.

Landowner survey responses over the past four years indicate that population may be increasing at a greater rate than the population estimates generated by the model. Harvest data is also suggestive of an increasing population across the herd unit over the past two or more years.

Classification data is vitally important to the population model estimates and sample sizes of classification data in this herd unit are consistently inadequate. Conversely, line-transect data helps improve the models. The model trend is reasonable, however landowner and hunter data suggest that the actual population is probably higher than the model estimate. According to the model, 37% of the male population is being harvested annually, which is unreasonably high and further indicates that model is underestimating the population estimate. The model is useful but could be improved with better classification samples, an updated line transect survey, and independent survival estimates. We will try and increase our sample size during classifications and we have a line transect survey planned for 2019. At this time, the model is therefore considered fair.

Management Summary

This herd unit is at objective and we do not expect excessive winter mortality to affect the 2019 hunting season.

Hunt area 22 continues to have high hunter success (96%) and low effort (3.2 days per animal harvested) as well as good landowner and hunter satisfaction. There are some indications that this population is increasing, and perhaps already higher than the population model estimates. There is increasing concern that pronghorn numbers will surpass the population objective and become problematic for landowners. Increasing the Type 6 licenses is a possibility; however increased hunting pressure will continue to push pronghorn onto refuge properties where little or no hunting occurs, which is already happening. It is challenging to ensure that enough licenses are available to obtain needed harvest, while maintaining high harvest success and not exacerbating the crowding issues. We propose no changes to this season for 2019 and plan to gauge public perceptions at the 2019 season setting meetings for potential changes for the 2020 season.

After increasing the Type 1 and Type 2 licenses in hunt area 113 in 2017, we were able to maintain high hunter success (103%) and satisfaction (90%). It is difficult to set quotas in this area that

provide enough harvest opportunity for population management, while minimizing crowding on public lands and maintaining high harvest rates. We propose no changes to this season for 2019.

A harvest of 1,718 pronghorn is projected for the 2019 hunting season. We do not expect hunter satisfaction, success, and participation to change significantly, although we continue to expect comments about access issues. We may see increased landowner concern with high pronghorn numbers in hunt area 22.

Both hunt areas offer limited public land hunting opportunity even though pronghorn densities are high. Securing private land access ensures a successful hunt. There appears to be increased interest in hunting in this part of Wyoming as license quotas have been reduced in other areas of the state. Hunters unsuccessful in the license draw pick up leftover licenses in northeast Wyoming and take their chances on public lands. However, private land access is essential to achieving harvest objectives.

Literature Cited

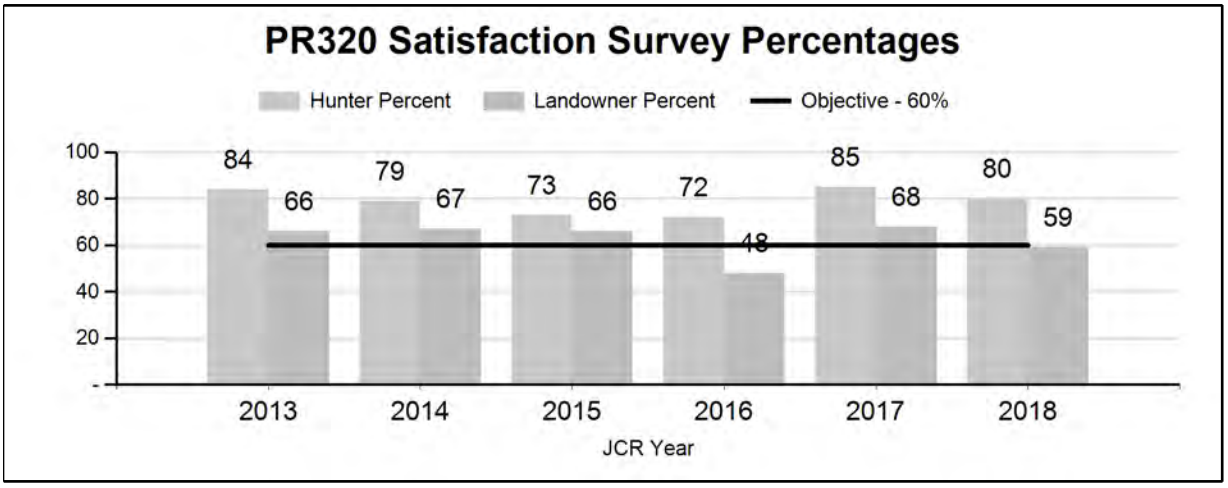
Morrison, T. 2012. User Guide: Spreadsheet model for ungulate population data. Wyoming Cooperative Fish and Wildlife Research Unit. Unpublished. 41 pp.

White, G.C. and B.C. Lubow. 2002. Fitting population models to multiple sources of observed data. Journal of Wildlife Management 66:300-309.

2018 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2018 - 5/31/2019
HERD: PR320 - HAZELTON
HUNT AREAS: 20, 102
PREPARED BY: CHEYENNE STEWART

	2013 - 2017 Average	2018	2019 Proposed
Hunter Satisfaction Percent	79%	80%	80%
Landowner Satisfaction Percent	63%	59%	60%
Harvest:	1,321	1,205	1,200
Hunters:	1,566	1,364	1,400
Hunter Success:	84%	88%	86%
Active Licenses:	1,752	1,487	1,450
Active License Success:	75%	81%	83%
Recreation Days:	6,368	5,291	5,000
Days Per Animal:	4.8	4.4	4.2
Males per 100 Females:	80	68	
Juveniles per 100 Females	86	74	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			10%
Number of years population has been + or - objective in recent trend:			0



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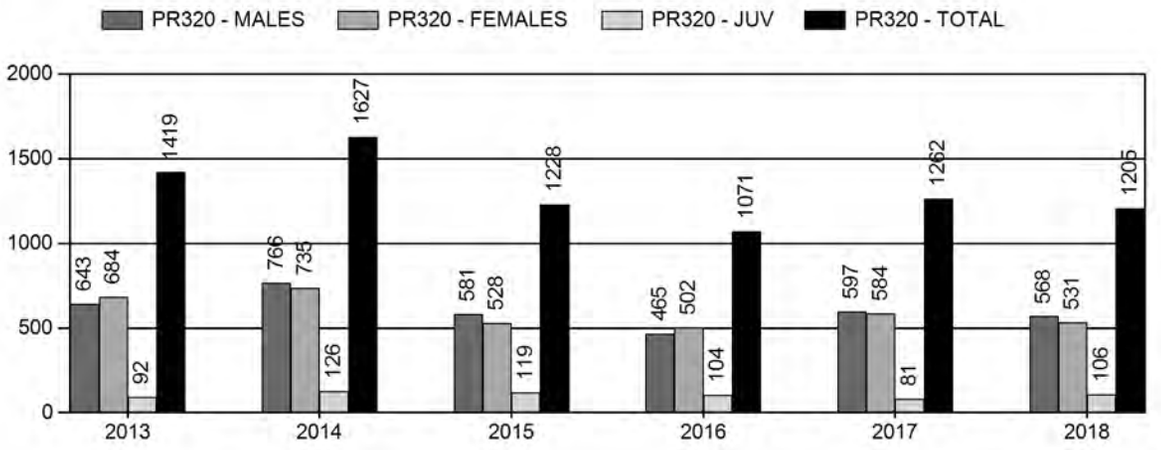

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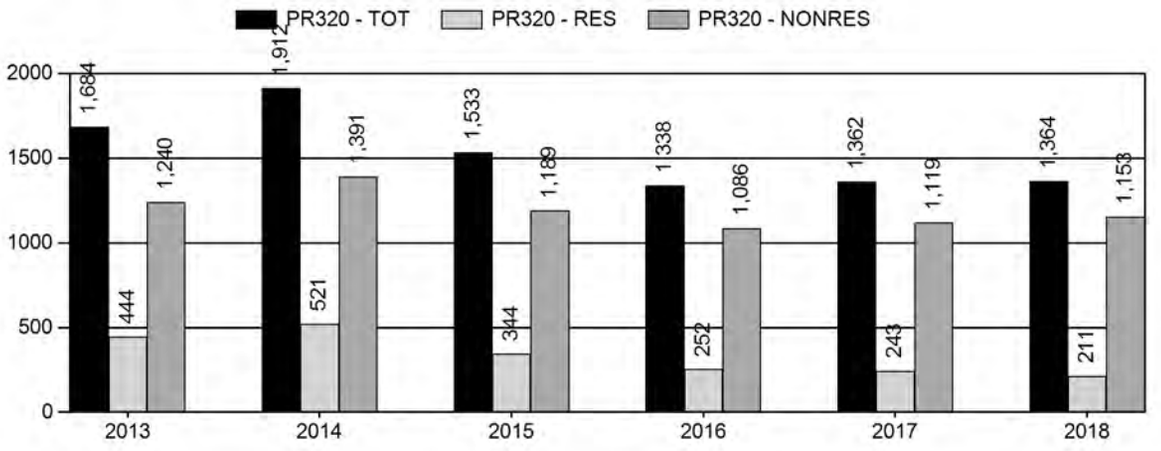

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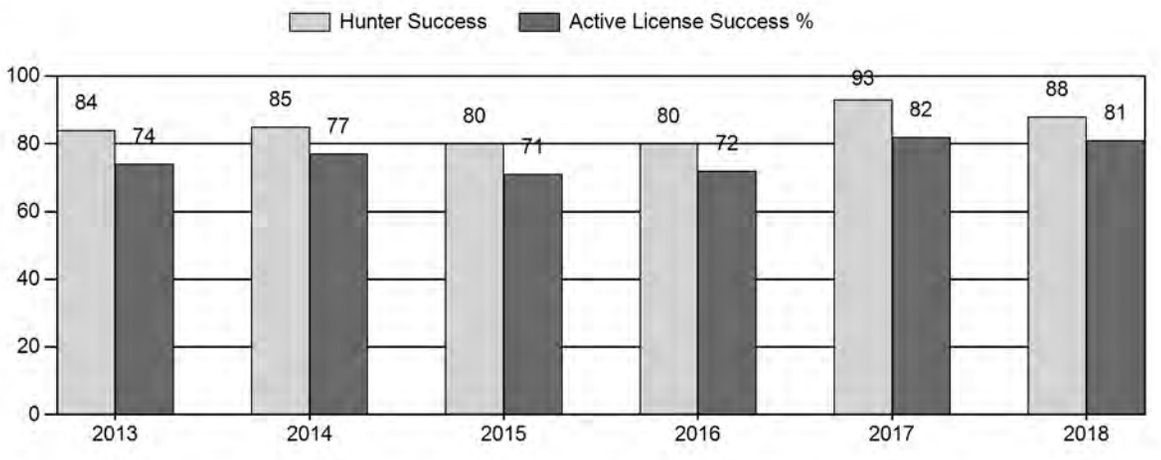

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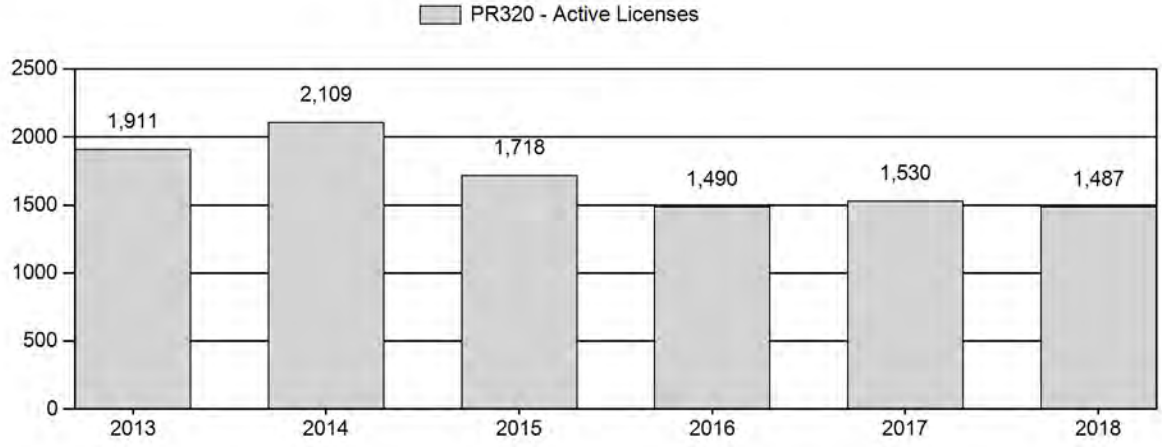
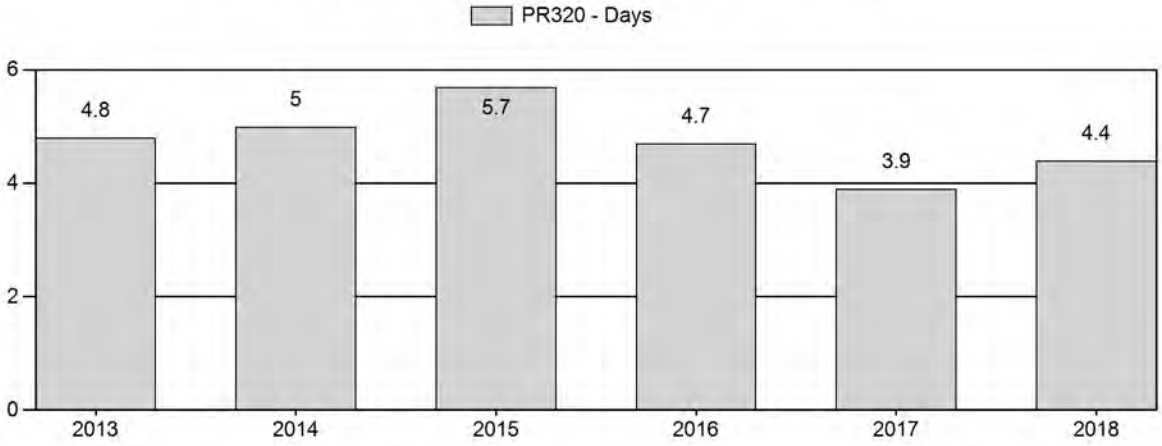
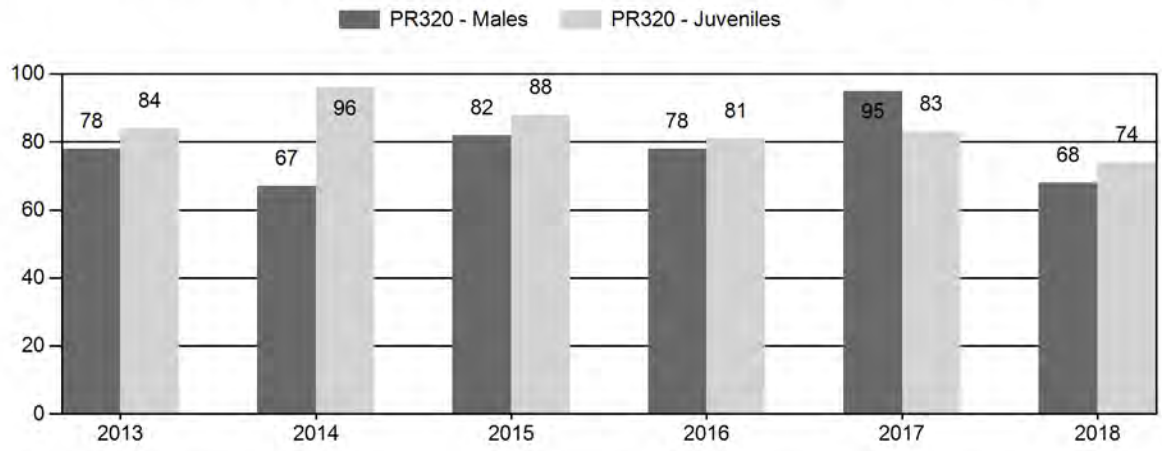


Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR320 - HAZELTON

		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	0	211	430	641	30%	817	38%	688	32%	2,146	5,131	26	53	78	± 0	84	± 0	47
2014	0	198	465	663	25%	993	38%	949	36%	2,605	3,080	20	47	67	± 0	96	± 0	57
2015	0	193	426	619	30%	753	37%	663	33%	2,035	2,905	26	57	82	± 0	88	± 0	48
2016	0	222	577	799	30%	1,021	39%	826	31%	2,646	2,440	22	57	78	± 0	81	± 0	45
2017	0	272	670	942	34%	994	36%	828	30%	2,764	0	27	67	95	± 0	83	± 0	43
2018	0	211	585	796	28%	1,176	41%	865	30%	2,837	2,443	18	50	68	± 0	74	± 0	44

2019 HUNTING SEASONS

HAZELTON PRONGHORN HERD (PR320)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
20	1	Oct. 15	Nov. 15	500	Limited quota	Any antelope
20	6	Oct. 15	Nov. 15	500	Limited quota	Doe or fawn
102	1	Oct. 15	Nov. 15	400	Limited quota	Any antelope
102	6	Sep. 1	Sep. 30	400	Limited quota	Doe or fawn valid on private land
102	6	Oct. 15	Nov. 15			Doe or fawn valid in the entire area

Special Archery Season Hunt Areas	Season Dates	
	Opens	Closes
20, 102	Aug. 15	Oct. 14

SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2018
20, 102	1	No change
	6	No change
Herd Unit Total		**No change**

Management Evaluation

Current Postseason Population Management Objective: 60% Landowner/Hunter Satisfaction
Management Strategy: Private Lands
2018 Landowner Satisfaction Survey: 59% Satisfied
2018 Hunter Satisfaction Survey: 80% Satisfied
2018 Postseason Population Estimate: ~3,200 (unreliable population model)
2019 Proposed Postseason Population Estimate: ~2,300

Herd Unit Issues

The Hazelton Herd Unit consists of hunt areas 20 and 102 and is managed by the Buffalo Wildlife Biologist. In 2013, the Buffalo (Hunt Area 102) and Upper Powder River (Hunt Area 20) Pronghorn Herd Units were combined to create the Hazelton Herd Unit. The herd was renamed to "Hazelton" in 2016 to provide for the maintenance of historical herd data in the JCR program.

The management objective for the herd unit is landowner and hunter satisfaction. The management strategy is private land management. Management objectives and strategies were last reviewed in 2018, with no changes made.

This herd unit is predominately private land with limited public land hunting opportunity, resulting in a disproportionate amount of hunting pressure on accessible public land. Subdivisions, restricted access to private land, and landlocked public land aggravate this situation. In general, it is getting more difficult to attain needed harvest. Increased outfitter leasing of ranches reduces the number of hunters a given ranch will take. Several ranches have changed ownership from traditional ranching operations to nonresident landowners with more conservative hunting philosophies. Additionally, pronghorn are often displaced by hunting pressure from ranches and public land and take refuge on neighboring ranches where limited or no hunting occurs. These factors contribute to high buck ratios, hunter overcrowding on publicly accessible public lands, and difficulty attaining needed harvest.

The population is characterized by high densities of pronghorn with high fawn ratios and high buck ratios. The Area 102 segment is somewhat immune from effects of drought because of irrigated meadows interspersed throughout much of the hunt area. Complaints of crop depredation are common in Area 102.

Weather

Weather conditions are summarized using Natural Resources Conservation Services Applied Climate Information System (www.wcc.nrcs.usda.gov) data from the Kaycee and Buffalo stations (Station IDs 5055 and 1165, respectively) for precipitation, the Bear Trap Meadow SNOTEL site (Station ID 325) for temperature, and the Palmer Drought Index (www.ncdc.noaa.gov) from Climate Division 5 (Powder, Little Missouri and Tongue drainages) for drought conditions.

Precipitation varies greatly throughout the herd unit. The beginning of the biological year (June), for example, ranged from greater precipitation in the southern end and lower elevations portion of the unit (151%) to lower precipitation at the higher elevation portion of the unit (46%). Alternatively, summer (July - Sept) had dry conditions in Kaycee (58%) and average conditions in Buffalo (110%). Mean summer temperatures were within the expected range (51-88ºF) based on 20-year averages per month (49-86ºF). Fall (Oct – Dec) had slightly greater than average precipitation (114-119%) with average mean temperatures (21-36ºF). Winter (Jan-Apr) had less precipitation than average (57-81%) in Buffalo and Bear Trap but greater than average moisture in Kaycee (130%). February 2019 had persistent colder than normal temperatures. The winter conditions prior to the biological year (Jan – Mar 2018) had greater than average precipitation (123-152%) with average mean temperatures for each month (16-25ºF) as compared to the 20-year average mean temperatures for each month (21-28ºF). Spring (Apr – May) was slightly dryer than average (87-93% precipitation) with average mean temperatures (35-47ºF). The generally average local weather conditions were corroborated by the broader-scale climate data, which classified all of 2018 as having “mid-range” climate conditions.

Habitat

The Hazelton herd unit includes a combination of sagebrush grassland and grassland habitat with interspersed irrigated hay meadows in the eastern half of both hunt areas. The western portion of hunt area 102 and northwestern portions hunt area 20 encompasses the Bighorn Mountain range and foothills. Some portions of the higher elevation areas that aren’t heavily timbered provide

spring/summer/fall habitat for pronghorn. With the exception of the southern one-third of Area 20, sagebrush habitat is scattered at best. There are no established habitat transects in this herd unit. The average weather conditions likely produced average habitat productivity, with a potentially late green up and lower productivity towards the southern portion of the unit.

Field Data

The pre-season classification survey was conducted in September 2018 and resulted in a sufficient sample size (2,837) based on a power analysis classification objective of 2,443 pronghorn classified. The classifications should be viewed with caution, however, as the survey is road-biased and the population models may be under-estimating the population.

The fawn:doe ratio (74:100) was the lowest ratio since 2010, with each classification since then resulting in ratios greater than 81:100. It should be noted that 2010 was the last year that classifications were conducted aerially in Area 20. In general, fawn ratios showed a notable increase since 2010, which has been attributed to inaccessible areas with lower fawn productivity not being represented in the sample. The lower fawn ratio observed in 2018 could be attributed to a dryer spring (later green-up), sampling error, or other factors.

The buck:doe ratio in 2017 was the highest recorded in at least 24 years at 95:100. In 2018 however, the buck:doe ratio dropped to 50:100 which is more similar to the previous five-year average when excluding the high 2017 ratio (2012-2016: 53:100). In general, this herd unit has higher buck ratios, which are not managed for, but result from private land access and outfitted hunting, which have led to conservative harvest strategies. Yearling buck:doe ratios were lower in 2018 (18:100) than the previous five-year average (2013-2017, 24:100), which could be the result of higher than average snowfall in winter 2018 causing some winter mortality of the 2017 fawn crop.

Fifty-seven percent of surveyed landowner respondents (*n*=30) following the hunting season indicated that pronghorn numbers were at desired levels. Of the 30% that thought the numbers were above desired levels, none responded favorably to a survey question asking if the landowner would be interested in discussing WGFD hunter/landowner coordination options, such as those available through the Access Yes program. Responses were similar between Hunt Areas 20 and 102. The landowner survey responses over the past several years show a trend suggesting pronghorn numbers are becoming stable in both hunt areas. In 2018, 67% of respondents thought the 2019 seasons should be the same as the 2018 seasons, with 23% requesting more liberal seasons.

Harvest Data

Total harvest (1,205) decreased slightly (5%) from 2017 (1,262), even with the addition of 50 Type 1 tags and 50 Type 6 tags in 2018. Hunter success (88%) and active license success (81%) remain high and above the previous five-year averages of 84% and 75%, respectively. Hunter effort increased from 3.9 days/animal harvested in 2017 to 4.4 days, which is comparable to the five-year average (4.8 days). All license types sold out.

Hunters responding to the 2018 hunter satisfaction survey reported high hunter satisfaction (80%), likely due to the high hunter success rates. For Area 20, 80% of nonresidents reported satisfied/very satisfied as opposed to 43% and 29% of resident hunters who were neutral or dissatisfied/very dissatisfied, respectively. This discrepancy was not apparent in Area 102 where 82% of nonresident hunters and 90% of resident hunters were satisfied/very satisfied. The

discrepancy between residents and nonresidents in Area 20 could be due to nonresidents being more likely to partake in an outfitted hunt on private land. We do not know how the satisfaction rates vary between public and private land hunters.

Population

We used integrated population models, referred to as Excel Spreadsheet Models, based on White and Lebow (2002) to estimate the pronghorn population in this heard unit. Model parameters and input follow the "User's Guide: Spreadsheet Model for Ungulate Population Data" (Morrison 2012).

The semi-constant juvenile/semi-constant adult (SCJ/SCA) model out-performed the other models and produced the lowest AIC value (88), although none of the models produced realistic population estimates or trends. The 2018 post-season population estimate of 3,189 pronghorn is a 34% reduction from the 2017 estimate (4,799), and continues the 13-year decreasing population trend estimated by the model. The model predicts a steadily decreasing population from a high of over 13,000 pronghorn in 2005 to the low in 2018 with 3,189 pronghorn. Model predictions for 2019 continue the population reduction trend. The model aligns to a 2014 line transect estimate which may be driving the population estimate down. This was the first and only line transect completed for newly created the herd unit.

By aligning to the 2014 line transect population estimate, the models appear to have initiated a consistent downward trend in the population, which is resulting in an over-estimation of the harvest impacts. As a result, the model is under-estimating the population level impacts of consistently high observed fawn ratios. The high male and female harvest rates (45% and 32%) generated in the model are unrealistic given the landownership status of this herd. Ground classifications have resulted in classifying greater than 2,000 pronghorn each year since 2011 without changing routes or methods over that time. If the model's population prediction was accurate, we would expect to find it more challenging to consistently classify that many pronghorn.

Landowner survey data suggests that the population has decreased since 2010, however landowner responses have not indicated any major population reductions since that time. In six of the last seven years, over 25% of respondents still believe the area has more pronghorn than desired.

In general, it is unlikely that the population is decreasing to the extent suggested by the model given the consistently high harvest numbers, hunter success rates, landowner satisfaction, and fawn ratios. The model is therefore considered a poor model. A more accurate population estimate is desirable but not immediately necessary to manage this herd given it is now managed to hunter and landowner satisfaction objectives which are appropriate for this private land herd.

Management Summary

This herd unit is at objective and we do not expect excessive winter mortality or reductions in fawn:doe and yearling male:doe ratios in 2019.

Hunt Area 20 has high hunter success (89%), hunter satisfaction (80%) and favorable landowner survey results (15/16 respondents note population above or at desired levels). Active license success improved (>80% in 2018) with reduced quotas since 2015 when success was below 70%. We propose no changes to this season.

Hunt Area 102 has increased in popularity and the September doe/fawn season corresponds to a doe/fawn white-tailed deer season because landowners deal with high numbers of both species. In

2018, both the Type 1 and Type 6 licenses were increased by 50 each based on landowner requests, which were substantiated by very high hunter satisfaction (86%), success (88%), an increase in license holder participation (85%), and a reduction in effort (4.4 days/animal harvested) in 2017. Following the quota increase in 2018, there were no major changes in hunter satisfaction (84%), success (87%), and effort (4.4 days/animal harvested). We propose no changes to this season.

License quotas will be more than adequate to address depredation and herd growth potential if hunter access is available. The opportunity to manage for a lower population is reasonable given depredation concerns and limited sagebrush habitat in the two hunt areas. Private land access will ultimately determine the level of harvest achieved in these hunt areas. The license adjustments in recent years will help alleviate hunter frustration with purchasing leftover licenses in hunt areas with limited public access and high public land hunting pressure.

A harvest of 1,205 pronghorn is projected for the 2019 hunting season if access is granted and hunter success is maintained. We expect hunter satisfaction, success, and participation to be heavily dependent on hunter access.

Both hunt areas offer very limited public land hunting opportunity and even though pronghorn densities are high, securing private land access ensures a successful hunt. There appears to be increased interest in hunting in this part of Wyoming as license quotas have been reduced in other areas of the state. Hunters unsuccessful in the license draw pick up leftover licenses in northeast Wyoming and take their chances on public lands. However, private land access is essential to achieving harvest objectives.

Literature Cited

Morrison, T. 2012. User Guide: Spreadsheet model for ungulate population data. Wyoming Cooperative Fish and Wildlife Research Unit. Unpublished. 41 pp.

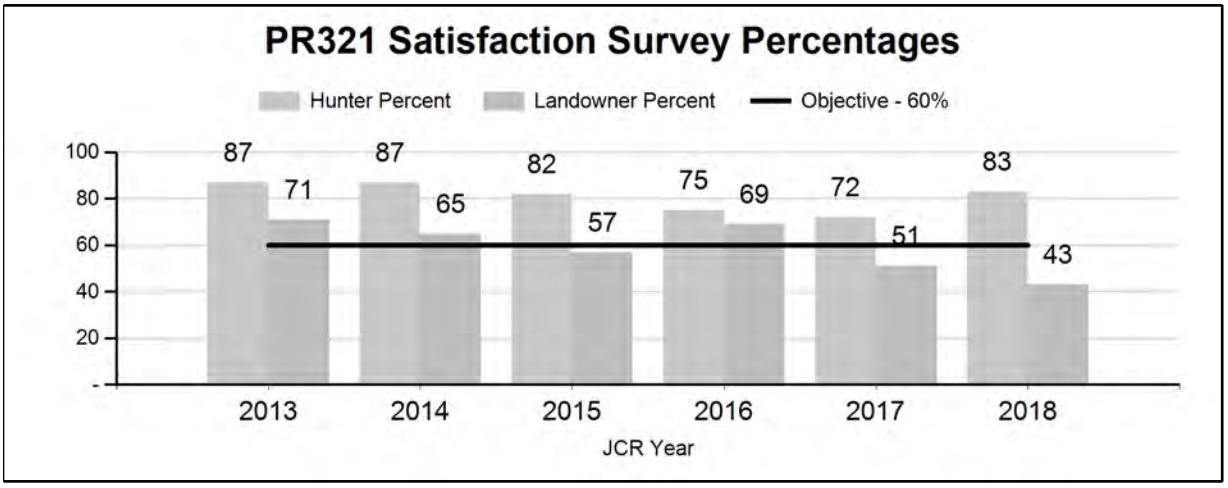
White, G.C. and B.C. Lubow. 2002. Fitting population models to multiple sources of observed data. Journal of Wildlife Management 66:300-309.

2018 - JCR Evaluation Form

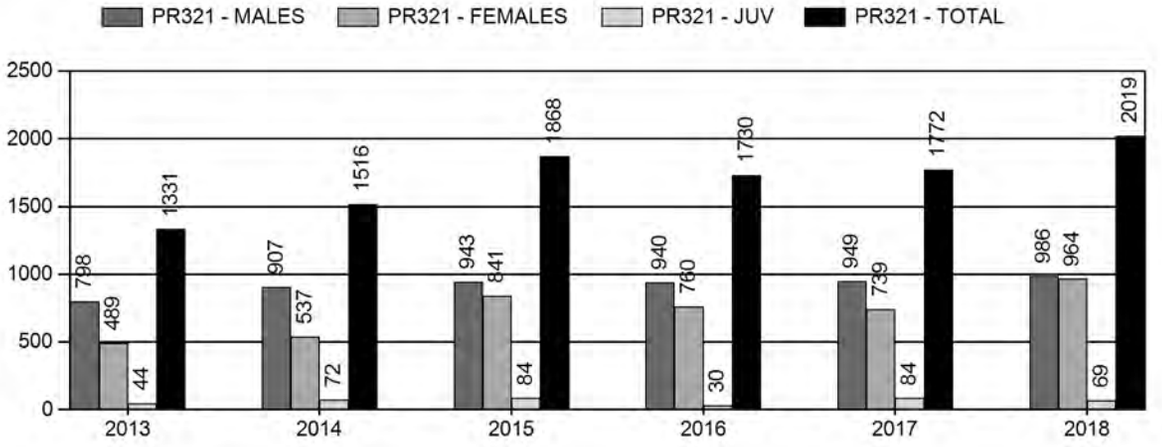
SPECIES: Pronghorn
HERD: PR321 - LEITER
HUNT AREAS: 10, 15-16

PERIOD: 6/1/2018 - 5/31/2019
PREPARED BY: TIM THOMAS

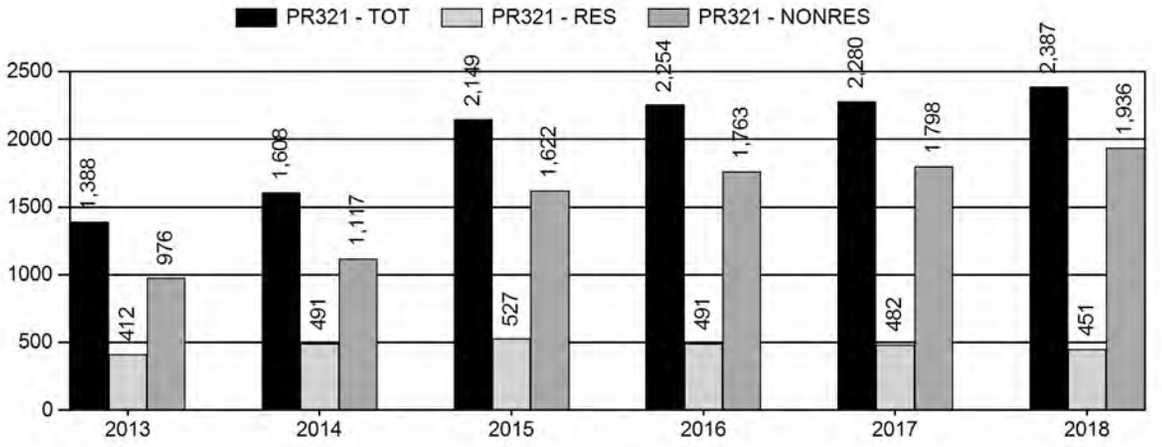
	2013 - 2017 Average	2018	2019 Proposed
Hunter Satisfaction Percent	80%	83%	80%
Landowner Satisfaction Percent	63%	43%	60%
Harvest:	1,643	2,019	1,870
Hunters:	1,936	2,387	2,200
Hunter Success:	85%	85%	85%
Active Licenses:	2,154	2,602	2,400
Active License Success:	76%	78%	78%
Recreation Days:	6,470	7,534	7,100
Days Per Animal:	3.9	3.7	3.8
Males per 100 Females:	57	50	
Juveniles per 100 Females	72	65	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			3%
Number of years population has been + or - objective in recent trend:			2



Harvest



Number of Active Licenses



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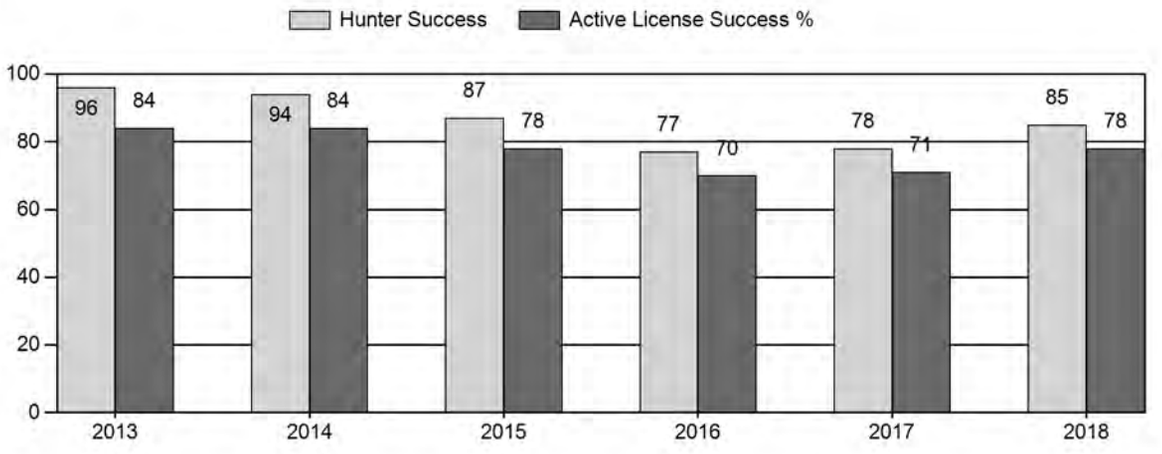

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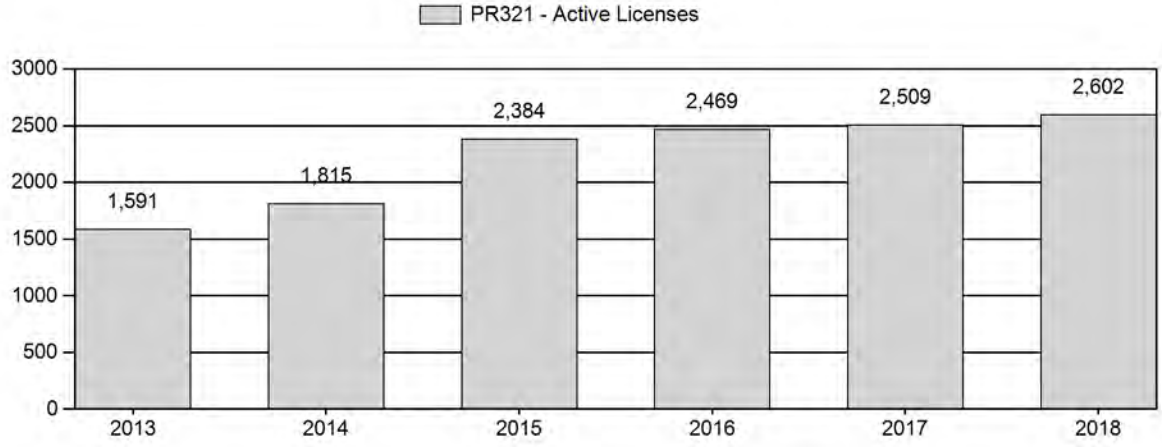
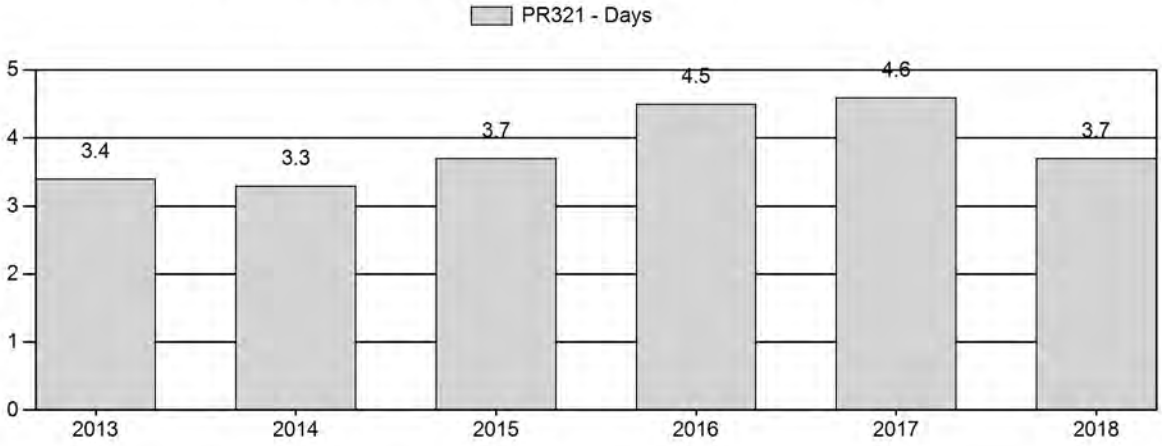
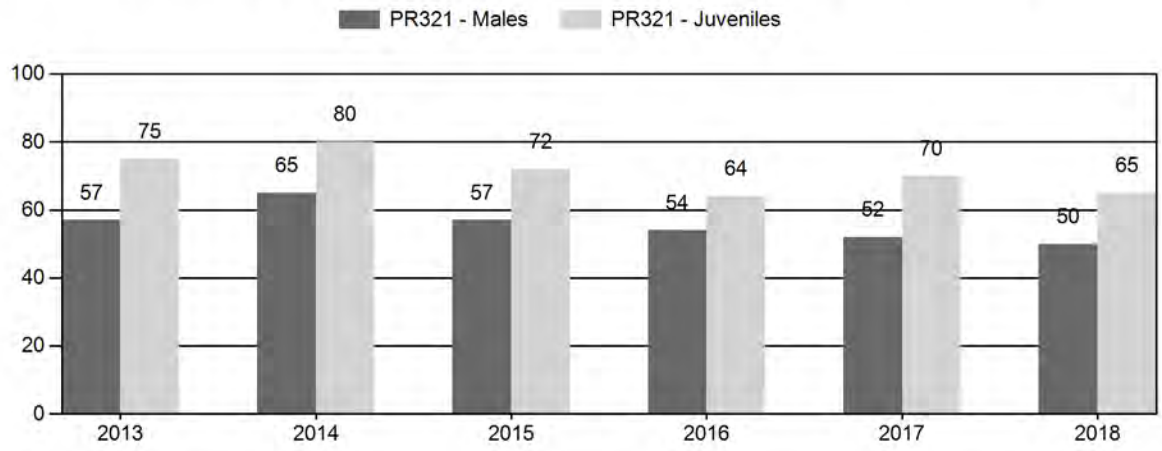


Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary for Pronghorn Herd PR321 - LEITER																		
		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	6,789	130	263	393	24%	694	43%	522	32%	1,609	4,498	19	38	57	± 16	75	± 19	48
2014	6,677	165	255	420	26%	650	41%	520	33%	1,590	3,783	25	39	65	± 17	80	± 21	49
2015	0	193	283	476	25%	832	44%	601	31%	1,909	2,534	23	34	57	± 0	72	± 0	46
2016	0	134	281	415	25%	763	46%	485	29%	1,663	1,983	18	37	54	± 0	64	± 0	41
2017	0	113	314	427	23%	829	45%	577	31%	1,833	2,194	14	38	52	± 0	70	± 0	46
2018	0	178	347	525	23%	1,045	46%	678	30%	2,248	1,928	17	33	50	± 0	65	± 0	43

2019 HUNTING SEASONS
LEITER PRONGHORN HERD (PR321)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
10	1	Oct. 1	Oct. 14	300	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	400	Limited quota	Doe or fawn
15	1	Oct. 1	Oct. 14	600	Limited quota	Any antelope
	6	Oct. 1	Nov. 30	800	Limited quota	Doe or fawn
16	1	Oct. 1	Oct. 14	600	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	400	Limited quota	Doe or fawn

Special Archery Season Hunt Areas	Opening Date	Limitations
10, 15, 16	Aug. 15	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2018
	1	
	6	
Herd Unit Total	**1**	**No Changes**
	6	

Management Evaluation
Current Hunter / Landowner Management Objective: 60% Satisfaction
Secondary Management Objective: Observed ratio of 30 bucks:100 does minimum
Management Strategy: Private Land
2018 Hunter Satisfaction Estimate: 83%
2018 Landowner Satisfaction Estimate: 43%
Most Recent 3-year Running Average Hunters Satisfaction Estimate: 77%
Most Recent 3-year Running Average Landowner Satisfaction Estimate: 54%

Herd Unit Issues

The Leiter Pronghorn Herd Unit is located in north central Wyoming, east of Sheridan and Buffalo. Interstate Highway 90 is the western and southern boundary; the Powder River is the eastern boundary; and the Wyoming-Montana state line is the northern boundary. The herd unit contains the town of Clearmont and the communities of Arvada, Leiter, Ucross and Wyarno. It is mostly agricultural lands with some rural residential development near Sheridan and Buffalo, and along U.S. Highways 14 and 16. Three hunt areas – Areas 10, 15, and 16 – make up this herd unit.

The primary management objective for the Leiter Pronghorn Herd Unit is a Landowner and Hunter Satisfaction Objective at 60% or higher, with a secondary management objective of 30 or more

bucks observed per 100 does. The management strategy is Private Land Management. We created the Leiter Pronghorn Herd Unit (PR321) in 2014 when the Clearmont (PR308) and Ucross (PR353) Pronghorn Herd Units were combined. We revised the objectives and management strategy at that time (i.e. 2014). We conducted a 5-year evaluation of the objective and management strategies in 2019, with no changes.

The majority of land within this herd unit is either private fee title or landlocked public lands. The restricted access makes it difficult to attain adequate harvest to regulate pronghorn populations in portions of this herd. Public lands include State Trust Lands and federal lands administered by the U.S.D.I. Bureau of Land Management (BLM). There are very limited public land hunting opportunities. There are three AccessYes Walk-In Areas (Johnson County #3 in Hunt Area 16; and Sheridan County #1 and 4 in Hunt Area 15) that provide some antelope hunting opportunity.

The Wyoming Women's Antelope Hunt, sponsored by the Wyoming Women's Foundation, was started in 2013 to encourage female participation in hunting. This event is based at the Ranch at Ucross and occurs primarily within this herd unit. Participants can purchase a license for this hunt independent of the normal allocation process within provisions of state statute.

Herd Unit Objective Review

The herd unit objective and management strategy were last reviewed in 2014. We evaluated and considered population status, landowner and hunter satisfaction, observed buck to doe ratios and habitat data included in this report. The current object and strategy meet our management needs. We concluded a change is not warranted at this time. We will review the herd objective and management strategy again in 2024. If the situation arises that a change is necessary, we will review and submit a proposal as needed.

Weather

Temperature and precipitation data referenced in this section were collected at the Sheridan Field Station (#488160), Clearmont 5SW (#481816) and Leiter 9NE (#485506) weather stations located within this herd unit. Historical climate data are reported by the Western Region Climate Center (www.wrcc.dri.edu).

The 2018 spring was generally cool, with temperatures in March-April below normal, and decreased precipitation until May. May was warm and wet, resulting in a good start for forage production. Temperatures remained near normal to slightly below normal during the summer and early fall. Conditions were generally dry during June-August, with below normal precipitation. September and November saw below normal precipitation, while October saw near normal precipitation and cooler temperatures. December and January were open, with near normal precipitation and above average temperatures. February turned cold and snowy, with precipitation near normal and average temperature ~16ºF below normal at the Leiter Station. There were several periods of 0^0F or below during this time, with at least one -20^0F day. March was generally colder than average with decreased precipitation while April was generally about normal for both temperature and precipitation. May was ~8ºF below average, with a 50-100% increase in precipitation. Cool wet weather during parturition may adversely influence neonate survival.

While adult wildlife entered the winter in good condition, they faced severe weather conditions during February and early March. Fawns, being more susceptible to cold temperatures, likely saw

average overwinter survival. We received several reports of overwinter fawn mortality during late winter.

Habitat

This herd unit contains open rangeland dominated by short-grass prairie and big sagebrush, dry land and irrigated crop lands. In the northern part of the herd unit is the Badger Hills which provide limited habitat for pronghorn. As you approach the Powder River, the country becomes more broken and rugged, which is less suitable for pronghorn.

A new invasive annual grass – ventenata or wiregrass (*Ventenata dubia*) – has been found in this herd unit. This invasive annual, along with the already established exotic annuals cheatgrass or downy brome (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*), reduce habitat quality over time by out competing more desirable forage plants. Also, fire frequency often increases with the presence of annual grasses, decreasing shrub components, such as big sagebrush, on the landscape. This could have long-term repercussions for pronghorn.

There are three historic habitat transects located in this herd unit. All of the habitat transects monitor annual growth and utilization of Wyoming big sagebrush communities. These transects have not been read in since at least 2014.

Field Data

During August, biologists and wardens conducted herd classification surveys using ground survey techniques. Designated routes were driven along county roads and all observed pronghorn were classified by gender and relative age cohort. Starting in 2011, we moved away from aerial classification surveys to ground classification surveys in this herd unit to reduce risk for employees and eliminate aircraft charter costs. In 2018, we classified 2,248 pronghorn, the highest classification count since switching exclusively to ground surveys. The count was above the desired sample size of 1,928 pronghorn at the 90% confidence level. This is the first time since 2001 that we have met our desired sample size in this herd unit. Even when conducting aerial surveys we seldom met the desired sample size at the 90% confidence level.

This year, we observed 65 fawns:100 does, a slight decrease from 2017 (70 fawns:100 does) and below the previous 5-year average of 72 fawns:100 does. A decline in fawns was not unexpected due to severe winter conditions during parts of the 2017-18 winter. Due to the fact we only classify pronghorn in a relatively small portion of the herd unit visible from county roads, our survey may be biased and not truly representative of the actual population dynamics.

We observed 50 bucks:100 does, a decrease from the most recent 5-year average of 56 bucks:100 does. Restricted access to private lands, and limited accessible public lands, limits our ability to obtain additional buck harvest, which could easily be sustained based on the observed buck to doe ratio. Since bucks are often segregated in bachelor groups prior to breeding season in September, we may be under estimating the actual buck:doe ratio in this herd unit. Based on observed buck:100 doe ratios, we are meeting our secondary management objective for this herd unit.

Hunter satisfaction increased in 2018, with 83% of surveyed hunters (n=334) satisfied (37%) or very satisfied (45%). This is the highest hunter satisfaction in four years. Both resident and nonresident hunter satisfaction increased in 2018, with resident satisfaction increasing from 63%

to 71% and nonresident satisfaction increasing from 74% to 84%. The increase in hunter satisfaction could be correlated to the increased hunter success and decreased effort required to harvest an antelope in 2018. Successful hunters tend to be satisfied hunters.

Hunter satisfaction increased the most in Area 10 (68% to 80%). In 2017, one landowner booked several groups of hunters on a relatively small property, resulting in a number of complaints and likely a function of low satisfaction that year. Hunter satisfaction was highest in Area 15 (86.5%), which is slightly surprising as there is limited public access in this hunt area. This area does have some public access for hunting, including two AccessYes Walk-In Areas.

Harvest Data

In 2018, we essentially sold all allocated licenses, except for 82 Type 6 licenses in Area 10. While we maintained licenses quotas for 2018, we again saw an increase in demand for antelope licenses, especially for leftover licenses.

In 2018, an estimated 2,387 hunters harvested an estimated 2,019 pronghorn, the highest harvest in 35+ years. This was the first year hunters harvested over 2,000 pronghorn. Hunter numbers increased 5% while harvest increase 14% compared to 2017. Pooled hunter success was 85%, the highest in three years, and similar to the previous 5-years success rate of 84%. Success measured by individual license was 78%. Hunter effort, as measured by the number of days hunted per animal harvested, was 3.7 days/animal, almost a full day less than in 2017 (4.6 days/animal), and slightly less than the previous 5-year average of 3.96 days/animal.

These data suggest pronghorn were relatively available for harvest in 2018, especially compared to 2017. Weather conditions were generally conducive to hunting during the 2018 season, so likely played a role in hunter success. While simulation modeling suggests this population is declining, we have had record pronghorn harvest the past four years. Landowners are about evenly split on having the desired number of pronghorn or having too many.

Population

The 2018 postseason population estimate was ~6,300 pronghorn, with the population trending downward, likely influenced by the high harvest in recent years. This population likely peaked in about 2014 at an estimated ~13,900 pronghorn. The population is thought to have declined over the past 3-4 years, likely due to record harvest levels. A line transect survey was conducted during June 2013, which resulted in an end-of-biological-year population estimate of 13,256 pronghorn. The current model estimates a population below the LT point estimate.

The “Time-Specific Juvenile – Constant Adult Survival Rate” (TSJ,CA) spreadsheet model was chosen to estimate the post-season population for this herd. This model had the highest relative Akaike information criterion (AIC) value (158) but the best fit (39) of the three possible models. The population dynamics of this model appear reasonable and consistent with the dynamics observed in the field. The model aligns well with all but one line transect estimate. While we have limited population dynamic data available for this herd, the model does align well with most of the line transect estimates, so we consider this a “good” model. The estimated percentage of males harvest the past 4 years seems unrealistically high, which suggests this model is underestimating the true population.

Of landowners who responded to an annual survey (n=30), an equal number (n=13; 43%) indicated the population was at or near desired levels or above desired levels. Most (n=16; 53%) suggested similar season strategies for 2019. For the first time in several years, at least one landowner in each hunt area (n=4; 13%) thought they had fewer than desired numbers of pronghorn.

Management Summary

Since the 2003 season, the regular hunting season has ran two weeks (October 1 – 14) for Type 1 licenses, and four weeks (October 1 – 31) for Type 6 licenses. An archery pre-season runs August 15 – September 30. In response to requests from landowners in Hunt Area 15, we extended the Area 15 - Type 6 (doe or fawn antelope) season to November 16th for 2016 and to November 30th for 2017.

Hunters are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, if available. This allows hunters with access the opportunity to harvest multiple animals. There is limited pronghorn hunting on scattered State Trust and BLM lands, as well as three Walk-In Areas. We observe high buck numbers, as measured by buck:doe ratios, observing 50 bucks:100 does during this year's classification survey. High buck to doe ratios are likely a function of limited access to private lands where the majority of pronghorn occur.

Due to very limited access for pronghorn hunting, we strive to balance license allocation between providing enough licenses to meet landowner desires and hunter demand, and having too many leftover licenses, which may give prospective hunters the impression there are abundant hunting opportunities. We have seen an increase in demand for non-resident license since 2014, with a lot of naïve hunters looking for an opportunity to hunt big game in Wyoming. This can result in frustrated hunters who purchase leftover licenses prior to learning about access issues in herd units such as this one.

We project a harvest of approximately 1,870 pronghorn in 2019, resulting in an estimated post-season population of about 6,000 pronghorn. These predictions assume about average fawn survival, similar license sales and lower success rates as seen during the 2018 hunting season.

2018 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR339 - NORTH BLACK HILLS

HUNT AREAS: 1-3, 18-19

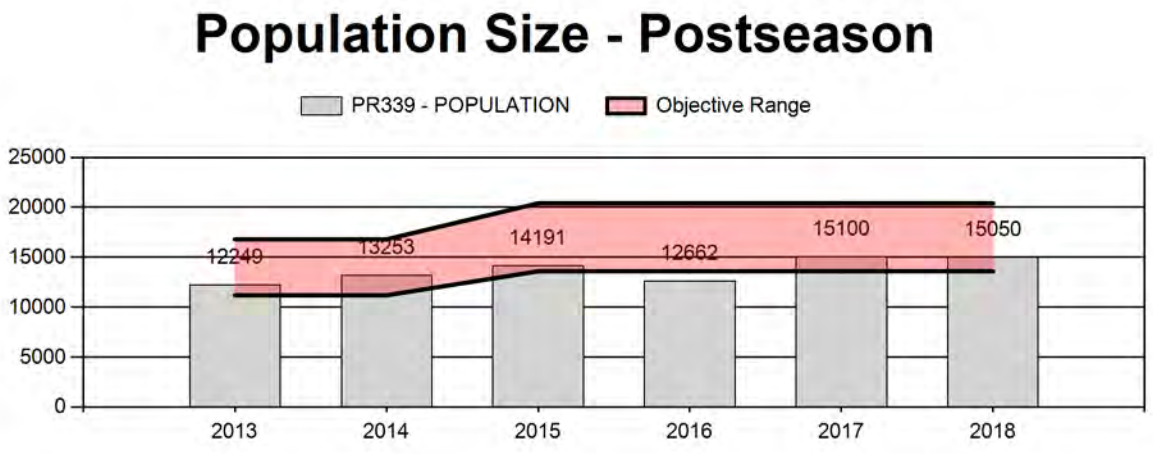
PREPARED BY: ERIKA PECKHAM

	2013 - 2017 Average	2018	2019 Proposed
Population:	13,491	15,050	14,870
Harvest:	1,049	1,382	1,425
Hunters:	1,157	1,516	1,550
Hunter Success:	91%	91%	92 %
Active Licenses:	1,309	1,711	1,760
Active License Success:	80%	81%	81 %
Recreation Days:	4,016	4,630	4,700
Days Per Animal:	3.8	3.4	3.3
Males per 100 Females	43	43	
Juveniles per 100 Females	79	71	

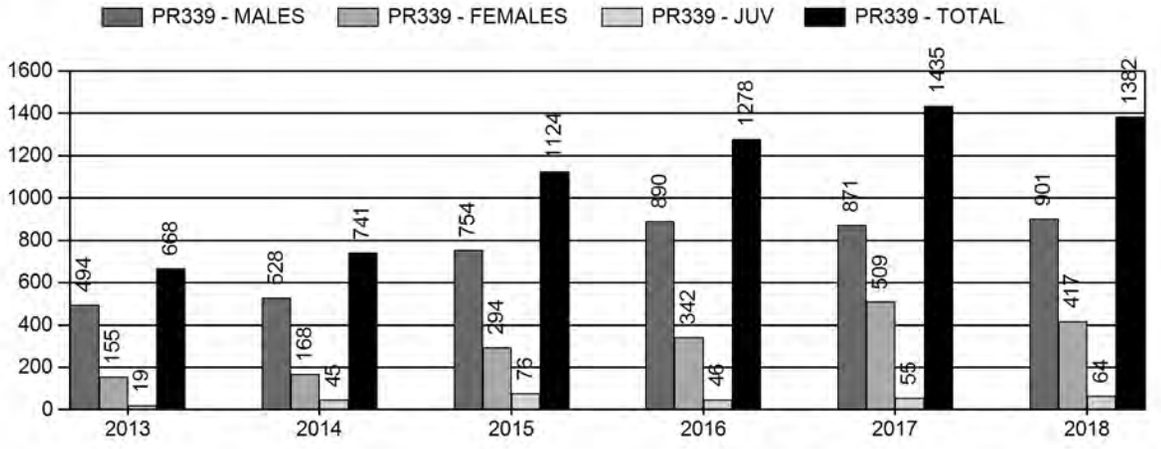
Population Objective (± 20%) :	17000 (13600 - 20400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-11.5%
Number of years population has been + or - objective in recent trend:	1
Model Date:	5/20/2019

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

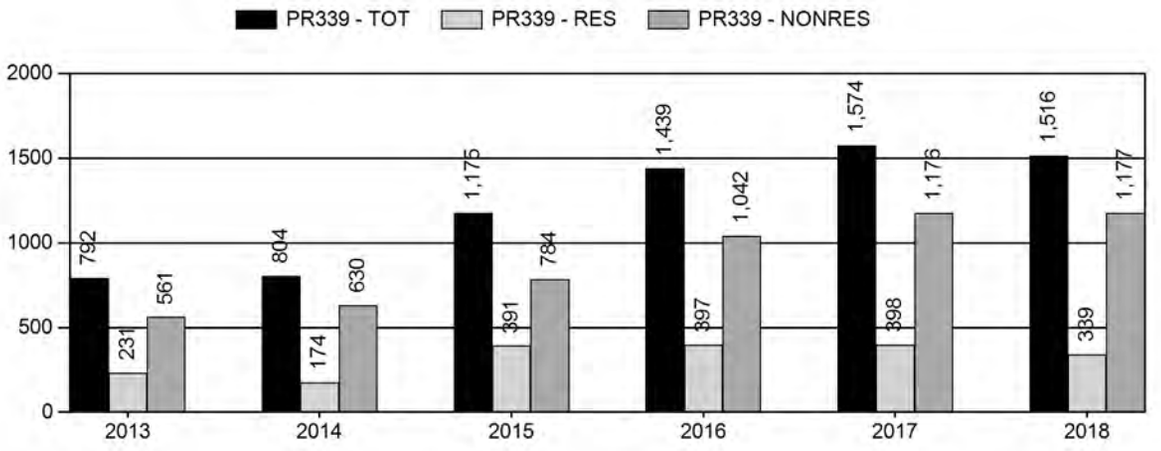
	JCR Year	Proposed
Females ≥ 1 year old:	7.1%	6.4%
Males ≥ 1 year old:	24.9%	31.4%
Total:	8.2%	-9.8%
Proposed change in post-season population:	2.2%	-1%



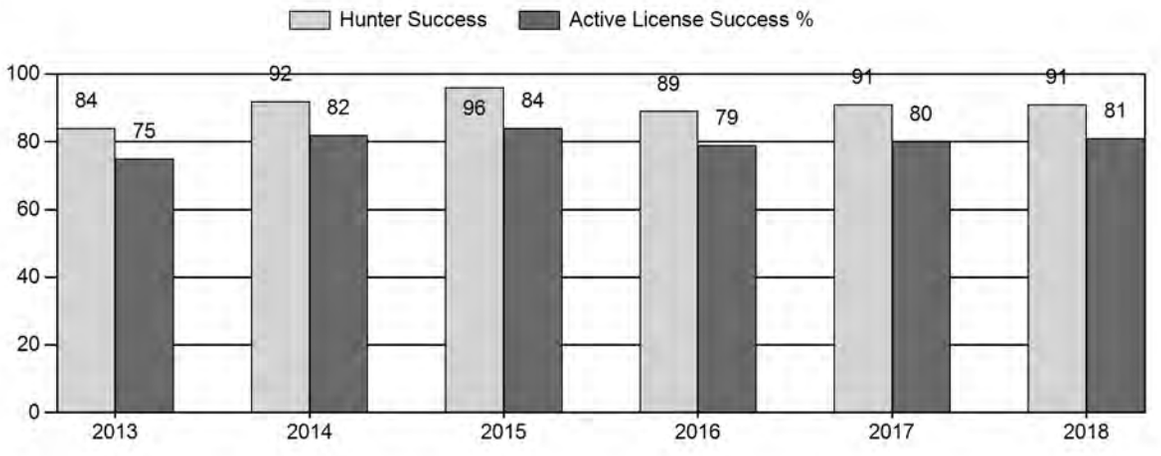
Harvest



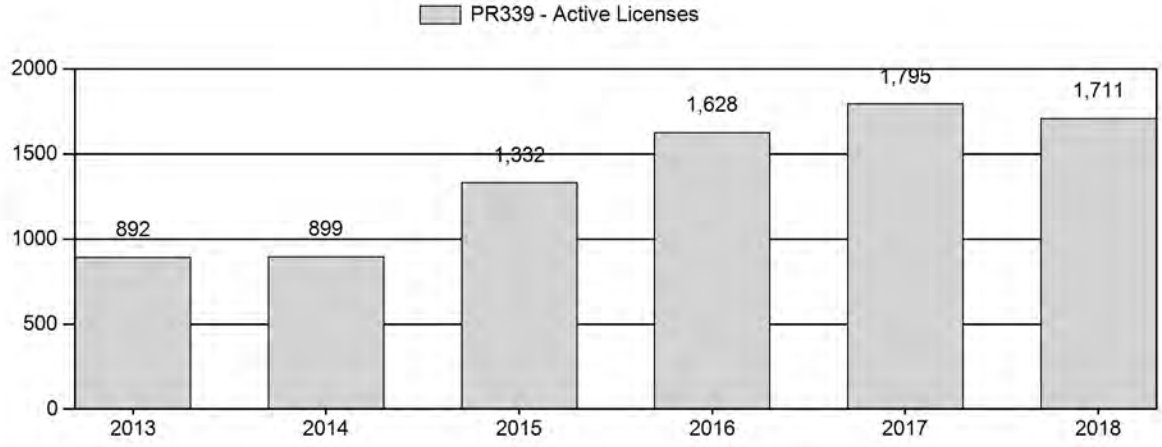
Number of Active Licenses



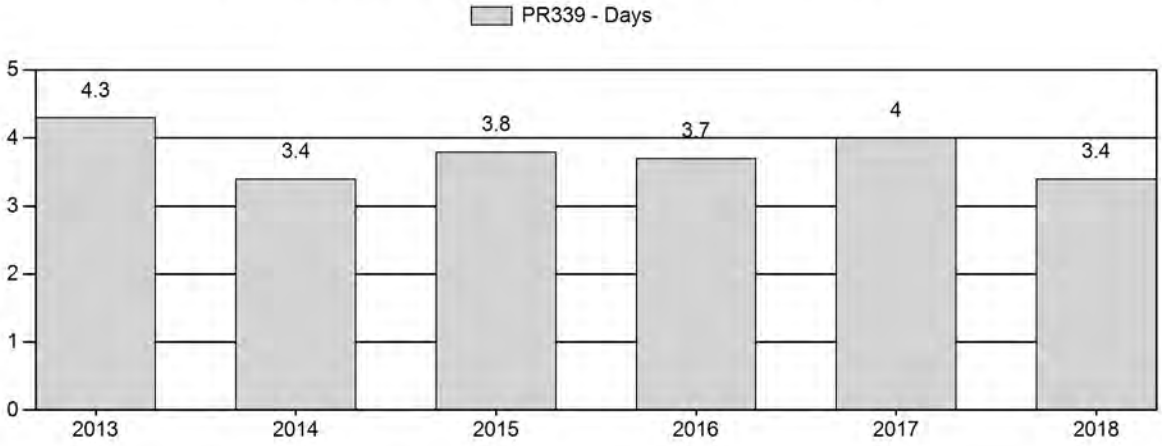
Harvest Success



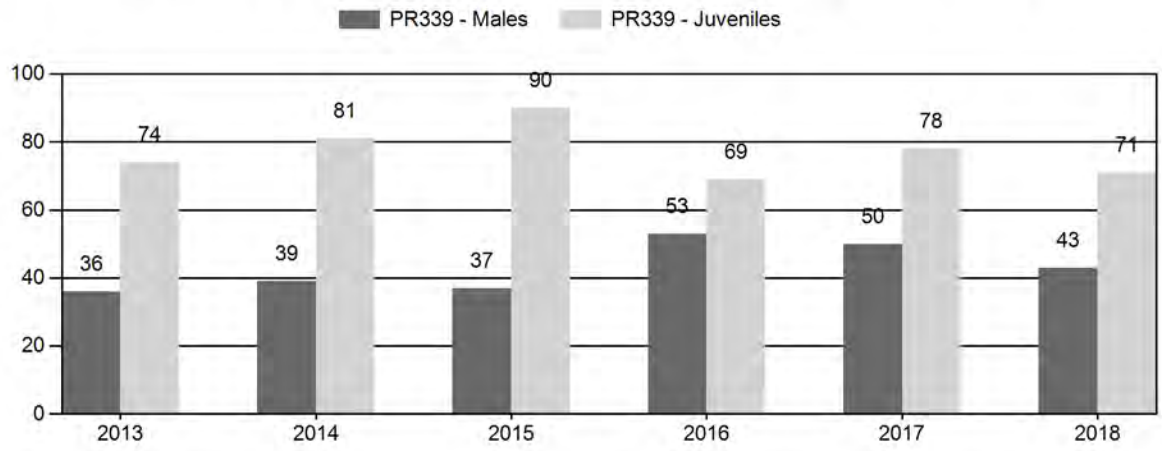
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR339 - NORTH BLACK HILLS

		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	12,984	75	229	304	17%	841	48%	621	35%	1,766	1,878	9	27	36	± 4	74	± 6	54
2014	14,069	125	258	383	18%	993	45%	808	37%	2,184	2,247	13	26	39	± 4	81	± 6	59
2015	15,427	143	271	414	16%	1,118	44%	1,004	40%	2,536	2,673	13	24	37	± 3	90	± 6	66
2016	13,998	182	378	560	24%	1,056	45%	730	31%	2,346	2,755	17	36	53	± 4	69	± 5	45
2017	16,700	177	459	636	22%	1,284	44%	996	34%	2,916	3,099	14	36	50	± 4	78	± 5	52
2018	16,550	211	442	653	20%	1,505	47%	1,076	33%	3,234	2,841	14	29	43	± 3	71	± 4	50

2019 HUNTING SEASONS
NORTH BLACK HILLS PRONGHORN HERD (PR339)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	License	Limitations
1	1	Oct. 1	Nov. 20	250	Limited quota	Any antelope
1	6	Oct. 1	Nov. 20	150	Limited quota	Doe or fawn
2	1	Oct. 1	Nov. 20	200	Limited quota	Any antelope
2	6	Oct. 1	Nov. 20	200	Limited quota	Doe or fawn
3	1	Oct. 1	Nov. 20	300	Limited quota	Any antelope
3	6	Oct. 1	Nov. 20	250	Limited quota	Doe or fawn
18	1	Oct. 1	Oct. 20	200	Limited quota	Any antelope
18	6	Oct. 1	Oct. 20	50	Limited quota	Doe or fawn
19	1	Oct. 1	Oct. 20	300	Limited quota	Any antelope
19	7	Oct. 1	Oct. 20	150	Limited quota	Doe or fawn valid on private land

Hunt Special Archery Season Hunt Areas	Opening Date	Limitations
1-3	Sep. 1	Refer to Section 2 of this Chapter
18, 19	Aug. 15	Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2018
1	1	No Change
1	6	No Change
2	1	No Change
2	6	No Change
3	1	No Change
3	6	No Change
18	1	+50
18	6	No Change
19	1	No Change
19	6	No Change

Herd Unit Total	1 6	+50 No Change

Management Evaluation
Current Postseason Population Management Objective: 17,000
Management Strategy: Recreational
2018 Postseason Population Estimate: ~15,050
2019 Proposed Postseason Population Estimate: ~14,870
2018 Hunter Satisfaction: 86% Satisfied, 8% Neutral, 6% Dissatisfied

Herd Unit Issues

The management objective for the North Black Hills Pronghorn Herd Unit is a post-season population of 17,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last reviewed in 2015.

The 2018 post-season population estimate was about 15,050 pronghorn. Currently, the population is estimated to be 12% below the management objective. Beginning around 2007 this population started declining. Issues related to adverse winter and spring weather, and low fawn production were observed, particularly from 2009-2011. Heavy spring snows and cold spring temperatures in 2009 and 2010 likely reduced fawn and adult survival, particularly in Hunt Areas 18 and 19. Although conditions have been favorable the last few years, certain hunt areas have not had very good fawn production and have not seen numbers rise to what they have been in the past.

Weather

Weather throughout 2018 was optimal for overall rangeland conditions. Precipitation was favorable resulting in good forage availability. The winter of 2018-2019 started out fairly mild with minimal amounts of snow as winter commenced. As February approached, much colder temperatures were experienced as winter progressed. In addition to the prolonged cold temperatures, numerous snow events were experienced in much of this herd unit. Over winter survival was impacted with numerous reports and subsequent confirmation of pronghorn in poor condition or dying.

The Palmer Drought Index indicates that all months of 2018 experienced “normal” conditions in the Powder River drainage. Additionally, looking at historic temperature information for November and December 2018, mean temperatures were very close to the 30-year normals.

Habitat

The North Black Hills Herd Unit is comprised of various habitat and therefore, differing densities of pronghorn. The dominant habitat types are sagebrush-grassland and ponderosa pine. There are stands of juniper found throughout the area as well. Pronghorn are found at fairly high densities in the sagebrush-grassland habitat type. This herd unit contains portions of the

Wyoming Black Hills. The Black Hills are dominated with ponderosa pine stands and steep topography interspersed with grassland parks.

Within the Black Hills Herd Unit, Rapid Habitat Assessments (RHA) were conducted on public land in Hunt Area 18. This information consists of basic plant community inventory and an overall picture of rangeland health. It is not an in-depth analysis, but includes photo points at different locations. A total of seven RHA's were conducted comprised of four upland and three riparian assessments. Within each allotment where a RHA was conducted, the area was walked and plants and habitat conditions were inventoried and assessed to get an overall assessment of the allotment/pasture condition. This information could prove helpful in planning future habitat projects.

Field Data

Classification surveys in 2018 showed a decrease in the observed fawn to doe ratio (71:100), down from 78:100 in 2017. This is lower than the preceding 5-year average of 78:100. Fawn ratios varied throughout the five hunt areas, ranging from 58 to 89 fawns per 100 does. Given favorable precipitation patterns during the 2018 growing season, these low observed fawn ratios are puzzling. Buck to doe ratios ranged from 36 to 50 the preceding five years. The 2018 buck ratio of 43 bucks per 100 does was down from 50 per 100 in 2017, but comparable to the 5-year average. A postseason landowner survey is conducted which provides another perspective of the population and hunting seasons. The 2018 survey indicated that 64% of respondents felt the herd was currently at an acceptable level. The Hunter Satisfaction Survey responses indicated that 86% of hunters were either "very satisfied" or "satisfied" with their hunting experience.

In February of 2019 a landowner report was received regarding numerous antelope mortalities within Hunt Area 19. Upon investigation, it was found that around 60 antelope succumbed to disease within a small area. All antelope present in this area eventually expired. Lab testing indicated that this was an outbreak of *Mycoplasma bovis*, which had not be documented in pronghorn prior to this event. Although the outbreak appeared to be localized, it will be important to continue monitoring this potential issue.

It should also be noted that numerous reports were received and verified of pronghorn dying beginning Mid-April and into May. This was typically one in a group and they would present with symptoms associated with overconsumption of green grass. The Wyoming State Veterinary Lab came to the area to attempt to assess the cause. It seems that some years are worse than others for this occurrence and the spring of 2019 seemed to be exceptionally bad throughout portions of this and adjacent herd unit.

Harvest

In 2018 there were 2,000 licenses available, 1,200 Type 1 any antelope and 800 Type 6 doe/fawn antelope licenses. With the exception of the area 19 Type 7 license, all licenses sold out before the hunting season. Only four Type 7 licenses were unsold. Overall, hunter success was 91%, identical to the 5-year average. Hunters averaged 4.0 days to harvest an animal, which was lower than 2017 and comparable to the preceding 5-year average of 3.8 days per harvest.

Population

The "Semi-Constant Juvenile – Semi-Constant Adult" (SCJ-SCA) spreadsheet model was chosen for the post season population estimate. This model aligns very well with the independent line transect survey estimates. Although this model did not have the lowest relative AIC (204), it did appear to most accurately represent what was occurring on the ground (Fair Model). We conducted line transect surveys in 1995, 1997, 1999, 2002, 2004, 2008, 2012, and 2014, which provided independent population estimates. The model aligns very well to the line transect estimates and predicts stable 2018 post-season population. A line transect survey is planned for the Spring of 2019.

Management Strategy

The traditional season has been the entire month of October and part of November in Hunt Areas 1, 2 and 3, and October 1 to October 20 in Hunt Areas 18 and 19. The season time and length seem to be adequate to allow a reasonable harvest and aligns well with the current deer season. Area 18 is the only hunt area that has a reasonable amount of accessible public land. This area appears to be slowly recovering from a sharp decline in pronghorn several years ago. This area can accommodate a slight increase in Type 1 licenses given the hunter success rate of 91%. With the change in license quotas, this herd will have 50 more Type 1 licenses as compared to 2018.

Overall, the population appears to be trending upwards with slight variability within hunt areas. If we attain the projected harvest of 1,425 pronghorn and near normal fawn recruitment, the population is predicted to decrease slightly. Based on the population model, we predict a 2018 post-season population of about 15,050 pronghorn.

2018 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR351 - GILLETTE

HUNT AREAS: 17

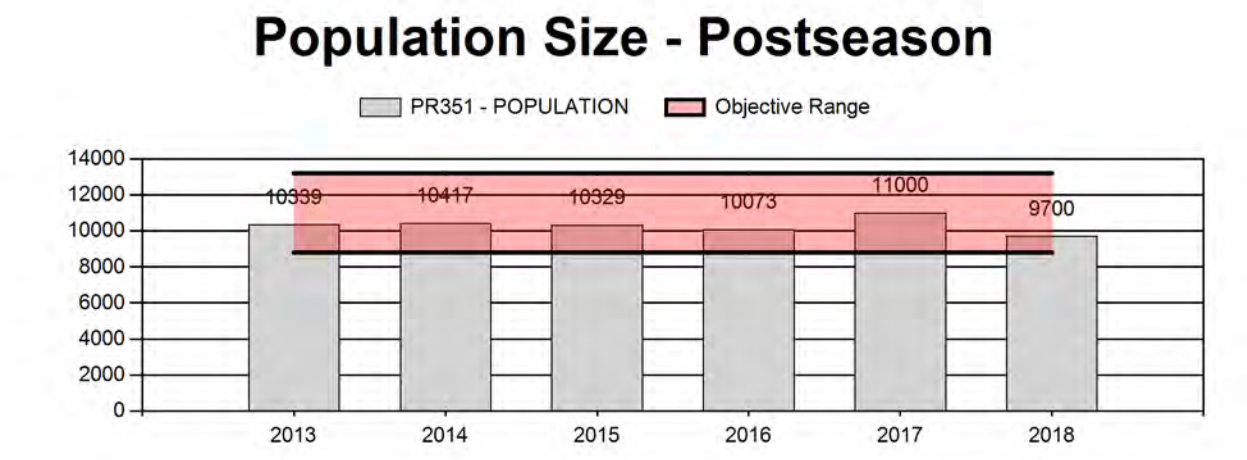
PREPARED BY: ERIKA PECKHAM

	2013 - 2017 Average	2018	2019 Proposed
Population:	10,432	9,700	9,300
Harvest:	1,077	1,081	1,070
Hunters:	1,254	1,220	1,225
Hunter Success:	86%	89%	87%
Active Licenses:	1,326	1,299	1,300
Active License Success:	81%	83%	82%
Recreation Days:	4,378	3,371	3,380
Days Per Animal:	4.1	3.1	3.2
Males per 100 Females	49	40	
Juveniles per 100 Females	61	52	

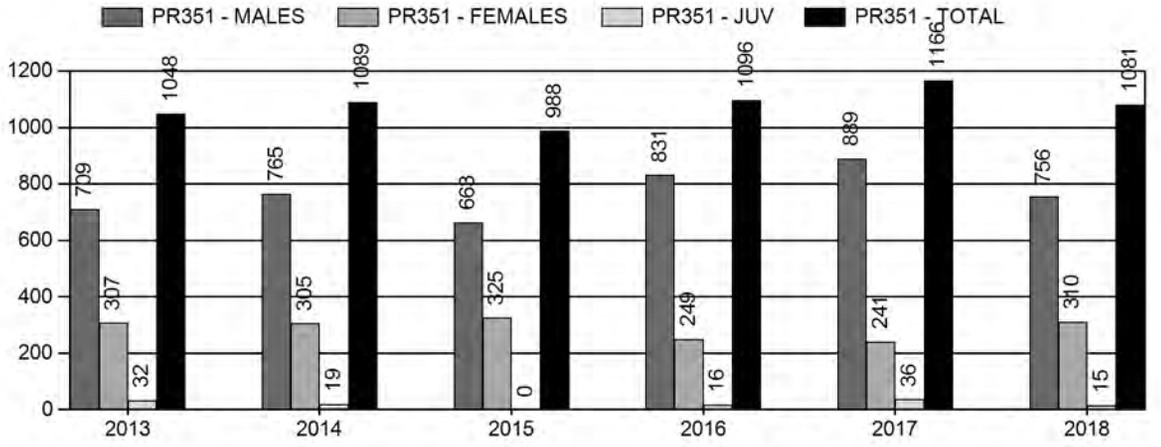
Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-11.8%
Number of years population has been + or - objective in recent trend:	4
Model Date:	1/29/2019

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

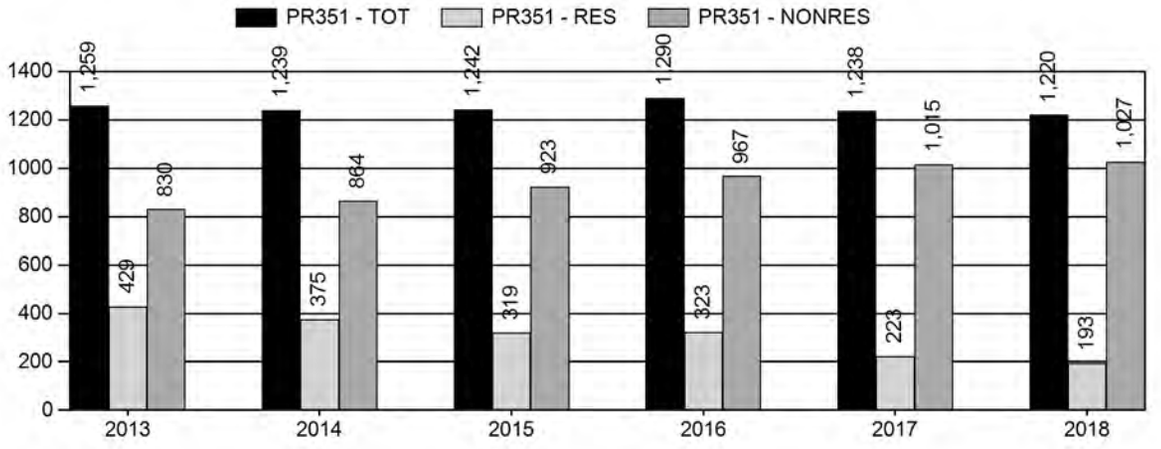
	JCR Year	Proposed
Females ≥ 1 year old:	4.5%	6.1%
Males ≥ 1 year old:	36.4%	37.8%
Total:	9.7%	10.25%
Proposed change in post-season population:	-8.5%	-5.2%



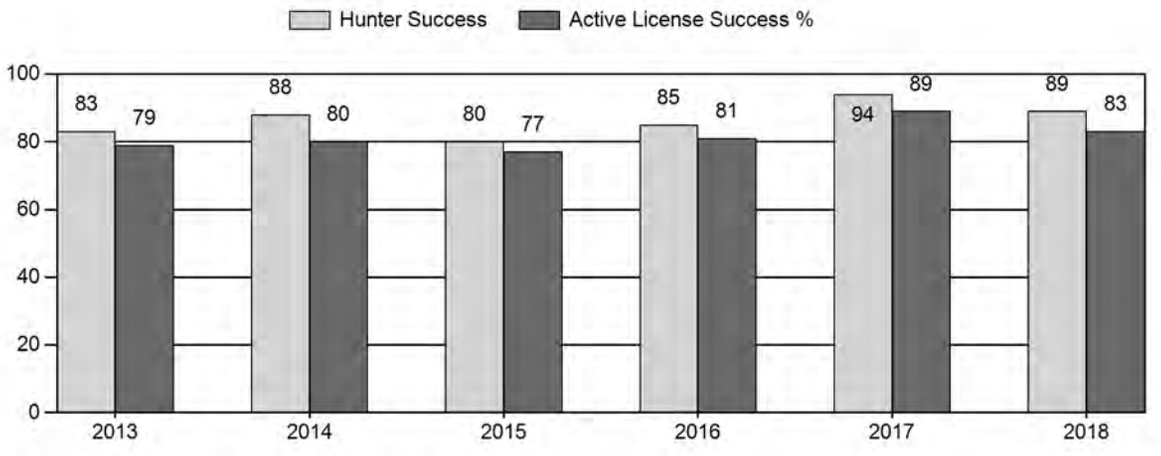
Harvest



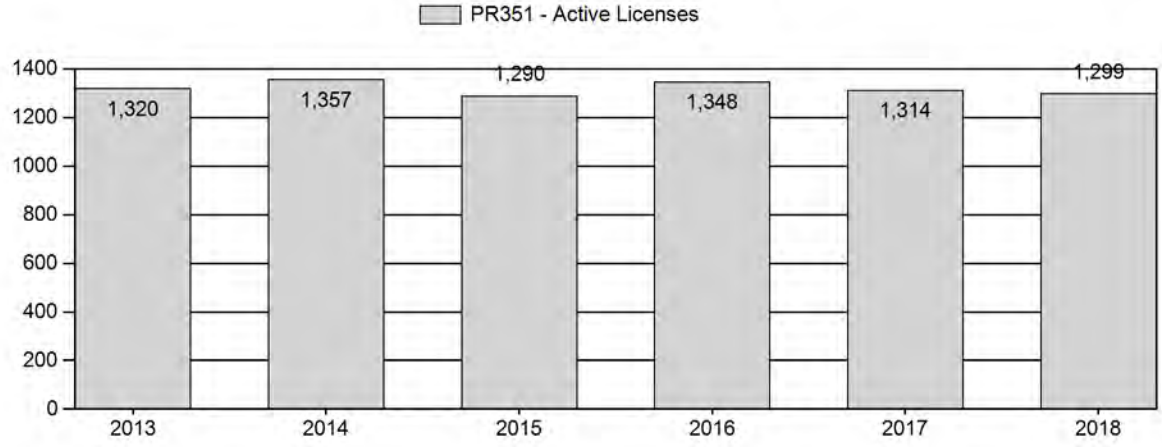
Number of Active Licenses



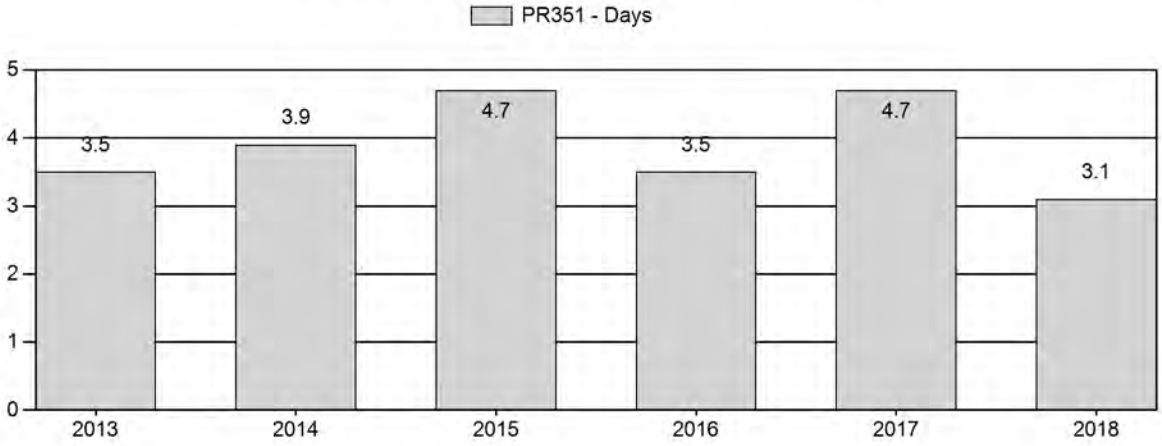
Harvest Success



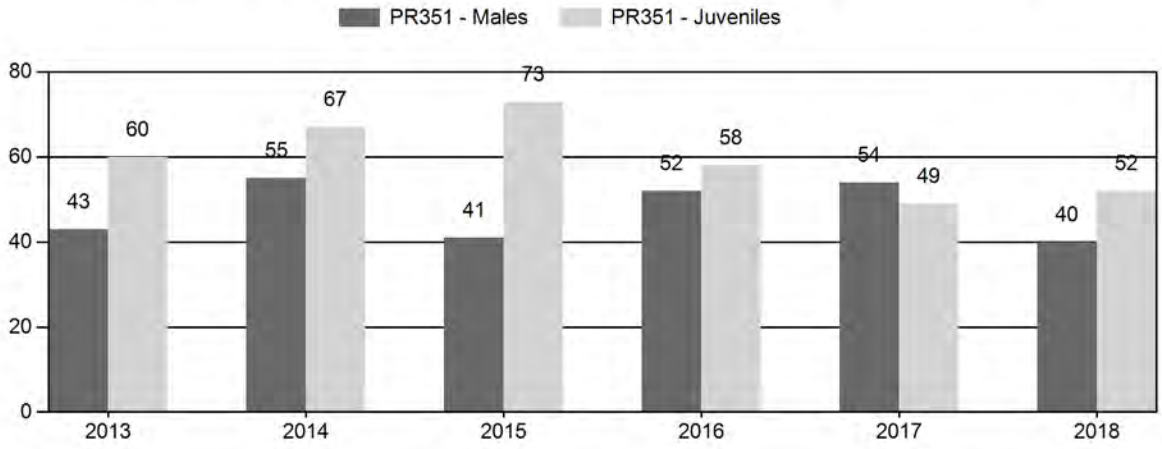
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR351 - GILLETTE

		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	11,492	175	235	410	21%	950	49%	574	30%	1,934	1,758	18	25	43	± 4	60	± 5	42
2014	11,615	245	299	544	25%	983	45%	661	30%	2,188	1,811	25	30	55	± 4	67	± 5	43
2015	11,416	174	226	400	19%	971	47%	706	34%	2,077	2,297	18	23	41	± 4	73	± 5	51
2016	11,279	121	317	438	25%	835	48%	481	27%	1,754	2,434	14	38	52	± 5	58	± 5	38
2017	12,300	249	490	739	26%	1,376	49%	678	24%	2,793	2,468	18	36	54	± 4	49	± 3	32
2018	10,900	164	345	509	21%	1,258	52%	651	27%	2,418	1,821	13	27	40	± 3	52	± 4	37

2019 HUNTING SEASONS
GILLETTE PRONGHORN HERD (PR351)

Hunt Area	Type	Dates of Seasons Opens	Dates of Seasons Closes	Quota	License	Limitations
17	1	Oct. 1	Oct. 31	1,100	Limited quota	Any antelope
17	6	Oct. 1	Oct. 31	400	Limited quota	Doe or fawn

Hunt Special Archery Season Hunt Areas	Opening Date	Limitations
17	Sep. 1	Refer to Section 2 of this Chapter

SUMMARY OF CHANGES IN LICENSE NUMBERS

Hunt Area	Type	Quota change from 2018
17	1	No Change
17	6	No Change

Management Evaluation
Current Postseason Population Management Objective: 11,000
Management Strategy: Recreational
2018 Postseason Population Estimate: ~9,750
2019 Proposed Postseason Population Estimate: ~9,250
2018 Hunter Satisfaction: 82% Satisfied, 10% Neutral, 8% Dissatisfied

Herd Unit Issues

The postseason population objective for the Gillette Pronghorn Herd Unit is 11,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last reviewed in 2015.

In years when pronghorn numbers are above objective, the largest issue with achieving adequate harvest in this herd is hunter access. There is very little publicly accessible land. Additionally, with increased hunting pressure, the limited public lands experience overcrowding. As surrounding hunt areas have gone to limited numbers of licenses valid on public land, it seems that this herd unit has become particularly crowded.

In the past, this herd unit experienced fairly intensive coal bed methane development. In recent years, development and associated activity has tapered off substantially. The more pressing issue is proper reclamation. Roads and structures associated with methane production remain. Currently, energy development and associated activity is limited.

Weather

Weather throughout 2018 was optimal for overall rangeland conditions. Precipitation was favorable resulting in good forage availability. The winter of 2018-2019 was fairly mild with minimal amounts of snow as winter commenced. As February approached, much colder temperatures were experienced as winter progressed; however, the timing of the snow and conditions still allowed animals to access residual forage. Over winter survival was likely slightly impacted with some reports of pronghorn in poor condition or dying. The amount of winter kill will likely not adversely affect this population.

The Palmer Drought Index indicates that all months of 2018 experienced "normal" conditions in the Powder River drainage. Additionally, looking at historic temperature information for November and December 2018, mean temperatures were very close to the 30-year normals.

Habitat

This herd unit is comprised of a mix of various habitat types, as such; pronghorn densities vary greatly throughout this area.

Areas supporting pronghorn are largely comprised of Wyoming big sagebrush (*Artemesia tridentata wyomingensis*) and silver sagebrush (*Artemesia cana*) interspersed with mid-prairie grasses such as wheatgrasses (*Agropyron* spp.), grama grasses (*Bouteloua* spp.), and needle grasses (*Stipa* spp.). These areas of dense sagebrush cover are scattered throughout this hunt area and typically have pronghorn densities.

Agricultural fields, most often consisting of alfalfa and grass hay mix, support high numbers of pronghorn in late summer and early fall when rangeland forage cures. Ponderosa pine occurs in steeper terrain with sandstone outcroppings. Pronghorn generally do not use this habitat type.

It has been noted that in some areas there has been chemical control of sagebrush which can influence where pronghorn winter.

There is currently no formal habitat monitoring occurring in this herd unit.

Field Data

This herd has hovered around the population objective over the last several years. In 2018, the fawn to doe ratio came in at a surprising low 52 fawns per 100 does. This herd was not impacted by drought this year, therefore the fawn ratio was much lower than anticipated. Low fawn ratios the past three years are not readily explained given the favorable rangeland conditions.

As this is a private lands dominated herd, it is no surprise this herd has high observed buck ratios. Over the last 6 years, ratios have ranged from 40-55 bucks per 100 does.

An annual landowner survey is conducted which provides another perspective of the population and hunting seasons. The 2018 survey indicates that the majority (59%) of respondents were satisfied with the current number of antelope. Hunters' response to the Hunter Satisfaction Survey indicate that 82% were either "very satisfied" or "satisfied", influenced by the 89% hunter success rate.

It should also be noted that numerous reports were received and verified of pronghorn dying beginning Mid-April and into May. This was typically one in a group and they would present with symptoms associated with overconsumption of green grass. The Wyoming State Veterinary Lab came to the area to attempt to assess what the exact cause was. It seems that some years are worse than others for this occurrence, and the spring of 2019 seemed to be exceptionally bad throughout portions of this herd unit.

Harvest Data

In 2018 there were 1,500 licenses available, 1,100 Type 1 any antelope and 400 Type 6 doe/fawn antelope licenses. All licenses sold in the initial draw. This herd has been hovering around objective, and it seems that this number of licenses is aligned with what this herd can support, particularly considering the last two years of observed fawn ratios (49:100 and 52:100, respectively). Reviewing the harvest history, 1,100 Type 1 licenses and 400 Type 6 licenses are around the maximum number of licenses issued. Population estimates indicate that the herd is trending slightly downward, but is still within 20% of the herd unit objective of 11,000 pronghorn. Hunter success averaged 86% over the preceding 5 years. The overall success rate in 2018 was 89% and hunters averaged 3.1 days to harvest an animal, down from 4.7 in 2017. The total harvest of 1,081 pronghorn was down slightly from the 2017 when 1,166 total antelope were harvested. It is felt that this area has received more pressure from hunters unfamiliar with the area the past several years. A high volume of non-resident hunter phone calls were received, with numerous people stating they did not draw their preferred hunt area. Additionally, numerous callers stated that it is becoming increasingly difficult to find access to hunt pronghorn.

Population

The "Constant Juvenile – Constant Adult Mortality Rate" (CJCA) spreadsheet model was chosen for the post season population estimate. Although this model did not have the lowest relative AIC (228), this model appeared to most accurately represent what was occurring on the ground, and made best use of the available information. The model is considered a "fair" model as there are no survival estimates for this herd. Although the SCJ, SCA model had the lowest AIC, there were years in which the estimates dipped into negative values. We conducted line transect surveys in 1995, 1998, 2000, 2002, 2008, 2013 and 2016 which provided independent population estimates. With the exception of the 2016 estimate, the model aligns within the confidence intervals of the estimates.

The 2018 post-season population estimate is about 9,700 pronghorn, a 4% decrease from the 2017 post-season estimate. The observed fawn:doe ratios for 2016 was 58:100 and 49:100 in 2017. The 2018 fawn ratio was also low at 52:100. As stated previously, although drought conditions occurred in 2016 and 2017, the fawn ratios were not expected in either of those years, and certainly not in 2018, given the favorable range conditions. Although there is some variability in observers, the variation from neighboring areas should not be this drastic. Classifications are conducted from

the ground using established routes every year. As such, the total number of pronghorn classified can give an idea of trends through the years. The total number of pronghorn classified in 2017 was close to 2,800, the highest number observed since 1983. The 2018 classification total was 2,400 pronghorn suggesting this population is remains high.

Management Strategy

Having adequate licenses available is imperative to achieve harvest objectives when this population is at objective. In 2018 there were 1,500 licenses available, 1,100 Type 1 and 400 Type 6. Both Type 1 and Type 6 licenses sold out in the initial draw. In speaking with hunters, it seemed many people who had historically drawn licenses in other hunt areas did not draw this year. This has been occurring for the past few years. This may have contributed to increased license demand in recent years.

The traditional season has been the entire month of October. This season timing and length seems adequate to allow for a reasonable harvest. The number of licenses available for 2019 was unchanged. The majority (64%) of landowners responding to the annual landowner survey state they would like to see the same season as 2018.

Due to landowner comments, hunter comments and the visible overcrowding of limited public lands, some hunt areas in this region have recently added a private lands only license type and restricted the number of licenses available for public lands. This strategy is being evaluated for the Gillette Herd Unit.

If we attain the projected harvest of 1,070 pronghorn and similar fawn recruitment, the population is anticipated to decrease slightly but remain within 12% of the objective. Based on the population model, we predict a 2019 post-season population of about 9,300.

2018 - JCR Evaluation Form

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

HERD: PR352 - MIDDLE FORK

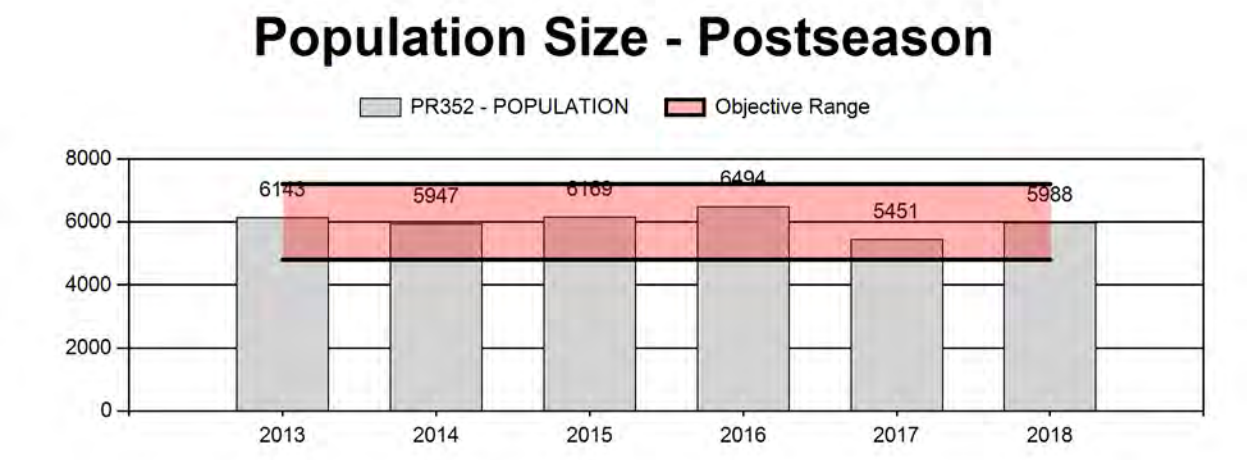
HUNT AREAS: 21
PREPARED BY: CHEYENNE STEWART

	2013 - 2017 Average	2018	2019 Proposed
Population:	6,041	5,988	6,202
Harvest:	641	705	675
Hunters:	771	746	760
Hunter Success:	83%	95%	89 %
Active Licenses:	846	825	846
Active License Success:	76%	85%	80 %
Recreation Days:	3,195	2,600	2,800
Days Per Animal:	5.0	3.7	4.1
Males per 100 Females	60	44	
Juveniles per 100 Females	86	72	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-0.2%
Number of years population has been + or - objective in recent trend:	0
Model Date:	2/13/2019

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

	JCR Year	Proposed
Females ≥ 1 year old:	8%	7%
Males ≥ 1 year old:	25%	23%
Total:	10%	9%
Proposed change in post-season population:	+9%	+3%



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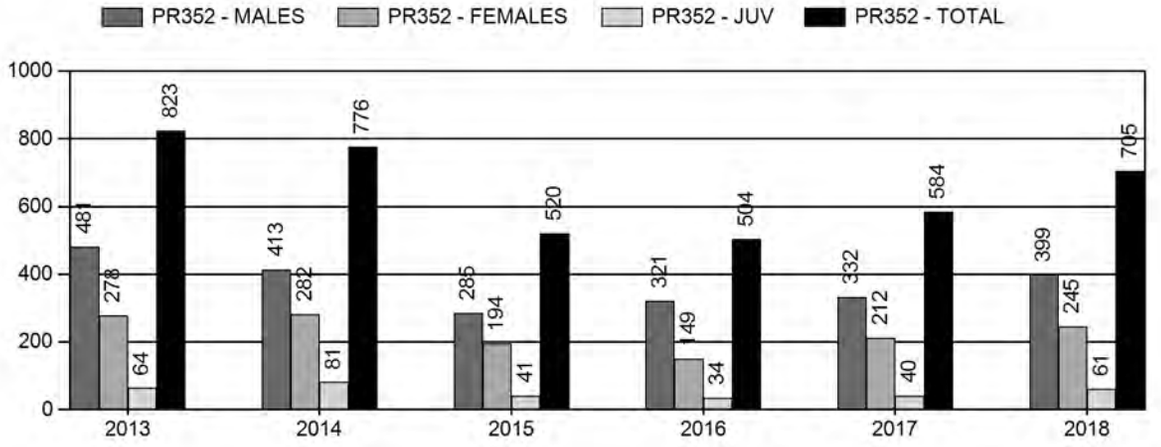
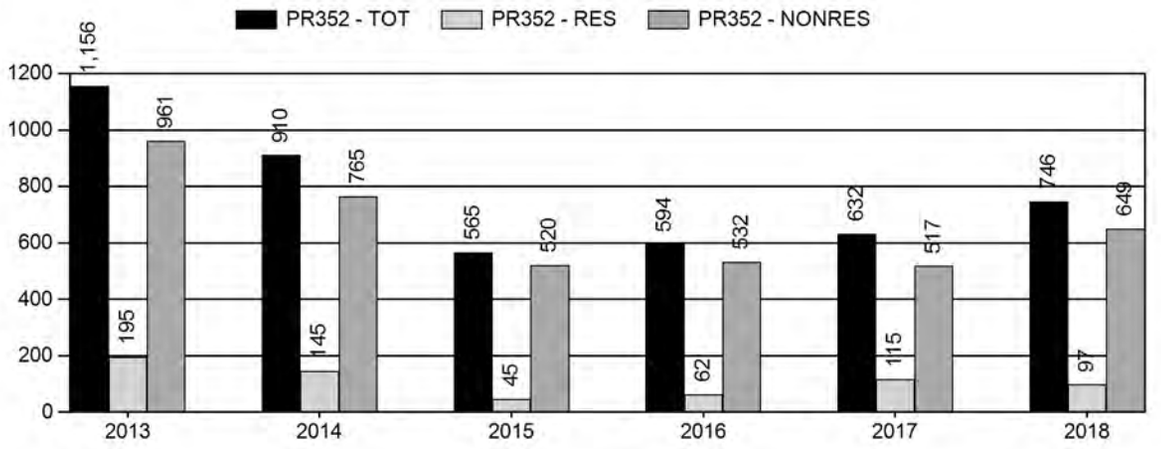
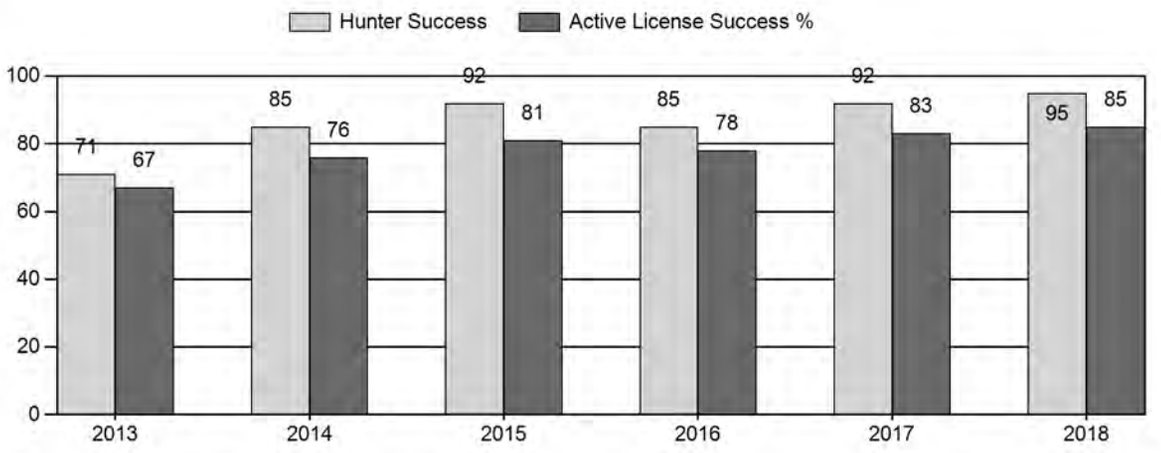


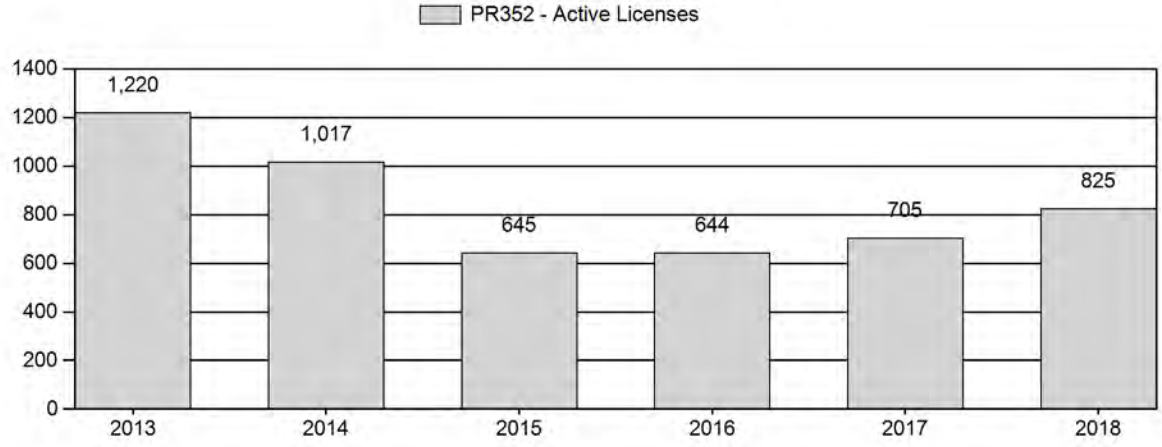
Number of Active Licenses



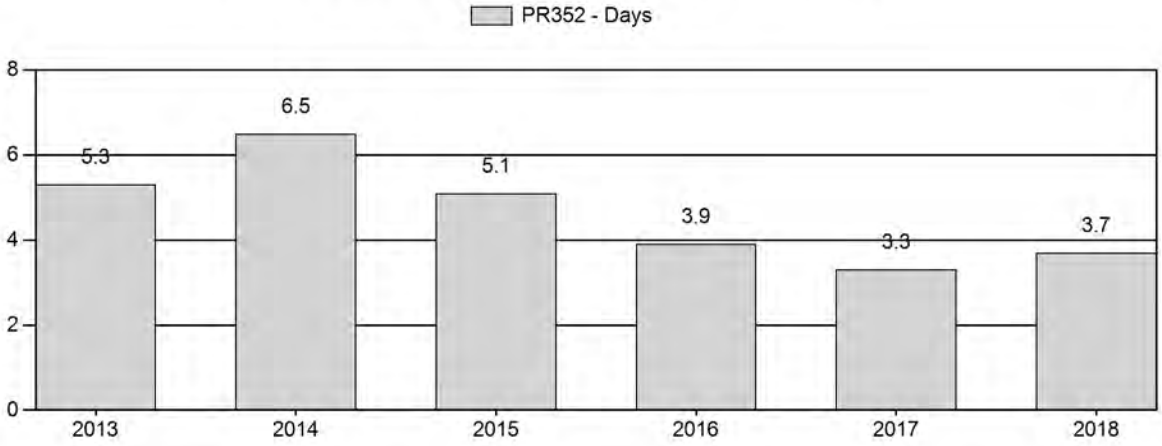
Harvest Success



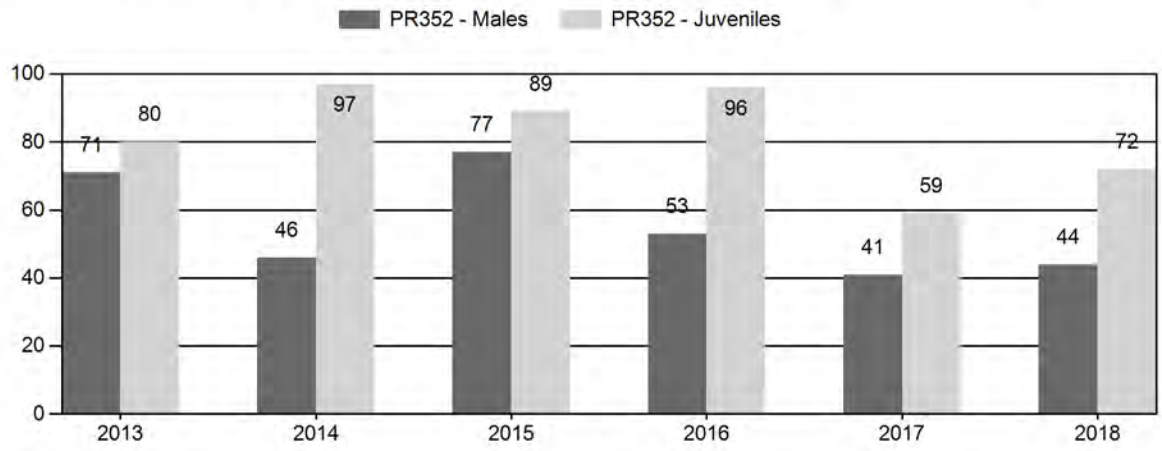
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary

for Pronghorn Herd PR352 - MIDDLE FORK

		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	7,048	85	280	365	28%	513	40%	412	32%	1,290	2,490	17	55	71	± 7	80	± 8	47
2014	6,801	43	122	165	19%	355	41%	346	40%	866	3,317	12	34	46	± 7	97	± 11	67
2015	6,741	96	162	258	29%	336	38%	298	33%	892	3,123	29	48	77	± 10	89	± 11	50
2016	7,048	74	118	192	21%	364	40%	349	39%	905	3,546	20	32	53	± 7	96	± 11	63
2017	6,093	21	73	94	21%	227	50%	134	29%	455	0	9	32	41	± 8	59	± 10	42
2018	6,764	24	90	114	20%	260	46%	186	33%	560	2,795	9	35	44	± 8	72	± 11	50

2019 HUNTING SEASONS

MIDDLE FORK PRONGHORN HERD (PR352)

Hunt Area	Type	Season Dates Opens	Season Dates Closes	Quota	License	Limitations
21	1	Oct. 15	Oct. 31	500	Limited quota	Any antelope
21	6	Oct. 15	Oct. 31	400	Limited quota	Doe or fawn

Special Archery Season Hunt Area	Season Dates Opens	Season Dates Closes
21	Aug. 15	Oct. 14

SUMMARY OF CHANGES IN LICENSES NUMBERS

Hunt Area	Type	Quota change from 2018
21	1	No change
	6	No change
Herd Unit Total		**No change**

Management Evaluation
Current Postseason Population Management Objective: 6,000
Management Strategy: Recreational
2018 Postseason Population Estimate: ~5988
2019 Proposed Postseason Population Estimate: ~6202
2018 Hunter Satisfaction: 83% Satisfied

Herd Unit Issues

The Middle Fork Pronghorn Herd Unit consists of hunt area 21 and is managed by the Buffalo Wildlife Biologist. The management objective is a post-season population of 6,000 pronghorn, which was increased from 2,100 in 2013. The management strategy is recreation management, with the goal of a pre-hunt buck:doe ratio of 30 – 59 bucks:100 does. The herd objective was last reviewed in 2018 and no changes were made.

Pronghorn densities are highest in the eastern section of the hunt area and lower on the mountain slope. The southeast corner of the hunt area and the mountain slope have large amounts of public land but the majority of the hunt area is private. Many public lands are inaccessible to the public due to landownership patterns and hunting on private land is predominantly controlled by outfitters. Conversely, the Natrona 16 walk-in area provides excellent access and connectivity to public land in prime pronghorn habitat. In general, there is a disproportionate amount of hunting pressure on accessible public lands. Often, the outfitted hunting which takes place on private land limits the ability to achieve adequate doe/fawn harvest to manage the population.

Weather

Weather conditions are summarized from Natural Resources Conservation Services Applied Climate Information System (www.wcc.nrcs.usda.gov) data from the Kaycee and Midwest stations (Station IDs 5055 and 6195, respectively) for precipitation and SNOTEL data from the Grave Springs station (Station ID 501) for precipitation and temperature data. The Palmer Drought Index (www.ncdc.noaa.gov) from Climate Division 5 (Powder, Little Missouri and Tongue drainages) was used to assess drought conditions.

The 2018 biological year began with a very wet June, with 150-297% average precipitation, but was followed by a dry summer (July - Sept) reported in Kaycee (58% average precipitation) and at Grave Springs (58% average precipitation) with no data available from Midwest. Fall (Oct – Dec) precipitation returned to average conditions and ranged from 88% to 119% of average. Winter (Jan-Apr) had lower than average precipitation at Grave Springs and Midwest (46-80%) in contrast to Kaycee which had higher than normal moisture (130%). Averages of mean monthly temperatures in 2018 did not vary greatly from the 20-year averages, however February 2019 had persistent colder than average temperatures. Prior to the 2018 biological year, winter (Jan – Mar 2018) varied from greater than average precipitation (123%) in Kaycee to less than average (58-87%) reported at Midwest and Grave Springs. Conversely, spring (Apr – May) was dryer than average (38-52% precipitation). Even though weather patterns vary greatly within the herd unit, the generally average local weather conditions were corroborated by the broader-scale climate data, which classified all of 2018 as having “mid-range” climate conditions in 2018.

Habitat

The Middle Fork herd unit ranges from low elevation sagebrush grassland with small drainages and breaks in the eastern portion of the unit to higher elevation forested areas with large areas of mountain mahogany and grassland parks. Pronghorn habitat is primarily limited to the eastern portion of the unit, with low densities of pronghorn found in the higher elevation grassland parks.

There is one permanent habitat transect in this herd unit. This transect is in a Wyoming Big sagebrush stand near Tisdale Mountain in the eastern end of the herd unit. Leader growth, hedging class, and age class were measured in fall 2018. Leader production was 2.5cm, which was slightly lower than the ten-year average for that site and may indicate lower forage quality over winter. Hedging class was scored at 1.54, which was lower than the ten-year average and is indicative of high utilization over time. The age class score (2.02) was slightly lower than the ten-year average, which could indicate the recruitment of new seedlings or the death of old decadent plants. Shrub utilization (3.6%) was measured during spring 2018, prior to the biological year, and was markedly lower than the ten-year average. Spring utilization is consistently low, and expected to be light during the spring 2019 survey. Although leader growth was slightly depressed in 2018, indices for hedging, age, and utilization may indicate a general improvement of range conditions; with new younger plant production and reduced browse levels.

Field Data

The pre-season classification was conducted in September of 2018 via ground classifications and resulted in 560 pronghorn being classified. The 2018 classification objective was approximately

2,800 pronghorn. We have failed to achieve an adequate sample size for the past ten years. Low sample sizes are due to limited road access and limited viewsheds from those roads due to terrain.

Classifications in 2018 yielded a fawn:doe ratio of 72:100, which is a notable increase from the 2017 ratio (59:100) but still below the five-year average (84:100 from 2013-2017). Sample sizes of pronghorn classified in 2017 (455 pronghorn) and 2018 were the lowest samples observed in the last ten years and could explain the lower fawn:doe ratios in those years.

The 2018 buck:doe ratio was 44:100 which is lower than the previous five-year average (58:100 from 2013 – 2017). The large variation (41-77 from 2008 to 2018) and lack of trend is likely due to inadequate classification samples. Furthermore, multiple personnel changes in the last ten years may be contributing to inconsistencies in the survey.

Post-season landowner surveys had some conflicting responses. While 14 landowners responded to the survey, some did not answer all of the questions. Forty-five percent of the respondents (n = 11) noted that the population was at desired levels, while 36% responded the population was above desired levels and 18% responded that it was below. When asked if landowners were satisfied with management, 92% (n = 13) were neutral, satisfied, or very satisfied. Seventy-one percent (n = 14) of respondents would keep the 2019 season the same as in 2018. Overall, there was no overwhelming response that would suggest major management changes are necessary.

Harvest Data

Total harvest in 2018 (705 pronghorn) was notably higher than the previous three years (504 – 584) and slightly higher than the previous five-year average (641 from 2013 to 2017). Hunter success (95%) and active license success (85%) were well above the previous five-year averages (85% and 77%, respectively).

The Type 1 and Type 6 license quotas were each reduced by 200 licenses in 2015 due to lower pronghorn numbers, low hunter success, and an increasing trend in hunter effort. The Type 1 and Type 6 quotas were increased by 50 and 100 licenses, respectively in 2018 in response to impressively high hunter success (92%) and active license success (83%) in 2017. Success rates increased in 2018 even with the increase in licenses available. Hunter effort increased slightly in 2018 (3.7 days per animal harvested) from 2017 (3.3 days) but is markedly lower than the previous five-year average (4.82 days from 2013 – 2017). Both license types sold out in the draw.

The hunter satisfaction survey showed 83% of hunters in 2018 were either satisfied or very satisfied. Hunter satisfaction decreased from 2017 (91%), which is surprising given the high success rates but could be explained by the increase in effort. Hunter satisfaction was more similar to that reported in 2015 (83%) and 2016 (82%). Hunter satisfaction is likely affected by access and we do not know how the satisfaction rates and success rates vary between public and private land hunters. Multiple hunter comments complained about overcrowding on public land, which is expected in hunt areas with difficult public access. We also received complaints about illegal off-road vehicle use on Bureau of Land Management property, which Wyoming Game and Fish does not enforce.

In general, the high hunter success and satisfaction suggest that the 2015 license reductions paired with the high productivity of this herd are providing a better hunting experience. The moderate

increase in licenses in 2018 appears to have provided additional hunting opportunity without diminishing the hunting experience.

Population

We used integrated population models, referred to as Excel Spreadsheet Models, based on White and Lebow (2002) to estimate the pronghorn population. Model parameters and input follow the "User's Guide: Spreadsheet Model for Ungulate Population Data" (Morrison 2012).

The semi-constant juvenile/semi-constant adult (SCJ/SCA) model out-performed the other models and produced the lowest AIC value (132). Classification data, harvest data, and line transect surveys inform the model. Line transect (LT) surveys provide end-of-year population estimates. Eight LT surveys have been conducted over the last 20 years, with the most recent occurring in 2018.

The 2018 LT survey was analyzed using the program Distance. Final analysis used a Uniform Cosine model with no stratification and five observation bins adjusted by average altitude relative to 300 feet. Model selection was based on lowest AIC (670) while maintaining maximum degrees of freedom. Uniform Cosine models with the five observation bins combined into four observation bins provided lower AIC values, however they were not selected because they reduced the power of the analysis (i.e. degrees of freedom) and did not meet the model assumptions as well as the five bin model. The final model met the assumption of higher detection rates (i.e. detection probability) of pronghorn closer to the aircraft (Figure 1) and resulted in reasonable percent coefficient variation (5.4 – 12.9%, with the goal of less than 15%). The model estimated pronghorn density to be 8.4 pronghorn per square mile, resulting in a population estimate of 5,284 pronghorn with a standard error of 1.1 pronghorn per square mile (± 680 pronghorn).

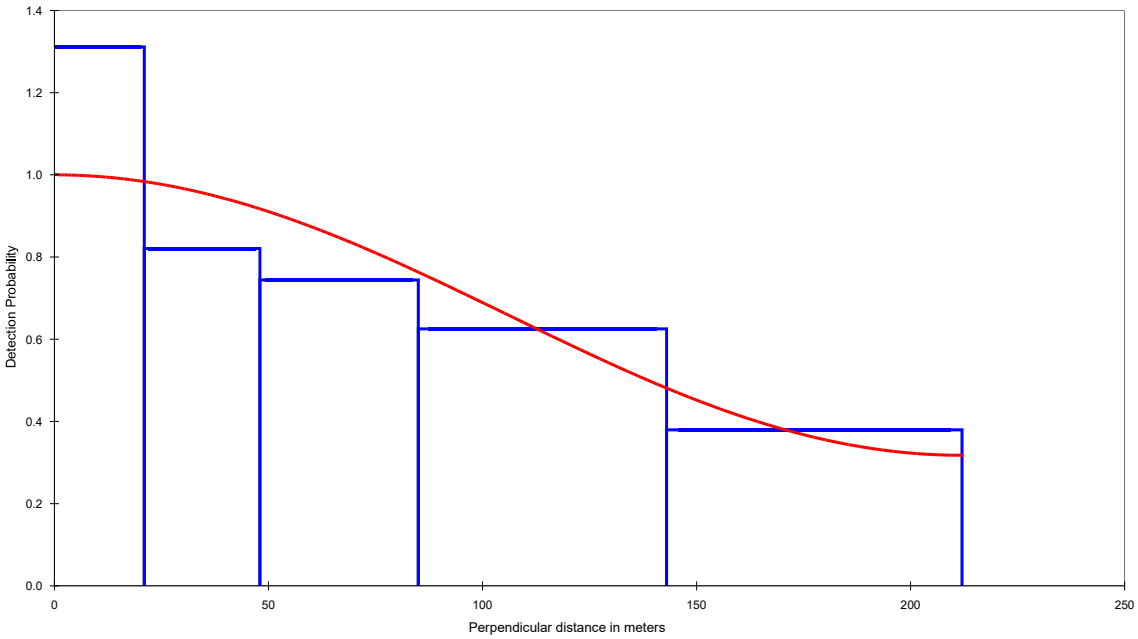


Figure 1. Detection probability plot with five observation distance bins for Line Transect survey analysis.

The excel spreadsheet population model estimate for 2018 was 5,988 pronghorn. This model result fell slightly outside of the upper limit of the 2018 LT confidence interval (5,284 - 5,964 pronghorn). The 2012 population estimate (5,041) also exceeded that years' LT population estimate (3,564 – 4,824). The excel model does track the same population increase as observed in the differences between the 2012 and 2018 LT population estimates. The model shows a fluctuating but relatively stable population trend that has been within objective since the objective was increased to 6,000 in 2013. Better classification data with an increase in sample size would provide much higher quality data to inform the model. The model does appear to be tracking general population trends and provides reasonable population estimates as compared with the last two LT surveys. This model is therefore considered fair.

Management Summary

This herd unit is at objective and we do not expect excessive winter mortality or reductions in fawn:doe and yearling male:doe ratios in 2019.

After increasing the Type 1 and Type 6 licenses in 2018, hunter success (95%) and hunter satisfaction (83%) were both extremely high. It is challenging to determine quotas in this area that provide enough harvest opportunity for population management, while minimizing crowding on public lands and maintaining high harvest rates. Population management goals are to maintain the current population, which requires high harvest rates due to high productivity (fawn:doe ratios) according to the excel spreadsheet model.

A harvest of 617 pronghorn is projected for the 2019 hunting season. We do not expect hunter success to remain over 90%, however we do not expect success or satisfaction to change significantly. We continue to anticipate comments expressing frustration about access issues given land ownership patters. If we maintain the population at objective, it seems reasonable that most landowners will continue to be satisfied with the population, while a smaller portion will think the numbers are too high or too low.

We will continue to attempt to increase our sample size for classifications and plan on conducting another line transect survey during spring 2021. We are hopeful that the Natrona 16 walk-in area continues enrollment in the Access Yes program because of the access and opportunity it provides to public land hunters.

Literature Cited

Morrison, T. 2012. User Guide: Spreadsheet model for ungulate population data. Wyoming Cooperative Fish and Wildlife Research Unit. Unpublished. 41 pp.

White, G.C. and B.C. Lubow. 2002. Fitting population models to multiple sources of observed data. Journal of Wildlife Management 66:300-309.

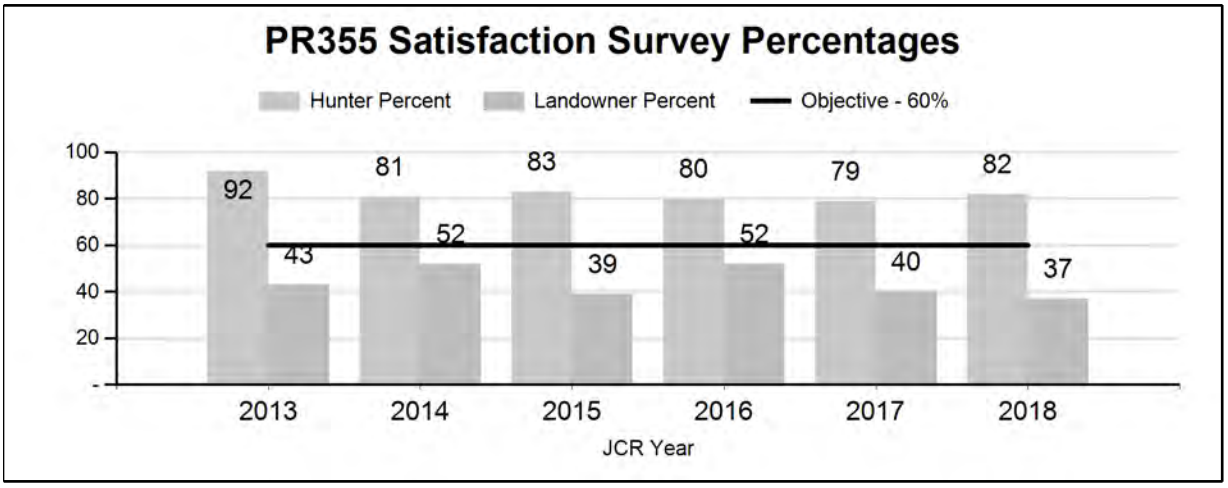
2018 - JCR Evaluation Form

SPECIES: Pronghorn
HERD: PR355 - BECKTON
HUNT AREAS: 109

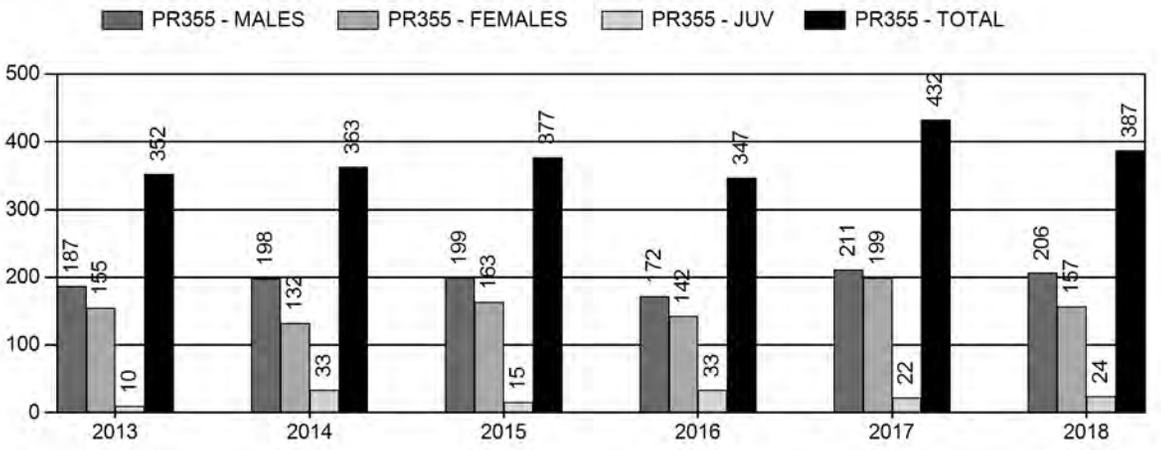
PERIOD: 6/1/2018 - 5/31/2019
PREPARED BY: TIM THOMAS

	2013 - 2017 Average	2018	2019 Proposed
Hunter Satisfaction Percent	82%	82%	80%
Landowner Satisfaction Percent	45%	37%	60%
Harvest:	374	387	400
Hunters:	469	524	500
Hunter Success:	80%	74%	80%
Active Licenses:	523	600	575
Active License Success:	72%	64%	70%
Recreation Days:	1,753	1,887	1,750
Days Per Animal:	4.7	4.9	4.4
Males per 100 Females:	35	31	
Juveniles per 100 Females	55	61	

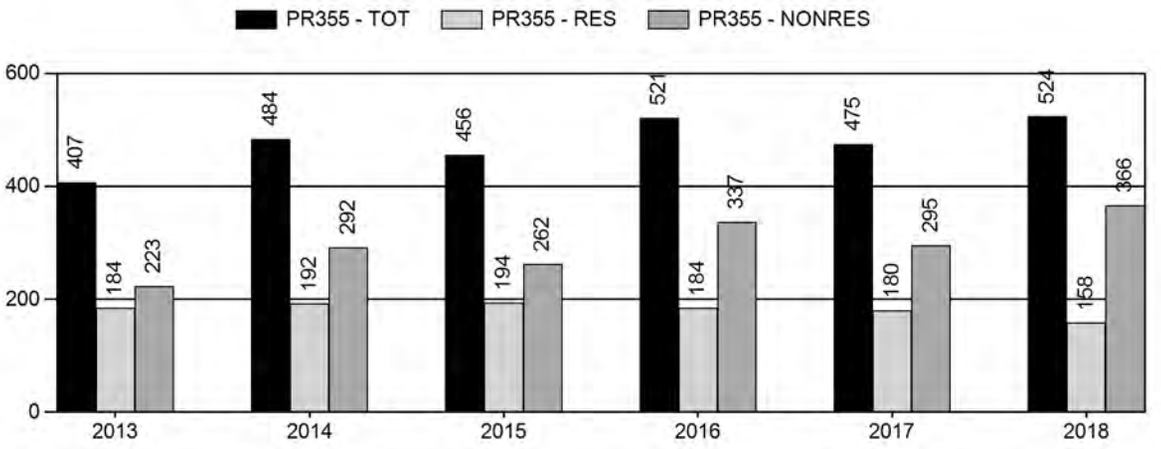
Satisfaction Based Objective	60%
Management Strategy:	Private Land
Percent population is above (+) or (-) objective:	0%
Number of years population has been + or - objective in recent trend:	2



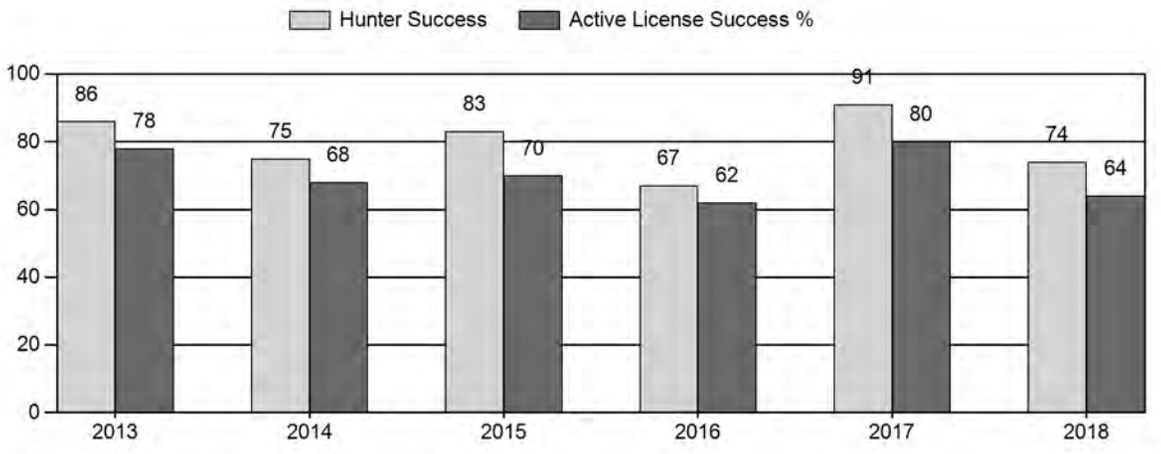
Harvest



Number of Active Licenses



Harvest Success



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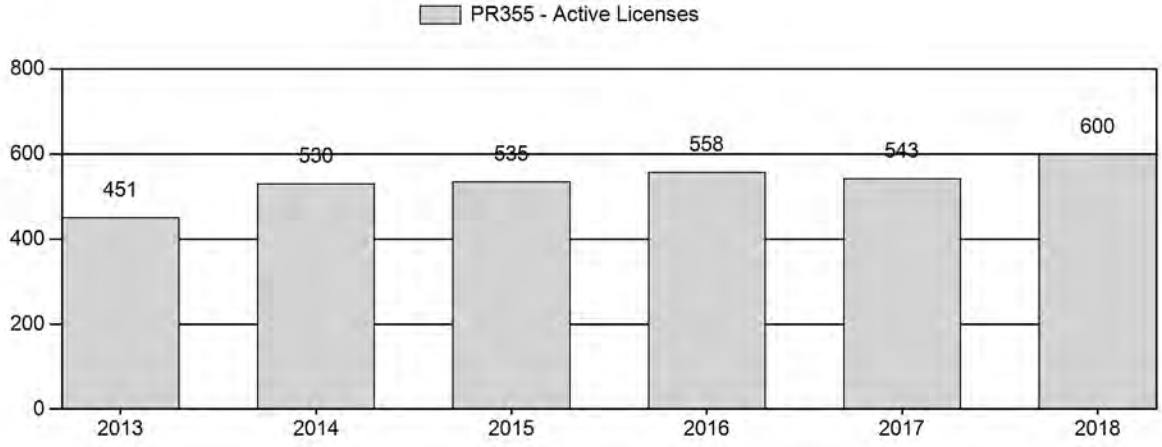
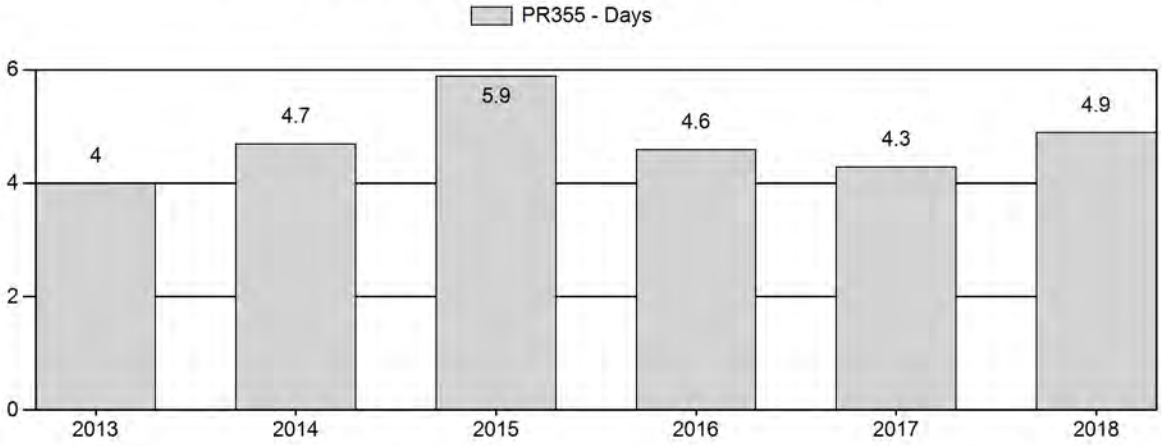
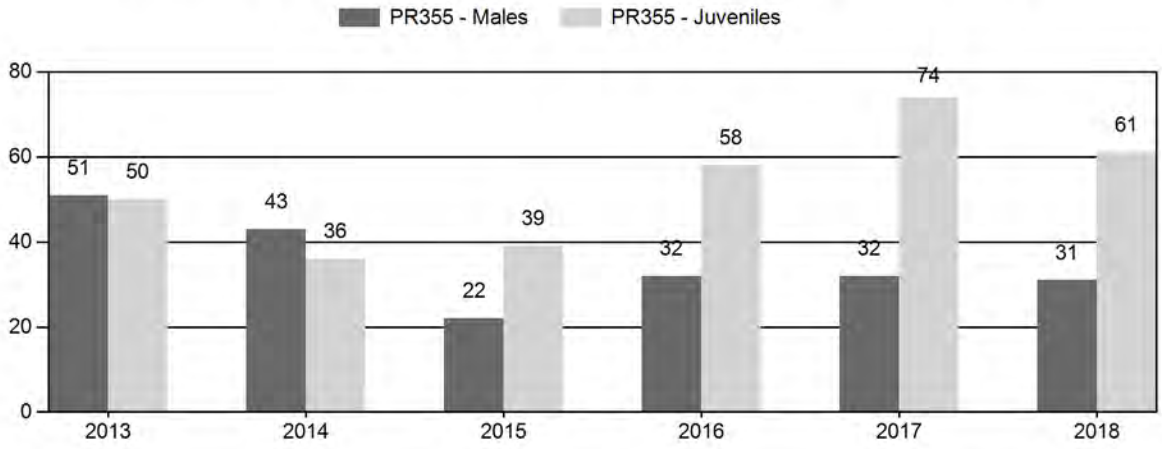


Days Per Animal Harvested



Preseason Animals per 100 Females



2013 - 2018 Preseason Classification Summary for Pronghorn Herd PR355 - BECKTON																		
		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	1,851	16	38	54	25%	105	50%	53	25%	212	792	15	36	51	± 13	50	± 13	33
2014	1,521	7	16	23	24%	53	56%	19	20%	95	815	13	30	43	± 17	36	± 15	25
2015	0	8	12	20	14%	92	62%	36	24%	148	660	9	13	22	± 0	39	± 0	32
2016	0	25	45	70	17%	221	53%	128	31%	419	992	11	20	32	± 0	58	± 0	44
2017	0	14	21	35	16%	108	48%	80	36%	223	1,405	13	19	32	± 0	74	± 0	56
2018	0	19	32	51	16%	167	52%	102	32%	320	1,187	11	19	31	± 0	61	± 0	47

2019 HUNTING SEASONS
BECKTON PRONGHORN HERD (PR355)

Hunt Area	Type	Season Dates		Quota	License	Limitations
		Opens	Closes			
109	1	Sep. 15	Nov. 30	350	Limited quota	Any antelope
	6	Sep. 15	Nov. 30	400	Limited quota	Doe or fawn

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

Hunt Area	Type	Quota change from 2018
109	1	
	6	+ 50
Herd Unit Total		**+50**

Management Evaluation
Current Hunter / Landowner Management Objective: 60% Satisfaction
Secondary Management Objective: Observed ratio of 30 bucks:100 does minimum
Management Strategy: Private Land
2018 Hunter Satisfaction Estimate: 82%
2018 Landowner Satisfaction Estimate: 37%
Most Recent 3-year Running Average Hunters Satisfaction Estimate: 80%
Most Recent 3-year Running Average Landowner Satisfaction Estimate: 43%

Herd Unit Issues

The Beckton Pronghorn Herd Unit is located in northcentral Wyoming, west of Sheridan. The herd unit is west of Interstate Highway 90, north of South Piney Creek and off national forest, along the eastern foothills of the Bighorn Mountains. This herd unit contains the towns of Sheridan, Ranchester and Dayton, and the communities of Story and Big Horn. There is also significant rural-residential development throughout the herd unit. This herd unit contains one antelope hunt area, Area 109.

The primary management objective for the Beckton Pronghorn Herd Unit is a Landowner and Hunter Satisfaction Objective at 60% or higher, with a secondary management objective of 30 or more bucks observed per 100 does. The management strategy is Private Land Management. The objectives and management strategy were last revised in 2014. We conducted a 5-year evaluation of the management objective and strategies in 2019, resulting in no changes.

The majority of this herd unit is private fee title lands, with much of it developed as rural residential areas or small acreage ranchettes. There are few public land hunting opportunities available. The restricted access has made it difficult to attain adequate harvest to regulate pronghorn numbers in portions of this herd unit. Rural residential development limits safe hunting opportunities in several

areas. Outfitting on some larger ranches also limits non-outfitted hunting opportunity, and hence harvest. There are several AccessYes Walk-In Areas and one Hunter Management Area that provide some limited public hunting opportunity.

Herd Unit Objective Review

The herd unit objective and management strategy were last reviewed in 2014. We evaluated and considered population status, landowner and hunter satisfaction, observed buck to doe ratios and habitat data included in this report. The current object and strategy meet our management needs. We concluded a change is not warranted at this time. We will review the herd objective and management strategy again in 2024. If the situation arises that a change is necessary, we will review and submit a proposal as needed.

Weather

Temperature and precipitation data referenced in this section were collected at the Sheridan Co Airport (#488155) weather station located within this herd unit. Historic climate data are reported by the Western Region Climate Center (www.wrcc.dri.edu).

The 2018 spring cool, with below normal temperatures in March and April, and near normal precipitation. May was warner than normal and wet, with over an inch of precipitation above normal. This allowed for a good start for grasses and forbes, providing high quality forage just prior to and during parturition. Temperatures remained near normal during the summer and early fall. Conditions were dry during June, but above average precipitation in July and August. September and November were near normal for temperature and precipitation, while October saw above normal precipitation and cooler temperatures. December and January was generally open, with slightly below average precipitation and above average temperatures. February turned cold, with average temperature ~14ºF below normal. There were several periods of 0^0F or below, with at least one -20^0F day. March was generally colder than average with decreased precipitation while April was generally about normal for both temperature and precipitation. May was ~5ºF below average, with a 2.5 times increase in precipitation. Cool wet weather during parturition may adversely influence neonate survival.

While adult wildlife entered the winter in good condition, they faced severe weather conditions during periods February and early March. Fawns, being more susceptible to cold temperatures, likely saw average over-winter survival. We received some reports of over-winter fawn mortality this year.

Habitat

There are no habitat transects within or near this herd unit. This herd unit is located along the foothills of the Bighorn Mountains and contains open rangeland dominated by short-grass prairie and big sagebrush, dry land and irrigated crop lands, mountain shrub draws and numerous rural subdivisions.

Two new invasive annual grasses – medusahead (*Taeniatherum caput-medusae*) and ventenata or wiregrass (*Ventenata dubia*) – have been found in this herd unit. These invasive annuals, along with the already established exotic annuals cheatgrass or downy brome (*Bromus tectorum*) and Japanese brome (*Bromus japonicus*), reduce habitat quality over time by out competing more

desirable forage plants. Also, fire frequency often increases with the presence of annual grasses, decreasing shrub components, such as big sagebrush, on the landscape. This could have long-term repercussions for pronghorn.

Field Data

During August, biologists and wardens conduct herd classification surveys using ground survey techniques. Designated routes are driven along county roads and all observed pronghorn are classified by gender and relative age cohort. This is generally considered a low priority herd unit when prioritizing workloads, often resulting in low sampling effort and small sample sizes. In 2018 we classified 320 pronghorn, the second highest classification count since 2006 but still well below the desired sample size of 1,187 at the 90% confidence level.

Fawn production, as measured by the observed fawn:doe ratio, has exceeded 60 fawns per 100 does only twice (i.e. 2010; 2017; 2018) in the past 15 years, suggesting this herd is not likely to grow quickly, even with limited harvest. In 2018, we observed 61 fawns per 100 does, a substantial decrease from the observed fawn:doe ratio of 74 fawns:100 does in 2017. Fawn production at that level should result in a stable population. With small sample sizes, low effort and associated biases, it can be difficult to draw reasonable conclusions based on these data. While harvest has continued to increase in this herd unit, the population appears to have at least remained stable and distribution continues to expand. This suggests the consistently low observed doe:fawn ratio may be biased and not representative of the true population.

The observed buck to doe ratio can be highly variable between years, likely due to bias associated with small sample sizes and low sampling effort. This year, we observed 31 bucks:100 does, similar to the past two years. Over the past 10 years, the observed buck to doe ratio has varied from 22-61 bucks:100 does, with an average of 38 bucks:100 does. Based on the 3-year running average (i.e. 32 bucks:100 does) we are just above the minimum of 30 males:100 females to satisfy the secondary management objective. We will monitor buck numbers over the next few years and make efforts to maintain or increase samples size during future classification surveys to monitor this objective.

Hunter satisfaction has remained high, with 82% of surveyed hunters (n=110) satisfied or very satisfied in 2018. The relatively high hunter satisfaction level may reflect Department personnel efforts to advise prospective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license.

Nonresident hunter (n=85) satisfaction this year (85%) increased from 2017 (80%) and was similar to previous years (2016 - 85%; 2015 - 85%). We saw a continued increase in the demand for leftover antelope licenses, which started in 2014. Seventy-two percent of resident hunters (n=25) were satisfied or very satisfied with their hunting experience in 2018, a decrease from 76% in 2017.

Harvest Data

An estimated 524 hunters harvested an estimated 387 pronghorn, the second highest harvest ever. Harvest decreased 10% compared to 2017, despite a 10% increase in hunters and active licenses. Pooled hunter success was 74%, the lowest in three years and below the previous 5-year average success rate of 78%. Hunters with a Type 1 (any antelope) license had a higher success rate (72%)

than Type 6 (doe or fawn) license holders (57%). Hunter success by license type was below the reported statewide harvest success for both license types (Type 1 72% vs. 87%; Type 6 57% vs. 84%). Hunter effort, as measured by the number of days hunted per animal harvested, was 4.9 days/animal, an increase from 2017 (4.3 days/harvest) and the same as the most recent 5-year average. This is considerably above the statewide effort rate of 3.2 days hunted per antelope harvested.

We continue to harvest relatively high buck numbers, with 206 bucks harvested this year, the second highest ever. During the past 10 years, we have averaged 176 bucks harvested annually, and 1,756 bucks total. We may be reducing buck numbers below desired levels with the current rate of buck harvest. Observed buck ratios and buck harvest will be monitored to assure we maintain at least 30 bucks per 100 does.

Population

We changed the management objective for this herd unit from a postseason population objective to a hunter / landowner satisfaction objective. Due to this herd's small size, both in numbers and geographically, we have never flown a line transect survey in this herd unit. A trend count was last conducted in May 1999, when 382 pronghorn were counted, resulting in an estimated ~1,500 pronghorn (25% sightability estimated).

We have a spreadsheet population simulation model constructed with only harvest and classification data to align the model. Classification data are collected somewhat sporadically and is likely biased due to low sampling effort, small sample sizes, and sampling protocol (i.e., sampling only along public roads). Modeling parameters, specifically adult and juvenile survival rates, are set wider than recommended to make this model work reasonably.

The "Time-Specific Juvenile – Constant Adult Survival Rate" (TSJ,CA) spreadsheet simulation model was chosen to estimate the post-season population. This model had the highest relative Akaike information criterion (AIC) value (135), but had the best fit (31) of the three possible models. It also seemed to better model manager's perceptions of population dynamics. Since we have limited management data, small survey sample size, sporadic data collection, and no independent population estimate, we consider this a "poor" population model. As such, managers have little faith in the actual estimate.

Landowners who responded (n = 19) to an annual survey indicated pronghorn populations where 'at' (37%) or 'above' (63%) desired levels (Fig 1); and suggested similar (58%) or more liberal (37%) hunting season strategies as in recent years. This annual survey reflects relative pronghorn numbers based on landowner's perceptions and tolerance for pronghorn. Even with record pronghorn harvest each of the past six years, the majority of landowners responding to this survey have higher pronghorn numbers than desired (Fig. 1).

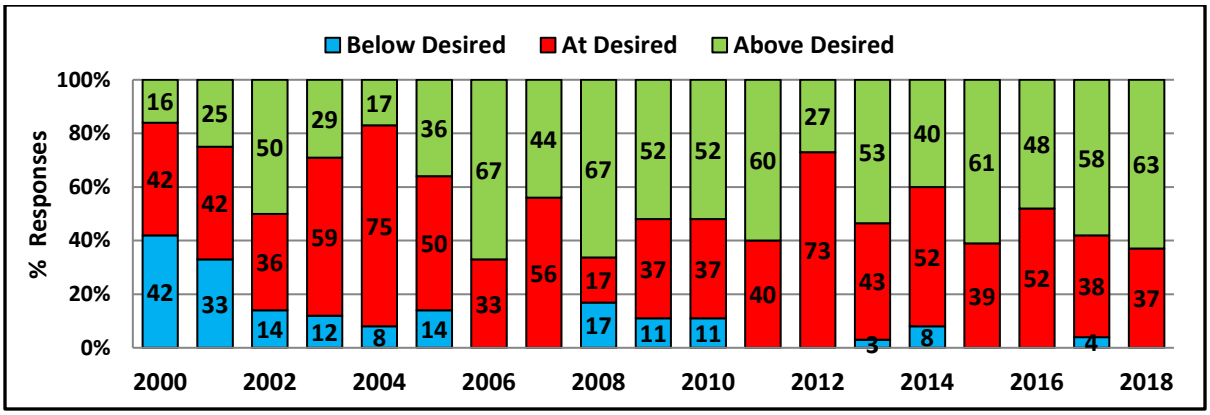


Figure 1. Relative landowner perceptions of pronghorn antelope populations on their property in the Beckton Pronghorn Herd Unit, by percentage. Desired level is a subjective expression of individual landowner tolerance of pronghorn. Respondent sample size varies, with some years as low as 6 responses.

Management Summary

The regular hunting season traditionally runs 10 weeks (September 15 – November 30) for both Type 1 and Type 6 licenses, with an archery pre-season August 15 – September 14. Hunters are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, if available, which allows hunters the opportunity to harvest multiple animals. There is limited pronghorn hunting on scattered State Trust Lands, as well as three Walk-In Areas and one Hunter Management Area. We commonly observe high buck numbers, as measured by buck:doe ratios, averaging 42 bucks:100 does over the long-term (n=34 years). This is likely a function of limited access to private lands where the majority of pronghorn occur. We may be reducing buck numbers due to high harvest rates in recent years. The most recent 5-year average is 32 bucks:100 does. This could be a function of low sample size and sampling design also.

We project a harvest of approximately 400 pronghorn in 2019, resulting in an estimated post-season population of about 2,700 pronghorn. These predictions assume average fawn survival, as well as similar license sales and similar success rates as the 2018 hunting season. Due to our inability to successfully place hunters on private land where a lot of pronghorn live, our ability to manage this population towards desired objectives (i.e. higher landowner satisfaction) with hunting is very limited.

We increased Type 6 (doe or fawn) licenses by 50 for the 2019 season. This was in response to requests from some landowners who desire to increase pronghorn harvest. We maintained Type 1 (any antelope) license numbers for 2019. We have some concern about the current level of buck harvest as well as our ability to place additional buck hunters. We are concerned with low participation rate on these licenses. We will make an effort to better place hunters with landowners for this coming season.