

## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2014 - 5/31/2015

HERD: PR309 - PUMPKIN BUTTES

HUNT AREAS: 23

PREPARED BY: ERIKA PECKHAM

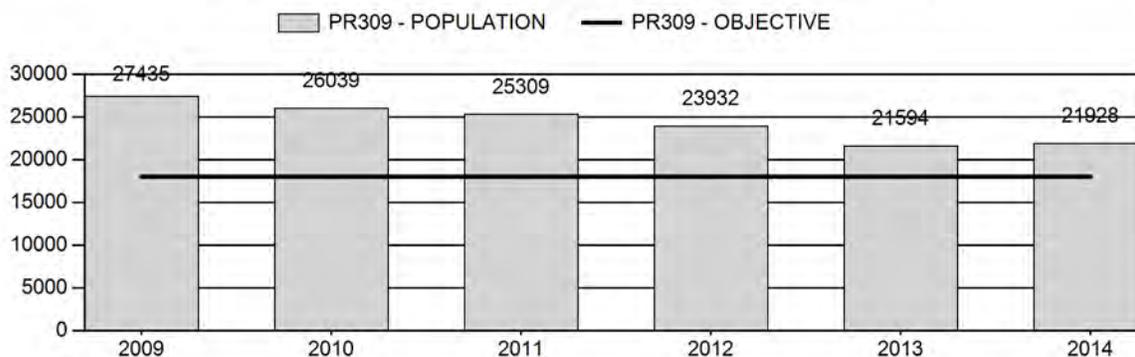
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	24,862	21,928	21,014
Harvest:	2,432	2,333	2,375
Hunters:	2,594	2,656	2,700
Hunter Success:	94%	88%	88%
Active Licenses:	2,694	2,764	2,800
Active License Success:	90%	84%	85 %
Recreation Days:	8,095	9,900	9,500
Days Per Animal:	3.3	4.2	4
Males per 100 Females	57	39	
Juveniles per 100 Females	68	80	

Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	22%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/25/2015

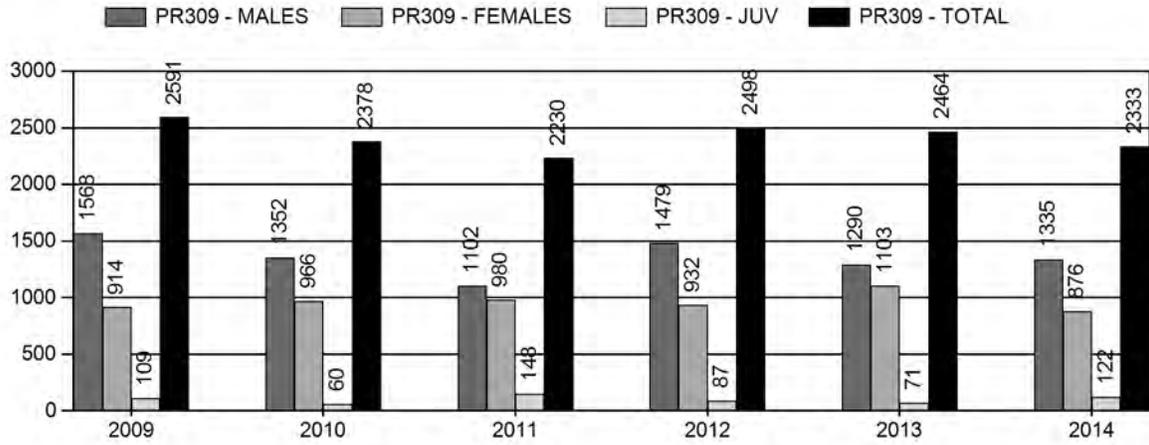
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	11.9%	9.7%
Males ≥ 1 year old:	25.0%	26.8%
Juveniles (< 1 year old):	0%	0%
Total:	11%	10%
Proposed change in post-season population:	-8.7%	-2.7%

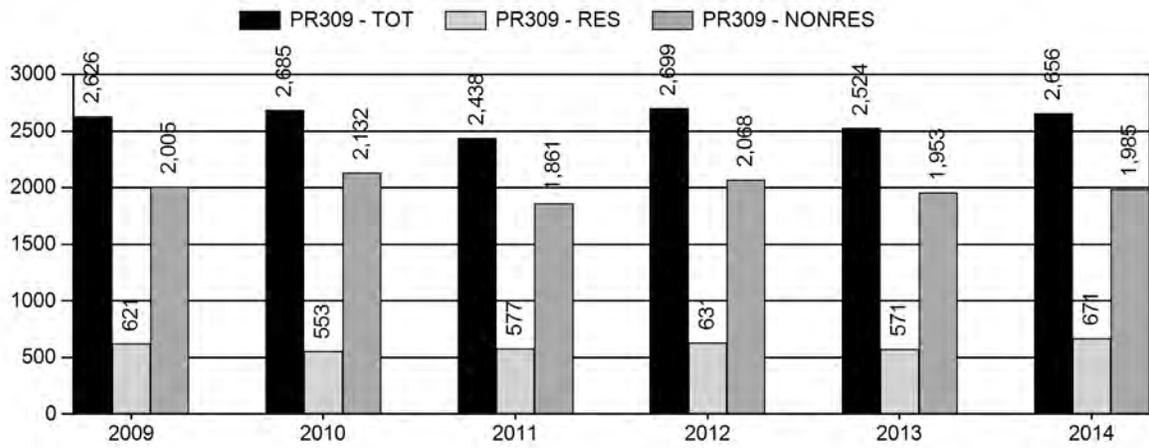
### Population Size - Postseason



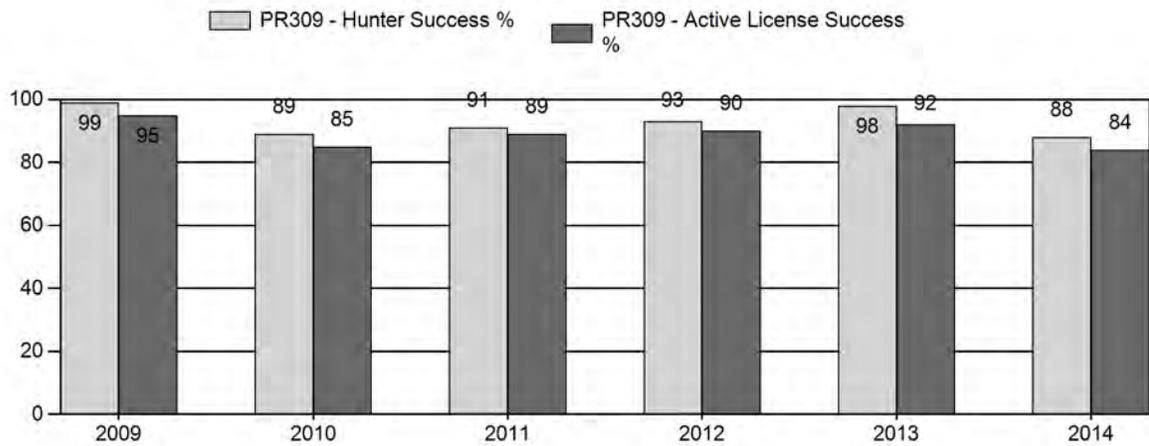
# Harvest



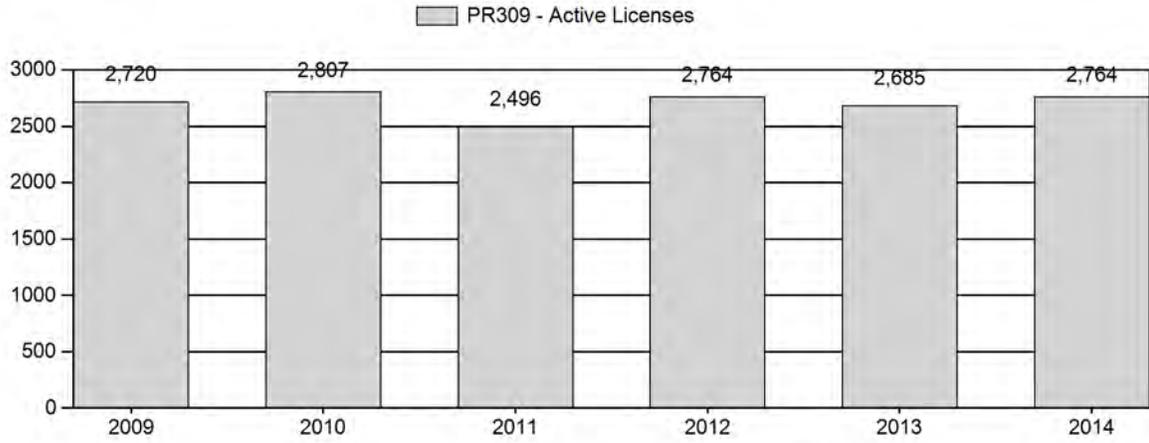
# Number of Hunters



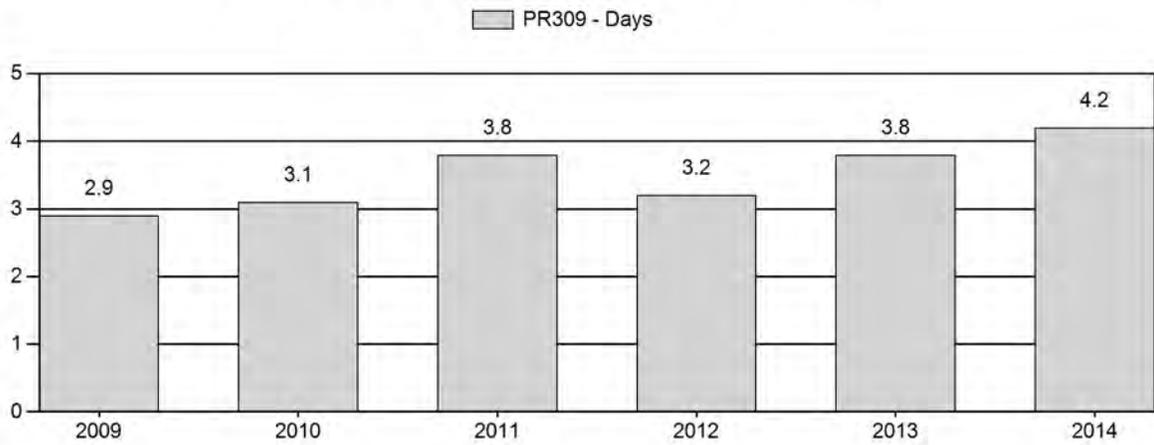
# Harvest Success



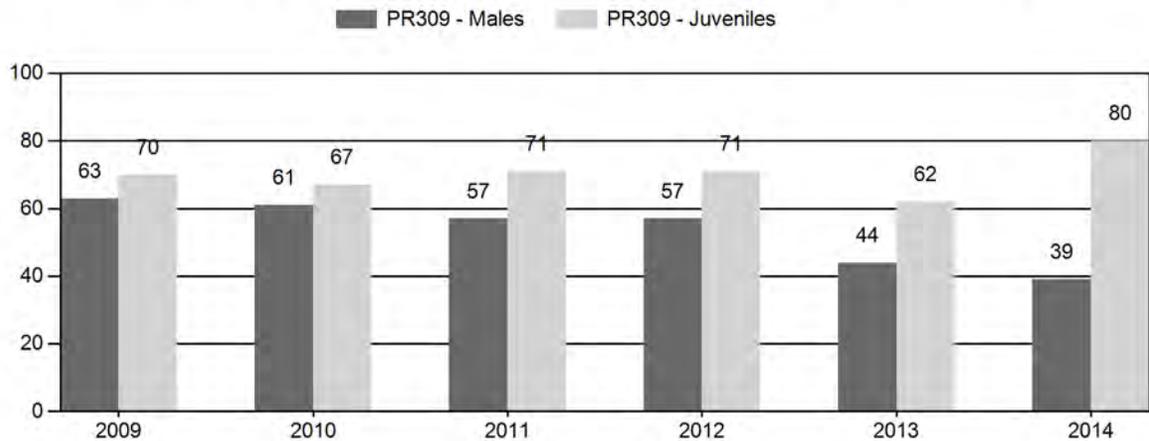
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR309 - PUMPKIN BUTTES

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	30,285	254	568	822	27%	1,313	43%	915	30%	3,050	2,918	19	43	63	± 4	70	± 5	43
2010	28,655	248	536	784	27%	1,294	44%	867	29%	2,945	2,740	19	41	61	± 4	67	± 5	42
2011	27,762	172	284	456	25%	796	44%	563	31%	1,815	2,713	22	36	57	± 5	71	± 6	45
2012	26,685	195	188	383	25%	672	44%	479	31%	1,534	2,748	29	28	57	± 6	71	± 7	45
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 HUNTING SEASONS  
PUMPKIN BUTTES PRONGHORN HERD (PR309)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Open	Closes			
23	1	Oct. 1	Oct. 31	1,750	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	1,300	Limited quota	Doe or fawn
Archery		Sep. 1	Sep. 30			Refer to Section 3 of this Chapter

**Management Evaluation**

**Current Postseason Population Management Objective: 18,000**

**Management Strategy: Recreational**

**2014 Postseason Population Estimate: ~21,900**

**2015 Proposed Postseason Population Estimate: ~21,000**

**Herd Unit Issues**

The postseason population objective for the Pumpkin Buttes Pronghorn Herd Unit is 18,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1989 and are scheduled for review in 2015. The largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

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 associated with the infrastructure required to support coal bed methane extraction. This development has tapered off and in some portions of this herd unit wells are being abandoned and reclaimed. Proper reclamation will be integral in keeping habitat intact. Portions of this herd unit are experiencing increased activity pertaining to conventional oil well drilling and production, with many wells transitioning from the planning to development stage. 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 2013 and into 2014 was optimal for rangeland conditions in this area. The growing season commenced with plentiful rainfall and ideal conditions to produce ample forage. The winter of 2013-2014 was moderate with not much for snow accumulation, or prolonged

snow cover. The winter of 2014-15 was mild with minimal snow and frequent above average temperatures. The Palmer Drought Index indicates that throughout 2014, the conditions in the Powder River drainage were “moderately moist”. During the majority of these two winters, the ground was open, with minimal snowpack. As a result over winter survival was likely high.

### **Habitat**

The Schoonover Wyoming Big Sage habitat transect is located within this herd unit. The utilization is typically very light on this transect. In the fall of 2014 the transect survey showed the average leader growth to be 2.1 cm, slightly lower than the 2.7 cm 10 year average. It is unknown why the growth was lower than the preceding 10-year average, as conditions were favorable for optimal growth.

### **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. High fawn to doe ratios coupled with limited access and low harvest have allowed this herd to exceed the management objective in the past. In 2014 the fawn to doe ratio was 80, up substantially from 62 in 2013. Conversely, the buck ratio was 39, which is the lowest it has been since 1980, or the first year on record, with the preceding 5 year average at 56. As this is a predominantly private land area, landowner post-season surveys are considered. In 2014, 67% of respondents felt that pronghorn numbers were at the desired level.

### **Harvest**

In 2014 there were 3,050 licenses available, 1,750 Type 1 and 1,300 Type 6. Both license types were sold out by the close of the season. Hunter success in this herd unit has averaged 94% over the preceding 5 years. 2014 had an overall success rate of 88%. It is felt that this area received more pressure than is typical in 2014. A high volume of non-resident hunter phone calls were received, with numerous people stating that they didn’t draw where they typically do. As there were plentiful licenses after the draw, people noticed this and likely purchased licenses without having access to private land. In years past, licenses have not always sold out, and it is probable that in 2014 there were a fair number of people that were unable to harvest an animal due to very limited public access.

### **Population**

The “Constant Juvenile – Constant Adult Mortality Rate” (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd (AIC value 151). The model appears to generally represent the population and trend and is considered a fair model. The 2014 post-season population estimate was 21,900. The last line transect survey was conducted in this herd unit in June of 2013, which resulted in an estimated population of 14,300 pronghorn at that time. Line transects were also flown in 2006 and 2009, with estimates of 32,900 and 18,000, respectively. Unfortunately, there is not information present to calculate the Standard Error for the 2006 line transect. Until this information is found, this line transect estimate is of little use to this model, except to evaluate the model on the point estimates.

## **Management Strategy**

The traditional season in this hunt area has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. The number of Type 1 and Type 6 licenses were not changed. The majority (78%) of landowners that responded to the survey indicated that they feel pronghorn are either around where they should be or are higher than they would like to see. According to both the model and field observations and data, this population peaked in 2006 at ~31,000 animals.

If we attain the projected harvest of 2,375 and near normal fawn recruitment, it is projected by the model that the population will slightly decline.

**INPUT**  
 Species: Pronghorn  
 Biologist: Erika Peckham  
 Herd Unit & No.: PR309-PumpkinButtes  
 Model date: 02/21/15

Clear form

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	Constant Juvenile & Adult Survival	142	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	172	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	60	

**Population Estimates from Top Model**

Year	Predicted Prehunt Population (year <i>t</i> )		Total	Predicted Posthunt Population (year <i>t</i> )		Total	Predicted adult End-of-bio-year Pop (year <i>t</i> )		LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females			
1993	8143	6780	12691	7826	4712	11149	23887	5812	11587	17399	18000
1994	11177	5695	11355	10803	3293	9153	23249	5253	10474	15727	18000
1995	8371	5148	10264	8029	3455	8716	20201	4794	9476	14269	18000
1996	8057	4698	9286	7942	3538	8522	20002	4975	9444	14419	18000
1997	7260	4875	9285	7234	3716	8861	19810	4974	9636	14610	18000
1998	8311	4875	9443	8307	3767	9393	21467	5305	10433	15738	18000
1999	8256	5199	10224	8243	4120	10161	22524	5604	11093	16697	18000
2000	9433	5492	10871	9404	4332	10676	24412	6073	11824	17697	18000
2001	9136	5951	11587	9101	4827	11353	25281	6437	12340	18777	18000
2002	11153	6308	12093	11132	5026	11680	27638	7113	13127	20240	18000
2003	9823	6971	12864	9792	5589	12533	27915	7255	13550	20806	18000
2004	10667	7110	13279	10630	5775	12770	29175	7638	13948	21586	18000
2005	11806	7485	13689	11713	6130	13073	30916	8212	14467	22679	18000
2006	11441	8048	14177	11405	6511	13336	31252	8461	14603	23064	18000
2007	9253	8292	14311	9196	6694	13354	29244	8047	14035	22082	18000
2008	10140	7886	13754	10069	6080	12716	28865	7694	13678	21372	18000
2009	9341	7540	13404	9221	5815	12399	27435	7241	13173	20414	18000
2010	8649	7096	12909	8583	5609	11846	26039	6942	12527	19468	18000
2011	8683	6803	12276	8520	5591	11198	25309	6559	12068	18627	18000
2012	8430	6428	11827	8329	4779	10824	23932	6397	11392	17788	18000
2013	6872	6269	11164	6794	4850	9950	21594	5808	10662	16470	18000
2014	8354	5692	10448	8220	4224	9485	21928	5658	10378	16036	18000
2015	7911	5545	10171	7773	4060	9181	21014				18000
2016											18000
2017											18000
2018											18000
2019											18000
2020											18000
2021											18000
2022											18000
2023											18000
2024											18000
2025											18000

Survival and Initial Population Estimates

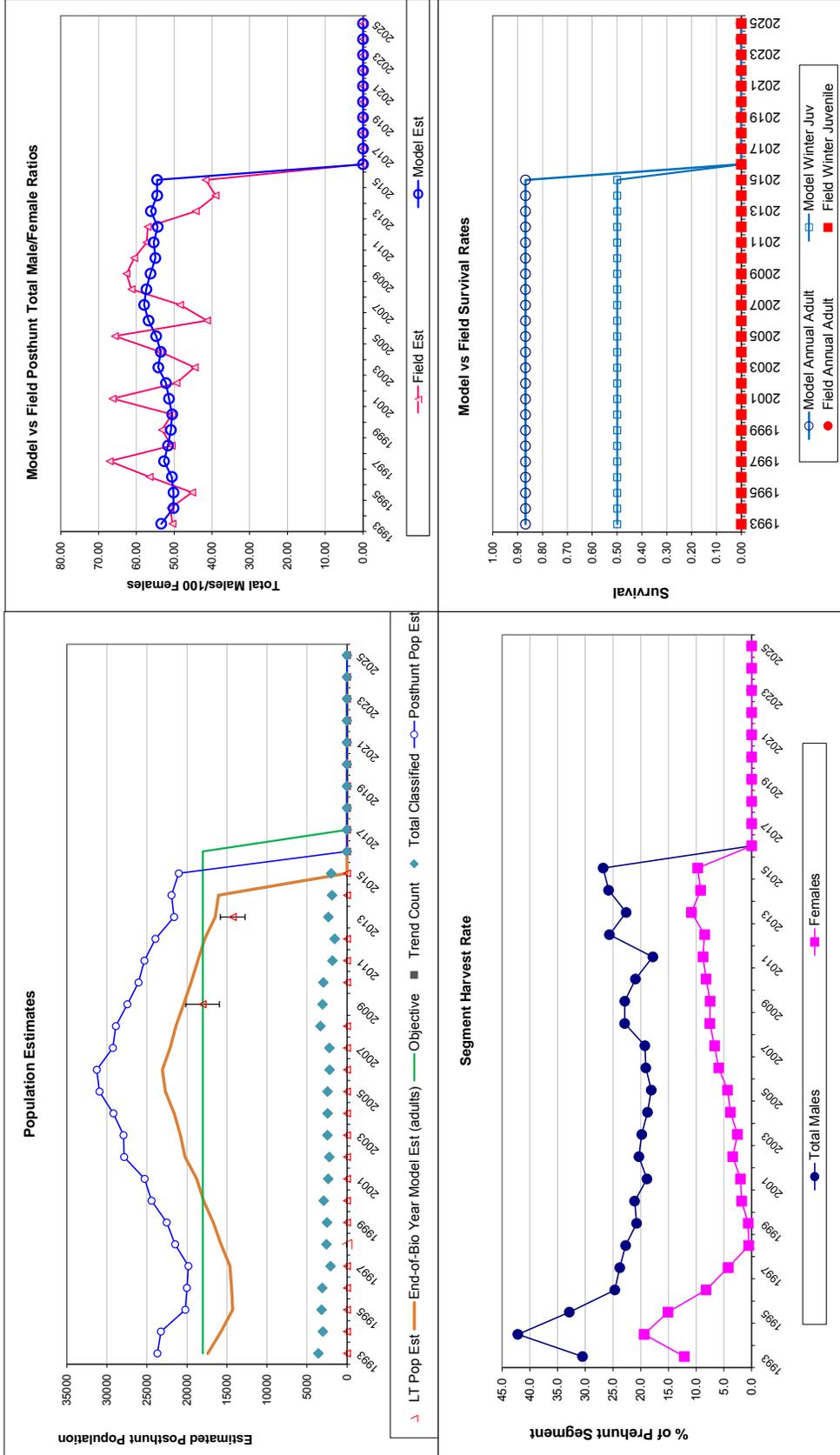
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.50		0.87	
1994	0.50		0.87	
1995	0.50		0.87	
1996	0.50		0.87	
1997	0.50		0.87	
1998	0.50		0.87	
1999	0.50		0.87	
2000	0.50		0.87	
2001	0.50		0.87	
2002	0.50		0.87	
2003	0.50		0.87	
2004	0.50		0.87	
2005	0.50		0.87	
2006	0.50		0.87	
2007	0.50		0.87	
2008	0.50		0.87	
2009	0.50		0.87	
2010	0.50		0.87	
2011	0.50		0.87	
2012	0.50		0.87	
2013	0.50		0.87	
2014	0.50		0.87	
2015	0.50		0.87	
2016	0.50		0.87	
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.499
Adult Survival =		0.869
Initial Total Male Pop/10,000 =		0.678
Initial Female Pop/10,000 =		1.269

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

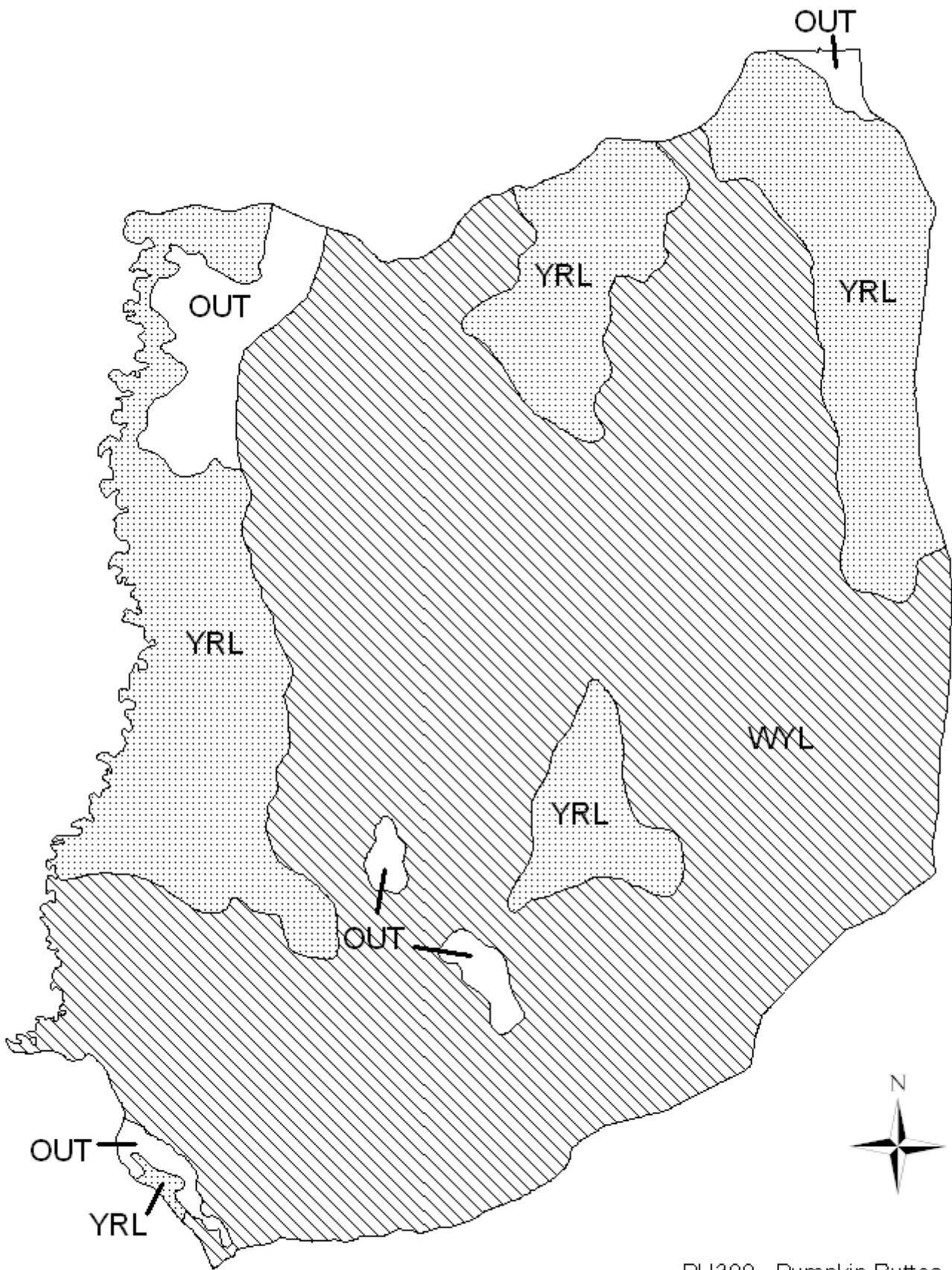
Year	Classification Counts						Harvest								
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Segment Harvest Rate (% of		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		64.16	2.52	53.42	50.45	2.14	1880	1402	288	3570	30.5	12.2			
1994		98.43	4.02	50.16	50.99	2.52	2184	2002	340	4526	42.2	19.4			
1995		81.56	3.25	50.16	45.25	2.17	1539	1407	311	3257	32.9	15.1			
1996		86.76	3.57	50.59	56.50	2.64	1054	695	104	1853	24.7	8.2			
1997		78.44	4.09	52.88	67.07	3.66	1054	359	24	1437	23.8	4.3			
1998		88.01	3.92	51.62	50.65	2.66	1007	46	4	1057	22.7	0.5			
1999		80.75	3.70	50.85	53.24	2.77	981	58	12	1051	20.8	0.6			
2000		86.76	3.64	50.51	50.57	2.49	1054	178	26	1258	21.1	1.8			
2001		78.65	3.84	51.36	66.28	3.40	1022	213	32	1267	18.9	2.0			
2002		92.22	4.41	52.16	49.40	2.84	1166	376	19	1561	20.3	3.4			
2003		76.36	3.49	54.19	44.57	2.42	1256	301	28	1585	19.8	2.6			
2004		80.33	3.75	53.54	53.68	2.83	1214	463	34	1711	18.8	3.8			
2005		86.37	4.09	54.76	65.66	3.36	1232	542	84	1858	18.1	4.4			
2006		80.70	3.87	56.76	41.27	2.45	1397	765	33	2195	19.1	5.9			
2007		64.66	3.22	57.94	48.45	2.64	1452	870	52	2374	19.3	6.7			
2008		73.72	3.02	57.94	61.29	2.65	1642	944	64	2650	22.9	7.5			
2009		69.69	3.00	56.25	62.60	2.78	1568	914	109	2591	22.9	7.5			
2010		67.00	2.94	54.97	60.59	2.74	1352	966	60	2378	21.0	8.2			
2011		70.73	3.89	55.42	57.29	3.36	1102	980	148	2230	17.8	8.8			
2012		71.28	4.26	54.35	56.99	3.65	1499	912	92	2503	25.7	8.5			
2013		61.56	2.97	56.15	44.29	2.38	1290	1103	71	2464	22.6	10.9			
2014		79.95	4.11	54.48	39.04	2.52	1335	876	122	2333	25.8	9.2			
2015		77.78	3.92	54.52	41.67	2.56	1350	900	125	2375	26.8	9.7			
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

FIGURES



Comments:

END



PH309 - Pumpkin Buttes  
HA 23  
Revised - 3/87

## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2014 - 5/31/2015

HERD: PR318 - CRAZY WOMAN

HUNT AREAS: 22, 113

PREPARED BY: DAN THIELE

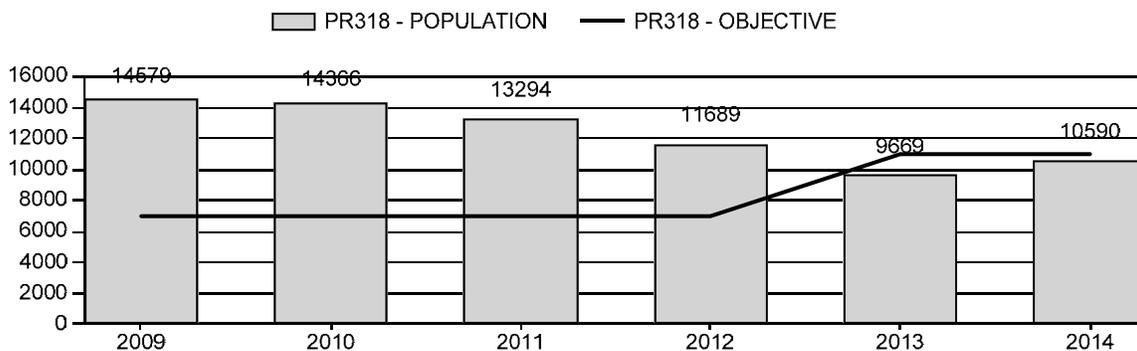
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	12,719	10,590	9,753
Harvest:	1,780	1,835	1,550
Hunters:	1,781	1,980	1,700
Hunter Success:	100%	93%	91%
Active Licenses:	2,002	2,195	1,900
Active License Success:	89%	84%	82%
Recreation Days:	6,368	6,862	5,600
Days Per Animal:	3.6	3.7	3.6
Males per 100 Females	63	60	
Juveniles per 100 Females	77	98	

Population Objective ( $\pm 20\%$ ) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-3.7%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/23/2015

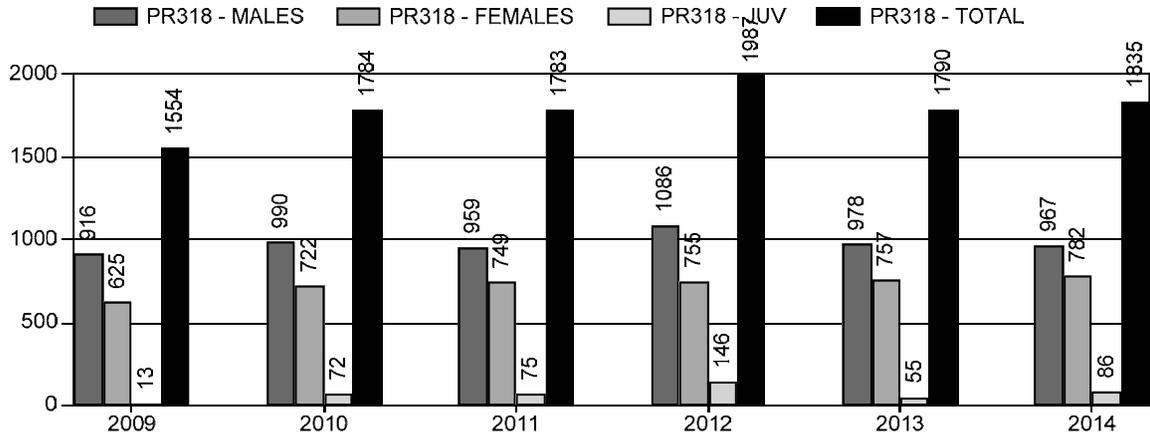
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females $\geq 1$ year old:	20%	15%
Males $\geq 1$ year old:	25%	35%
Juveniles (< 1 year old):	1%	1%
Total:	15%	14%
Proposed change in post-season population:	-2%	-8%

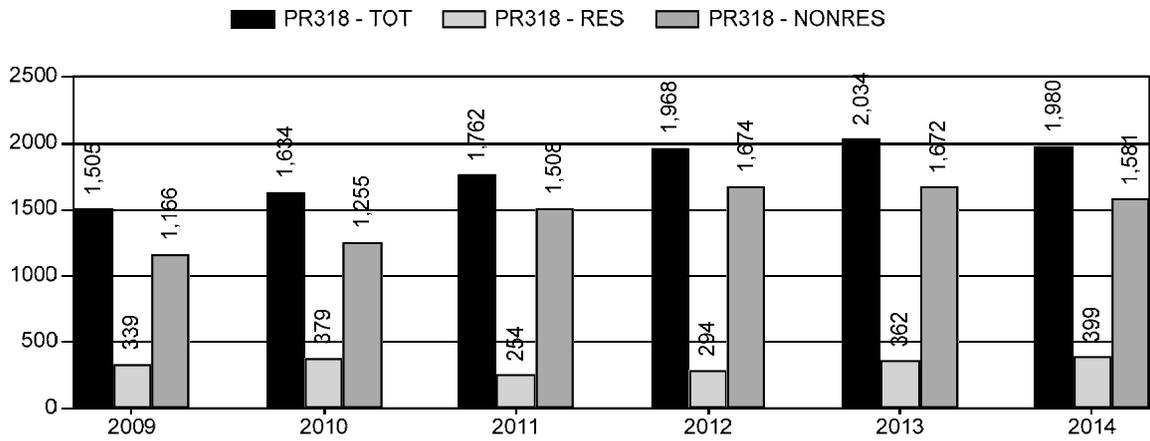
## Population Size - Postseason



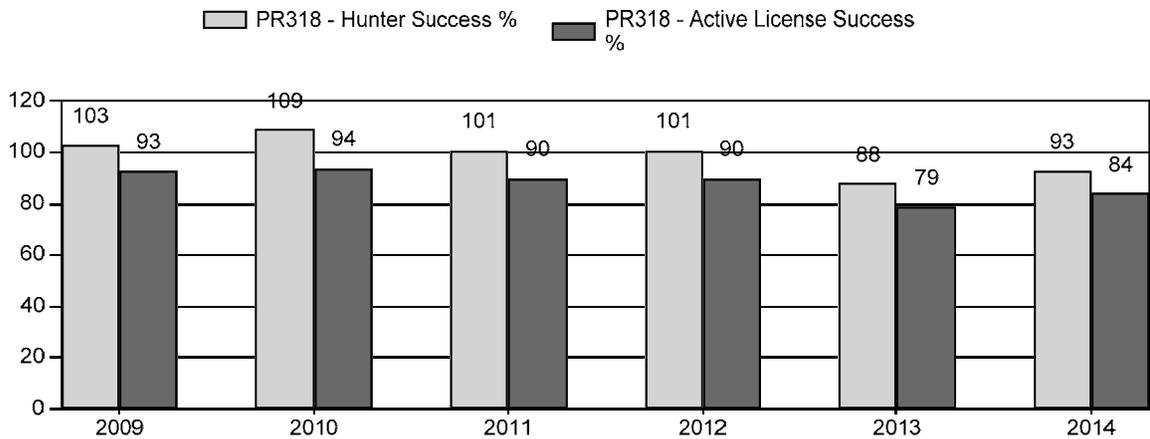
# Harvest



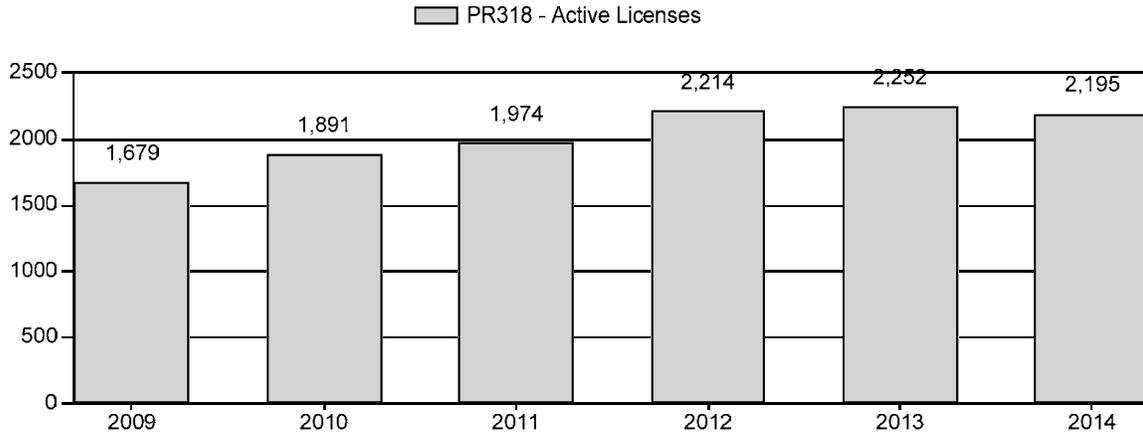
# Number of Hunters



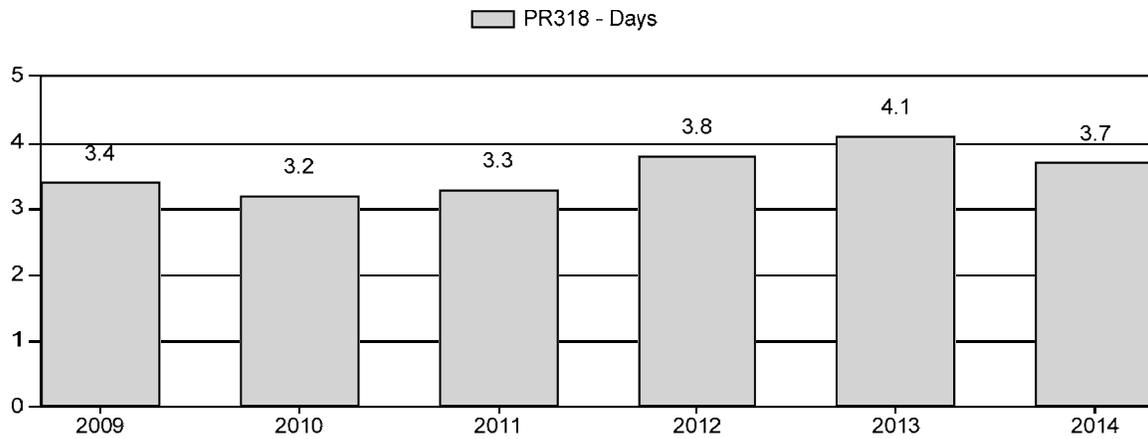
# Harvest Success



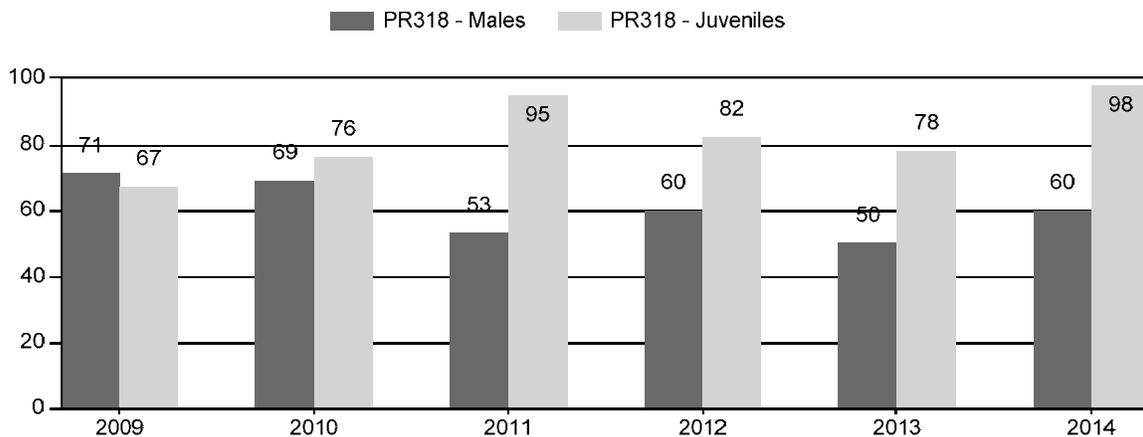
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR318 - CRAZY WOMAN

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	16,288	355	1,031	1,386	30%	1,945	42%	1,303	28%	4,634	2,537	18	53	71	± 3	67	± 3	39
2010	16,328	153	808	961	28%	1,392	41%	1,054	31%	3,407	2,727	11	58	69	± 4	76	± 5	45
2011	15,256	100	395	495	21%	936	40%	888	38%	2,319	3,889	11	42	53	± 4	95	± 7	62
2012	13,875	172	371	543	25%	911	41%	743	34%	2,197	3,069	19	41	60	± 5	82	± 6	51
2013	11,638	64	344	408	22%	818	44%	635	34%	1,861	2,745	8	42	50	± 5	78	± 6	52
2014	12,608	124	321	445	23%	743	39%	727	38%	1,915	3,790	17	43	60	± 5	98	± 8	61

**2015 HUNTING SEASONS  
CRAZY WOMAN PRONGHORN HERD (PR318)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
22	1	Oct. 1	Oct. 31	1,000	Limited quota	Any antelope Doe or fawn valid on private land in that portion of Area 22 north of Crazy Woman Creek Unused Area 22 Type 6 licenses valid in the entire area
	6	Sep. 1	Sep. 30	800	Limited quota	
		Oct. 1	Oct. 31			
113	1	Oct. 1	Oct. 31	150	Limited quota	Any antelope
	2	Oct. 11	Oct. 31	150	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	200	Limited quota	Doe or fawn
Archery		Aug. 15	Sep. 30			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
22		No change
113	1	-50
	2	-50
	6	-150
<b>Herd Unit Total</b>	<b>1 &amp; 2</b>	<b>-100</b>
	<b>6</b>	<b>-150</b>

**Management Evaluation**

**Current Postseason Population Management Objective: 11,000**

**Management Strategy: Recreational**

**2014 Postseason Population Estimate: ~10,600**

**2015 Proposed Postseason Population Estimate: ~9,750**

**Herd Unit Issues**

The Crazy Woman Pronghorn Herd Unit post-season population objective was reviewed in 2013 and revised to 11,000 pronghorn. The management strategy remains recreational management.

Area 22 is largely private land with limited public land hunting opportunities. Therefore, access to hunt 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. A cooperative agreement between private landowners, the BLM and the WGFD ended in 2008 when one of the remaining two landowners withdrew from the program. In 2012, the Mieke Ranch sold most of its property which has significantly reduced hunter access. Even with the expansive outfitting industry, at the herd unit level increasing numbers of hunters are finding

hunting opportunity. This may be due in part to GPS technology that allows hunters to readily identify public and private land boundaries.

### **Weather**

Weather in the area of the Crazy Woman Herd Unit during 2014 was favorable after 2013 was very dry though the most of the year. Fall moisture in 2013 provided pronghorn a nutritional boost followed by a relatively mild winter. Precipitation in 2014 was above normal with abundant precipitation in June and August. The Palmer Drought Index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed “moderately moist” conditions for January 2014 and progressed to “very moist” in August and September. August precipitation was 250% of normal. Winter weather conditions were relatively mild with interspersed periods of very warm temperatures. Precipitation for March and April 2015 was 64% of normal resulting in a “mid range” Palmer Drought Index rating.

### **Habitat**

There is one Wyoming big sagebrush transect in this herd unit. Production measured in October 2014 averaged 22 mm per leader compared to 8 mm per leader in 2013 and a five year average of 4.7 mm per leader. Winter utilization during the 2014-15 winter was light (less than 5% of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range. Winter conditions were normal so above average mortality was not observed. Complete shrub monitoring results are available in the appendix, Shrub Monitoring Report for the Sheridan Region.

### **Field Data**

Classifications in 2014 yielded a fawn ratio of 98:100 and a buck ratio of 60:100. Fawn production and survival was excellent due to the abundant 2013 fall moisture, mild winter weather and excellent spring 2014 moisture. The fawn ratio set a six year high and compares to the five year average of 77:100. It was the highest fawn ratio since 1989. Buck ratios in this herd often exceed the 60:100 threshold designated for special management although high buck ratios are not managed for. Buck ratios equaled or exceeded 60:100 in four of the past six years, including 2014. Buck ratios at the hunt area scale varied considerably with Area 22 at 75:100 and Area 113 at 33:100.

The annual postseason landowner survey was conducted following the hunting season with responses showing that 74% of landowners at the herd unit scale are satisfied with current pronghorn numbers. The five year trend shows a strong indication that this population is decreasing, reflecting the trend of the population model. A line transect survey flown in 2010 produced an end of year population estimate of 13,163 pronghorn, the highest estimate to date. Hunter satisfaction was high with Areas 22 and 113 hunters reporting 82% and 67% positive responses, respectively.

### **Harvest Data**

The 2014 harvest survey reported the second highest total harvest for the six year period and third highest since 1985. Buck harvest decreased for the second year in a row while doe/fawn harvest increased to the second highest harvest of the six year period. Hunter numbers remained very high as all license types sold out for the first time in recent history. Interest in hunting northeast Wyoming hunt areas has increased as license quotas have become more conservative in

other areas of the state. Hunter success and active license success improved over 2013 but were well below the 2009 to 2012 success rates. Hunter effort improved, decreasing to 3.7 day per harvest compared to 4.1 days per harvest in 2013. Multiple hunter comments were received from Area 113 complaining about the lack of access to the large parcels of public land and low pronghorn numbers. This reflects decreasing hunter success for all license types, especially the Type 2 hunter success of 74% as well as the lower hunter satisfaction.

## **Population**

This population is estimated at 10,600 pronghorn, 4% below the new objective of 11,000 pronghorn. This population objective corresponds well with the 72% of responding landowners who are satisfied with the current population. The population estimate was generated with the newly adopted EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult (SCJ/SCA) model was chosen as it produced the lowest AIC value (59) and results are consistent with harvest and landowner survey trends. The model attempts to track three line transect surveys over the last 10 years. The 2010 line transect estimate is the highest to date but the model does not track though the confidence interval. The model indicates this population has decreased about 38% from its 2005 high of just over 17,000 pronghorn and about 27% since 2009. Widely fluctuating buck ratios due to inadequate classification samples and conversion from aerial to ground surveys likely complicate modeling efforts. The model is considered a fair model due to inadequate classification samples and lack of independent survival estimates.

## **Management Summary**

The population model is considered a fair model as the population trend and estimate appear reasonable. Harvest data, landowner surveys and WGFD field observations confirm the trend represented in the model. A decrease of 100 Area 22 Type 6 licenses occurred in 2014. Reductions are proposed for Area 113 due to the low buck ratio (33:100), low hunter success (Type 1 and 2 = 77% and Type 6 = 79%) and negative hunter comments regarding lack of access to public land. The proposal will reduce the number of leftover licenses which are contributing to the hunter access problem. A reduction in the Area 22 quotas was considered but the very high 2014 fawn ratio should maintain a stable segment of the population in Area 22. More conservative seasons will be warranted if the population continues to decrease. If projected harvest is achieved a postseason population of 9,750 pronghorn is projected.

<b>INPUT</b>	
Species:	Pronghorn
Biologist:	Dan Thiele
Herd Unit & No.:	Crazy woman (318)
Model date:	02/23/15

MODELS SUMMARY			Relative AICc	Notes
C,J,CA	Constant Juvenile & Adult Survival	Fit	98	<input type="checkbox"/> Clear form Check best model to create report <input type="checkbox"/> C,J,CA Model <input checked="" type="checkbox"/> SCJ,SCA Mod <input type="checkbox"/> TS,J,CA Model
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	89	59	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	50	169	

Year	Predicted Prehunt Population (year /)		Predicted Posthunt Population (year /)		Predicted adult End-of-bio-year Pop (year /)		Total	Total	Total	Objective
	Juveniles	Total Males	Juveniles	Total Males	Total Males	Females				
1993	3646	3552	3580	2597	5543	11720	11720	9697	7000	
1994	4496	3481	4351	2553	5144	12047	12047	8063	7000	
1995	4187	2849	4026	2007	4393	10426	10426	6847	7000	
1996	3925	2330	3868	1645	4021	9534	9534	6282	7000	
1997	3065	2046	3065	1595	4078	8739	8739	4774	7000	
1998	4253	2510	4245	2042	4665	10952	10952	8051	7000	
1999	4829	2799	4816	2297	5066	12178	12178	8244	7000	
2000	3902	2830	3902	2341	5231	11474	11474	8063	7000	
2001	3500	2691	3500	2193	5145	10838	10838	7766	7000	
2002	3730	2522	3717	2035	5010	10762	10762	9038	7000	
2003	5477	3137	5462	2543	5630	13634	13634	9840	7000	
2004	5510	3475	5491	2870	6033	14394	14394	11537	7000	
2005	6708	4277	6672	3635	6635	17142	17142	11627	7000	
2006	6116	4307	6104	3629	6675	16408	16408	11370	7000	
2007	5116	4260	5069	3448	6307	14825	14825	11084	7000	
2008	4873	4202	4849	3159	6163	14170	14170	11776	7000	
2009	4746	4456	4732	3448	6397	14578	14578	11372	7000	
2010	5184	4298	5105	3209	6053	14366	14366	9753	7000	
2011	5699	3551	5616	2496	5183	13295	13295	9334	7000	
2012	4727	3351	4567	2156	4966	11689	11689	7894	7000	
2013	3902	2710	3841	1634	4193	9668	9668	5062	11000	
2014	4854	2794	4759	1730	4100	10590	10590	7495	11000	
2015	4113	2644	4058	1709	3986	9753	9753	7495	11000	
2016									11000	
2017									11000	
2018									11000	
2019									11000	
2020									11000	
2021									11000	
2022									11000	
2023									11000	
2024									11000	
2025									11000	

Survival and Initial Population Estimates

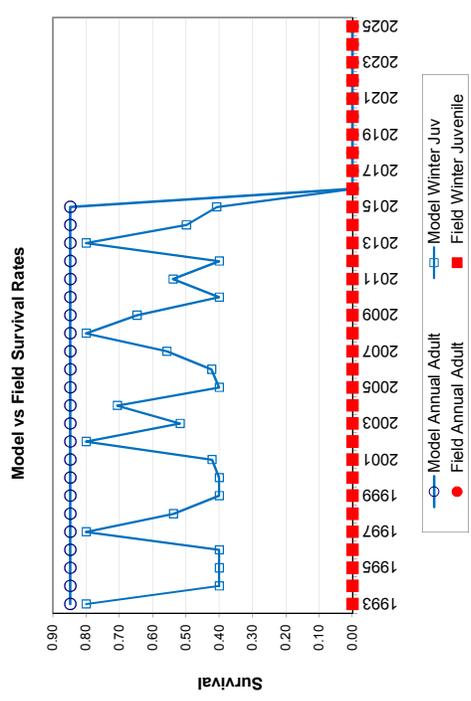
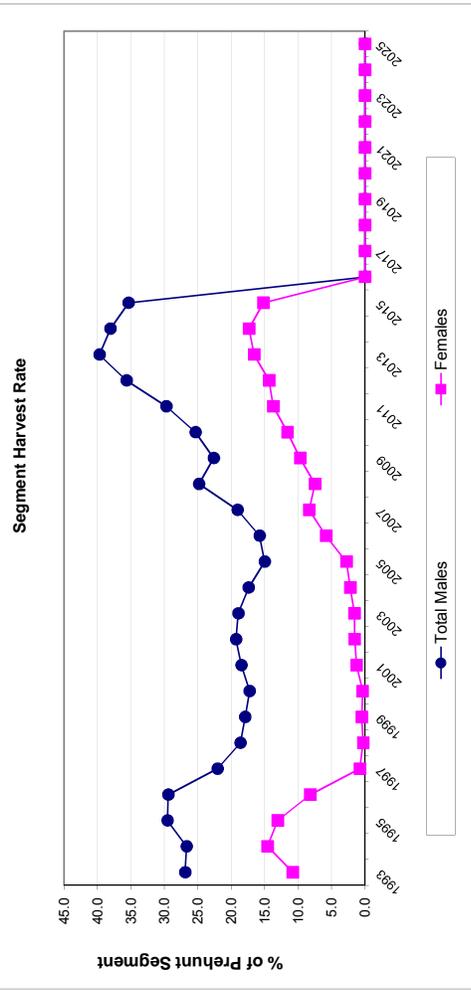
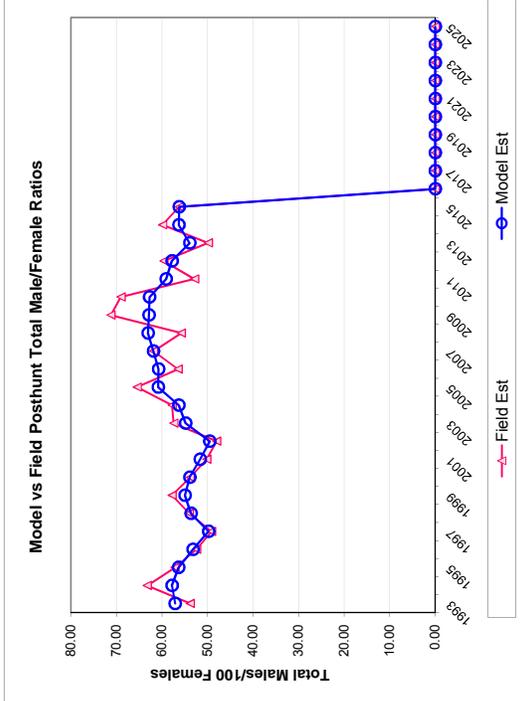
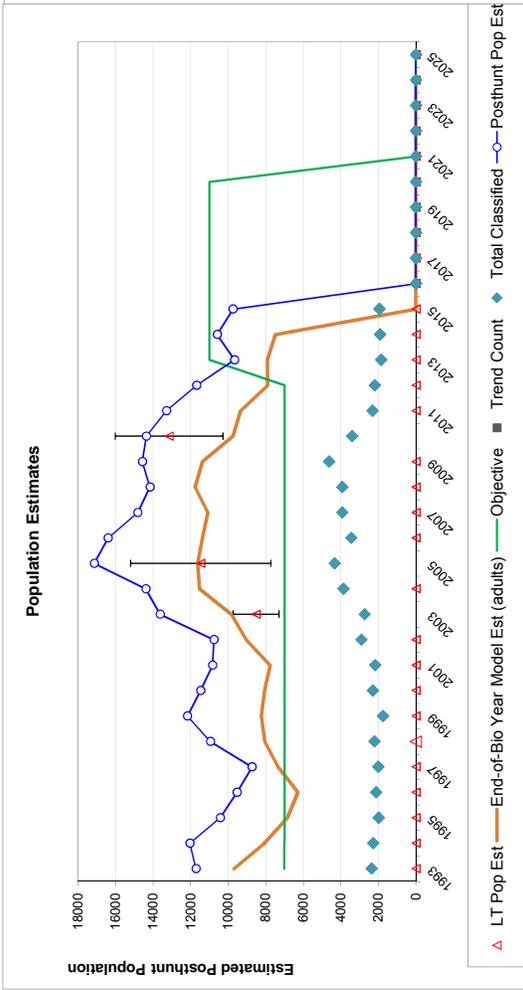
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.80		0.85	
1994	0.40		0.85	
1995	0.40		0.85	
1996	0.40		0.85	
1997	0.80		0.85	
1998	0.54		0.85	
1999	0.40		0.85	
2000	0.40		0.85	
2001	0.42		0.85	
2002	0.80		0.85	
2003	0.52		0.85	
2004	0.71		0.85	
2005	0.40		0.85	
2006	0.42		0.85	
2007	0.56		0.85	
2008	0.80		0.85	
2009	0.65		0.85	
2010	0.40		0.85	
2011	0.54		0.85	
2012	0.40		0.85	
2013	0.80		0.85	
2014	0.50		0.85	
2015	0.41		0.85	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.650
Adult Survival =		0.848
Initial Total Male Pop/10,000 =		0.355
Initial Female Pop/10,000 =		0.621

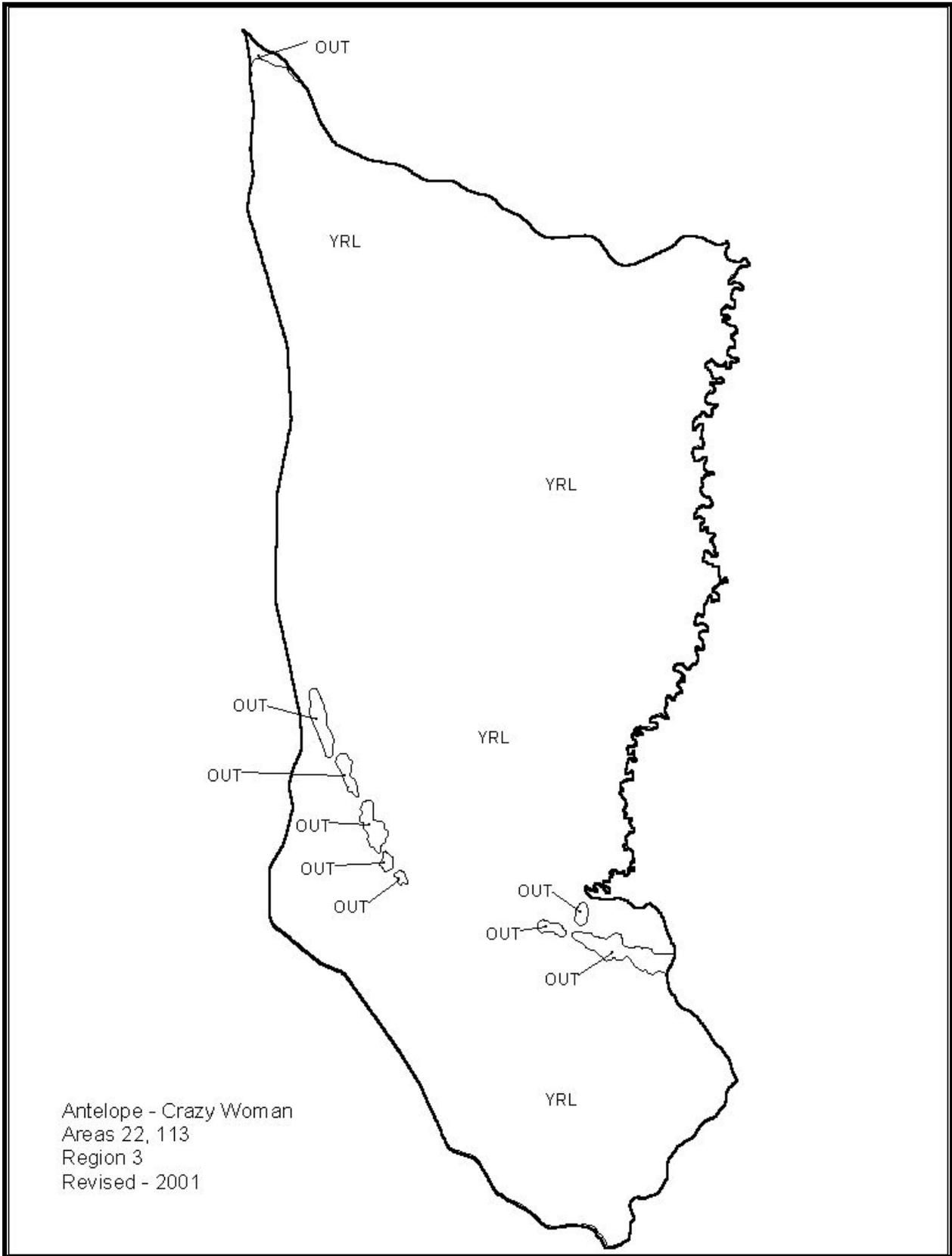
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

Year	Classification Counts						Harvest								
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Total Harvest		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Total Females	Segment Harvest Rate (% of		
1993		58.67	2.89	57.15	53.82	2.73	868	611	60	1539	26.9	10.8			
1994		74.66	3.69	57.81	63.30	3.28	844	798	132	1774	26.7	14.6			
1995		82.87	4.28	56.38	57.18	3.29	765	600	147	1512	29.5	13.1			
1996		89.62	4.40	53.20	52.45	3.02	623	326	52	1001	29.4	8.2			
1997		74.58	3.80	49.78	49.17	2.85	410	29	0	439	22.0	0.8			
1998		90.92	4.38	53.64	54.04	3.04	425	12	8	445	18.6	0.3			
1999		94.85	5.14	54.97	57.80	3.61	456	23	12	491	17.9	0.5			
2000		74.33	3.58	53.91	53.82	2.86	444	17	0	461	17.3	0.4			
2001		67.17	3.35	51.63	50.20	2.74	452	60	0	512	18.5	1.3			
2002		73.29	3.11	49.55	48.02	2.33	442	72	12	526	19.3	1.6			
2003		95.75	4.16	54.83	57.43	2.89	540	82	14	636	18.9	1.6			
2004		89.33	3.29	56.33	57.83	2.41	550	123	18	691	17.4	2.2			
2005		95.43	3.35	60.84	65.48	2.55	583	177	33	793	15.0	2.8			
2006		86.30	3.36	60.77	56.50	2.49	617	375	11	1003	15.8	5.8			
2007		74.34	2.79	61.89	61.90	2.45	738	523	43	1304	19.1	8.4			
2008		73.15	2.72	63.07	55.79	2.25	948	453	22	1423	24.8	7.5			
2009		66.99	2.40	62.89	71.26	2.50	916	625	13	1554	22.6	9.7			
2010		75.72	3.09	62.77	69.04	2.90	990	722	72	1784	25.3	11.6			
2011		94.87	4.44	59.12	52.88	2.94	959	749	75	1783	29.7	13.7			
2012		81.56	4.03	57.81	59.60	3.23	1086	755	146	1987	35.7	14.3			
2013		77.63	4.11	53.92	49.88	3.02	978	757	55	1790	39.7	16.6			
2014		97.85	5.10	56.32	59.89	3.59	967	782	86	1835	38.1	17.3			
2015		87.50	4.53	56.25	56.25	3.31	850	650	50	1550	35.4	15.2			
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

FIGURES



Comments:

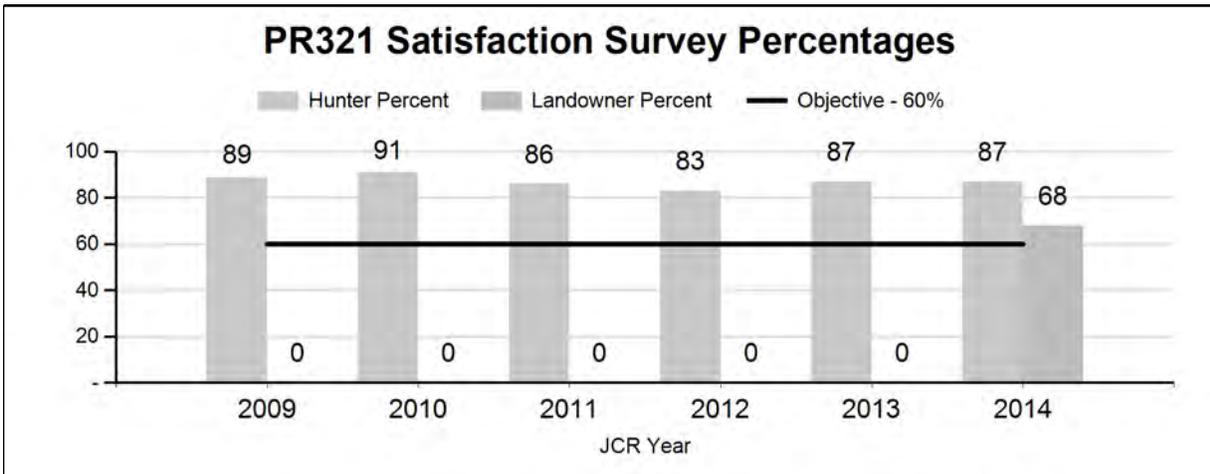


## 2014 - JCR Evaluation Form

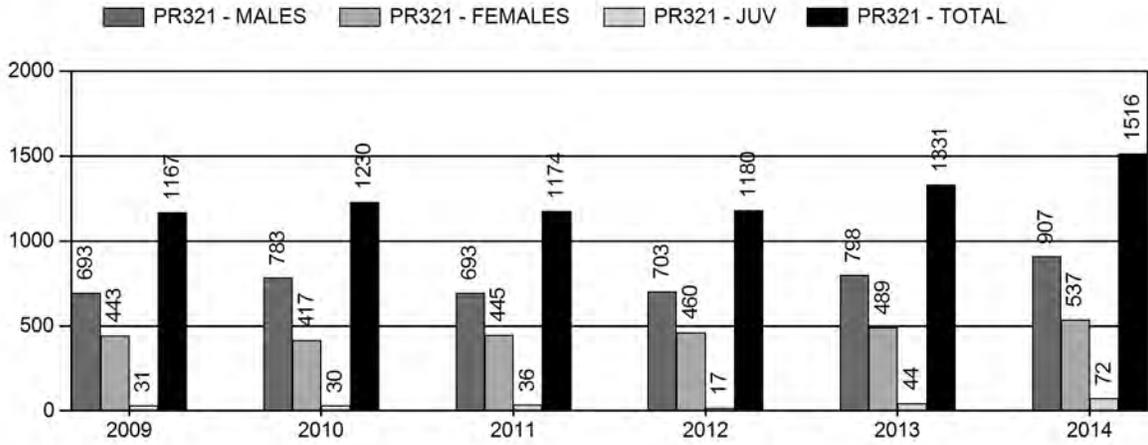
SPECIES: Pronghorn  
 HERD: PR321 - LEITER  
 HUNT AREAS: 10, 15-16

PERIOD: 6/1/2014 - 5/31/2015  
 PREPARED BY: TIM THOMAS

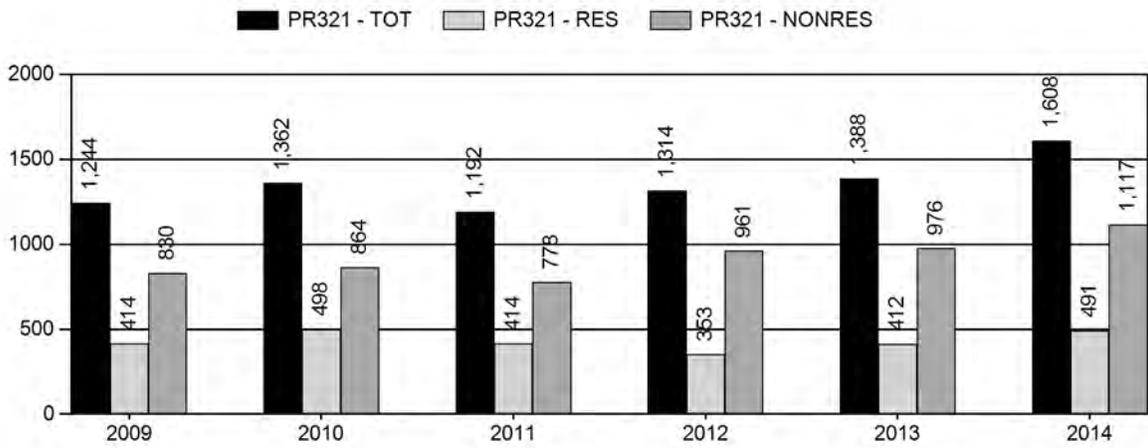
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent	87%	87%	87%
Landowner Satisfaction Percent	57%	68%	70%
Harvest:	1,216	1,516	1,700
Hunters:	1,300	1,608	1,800
Hunter Success:	94%	94%	94%
Active Licenses:	1,499	1,815	2,100
Active License Success:	81%	84%	81%
Recreation Days:	4,601	5,025	5,500
Days Per Animal:	3.8	3.3	3.2
Males per 100 Females:	55	65	
Juveniles per 100 Females	63	80	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			18%
Number of years population has been + or - objective in recent trend:			1



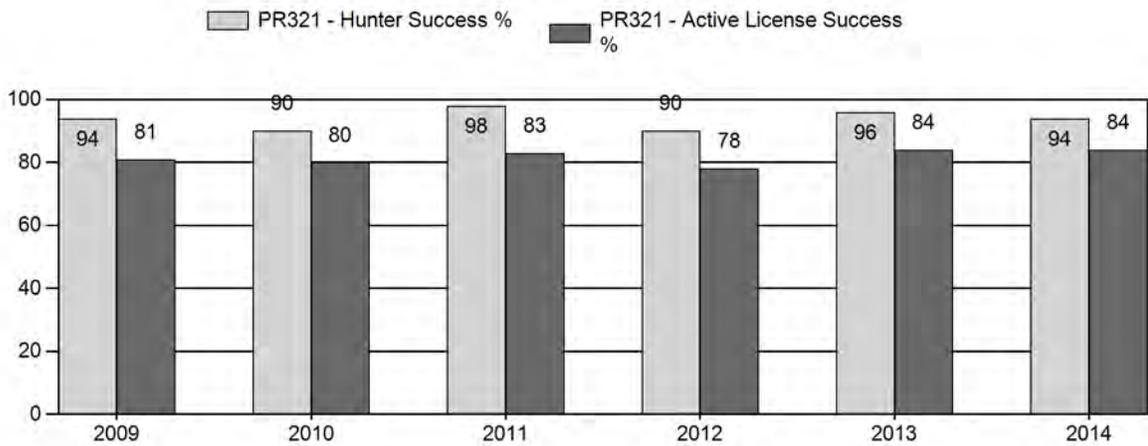
# Harvest



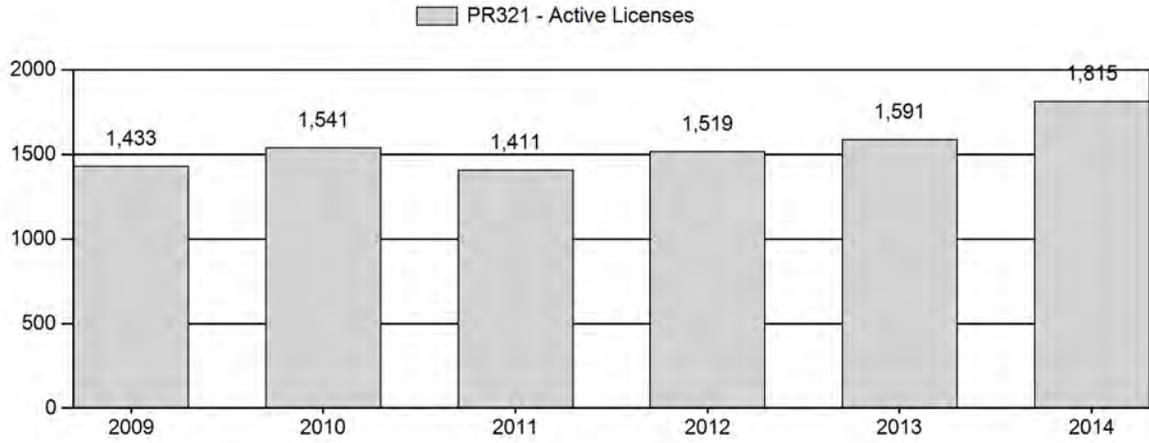
# Number of Hunters



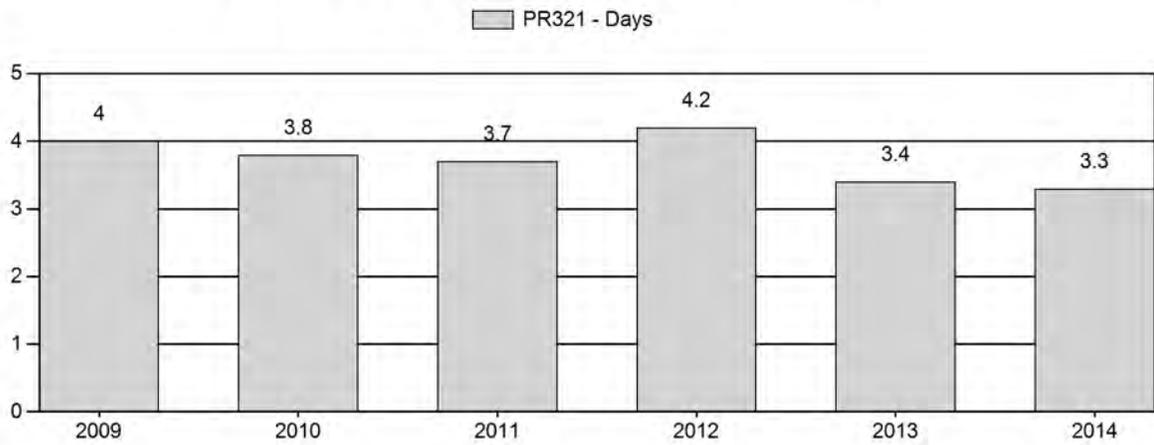
# Harvest Success



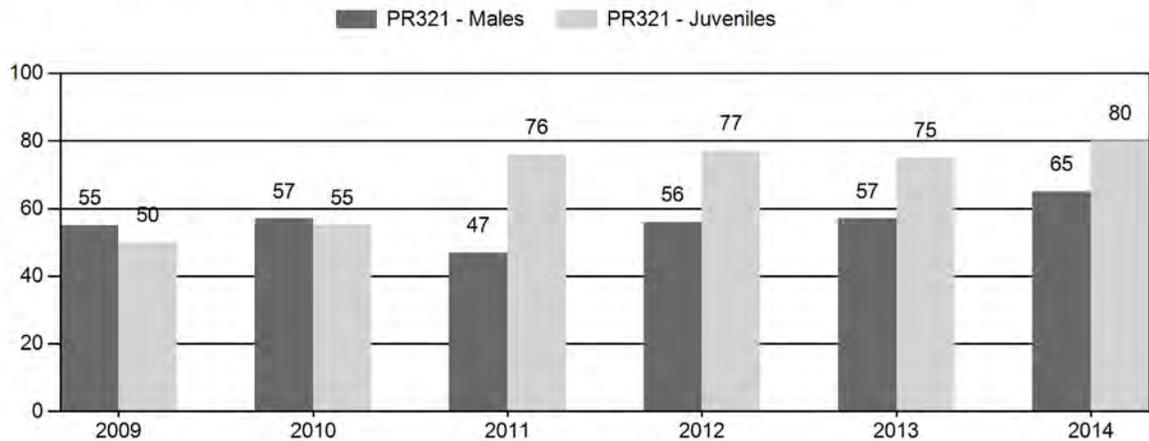
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR321 - LEITER

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	5,362	83	522	605	27%	1,102	49%	550	24%	2,257	3,145	8	47	55	± 12	50	± 11	32
2010	5,003	211	437	648	27%	1,128	47%	617	26%	2,393	3,211	19	39	57	± 12	55	± 12	35
2011	4,818	69	200	269	21%	567	45%	430	34%	1,266	4,180	12	35	47	± 16	76	± 22	51
2012	4,770	148	245	393	24%	697	43%	536	33%	1,626	4,367	21	35	56	± 15	77	± 19	49
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 HUNTING SEASONS  
LEITER PRONGHORN HERD (PR321)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
10	1	Oct. 1	Oct. 14	250	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	300	Limited quota	Doe or fawn
15	1	Oct. 1	Oct. 14	600	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	600	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
Archery		Aug. 15	Sep. 30			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
10	1	+ 50
15	1	+ 100
	6	+ 200
16	1	+ 100
	6	+ 100
<b>Herd Unit Total</b>	<b>1</b>	<b>+ 250</b>
	<b>6</b>	<b>+ 300</b>

**Management Evaluation**

**Current Hunter / Landowner Management Objective:** 60% Satisfaction

**Secondary Management Objective:** Observed ratio of 30 bucks:100 does minimum

**Management Strategy:** Private Land

**2014 Hunter Satisfaction Estimate:** 87%

**2014 Landowner Satisfaction Estimate:** 68%

**Most Recent 3-year Running Average Hunters Satisfaction Estimate:** 86%

**Most Recent 3-year Running Average Landowner Satisfaction Estimate:** n/a

**Herd Unit Issues**

The management objective for the Leiter Pronghorn Herd Unit is Hunter and Landowner Satisfaction Objective at 60% or higher, with a secondary objective of 30 or more bucks observed per 100 does. The management strategy is Private Land Management. The Leiter Pronghorn Herd Unit was created in 2014 when the Clearmont (PR308) and Ucross (PR353) Pronghorn Herd Units were combined. The objective and management strategy were last revised in 2014.

Industrial scale oil and gas development and outfitting in the herd unit have resulted in restricted hunting access to some private lands. There are very few public land hunting opportunities in this herd unit. The restricted access has made it difficult to attain adequate harvest to regulate pronghorn populations in portions of this herd.

Due to very limited access for pronghorn hunting, we try to balance license allocation between meeting desires of landowners and hunter demand, and having too many leftovers licenses, which may give potential hunters the impression there are lots of hunting opportunities in this herd unit.

## **Weather**

The spring and summer of 2014 was generally warm and wet, resulting in good conditions for forage production in the northwest portion of the region. Conditions generally became warmer and drier as you went south and east, which is consistent with normal weather patterns, but were still favorable during most of the summer. The 2014-15 winter was highly variable, with relatively open conditions into early November, cold and snowy conditions from early November through January, then periods of warm weather alternating with colder temperatures and snow. Several thaw/freeze cycles during parts of the winter resulted in hard, crusted snow that was difficult for animals to paw through to access forage. Overall, adults entered the winter in good condition and likely survived the winter well. Fawns likely saw about average over-winter survival.

## **Habitat**

There are three habitat transects located in this herd unit. All of the habitat transects monitor annual growth and utilization of Wyoming big sagebrush communities.

The SR – Buffalo Creek Divide habitat transect is located in the north-central portion of this herd unit on State Trust Lands accessed by the SR-Buffero Creek Road (Sheridan County Road 86). This transect was read October 22, 2014 to measure production based on leader growth, as well as relative hedging and age class. Standard protocol was followed to read this transect. The average leader growth was 28.2 mm (range = 0-90mm). The majority of sagebrush plants measured exhibited light (n=22; 44%) or moderate hedging (n=21; 42%), and most were mature plants (n=46; 92%).

The Coal Creek habitat transect is located in the central portion of this herd unit, just north of U.S. Highway 14 near Ucross. It is located on State Trust Land accessed by the Coal Creek Road (Sheridan County Road 195). This transect was read October 22, 2014 to measure production based on leader growth, as well as relative hedging and age class. Standard protocol was followed to read this transect. The average leader growth was 35.8 mm (range = 0 – 135mm). The majority of sagebrush plants measured exhibited moderate hedging (n=25; 50%) and were mature plants (n=34; 68%).

Petrified Tree habitat transect is located in the south-central portion of this herd unit on BLM land. This transect is accessed off of the Tipperary Road east of Buffalo. This transect has not been read for several years.

## **Field Data**

In August, we conducted herd classification surveys using ground survey techniques. Designated routes were driven along county roads and all observed pronghorn were classified. Starting in 2011, we moved away from aerial classification surveys to ground classification surveys to reduce risk for employees and reduce costs associated with aircraft rentals. In 2014, we classified 1,590 pronghorn, well below the desired sample size of 3,783 pronghorn at the 90% confidence level.

Fawn production, as measured by observed fawn:doe ratios, has equalled or exceeded 75 fawns per 100 does during the past four years, suggesting this herd has the potential to increase quickly under favorable conditions. This year, we observed 80 fawns:100 does, higher than the long-term (n=33 years) average of 70 fawns:100 does.

Observed buck to doe ratios averaged 65 bucks:100 does, well above the desired number of bucks for recreational management (i.e. 30 bucks:100 does minimum). The buck to doe ratio has averaged 55 bucks:100 does over the long-term (n=33 years). Restricted access to private lands, and very limited accessible public lands, reduces our ability to obtain additional buck harvest, which could easily be sustained in this herd unit based on the observed buck to doe ratio.

Hunter satisfaction has remained high, with 87% of surveyed hunters (n=272) satisfied (42%) or very satisfied (45%), suggesting those hunters who do obtain access to private lands experience a quality hunt. Nonresident hunters have a slightly higher satisfaction level (88%) than resident hunters (84%). Satisfaction was similar between hunt areas, with Area 10 the lowest (85%) and Area 15 the highest (88%).

The high hunter satisfaction level partially reflects Department personnel efforts to advise perspective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license. There is some very limited public land and PLPW Walk-In Area and Hunter Management Area access in this herd unit, which may give some hunters higher than deserved hope of a quality pronghorn hunt.

## **Harvest Data**

In 2014, we sold all allocated licenses in this herd unit except for 131 Area 10 Type 6 licenses. We reduced license quotas in 2014 to better match demand. We also saw a significant increase in demand for antelope licenses in 2014, especially for leftover licenses. We sold 558 (47%) Type 1 licenses through the draw process and 642 (53%) as leftover licenses. We sold 70 (8%) Type 6 licenses through the draw process and 794 (92%) as leftover licenses. Nonresident hunters continue to dominate the hunting ranks in this herd unit. In 2014, nonresidents purchased 68% of the licenses sold (60% of Type 1 licenses; 80% of Type 6 licenses). Hunt Area 10 was the only area with more resident hunters.

In 2014, an estimated 1,608 hunters harvested an estimated 1,516 pronghorn, the highest harvest in 30 years, and a 14% increase over the 2013 harvest. Hunters average about 96% success over the past 10 years, compared to 94% success in 2014. Success by individual license was 84%. Hunter effort, as measured by the number of days hunted per animal harvested, was 3.3 days/animal, compared to 3.6 days/animal over the past 10 years. Access has varied over the past 10 years, with changes in ownership of several large ranches influencing hunter access.

## **Population**

The 2014 postseason population estimate was ~16,100 pronghorn, with the population trending upward. This population likely bottomed out in the late 1990s, and again around 2010-2011. The population appears to have been increasing since then. A line transect survey was conducted during June 2013, which resulted in an end-of-biological-year population estimated of 13,256 pronghorn.

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 (133) but the best fit (31) 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 very 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 the line transect estimates, so we consider this a “good” model.

Landowners, hunters and Department field personnel have noted an increase in this population over the past several years. Of landowners (n=43) who responded to an annual survey, 67% (n=28) indicated the population was at or near desired levels and most (58%, n=23) suggested similar season strategies for 2015. No landowners thought they had fewer than desired numbers of pronghorn.

## **Management Summary**

The regular hunting season has traditionally ran two weeks (October 1 – 14) for Type 1 licenses, and four weeks (October 1 – 31) for Type 6 licenses since the 2003 season. An archery pre-season generally runs August 15 – September 30. In 2009, the Type 6 season was extended to the end of November in Area 10 to address some damage concerns of private landowners. These concerns have abated and the closing date was moved back to October 31 for the 2014 season.

Hunters in this herd unit are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, which allows hunters the opportunity to harvest multiple animals. There is limited pronghorn hunting on scattered State Trust and BLM land, as well as one Walk-In Area and one Hunter Management Area. We observe high buck numbers, as measured by buck:doe ratios, averaging 60 bucks:100 does over the past 10 years. This is likely a function of limited access to private lands where the majority of pronghorn occur.

Since we had not sold all of the available licenses since 2006, we reduced the license allocation for the 2014 season to better reflect demand and available opportunity. This reduction was intended to reduce the perception that there was lots of opportunity because of hundreds of leftover licenses. We saw a significant increase in demand for pronghorn licenses in 2014, selling all but 131 Type 6 licenses. The increase in demand for licenses was likely due to reduced licenses across most of Wyoming resulting in a shift in hunters, and increased hunter numbers due to improved economic conditions. We increased licenses in all hunt areas for 2015.

We project a harvest of approximately 1,700 pronghorn in 2015, resulting in an estimated post-season population of about 16,300 pronghorn. These predictions assume near normal fawn production and survival, as well as similar license sales and success rates for the 2015 hunting season.

**INPUT**  
 Species: Pronghorn  
 Biologist: Timothy P. Thomas  
 Herd Unit & No.: Leiter  
 Model date: 03/01/15

Clear form

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	95	87	
SC,J,SCA	95	87	
TS,J,CA	133	31	

Check best model to create report  
 CJ,CA Model  
 SC,J,SCA Mod  
 TS,J,CA Model

Year	Predicted Prehunt Population (year <i>t</i> )		Total	Predicted Posthunt Population (year <i>t</i> )		Total	Predicted adult End-of-bio-year Pop (year <i>t</i> )		LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females			
1993	2096	2345	4567	2023	1535	3954	7511	2163	7918	3722	
1994	2314	2119	4233	2263	1353	3601	7217	1756	6482	5509	
1995	2395	1720	3678	2282	1102	3182	6567	1414	4676	4676	3133
1996	1957	1386	3197	1946	724	3071	5741	1437	5017	5017	1482
1997	1495	1409	3508	1490	886	3462	5838	1391	5116	5116	819
1998	2594	1363	3650	2594	887	3613	7094	1905	6271	6271	
1999	2955	1867	4279	2952	1485	4242	8679	2068	6610	6610	1172
2000	3335	2026	4452	3335	1648	4412	9395	1908	6297	6297	
2001	2391	1870	4301	2382	1519	4270	8172	2382	7230	7230	1424
2002	3421	2334	4751	3421	1918	4724	10062	3201	8926	8926	1464
2003	3833	3137	5611	3830	2650	5523	12002	3590	9766	9766	
2004	4347	3519	6052	4336	2956	5978	13270	4514	11757	11757	1797
2005	5501	4424	7088	5456	3756	6830	16042	5716	14194	14194	
2006	6385	5601	8309	6306	4751	7749	18806	6610	13900	13900	
2007	5070	5498	8124	5014	4542	7618	17174	4612	11994	11994	
2008	4471	4520	7235	4447	3510	6759	14715	3620	10175	10175	
2009	3206	3548	6424	3172	2786	5936	11894	3609	10030	10030	
2010	3442	3537	6293	3409	2675	5834	11919	2745	8326	8326	
2011	4148	2690	5470	4109	1927	4980	11016	3483	9687	9687	
2012	4675	3414	6080	4657	2640	5574	12871	3993	10680	10680	
2013	4929	3913	6553	4881	3036	6015	13932	4690	12120	12120	1684
2014	5825	4597	7281	5745	3599	6990	16034	5039	12778	12778	
2015	5688	4939	7584	5578	3894	6869	16341				
2016											
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											

Survival and Initial Population Estimates

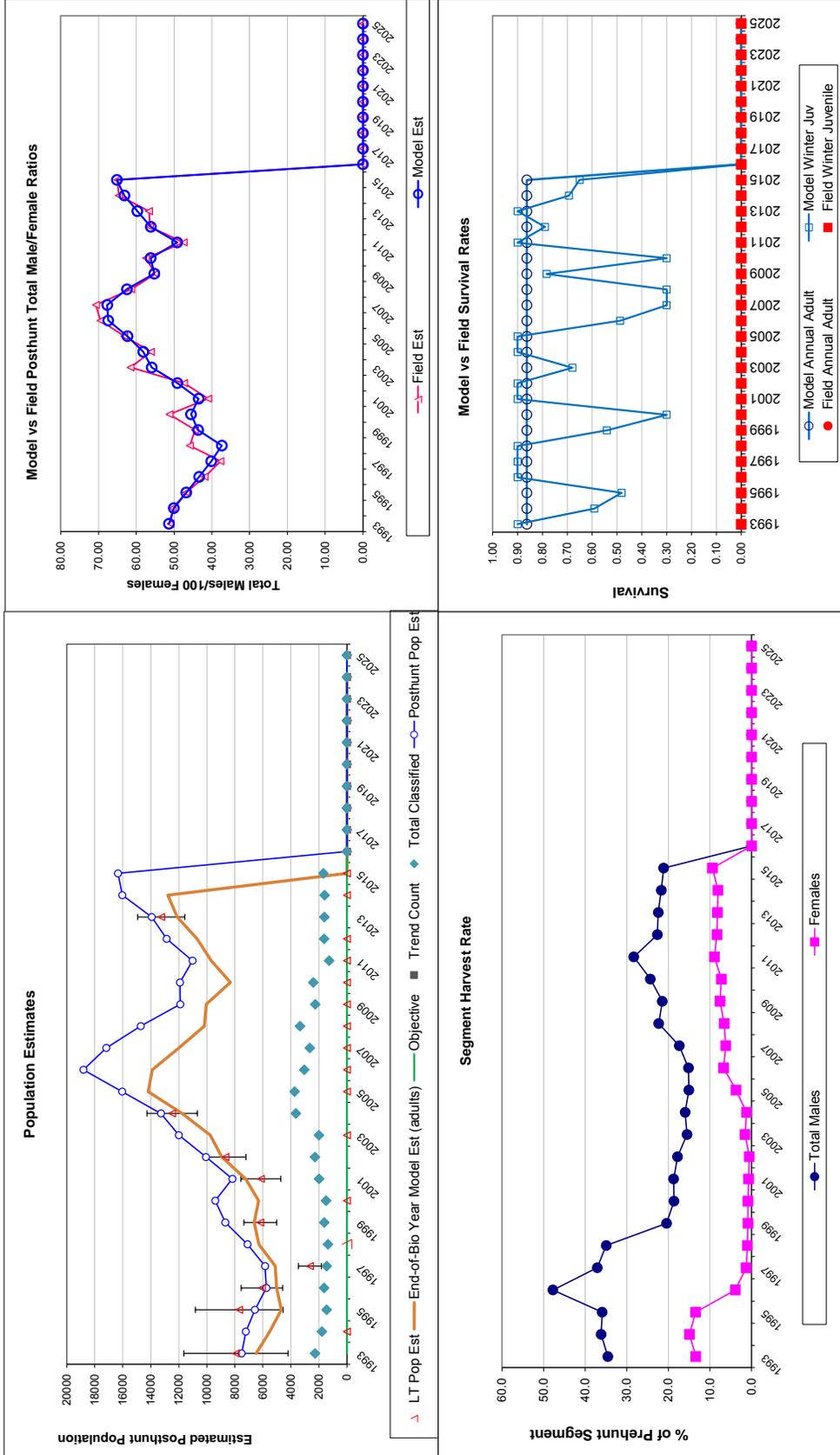
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.90		0.86	
1994	0.59		0.86	
1995	0.48		0.86	
1996	0.90		0.86	
1997	0.90		0.86	
1998	0.90		0.86	
1999	0.54		0.86	
2000	0.30		0.86	
2001	0.90		0.86	
2002	0.90		0.86	
2003	0.68		0.86	
2004	0.90		0.86	
2005	0.90		0.86	
2006	0.49		0.86	
2007	0.30		0.86	
2008	0.30		0.86	
2009	0.78		0.86	
2010	0.30		0.86	
2011	0.90		0.86	
2012	0.79		0.86	
2013	0.90		0.86	
2014	0.69		0.86	
2015	0.65		0.86	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.863
Initial Total Male Pop/10,000 =	0.235
Initial Female Pop/10,000 =	0.457

MODEL ASSUMPTIONS
Sex Ratio (% Males) = 50%
Wounding Loss (total males) = 10%
Wounding Loss (females) = 10%
Wounding Loss (juveniles) = 10%
Over-summer adult survival = 98%

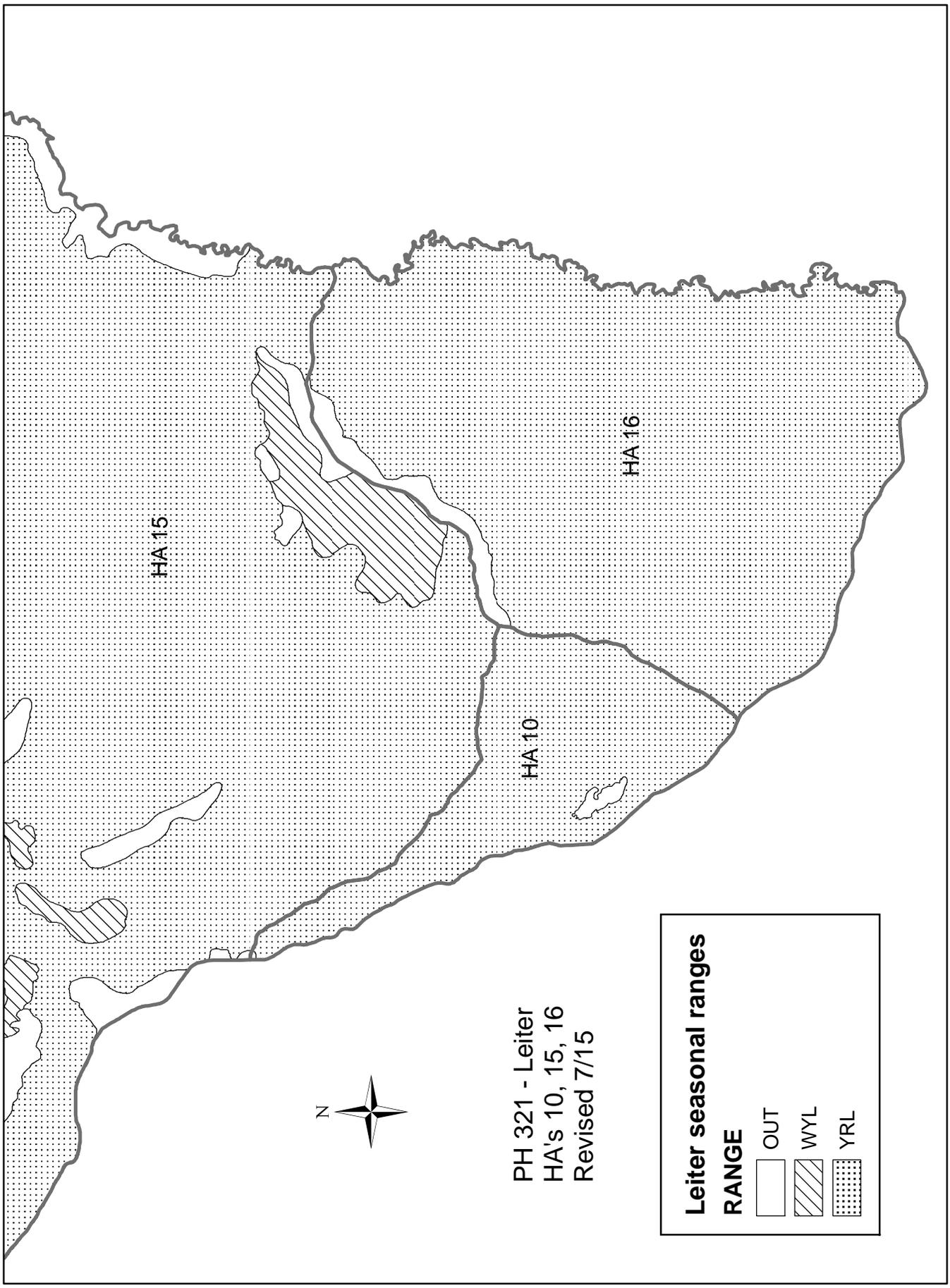
Year	Classification Counts						Harvest									
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Segment Harvest Rate (% of			
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females	
1993				51.35	50.91	2.58	737	558	66	1361	34.6	13.4				
1994	45.89	2.41	3.12	50.07	50.40	2.95	697	575	46	1318	36.2	14.9				
1995	54.66	3.12	3.97	46.77	46.77	3.17	562	451	102	1115	35.9	13.5				
1996	61.22	3.51	3.51	43.35	41.90	2.72	602	114	10	726	47.8	3.9				
1997	42.61	2.76	2.76	40.16	37.72	2.55	475	42	4	521	37.1	1.3				
1998	71.06	4.42	4.42	37.34	45.82	3.28	433	34	0	467	34.9	1.0				
1999	69.05	3.93	3.93	43.63	44.44	2.91	347	34	2	383	20.4	0.9				
2000	74.92	4.46	4.46	45.52	51.22	3.43	344	36	0	380	18.7	0.9				
2001	55.59	2.92	2.92	43.48	40.95	2.39	319	28	8	355	18.8	0.7				
2002	71.99	3.45	3.45	49.12	47.35	2.59	378	25	0	403	17.8	0.6				
2003	68.32	3.64	3.64	55.91	61.52	3.38	443	80	3	526	15.5	1.6				
2004	71.82	2.78	2.78	58.14	56.11	2.34	511	67	10	588	16.0	1.2				
2005	77.50	2.98	2.98	62.33	63.19	2.58	607	243	41	891	15.1	3.8				
2006	76.84	3.32	3.32	67.42	69.47	3.09	773	509	71	1353	15.2	6.7				
2007	62.41	2.99	2.99	67.68	70.69	3.26	869	460	51	1380	17.4	6.2				
2008	61.80	2.58	2.58	62.47	61.33	2.57	918	433	22	1373	22.3	6.6				
2009	49.91	2.61	2.61	55.23	54.90	2.78	693	443	31	1167	21.5	7.6				
2010	54.70	2.74	2.74	56.20	57.45	2.83	783	417	30	1230	24.4	7.3				
2011	75.84	4.85	4.85	49.17	47.44	3.51	693	445	36	1174	28.3	8.9				
2012	76.90	4.42	4.42	56.15	56.38	3.56	703	460	17	1180	22.7	8.3				
2013	75.22	4.36	4.36	59.72	56.63	3.57	798	489	44	1331	22.4	8.2				
2014	80.00	4.71	4.71	63.13	64.62	4.05	907	537	72	1516	21.7	8.1				
2015	75.00	4.33	4.33	65.12	65.00	3.91	950	650	100	1700	21.2	9.4				
2016																
2017																
2018																
2019																
2020																
2021																
2022																
2023																
2024																
2025																

FIGURES



Comments:

END





## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2014 - 5/31/2015

HERD: PR339 - NORTH BLACK HILLS

HUNT AREAS: 1-3, 18-19

PREPARED BY: ERIKA PECKHAM

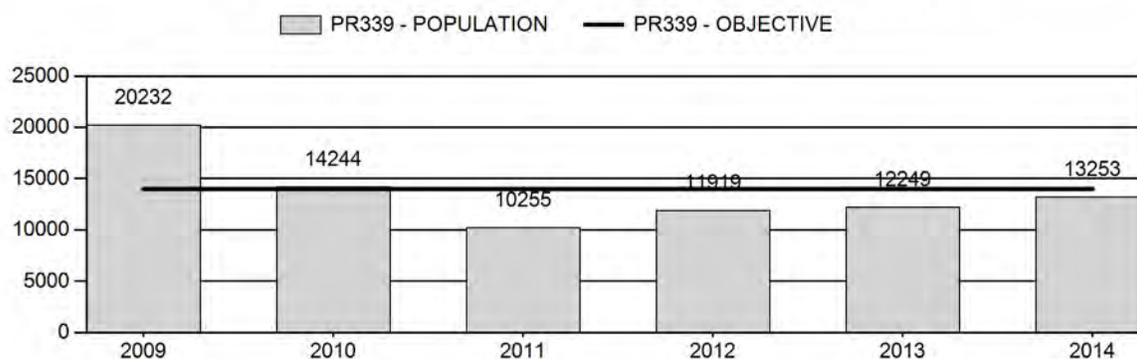
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	13,780	13,253	13,337
Harvest:	1,039	741	1,190
Hunters:	1,178	804	1,300
Hunter Success:	88%	92%	92%
Active Licenses:	1,348	899	1,400
Active License Success:	77%	82%	85%
Recreation Days:	4,711	2,536	4,300
Days Per Animal:	4.5	3.4	3.6
Males per 100 Females	42	39	
Juveniles per 100 Females	64	81	

Population Objective (± 20%) :	14000 (11200 - 16800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-5.3%
Number of years population has been + or - objective in recent trend:	4
Model Date:	05/4/2015

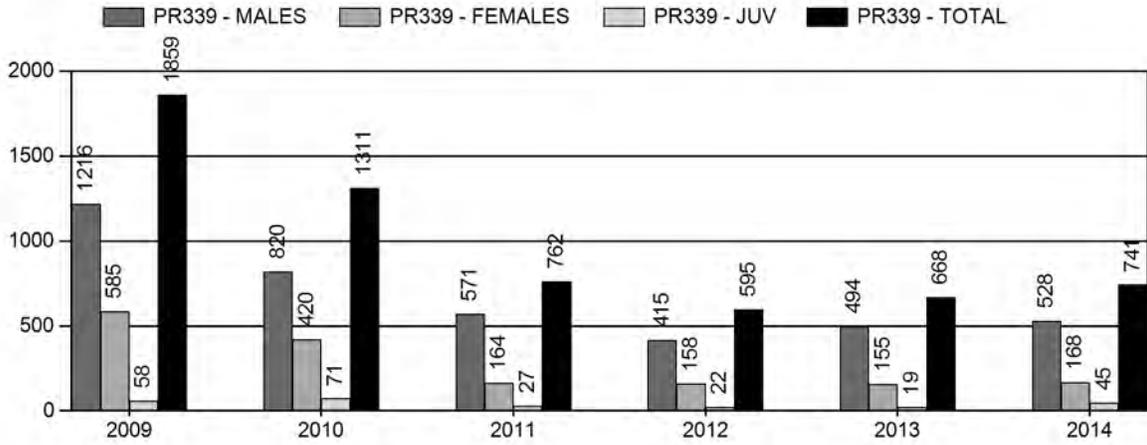
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1.6%	6.2%
Males ≥ 1 year old:	23.8%	31.2%
Juveniles (< 1 year old):	0%	0%
Total:	4.8%	8.9%
Proposed change in post-season population:	-1.3%	.6%

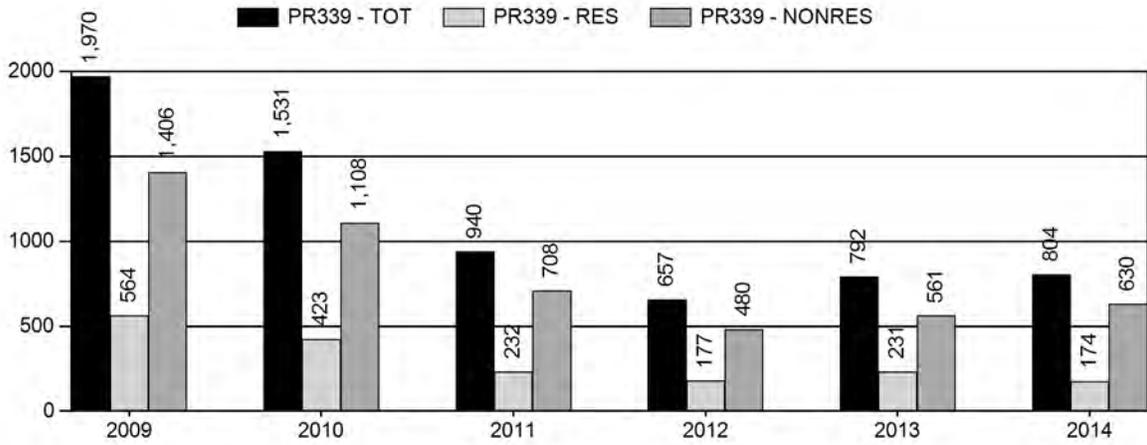
## Population Size - Postseason



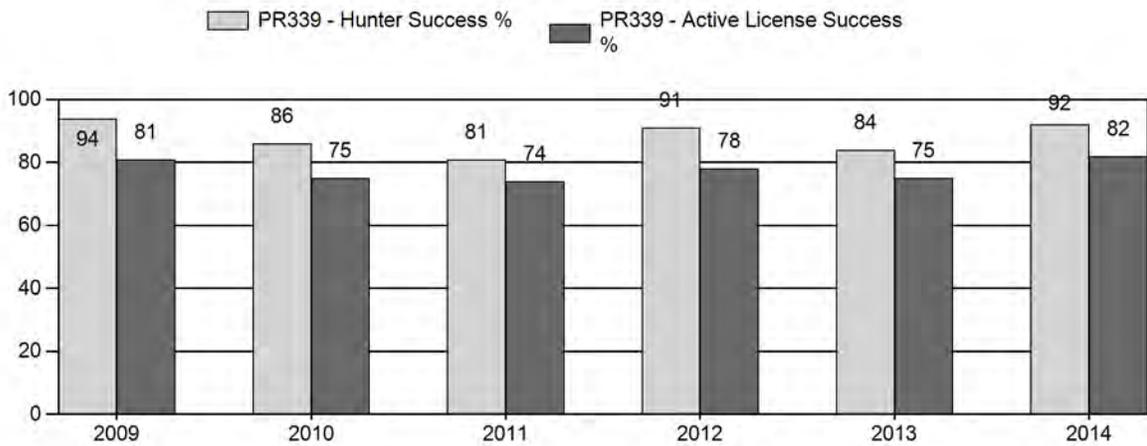
# Harvest



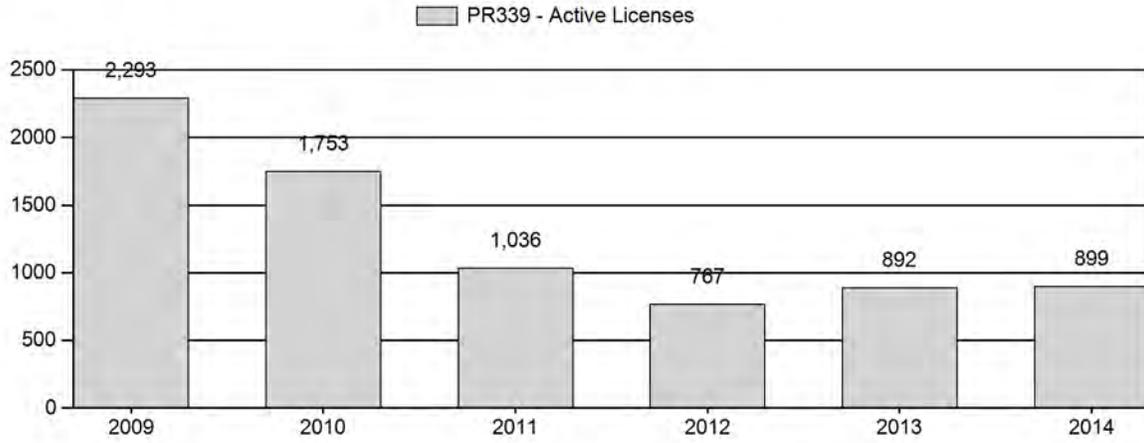
# Number of Hunters



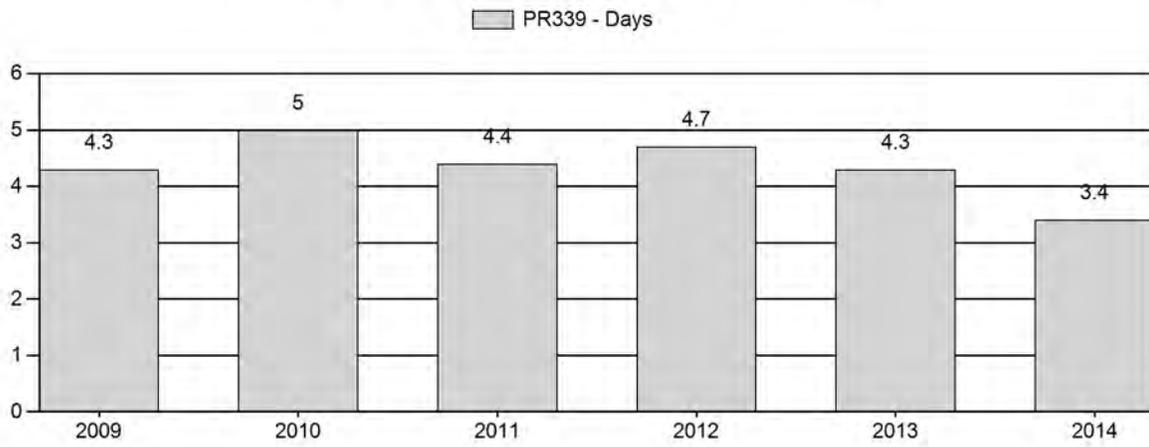
# Harvest Success



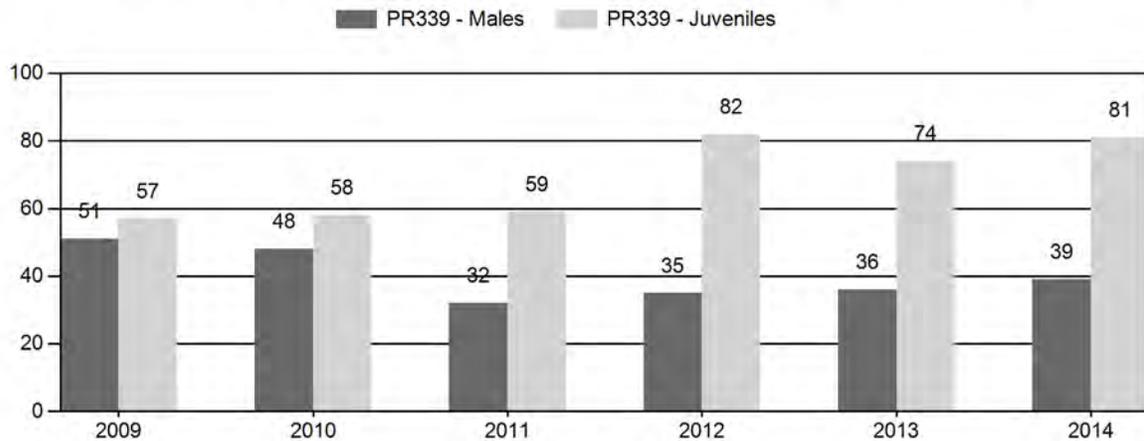
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

### for Pronghorn Herd PR339 - NORTH BLACK HILLS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	22,296	160	423	583	25%	1,137	48%	649	27%	2,369	2,732	14	37	51	± 4	57	± 4	38
2010	15,701	103	320	423	23%	874	48%	511	28%	1,808	1,761	12	37	48	± 4	58	± 5	39
2011	11,105	51	137	188	17%	595	52%	353	31%	1,136	1,662	9	23	32	± 4	59	± 6	45
2012	12,568	31	148	179	16%	513	46%	419	38%	1,111	2,330	6	29	35	± 5	82	± 8	61
2013	12,976	75	229	304	17%	841	48%	621	35%	1,766	1,878	9	27	36	± 4	74	± 6	54
2014	14,060	125	258	383	18%	993	45%	808	37%	2,184	2,247	13	26	39	± 4	81	± 6	59

**2015 HUNTING SEASONS  
NORTH BLACK HILLS PRONGHORN HERD (PR339)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
1	1	Oct. 1	Nov. 20	250	Limited quota	Any antelope
	6	Oct. 1	Nov. 20	100	Limited quota	Doe or fawn
2	1	Oct. 1	Nov. 20	200	Limited quota	Any antelope
	6	Oct. 1	Nov. 20	200	Limited quota	Doe or fawn
3	1	Oct. 1	Nov. 20	150	Limited quota	Any antelope
	6	Oct. 1	Nov. 20	75	Limited quota	Doe or fawn
18	1	Oct. 1	Oct. 20	100	Limited quota	Any antelope
19	1	Oct. 1	Oct. 20	300	Limited quota	Any antelope
19	6	Oct. 1	Oct. 20	150	Limited quota	Doe or fawn valid on private land
Archery		Sep. 1	Sep. 30			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
1	1	+50
2	1	+100
2	6	+150
3	1	+50
3	6	+50
19	1	+50
19	6	+50
<b>Herd Unit Total</b>	<b>1</b>	<b>+250</b>
	<b>6</b>	<b>+250</b>

**Management Evaluation**

**Current Postseason Population Management Objective: 14,000**

**Management Strategy: Recreational**

**2014 Postseason Population Estimate: ~13,200**

**2015 Proposed Postseason Population Estimate: ~13,300**

### **Herd Unit Issues**

The management objective for the North Black Hills Herd Unit is a post-season population objective of 14,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1994.

The 2014 post-season population estimate was about 13,200. Beginning in 2007 this population started a decline. Currently, the population is estimated to be slightly below the management objective. Issues related to adverse winter and spring weather, and low fawn production have been observed in this herd, particularly from 2009-2011. The winters of 2008 to 2010 appeared to have taken a toll on this herd in the form of increased winter mortality and decreased fawn recruitment. Heavy spring snows and cold spring temperatures in 2009 & 2010 likely reduced fawn and adult survival, particularly in Areas 18 and 19. Pronghorn numbers in Area 18 still appear to be suppressed, with other hunt areas experiencing a slight rebound in numbers. The last line transect survey was conducted in this herd unit was in June of 2014.

### **Weather**

Weather conditions throughout 2014 and into 2015 were very favorable to big game populations in this area. The winters of 2013-2014 and 2014-15 were mild to moderate and did not see much snow accumulation. During the majority of these 2 winters, the ground was open in many areas, with minimal snowpack. As a result over winter survival was likely high. The spring and summer of 2014 saw excellent range conditions in this herd unit with continued rainfall throughout much of the summer.

### **Habitat**

The Stewart Creek Wyoming big sagebrush transect falls within this herd unit. The utilization is typically very light on this transect. In the fall of 2014, the transect survey showed the average leader growth at 4.1 cm, which is fairly close to the 10 year average of 4.5 cm.

### **Field Data**

Classifications in 2014 showed an increase in the fawn ratio at 81:100, up from 74 in 2013. This is markedly improved from the preceding 5 year average of 62:100. It is important to note that 2008-2011 experienced four consecutive years of the poorest fawn ratios on record, or since 1981. Three of these years had fawn ratios that were in the fifties. Another significant finding of the classification surveys was that Hunt Area 18 seemed to suffer more so, with 2008-2010 experiencing fawn ratios of 35, 32 and 28:100, respectively. This is likely why Hunt Area 18 has not recovered as quickly as the surrounding Hunt Areas. The aforementioned weather conditions had a large impact on these ratios, and consequently the productivity of this herd in that time span. Bucks ratios since 2011 have been in the thirties. Previous to that the buck ratios fluctuated from the 40-60:100 mark, never dipping below 40:100. As there is a fair amount of private land in this herd unit landowner surveys are considered. The 2014 survey was fairly

split, indicating that 45% of respondents felt that the herd was below objective and 40% felt that it was at objective.

### **Harvest**

In 2014 there were 1,025 licenses available, 750 Type 1 and 275 Type 6. All licenses were sold by the season's close. Days per harvested animal decreased to 3.4, lower than the preceding 5-year average of 4.5. This decrease was likely due to favorable conditions during the hunting season, coupled with the population increasing. Even with the population slightly below objective, hunter success was reported at 92%, and 81% of hunters were either "very satisfied" or "satisfied".

### **Population**

The "Semi-Constant Juvenile – Semi-Constant Adult" (SCJ-SCA) spreadsheet model was chosen to use for the post season population estimate of this herd. It should be noted that this is different than the model that was chosen in the past. This change in the model from the "TSJ-CA" has slightly increased the population estimate as compared to last year. This model aligns much better with the independent Line Transect estimates. Additionally, juvenile and adult survivals were changed in 2009 and 2010 to .3 and .7 respectively. As stated earlier, field data and observations show that this is a reasonable assumption. This model had the lowest relative AIC (161) and appeared 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 that were similar to the model estimates. The model currently predicts a slight increase in post-season population. With continued favorable weather conditions and improving fawn to doe ratios, it seems that this herd should continue in an upward trend.

### **Management Strategy**

The traditional season in this hunt area has been the entire month of October and part of November in Hunt Areas 1, 2 and 3, and from October 1 to October 20 in Areas 18 and 19. The season time and length seem to be adequate to allow a reasonable harvest. The numbers of Type 1 and Type 6 licenses were both increased by 250. Licenses have been greatly reduced the past few years, however as this herd is trending upwards, it was felt that numbers warranted higher license issuance in most hunt areas. The one exception to this is Hunt Area 18, which still appears to be struggling. If we attain the projected harvest of 1,190 and near normal fawn recruitment, the population will increase slightly. Based on the population model, we predict a 2015 post-season population of about 13,300.

**INPUT**  
 Species: Pronghorn  
 Biologist: Erika Peckham  
 Herd Unit & No.: North Black Hill 339  
 Model date: 02/12/14

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	184	175	<input type="checkbox"/> Clear form Check best model to create report <input type="checkbox"/> CJ,CA Model <input checked="" type="checkbox"/> SCJ,SJC Mod <input type="checkbox"/> TSJ,CA Model
SCJ,SJC	161	142	
TSJ,CA	170	66	

Year	Predicted Prehunt Population (year <i>t</i> )		Total	Predicted Posthunt Population (year <i>t</i> )		Total	Predicted adult End-of-bio-year Pop (year <i>t</i> )		LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females			
1993	5680	4627	9396	5504	2895	7794	3685	8262	11947		14000
1994	7075	3611	10686	6852	1949	6885	3088	7523	10611		14000
1995	6134	3026	9160	5911	1706	6281	2688	6971	9659	6518	14000
1996	5806	2634	8440	5700	1790	6027	2797	6749	9546	1508	14000
1997	4590	2741	7331	4553	2131	6268	2907	6786	9693	1696	14000
1998	5288	2849	8137	5272	2420	6485	3355	7167	10521		14000
1999	5873	3287	9160	5849	2874	6925	3901	7705	11606	3097	14000
2000	6781	3823	10604	6737	3108	7379	4280	8308	12588		14000
2001	6724	4194	10918	6691	3621	7967	4763	8849	13613		14000
2002	6912	4668	11580	6890	4065	8470	5221	9362	14583	1754	14000
2003	7515	5117	12632	7470	4180	8860	5221	9362	14583		14000
2004	8068	5309	13377	8012	4172	9254	5506	10310	15816	2690	14000
2005	7985	5396	13381	7888	4226	9680	5515	10664	16179		14000
2006	9332	5404	14736	9264	4215	9835	5810	11098	16908		14000
2007	8017	5694	13711	7945	4318	10213	5602	11159	16761		14000
2008	7132	5490	12622	7072	4053	10423	5165	11183	16348	3424	14000
2009	6256	5061	11317	6192	3724	10316	3175	8097	11272		14000
2010	4639	3112	7751	4561	2210	7473	1973	5866	7839		14000
2011	3411	1933	5344	3381	1305	5569	2072	5922	7994		14000
2012	4740	2031	6771	4716	1572	5632	2365	6261	8626	1134	14000
2013	4531	2317	6848	4510	1774	5965	2547	6511	9058		14000
2014	5192	2496	7688	5143	1914	6196	2631	6656	9287	1170	14000
2015	5544	2579	8123	5445	1776	6116					14000
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											

Survival and Initial Population Estimates

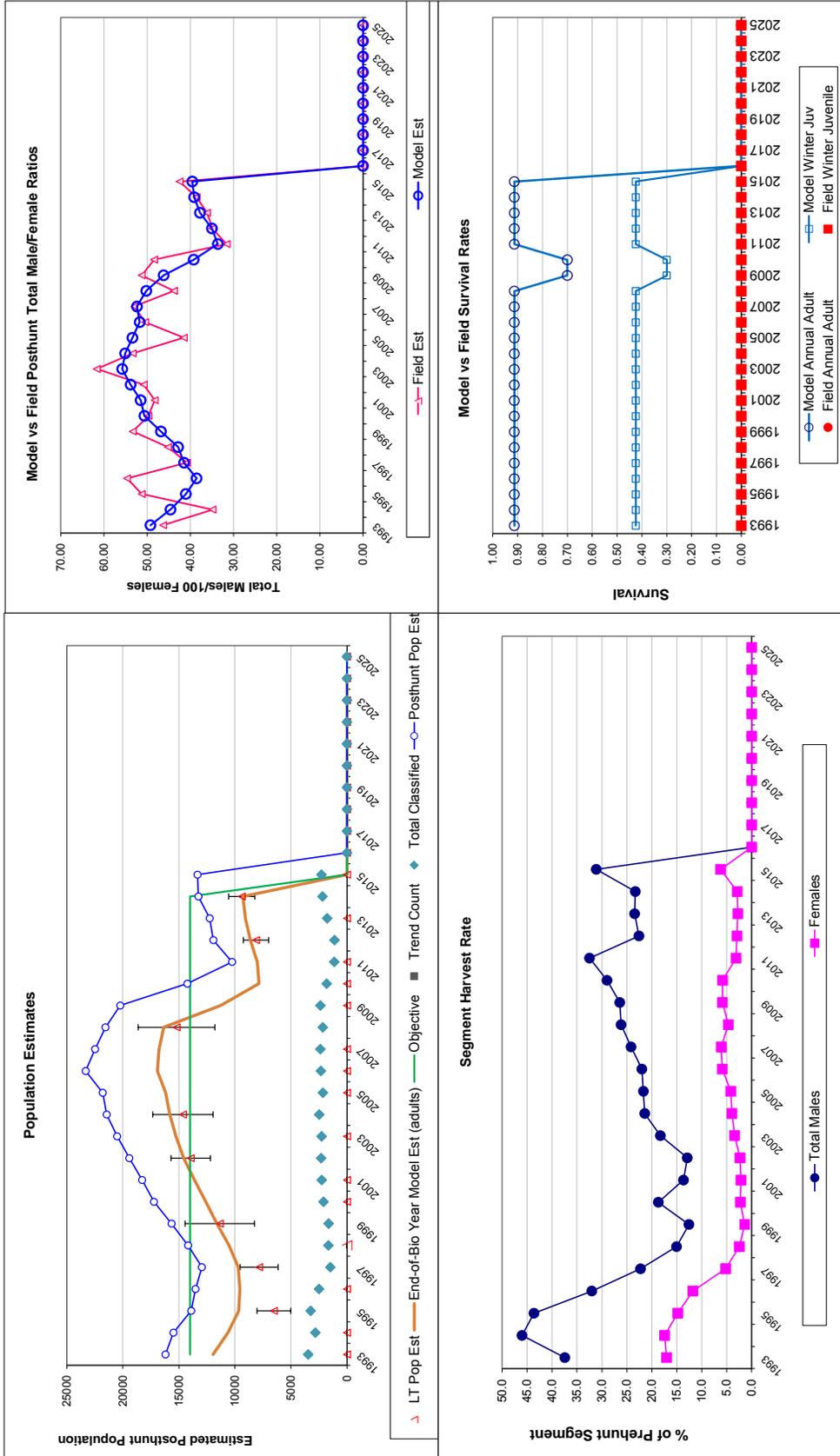
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est.	Field Est. SE	Model Est.	Field Est. SE
1993	0.42		0.91	
1994	0.42		0.91	
1995	0.42		0.91	
1996	0.42		0.91	
1997	0.42		0.91	
1998	0.42		0.91	
1999	0.42		0.91	
2000	0.42		0.91	
2001	0.42		0.91	
2002	0.42		0.91	
2003	0.42		0.91	
2004	0.42		0.91	
2005	0.42		0.91	
2006	0.42		0.91	
2007	0.42		0.91	
2008	0.42		0.91	
2009	0.30		0.70	
2010	0.30		0.70	
2011	0.42		0.91	
2012	0.42		0.91	
2013	0.42		0.91	
2014	0.42		0.91	
2015	0.42		0.91	
2016	0.42		0.91	
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.424
Adult Survival =		0.913
Initial Total Male Pop/10,000 =		0.463
Initial Female Pop/10,000 =		0.940

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

Year	Classification Counts						Harvest								
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Segment Harvest Rate (% of Total Harvest)		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		60.45	2.41	49.25	46.30	2.01	1575	1457	160	3192				37.4	17.1
1994		87.38	3.59	44.60	34.86	1.93	1511	1284	203	2998				46.0	17.4
1995		83.20	3.32	41.04	51.27	2.37	1200	993	203	2396				43.6	14.8
1996		84.99	3.89	38.56	54.67	2.85	767	732	96	1595				32.0	11.8
1997		69.41	4.08	41.45	40.79	2.85	555	315	34	904				22.3	5.2
1998		79.51	4.40	42.84	45.18	2.98	390	150	14	554				15.1	2.5
1999		83.62	4.72	46.81	53.33	3.44	376	89	22	487				12.6	1.4
2000		89.81	4.42	50.63	49.71	2.92	650	156	40	846				18.7	2.3
2001		82.58	3.93	51.51	48.26	2.71	521	159	30	710				13.7	2.1
2002		79.70	3.78	53.83	50.80	2.77	548	184	20	752				12.9	2.3
2003		81.92	4.01	55.77	61.68	3.28	851	286	41	1178				18.3	3.4
2004		83.72	3.84	55.09	53.35	2.80	1034	348	51	1433				21.4	4.0
2005		79.03	3.81	53.41	41.52	2.46	1064	385	88	1537				21.7	4.2
2006		89.29	4.17	51.71	50.46	2.80	1081	560	61	1702				22.0	5.9
2007		73.71	3.50	52.35	52.96	2.78	1251	603	65	1919				24.2	6.1
2008		65.21	3.23	50.20	43.80	2.47	1306	466	54	1826				26.2	4.7
2009		57.08	2.81	46.18	51.28	2.61	1216	585	58	1859				26.4	5.9
2010		58.47	3.26	39.22	48.40	2.87	820	420	71	1311				29.0	5.8
2011		59.33	3.99	33.62	31.60	2.64	571	164	27	762				32.5	3.1
2012		81.68	5.38	34.99	34.89	3.03	417	156	22	595				22.6	3.0
2013		73.84	3.91	37.77	36.15	2.42	494	155	19	668				23.5	2.8
2014		81.37	3.86	39.12	38.57	2.32	529	168	45	742				23.3	2.9
2015		85.00	3.97	39.53	42.50	2.46	730	370	90	1190				31.1	6.2
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

FIGURES



Comments:

END

---

---

## 2014 PR339 - NORTH BLACK HILLS Pronghorn Line-Transect Summary

---

---

Survey Dates: 6/16/2015 - 6/23/2015  
Survey Cost: \$ 5,100.00  
Flight Service: LAIRD FLYING SERVICE  
Aircraft: HUSKY AVIAT  
Observers: Peckham

---

**Weather Conditions:**

Temperature (Degrees Fahrenheit): 55-70  
Cloud Cover (%): 0-50  
Wind Speed (MPH): 0 - 15

---

Transect Limits: 461641/4984576 to 573719/4905360  
Transect Direction: North/South  
Transect Interval (Minutes of Longitude): 5000  
Transect Length: (Mi.): 911  
Transect Altitude (AGL): 320 ft.

---

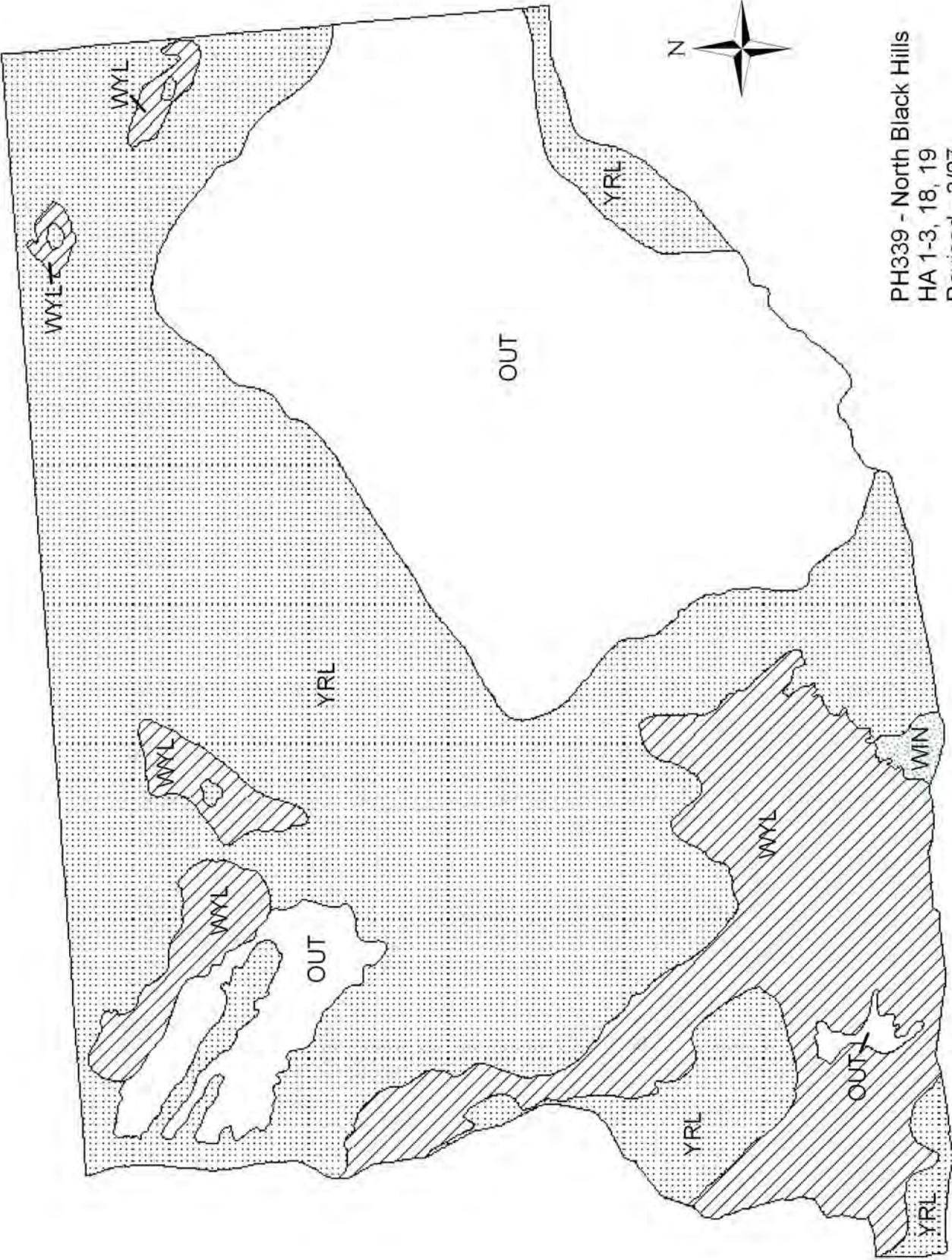
Occupied Habitat (mi<sup>2</sup>): 2,020

Density Estimate (Animals/mi<sup>2</sup> with Confidence Intervals): 4.6471 (3.6379 - 5.9363)

Population Estimate (with Confidence Intervals): 9,387 (7,348 - 11,991)

---

---



PH339 - North Black Hills  
 HA 1-3, 18, 19  
 Revised - 3/87



## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2014 - 5/31/2015

HERD: PR351 - GILLETTE

HUNT AREAS: 17

PREPARED BY: ERIKA PECKHAM

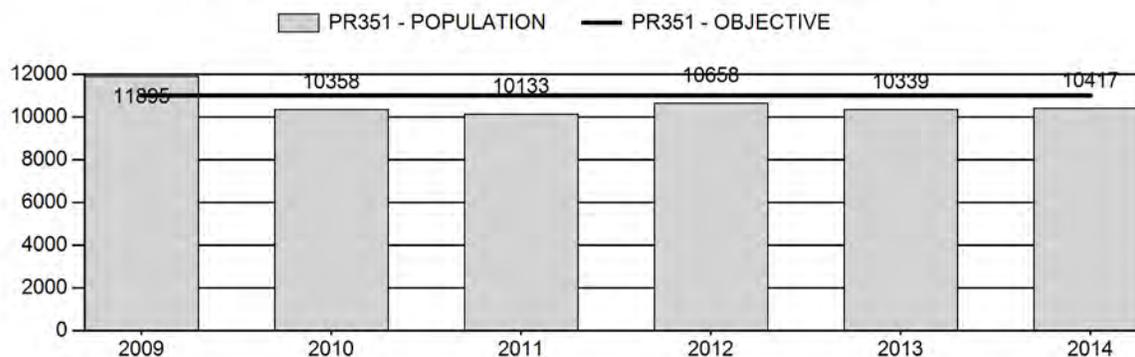
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	10,677	10,417	10,960
Harvest:	1,088	1,089	1,070
Hunters:	1,229	1,239	1,250
Hunter Success:	89%	88%	86%
Active Licenses:	1,320	1,357	1,360
Active License Success:	82%	80%	79 %
Recreation Days:	4,045	4,298	4,200
Days Per Animal:	3.7	3.9	3.9
Males per 100 Females	43	55	
Juveniles per 100 Females	52	67	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-5.3%
Number of years population has been + or - objective in recent trend:	0
Model Date:	02/25/2015

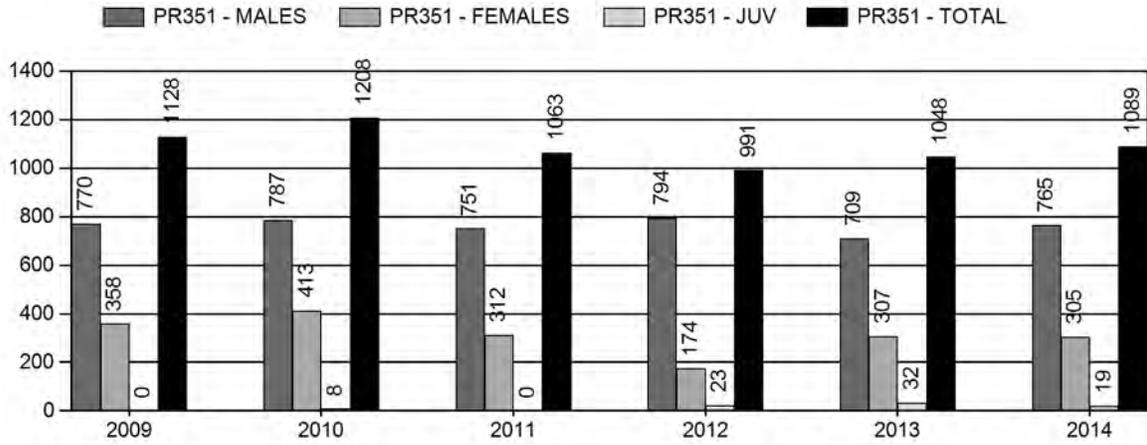
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	5.9%	5.9%
Males ≥ 1 year old:	32.8%	34.5%
Juveniles (< 1 year old):	0%	0%
Total:	8.9%	8.8%
Proposed change in post-season population:	-10%	-9.6%

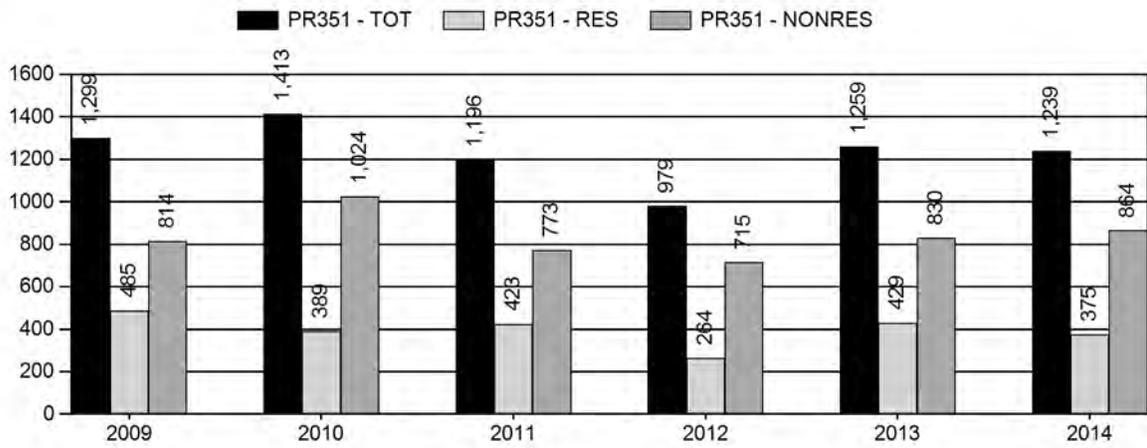
## Population Size - Postseason



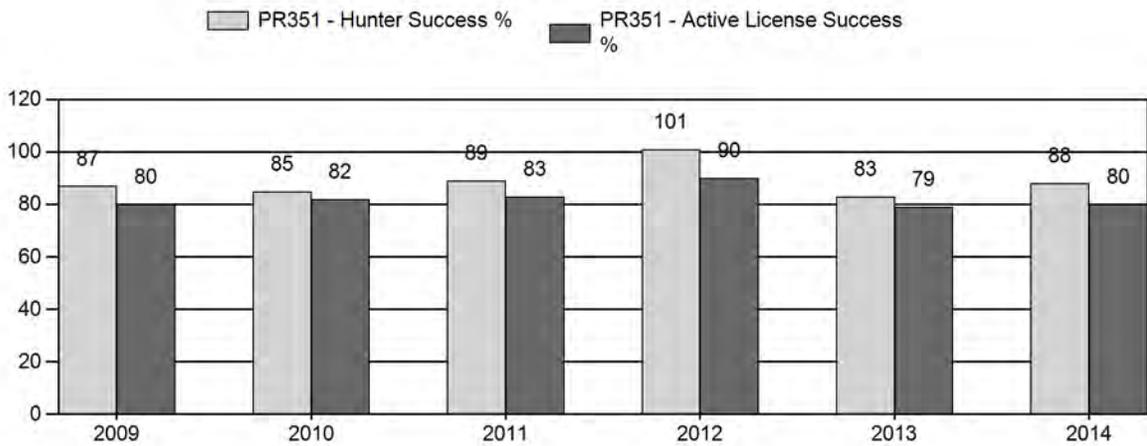
# Harvest



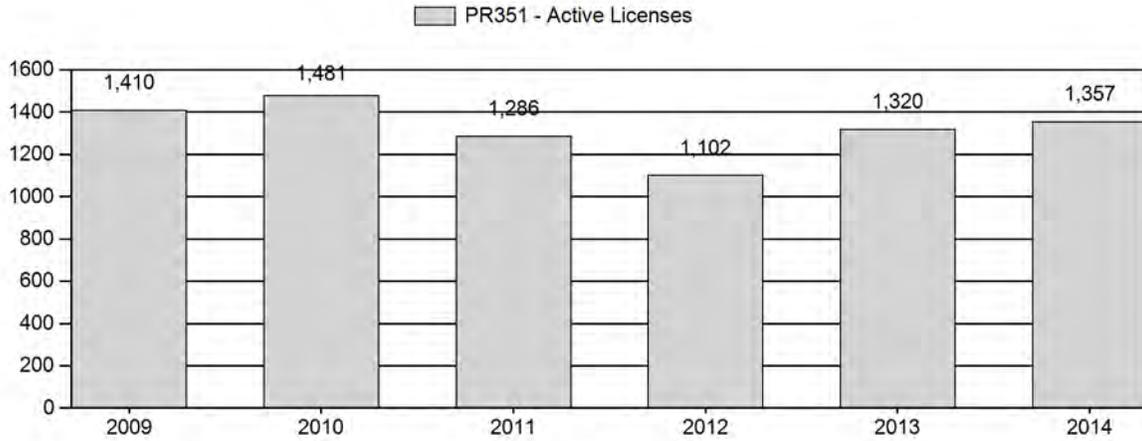
# Number of Hunters



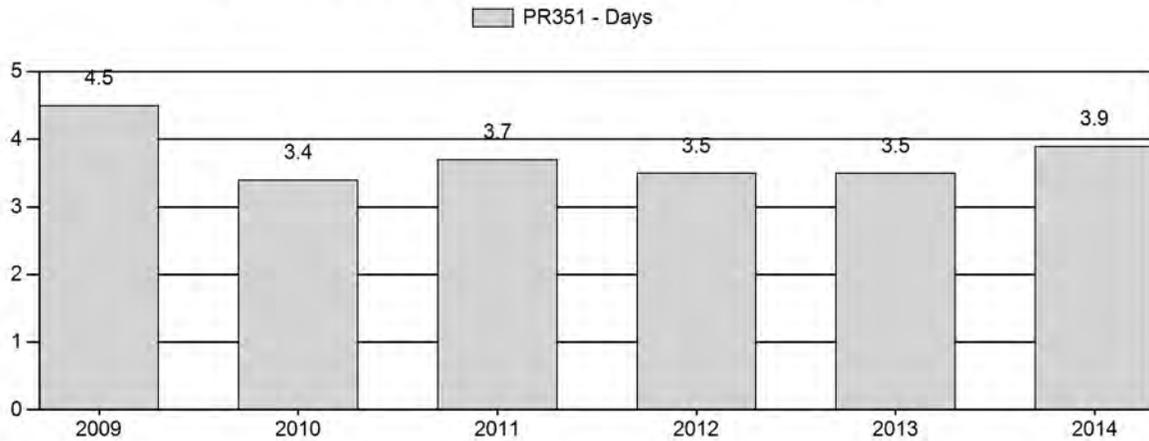
# Harvest Success



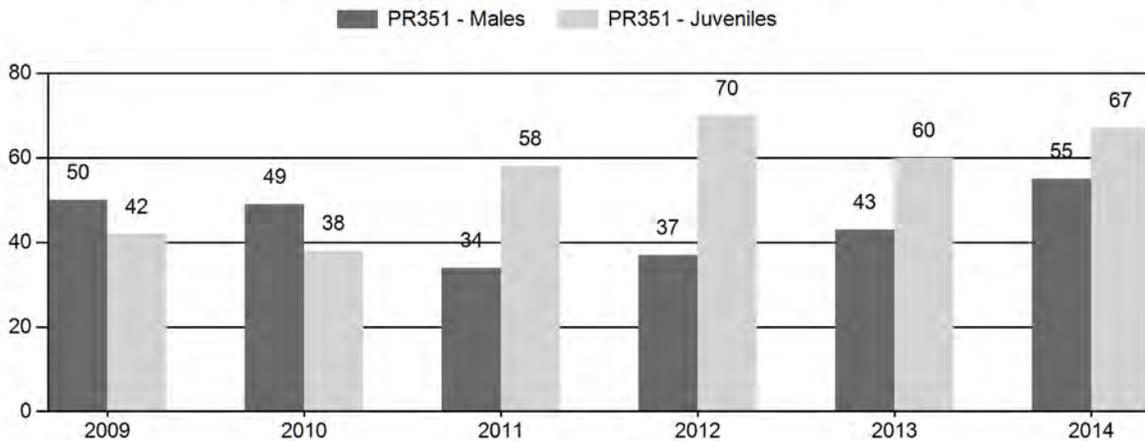
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



**2009 - 2014 Preseason Classification Summary**

for Pronghorn Herd PR351 - GILLETTE

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylg	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	13,076	144	486	630	26%	1,250	52%	527	22%	2,407	1,385	12	39	50	± 4	42	± 3	28
2010	11,550	112	437	549	26%	1,126	54%	429	20%	2,104	1,920	10	39	49	± 4	38	± 3	26
2011	11,095	75	301	376	18%	1,111	52%	640	30%	2,127	1,639	7	27	34	± 3	58	± 4	43
2012	11,428	78	214	292	18%	779	48%	545	34%	1,616	1,970	10	27	37	± 4	70	± 6	51
2013	11,692	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 HUNTING SEASONS  
GILLETTE PRONGHORN HERD (PR351)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
17	1	Oct. 1	Oct. 31	1,100	Limited quota	Any antelope
	6	Oct. 1	Oct. 31	400	Limited quota	Doe or fawn
Archery		Sep. 1		Sep. 30		Refer to Section 3 of this Chapter

**Management Evaluation**

**Current Postseason Population Management Objective: 11,000**

**Management Strategy: Recreational**

**2014 Postseason Population Estimate: ~10,400**

**2015 Proposed Postseason Population Estimate: ~10,950**

**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 revised in 1994 and are scheduled for review in 2015. In years when numbers are above objective, the largest issue with achieving adequate harvest in this herd is access. There is very minimal publicly accessible land in this herd unit.

Extensive coal bed methane development has occurred in the herd unit and has resulted in a network of roads and other development associated with the infrastructure required to support coal bed methane extraction. The increased traffic was an issue with hunting in the past, however in recent years, development and activity has tapered off substantially. The more pressing issue in this herd unit will be proper reclamation as these wells are abandoned. Although other surrounding herd units have experienced an increase in conventional oil drilling, this herd unit has remained on the periphery of most of that development.

**Weather**

Weather throughout 2013 and into 2014 was optimal for rangeland conditions in this area. There were a few isolated hailstorms that afflicted this unit; however nothing that was very widespread. The growing season commenced with plentiful rainfall and ideal conditions to produce ample forage. The winter of 2013-2014 was moderate with not much for snow accumulation, or prolonged snow cover. The winter of 2014-15 was mild with minimal snow and frequent above average temperatures. The Palmer Drought Index indicates that throughout 2014, the conditions

in the Powder River drainage were “moderately moist”. During the majority of these two winters, the ground was open, with minimal snowpack. As a result over winter survival was likely high.

### **Habitat**

The SA Creek habitat transect is located within this herd unit. The utilization is typically very light on this transect. In the fall of 2014, the transect survey showed the average leader growth to be 6.4cm, which is lower than anticipated, given the favorable conditions that were experienced in the 2014 growing season. The 10 year average leader growth for this transect is ~6cm, so it is slightly above the average. It should be noted that various stands of sagebrush in this area appeared to be stressed with overall low vigor. It is unknown what may be the cause of this, but has been noted throughout the general area.

### **Field Data**

This herd has the potential for rapid growth as has been seen in years past. High fawn to doe ratios coupled with limited access have allowed this herd to exceed management objective in the past. However, the last several years (2010-2014), this herd has been below objective, with licenses having been reduced accordingly. In 2014 the fawn to doe ratio was slightly improved at 67, which was up from a ratio of 60 in 2013. It should again be noted that the growing season of 2014 was very productive. In certain areas the sweet clover and other vegetation was very tall. Though best efforts are put forth to accurately classify the pronghorn, it is possible that fawns were not visible in areas of tall vegetation. As this is a predominantly private lands area, landowner surveys are considered. The 2014 survey indicates that 64% of respondents feel that the herd was where they would like to see it.

### **Harvest Data**

In 2014 there were 1,500 licenses available, 1,100 Type 1 and 400 Type 6. Both license types were sold out by the close of the season. Hunter success in this herd unit has averaged 89% over the preceding 5 years, with similar success in previous years as well. 2014 had an overall success rate of 88% and hunters averaged 3.9 days to harvest an animal, up slightly from the preceding years. It is felt that this area received more pressure than is typical in 2014. A high volume of non-resident hunter phone calls were received, with numerous people stating that they didn't draw where they typically do. As there are plentiful licenses after the draw, people notice this and likely purchase licenses without having access to private land.

### **Population**

The “Constant Juvenile – Constant Adult Mortality Rate” (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. Although this model did not have the lowest relative AIC (188), they were all fairly close and this one appeared to most accurately represent what was occurring on the ground, and made best use of the available information. We conducted line transect surveys in 1995, 1998, 2000, 2002, 2008 and 2013 which provided independent population estimates that were similar to the model estimates. With the exception of the 2002 line transect population estimate, the model projections were in line with the line transect surveys. The 2002 line transect was an outlier and appeared to vastly overestimate the

population. Due to this discrepancy, it was felt that the 2002 line transect estimate be removed from the model. This removal appeared to improve the model (Fair Model).

The 2014 post-season population estimate was about 11,000, which illustrates a slight increase from the 2013 post-season estimate. In 2007 the population started a decline, hitting a low in 2011 at an estimate of 8,500 individuals. This herd experienced extremely poor fawn ratios from 2008-2010, ranging from 38-43 fawns per 100 does. Since 2007, the fawn:doe ratio has yet to reach 70:100, with the preceding 5 year average coming in at 59. 2014 saw a slight increase with a fawn:doe ratio of 67.

The last line transect survey was conducted in this herd unit in June 2013, which resulted in an estimated population of 8,300 pronghorn at that time.

### **Management Strategy**

Having adequate licenses available is imperative to keep harvest up on this herd when numbers warrant. In 2014 there were 1,500 licenses available, 1,100 Type 1 and 400 Type 6. Both Type 1 and Type 6 licenses were sold out before the close of the season. In speaking with hunters, it seemed that many people who had historically drawn licenses in other hunt areas did not draw them this year. It is thought that this may have been a factor in increased license sales for this hunt area.

The traditional season in this hunt area has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. The number of licenses available for 2015 was unchanged. All respondents on the landowner survey within this herd unit felt that a similar or more liberal season as last year would be in line with their observations of antelope.

If we attain the projected harvest of 1,070 and slightly improved fawn recruitment the population is anticipated to grow slightly and is projected to be close to objective. Based on the population model, we predict a 2015 post-season population of about 11,000.

<b>INPUT</b>	
Species:	Proughorn
Biologist:	Erika Peckham
Herd Unit & No.:	PR351-Gillette
Model date:	02/11/15

<b>MODELS SUMMARY</b>		Relative AICs	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival	188	179	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	171	152	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	184	73	

Year	Predicted Prehunt Population (year <i>t</i> )		Predicted Posthunt Population (year <i>t</i> )		Predicted adult End-of-bio-year Pop (year <i>t</i> )		LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total	Juveniles	Total	Total Males	Females			
1993	3007	3788	2964	14888	3363	7167	10530		11000
1994	6216	3296	6127	16535	2201	6176	3772		11000
1995	3119	3697	2954	13898	2646	6034	3076	6860	11000
1996	3997	3014	3917	12879	2065	5361	2933	1624	11000
1997	2462	2874	2433	11056	1936	5612	2330		11000
1998	2450	2284	2450	10245	1790	5495	2287	6840	11000
1999	3120	2241	3120	10799	1842	5414	2574	1706	11000
2000	3862	2523	3854	11975	1808	5540	2741	1718	11000
2001	2741	2686	2737	11361	2107	5887	2643		11000
2002	2957	2590	2955	11404	2032	5828	2656		11000
2003	3253	2603	3248	11739	2006	5797	2726		11000
2004	4364	2671	4342	12980	2025	5813	3102		11000
2005	5124	3040	5114	14474	2227	6062	3511		11000
2006	7214	3440	7179	17414	2466	6458	4384		11000
2007	4787	4296	4787	16849	3254	7179	4247		11000
2008	3246	4162	3130	14949	3179	6921	3613	10625	11000
2009	2846	3540	2846	13135	2693	6356	3141	2003	11000
2010	2375	3078	2366	11687	2212	5780	2561		11000
2011	3214	2509	3214	11302	1683	5236	2355		11000
2012	3890	2307	3865	11758	1436	5357	2503		11000
2013	3404	2453	3369	11492	1673	5297	2401	8337	11000
2014	3724	2353	3703	11615	1511	5203	2440		11000
2015	4177	2391	4155	12137	1566	5239	2440		11000
2016									11000
2017									11000
2018									11000
2019									11000
2020									11000
2021									11000
2022									11000
2023									11000
2024									11000
2025									11000

Survival and Initial Population Estimates

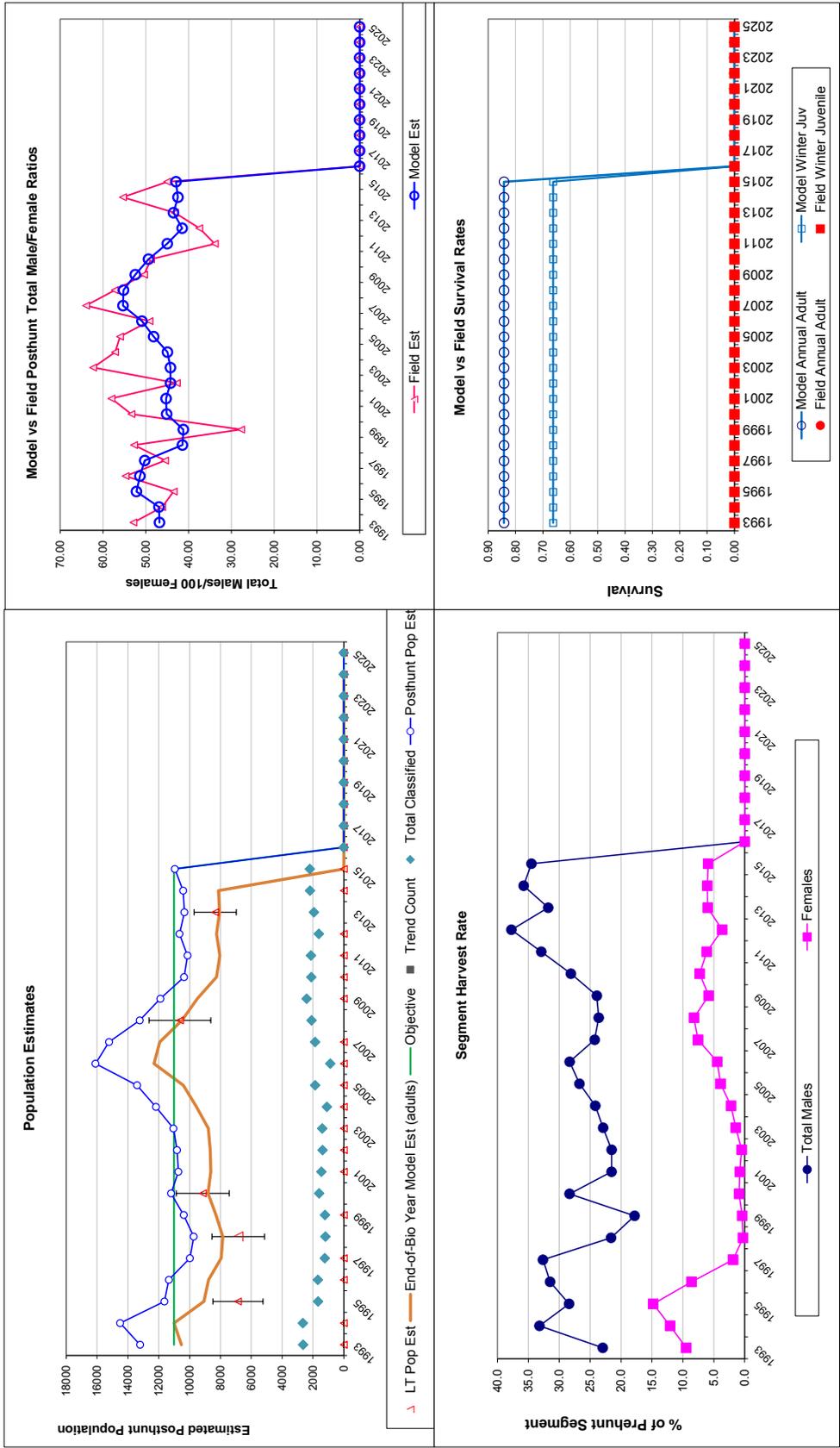
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.66		0.84	
1994	0.66		0.84	
1995	0.66		0.84	
1996	0.66		0.84	
1997	0.66		0.84	
1998	0.66		0.84	
1999	0.66		0.84	
2000	0.66		0.84	
2001	0.66		0.84	
2002	0.66		0.84	
2003	0.66		0.84	
2004	0.66		0.84	
2005	0.66		0.84	
2006	0.66		0.84	
2007	0.66		0.84	
2008	0.66		0.84	
2009	0.66		0.84	
2010	0.66		0.84	
2011	0.66		0.84	
2012	0.66		0.84	
2013	0.66		0.84	
2014	0.66		0.84	
2015	0.66		0.84	
2016	0.66		0.84	
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.663
Adult Survival =		0.842
Initial Total Male Pop/10,000 =		0.379
Initial Female Pop/10,000 =		0.809

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

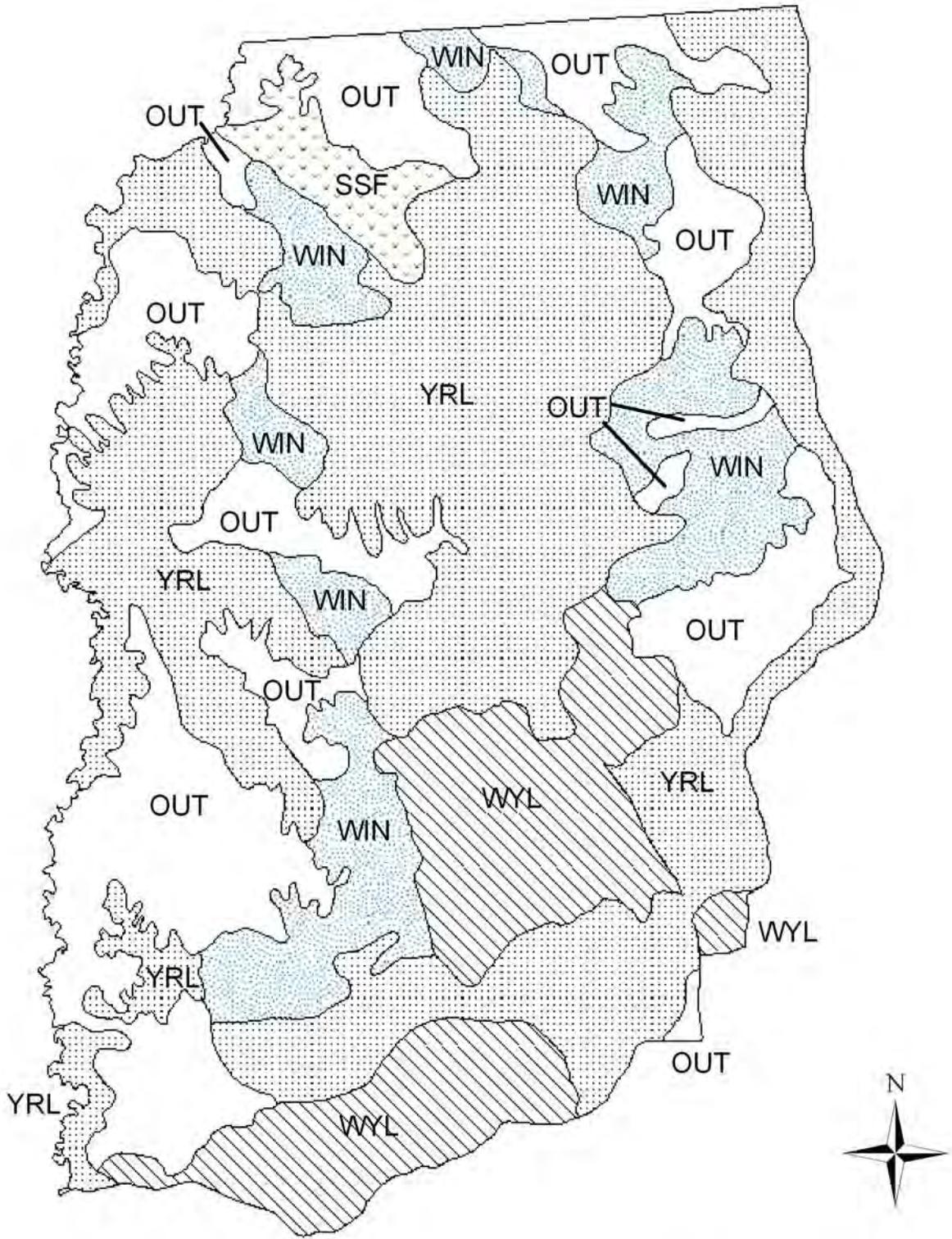
Year	Classification Counts						Harvest					
	Juvenile/Female Ratio			Total Male/Female Ratio			Males		Females		Segment Harvest Rate (% of Total Harvest)	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1993		37.16	1.92	46.81	52.89	2.42	791	688	39	1528	23.0	9.5
1994		88.50	3.84	46.92	46.19	2.44	995	771	81	1847	33.2	12.1
1995		44.03	2.67	52.19	43.47	2.65	955	954	150	2059	28.4	14.8
1996		68.13	3.90	51.37	54.71	3.35	863	460	73	1396	31.5	8.6
1997		43.03	3.07	50.24	45.48	3.18	853	98	26	977	32.6	1.9
1998		44.44	3.26	41.44	52.74	3.65	449	15	0	464	21.6	0.3
1999		57.38	3.71	41.22	27.70	2.32	363	21	0	384	17.8	0.4
2000		69.08	4.03	45.12	53.34	3.38	650	46	7	703	28.3	0.9
2001		46.20	3.08	45.26	58.03	3.59	526	43	4	573	21.5	0.8
2002		50.49	3.27	44.22	42.76	2.93	507	26	2	535	21.5	0.5
2003		55.30	3.66	44.24	62.31	3.97	542	78	5	625	22.9	1.5
2004		73.42	5.18	44.93	57.17	4.35	587	120	20	727	24.2	2.2
2005		81.20	4.34	48.17	56.01	3.34	739	226	9	974	26.7	3.9
2006		106.73	8.03	50.90	49.12	4.63	886	274	32	1192	28.3	4.5
2007		61.65	3.48	55.33	63.96	3.57	948	533	0	1481	24.3	7.6
2008		43.05	2.43	55.20	57.24	2.94	894	563	105	1562	23.6	8.2
2009		42.16	2.19	52.46	50.40	2.46	770	358	0	1128	23.9	5.8
2010		38.10	2.16	49.38	48.76	2.54	787	413	8	1208	28.1	7.3
2011		57.61	2.86	44.98	33.84	2.02	751	312	0	1063	32.9	6.2
2012		69.96	3.91	41.50	37.48	2.57	792	185	23	1000	37.8	3.7
2013		60.42	3.19	43.53	43.16	2.55	709	307	32	1048	31.8	6.0
2014		67.24	3.38	42.48	55.34	2.96	765	305	19	1089	35.8	6.1
2015		75.00	3.62	42.93	45.00	2.55	750	300	20	1070	34.5	5.9
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



Comments:

END



PH351 - Gillette  
 HA 17  
 Revised - 3/87

## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2014 - 5/31/2015

HERD: PR352 - MIDDLE FORK

HUNT AREAS: 21

PREPARED BY: DAN THIELE

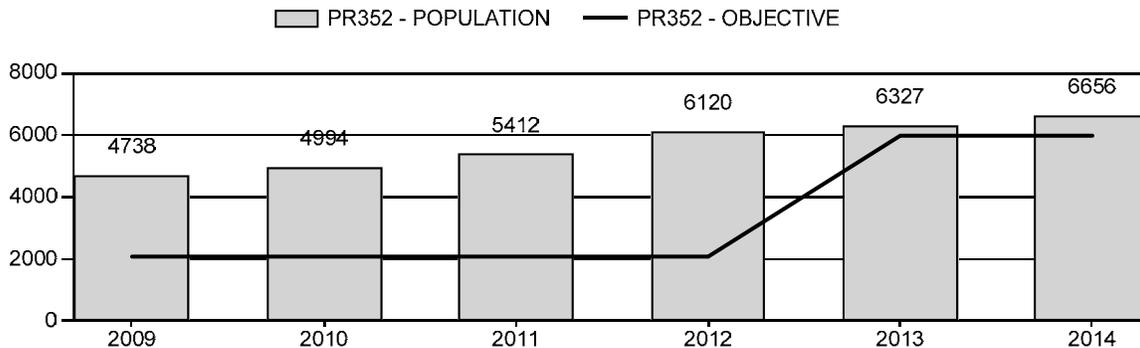
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	5,518	6,656	6,783
Harvest:	849	776	525
Hunters:	997	910	600
Hunter Success:	85%	85%	88%
Active Licenses:	1,081	1,017	650
Active License Success:	79%	76%	81%
Recreation Days:	3,758	5,061	3,000
Days Per Animal:	4.4	6.5	5.7
Males per 100 Females	61	46	
Juveniles per 100 Females	80	97	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	11%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/23/2015

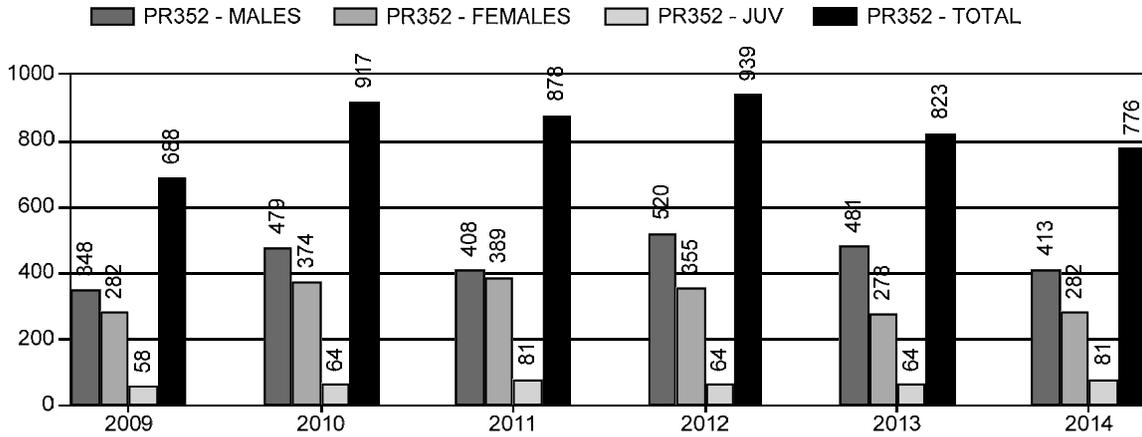
**Proposed harvest rates (percent of pre-season estimate for each sex/age group):**

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	10%	6%
Males ≥ 1 year old:	29%	19%
Juveniles (< 1 year old):	3%	2%
Total:	10%	7%
Proposed change in post-season population:	+5%	+2%

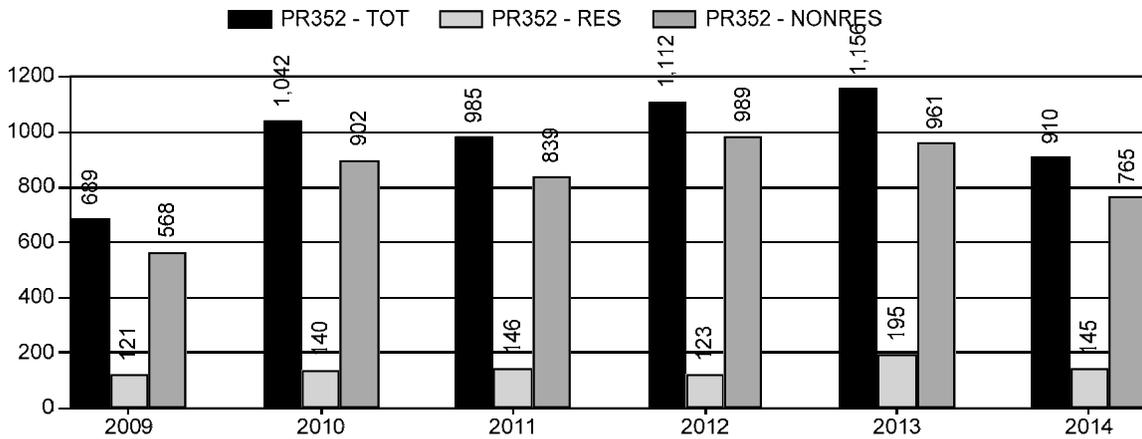
## Population Size - Postseason



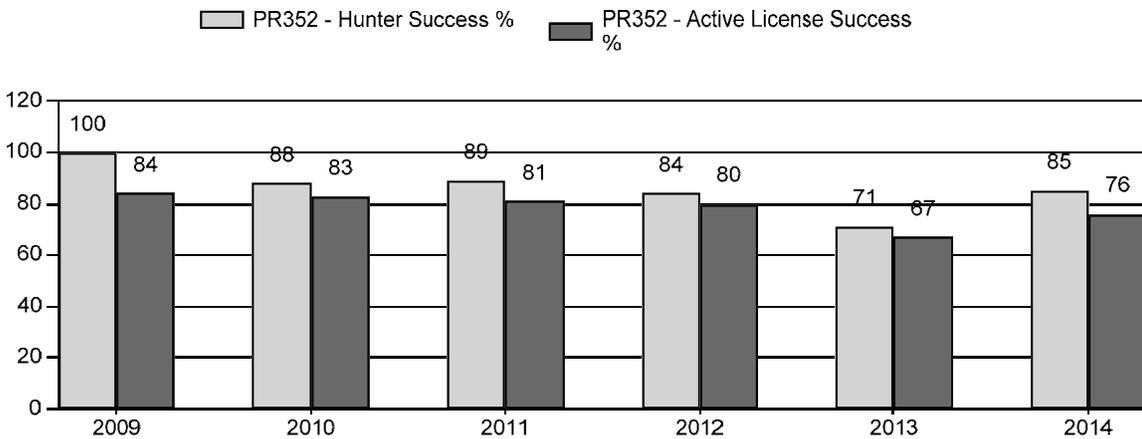
# Harvest



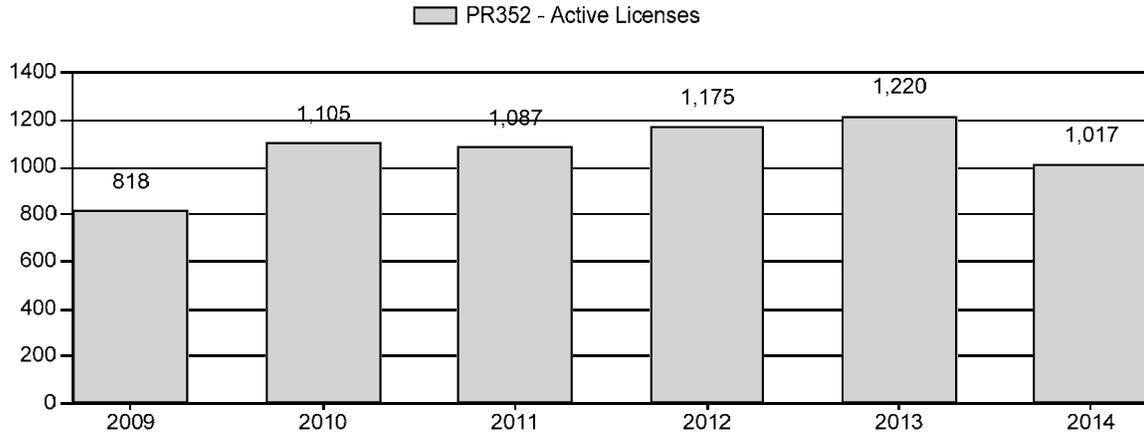
# Number of Hunters



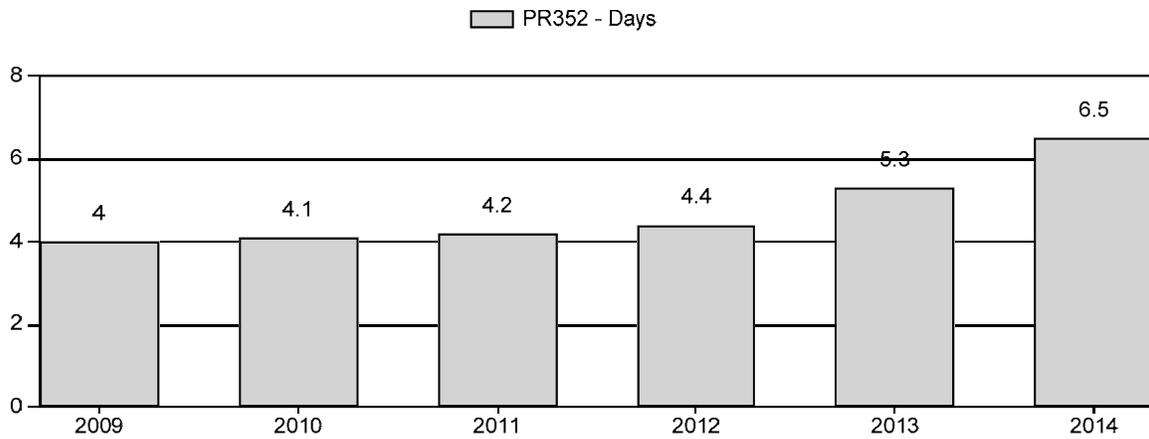
# Harvest Success



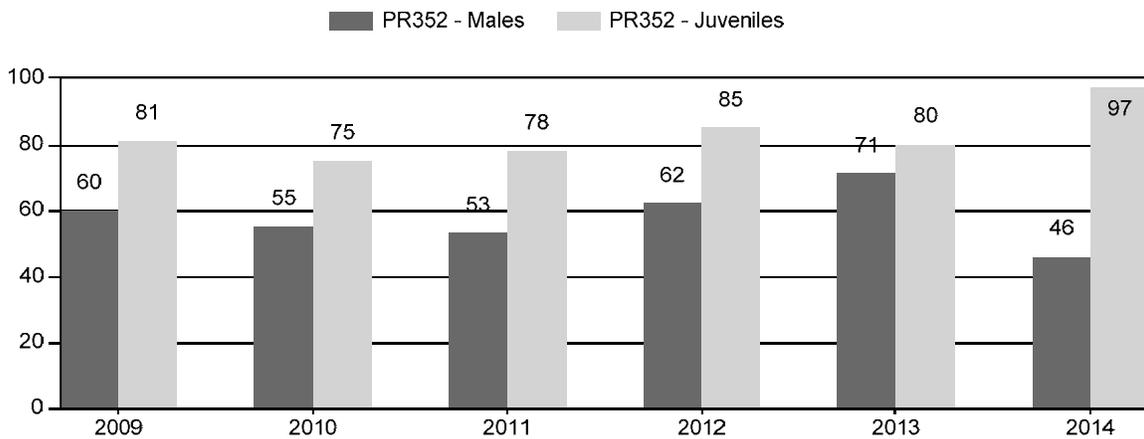
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR352 - MIDDLE FORK

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	5,495	64	185	249	25%	412	41%	332	33%	993	2,285	16	45	60	± 7	81	± 9	50
2010	6,003	73	137	210	24%	379	43%	283	32%	872	2,196	19	36	55	± 7	75	± 9	48
2011	6,378	39	130	169	23%	321	43%	249	34%	739	2,305	12	40	53	± 8	78	± 10	51
2012	7,153	84	142	226	25%	362	40%	309	34%	897	2,824	23	39	62	± 8	85	± 10	53
2013	7,232	85	280	365	28%	513	40%	412	32%	1,290	2,490	17	55	71	± 7	80	± 8	47
2014	7,510	43	122	165	19%	355	41%	346	40%	866	3,317	12	34	46	± 7	97	± 11	67

**2015 HUNTING SEASONS  
MIDDLE FORK PRONGHORN HERD (PR352)**

Hunt Area	Type	Dates of Season		Quota	License	Limitations
		Opens	Closes			
21	1	Oct. 15	Oct. 31	450	Limited quota	Any antelope
	6	Oct. 15	Oct. 31	300	Limited quota	Doe or fawn
Archery		Aug. 15	Oct. 14			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
21	1	-200
	6	-200
<b>Herd Unit Total</b>	<b>1</b>	<b>-200</b>
	<b>6</b>	<b>-200</b>

**Management Evaluation**

**Current Postseason Population Management Objective: 6,000**

**Management Strategy: Recreational**

**2014 Postseason Population Estimate: ~6,650 (unreliable population model)**

**2015 Proposed Postseason Population Estimate: ~6,800**

**Herd Unit Issues**

The Middle Fork Pronghorn Herd Unit post-season population objective was reviewed in 2013 and revised to 6,000 pronghorn. The management strategy remains recreational management.

Area 21 extends from Interstate Highway 25 west to the Bighorn Mountain divide. Antelope 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. Hunting on private land is controlled by outfitters and landowners who charge trespass fees and take a limited number of hunters. This causes a disproportionate amount of hunting pressure on accessible public lands. In many cases, the outfitted hunting which takes place on private land limits access as well as the ability to achieve adequate doe/fawn harvest. Private lands are under hunted and outfitters are doing little to manage this pronghorn population.

**Weather**

Weather in the area of the Middle Fork Herd Unit during 2014 was favorable after 2013 was very dry though the most of the year. Fall moisture in 2013 provided pronghorn a nutritional boost followed by a relatively mild winter. Precipitation in 2014 was above normal with abundant precipitation in June and August. The Palmer drought index for Climate Division 5

(Powder, Little Missouri and Tongue drainages) showed “moderately moist” conditions for January 2014 and progressed to “very moist” in August and September. August precipitation was 250% of normal. Winter weather conditions were relatively mild and interspersed with periods of very warm temperatures.

### **Habitat**

There is one Wyoming big sagebrush habitat transect in this herd unit. Production measured in September 2014 averaged 36 mm per leader compared to 36 mm per leader in 2013 and a 10 year average of 28 mm. Above normal 2014 precipitation provided for above normal shrub growth and excellent herbaceous forage production. Winter conditions were normal so above average mortality was not observed. Utilization during the 2014-15 winter was light (less than 5% of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range. Complete shrub monitoring results are available in the appendix, Shrub Monitoring Report for the Sheridan Region.

### **Field Data**

Preseason classification efforts again failed to achieve an adequate sample. The survey yielded a fawn ratio of 97:100, the highest ratio for the six year period and well above the five year average of 80:100. The buck ratio was the lowest of the six year period at 46:100 which most likely is due to an inadequate classification sample. Postseason landowner surveys indicate that the population has decreased over the last five years. In 2014, 73% of landowners were satisfied with pronghorn numbers while 9% desired more pronghorn and 18% reported there were too many pronghorn. The last line transect survey was flown in 2012 resulting in an end of year population estimate of 4,200 pronghorn, well below the 6,200 pronghorn estimated in 2006. The hunter satisfaction survey showed 78% of hunters in 2014 were either satisfied or very satisfied, up from 65% in 2013.

### **Harvest Data**

Harvest for the six year period peaked in 2012 at 939 pronghorn which was also the highest harvest since at least 1985. The 2012 buck harvest matched the 1985 high of 520 bucks. Doe/fawn harvest reached a new high in 2011. Harvest decreased in both 2013 and 2014. The Type 1 and Type 6 license quotas were each reduced 100 licenses in 2014 due to lower pronghorn numbers and low hunter success. Total harvest decreased 6% from 2013 while buck harvest decreased 14% and doe/fawn harvest increased 6%. Hunter numbers declined while hunter success and active license success improved. However, the Type 1 hunter success was only 74% and the Type 6 hunter success was 79%. Additionally, hunter effort increased to 6.5 days per animal harvested (Type 1 – 7.5 days per animal and Type 6 – 5.1 days/animal) compared to 5.3 days per animal harvested in 2013 and the five year average of 4.4 days per animal harvested. Both license types sold out with after-draw quotas of 184 Type 1 and 309 Type 6 licenses.

### **Population**

This population is estimated at about 6,650 pronghorn putting this herd slightly above the revised population objective. The population estimate was generated with the EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult (SCJ/SCA) model was chosen as it

produced the lowest AIC value (103). The model attempts to track eight line transect survey estimates over the last 20 years, the last obtained in 2012. The 2006 estimate was the highest to date but the model does not align though its confidence interval. The 2012 estimate was 35% lower with a much narrower confidence interval. This was the first of the surveys flown using a one observer plane. The model indicates this population has nearly doubled since 2007 and shows little influence from the record high harvest of recent years. This is highly unlikely. Inadequate classification samples and the fluctuating buck ratios may contribute to the questionable results. The population estimate is similar to the old POP-II estimate, however, the POP-II model predicted a decreasing trend.

The population model's increasing trend conflicts with the harvest data, landowner surveys and field observations which suggest a decreasing population. Harvest data clearly shows decreasing hunter success and increasing hunter effort reflective of tougher hunting conditions due to lower pronghorn numbers. Given that record harvest is not dampening the model's growth rate it is difficult to put much credibility in the outputs. Therefore, the model is considered a poor model.

### **Management Summary**

Changes made for the 2015 hunting season included decreasing the Type 1 and Type 6 license quotas by 200 licenses each to address decreasing active license success and increasing hunter effort. Harvest is expected to decrease with the reduced license quotas, however, hunter success and hunter effort are expected to be more favorable. If expected harvest is achieved a postseason population estimate of 6,800 pronghorn is projected by the EXCEL model. However, managers expect this population to actually remain stable with this level of harvest.

<b>INPUT</b>	
Species:	Pronghorn
Biologist:	Dan Thiele
Herd Unit & No.:	Middle Fork (352)
Model date:	02/23/15

MODELS SUMMARY			Clear form	Check best model to create report	Notes
	Relative AICc	Fit			
C,J,CA	Constant Juvenile & Adult Survival	145	<input type="checkbox"/> C,J,CA Model		
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	94	<input checked="" type="checkbox"/> SC,J,SCA Mod		
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	87	<input type="checkbox"/> TS,J,CA Model		

Year	Predicted Prehunt Population (year /)		Predicted Posthunt Population (year /)		Predicted adult End-of-bio-year Pop (year /)		Total	Relative AICc	Fit	Females	Total	Total Males	Females	Total Males	Females	Total Adults	LT Population Estimate	Field SE	Trend Count	Objective
	Juveniles	Total	Juveniles	Total	Juveniles	Total														
1993	699	718	1410	2827	660	460	1174	2284	154	1174	460	1174	880	330	1200	1731	700	1670	2100	
1994	899	521	1176	2595	880	330	943	2153	145	943	330	943	650	531	1219	1868	700	1467	2100	
1995	818	637	1194	2649	788	453	1041	2282	94	1041	453	1041	559	559	1112	1671	739	1467	2100	
1996	990	548	1090	2628	962	444	931	2337	87	931	444	931	594	594	1045	1639	270	1473	2100	
1997	734	562	1024	2340	729	443	999	2171	87	999	443	999	558	558	1087	1645	270	1473	2100	
1998	963	547	1065	2575	963	407	1026	2396	87	1026	407	1026	565	565	1152	1717	623	3367	2100	
1999	1024	554	1129	2706	1012	412	1110	2534	87	1110	412	1110	785	785	1448	2232	623	3367	2100	
2000	1005	769	1419	3193	1002	602	1384	2987	87	1384	602	1384	957	957	1699	2655	623	3367	2100	
2001	1090	937	1665	3692	1079	786	1602	3467	87	1602	786	1602	1161	1161	1931	3092	623	3367	2100	
2002	1352	1137	1893	4382	1314	955	1848	4117	87	1848	955	1848	1232	1232	2078	3309	1104	3264	2100	
2003	1615	1207	2036	4859	1604	963	1933	4500	87	1933	963	1933	1490	1490	2409	3898	1104	3264	2100	
2004	1741	1460	2360	5561	1716	1176	2308	5199	87	2308	1176	2308	1417	1417	2495	3912	2637	5190	2100	
2005	1789	1389	2445	5623	1767	1036	2293	5096	87	2293	1036	2293	1292	1292	2485	3777	2637	5190	2100	
2006	1386	1266	2435	5087	1353	913	2196	4462	87	2196	913	2196	1089	1089	2298	3388	1949	6375	2100	
2007	1055	1067	2252	4374	1016	668	1963	3647	87	1963	668	1963	1001	1001	2221	3222	1949	6375	2100	
2008	1958	981	2177	5116	1912	511	1807	4230	87	1807	511	1807	1213	1213	2433	3646	1949	6375	2100	
2009	1921	1189	2384	5495	1858	806	2074	4738	87	2074	806	2074	1473	1473	2664	4136	1949	6375	2100	
2010	1949	1443	2611	6003	1879	916	2199	4994	87	2199	916	2199	1571	1571	2780	4351	630	4194	2100	
2011	2113	1540	2725	6378	2024	1091	2297	5412	87	2297	1091	2297	1718	1718	3011	4729	630	4194	2100	
2012	2519	1684	2951	7153	2448	1112	2560	6120	87	2560	1112	2560	1724	1724	3137	4861	630	4194	2100	
2013	2469	1690	3074	7232	2398	1161	2768	6327	87	2768	1161	2768	1620	1620	3061	4680	630	4194	6000	
2014	2923	1587	2999	7510	2834	1133	2689	6656	87	2689	1133	2689	1744	1744	3204	4947	630	4194	6000	
2015	2512	1709	3140	7360	2457	1379	2947	6783	87	2947	1379	2947	1744	1744	3204	4947	630	4194	6000	
2016									87											6000
2017									87											6000
2018									87											6000
2019									87											6000
2020									87											6000
2021									87											6000
2022									87											6000
2023									87											6000
2024									87											6000
2025									87											6000

Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.40		0.92	
1994	0.80		0.92	
1995	0.40		0.92	
1996	0.40		0.92	
1997	0.42		0.92	
1998	0.40		0.92	
1999	0.80		0.92	
2000	0.80		0.92	
2001	0.80		0.92	
2002	0.54		0.92	
2003	0.75		0.92	
2004	0.40		0.92	
2005	0.40		0.92	
2006	0.40		0.92	
2007	0.80		0.92	
2008	0.80		0.92	
2009	0.80		0.92	
2010	0.80		0.92	
2011	0.80		0.92	
2012	0.54		0.92	
2013	0.40		0.92	
2014	0.40		0.92	
2015	0.75		0.92	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

**Parameters:**

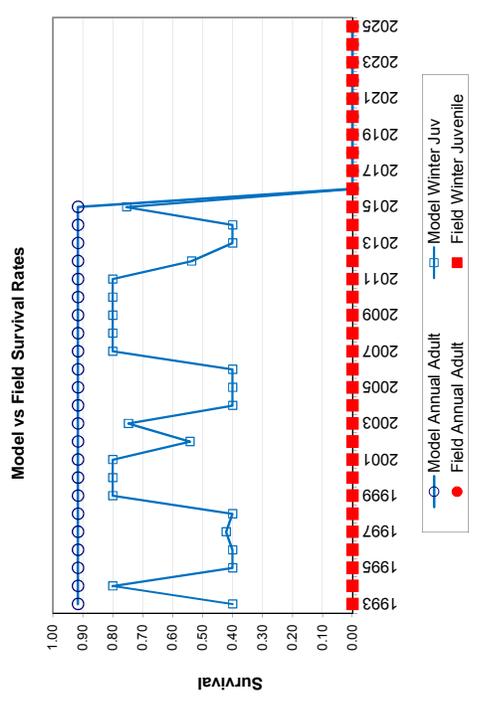
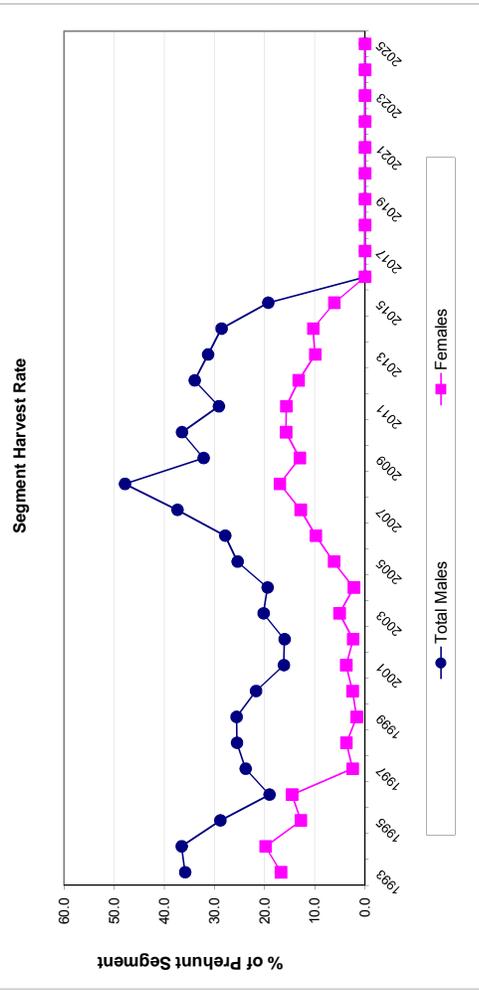
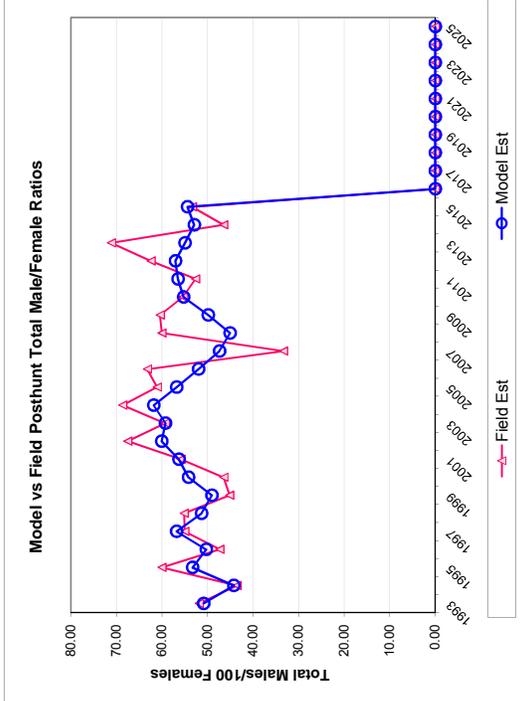
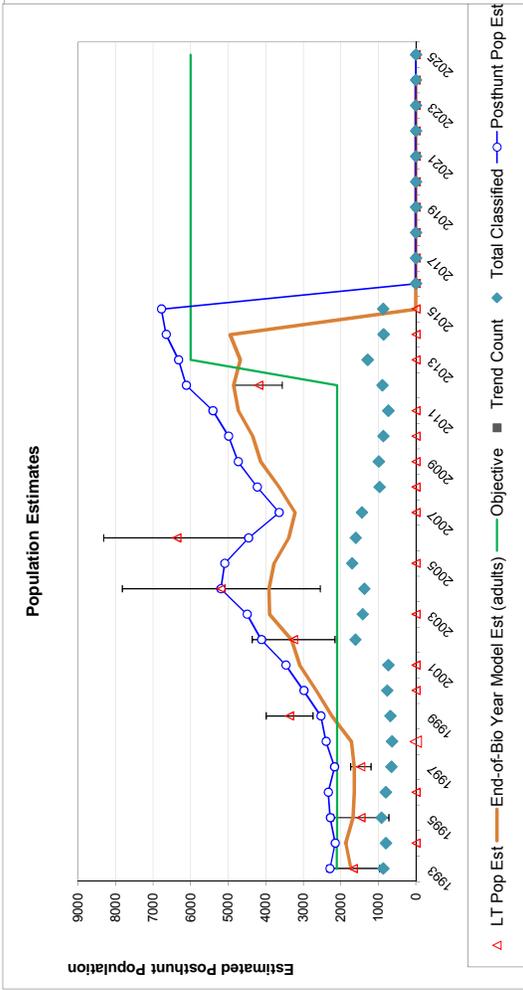
Juvenile Survival =	0.650
Adult Survival =	0.916
Initial Total Male Pop/10,000 =	0.072
Initial Female Pop/10,000 =	0.141

**MODEL ASSUMPTIONS**

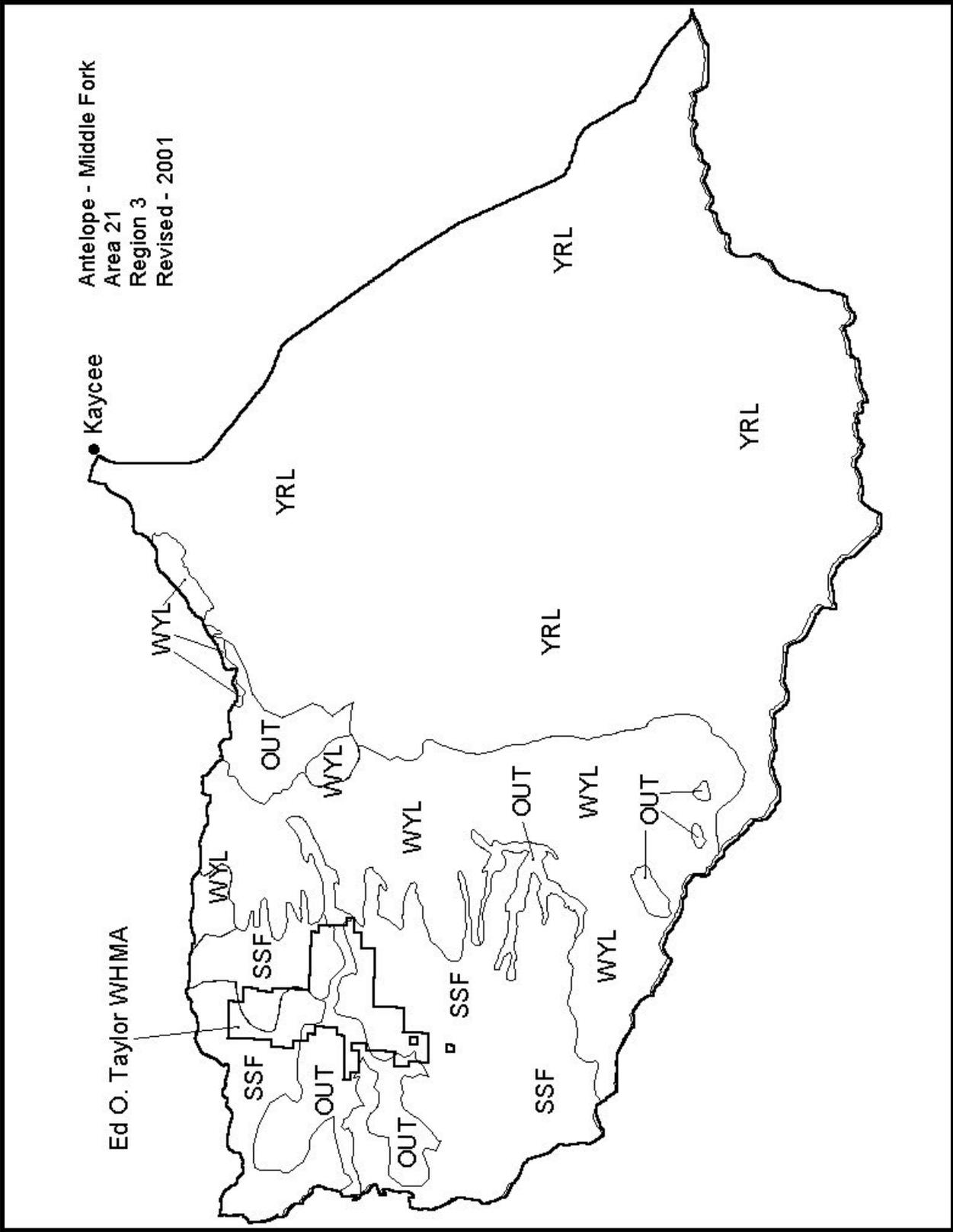
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

Year	Classification Counts						Harvest								
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Segment Harvest Rate (% of Total Harvest)		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Total Females	Total Males	Total Females	
1993		49.54	4.13	50.89	51.84	4.26	234	215	35	484	359	16.8	35.9	16.8	
1994		76.44	6.08	44.26	43.56	4.14	173	212	17	402	36.6	19.8	36.6	19.8	
1995		68.49	5.35	53.32	60.05	4.88	167	139	27	333	28.9	12.8	28.9	12.8	
1996		90.83	7.16	50.31	47.34	4.54	95	144	25	284	19.1	14.5	19.1	14.5	
1997		71.63	6.52	56.83	55.02	5.43	126	23	4	153	23.8	2.5	23.8	2.5	
1998		90.42	8.12	51.34	55.17	5.73	127	36	0	163	25.5	3.7	25.5	3.7	
1999		90.69	7.72	49.07	45.17	4.76	129	17	11	157	25.6	1.7	25.6	1.7	
2000		70.82	5.85	54.20	46.46	4.39	152	32	3	187	21.7	2.5	21.7	2.5	
2001		65.47	5.70	56.31	55.86	5.11	138	57	10	205	16.2	3.8	16.2	3.8	
2002		71.41	4.26	60.09	67.56	4.10	166	41	34	241	16.1	2.4	16.1	2.4	
2003		79.33	4.89	59.27	59.33	3.99	222	94	10	326	20.2	5.1	20.2	5.1	
2004		73.77	4.75	61.85	68.66	4.52	258	48	23	329	19.4	2.2	19.4	2.2	
2005		73.18	4.18	56.81	61.07	3.68	321	138	20	479	25.4	6.2	25.4	6.2	
2006		56.93	3.50	52.00	63.24	3.76	321	217	30	568	27.9	9.8	27.9	9.8	
2007		46.82	2.93	47.39	33.33	2.36	363	263	35	661	37.4	12.8	37.4	12.8	
2008		89.95	6.84	45.08	60.05	4.98	427	336	42	805	47.9	17.0	47.9	17.0	
2009		80.58	5.94	49.87	60.44	4.85	348	282	58	688	32.2	13.0	32.2	13.0	
2010		74.67	5.87	55.28	55.41	4.77	479	374	64	917	36.5	15.8	36.5	15.8	
2011		77.57	6.55	56.51	52.65	5.00	408	389	81	878	29.2	15.7	29.2	15.7	
2012		85.36	6.61	57.06	62.43	5.29	520	355	64	939	34.0	13.2	34.0	13.2	
2013		80.31	5.31	54.98	71.15	4.87	481	278	64	823	31.3	9.9	31.3	9.9	
2014		97.46	7.36	52.93	46.48	4.38	413	282	81	776	28.6	10.3	28.6	10.3	
2015		80.00	6.20	54.43	53.33	4.67	300	175	50	525	19.3	6.1	19.3	6.1	
2016															
2017															
2018															
2019															
2020															
2021															
2022															
2023															
2024															
2025															

FIGURES



Comments:



## 2014 - JCR Evaluation Form

Species: Pronghorn

Period: 6/1/2014 - 5/31/2015

Herd: PH354 - Buffalo

Hunt Areas: 20, 102

Prepared By: Dan Thiele

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent:	N/A	79%	60%
Landowner Satisfaction Percent:	59%	67%	60%
Harvest	1,380	1,627	1,350
Hunters:	1,491	1,912	1,450
Hunter Success:	93%	85%	93%
Active Licenses:	1,679	2,109	1,700
Active License Percent:	82%	77%	79%
Recreation Days:	5,764	8,067	6,400
Days Per Animal:	4.2	5.0	4.7
Ratio Males per 100 Females	71	67	
Ratio Juveniles per 100 Females	82	96	

Population Objective: 60% Landowner/Hunter Satisfaction

Management Strategy: Private Lands

Percent population is above (+) or below (-) objective: N/A

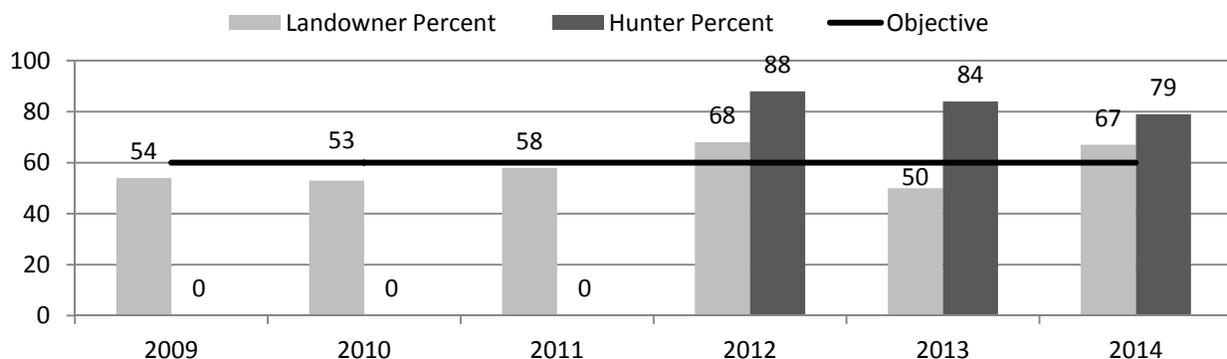
Number of years population has been + or - objective in recent trend:

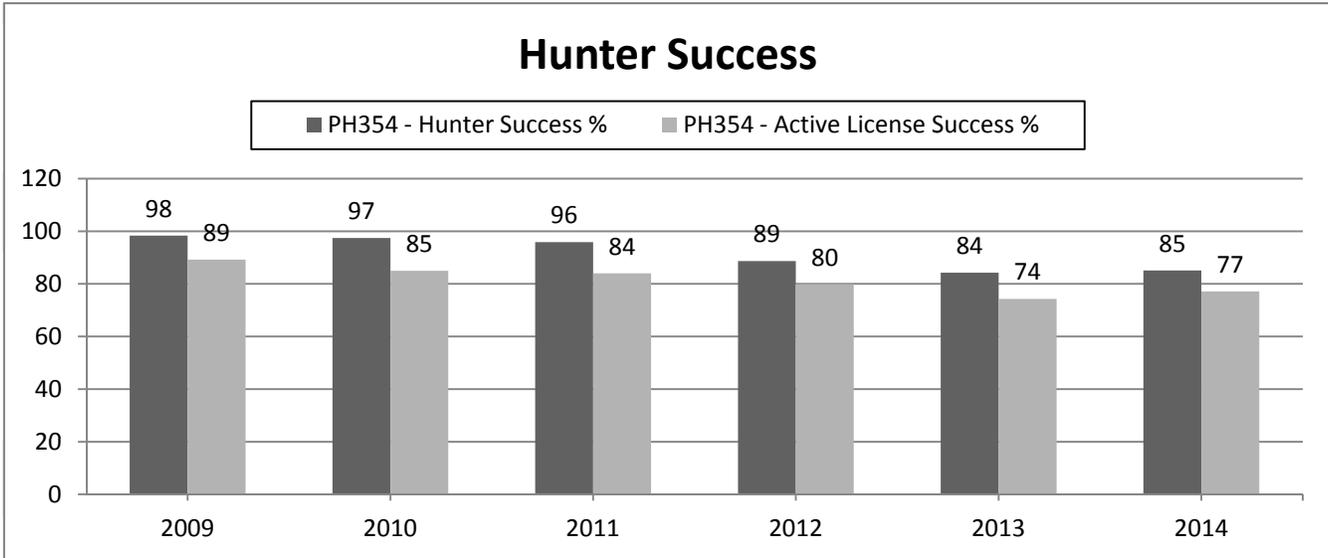
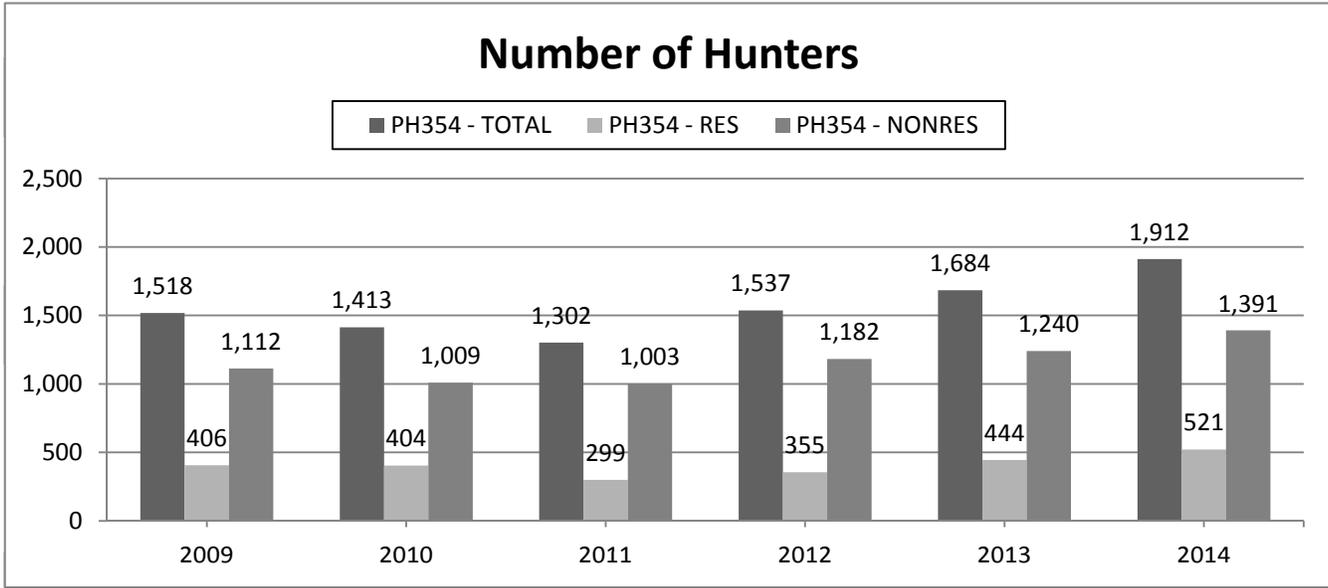
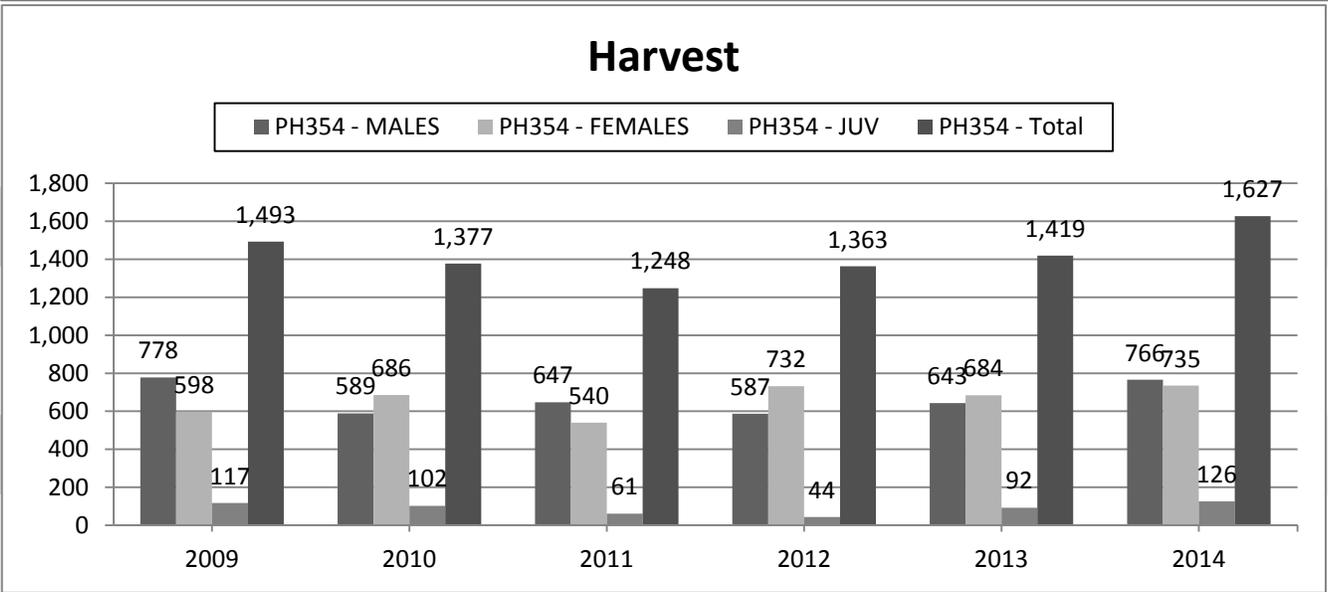
Model Date: 02/20/2015

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

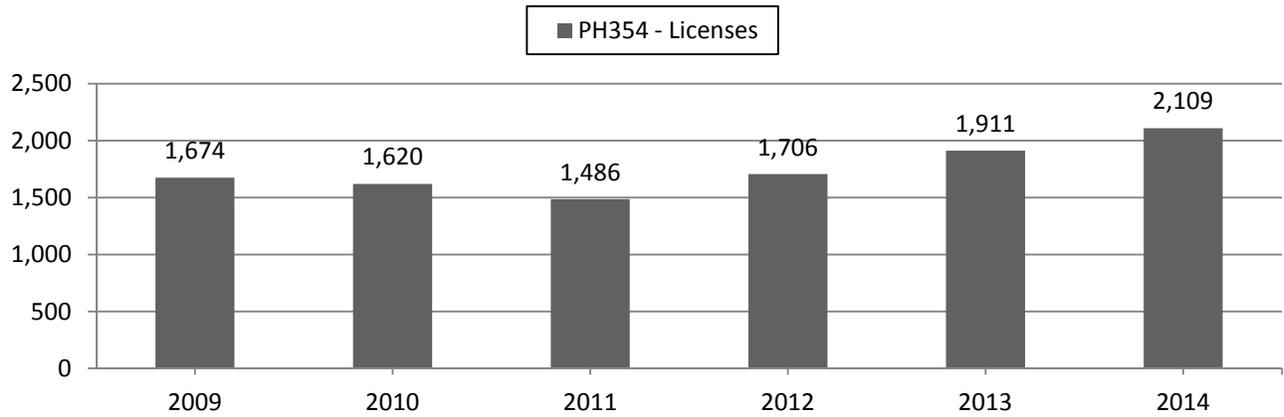
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	36%	36%
Males ≥ 1 year old:	54%	51%
Juveniles (< 1 year old):	0%	0%
Total:	28%	28%
Projected change in post-season population:	-43%	--15%

### PR354 Satisfaction Survey Percentages

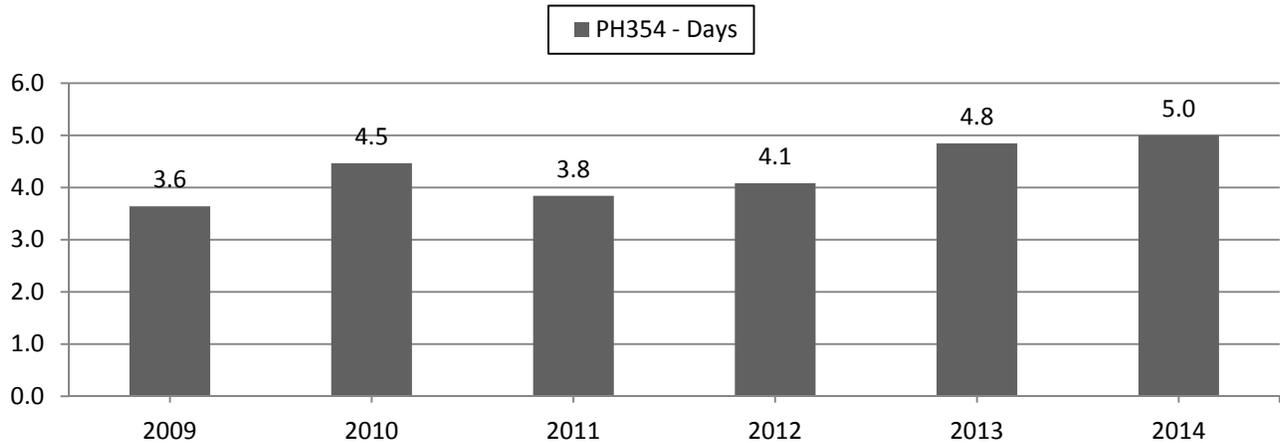




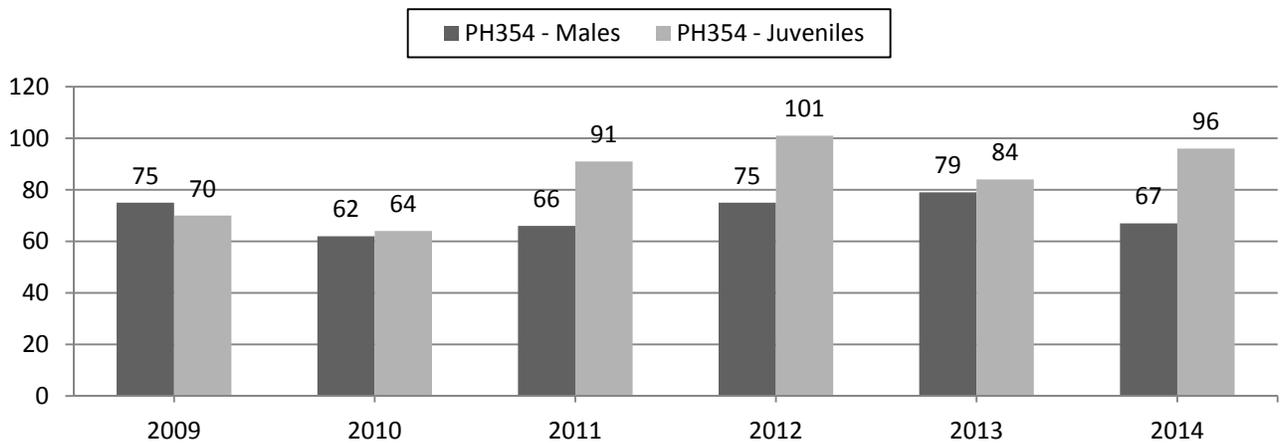
### Active Licenses



### Days Per Animal Harvested



### Preseason Animals per 100 Females



**2009 - 2014 Preseason Classification Summary**  
for Pronghorn Herd PR354 - BUFFALO

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	12,501	268	736	1,004	30%	1,348	41%	949	29%	3,301	1,906	20	55	74	± 1	70	± 1	40
2010	10,220	161	601	762	27%	1,225	44%	786	29%	2,773	1,707	19	70	199	± 8	91	± 10	30
2011	9,822	117	362	479	26%	730	39%	666	36%	1,875	2,092	16	50	66	± 4	91	± 5	55
2012	9,414	253	512	765	27%	1,020	36%	1,032	37%	2,817	2,147	25	50	75	± 2	101	± 2	58
2013	7,806	211	430	641	30%	817	38%	688	32%	2,146	2,827	26	53	78	± 0	84	± 0	47
2014	5,908	198	465	663	30%	993	38%	949	32%	2,605	2,809	20	47	67	± 0	96	± 0	57

**2015 HUNTING SEASONS  
BUFFALO PRONGHORN HERD (PR354)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
20	1	Oct. 15	Nov. 15	600	Limited quota	Any antelope
	6	Oct. 15	Nov. 15	700	Limited quota	Doe or fawn
102	1	Oct. 15	Nov. 15	400	Limited quota	Any antelope
	6	Sep. 1	Sep. 30	400	Limited quota	Doe or fawn valid on private land
		Oct. 15	Nov. 15			Unused Area 102 licenses valid for the entire area
Archery		Aug. 15	Oct. 14			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
20	1	-200
	6	-100
102	1	-100
	6	-100
<b>Herd Unit Total</b>	<b>1</b>	<b>-300</b>
	<b>6</b>	<b>-200</b>

**Management Evaluation**

**Current Postseason Population Management Objective: 60% Landowner/Hunter Satisfaction**

**Management Strategy: Private Lands**

**2014 Landowner Satisfaction Survey: 67%**

**2014 Hunter Satisfaction Survey: 79%**

**2014 Postseason Population Estimate: ~4,100 (unreliable population model)**

**2015 Proposed Postseason Population Estimate: ~3,500**

**Herd Unit Issues**

The Buffalo (Hunt Area 102) and Upper Powder River (Hunt Area 20) Pronghorn Herd Units were combined in 2013, adopting a landowner and hunter satisfaction post-season population objective and a private lands management strategy.

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, restrictive access to private land and landlocked public land aggravates this situation. In recent years several ranches have changed ownership resulting in reduced hunting access. Typically, traditional ranching operations are bought by nonresident landowners with more conservative hunting philosophies. Increased outfitter leasing of ranches reduces the

number of hunters a given ranch will take. These factors contribute to high buck ratios, difficulty in placing hunters and attaining needed harvest. Additionally, pronghorn are often displaced from ranches that allow hunting to neighboring ranches that take limited numbers of hunters, or no hunters.

Habitat is a combination of sagebrush grassland and grassland habitat with interspersed irrigated hay meadows. With the exception of the southern one-third of Area 20, sagebrush habitat is scattered at best. 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 the occurrence of irrigated meadows interspersed throughout much of the herd unit. Complaints of crop depredation are common in Area 102. Available hunter access largely determines the number of licenses sold.

### **Weather**

Weather in the area of the Buffalo Herd Unit during 2014 was favorable after 2013 was very dry though the most of the year. Fall moisture in 2013 provided pronghorn a nutritional boost followed by a relatively mild winter. Precipitation in 2014 was above normal with abundant precipitation in June and August. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed “moderately moist” conditions for January 2014 and progressed to “very moist” in August and September. August precipitation was 250% of normal. Winter weather conditions were relatively mild and interspersed with periods of very warm temperatures.

### **Habitat**

There are no established habitat transects in this herd unit. However, in two adjacent herd units production for two Wyoming big sagebrush transects measured in October 2014 averaged 36 mm and 22 mm per leader compared to 36 mm and 8 mm per leader in 2013, respectively. Winter utilization during the 2014-15 winter was light (less than 5% of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range. Winter conditions were normal so above average mortality was not observed. Complete shrub monitoring results are available in the appendix, Shrub Monitoring Report for the Sheridan Region.

### **Field Data**

Classifications the last four years showed fawn ratios exceeding 80:100 suggesting this herd may be increasing even with the higher 2014 doe/fawn harvest. It should be noted, however, that with the elimination of aerial classifications in Area 20, fawn ratios showed a notable increase suggesting inaccessible areas with lower fawn productivity are not being represented in the sample. Buck ratios have fluctuated but decreased to 67:100 in 2014, in part due to an increase in Type 1 license sales. A June 2012 line transect survey of Area 20 indicated that pronghorn numbers had decreased 50% from the 2007 line transect survey. However, there is question as to the accuracy of this estimate. No line transect has been conducted since this herd was created in 2013.

Sixty-seven percent of responding landowners surveyed following the hunting season indicated that numbers were acceptable while 31% thought numbers were too high. Landowners in Area 20 were generally satisfied with pronghorn numbers (61%) although 35% felt numbers were too high. The landowner survey over the past several years shows a trend suggesting numbers are

decreasing in Area 20 whereas nearly 74% of Area 102 landowners currently believe numbers are acceptable. Hunters responding to the 2014 hunter satisfaction survey reported high hunter satisfaction for the two hunt areas with 75% and 83% positive responses for Areas 20 and 102, respectively.

### **Harvest Data**

Total harvest (1,627) increased for the third year in a row exceeding the six year high of 1,493 pronghorn harvested in 2009. Harvest in each hunt area reached its highest level since at least 1994. Area 20 supported the bulk of the increase with a 25% increase in harvest. Hunter numbers increased 15% to a new six year high due to increased license sales. Area 20 Type 6 licenses sold out as did Area 102 Type 1 and Type 6 licenses. Only 18 Area 20 Type 1 licenses went unsold. However, hunter success and active license success were well below the five year averages as Area 20 and Area 102 Type 1 hunter success both fell to 74%. Likewise, hunter effort reached a six year high increasing to 5.0 days per animal harvested, well above the five year average of 4.2 days per animal harvested. 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 picked up leftover licenses in northeast Wyoming without realizing hunting access is very limited. Private land access is essential to achieving harvest objectives. Public land hunters have benefited from GPS technology that allows them to readily identify public and private land boundaries.

### **Population**

This herd has a 2014 post-season population estimate of 4,100 pronghorn, 33% below the 2013 estimate. The population estimate was generated with the EXCEL spreadsheet model. The semi-constant juvenile/semi-constant adult (SCJ/SCA) option was chosen as it produced the lowest AIC value (64), although none of the models produced a realistic population estimate. Modeling efforts are complicated by the fact that no herd unit wide line transect estimate is available for a given year. The model suggests a steadily decreasing population from a high of nearly 14,000 pronghorn in 2005. This model trend is supported by the harvest data showing lower hunter success and higher hunter effort, although the low population estimate is incapable of supporting this level of continued harvest. Modeling into 2015 and 2016 suggest the current level of harvest will decrease this population at an even more exaggerated rate. Conversely, the high fawn ratios the last three years and private land access would suggest it is not possible to decrease this population to the extent modeled by hunting alone. Therefore, the model is considered a poor model and warrants an abundance estimate with which to align the model. A more accurate population estimate is desirable but not immediately necessary to manage this herd. The population is now managed under a landowner and hunter satisfaction objective which is appropriate for this private land herd. The management objective for landowner satisfaction was exceeded in 2012 and 2014. Hunter satisfaction has easily exceeded the 60% objective for the three years the survey has been conducted.

### **Management Summary**

The 2015 hunting season includes continuation of the Area 102 September Type 6 season to address landowner concerns with depredation to irrigated hay meadows. This season has increased in popularity and corresponds to a doe/fawn white-tailed deer season because landowners deal with high numbers of both species. A reduction in Type 1 licenses for both hunt areas is proposed to address low hunter success the last two years. Likewise, Type 6 licenses

will be decreased to address low hunter success in Area 20 (78%) and low hunter participation rates in both hunt areas, 77% in Area 20 and 71% in Area 102. A total license reduction of 20% was implemented.

License quotas will be more than adequate to address depredation and herd growth potential if hunter access is available. The opportunity to manage 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.

A harvest of 1,350 pronghorn is projected for the 2015 hunting season if access improves and hunter success increases. An unreliable postseason population of 3,500 pronghorn is projected.

**INPUT**  
 Species: Pronghorn  
 Biologist: Dan Thiele  
 Herd Unit & No.: Buffalo PR354  
 Model date: 02/20/15

**MODELS SUMMARY**

	Fit	Relative AICc	Notes
C,J,CA	103	112	
SC,J,SCA	55	64	
TS,J,CA	48	174	

Clear form

Check best model to create report

- C,J,CA Model
- SC,J,SCA Mod
- TS,J,CA Model

**Population Estimates from Top Model**

Year	Predicted Prehunt Population (year /)		Total	Predicted Posthunt Population (year /)		Total	Predicted adult End-of-bio-year Pop (year /)		Total	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females			
1993	2845	3993	4952	2784	3121	4236	3127	4119	7246		
1994	2686	3065	4036	2560	2106	3242	2168	3179	5347		
1995	2857	2124	3115	2685	1417	2576	2202	3234	5436		
1996	2693	2158	3169	2635	1568	2930	2342	3577	5919		
1997	2855	2295	3506	2855	1705	3368	2557	4069	6626		
1998	3238	2505	3988	3232	1907	3948	2223	4081	6304		
1999	3033	2179	3999	3003	1679	3885	1986	3960	5946		
2000	2923	1946	3881	2895	1391	3658	2176	4195	6371		
2001	2693	2133	4111	2655	1568	3844	2207	4228	6435		
2002	3628	2163	4143	3586	1514	3851	2675	4759	7434		
2003	4383	2622	4664	4331	1988	4325	3319	5393	8711		
2004	4381	3252	5285	4312	2630	4900	3942	5950	9891		
2005	5168	3863	5831	5079	3268	5388	3757	5621	9378		
2006	4417	3682	5509	4373	2996	5003	3377	5147	8523		
2007	3434	3309	5044	3309	2579	4509	3466	5172	8639		
2008	3953	3397	5069	3843	2491	4458	3582	5336	8919		
2009	3682	3511	5230	3553	2655	4572	2861	4556	7417		
2010	2865	2804	4465	2753	2156	3710	2545	3878	6423		
2011	3467	2494	3801	3400	1782	3207	2645	3617	6262		
2012	3586	2592	3544	3538	1946	2739	2261	3042	5303		
2013	2511	2216	2981	2409	1508	2229	1577	2276	3853		
2014	2132	1545	2231	1993	703	1422	1439	2034	3473		
2015	1605	1410	1994	1517	695	1279					
2016											
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											

Survival and Initial Population Estimates

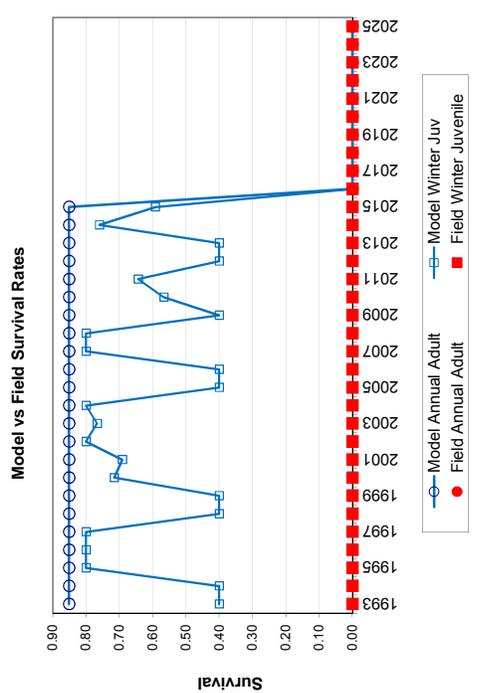
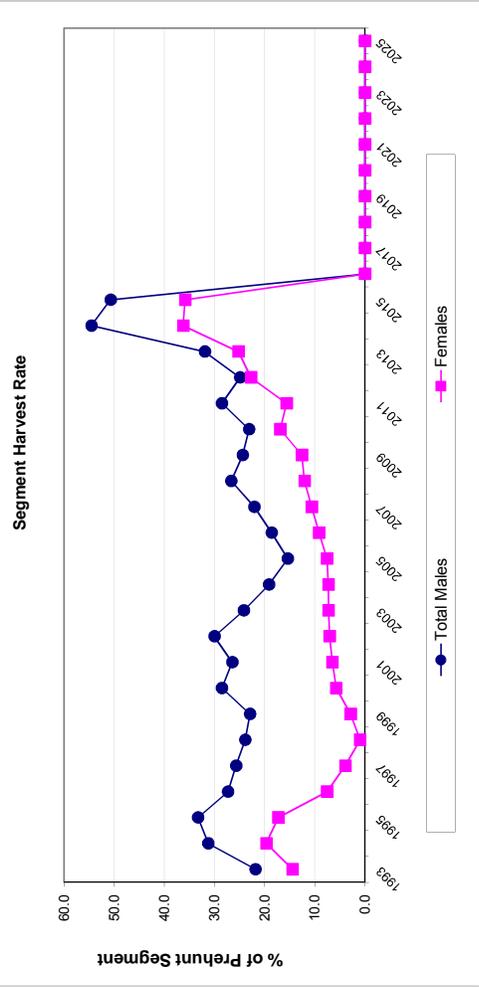
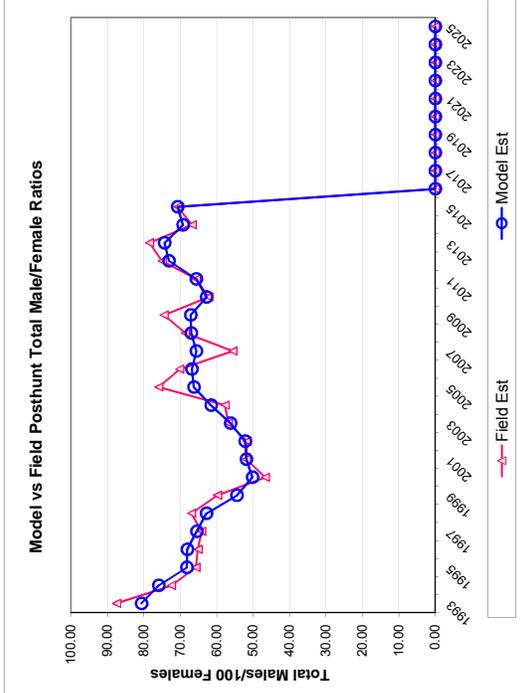
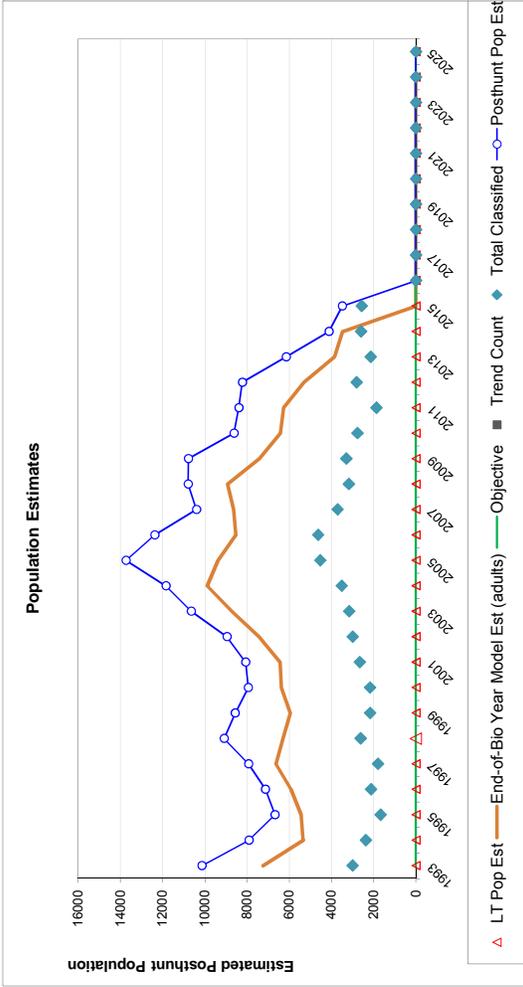
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.40		0.85	
1994	0.40		0.85	
1995	0.80		0.85	
1996	0.80		0.85	
1997	0.80		0.85	
1998	0.40		0.85	
1999	0.40		0.85	
2000	0.72		0.85	
2001	0.69		0.85	
2002	0.80		0.85	
2003	0.77		0.85	
2004	0.80		0.85	
2005	0.40		0.85	
2006	0.40		0.85	
2007	0.80		0.85	
2008	0.80		0.85	
2009	0.40		0.85	
2010	0.57		0.85	
2011	0.64		0.85	
2012	0.40		0.85	
2013	0.40		0.85	
2014	0.76		0.85	
2015	0.59		0.85	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.650
Adult Survival =		0.851
Initial Total Male Pop/10,000 =		0.399
Initial Female Pop/10,000 =		0.495

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

Year	Classification Counts						Harvest											
	Juvenile/Female Ratio			Total Male/Female Ratio			Males			Females			Total Harvest			Segment Harvest Rate (% of		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE
1993		57.46	2.72	80.65	87.53	3.66	793	651	56	1500	21.8	14.5						
1994		66.53	3.34	75.92	72.46	3.54	871	722	114	1707	31.3	19.7						
1995		91.71	5.20	68.19	65.75	4.09	643	490	156	1289	33.3	17.3						
1996		84.98	4.30	68.08	65.14	3.55	536	218	53	807	27.3	7.6						
1997		81.45	4.49	65.46	64.12	3.79	536	125	0	661	25.7	3.9						
1998		81.19	3.73	62.82	66.92	3.25	544	36	5	585	23.9	1.0						
1999		75.84	3.80	54.48	59.80	3.22	454	104	27	585	22.9	2.9						
2000		75.33	3.67	50.16	46.69	2.64	505	203	26	734	28.5	5.8						
2001		65.50	2.97	51.88	51.88	2.54	513	243	34	790	26.5	6.5						
2002		87.56	3.62	52.20	51.67	2.50	590	266	38	894	30.0	7.1						
2003		93.98	3.80	56.21	56.81	2.66	576	308	67	931	24.2	7.3						
2004		82.90	3.22	61.54	57.73	2.50	566	350	63	979	19.1	7.3						
2005		88.63	3.12	66.25	75.92	2.79	541	402	81	1024	15.4	7.6						
2006		80.17	2.79	66.83	70.18	2.54	623	460	40	1123	18.6	9.2						
2007		68.09	2.63	65.61	55.57	2.28	664	486	114	1264	22.1	10.6						
2008		77.98	3.28	67.02	68.60	2.99	824	555	100	1479	26.7	12.0						
2009		70.40	2.98	67.13	74.48	3.10	778	598	117	1493	24.4	12.6						
2010		64.16	2.93	62.80	62.20	2.87	589	686	102	1377	23.1	16.9						
2011		91.23	4.89	65.62	65.62	3.86	647	540	61	1248	28.5	15.6						
2012		101.18	4.47	73.12	75.00	3.59			732	1363	24.9	22.7						
2013		84.21	4.36	74.32	78.46	4.14			684	1419	31.9	25.2						
2014		95.57	4.34	69.26	66.77	3.35			735	1627	54.5	36.2						
2015		80.49	3.76	70.73	70.73	3.43			650	1350	50.7	35.9						
2016																		
2017																		
2018																		
2019																		
2020																		
2021																		
2022																		
2023																		
2024																		
2025																		

FIGURES



Comments:

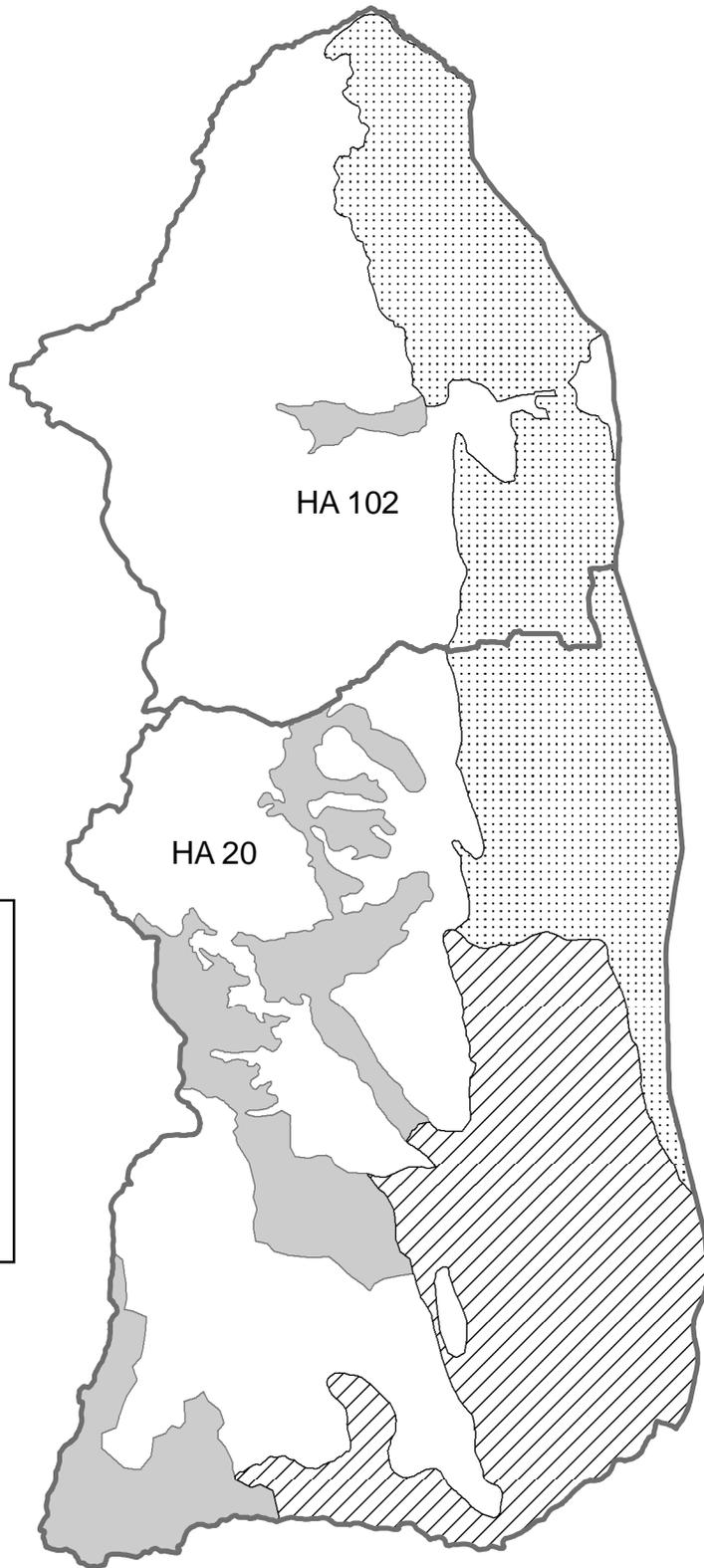


PH 354 - Buffalo  
HA's 20, 102  
Revised 7/15

**Buffalo Seasonal Ranges**

**RANGE**

	OUT
	SSF
	WYL
	YRL





## 2014 - JCR Evaluation Form

SPECIES: Pronghorn

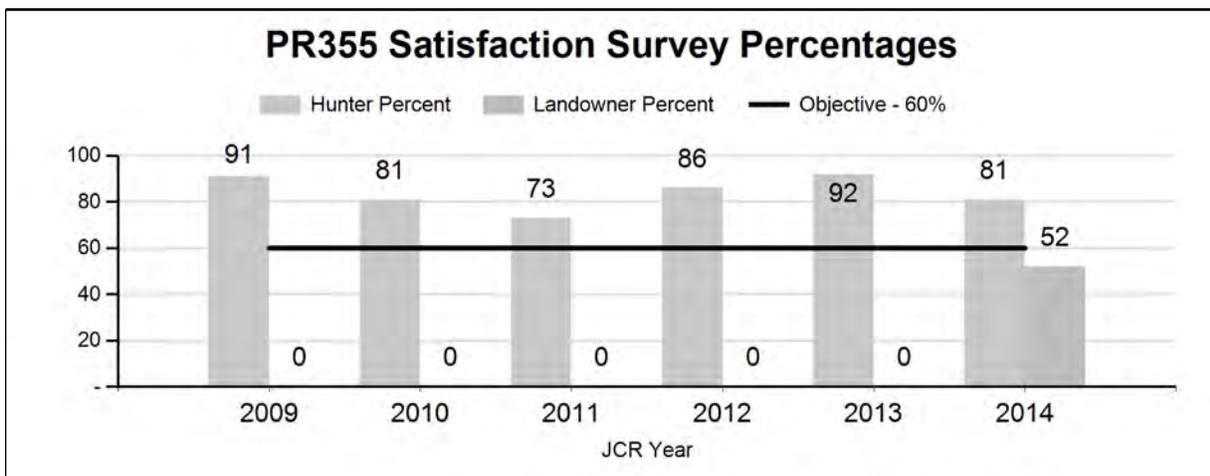
PERIOD: 6/1/2014 - 5/31/2015

HERD: PR355 - BECKTON

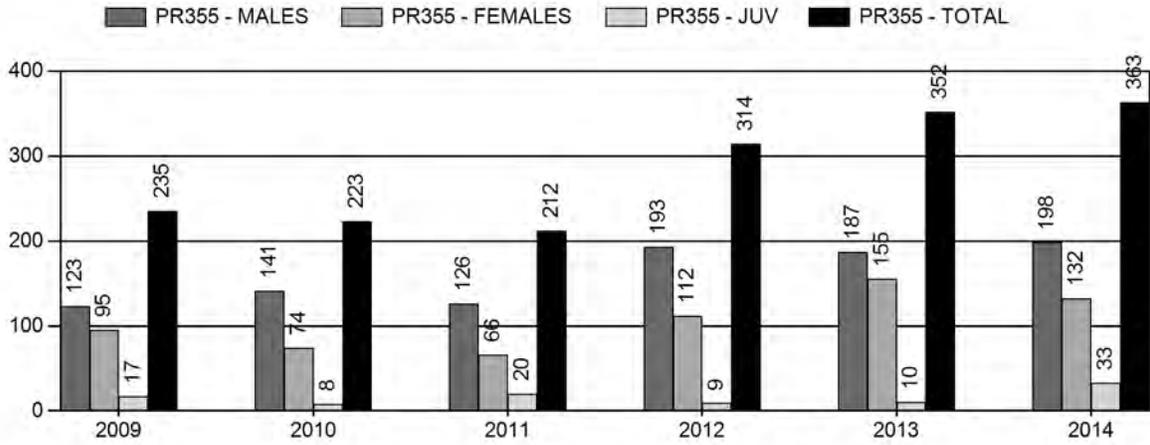
HUNT AREAS: 109

PREPARED BY: TIM THOMAS

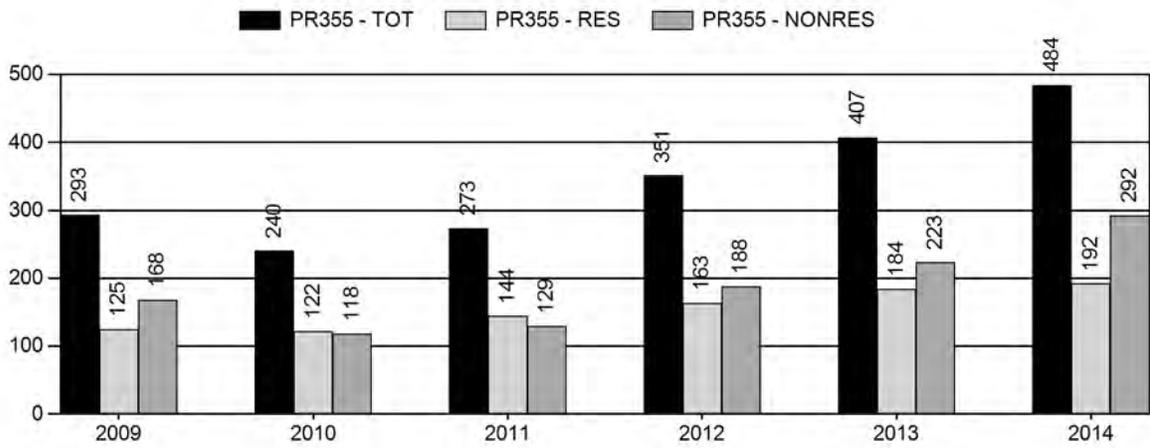
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent	85%	81%	82%
Landowner Satisfaction Percent	47%	52%	55%
Harvest:	267	363	375
Hunters:	313	484	500
Hunter Success:	85%	75%	75%
Active Licenses:	362	530	550
Active License Success:	74%	68%	68%
Recreation Days:	1,237	1,704	1,700
Days Per Animal:	4.6	4.7	4.5
Males per 100 Females:	48	43	
Juveniles per 100 Females	51	36	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			6%
Number of years population has been + or - objective in recent trend:			1



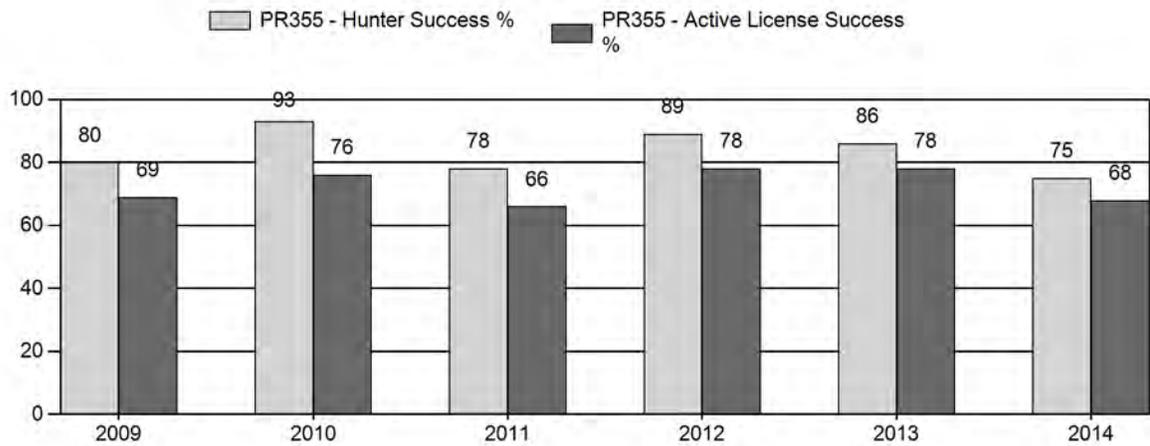
# Harvest



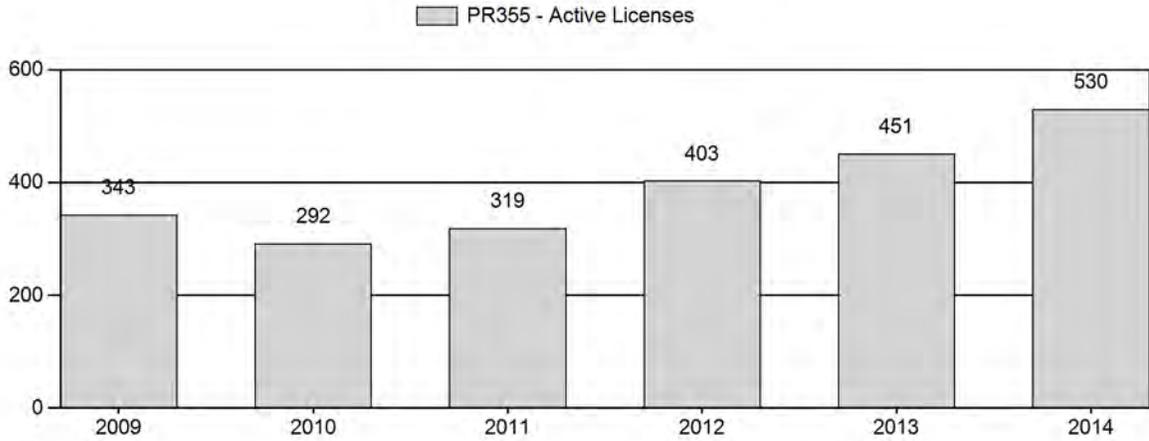
# Number of Hunters



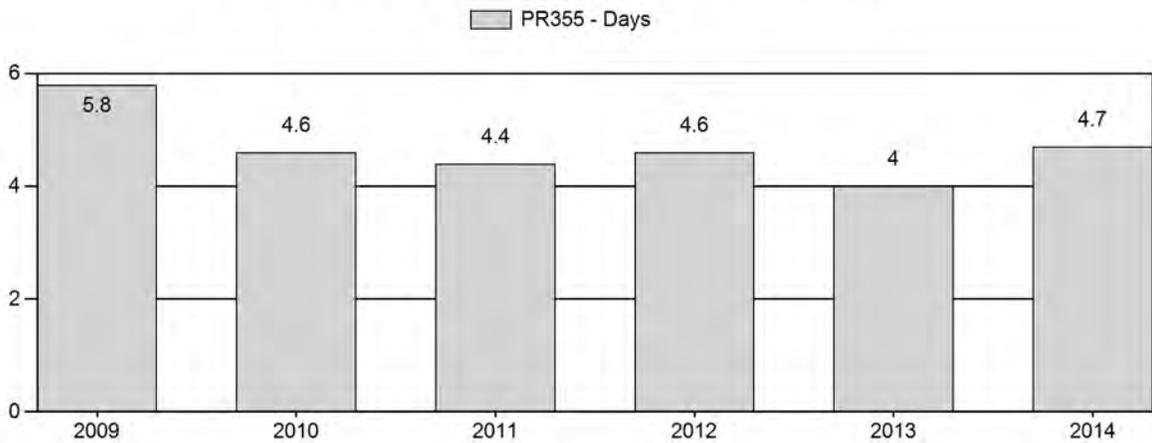
# Harvest Success



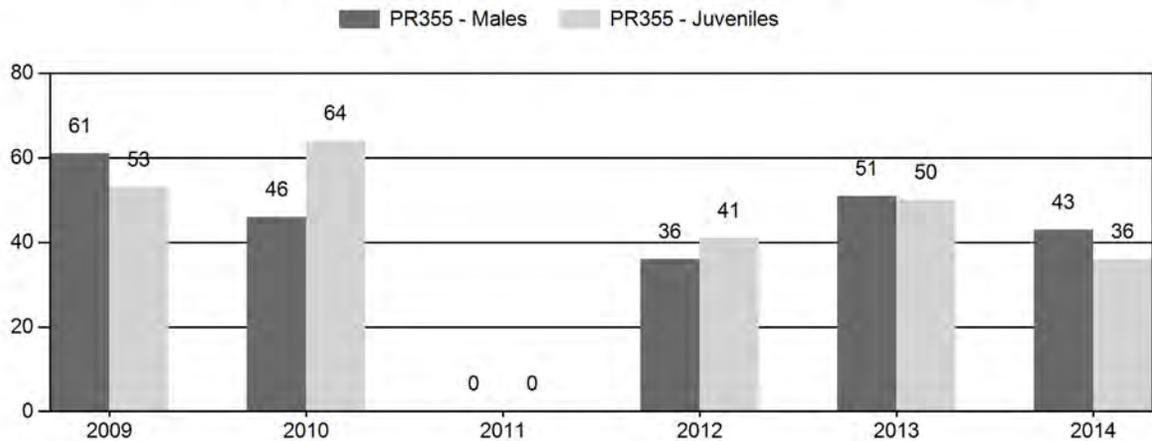
# Active Licenses



# Days Per Animal Harvested



# Preseason Animals per 100 Females



## 2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR355 - BECKTON

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot CIs	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	1,346	24	47	71	28%	117	47%	62	25%	250	929	21	40	61	± 14	53	± 12	33
2010	1,459	12	32	44	22%	95	48%	61	30%	200	969	13	34	46	± 13	64	± 16	44
2011	1,523	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2012	1,428	18	34	52	20%	145	56%	60	23%	257	623	12	23	36	± 9	41	± 9	30
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 HUNTING SEASONS  
BECKTON PRONGHORN HERD (PR355)**

Hunt Area	Type	Dates of Seasons		Quota	License	Limitations
		Opens	Closes			
109	1	Sep. 15	Nov. 30	350	Limited quota	Any antelope
	6	Sep. 15	Nov. 30	300	Limited quota	Doe or fawn
Archery		Aug. 15	Sep. 14			Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
<b>Herd Unit Total</b>		<b>No Changes</b>

**Management Evaluation**

**Current Hunter / Landowner Management Objective:** 60% Satisfaction

**Secondary Management Objective:** Observed ratio of 30 bucks: 100 does minimum

**Management Strategy:** Private Land

**2014 Hunter Satisfaction Estimate:** 81%

**2014 Landowner Satisfaction Estimate:** 52%

**Most Recent 3-year Running Average Hunters Satisfaction Estimate:** 86%

**Most Recent 3-year Running Average Landowner Satisfaction Estimate:** n/a

**Herd Unit Issues**

The Beckton Pronghorn Herd Unit is located west of Interstate Highway 90, north of South Piney Creek and off national forest. This herd unit contains the towns of Story, Big Horn, Sheridan, Ranchester and Dayton, as well as significant rural-residential development.

The management objective for the Beckton Pronghorn Herd Unit is a Hunter and Landowner Satisfaction Objective at 60% or higher, with a secondary objective of 30 or more bucks observed per 100 does. The management strategy is Private Land Management. The objective and management strategy were last revised in 2014.

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

**Weather**

The spring and summer of 2014 was generally warm and wet, resulting in good conditions for forage production throughout the northwest portion of the Sheridan Region. The 2014-15 winter was highly variable, with generally open conditions into early November, cold and snowy conditions from early November through January, then periods of warm weather alternating with colder temperatures and snow. Several thaw/freeze cycles during parts of the winter resulted in

hard, crusted snow that was difficult for animals to paw through to access forage. Overall, adults entered the winter in good condition and likely survived the winter well. Fawns likely saw about average over-winter survival.

## **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, and numerous rural subdivisions.

## **Field Data**

Fawn production, as measured by the observed fawn:doe ratio, has exceeded 60 fawns per 100 does only once (i.e. 2010) in the past 12 years, suggesting this herd is not likely to grow quickly, even with limited harvest. In 2014 we only classified 95 pronghorn, the fewest in almost 30 years. This was more an issue of low survey effort due to competing work demands than a reflection of population dynamics. With such a low sample size, it is difficult to make reasonable extrapolations based on these data. While we have continued to increase harvest in this herd unit, the population appears to have at least remained steady and distribution continues to expand. This suggests the 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 in this herd unit, likely due to bias associated with small sample sizes. We are confident we have sufficient bucks to maintain adequate breeding of females as well as provide the current level of buck harvest in this herd unit. We are likely well over the minimum of 30 males:100 females to satisfy the secondary management objective in this herd unit.

Hunter satisfaction has remained high, with 81% of surveyed hunters (n=81) satisfied or very satisfied in 2014. The high hunter satisfaction level reflects Department personnel efforts to advise perspective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license.

Nonresident hunter satisfaction decreased significantly in 2014 (77%), compared to 2012 (90%) and 2013 (94%). We increased available Type 1 (any antelope) licenses in 2014 in response to selling all Type 1 licenses in 2013. We saw a significant increase in the demand for leftover antelope licenses in 2014. We believe the decrease in satisfaction is due to hunters purchasing licenses for this herd unit without either talking with regional personnel or securing access to hunt private lands. While we saw an increase in total nonresident hunters, it was mostly Type 6 (doe/fawn) license hunters. We sold 50 additional Type 1 (any antelope) licenses in 2014 but estimate only 2 additional hunters actually hunted on this license type.

## **Harvest Data**

Until the 2013 season, we had not sold all allocated licenses in this herd unit since 2005. As such, we increased Type 1 licenses for the 2014 season, adding 50 licenses. In 2014, we sold 350 Type 1 (any antelope) licenses and 300 Type 6 (doe or fawn) licenses, the most licenses ever sold in this herd unit.

An estimated 484 hunters harvested an estimated 363 pronghorn, the highest harvest ever in this herd unit. Harvest increased only 3% in 2014 compared to 2013, despite a 21% increase in licenses sold and a 17.5% increase in active licenses. Hunters success was 75%, a decrease from 86% in 2013 and the past 10 year mean of 86%. Hunters with a Type 1 (any antelope) license had a higher success rate (83%) than Type 6 (doe or fawn) license holders (54%). Hunter effort, as measured by the number of days hunted per animal harvested, was 4.7 days/animal, similar to the 10 year average of 4.6 days/animal.

The decrease in success was likely a function of new hunters purchasing licenses who were not familiar with the hunt area. We don't believe the population decreased significantly enough to account for the decrease in success. Also, weather conditions were not very conducive to antelope hunting during much of November, likely contributing to reduced hunter participation and success rates.

## **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 and resulted in an estimated 1,500 pronghorn (25% sightability estimated).

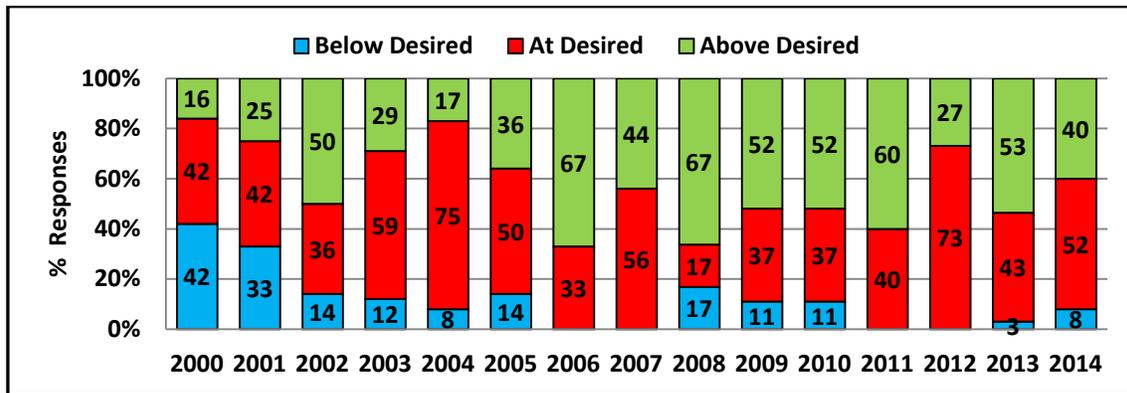
We do have a functioning spreadsheet population simulation model for this herd unit. We only have harvest and classification data from this herd unit. Classification data is collected somewhat sporadically in this herd unit, and is likely biased due to low sampling effort and small sample sizes. Modeling parameters, specifically juvenile survival rates, are set wider than recommended to make this model work.

The "Time-Specific Juvenile – Constant Adult Survival Rate" (TSJ,CA) spreadsheet simulation model was chosen to estimate the post-season population for this herd. This model had the highest relative Akaike information criterion (AIC) value (143), but had the best fit (28) of the three possible models. It also seemed to better model manager's perceptions of population dynamics in this herd unit. Since we have limited management data, small survey sample size, sporadic data collection, and no independent population estimate for this herd unit, we consider this a "poor" population model.

Nineteen landowners in this herd unit completed the satisfaction portion of the annual landowner survey. Of these responses, 42% (n=8) were satisfied with pronghorn numbers, 37% were very dissatisfied or dissatisfied (n=7) and 21% (n=4) were neutral. No landowners were "very satisfied". It is difficult to interpret these data as satisfaction or dissatisfaction can mean different things to different individuals. For example some landowners who indicated they had higher than desired pronghorn numbers indicated they were satisfied and some landowners who indicated they had fewer than desired pronghorn numbers indicated they were also satisfied.

A better index of landowner desires may be the long-term survey sent annually to landowners in the Sheridan Region. This survey simply asks if big game numbers are at, above or below desired levels. Desired level is also a subjective expression of individual landowner tolerance or preference but it appears to better gauge landowner preferences.

Landowners, hunters and WGFD field personnel have not seen any significant increase or decrease in this herd unit in recent years. Landowners who responded (n = 25) to an annual survey indicated pronghorn populations where ‘at’ (52%) or ‘above’ (40%) desired levels (Fig 1); and suggested similar (70%) or more liberal (30%) hunting season strategies as in recent years.



**Figure 1.** Relative landowner perceptions of pronghorn antelope populations on their property in the Beckton Antelope Herd Unit, by percentage. Desired level is a subjective expression of individual landowner tolerance of pronghorn. Sample sizes some years were as low as 6 responses.

### Management Summary

The regular hunting season in this herd unit 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 in this herd unit are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, 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 44 bucks:100 does over the long-term (n=30 years). This is likely a function of limited access to private lands where the majority of pronghorn occur.

We project a harvest of approximately 375 pronghorn in 2015, resulting in an estimated post-season population of about 2,100 pronghorn. These predictions assume near normal fawn production and survival, as well as similar license sales and success rates for the 2015 hunting season. Due to limited access to private land, our ability to manage this population towards desired objectives with hunting is very limited.

Even though we sold all available licenses in 2014, we did not increase license allocations for 2015. We saw a significant increase in demand for leftover antelope licenses in 2014, likely a function of hunters shifting from other areas as licenses decreased, and increased hunter numbers due to improved economic conditions. We sold 50 more Type 1 licenses for this hunt area, but only 2 additional hunters participated. Only 75% of hunters who purchased a Type 1 license actually hunted, likely a function of very limited access in this herd unit. This was the lowest participation rate in past 10 years (mean=88%). More Type 6 license holders hunted (90%) but success on this license type was only 54%, compared to the 10 year average of 75%.

**INPUT**  
 Species: Pronghorn  
 Biologist: Timothy P. Thomas  
 Herd Unit & No.: Beckton PR 355  
 Model date: 03/01/15

**MODELS SUMMARY**

	Fit	Relative AICc	Notes
CJ,CA	69	78	
SC,J,SCA	69	78	<input type="checkbox"/> CJ,CA Model
TS,J,CA	28	143	<input type="checkbox"/> SC,J,SCA Mod <input checked="" type="checkbox"/> TS,J,CA Model

Clear form

Check best model to create report

Year	Predicted Prehunt Population (year t)		Total	Predicted Posthunt Population (year t)		Total	Predicted adult End-of-bio-year Pop (year t)		LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females			
1993	330	391	1148	321	325	1121	352	1149	1502		100
1994	804	345	1126	790	285	1043	444	1201	1645		100
1995	711	435	1177	701	378	1088	444	1154	1598		100
1996	879	435	1131	871	374	1025	458	1108	1566		100
1997	399	449	1086	389	387	1007	544	1163	1707		100
1998	682	533	1140	682	471	1075	539	1143	1683		100
1999	741	529	1120	736	470	1060	542	1132	1674		100
2000	851	532	1109	849	491	1050	576	1134	1710		100
2001	700	564	1112	695	507	1064	575	1132	1707		100
2002	819	563	1109	810	506	1054	703	1252	1955		100
2003	701	689	1227	695	626	1153	694	1220	1914		100
2004	452	680	1196	441	574	1128	613	1167	1779		100
2005	739	601	1143	714	494	1057	554	1117	1671		100
2006	557	543	1095	549	375	976	430	1033	1463		100
2007	464	422	1012	457	273	894	429	1050	1479		100
2008	452	420	1029	443	263	935	440	1113	1552		100
2009	578	431	1091	559	295	986	519	1210	1729		100
2010	762	509	1186	753	354	1105	636	1389	2025		100
2011	692	623	1361	670	485	1288	650	1378	1928		100
2012	559	539	1351	549	327	1228	593	1369	1962		100
2013	677	581	1342	666	411	1136	635	1470	2105		100
2014	516	623	1441	480	405	1295	510	1384	1895		100
2015	678	500	1357	651	280	1192					100
2016											100
2017											100
2018											100
2019											100
2020											100
2021											100
2022											100
2023											100
2024											100
2025											100

Survival and Initial Population Estimates

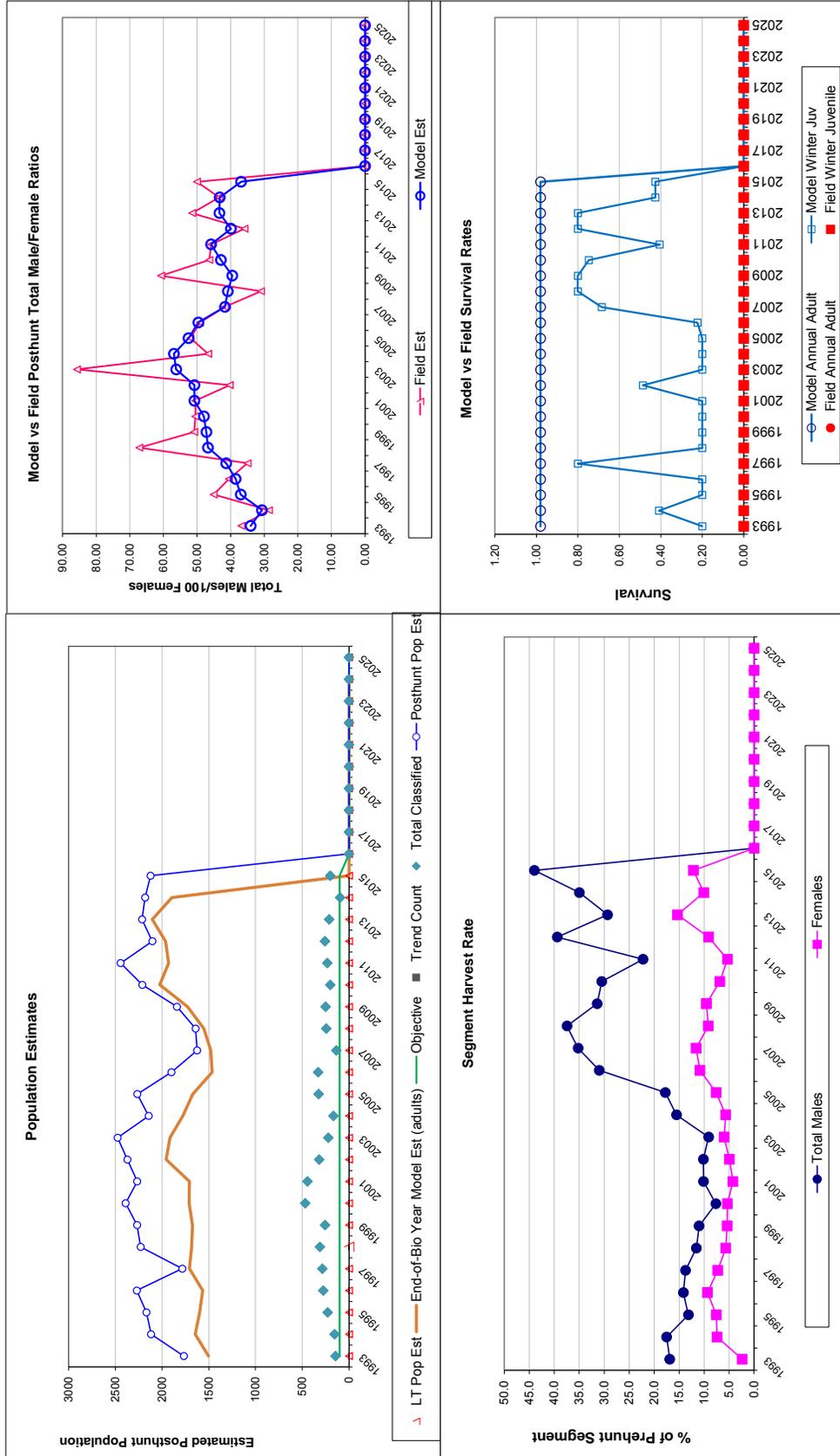
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.20		0.98	
1994	0.41		0.98	
1995	0.20		0.98	
1996	0.20		0.98	
1997	0.80		0.98	
1998	0.20		0.98	
1999	0.20		0.98	
2000	0.20		0.98	
2001	0.20		0.98	
2002	0.49		0.98	
2003	0.20		0.98	
2004	0.20		0.98	
2005	0.20		0.98	
2006	0.22		0.98	
2007	0.68		0.98	
2008	0.80		0.98	
2009	0.80		0.98	
2010	0.75		0.98	
2011	0.41		0.98	
2012	0.80		0.98	
2013	0.80		0.98	
2014	0.43		0.98	
2015	0.43		0.98	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.980
Initial Total Male Pop/10,000 =	0.039
Initial Female Pop/10,000 =	0.115

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

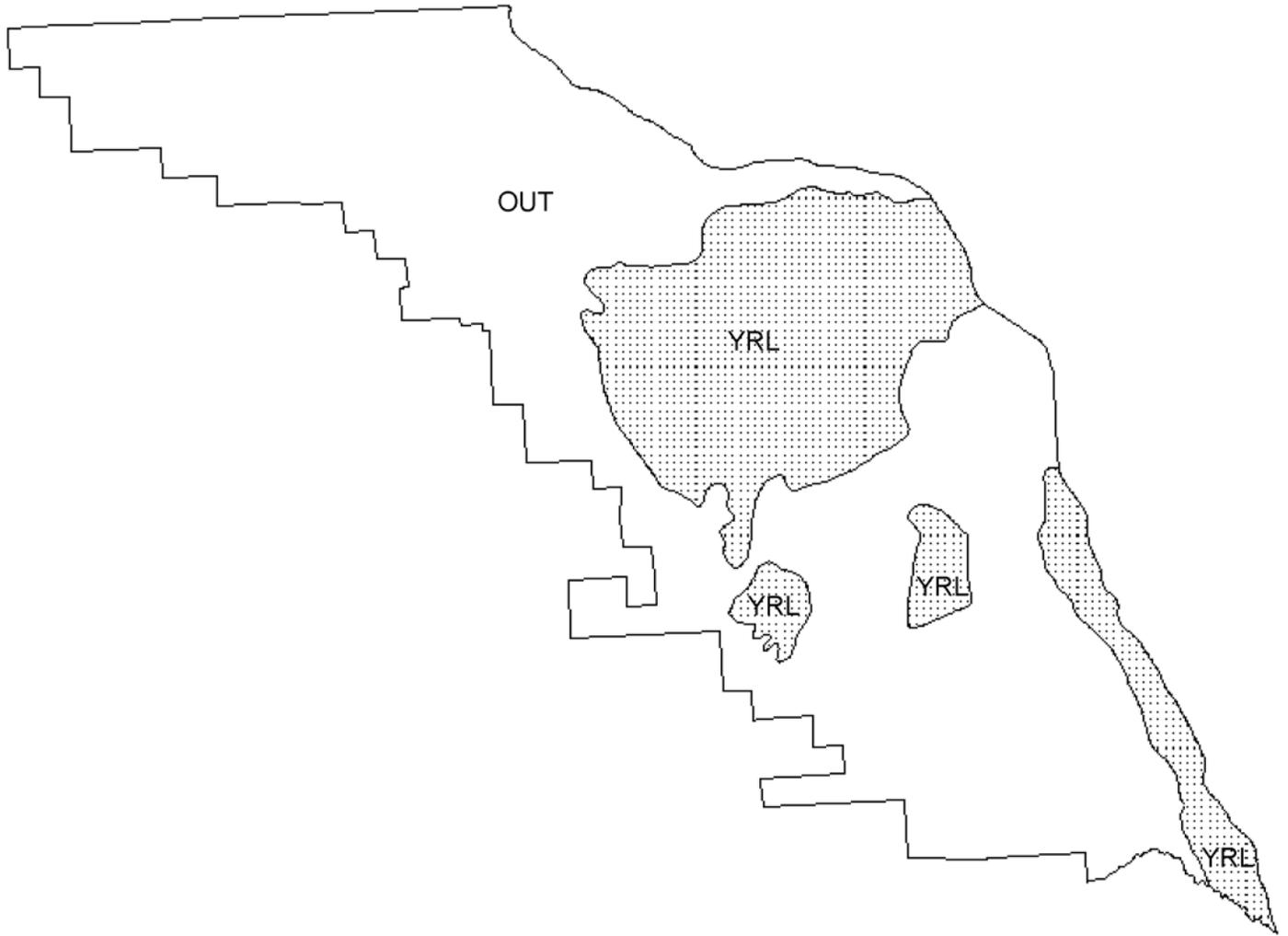
Year	Classification Counts				Total Male/Female Ratio				Harvest											
	Juvenile/Female Ratio		Field SE		Derived Est		Field Est		Field SE		Males		Females		Juv		Total Harvest		Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Field SE	Derived Est	Field Est	Field Est	Field Est	Field SE	Field SE	Derived Est	Males	Females	Juv	Total Harvest	Total Males	Females			
1993		28.74	6.52	7.60	34.03	36.78	60	25	8	93	60	25	8	93	16.9	2.4				
1994		71.43	12.61	6.91	30.67	28.57	55	76	13	144	55	76	13	144	17.5	7.4				
1995		60.36	9.34	7.67	36.96	45.05	52	81	9	142	52	81	9	142	13.1	7.6				
1996		77.78	10.48	6.72	38.50	40.48	56	96	8	160	56	96	8	160	14.1	9.3				
1997		36.75	5.50	5.33	41.31	34.94	56	72	9	137	56	72	9	137	13.7	7.3				
1998		59.85	8.36	9.05	46.74	67.15	56	59	0	115	56	59	0	115	11.6	5.7				
1999		66.10	9.65	8.06	47.19	50.85	53	55	4	112	53	55	4	112	11.0	5.4				
2000		76.70	8.11	6.07	47.93	50.49	37	54	2	93	37	54	2	93	7.7	5.4				
2001		62.98	7.02	6.04	50.76	50.48	52	43	5	100	52	43	5	100	10.1	4.3				
2002		73.83	9.28	6.16	50.76	40.27	52	50	8	110	52	50	8	110	10.2	5.0				
2003		57.14	9.93	13.23	56.18	85.71	57	67	5	129	57	67	5	129	9.1	6.0				
2004		37.78	7.60	8.72	56.87	46.67	96	62	10	168	96	62	10	168	15.5	5.7				
2005		64.67	8.43	7.26	52.52	52.00	97	79	23	199	97	79	23	199	17.8	7.6				
2006		50.91	6.82	6.66	49.60	49.09	153	108	8	269	153	108	8	269	31.0	10.9				
2007		45.83	9.64	9.05	41.67	41.67	135	107	6	248	135	107	6	248	35.2	11.6				
2008		43.88	6.74	5.40	40.81	30.94	143	86	8	237	143	86	8	237	37.4	9.2				
2009		52.99	8.32	9.13	39.50	60.68	123	95	17	235	123	95	17	235	31.4	9.6				
2010		64.21	10.54	8.45	42.88	46.32	141	74	8	223	141	74	8	223	30.5	6.9				
2011		50.85	8.06	7.52	45.81	45.76	126	66	20	212	126	66	20	212	22.2	5.3				
2012		41.38	6.35	5.80	39.89	35.86	193	112	9	314	193	112	9	314	39.4	9.1				
2013		50.48	8.51	8.61	43.32	51.43	155	187	10	352	155	187	10	352	29.3	15.3				
2014		35.85	9.59	10.84	43.23	43.40	198	132	33	363	198	132	33	363	35.0	10.1				
2015		50.00	8.66	8.66	36.87	50.00	200	150	25	375	200	150	25	375	44.0	12.2				
2016																				
2017																				
2018																				
2019																				
2020																				
2021																				
2022																				
2023																				
2024																				
2025																				

FIGURES



**Comments:** In 1996, only total male pronghorn observed was recorded. I averaged the proportion of yearling vs. adult males for 3 years prior (1993-1995) and 2 years post (1997-98) for values. Classification data were not available for 2005 and 2011. 5-year averages were used. Trend data was adjusted by 80% in 1994 and 85% in 1996 based on hours flown (3.5 hrs in 1994 and 3.0 hrs in 1996).

END



PH355 - Beckton  
HA 109  
Revised - 4/87

