2013 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2013 - 5/31/2014

HERD: PR615 - RED DESERT

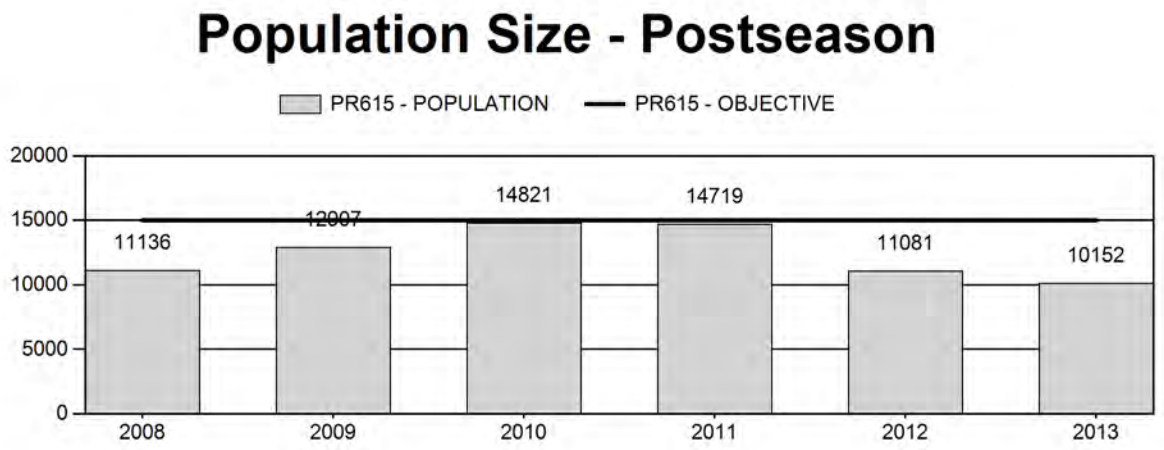
HUNT AREAS: 60-61, 64 | PREPARED BY: GREG HIATT

	2008 - 2012 Average	2013	2014 Proposed
Population:	12,933	10,152	10,237
Harvest:	716	451	340
Hunters:	739	494	375
Hunter Success:	97%	91%	91%
Active Licenses:	798	553	375
Active License Percent:	90%	82%	91%
Recreation Days:	2,109	1,765	1,080
Days Per Animal:	2.9	3.9	3.2
Males per 100 Females	60	58	
Juveniles per 100 Females	60	36	

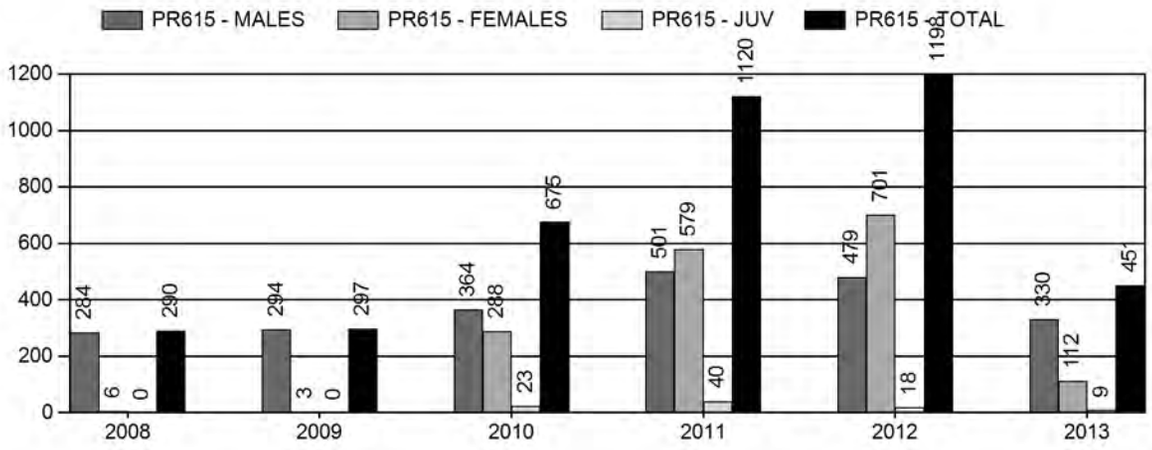
Population Objective:	15,000
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-32.3%
Number of years population has been + or - objective in recent trend:	4
Model Date:	3/5/2014

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

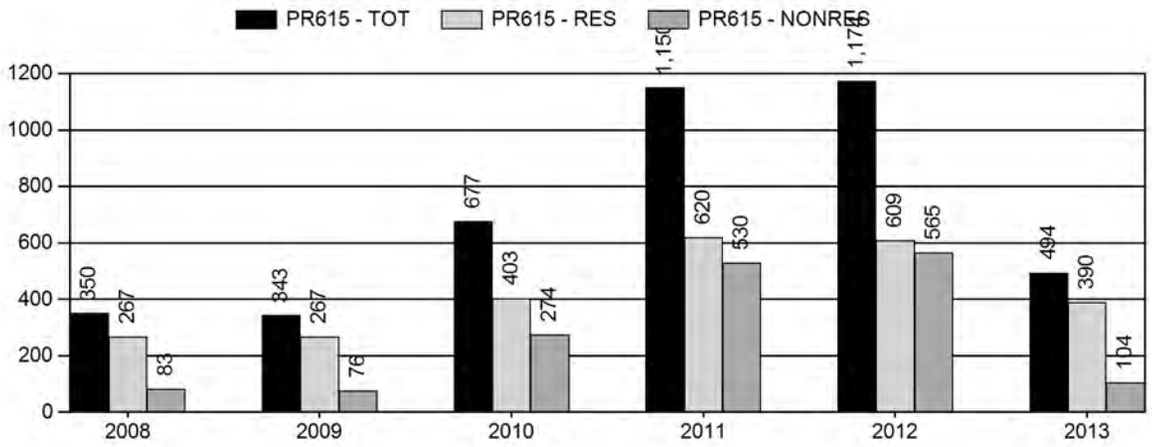
	JCR Year	Proposed
Females ≥ 1 year old:	2.5%	1.5%
Males ≥ 1 year old:	11.2%	8.7%
Juveniles (< 1 year old):	0.1%	0.2%
Total:	4.3%	3.2%
Proposed change in post-season population:	+5.8%	+0.8%



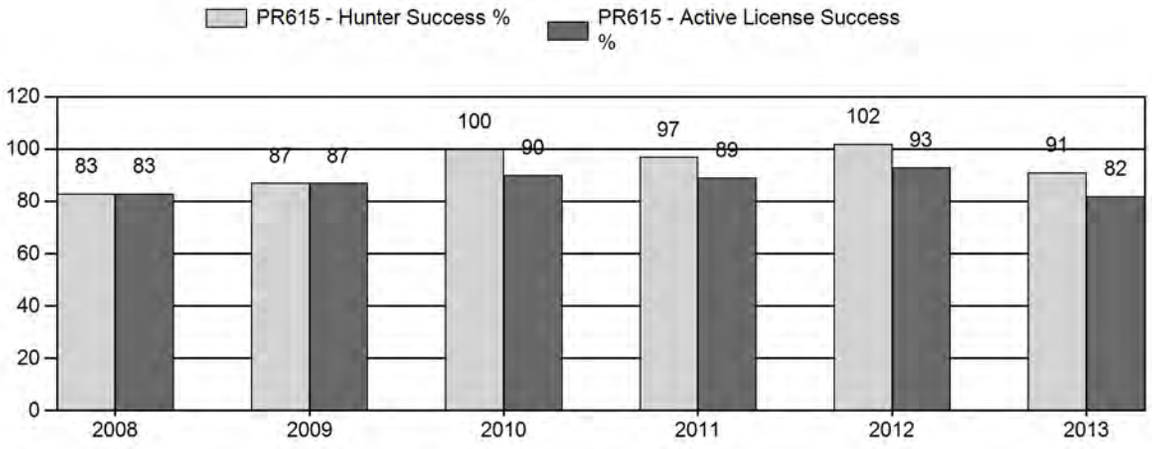
Harvest



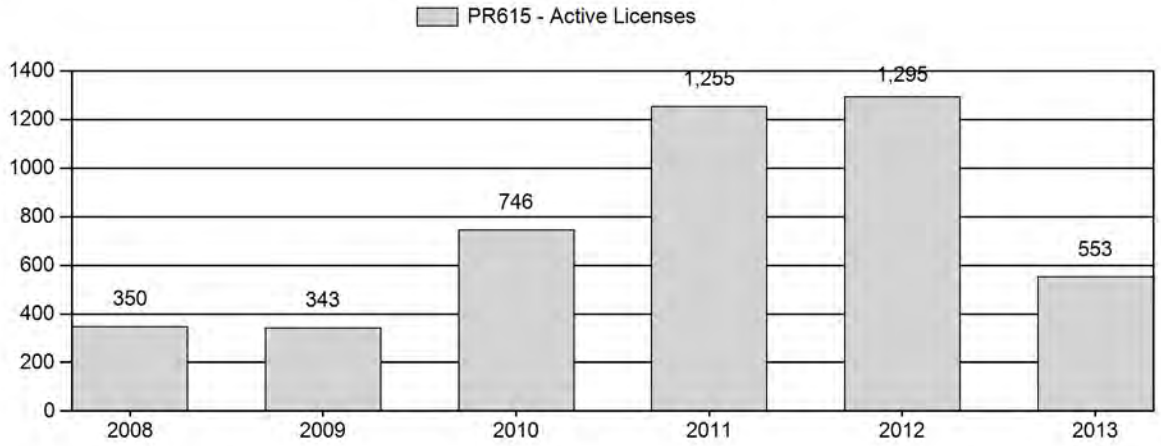
Number of Hunters



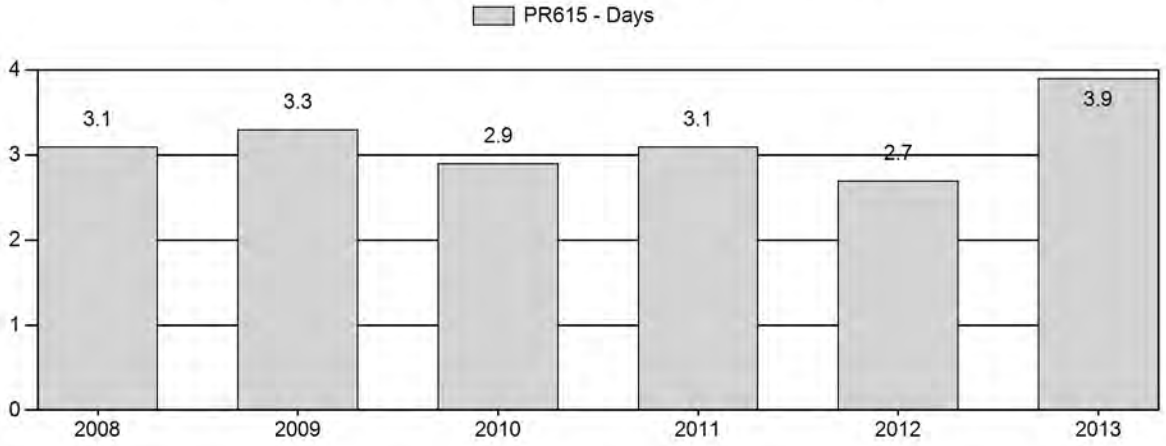
Harvest Success



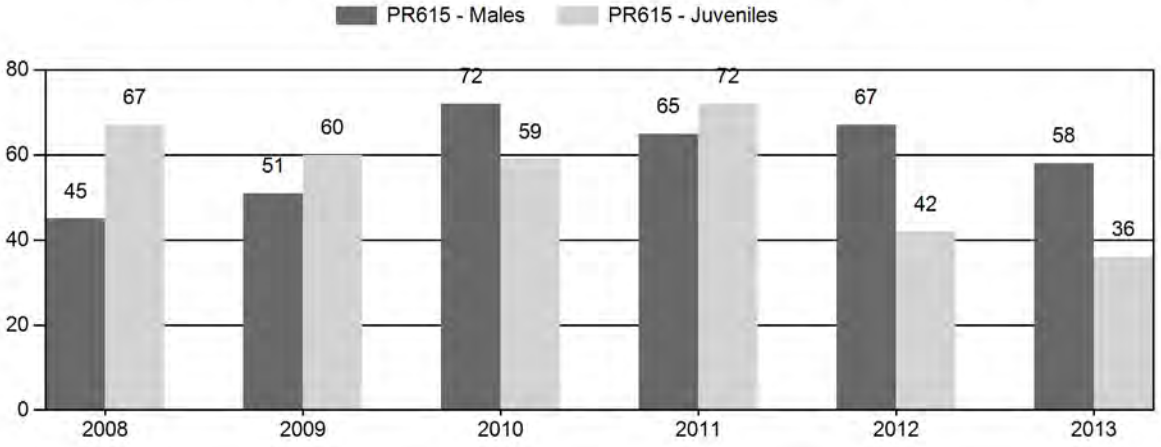
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR615 - RED DESERT

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	11,455	136	428	564	21%	1,255	47%	842	32%	2,661	2,167	11	34	45	± 3	67	± 4	46
2009	13,234	268	749	1,017	24%	1,987	47%	1,190	28%	4,194	1,907	13	38	51	± 3	60	± 3	40
2010	15,563	361	951	1,312	31%	1,823	43%	1,077	26%	4,212	2,595	20	52	72	± 4	59	± 3	34
2011	15,951	263	736	999	27%	1,540	42%	1,115	31%	3,654	2,650	17	48	65	± 4	72	± 4	44
2012	12,390	177	888	1,065	32%	1,600	48%	667	20%	3,332	2,103	11	56	67	± 4	42	± 3	25
2013	10,648	66	809	875	30%	1,517	52%	539	18%	2,931	1,629	4	53	58	± 3	36	± 2	23

2014 HUNTING SEASONS
RED DESERT PRONGHORN HERD (PR615)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Limitations
60	1	Sep. 20	Oct. 22	50	Limited quota; any antelope
	6	Sep. 20	Oct. 22	25	Limited quota; doe or fawn
61	1	Sep. 13	Oct. 14	150	Limited quota; any antelope
	6	Sep. 13	Oct. 14	25	Limited quota; doe or fawn
64	1	Sep. 20	Oct. 22	100	Limited quota; any antelope
	6	Sep. 20	Oct. 22	50	Limited quota; doe or fawn
Archery					
60, 64		Aug. 15	Sep. 19		Refer to Section 3 of this Chapter
61		Aug. 15	Sep. 12		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
60	1	-25
	6	0
61	1	0
	6	-25
64	1	-100
	6	-50
Total	**1**	**-125**
	6	**-75**

<u>Management Evaluation</u>
Current Management Objective: 15,000
Management Strategy: Special
2013 Postseason Population Estimate: ~10,150
2014 Proposed Postseason Population Estimate: ~10,240

The Red Desert pronghorn herd is managed toward a post-hunt population of 15,000, an objective last publicly reviewed in 1994. Population size is estimated using a spreadsheet model developed in 2012 and most recently updated in 2014. The herd is in special management, with harvest quotas designed to maintain pre-hunt buck:doe ratios above 60:100.

Herd Unit Issues

Historically, access in this herd unit has been good. Much of the unit is public land, and hunters have been able to acquire access to most private lands in the checkerboard. The seasonal

distribution map for the herd has not been updated for many years, and it is likely there are crucial winter habitats, particularly in Area 60, that have not yet been delineated.

Habitat issues in this herd unit include continued gas field development, coalbed natural gas development, opening of an *in situ* uranium mine with other mines proposed and possible development of shale oil. Many miles of sheep-tight fences exist in the herd unit, impeding pronghorn movements and migrations, and increasing losses during severe winters.

Weather

Severe drought conditions in 2012, with almost no precipitation throughout the spring and summer, were followed by three severe late winter blizzards in April 2013. Based on low yearling ratios in 2013, losses appeared to be well above normal during the 2012-13 winter. The 2013 summer was also exceptionally dry, reducing browse availability for the 2013-14 winter. Precipitation increased in the fall, providing for some herbaceous plant growth, but appeared to be too late for most forbs and shrubs. The 2013-14 winter had numerous bitter cold spells, and high winds, but those winds also exposed forage on most winter ranges. Losses may still be above average because of the poor body condition of animals going into the winter.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have been minimal due to record drought. Only one shrub transect has been established near this herd unit, on the Chain Lakes WHMA, but was not read in 2013.

BP America transferred ownership of two water wells on Chain Lakes WHMA to WGFD. Developed with funds provided by WWNRT, these solar wells provide additional water sources for wildlife and help disperse domestic livestock that graze Chain Lakes WHMA.

Habitat losses to uranium development increased with opening of the Ur *in situ* uranium mine in Area 61, but is not in or near crucial pronghorn ranges. Habitat losses to gas development have slowed due to low gas prices and demand for drilling rigs in the Bakken fields.

Field Data

Fawn production fell to 36:100, the lowest fawn:doe ratio ever recorded for this herd, exceeding the previous record of 42:100 set in 2012. Production was lowest in Area 60 at only 22:100, the second lowest for that arid area. Production in Area 64 was only 34:100, the lowest ever for that Area. Fawn production was highest in Area 61 at 46:100, which was an improvement over production in 2012 for that area.

The herd buck:doe ratio failed to meet the special management criterion of 60:100, largely because of the exceptionally poor yearling buck:doe ratio of 4:100. Yearling recruitment was poorest for Area 64. Both Areas 60 and 61 met the 60:100 criterion, but the buck:doe ratio for Area 64 was only 47:100, the lowest in five years. With the poor production seen this year, yearling buck:doe ratios are unlikely to improve in 2014.

Harvest Data

Hunter success dropped to its lowest level in seven years, at 82 percent, while hunter effort increased to its highest level ever, at 3.9 days per animal. As with the herd ratios, hunter success was best in Area 61 and lower in Areas 60 and 64. The average days of effort required to harvest an animal was high in all three areas. These data suggest the number of pronghorn in the herd has decreased, particularly in the western half.

Population

The Time-Specific Juvenile & Constant Adult Survival (TSJ,CAS) spreadsheet model provided the best fit with observed buck:doe ratios for this herd, behaved predictably when 2013 classification and harvest data were added and is considered a "Fair" model of the herd. Annual adult survival was predicted at 88 percent, a reasonable level. Juvenile survival rates fluctuated within the allowed range but did hover at maximum or minimum values for many years. The CJ,CA and SCJ,SCA models each had slightly lower AIC values, but both models predicted herd sizes well below line transect estimates and generated roughly stable buck:doe estimates that did not track the dips and rises of observed values. Fawn production in 2014 was projected to be near the five-year average and the model was run with median juvenile survival in 2014.

The model predicts the herd has been roughly 30 percent below objective for the past two years. Even with optimistic assumptions on fawn production and survival, the 2014 pre-hunt population should be roughly equal to that seen in 2013 and herd growth will be minimal. Without major improvement in fawn production and survival, proposed reductions in harvest quotas for 2014 will only stabilize the herd near the current size.

Management Summary

This herd was well below objective size following a record harvest and severe winter losses in 1992. Conservative harvests after that winter combined with improved fawn production and survival beginning in 2007 allowed the herd to reach and be maintained at objective size in 2010 and 2011.

According to the spreadsheet model, the combination of heavy harvests and extremely poor fawn production in 2012 and 2013 significantly reduced herd size, estimated at just over 10,000.

With the population estimated to be 30 percent below objective, harvests need to be reduced to allow the herd to recover. Quotas for Type 6 doe/fawn licenses are reduced to minimal numbers in Areas 60 and 61, and reduced by half for Area 64. Quotas for Type 1 licenses are also reduced in Areas 60 and 64. With the highest buck:doe ratio and fawn production, no decrease is recommended for these licenses in Area 61. With the projected harvest of roughly 260 bucks and 80 does and fawns, the model predicts the herd will remain near the current size in 2014. If precipitation improves, raising both fawn production and survival, some minor increase in herd size may occur, but the herd is unlikely to reach objective in two or three years.

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	Red Desert
Model date:	03/05/14

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	145	154	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	143	157	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	67	176	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	3691	2861	6085	**12637**	3626	2178	5598	**11402**	3550	6663	**10213**				15000
1994	3308	3479	6530	**13317**	3239	2899	6021	**12158**	3022	5851	**8873**				15000
1995	2687	2962	5734	**11383**	2664	2547	5470	**10681**	3045	5703	**8748**				15000
1996	3206	2984	5589	**11779**	3206	2555	5544	**11305**	2749	5494	**8243**				15000
1997	2939	2694	5384	**11018**	2939	2278	5373	**10591**	2460	5304	**7763**				15000
1998	3027	2410	5197	**10635**	3027	1996	5183	**10206**	2916	5843	**8759**	15906	7414		15000
1999	3395	2858	5726	**11978**	3395	2443	5720	**11558**	3718	6726	**10444**				15000
2000	3517	3643	6592	**13753**	3502	3187	6391	**13079**	3356	6281	**9637**				15000
2001	3050	3289	6155	**12494**	3050	2941	6155	**12145**	3083	6028	**9111**	11222	1700		15000
2002	2796	3021	5907	**11724**	2783	2567	5724	**11073**	3100	5984	**9084**				15000
2003	3145	3038	5864	**12047**	3128	2587	5633	**11348**	2757	5535	**8293**				15000
2004	3918	2702	5425	**12045**	3876	2250	5197	**11323**	3758	6447	**10205**				15000
2005	3946	3683	6318	**13947**	3926	3247	6112	**13285**	3476	6091	**9568**				15000
2006	3464	3407	5970	**12840**	3459	2973	5903	**12334**	3163	5852	**9016**				15000
2007	2903	3100	5735	**11738**	2903	2660	5735	**11298**	2796	5626	**8422**	9826	1859		15000
2008	3699	2740	5514	**11953**	3699	2428	5507	**11634**	3474	6292	**9767**				15000
2009	3693	3405	6167	**13265**	3693	3082	6163	**12938**	4442	7264	**11706**				15000
2010	4206	4353	7119	**15678**	4180	3953	6802	**14935**	4155	6739	**10895**	20222	2911		15000
2011	4782	4072	6604	**15459**	4738	3521	5968	**14227**	3877	5918	**9795**				15000
2012	2418	3799	5799	**12016**	2398	3276	5034	**10707**	3432	5484	**8916**				15000
2013	1910	3364	5374	**10648**	1900	3001	5251	**10152**	3040	5064	**8103**				15000
2014	2670	2979	4963	**10611**	2664	2693	4880	**10237**							15000
2015															
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			0.89		
1994	0.30			0.89		
1995	0.59			0.89		
1996	0.30			0.89		
1997	0.30			0.89		
1998	0.75			0.89		
1999	0.90			0.89		
2000	0.30			0.89		
2001	0.30			0.89		
2002	0.59			0.89		
2003	0.30			0.89		
2004	0.90			0.89		
2005	0.30			0.89		
2006	0.30			0.89		
2007	0.30			0.89		
2008	0.70			0.89		
2009	0.90			0.89		
2010	0.30			0.89		
2011	0.30			0.89		
2012	0.30			0.89		
2013	0.30			0.89		
2014	0.60			0.89		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.885
Initial Total Male Pop/10,000 =	0.286
Initial Female Pop/10,000 =	0.608

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		60.67	2.93	47.02	45.30	2.40	621	442	59	1122	23.9	8.0
1994		50.66	2.79	53.27	57.00	3.02	527	463	63	1053	16.7	7.8
1995		46.86	2.13	51.66	51.22	2.26	377	240	21	638	14.0	4.6
1996		57.37	2.75	53.39	56.95	2.74	390	41	0	431	14.4	0.8
1997		54.59	2.47	50.03	50.25	2.34	378	10	0	388	15.4	0.2
1998		58.25	2.49	46.38	44.44	2.08	377	13	0	390	17.2	0.3
1999		59.29	2.47	49.91	46.99	2.11	377	5	0	382	14.5	0.1
2000		53.36	2.54	55.27	61.11	2.79	415	183	14	612	12.5	3.1
2001		49.54	2.37	53.44	55.78	2.57	317	0	0	317	10.6	0.0
2002		47.33	2.28	51.14	48.14	2.30	413	167	12	592	15.0	3.1
2003		53.62	2.65	51.80	53.88	2.66	410	210	15	635	14.8	3.9
2004		72.22	2.85	49.81	47.58	2.14	411	207	38	656	16.7	4.2
2005		62.47	2.99	58.29	62.38	2.99	396	187	19	602	11.8	3.3
2006		58.03	2.50	57.07	57.01	2.47	394	61	5	460	12.7	1.1
2007		50.62	2.42	54.05	59.40	2.70	400	0	0	400	14.2	0.0
2008		67.09	2.99	49.70	44.94	2.28	284	6	0	290	11.4	0.1
2009		59.89	2.20	55.22	51.18	1.97	294	3	0	297	9.5	0.1
2010		59.08	2.27	61.15	71.97	2.61	364	288	23	675	9.2	4.5
2011		72.40	2.85	61.66	64.87	2.64	501	579	40	1120	13.5	9.6
2012		41.69	1.92	65.51	66.56	2.63			696	1190	13.8	13.2
2013		35.53	1.78	62.59	57.68	2.45			112	451	10.8	2.3
2014		53.80	2.34	60.03	57.76	2.45			75	340	9.6	1.7
2015												
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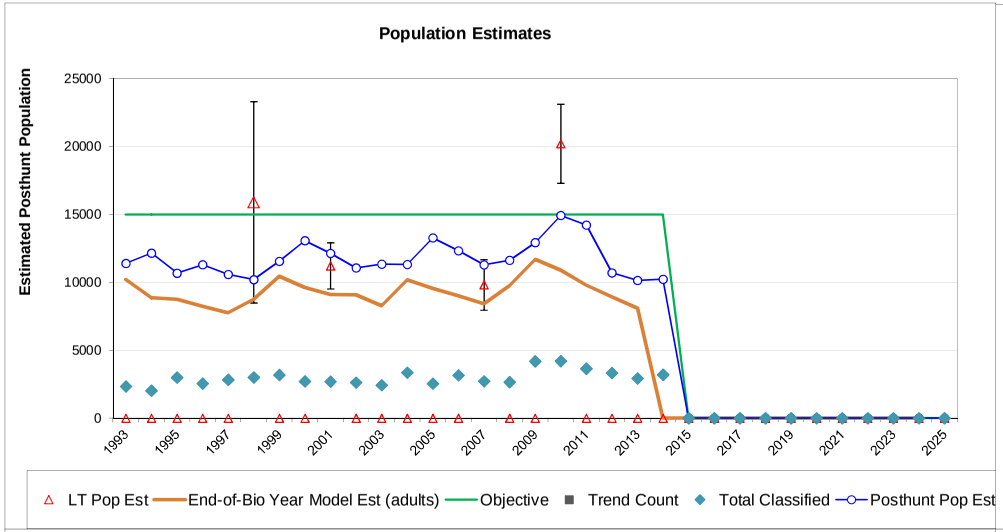
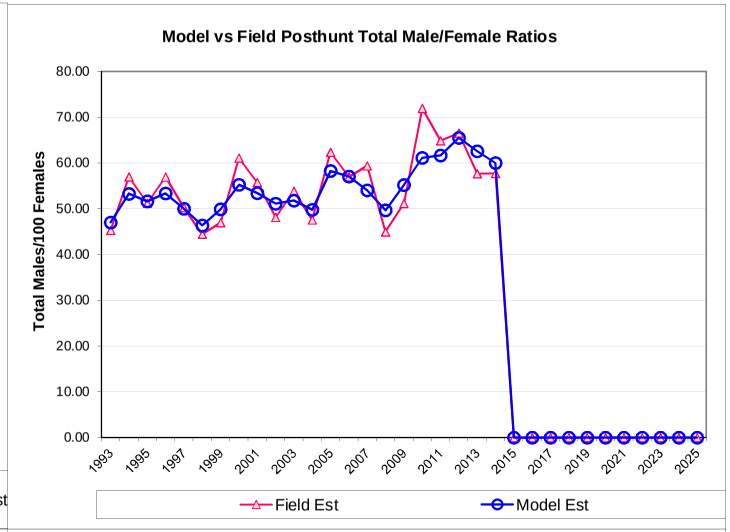
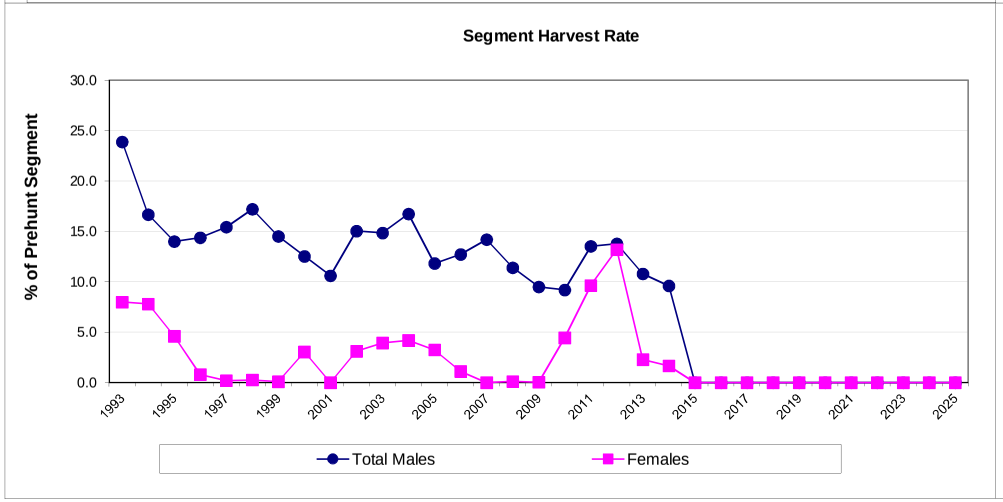
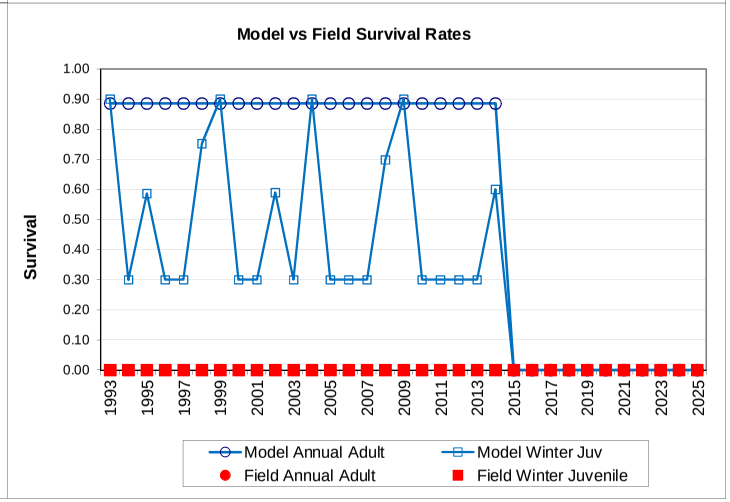
FIGURES









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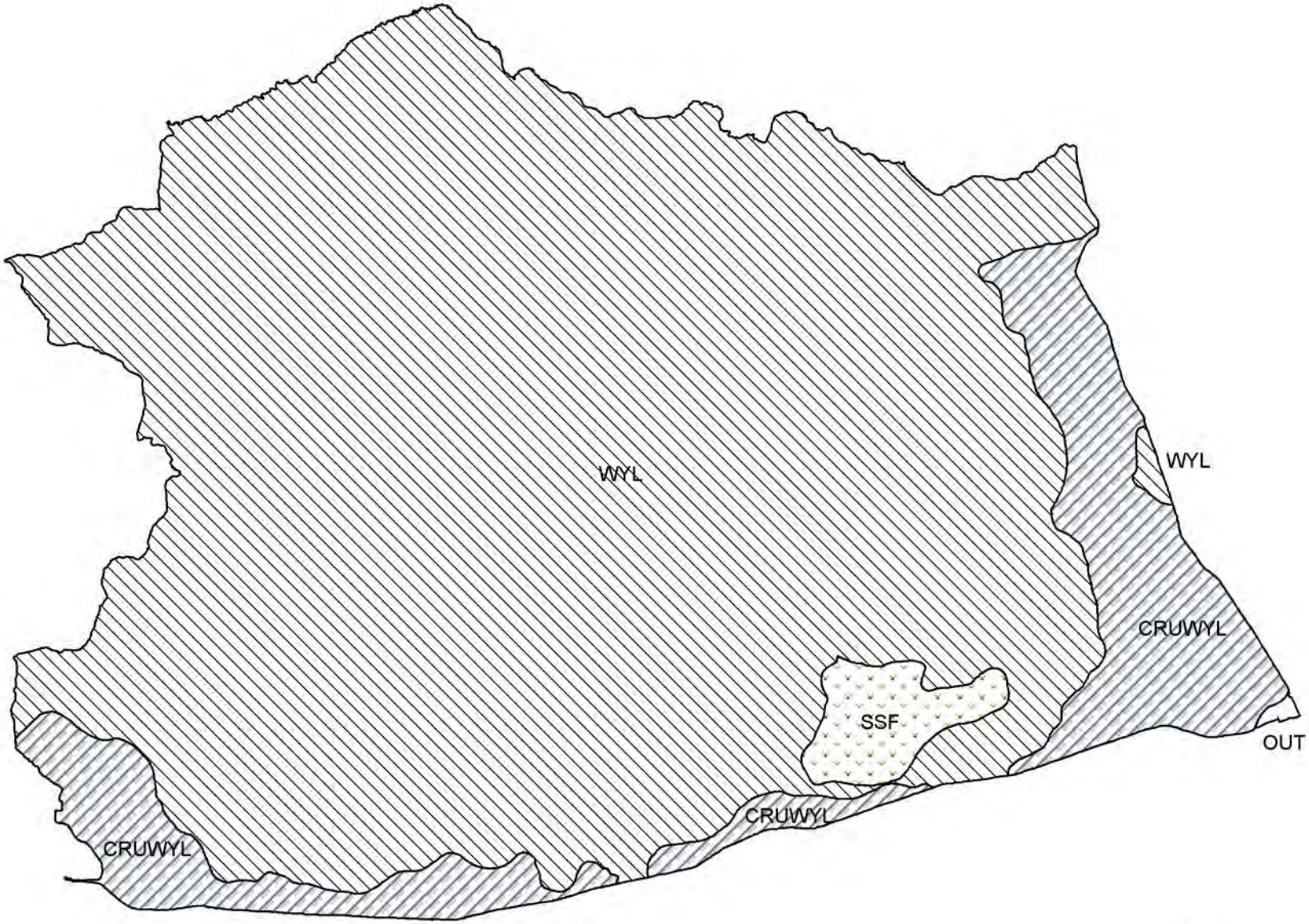


PH615 - Red Desert
HA 60, 61, 64
Revised - 3/94

2013 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2013 - 5/31/2014

HERD: PR630 - IRON SPRINGS

HUNT AREAS: 52, 56, 108 | PREPARED BY: GREG HIATT

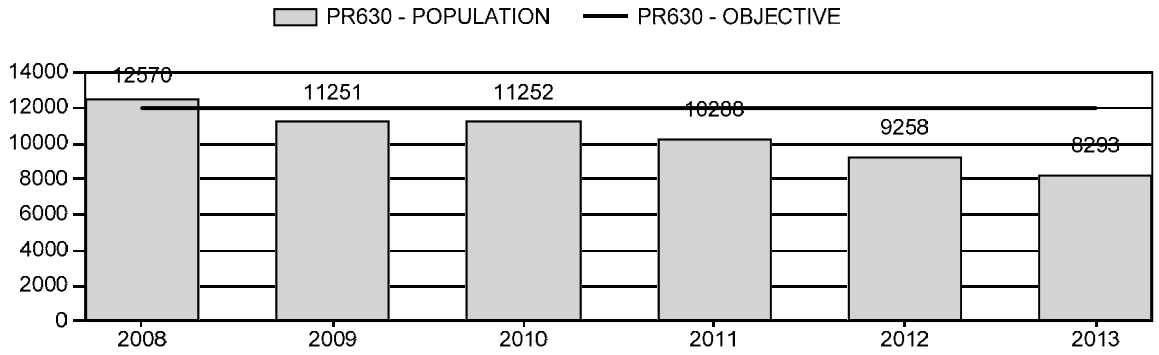
	2008 - 2012 Average	2013	2014 Proposed
Population:	10,924	8,293	7,922
Harvest:	776	717	410
Hunters:	802	722	475
Hunter Success:	97%	99%	86 %
Active Licenses:	898	846	475
Active License Percent:	86%	85%	86 %
Recreation Days:	2,568	2,854	1,500
Days Per Animal:	3.3	4.0	3.7
Males per 100 Females	45	43	
Juveniles per 100 Females	51	50	

Population Objective:	12,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-30.9%
Number of years population has been + or - objective in recent trend:	6
Model Date:	4/19/2014

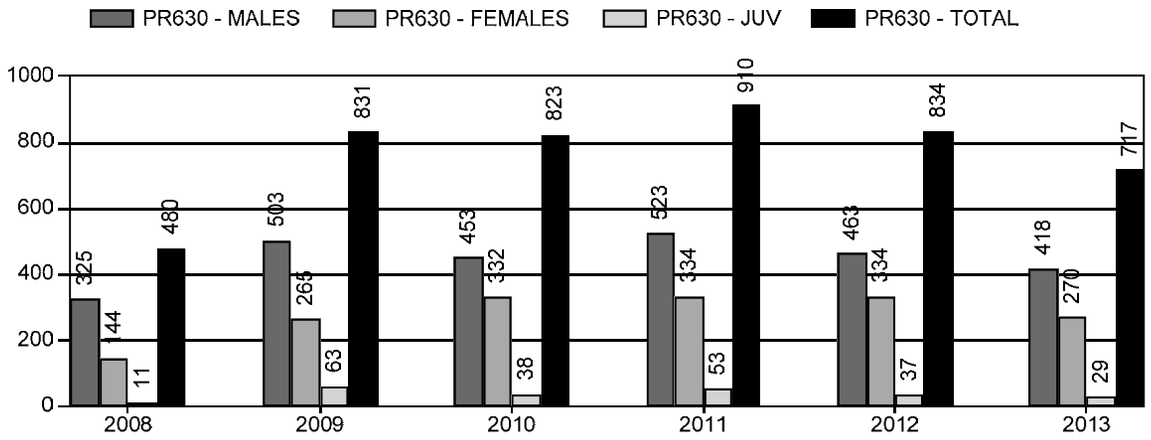
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	JCR Year	Proposed
Females ≥ 1 year old:	6.4%	3.1%
Males ≥ 1 year old:	19.6%	13.9%
Juveniles (< 1 year old):	1.2%	0.7%
Total:	8.1%	4.9%
Proposed change in post-season population:	-8.2%	-4.5%

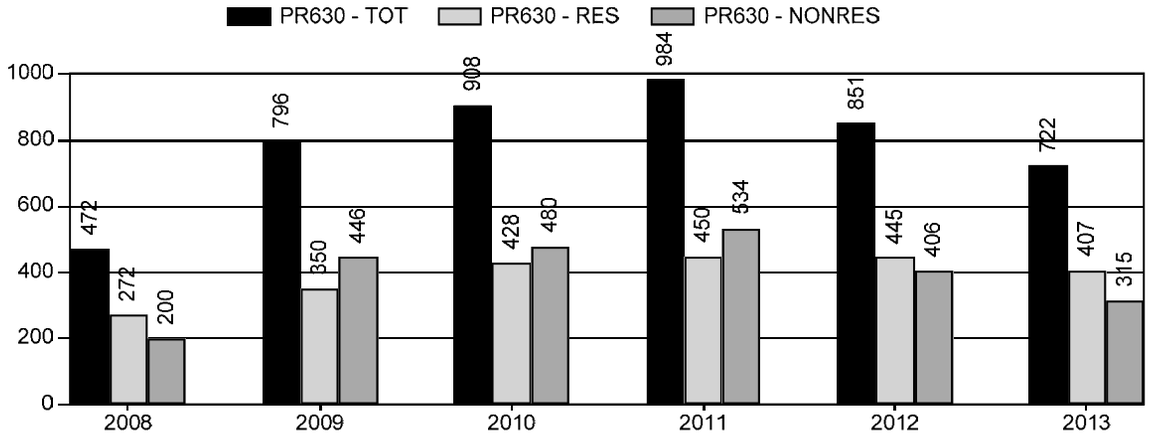
Population Size - Postseason



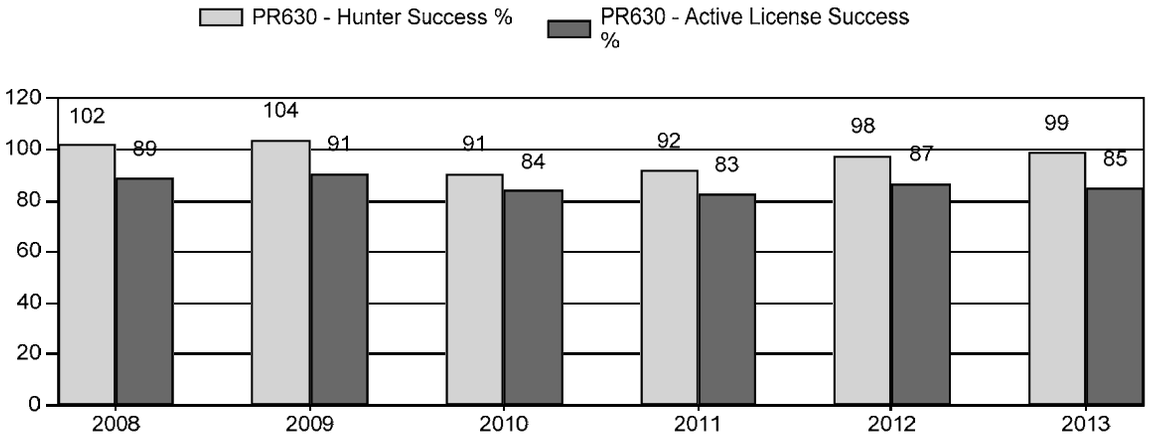
Harvest



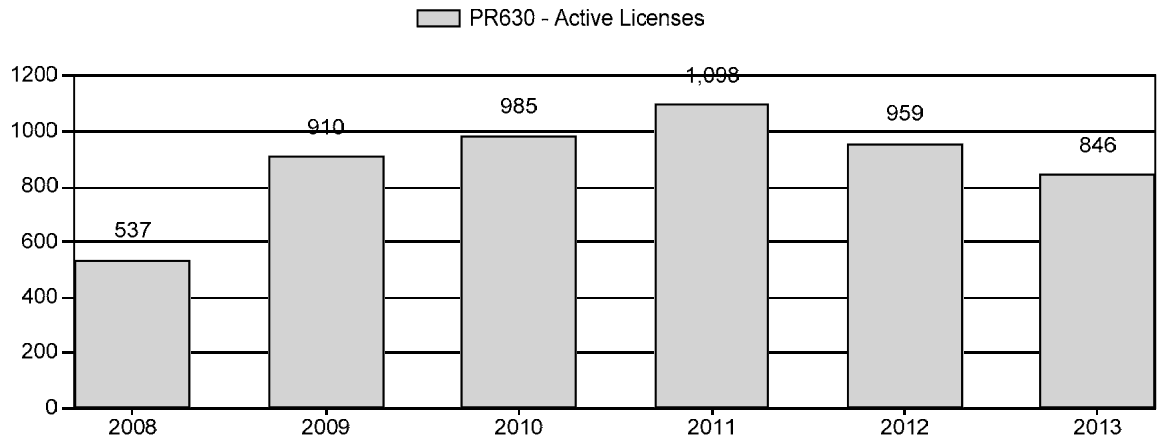
Number of Hunters



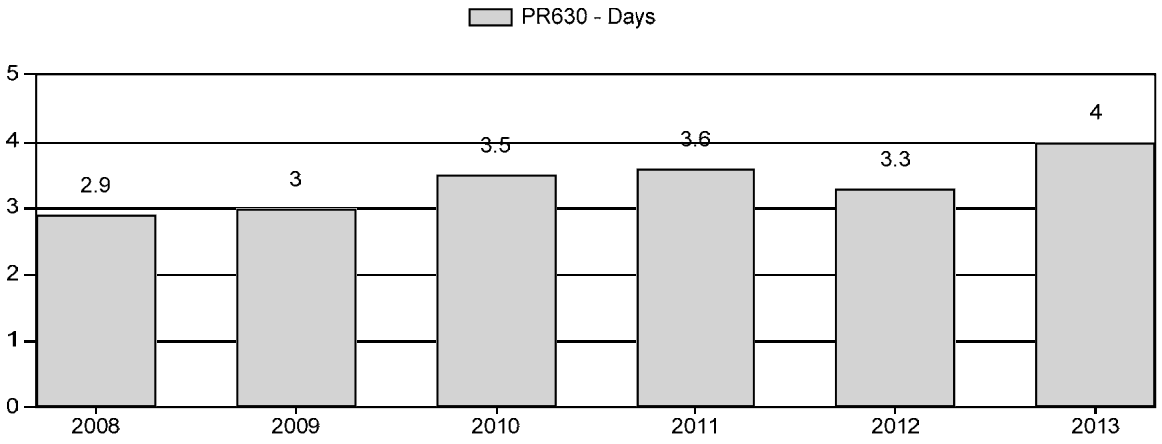
Harvest Success



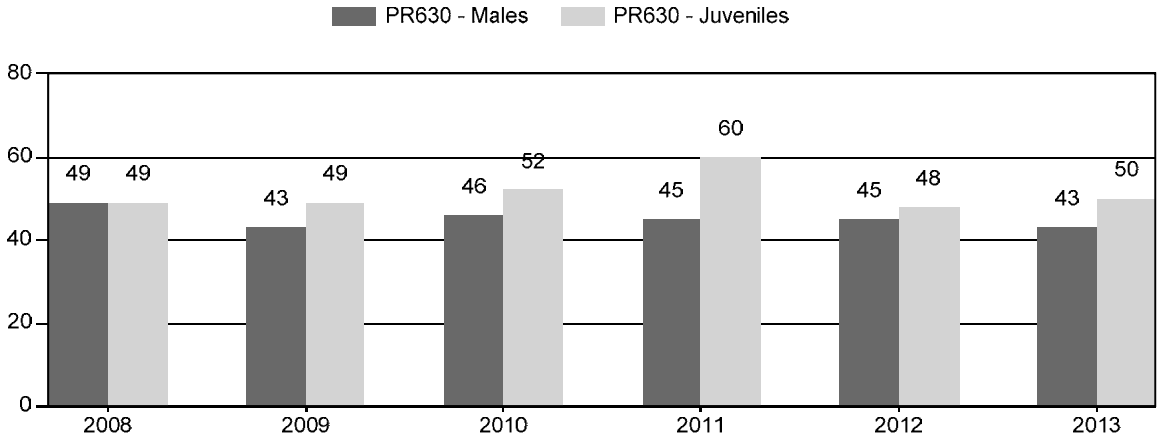
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR630 - IRON SPRINGS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	13,098	204	637	841	25%	1,734	51%	844	25%	3,419	1,373	12	37	49	± 3	49	± 3	33
2009	12,165	225	525	750	22%	1,764	52%	861	26%	3,375	1,343	13	30	43	± 3	49	± 3	34
2010	12,157	159	710	869	23%	1,874	50%	968	26%	3,711	1,477	8	38	46	± 3	52	± 3	35
2011	11,289	150	576	726	22%	1,627	49%	984	29%	3,337	1,791	9	35	45	± 3	60	± 3	42
2012	10,153	212	604	816	23%	1,801	52%	863	25%	3,480	1,295	12	34	45	± 3	48	± 3	33
2013	9,082	131	514	645	22%	1,488	52%	746	26%	2,879	1,336	9	35	43	± 3	50	± 3	35

2014 HUNTING SEASONS
IRON SPRINGS PRONGHORN HERD (PR630)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Limitations
52	1	Sep. 16	Oct. 31	100	Limited quota; any antelope
	2	Sep. 16	Nov. 14	100	Limited quota; any antelope valid south of North Spring Creek
	6	Sep. 16	Oct. 31	75	Limited quota; doe or fawn
	7	Sep. 16	Nov. 14	100	Limited quota; doe or fawn valid south of North Spring Creek
56	1	Sep. 20	Oct. 31	50	Limited quota; any antelope
108	1	Sep. 20	Oct. 31	75	Limited quota; any antelope
	6	Sep. 20	Oct. 31	50	Limited quota; doe or fawn
Archery					
52		Aug. 15	Sep. 15		Refer to Section 3 of this Chapter
56, 108		Aug. 15	Sep. 19		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
52	1	-50
	2	-100
	6	-75
	7	-150
56	1	-25
108	1	-25
	6	-25
Total	**1&2**	**-200**
	6&7	**-250**

<u>Management Evaluation</u>
Current Management Objective: 12,000
Management Strategy: Recreation
2013 Postseason Population Estimate: ~8,300
2014 Proposed Postseason Population Estimate: ~7,925

The Iron Springs pronghorn herd is managed toward a post-hunt population of 12,000, an objective last publicly reviewed in 1994. Population size is estimated using a spreadsheet model developed in 2012 and updated in 2014. The herd is in recreational management, with harvest quotas designed to maintain pre-hunt buck:doe ratios below 60:100.

Herd Unit Issues

Construction of the proposed Chokecherry and Sierra Madre wind farms, consisting of roughly 1,000 turbines and the associated road network, could have significant impacts on important habitats in large portions of Areas 56 and 108, as well as the north portion of Area 52. Construction of several large, trans-continental powerlines would cross important winter habitats at the north edge of Area 56.

Access remains an issue in this herd unit, particularly in the checkerboard in association with the proposed Chokecherry and Sierra Madre wind farms. The Walk-In program has opened access to large blocks of private land, primarily in Area 52, which helped address concerns over large numbers of pronghorn residing on irrigated croplands during summer and fall.

The seasonal distribution map was last revised in March 1994 and no changes have been made since that review. Observations during winters since 1994 indicate consideration should be given to delineating crucial winter ranges south of Saratoga, southeast of Chokecherry Knob and near Fort Steele. The southern boundary between Area 108 and Area 53 of the Baggs herd was moved further south onto more easily recognized county roads in 2011 and the herd unit boundary should be expanded to align with the new hunt area boundary. Fences continue to pose barriers to pronghorn movements throughout much of the herd unit, increasing mortality during tough winters. Sheep-tight fences may also contribute to low fawn survival in pastures with limited water sources during dry summers.

Small acreages of crucial winter range have been lost to subdivision of deeded lands, primarily in the southern portion of the herd, and along Interstate Highway 80 in Area 56. Increased subdivision of these habitats, especially if these tracts are fenced, could seriously degrade the quality and utility of some winter ranges and migration routes. Development, partitioning, and fencing of these lands could have more deleterious effects on pronghorn migrations and habitat than some energy developments. Segregating land ownership among dozens of owners also deters recreational use of those divided lands and inter-mixed public lands.

Losses to EHD were confirmed in the South Ferris herd immediately north of Area 56 in late summer 2013 and the disease probably struck pronghorn in this herd as well. A mule deer fawn died of EHD at the southern tip of Antelope Area 108 so it is likely the disease spanned at least the northern half of the Iron Springs herd unit.

Weather

Severe drought conditions in 2012, with almost no precipitation throughout the spring and summer, were followed by three severe late winter blizzards in April 2013. Losses appeared to be above normal during the 2012-13 winter. The 2013 summer was also exceptionally dry, reducing browse availability for the 2013-14 winter. Precipitation increased in the fall, providing for some herbaceous plant growth, but appeared to be too late for most forbs and shrubs. The 2013-14 winter had numerous bitter cold spells, and high winds, but those winds also exposed forage on most winter ranges. Losses this winter may still be above average because of the poor body condition of animals going into the winter.

Habitat

This herd unit overlaps most of the western half of the Platte Valley Mule Deer herd, and habitats for pronghorn suffer the same low productivity due to overuse, decadent shrubs and drought. Treatments designed to improve habitat for mule deer through the Platte Valley Habitat Partnership are likely to improve habitats for pronghorn as well. Recent tebuthiuron treatments on top of Miller Hill in Area 108 and prescribed burns in Area 52 should improve summer ranges for pronghorn, at least in the short term.

Oil and gas drilling activity has tapered off in the herd unit, as most drilling rigs are active in more productive fields elsewhere in the country, but a successful shale oil well a few miles east of the herd unit may lead to increased interest here. Proposed strip mining of coal in Kindt Basin in Area 56 could damage winter habitats, but is unlikely to occur in the near future because of more competitive coal reserves elsewhere in the state and conflict with the Chokecherry wind farm. Increased interest in developing coalbed methane resources in southern Wyoming may lead to proposals to develop well fields to extract the methane from these coal seams.

Construction of the 1,000 turbine Chokecherry and Sierra Madre wind farms is predicted to begin next year. Planned revegetation of the massive road network necessary for this project is likely to improve summer forage for pronghorn, but will permanently remove browse in winter ranges and provide avenues for expansion of noxious weeds, as seen in gas fields to the west. Wind turbines have been shown to reduce soil moisture in their wind shadow and the large number of turbines in already arid habitats may remove the benefits gained from revegetation of roads and pads.

Field Data

Classification sample size dropped to its lowest level in 10 years in 2013. Classification sample size declined again in Area 56 for the fourth year, and was the smallest sample in over 30 years. The 2013 sample size was less than 30 percent of the 2007 sample. In Area 52, the 2013 sample was the smallest in ten years and 25 percent less than that of 2012. Only in Area 108 have sample sizes remained relatively stable over recent years.

As a consequence of extreme drought, fawn production dropped to 48:100 in 2012 and remained low in 2013, at only 50:100, the second lowest in 16 years. Fawn production was lowest in Area 56, at only 15:100. Production improved slightly in Area 52 in 2013, to 59:100, but was still the second lowest ratio in 10 years for that area. Fawn production in Area 108 remained stable at 42:100, which was above the five-year average for that area.

The buck:doe ratio dropped slightly in 2013, mostly from a reduced number of yearling bucks in the sample. The yearling buck:doe ratio for this herd was not unusually low, especially considering the low fawn crop in 2012. Either losses during the April 2013 blizzards were less extreme in this herd, or mortalities also affected doe age classes. Yearling buck:doe ratios were similar for the three hunt areas. Surprisingly, the supply of mature bucks was highest in Area 52, at 38:100. The buck:doe ratio in Area 56 declined again, despite the limited access for hunters. If access continues to be denied after the wind project is constructed, buck:doe ratios will be

expected to rise in this area and may exceed the maximum for recreational management. The adult buck:doe ratio declined in Area 108, but was within the recent range for this area. Overall, buck:doe ratios for this herd over the past seven years have been less than would be desired in areas with large blocks of public land.

Harvest Data

Hunter success declined in 2013, for almost all license types in each of the three areas. Success was lowest for the Type 7 licenses in southern Area 52, at only 75 percent. Similarly, the average number of days of effort required to harvest an animal increased for most license types, but was highest for Type 7 license holders in Area 52. This average was also high for the Type 2 hunters in Area 52, again those restricted to the southern half of the area.

Population

This herd was more than 10 percent below objective size following severe losses during the 1992-93 winter and remained below objective size for the rest of that decade due to poor fawn production. Fawn production began to improve in 1999, particularly in Area 52, allowing the herd to quickly reach objective size and then exceed it by ~35 percent by 2002. Most of the population growth was associated with irrigated croplands in the southern portion of Area 52. Harvests were increased, especially with the addition of Type 2 and 7 licenses limited to the southern portion of Area 52. Harvest statistics and landowners' comments about low numbers of pronghorn in their fields indicate that strategy was successful.

Losses in the northern portion of the herd unit were high again during the 2007-08 winter and pronghorn densities in that portion of the herd have not recovered due to repeated poor fawn production in low desert habitats in Areas 56 and 108. Losses were not exceptional in Area 52 during that winter and fawn production remained adequate in that portion of the herd until 2012.

Prior to the development of a reasonable spreadsheet model in mid-2012, population estimates suggested this herd was roughly at objective size up until 2011. According to the spreadsheet model and a line transect survey flown in spring of 2012, the herd was actually 15 percent below objective as early as 2010. The combination of continued doe/fawn harvest and extremely poor fawn production in 2012 and 2013 significantly reduced herd size, estimated at about 8,300 animals in 2013, more than 30 percent below objective.

The Time-Specific Juvenile & Constant Adult Survival (TSJ/CAS) spreadsheet model provided the best fit with observed buck:doe ratios for this herd, behaved predictably when 2013 classification and harvest data were added and is considered a "Fair" model of the herd. Annual adult survival was predicted at 88 percent, a reasonable level. Juvenile survival rates fluctuated within the allowed range and did not hover at maximum or minimum values for most years. The CJ,CA and SCJ,SCA models each had slightly lower AIC values, but both models predicted herd sizes well below the confidence interval of the most recent line transect estimate and generated roughly stable buck:doe estimates that did not track major dips and rises of observed values. The SCJ,SCA model also overestimated observed buck:doe ratios for each of the past three years. Due to the poor condition of animals going into this winter, fawn production in 2014 was

projected to be similar to that seen in 2013. The model was run using a median to low juvenile survival in 2014.

Management Evaluation

With the population estimated to be more than 30 percent below objective, harvests should be reduced to allow the herd to recover. Recommended quotas were reduced for all license types in Area 52, particularly for the Type 2 and Type 7 licenses which are restricted to the southern portion. These licenses are intended to direct harvest to irrigated hayfields, and even those landowners have been expressing concern over low pronghorn numbers. License quota for Area 56 is reduced to compensate for the extremely low fawn production in 2013. License quotas in Area 108 have also been reduced because of low numbers and poor buck:doe ratios, but doe/fawn licenses intended primarily to address landowner concerns over high pronghorn numbers on one ranch that allows public hunting have been retained.

If fawn production remains low, the expected harvest of roughly 260 bucks and 150 does and fawns from the 2014 season quotas should still slightly reduce herd size, projected to be roughly 7,900 at post-hunt 2014. If fawn production improves, the recommended quotas should allow for a small increase in herd size. When weather and range conditions allow for growth of this population towards objective size, the most desired areas for that growth would be in the northern portion of Area 52 and southern portion of Area 108 where access is available and numbers of pronghorn on private lands has been less of an issue.

Opening dates for all areas and types are consistent with the application booklets. Opening dates for licenses in Area 52 are the same as in 2013 and coincide with seasons in neighboring Areas 50 and 51. As in 2013, the Type 2 and 7 licenses in the southern portion of this area are valid for an additional two weeks into November. The season in area 52 entirely overlaps local deer and elk general license seasons. Opening dates for areas 56 and 108 are the same as in the previous 15 years and coincide with neighboring areas 53 and 55 of the Baggs herd. Closing dates for areas 56 and 108 are extended to the end of October. Archery seasons use standardized opening dates and close the day before the regular season opens for each area.

If significant portions of the herd unit remain closed to hunting, buck:doe ratios for the herd may have to exceed 60:100 in order to maintain reasonable levels of buck quality on the portions where harvest occurs.

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	630 = Iron Springs
Model date:	04/19/14

☑ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	93	102	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	121	141	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	20	139	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	2819	3038	6006	**11863**	2740	2254	5541	**10535**	3185	6179	**9364**				12000
1994	3527	3121	6055	**12703**	3425	2430	5600	**11455**	2854	5732	**8585**				12000
1995	2299	2797	5617	**10713**	2221	2135	5214	**9570**	2403	5203	**7606**				12000
1996	2914	2355	5099	**10367**	2860	1819	4914	**9593**	2669	5494	**8163**				12000
1997	2268	2616	5384	**10267**	2235	2152	5288	**9674**	2208	5072	**7280**				12000
1998	2848	2164	4971	**9983**	2824	1706	4909	**9439**	2675	5602	**8277**				12000
1999	3578	2621	5490	**11689**	3564	2174	5403	**11141**	3335	6282	**9616**				12000
2000	3729	3268	6156	**13153**	3719	2821	6072	**12613**	3756	6722	**10478**				12000
2001	4063	3681	6588	**14332**	4046	3246	6512	**13805**	4722	7702	**12424**				12000
2002	4627	4628	7548	**16802**	4610	4168	7421	**16200**	4391	7355	**11746**				12000
2003	3947	4303	7208	**15458**	3924	3609	7015	**14547**	3752	6874	**10627**				12000
2004	4385	3677	6737	**14799**	4364	2963	6566	**13894**	3237	6543	**9780**				12000
2005	4184	3173	6412	**13769**	4165	2422	6216	**12804**	3998	7476	**11474**				12000
2006	4183	3918	7326	**15427**	4150	3092	7108	**14350**	3481	7165	**10645**				12000
2007	4183	3411	7021	**14615**	4152	2693	6811	**13656**	3124	6888	**10012**				12000
2008	3285	3061	6750	**13097**	3273	2704	6592	**12569**	2884	6403	**9287**				12000
2009	3063	2826	6275	**12163**	2993	2273	5983	**11249**	2899	6267	**9166**				12000
2010	3172	2842	6141	**12155**	3130	2343	5776	**11250**	2510	5612	**8122**				12000
2011	3326	2460	5500	**11286**	3268	1885	5132	**10285**	2459	5341	**7801**	8736	884		12000
2012	2508	2410	5235	**10153**	2466	1905	4876	**9248**	2081	4786	**6867**				12000
2013	2352	2040	4691	**9082**	2320	1580	4394	**8293**	1904	4427	**6330**				12000
2014	2169	1865	4338	**8373**	2153	1579	4190	**7922**							12000
2015															12000
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			0.88		
1994	0.45			0.88		
1995	0.52			0.88		
1996	0.76			0.88		
1997	0.30			0.88		
1998	0.83			0.88		
1999	0.79			0.88		
2000	0.67			0.88		
2001	0.90			0.88		
2002	0.30			0.88		
2003	0.30			0.88		
2004	0.30			0.88		
2005	0.90			0.88		
2006	0.38			0.88		
2007	0.38			0.88		
2008	0.30			0.88		
2009	0.61			0.88		
2010	0.30			0.88		
2011	0.45			0.88		
2012	0.30			0.88		
2013	0.30			0.88		
2014	0.50			0.88		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.881
Initial Total Male Pop/10,000 =	0.304
Initial Female Pop/10,000 =	0.601

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		46.93	2.11	50.58	48.87	2.17	713	423	71	1207	25.8	7.7
1994		58.25	2.90	51.54	54.15	2.76	628	414	93	1135	22.1	7.5
1995		40.93	2.01	49.79	49.79	2.28	602	366	71	1039	23.7	7.2
1996		57.15	2.50	46.18	46.18	2.17	487	168	49	704	22.7	3.6
1997		42.12	2.06	48.59	50.78	2.33	422	87	30	539	17.7	1.8
1998		57.29	2.68	43.53	41.83	2.17	416	56	22	494	21.1	1.2
1999		65.16	2.89	47.74	47.74	2.34	407	79	12	498	17.1	1.6
2000		60.58	2.76	53.08	53.08	2.52	406	76	9	491	13.7	1.4
2001		61.67	2.95	55.87	52.96	2.66	395	69	15	479	11.8	1.2
2002		61.30	2.78	61.32	70.60	3.07	418	115	15	548	9.9	1.7
2003		54.75	2.55	59.69	60.58	2.73	631	176	21	828	16.1	2.7
2004		65.09	2.53	54.58	53.56	2.22	649	155	19	823	19.4	2.5
2005		65.26	2.57	49.48	47.49	2.07	682	178	17	877	23.6	3.1
2006		57.10	2.22	53.48	54.40	2.15	751	198	30	979	21.1	3.0
2007		59.57	2.26	48.58	48.58	1.97	653	191	28	872	21.1	3.0
2008		48.67	2.04	45.35	48.50	2.04	325	144	11	480	11.7	2.3
2009		48.81	2.03	45.04	42.52	1.85	503	265	63	831	19.6	4.6
2010		51.65	2.04	46.27	46.37	1.90	453	332	38	823	17.5	5.9
2011		60.48	2.44	44.73	44.62	1.99	523	334	53	910	23.4	6.7
2012		47.92	1.98	46.04	45.31	1.91			326	823	20.9	6.9
2013		50.13	2.25	43.48	43.35	2.04			270	717	22.5	6.3
2014		50.00	2.24	43.00	43.00	2.02			135	410	15.3	3.4
2015												
2016												
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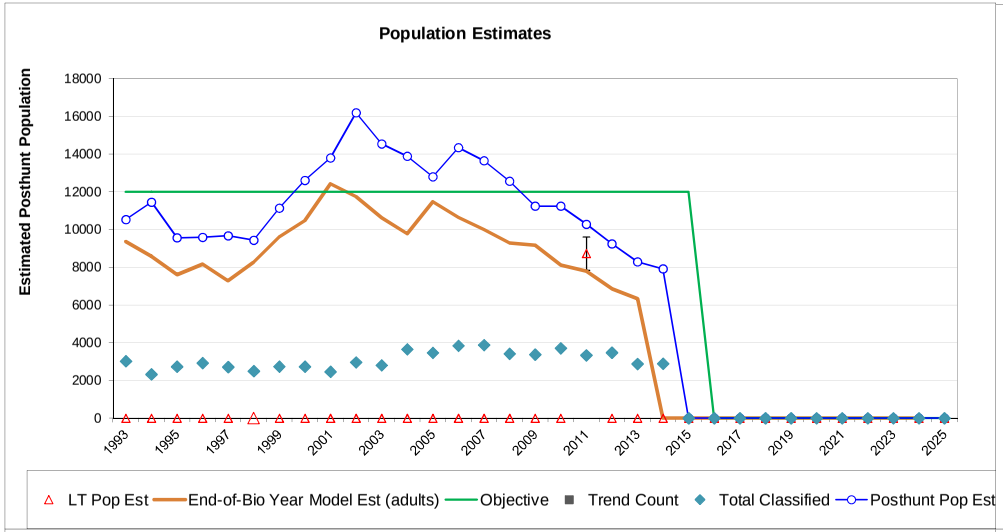
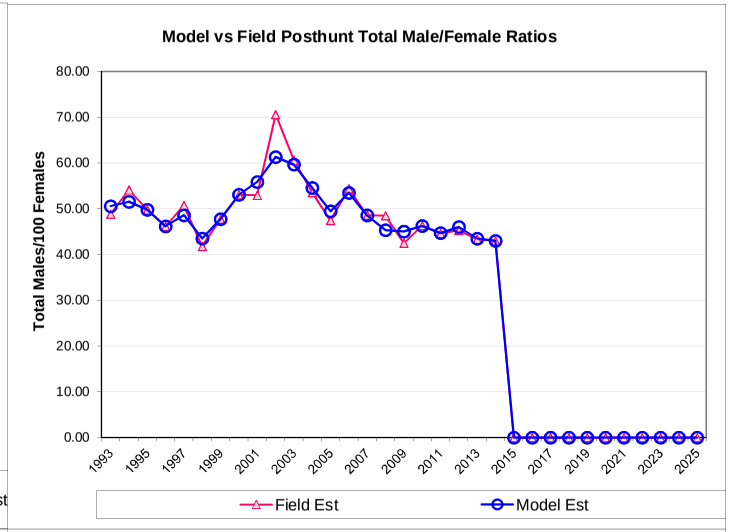
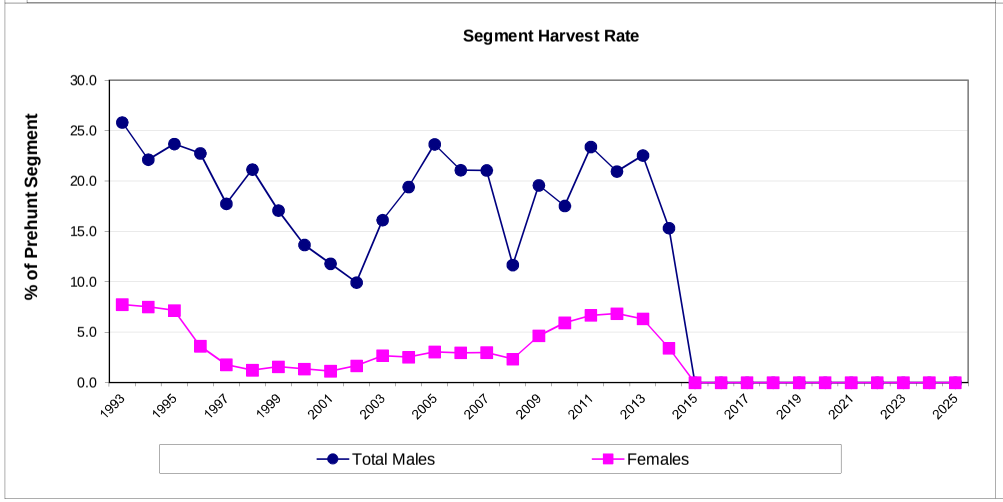
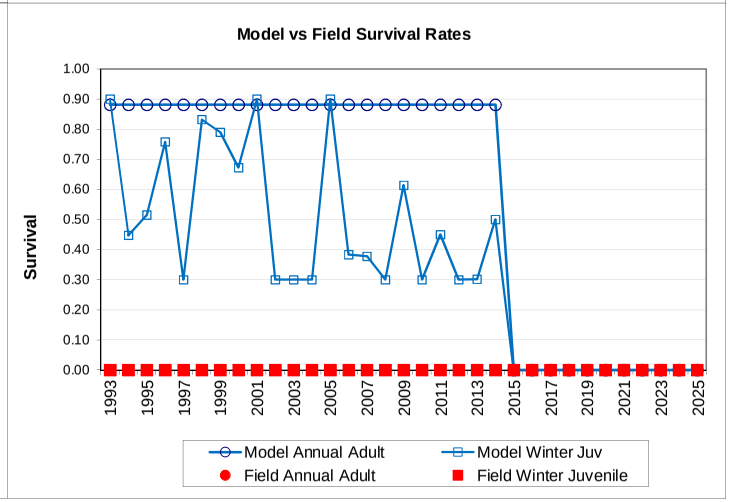
FIGURES









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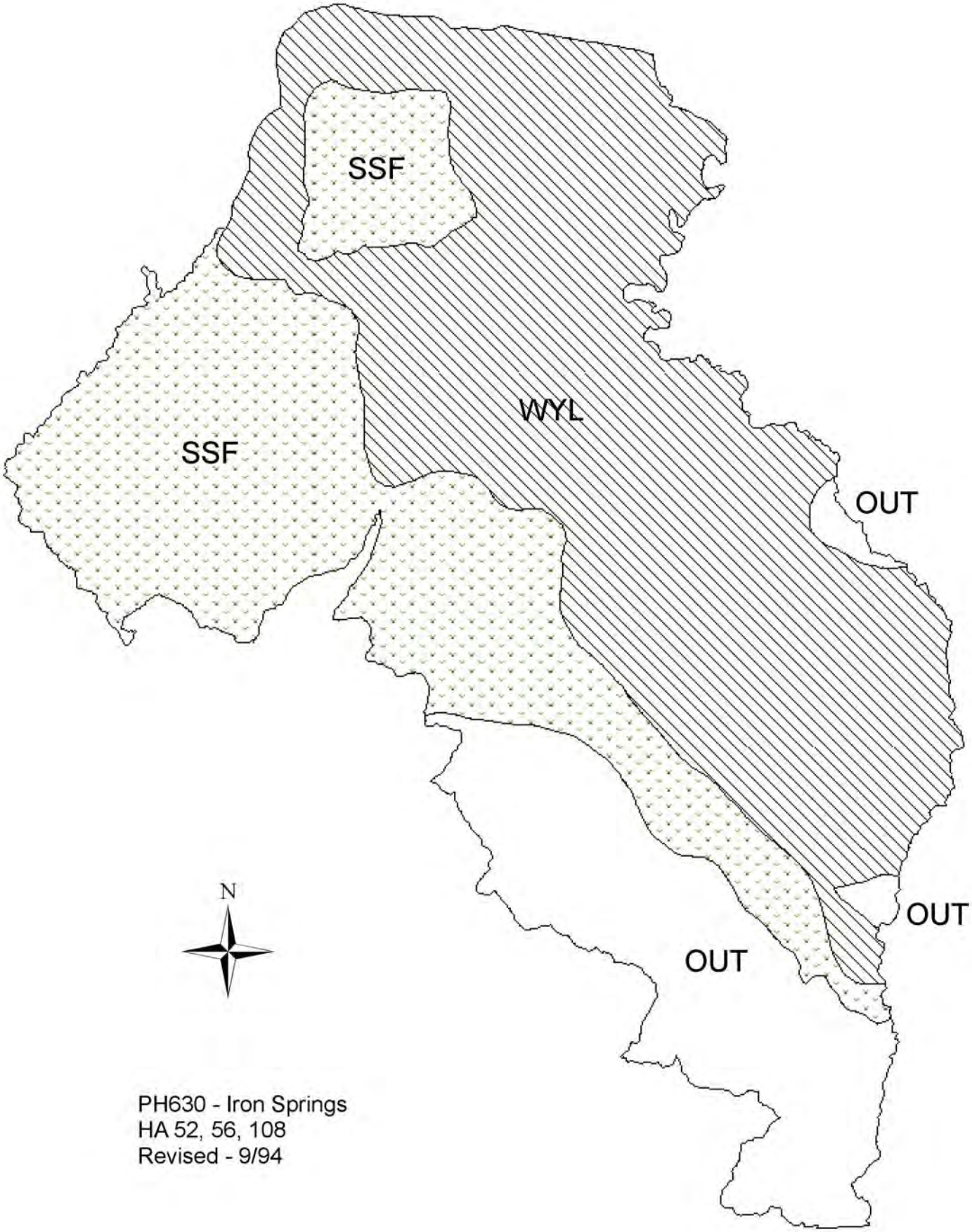
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PH630 - Iron Springs
HA 52, 56, 108
Revised - 9/94

2013 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2013 - 5/31/2014

HERD: PR631 - WIND RIVER

HUNT AREAS: 84

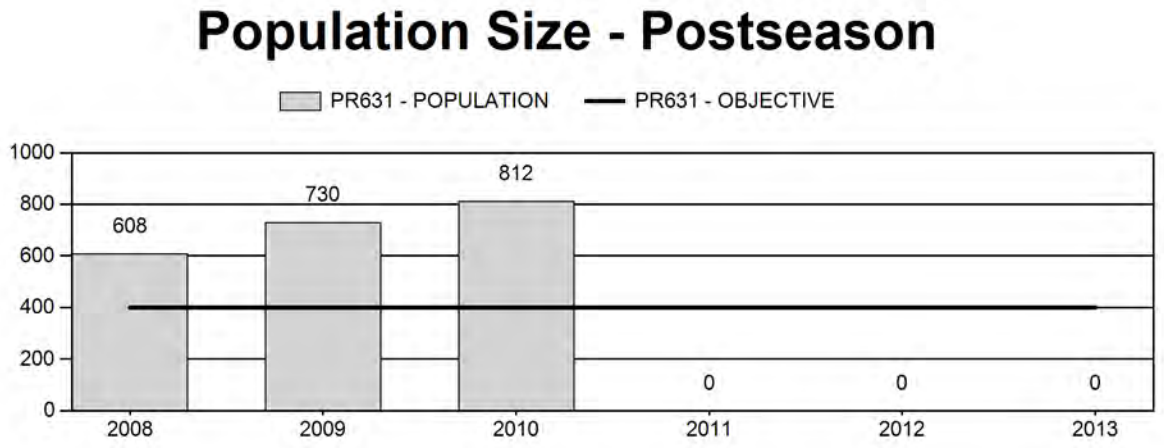
PREPARED BY: GREG ANDERSON

	2008 - 2012 Average	2013	2014 Proposed
Population:	430	N/A	N/A
Harvest:	99	94	100
Hunters:	97	102	115
Hunter Success:	102%	92%	87 %
Active Licenses:	119	138	130
Active License Percent:	83%	68%	77 %
Recreation Days:	537	567	575
Days Per Animal:	5.4	6.0	5.8
Males per 100 Females	34	40	
Juveniles per 100 Females	49	25	

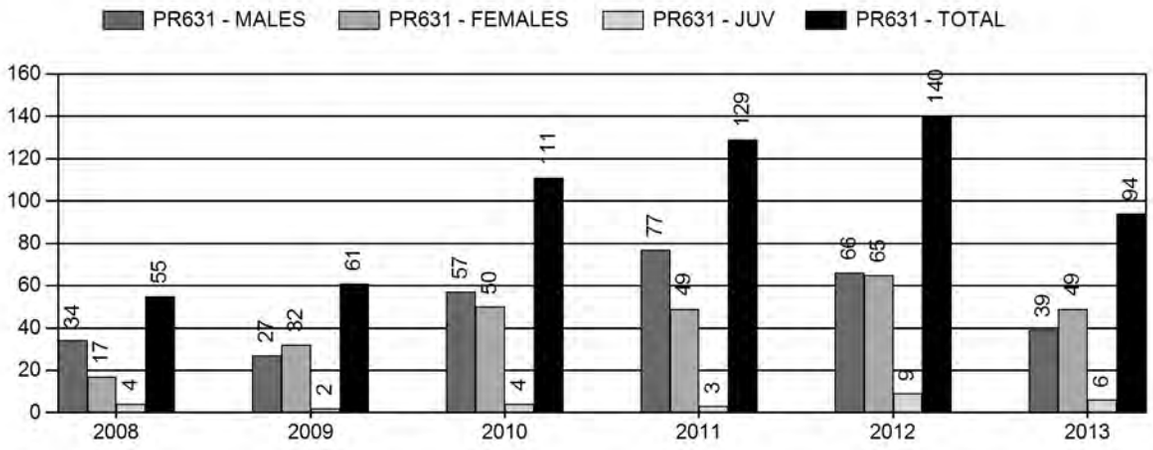
Population Objective:	400
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

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

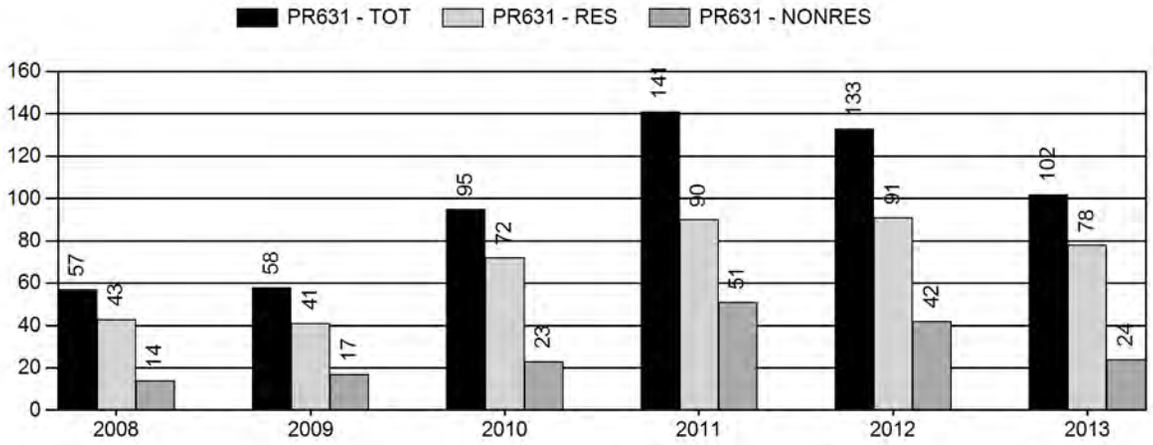
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%
Total:	0%	0%
Proposed change in post-season population:	0%	0%



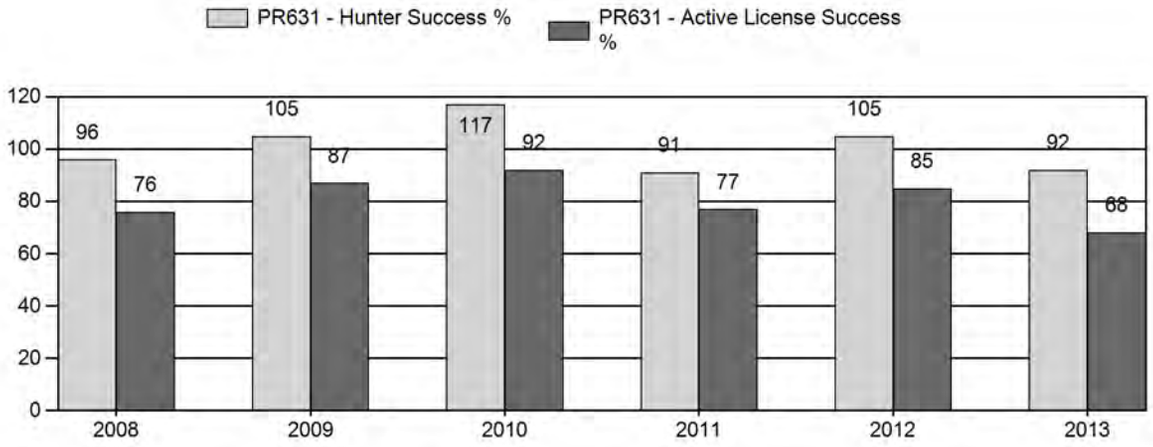
Harvest



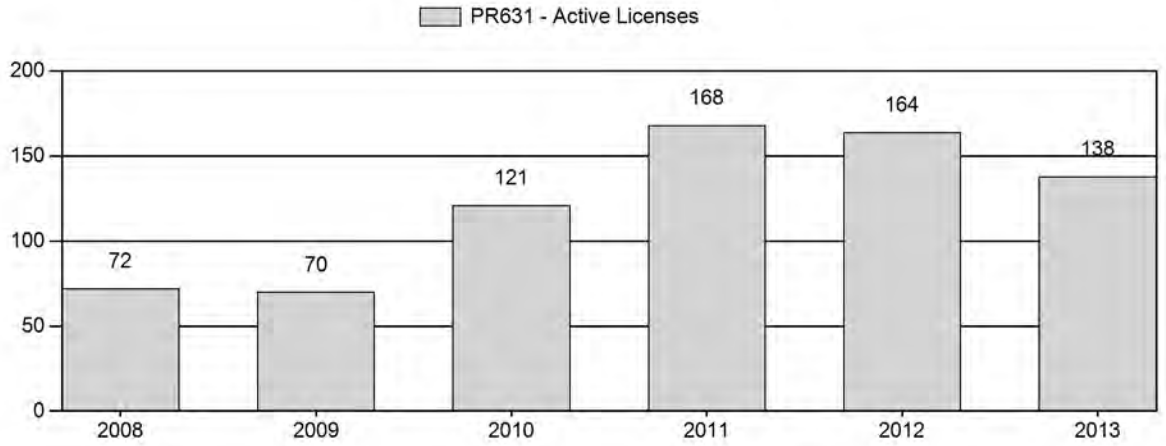
Number of Hunters



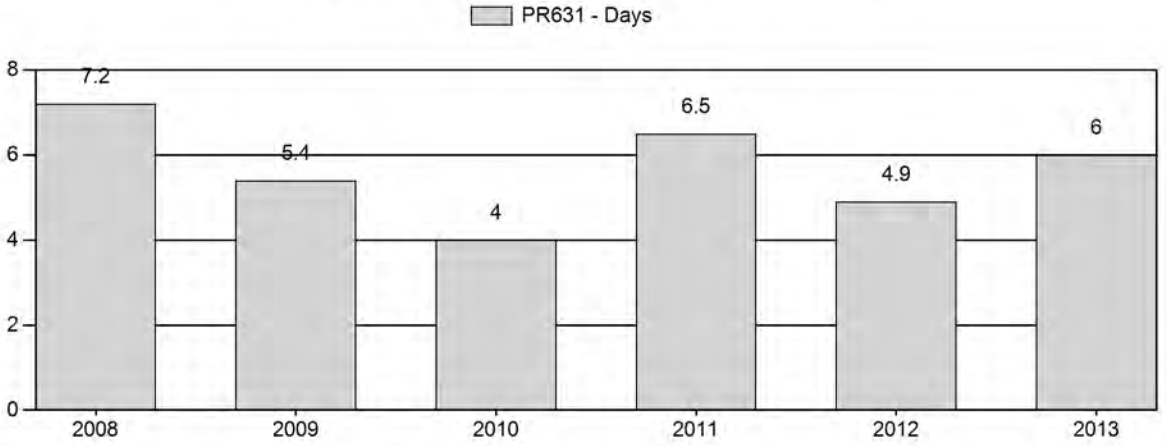
Harvest Success



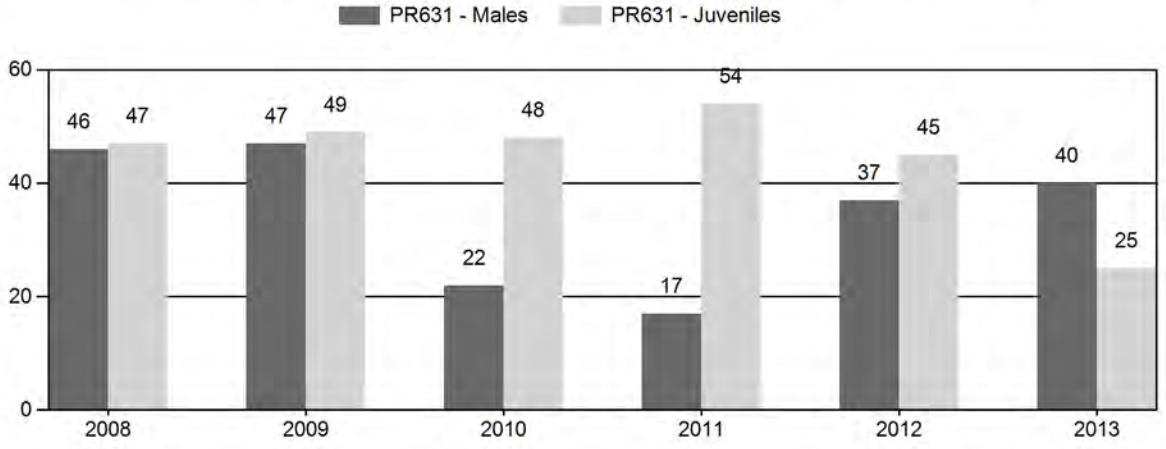
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR631 - WIND RIVER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	663	0	0	103	24%	223	52%	105	24%	431	453	0	0	46	± 0	47	± 0	32
2009	790	0	0	123	24%	262	51%	129	25%	514	523	0	0	47	± 0	49	± 0	34
2010	923	0	0	79	13%	352	59%	169	28%	600	541	0	0	22	± 0	48	± 0	39
2011	0	4	17	21	10%	124	58%	67	32%	212	0	3	14	17	± 0	54	± 0	46
2012	0	7	29	36	20%	97	55%	44	25%	177	0	7	30	37	± 0	45	± 0	33
2013	0	7	14	21	24%	52	60%	13	15%	86	0	13	27	40	± 0	25	± 0	18

2014 HUNTING SEASONS
WIND RIVER PRONGHORN (PR 631)

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
84	1	Sep. 20	Oct. 22	75	Limited quota; any antelope
	6	Sep. 20	Oct. 22	75	Limited quota; doe or fawn
Archery		Aug. 15	Sep. 19		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
84		
Total		

Management Evaluation
Current Management Objective: 400
Management Strategy: Recreational
2013 Postseason Population Estimate: unknown
2014 Proposed Postseason Population Estimate: unknown

Management Issues
The Wind River pronghorn herd has a management objective of 400 with a recreational management strategy. This objective has been in place since 1994. Despite the length of time the numerical objective has been on record, personnel have never been able to effectively estimate the population based on interchange with the Wind River Reservation (WRR) and difficulty collecting adequate demographic data in the mountainous terrain throughout the herd unit. Over the next year, the Lander Region plans to adopt a suitable alternative objective.

Habitat/Weather
This pronghorn population occupies the upper Wind River basin west of the WRR. Much of the habitat throughout the herd unit is marginal or unsuitable. Pronghorn densities are highest on the east end of the herd unit where they occupy deer and elk winter range throughout the summer months. Some pronghorn winter on bare slopes in the mountain foothills, but many migrate east down the Wind River onto the WRR. Available habitat and climatic conditions seem to be the biggest factors limiting this population.

The past year was characterized by extreme drought throughout the herd unit. Vegetation transects monitored to determine the amount of forage available on elk winter range revealed herbaceous vegetation production was approximately 55% of the previous 5 year average.

Herbaceous production was even lower than in 2012 which was also a very dry year. No shrub data is collected in the herd unit, but the dry conditions undoubtedly resulted in poor browse production. Casual observations of shrub conditions in the herd unit did indicate growth was poor. Given the majority of antelope spend much of the year on elk winter range, they subsisted on very poor feed in 2013 and undoubtedly entered winter in poor shape. In contrast to low precipitation during the growing season, there was unusually high precipitation throughout the herd unit starting in September. Much of the precipitation was snow and appeared to force some antelope out of the herd unit onto the WRR during the hunt season. With average winter conditions, overwinter antelope mortality may be higher than normal due to the poor condition of animals entering winter.

Field/Harvest Data/Population

Classification samples have been collected from the ground and have been low over the past 3 years. Prior to that classification data was collected aerially and sample sizes were much higher. In 2013 the classification sample was very low at 86 antelope. Personnel were involved in other duties in August, 2013 so the low sample size is more an artifact of effort than a population change. That said, the classification sample yielded a very low fawn/doe ratio at 25/100. The buck/doe ratio was also extremely low at 18/100. Given poor weather conditions over the past 2 years it is certainly possible recruitment was low and the buck/doe ratio declined. However, the magnitude of the declines in both ratios for 2013 should be viewed with caution given the low sample size.

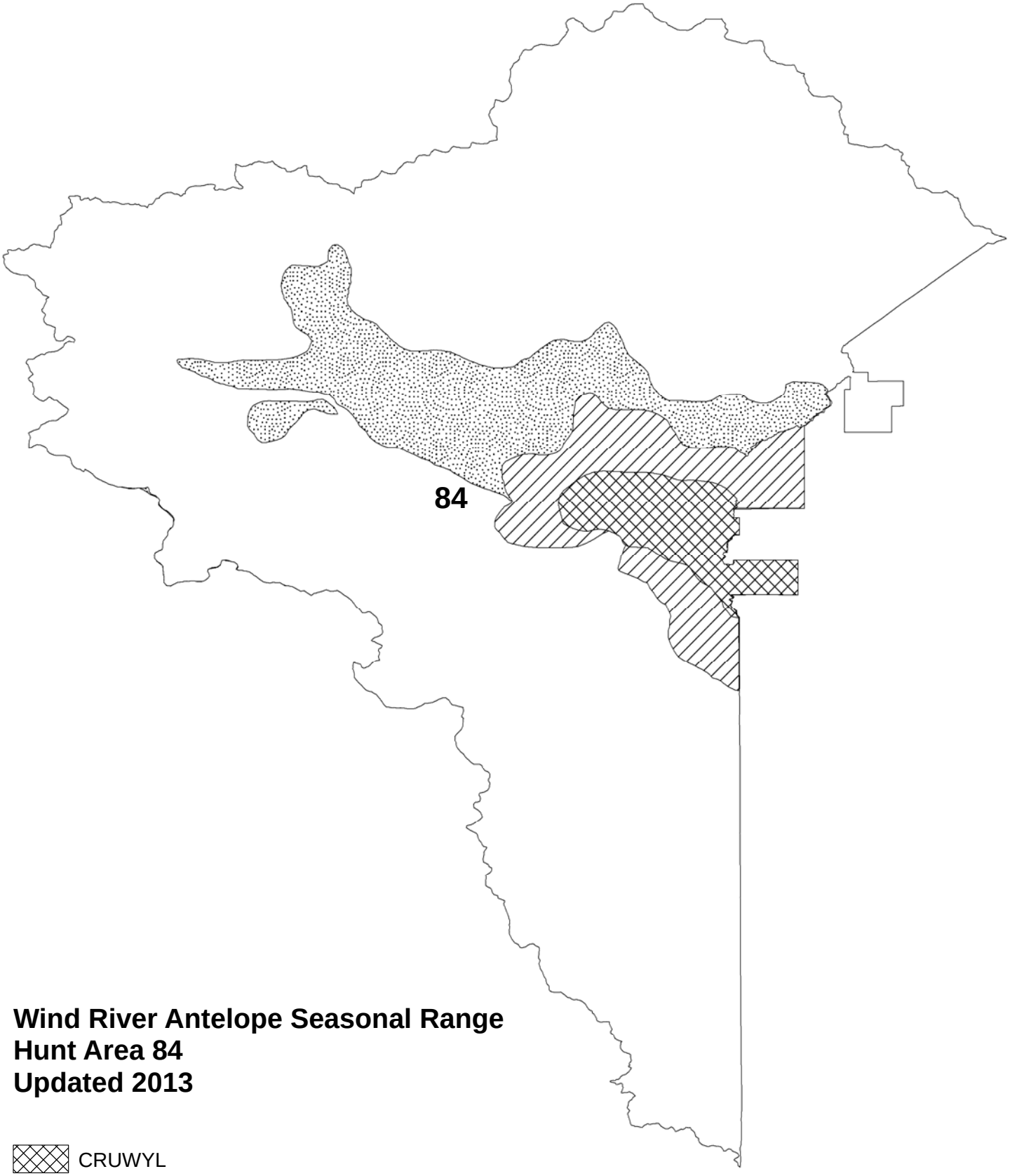
Similar to classification data, harvest statistics for 2013 indicate low buck numbers. The Type 1 license success rate was only 61%. Hunter success tends to be lower in this herd than many antelope herds with a 10 year average of 83%. That said, 61% success in 2013 is quite low even for this herd unit. While the low success rate is indicative of poor hunting, it is not necessarily related to a population decline. As mentioned previously, there was abnormally high snowfall and rain throughout the herd unit in the fall. Weather conditions are likely to have resulted in decreased antelope hunter effort. In addition, casual observations suggest some antelope moved onto the WRR along the Wind River as a result of the early winter conditions during the hunt season. These animals subsequently moved back into the herd unit as conditions moderated in mid-winter.

While both classification data and harvest statistics indicate a significant population decline in 2013, the data is suspect for the reasons mentioned above. It is likely the population did decline some over the past 2 years as a result of poor environmental conditions, but it is doubtful the magnitude of decline is as great as indicated by 2013 data. If classification data and harvest statistics for 2014 are similar to 2013 values the possibility of a larger population decline should be considered.

Management Summary

Given scarce demographic data it is difficult to make strong statements regarding population trend in this herd unit. Anecdotally, based on public and personnel observations, it appears this population grew substantially from the middle to end of the past decade. Following a harsh winter in 2010 and extreme drought in 2012 and 2013 it seems the population declined somewhat, but not as dramatically as indicated by the 2013 data. License numbers were reduced

in 2013 in response to the perceived decline. For 2014, license numbers will remain unchanged since the numbers are low enough to have little effect on the overall population.



Wind River Antelope Seasonal Range
Hunt Area 84
Updated 2013

CRUWYL
OUT
SSF
WYL
YRL

N

2013 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2013 - 5/31/2014

HERD: PR632 - BEAVER RIM

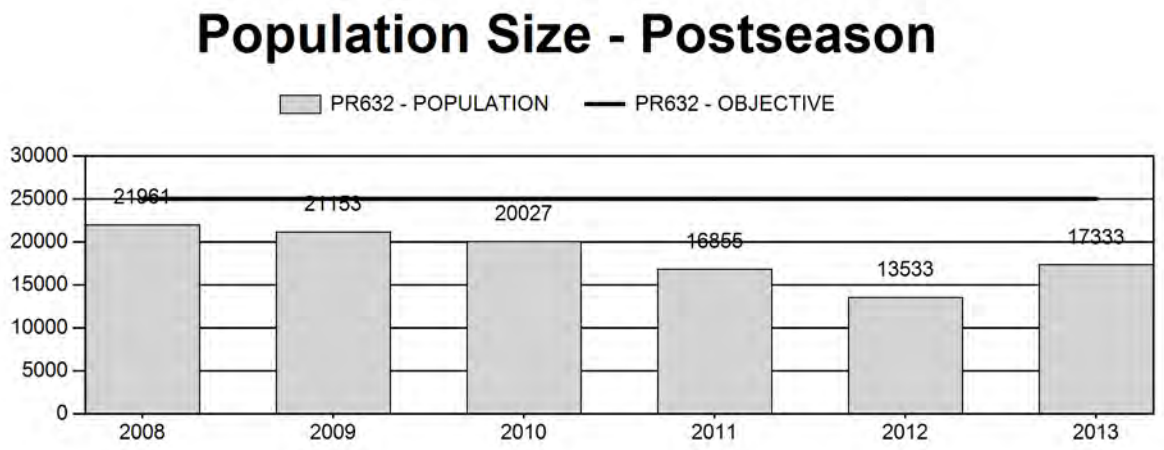
HUNT AREAS: 65-69, 74, 106 | PREPARED BY: STAN HARTER

	2008 - 2012 Average	2013	2014 Proposed
Population:	18,706	17,333	16,880
Harvest:	2,570	1,115	1,125
Hunters:	2,587	1,272	1,200
Hunter Success:	99%	88%	94 %
Active Licenses:	2,924	1,366	1,325
Active License Percent:	88%	82%	85 %
Recreation Days:	8,180	3,889	3,800
Days Per Animal:	3.2	3.5	3.4
Males per 100 Females	56	46	
Juveniles per 100 Females	59	54	

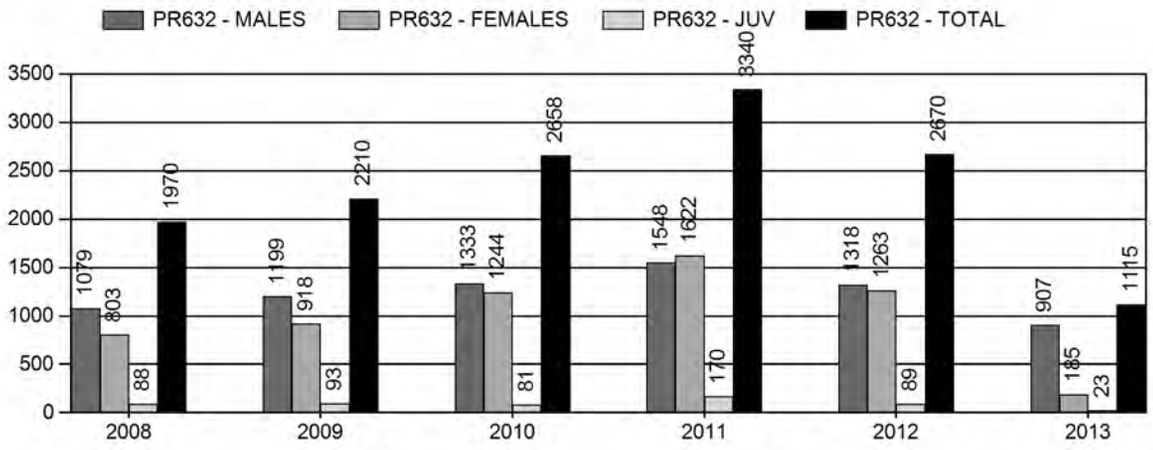
Population Objective:	25,000
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-30.7%
Number of years population has been + or - objective in recent trend:	7
Model Date:	3/3/2014

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

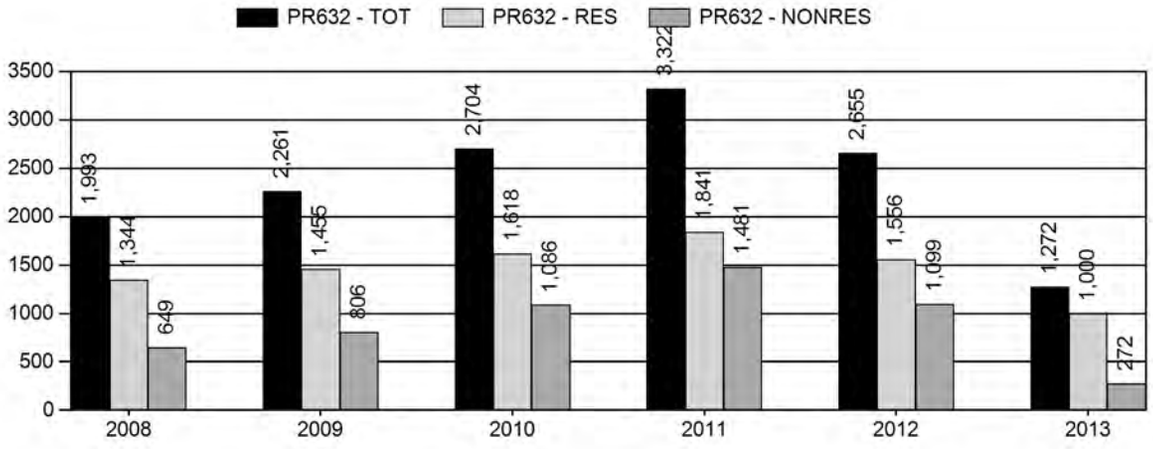
	JCR Year	Proposed
Females ≥ 1 year old:	2.3%	2.4%
Males ≥ 1 year old:	21.4%	22.3%
Juveniles (< 1 year old):	0.1%	0.1%
Total:	6.0%	6.2%
Proposed change in post-season population:	+11.8%	-2.6%



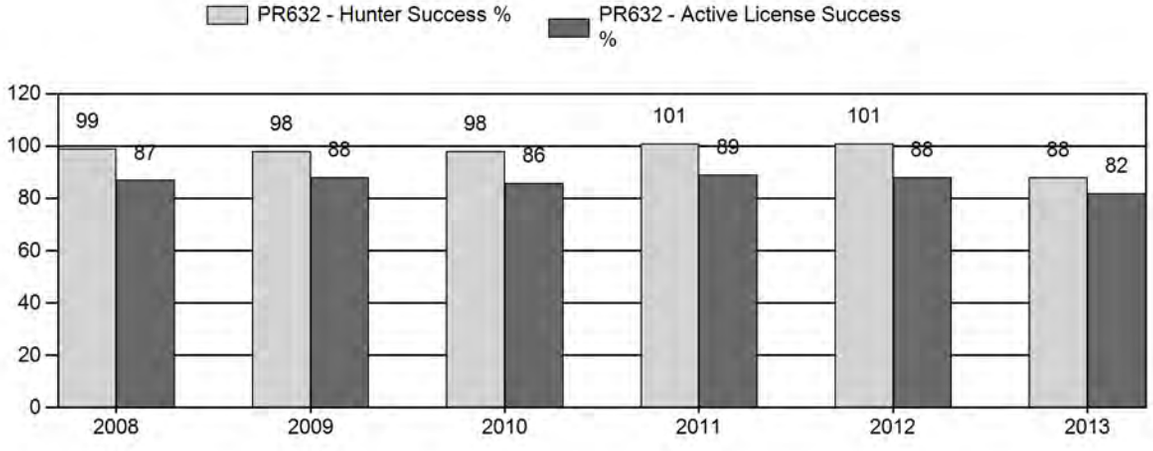
Harvest



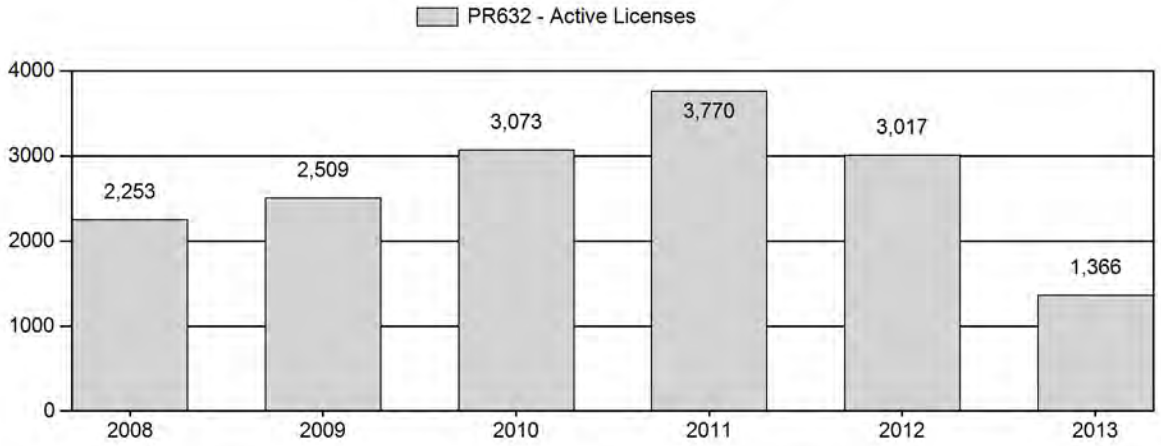
Number of Hunters



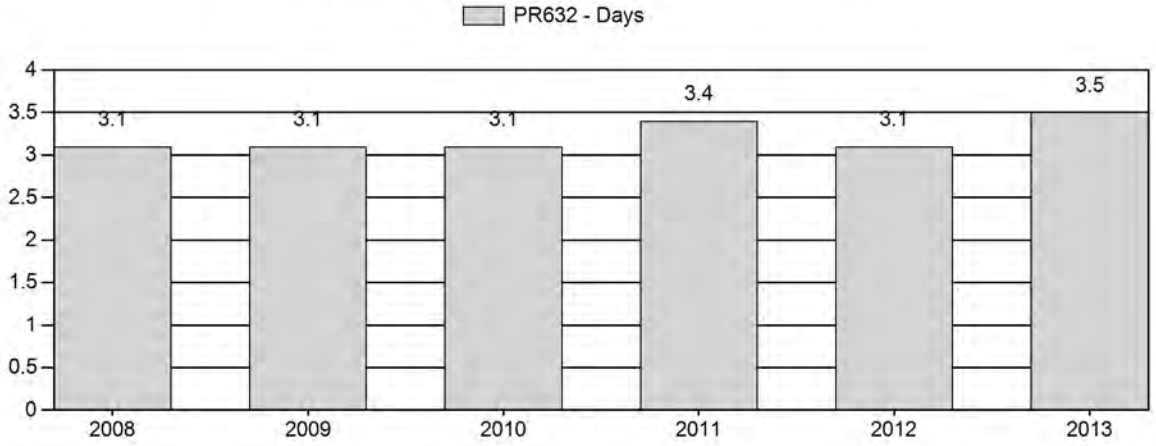
Harvest Success



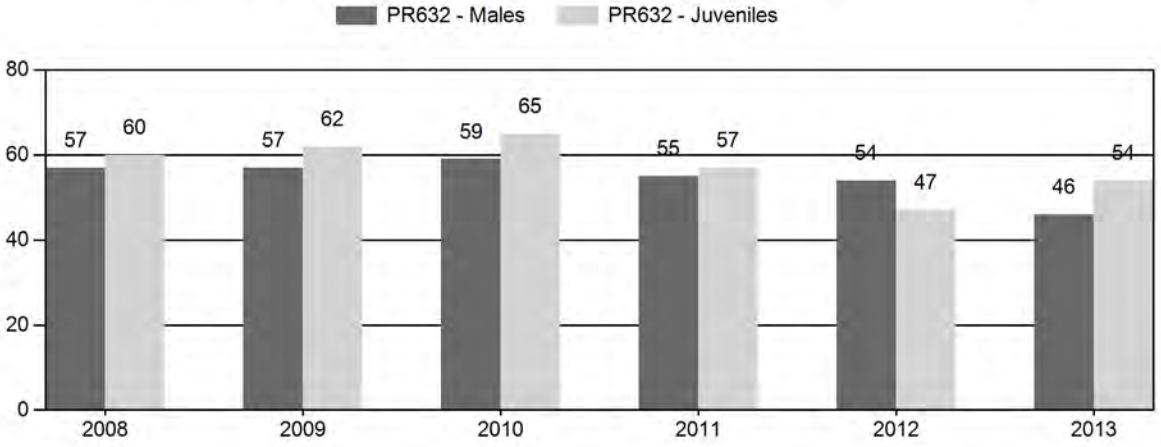
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR632 - BEAVER RIM

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	24,128	687	1,447	2,134	26%	3,747	46%	2,232	28%	8,113	2,064	18	39	57	± 2	60	± 2	38
2009	23,584	649	1,673	2,322	26%	4,109	46%	2,529	28%	8,960	2,190	16	41	57	± 2	62	± 2	39
2010	22,951	778	1,745	2,523	26%	4,278	45%	2,800	29%	9,601	2,381	18	41	59	± 2	65	± 2	41
2011	20,529	521	1,413	1,934	26%	3,544	47%	2,011	27%	7,489	1,893	15	40	55	± 2	57	± 2	37
2012	16,470	317	1,234	1,551	27%	2,867	50%	1,350	23%	5,768	1,766	11	43	54	± 2	47	± 2	31
2013	18,560	149	1,314	1,463	23%	3,199	50%	1,725	27%	6,387	1,608	5	41	46	± 2	54	± 2	37

2014 HUNTING SEASONS
Beaver Rim Pronghorn Herd Unit (PR 632)

HUNT AREA	TYPE	Season Dates OPENS	CLOSES	Quota	LIMITATIONS
65	1	Sept. 20	Oct. 22	75	Limited quota; any antelope
	6	Sept. 20	Oct. 22	25	Limited quota; doe or fawn
	7	Sept. 1	Oct. 31	75	Limited quota; doe or fawn valid north of the Little Popo Agie River
66	1	Sept. 20	Oct. 22	75	Limited quota; any antelope
	6	Sept. 20	Oct. 22	75	Limited quota; doe or fawn
67	1	Sept. 20	Oct. 22	250	Limited quota; any antelope
	6	Sept. 20	Oct. 22	25	Limited quota; doe or fawn
68	1	Sept. 20	Oct. 22	250	Limited quota; any antelope
	6	Sept. 20	Oct. 22	25	Limited quota; doe or fawn
69	1	Sept. 15	Oct. 31	75	Limited quota; any antelope
	6	Sept. 15	Oct. 31	25	Limited quota; doe or fawn
74	1	Sept. 20	Oct. 22	200	Limited quota; any antelope
	6	Sept. 20	Oct. 22	25	Limited quota; doe or fawn
106	1	Sept. 20	Oct. 22	100	Limited quota; any antelope
	6	Sept. 20	Oct. 22	25	Limited quota; doe or fawn

Hunt Area	Type	Change from 2013
65	6	-25
	7	+75
67	1	-50
68	1	-50
	6	-25
69	1	-25
106	1	-25
	6	-25
	1	**-125**
	6 & 7	**0**
Total PR 632		**-125**

MANAGEMENT EVALUATION

Current Management Objective: 25,000
Management Strategy: Special (60-70 bucks/100 does)
2013 Post-season Population Estimate: ~17,300
2014 Post-season Population Estimate: ~16,900

Herd Unit Issues

Habitats are relatively intact with localized energy development and agricultural developments scattered throughout the herd unit, and urban/rural residential development occurring primarily near Lander. This population fluctuated below objective in the 1990s, approached the objective in the mid-2000s, and has subsequently declined to a 2013 post-season population of about 17,300 pronghorn, about 31% below objective.

Weather/Habitat

Drought conditions were extreme to exceptional for most of the past two years, beginning with minimal snowfall in winter 2011-12 and continuing with almost no precipitation during spring and summer 2012. In April 2013, a series of several late winter/early spring snow storms produced heavy snow through early May throughout the herd unit. These storms were extremely helpful in lessening the effects of drought, yet they only helped change the drought status from Extreme to Severe. Drought returned in summer 2013, with only 0.34 and 0.2 inches of precipitation recorded in Lander and Jeffrey City respectively from June 1 to September 1. This reduced forage production in herbaceous and browse species across the herd unit, although some improvement over 2012 conditions was noted. Thus, poor body condition was observed in many pronghorn by late-summer, especially lactating females. Many does were observed in late-August and September with backbones and ribs showing. Rain and snow returned to the area in September and October 2013, with nearly 300% of normal precipitation recorded in Lander and Jeffrey City with warm temperatures between early storms. This led to improvement in vegetation condition, primarily grasses. Consequently, many pronghorn were observed with apparent improvement in body condition in fall and early-winter compared with those observed in late-summer. In spite of fairly mild winter conditions in 2013-14, late winter mortality may still be above average due to the poor condition of winter range shrubs following long-term drought.

Field Data

Fawn/doe ratios have declined the past 3 years, but increased to 54J/100F in 2013. Buck/doe ratios continued to decline to 46M/100F in 2013. As expected following an 18-year low fawn/doe ratio in 2012, the yearling buck/doe ratio fell dramatically to 5YM/100F in 2013. This was also likely due in part to the extensive late-winter blizzard conditions experienced in April 2013 causing mortality among many species. With the lingering effects of drought on sagebrush and other shrubs throughout the herd unit, we don’t anticipate rapid recovery of this population or buck/doe ratios.

Harvest Data

With declines in pronghorn numbers, 2013 hunting seasons had dramatic reductions in license quotas. Yet, harvest statistics indicated some hunters still had difficulty finding pronghorn or were less satisfied with quality, especially adult buck quality. Hunter success in 2013 dropped from 101% to 88%, along with active license success decreasing from 88% to 82%. In all, it took 3.5 days of hunting for each animal harvested. This statistic was the highest since 1994, albeit barely above the 3.4 days/animal needed in some years. However, this is a large herd unit and success rates were more variable between hunt areas (range of 49% to 100% for Type 6 doe/fawn licenses and 67% to 92% for Type 1 any antelope licenses). Concerns about low pronghorn numbers were heard from hunters in several areas. Adjustments to the 2014 season structure have been made considering these variables, combined with variations in classification data to best fit harvest to individual hunt areas.

Population

A spreadsheet model was developed for this population in 2012, and updated utilizing 2013 pre-season classification and 2013 harvest data. The CJ, CA model was selected because it had the lowest Relative AICc value and generated population estimates that are either closely aligned with the LT point estimate or lie within the 95% confidence intervals (CI) for 5 of 6 LT estimates. Therefore, the model is considered Good. The latest LT survey was conducted in bio-year 2010, with a resultant end-of-year population estimate of almost 20,000. The spreadsheet model simulates the 2010 end-of-year trend just below the CI for that LT, but the 2013 model aligns closer to this CI than did the 2012 version. Regardless, the model appears to consistently follow perceived population trends. The initial model in 2012 showed a much lower population throughout the past decade than the 2013 version and did not align as well with all LT estimates. In addition, another LT survey is planned for the end of the current bio-year (2013). Therefore, we anticipate the need to adjust population data in the JCR database once the LT is completed to reflect the model as it incorporates the new LT. We predict this model will then "settle in" and don't anticipate such dramatic changes will be needed in the future.

Management Summary

For 2014, adjustments in license numbers were made to control limited private land damage situations, while providing hunter opportunity. Due to very low yearling buck/doe ratios and overall lower buck numbers, the number of Type 1 licenses was reduced again in some areas, especially where buck/doe ratios fell or were already low. The overall buck/doe ratio is about 23% below the minimum of 60M/100F needed to keep this population within the Department's Special Management criteria. Reductions made in 2013 and continued adjustments for 2014 are consistent with public comments received during hunting seasons and at public meetings.

The seasons outlined should curb population decline if drought lessens and fawn production levels improve. Doe/fawn licenses remain a part of the 2014 hunting season structure to address localized damage to private land hay crops. Growing numbers of pronghorn in the Lander Foothills have prompted an increase in the number of Hunt Area 65 Type 7 licenses available, and at the request of one landowner who will provide access, the season length for that license has been changed to open early (Sept. 1 compared to Sept. 20 as advertised online) and close later (end of October). A total of 1,025 any antelope and 300 doe/fawn licenses will be available for 2014, and should result in a harvest of approximately 1,100 animals. With average survival in combination with our harvest, we anticipate the population to remain relatively stable at just under 17,000 pronghorn.

INPUT	
Species:	Pronghorn
Biologist:	Stan Harter
Herd Unit & No.:	Beaver Rim (PR632)
Model date:	03/03/14

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	113	122	☑ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	113	122	☐ SCJ,SCA Mode	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	96	196	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1994	4571	3758	9242	**17571**	4487	2908	8332	**15727**	3719	8681	**12400**				25000
1995	3781	3645	8507	**15933**	3781	3037	8488	**15307**	3701	8755	**12456**	12460	1658		25000
1996	5569	3627	8580	**17775**	5569	2979	8558	**17105**	4108	9282	**13390**				25000
1997	4826	4025	9096	**17948**	4805	3375	9068	**17248**	4267	9545	**13812**				25000
1998	5609	4181	9354	**19145**	5608	3522	9260	**18390**	4614	9928	**14542**	15290	2692		25000
1999	5570	4522	9729	**19821**	5559	3754	9688	**19001**	4799	10311	**15110**				25000
2000	5578	4703	10104	**20385**	5558	3927	10019	**19503**	4954	10606	**15560**				25000
2001	5275	4855	10394	**20524**	5268	4202	10368	**19839**	5147	10861	**16008**	14650	2577		25000
2002	5278	5044	10644	**20966**	5273	4365	10570	**20207**	5295	11042	**16337**				25000
2003	6165	5189	10821	**22175**	6164	4401	10692	**21257**	5550	11380	**16930**				25000
2004	7786	5439	11153	**24378**	7760	4700	10932	**23391**	6237	11998	**18235**	19677	2176		25000
2005	7718	6112	11758	**25588**	7692	5340	11432	**24463**	6802	12428	**19229**				25000
2006	7275	6666	12179	**26120**	7228	5657	11621	**24506**	6942	12452	**19393**				25000
2007	7312	6803	12203	**26318**	7238	5470	11395	**24103**	6732	12214	**18947**	17919	2347		25000
2008	7130	6598	11970	**25698**	7033	5411	11087	**23531**	6635	11865	**18500**				25000
2009	7156	6502	11628	**25286**	7054	5183	10618	**22855**	6417	11426	**17843**				25000
2010	7329	6288	11198	**24815**	7240	4822	9829	**21891**	6122	10718	**16840**	19965	2762		25000
2011	5960	5999	10504	**22463**	5773	4296	8719	**18789**	5210	9253	**14463**				25000
2012	4270	5106	9068	**18443**	4172	3656	7678	**15506**	4768	9206	**13974**				25000
2013	4865	4672	9022	**18560**	4840	3675	8819	**17333**	4533	9303	**13836**				25000
2014	4558	4442	9117	**18118**	4531	3452	8897	**16880**							25000
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Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1994	0.51			0.90		
1995	0.51			0.90		
1996	0.51			0.90		
1997	0.51			0.90		
1998	0.51			0.90		
1999	0.51			0.90		
2000	0.51			0.90		
2001	0.51			0.90		
2002	0.51			0.90		
2003	0.51			0.90		
2004	0.51			0.90		
2005	0.51			0.90		
2006	0.51			0.90		
2007	0.51			0.90		
2008	0.51			0.90		
2009	0.51			0.90		
2010	0.51			0.90		
2011	0.51			0.90		
2012	0.51			0.90		
2013	0.51			0.90		
2014	0.51			0.90		
0						
0						
0						
0						
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Parameters:	Optim cells
Juvenile Survival =	0.509
Adult Survival =	0.898
Initial Total Male Pop/10,000 =	0.376
Initial Female Pop/10,000 =	0.924

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Males	Females	Juveniles	Total Harvest	Total Males	Females
1994		49.46	1.66	40.66	43.14	1.52	773	828	76	1677	22.6	9.9
1995		44.45	1.71	42.84	44.31	1.71	552	17	0	569	16.7	0.2
1996		64.91	2.21	42.27	36.32	1.50	589	20	0	609	17.9	0.3
1997		53.06	1.85	44.25	45.98	1.68	591	26	19	636	16.2	0.3
1998		59.96	1.95	44.70	48.77	1.70	599	86	1	686	15.8	1.0
1999		57.25	1.80	46.48	44.16	1.52	698	37	10	745	17.0	0.4
2000		55.20	1.75	46.55	48.18	1.59	706	78	18	802	16.5	0.8
2001		50.75	1.66	46.71	45.31	1.54	594	23	6	623	13.5	0.2
2002		49.59	1.66	47.39	41.20	1.47	618	67	5	690	13.5	0.7
2003		56.97	1.84	47.95	47.74	1.64	716	117	1	834	15.2	1.2
2004		69.81	2.03	48.77	51.63	1.65	672	201	24	897	13.6	2.0
2005		65.64	1.88	51.98	56.74	1.70	702	297	24	1023	12.6	2.8
2006		59.74	1.73	54.73	60.33	1.74	917	507	43	1467	15.1	4.6
2007		59.92	1.63	55.75	54.37	1.52	1212	734	67	2013	19.6	6.6
2008		59.57	1.59	55.12	56.95	1.54	1079	803	88	1970	18.0	7.4
2009		61.55	1.56	55.92	56.51	1.47	1199	918	93	2210	20.3	8.7
2010		65.45	1.59	56.16	58.98	1.48	1333	1244	81	2658	23.3	12.2
2011		56.74	1.58	57.12	54.57	1.54	1548	1622	170	3340	28.4	17.0
2012		47.09	1.55	56.31	54.10	1.71	1318	1263	89	2670	28.4	15.3
2013		53.92	1.61	51.79	45.73	1.44	907	185	23	1115	21.4	2.3
2014		50.00	1.58	48.73	55.00	1.69	900	200	25	1125	22.3	2.4
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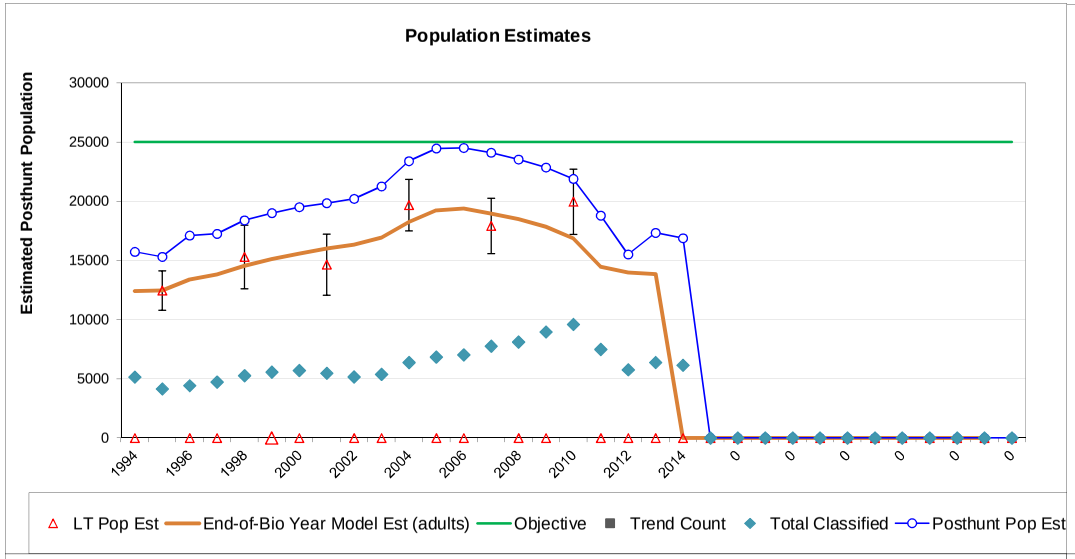
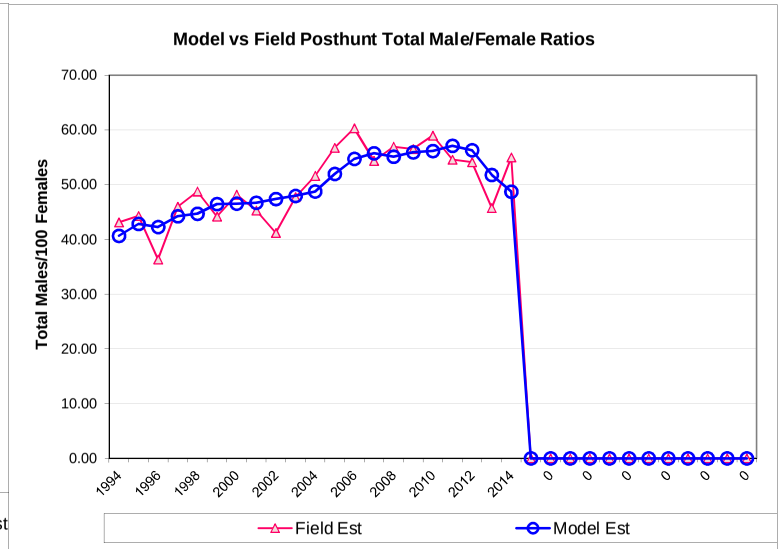
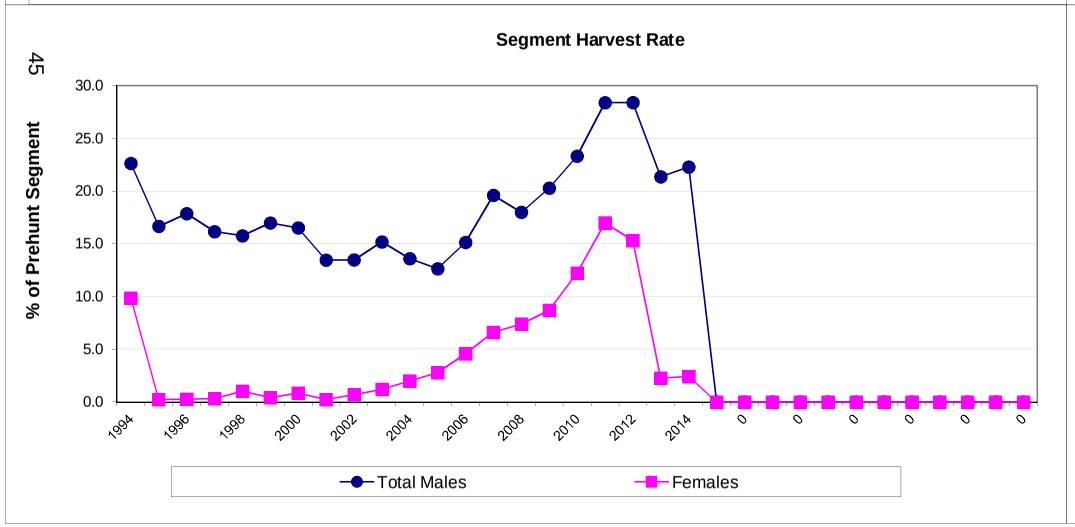
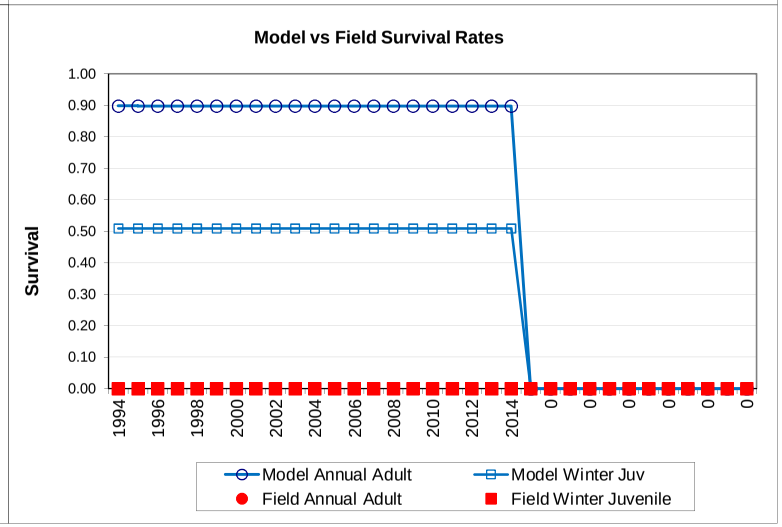
FIGURES









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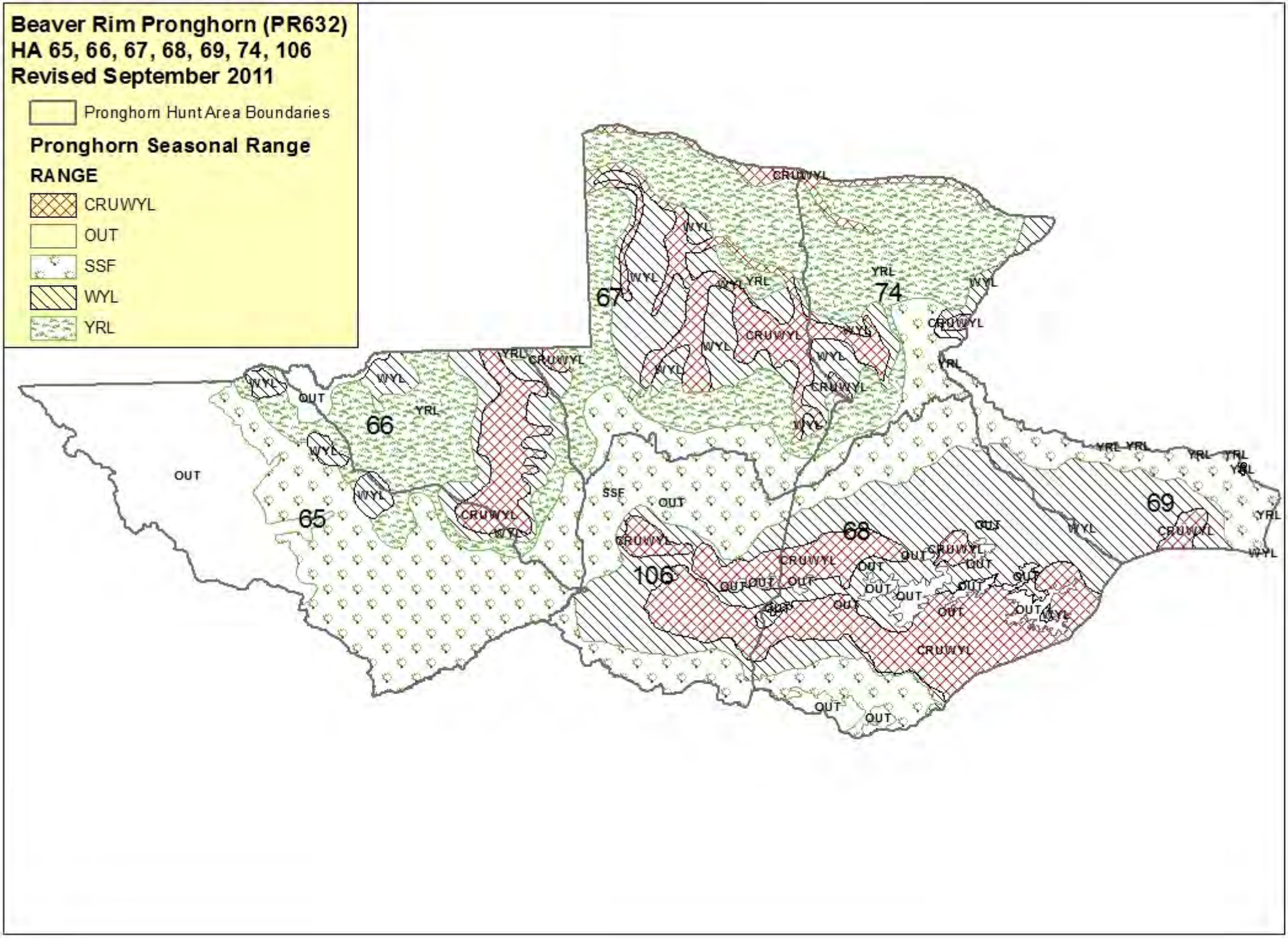

Beaver Rim Pronghorn (PR632)
HA 65, 66, 67, 68, 69, 74, 106
Revised September 2011
Pronghorn Hunt Area Boundaries
Pronghorn Seasonal Range
RANGE
CRUWYL
OUT
SSF
WYL
YRL
65
66
67
68
69
74
106

2013 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2013 - 5/31/2014

HERD: PR634 - BADWATER

HUNT AREAS: 75

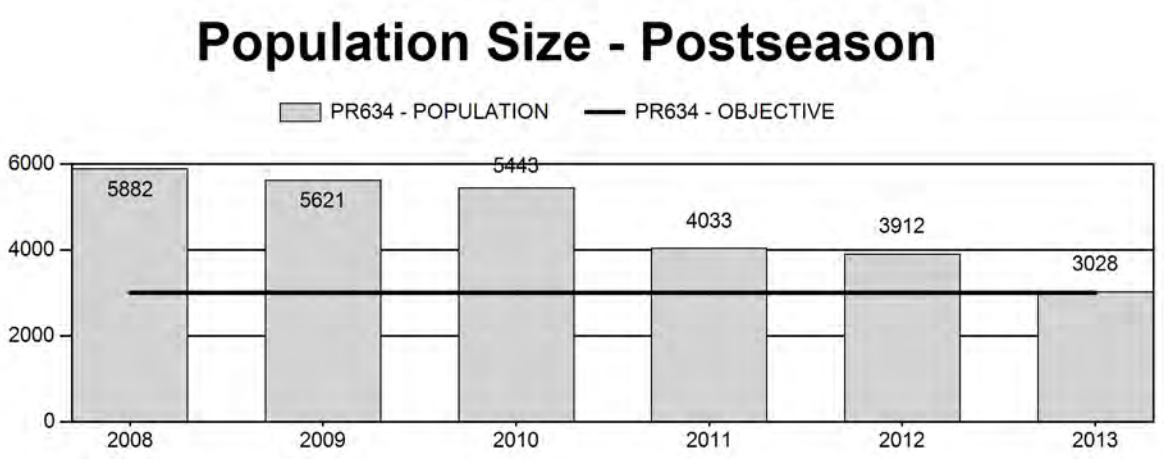
PREPARED BY: GREG ANDERSON

	2008 - 2012 Average	2013	2014 Proposed
Population:	4,978	3,028	2,956
Harvest:	664	536	295
Hunters:	697	519	300
Hunter Success:	95%	103%	98%
Active Licenses:	749	585	325
Active License Percent:	89%	92%	91%
Recreation Days:	2,280	1,376	900
Days Per Animal:	3.4	2.6	3.1
Males per 100 Females	64	50	
Juveniles per 100 Females	51	44	

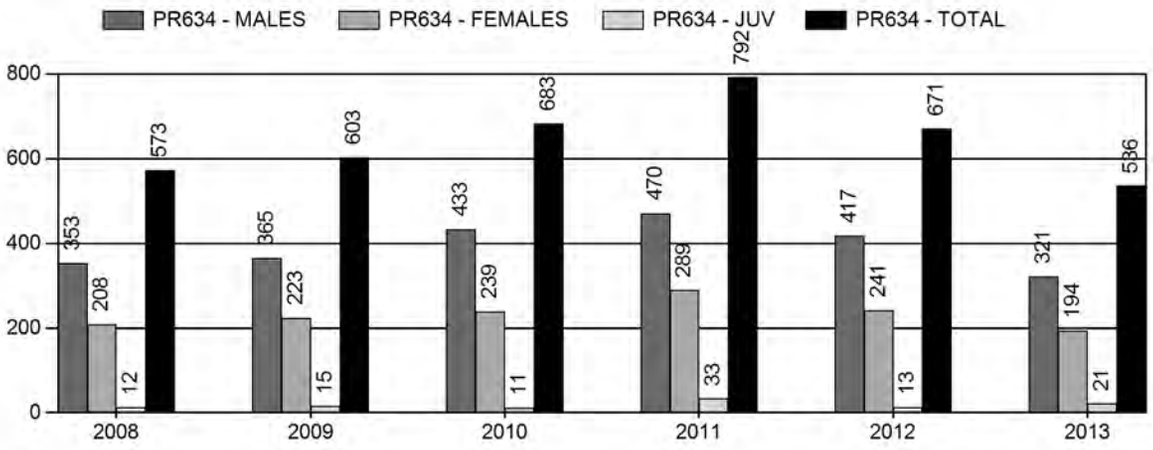
Population Objective:	3,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	1%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/13/2014

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

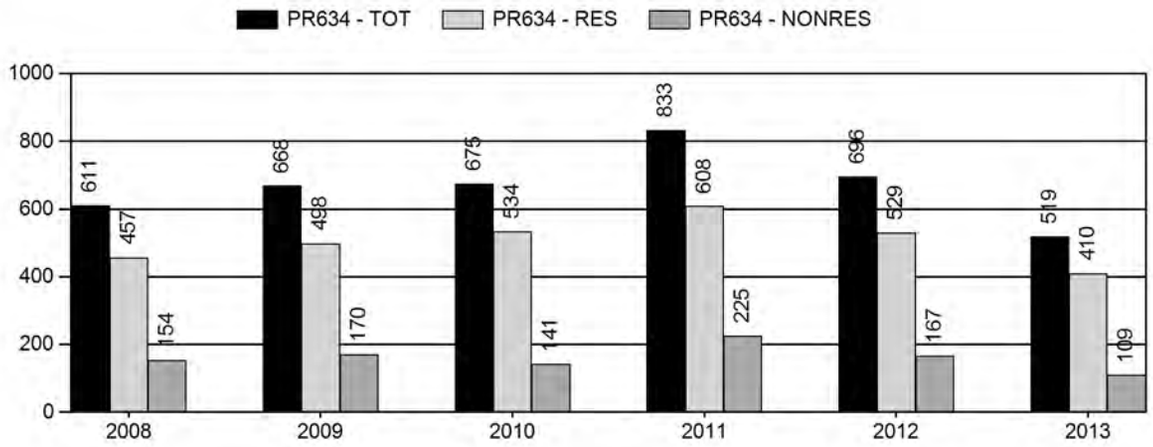
	JCR Year	Proposed
Females ≥ 1 year old:	12%	3%
Males ≥ 1 year old:	45%	41%
Juveniles (< 1 year old):	1%	1%
Total:	15%	8%
Proposed change in post-season population:	-20%	-2%



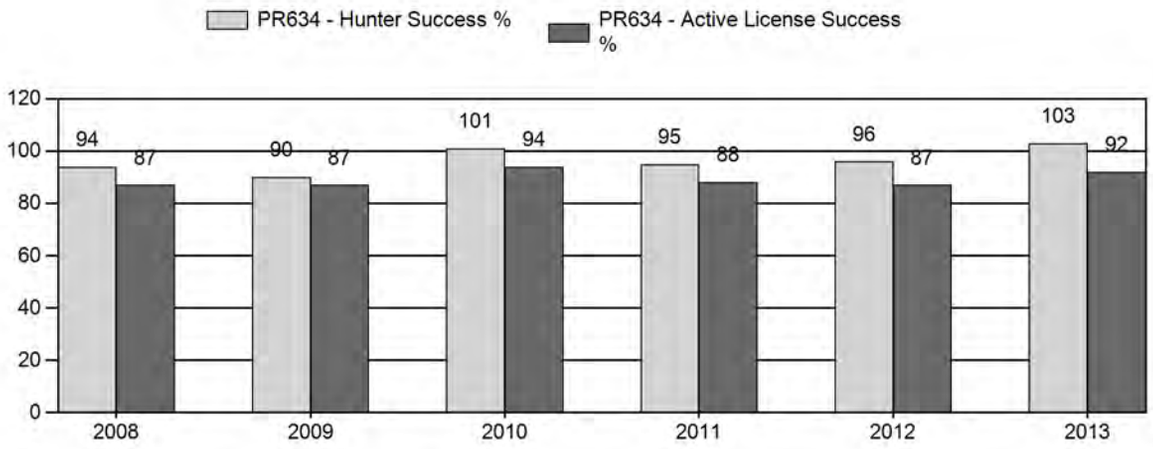
Harvest



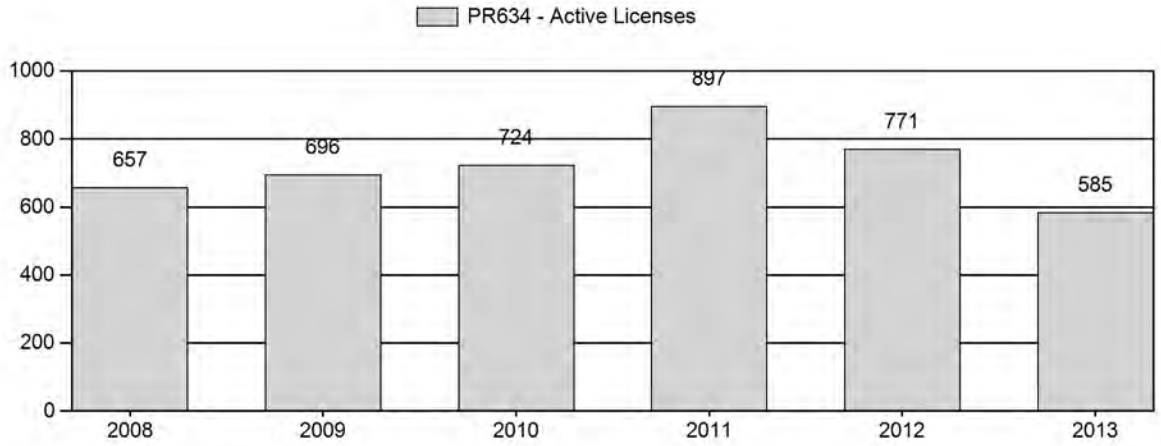
Number of Hunters



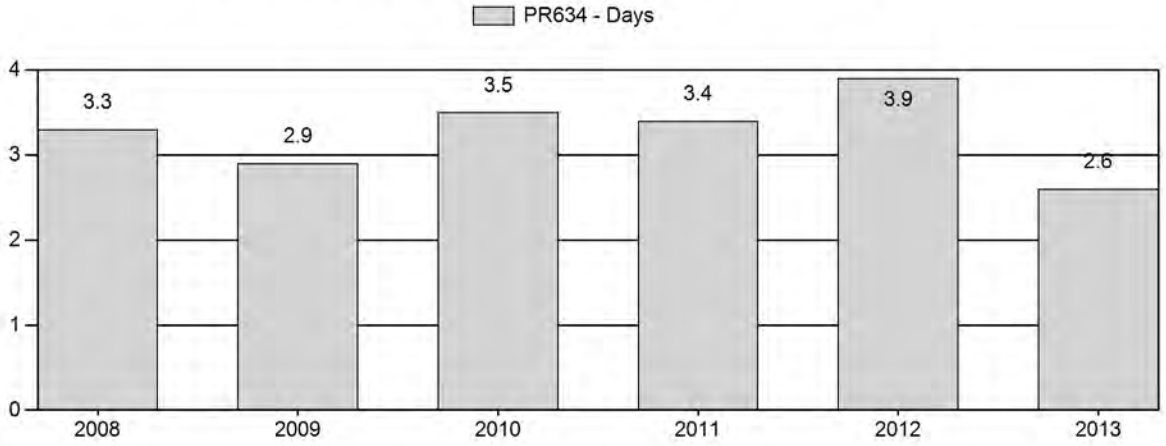
Harvest Success



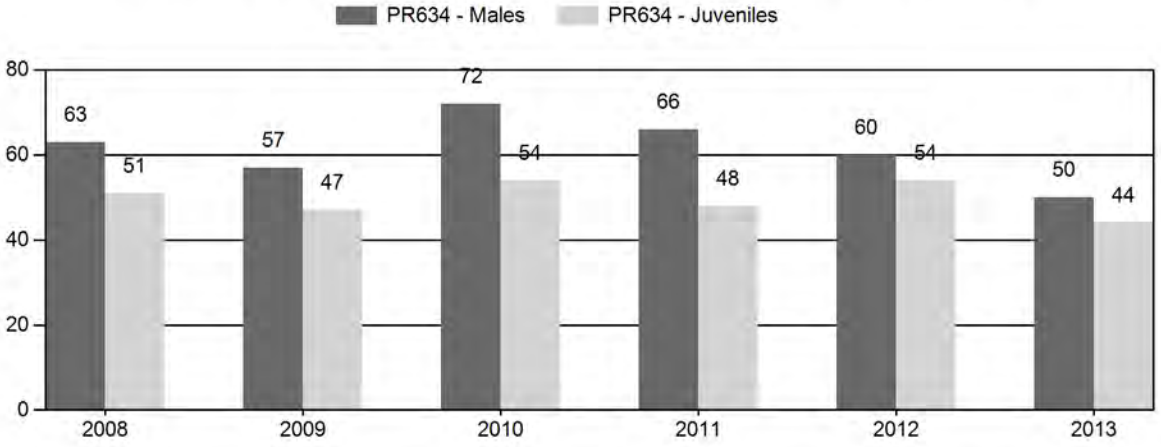
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR634 - BADWATER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	6,512	176	361	537	29%	858	47%	439	24%	1,834	1,489	21	42	63	± 5	51	± 4	31
2009	6,285	164	360	524	28%	923	49%	433	23%	1,880	1,279	18	39	57	± 4	47	± 4	30
2010	6,195	191	425	616	32%	860	44%	464	24%	1,940	1,955	22	49	72	± 5	54	± 4	31
2011	4,904	113	468	581	31%	875	47%	421	22%	1,877	1,689	13	53	66	± 5	48	± 4	29
2012	4,650	83	296	379	28%	631	47%	339	25%	1,349	1,522	13	47	60	± 5	54	± 5	34
2013	3,617	58	268	326	26%	646	51%	285	23%	1,257	1,098	9	41	50	± 5	44	± 4	29

2014 HUNTING SEASONS
BADWATER PRONGHORN (PR 634)

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
75	1	Sep. 20	Oct. 22	300	Limited quota; any antelope
	6	Sep. 20	Oct. 22	25	Limited quota; doe or fawn
Archery		Aug. 15	Sep. 19		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
75	1	-100
	6	-225
Total	**1**	**-100**
	6	**-225**

Management Evaluation
Current Management Objective: 3,000
Management Strategy: Recreational
2013 Postseason Population Estimate: ~3,000
2014 Proposed Postseason Population Estimate: ~3,000

Management Issues
The Badwater pronghorn herd is managed toward a numerical objective of 3,000. The population is estimated using a spreadsheet model developed in 2012 and updated in 2014. The herd is managed for recreational opportunity. The objective was last reviewed in 1994.

This pronghorn population inhabits a heavily industrialized area in central Wyoming. Much of the herd unit has or will soon be designated as a special management area emphasizing oil and gas production in both the Casper and Lander BLM RMPs. The Lander BLM is currently analyzing a proposal by EnCana to develop approximately 4,200 oil/gas wells in the central part of the herd unit. Given the commodities production emphasis in the area, it is likely a significant amount of pronghorn habitat will we lost or degraded over the next 20 years.

Habitat/Weather
Over the past 2 years, drought conditions were extreme in this herd unit. Virtually no vegetation grew throughout the herd unit for the past 2 years. The exception being some early fall green-up in September, 2013. This late season green-up helped antelope entering winter but they remained in generally poor body condition. Given the poor feed resource, pronghorn body condition in the herd unit was quite poor in 2013. This was particularly true for reproductively successful does that succeeded in raising fawns through early fall. Despite relatively mild winter

conditions in 2013/14 it is likely winter mortality was above average due to the poor body condition of many animals in the fall.

Field Data

Personnel observed significantly fewer pronghorn along classification routes in 2013. The number of antelope seen along designated classification routes declined from a high of 1,940 in 2010 to 1,257 in 2013. Additionally, the buck/doe ratio in the area has steadily declined over the past 4 years from 72/100 in 2010 to 50/100 in 2013. Fawn recruitment was very low in 2013 with a fawn/doe ratio of 44/100. Compounding the impacts of very low fall recruitment, it is likely winter fawn survival will be lower than average over the 2013/14 winter due to lack of feed resources. All of the classification data from the past several years indicate the population has declined.

Harvest Data

Harvest statistics were unremarkable in 2013 with a Type 1 license success of 92%. This was higher than the 5-year average of 87%. Some of the increase could be attributable to fewer hunters in the field given a reduction in Type 1 licenses from 2012 to 2013. The days/animal for Type 1 license holders also declined from 3.7 in 2012 to 2.8 in 2013. Again, while 2013 harvest statistics are not remarkable, classification data, the population model, and comments from the public all indicate the population declined significantly over the past several years.

Population

The population estimate for 2013 is approximately 3,000 pronghorn. The population is at objective. This population increased steadily in the late 1990's through the mid 2000's. The population peaked around 2007 at approximately 5,900 animals according the most recent population model. Over the past 6 years the population has declined dramatically and reached objective in 2013. The long-term population decline is a result of extended, poor environmental conditions combined with increased harvest designed to reduce the population to objective.

In 2012, a spreadsheet model was developed for this population. The model behaved predictably with the addition of 2013 data and appears to track population trends reliably. For 2013, the SCJ/SCA version of the model was selected to simulate the population. The SCJ/SCA model had a slightly higher AIC value than the CJ/CA model, but the CJ/CA version models a population increase over the past several years and is not biologically defensible. The TSJ/CA had a significantly higher AIC value but produced similar trends to the SCJ/SCA version. Annual juvenile survival in the selected model is 0.9 and considered reasonable for the area. The SCJ/SCA model has 3 years with modified juvenile survival to account for extreme winter conditions in 2010 and extreme drought conditions in 2012 and 2013. Juvenile survival for these years is fixed at 0.4, 0.4, and 0.5 respectively. This model version produces population estimates mirroring field personnel impressions and supported by harvest statistics. The model attempts to track 6 line transect estimates over the past 20 years. The estimates from 2007 and 2010 were vastly different and the model is unable to track through the CIs of the estimates effectively. Nevertheless, the model produces a peak estimate in 2007 and shows a significant population decline over the past 6 years with a marked reduction over the past 3 years. The model appears to track population trends in the herd unit well and estimates from the past several years are

supported by trends in classification data as well as harvest statistics. Due to the lack of survival estimates, the model is considered a fair simulation.

Management Summary

Given the population decline over the past several years, expected low survival over the 2013/14 winter, and the fact the population is at objective, Type 6 licenses will be reduced significantly in 2014. Type 1 licenses will also be reduced given the recent, marked decline in the buck/doe ratio. Given average survival over the next year combined with the proposed hunting season, the population is expected to remain stable at 3,000 in 2014. Although this population has been managed toward the objective of 3,000 over the past several years, public comments indicate the Department may need to review the population objective for the herd. Field personnel have received numerous complaints over the past several years from the public concerned about the decline in antelope numbers and buck quality in the herd unit.

INPUT	
Species:	Pronghorn
Biologist:	Greg Anderson
Herd Unit & No.:	Badwater
Model date:	02/13/14

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	78	87	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	88	100	☑ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	62	166	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	818	1018	1456	**3292**	769	562	1125	**2456**	751	1251	**2002**				3000
1994	650	736	1226	**2613**	634	384	990	**2008**	557	1092	**1649**				3000
1995	681	546	1070	**2297**	658	300	944	**1901**	514	1082	**1596**				3000
1996	969	504	1060	**2534**	969	312	1053	**2334**	678	1339	**2018**				3000
1997	730	665	1313	**2707**	730	443	1297	**2470**	674	1436	**2110**				3000
1998	928	660	1407	**2996**	925	468	1407	**2800**	790	1622	**2412**				3000
1999	1103	774	1589	**3466**	1103	605	1580	**3288**	992	1849	**2841**				3000
2000	969	972	1812	**3753**	969	791	1809	**3568**	1087	1983	**3070**	3090	751		3000
2001	850	1065	1944	**3859**	850	882	1940	**3673**	1110	2041	**3151**	2766	586		3000
2002	924	1088	2000	**4011**	924	907	1990	**3821**	1166	2115	**3281**				3000
2003	1116	1142	2073	**4331**	1116	937	2073	**4126**	1274	2276	**3550**				3000
2004	1570	1249	2231	**5050**	1570	1053	2226	**4850**	1584	2614	**4198**	3760	796		3000
2005	1798	1552	2562	**5912**	1796	1273	2493	**5561**	1860	2933	**4793**				3000
2006	1491	1823	2875	**6188**	1487	1480	2698	**5664**	1883	2947	**4830**				3000
2007	1820	1845	2888	**6554**	1805	1481	2660	**5945**	2026	3052	**5078**	2764	507		3000
2008	1530	1986	2991	**6506**	1517	1597	2762	**5876**	1989	3007	**4995**				3000
2009	1382	1949	2946	**6278**	1366	1548	2701	**5614**	1875	2883	**4757**				3000
2010	1524	1837	2825	**6186**	1512	1361	2562	**5435**	1382	2440	**3822**	5256	931		3000
2011	1150	1354	2391	**4895**	1114	837	2073	**4024**	1212	2292	**3504**				3000
2012	1207	1188	2246	**4640**	1192	729	1981	**3902**	897	1939	**2836**	2303	527		3000
2013	838	879	1900	**3617**	815	525	1687	**3028**	681	1786	**2466**				3000
2014	864	667	1750	**3281**	858	392	1706	**2956**							3000
2015															
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2017															
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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			0.83		
1994	0.90			0.83		
1995	0.90			0.83		
1996	0.90			0.83		
1997	0.90			0.83		
1998	0.90			0.83		
1999	0.90			0.83		
2000	0.90			0.83		
2001	0.90			0.83		
2002	0.90			0.83		
2003	0.90			0.83		
2004	0.90			0.83		
2005	0.90			0.83		
2006	0.90			0.83		
2007	0.90			0.83		
2008	0.90			0.83		
2009	0.90			0.83		
2010	0.40			0.83		
2011	0.90			0.83		
2012	0.40			0.83		
2013	0.50			0.83		
2014	0.90			0.83		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Juvenile Survival =	0.900
Adult Survival =	0.834
Initial Total Male Pop/10,000 =	0.102
Initial Female Pop/10,000 =	0.146

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		56.17	3.32	69.96	63.98	3.64	44	415	301	760	44.8	22.7
1994		53.03	4.43	60.04	65.38	5.12	15	320	215	550	47.8	19.3
1995		63.61	5.01	51.03	53.01	4.42	21	224	115	360	45.1	11.8
1996		91.42	7.20	47.50	60.65	5.37	0	174	7	181	38.0	0.7
1997		55.60	4.24	50.64	44.81	3.67	0	202	14	216	33.4	1.2
1998		65.93	4.90	46.93	43.96	3.73	3	175	0	178	29.1	0.0
1999		69.39	5.24	48.70	66.36	5.08	0	154	8	162	21.9	0.6
2000		53.45	3.71	53.64	52.94	3.69	0	165	3	168	18.7	0.2
2001		43.75	3.26	54.79	51.18	3.62	0	166	3	169	17.1	0.2
2002		46.19	3.38	54.40	51.61	3.64	0	164	9	173	16.6	0.5
2003		53.85	3.90	55.10	48.17	3.62	0	187	0	187	18.0	0.0
2004		70.40	4.90	55.99	66.80	4.72	0	178	4	182	15.7	0.2
2005		70.20	4.25	60.58	65.51	4.05	2	254	63	319	18.0	2.7
2006		51.87	3.36	63.41	60.78	3.75	4	312	161	477	18.8	6.2
2007		63.02	4.04	63.88	68.73	4.29	14	331	208	553	19.7	7.9
2008		51.17	3.00	66.39	62.59	3.44	12	353	208	573	19.6	7.7
2009		46.91	2.73	66.15	56.77	3.11	15	365	223	603	20.6	8.3
2010		53.95	3.11	65.04	71.63	3.78	11	433	239	683	25.9	9.3
2011		48.11	2.85	56.63	66.40	3.55	33	470	289	792	38.2	13.3
2012		53.72	3.62	52.89	60.06	3.90	13	417	241	671	38.6	11.8
2013		44.12	3.14	46.23	50.46	3.43	21	321	194	536	40.2	11.2
2014		49.36	3.09	38.12	50.00	3.55	5	250	40	295	41.2	2.5
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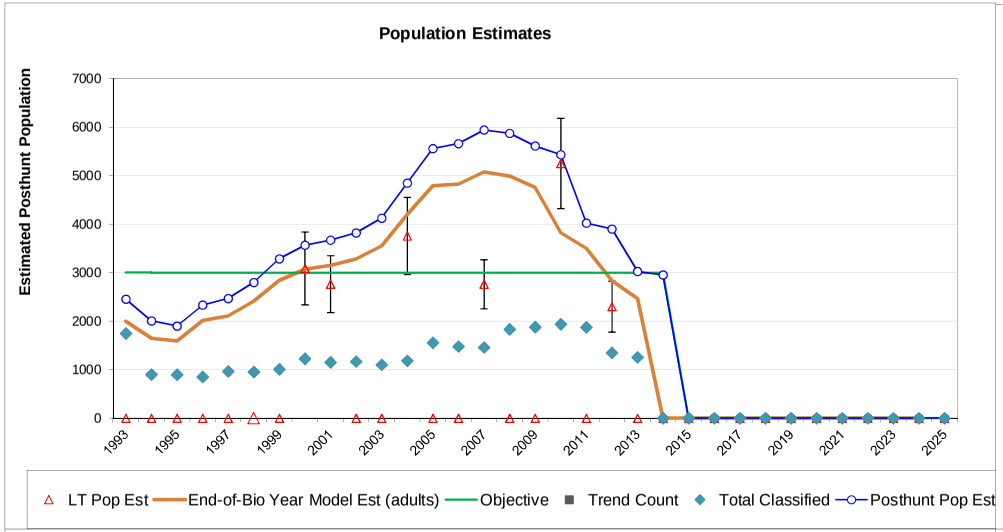
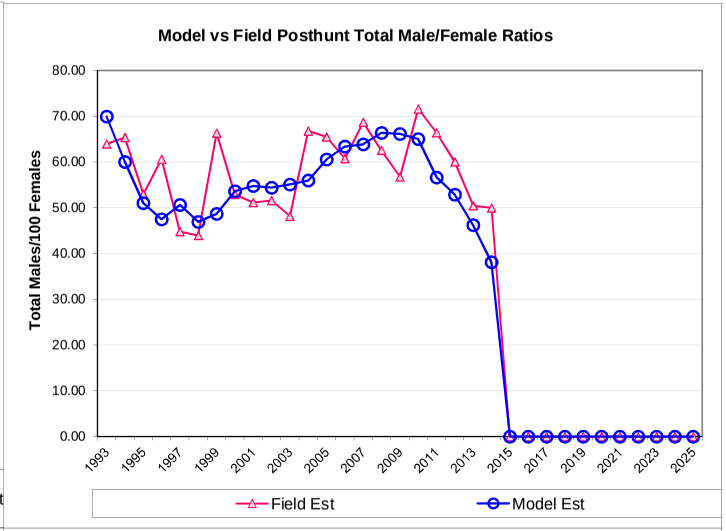
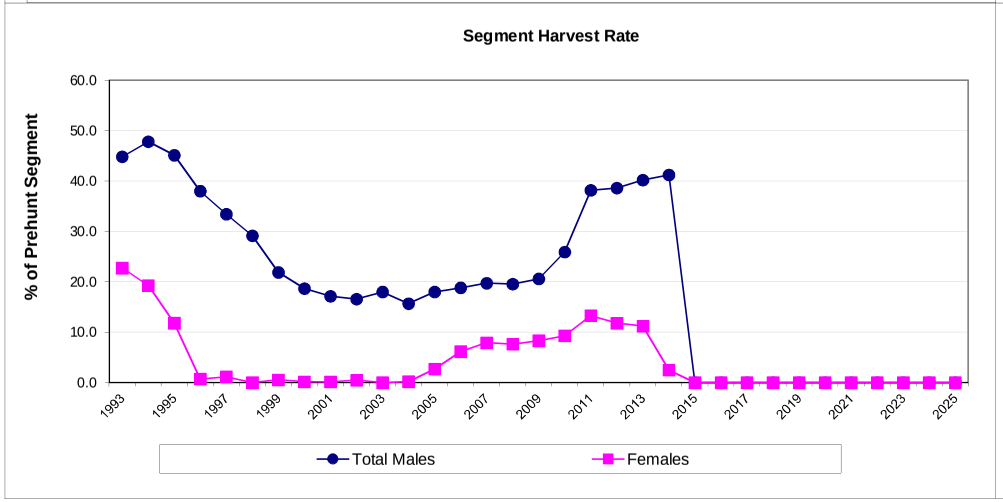
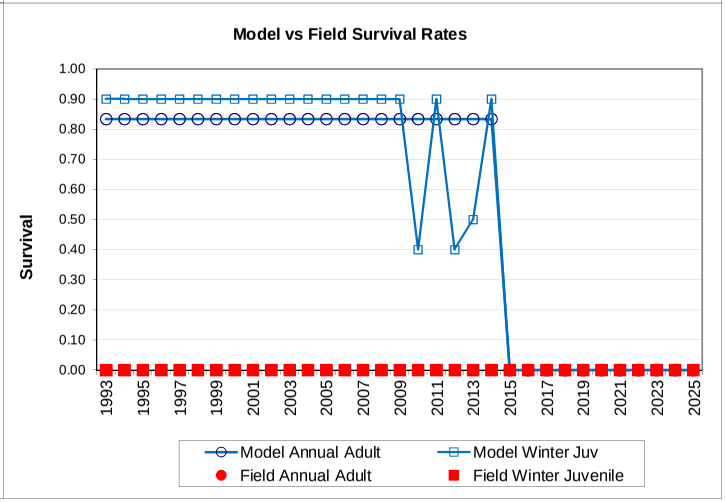
FIGURES









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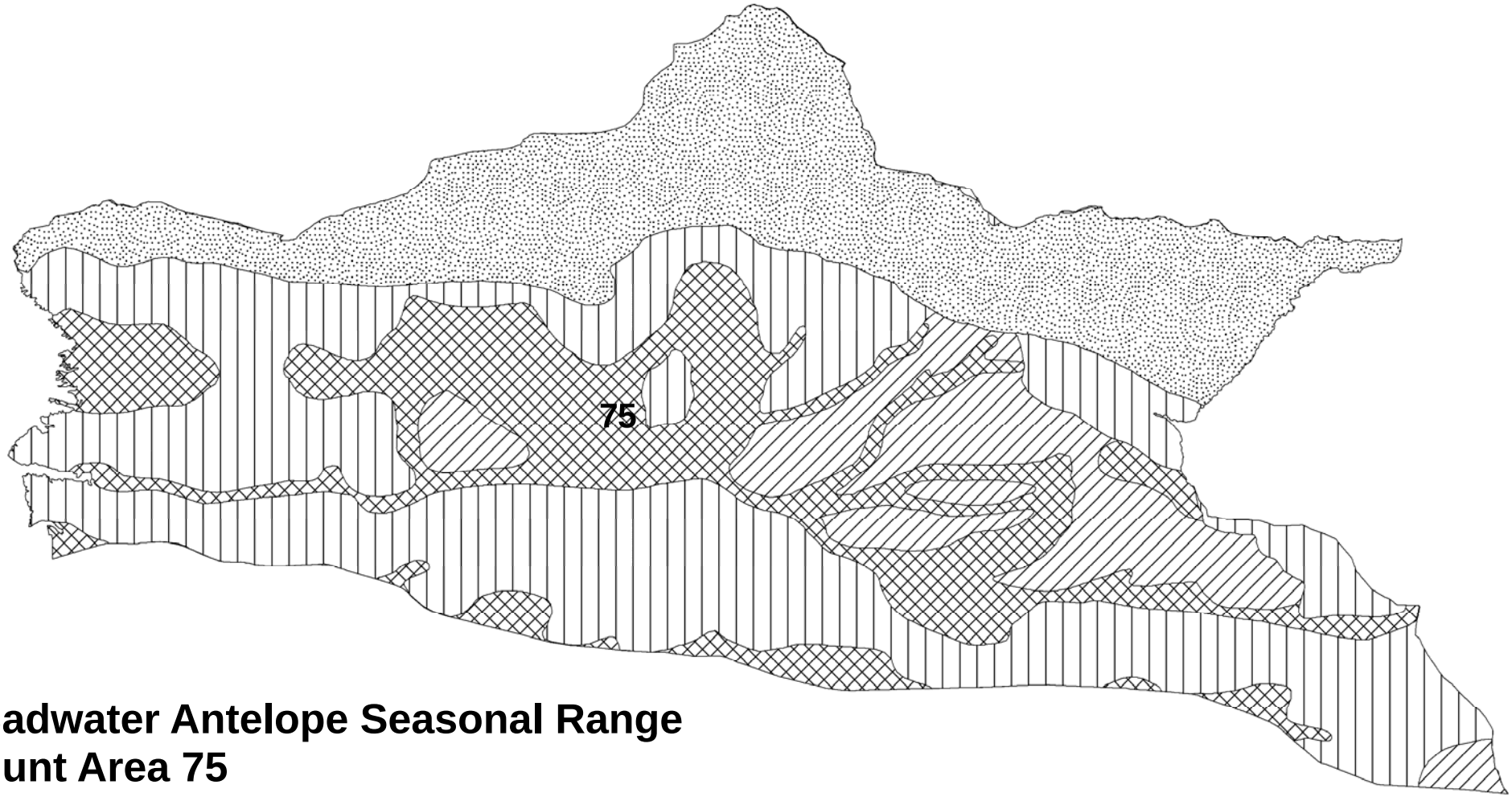


Badwater Antelope Seasonal Range
Hunt Area 75
Updated 2013

- CRUWYL
- OUT
- SSF
- WYL
- YRL

N

2013 - JCR Evaluation Form

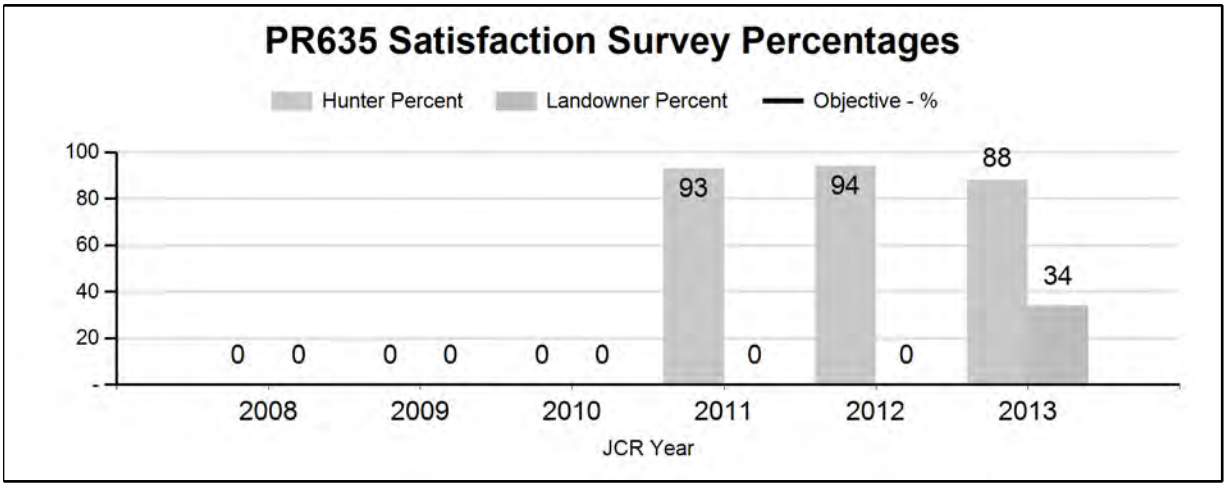
SPECIES: Pronghorn
HERD: PR635 - PROJECT
HUNT AREAS: 97, 117

PERIOD: 6/1/2013 - 5/31/2014

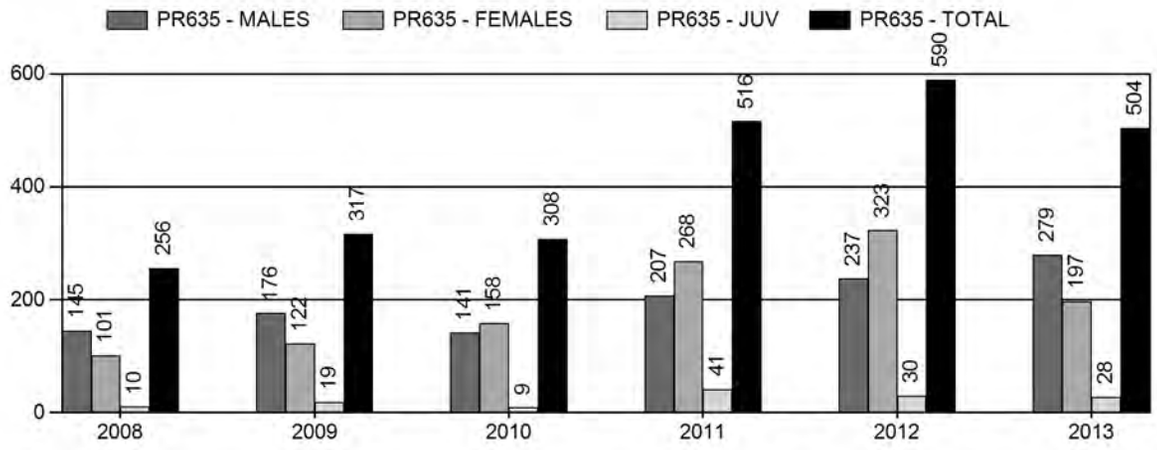
PREPARED BY: GREG ANDERSON

	2008 - 2012 Average	2013	2014 Proposed
Hunter Satisfaction Percent	94%	88%	85%
Landowner Satisfaction Percent	0%	34%	40%
Harvest:	397	504	475
Hunters:	340	470	450
Hunter Success:	117%	107%	106%
Active Licenses:	442	87%	500
Active License Percentage:	90%	87%	95%
Recreation Days:	1,281	1,434	1,300
Days Per Animal:	3.2	2.8	2.7
Males per 100 Females:	58	70	
Juveniles per 100 Females	65	55	

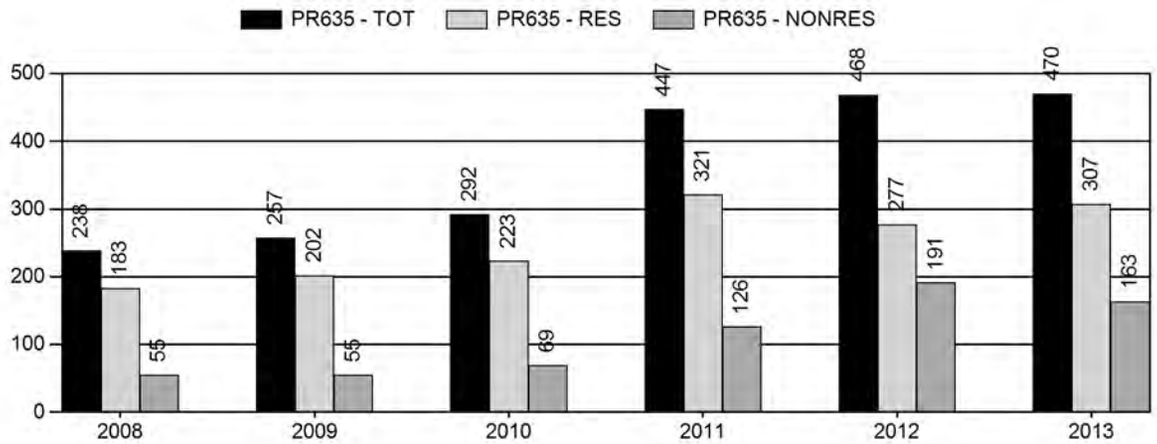
Satisifaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	1%
Number of years population has been + or - objective in recent trend:	1



Harvest



Number of Hunters



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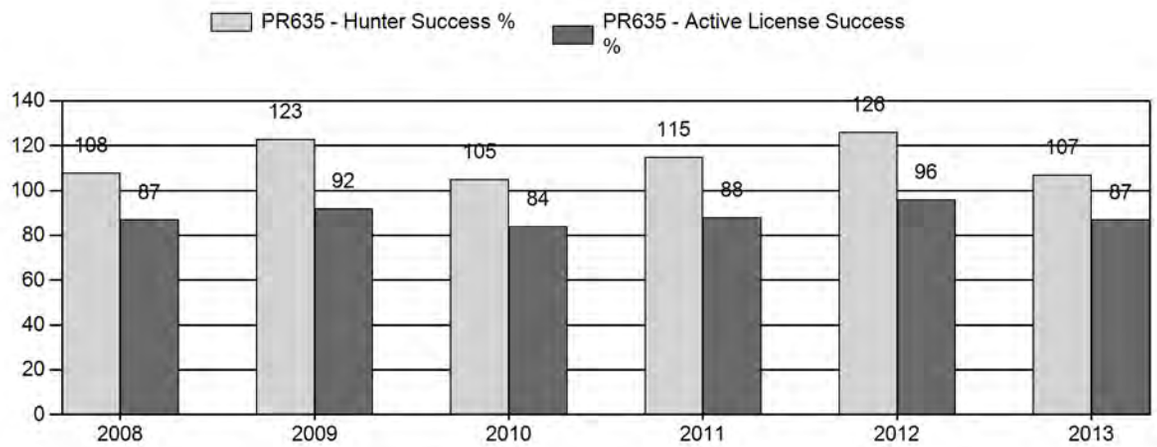
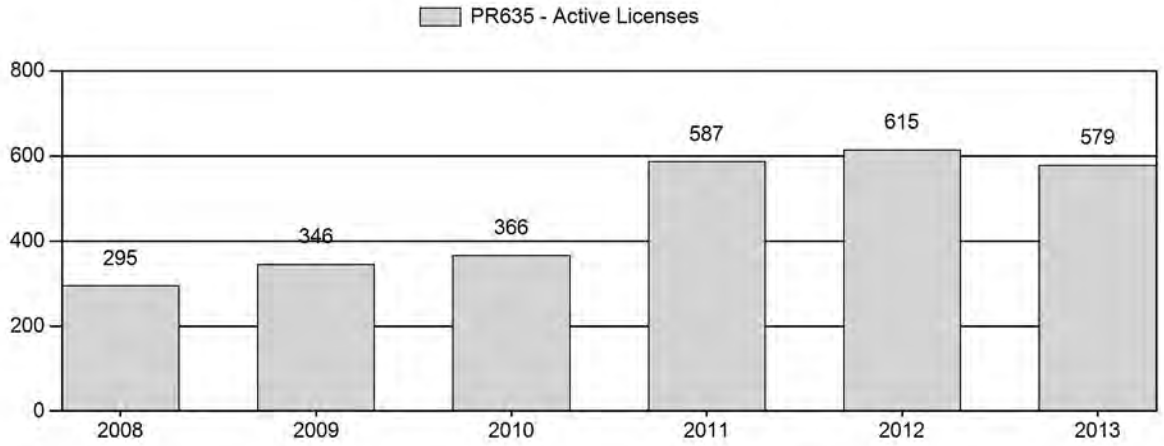
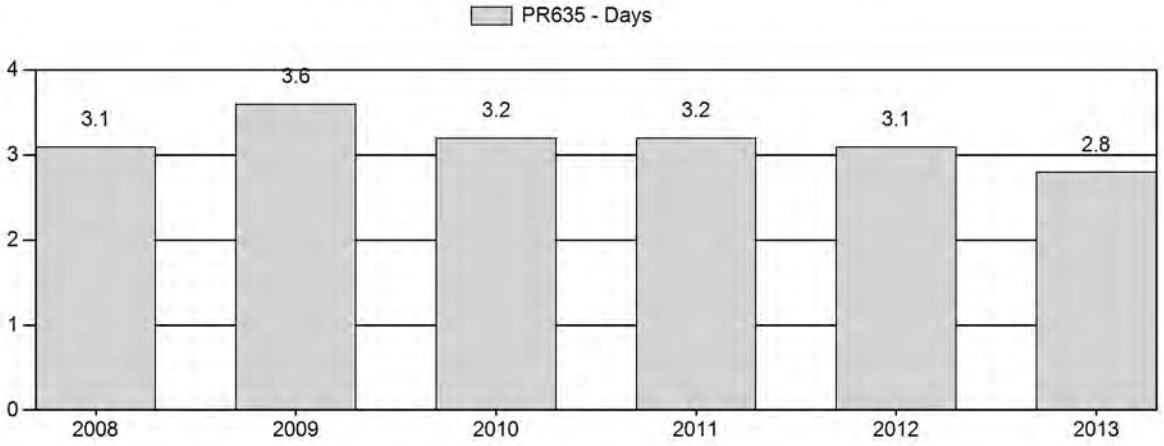


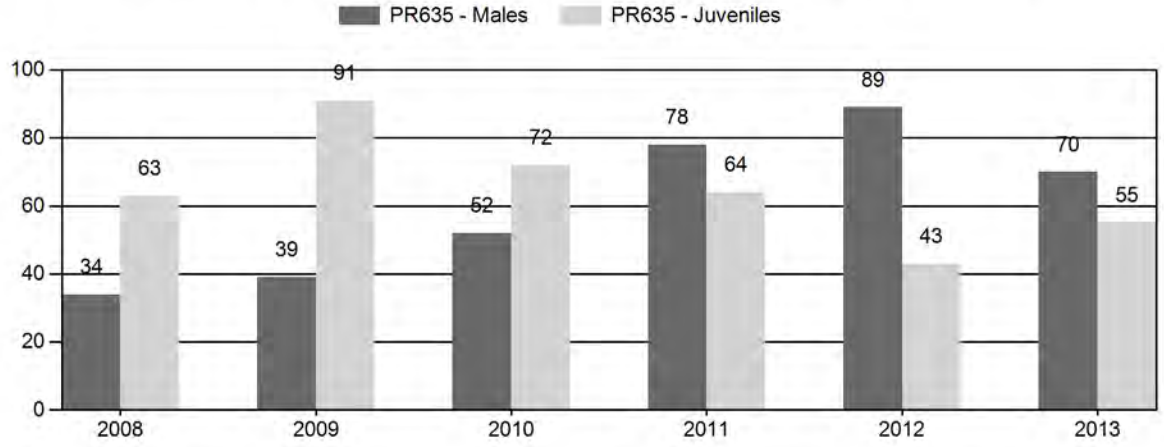
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR635 - PROJECT

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	563	0	0	78	17%	229	51%	144	32%	451	450	0	0	34	± 0	63	± 0	47
2009	429	0	0	58	17%	149	43%	136	40%	343	391	0	0	39	± 0	91	± 0	66
2010	634	0	0	118	23%	226	45%	163	32%	507	524	0	0	52	± 0	72	± 0	47
2011	0	45	89	134	32%	171	41%	109	26%	414	0	26	52	78	± 0	64	± 0	36
2012	0	67	112	179	38%	202	43%	86	18%	467	0	33	55	89	± 0	43	± 0	23
2013	0	28	125	153	31%	219	45%	120	24%	492	0	13	57	70	± 0	55	± 0	32

2014 SEASONS
PROJECT PRONGHORN (PR 635)

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
97, 117	1	Sep. 20	Oct. 22	300	Limited quota; any antelope
	2	Aug. 15	Oct. 22	50	Limited quota; any antelope valid in Area 97 south of U.S. Highway 26 and in all of Area 117
	6	Sep. 20	Oct. 22	150	Limited quota; doe or fawn
	7	Aug. 15	Oct. 22	75	Limited quota; doe or fawn valid in Area 97 south of U.S. Highway 26 and in all of Area 117
Archery 97, 117		Aug. 15	Sep. 19		Refer to section 3 of this chapter

Hunt Area	Type	Quota change from 2013
97, 117	1	+50
	2	-50
	7	-75
Total	**1**	**+50**
	2	**-50**
	7	**-75**

<u>Management Evaluation</u>
Current Management Objective: Hunter/Landowner Satisfaction 60%
Management Strategy: Recreational
2013 Hunter Satisfaction: 88%
2013 Landowner Satisfaction: 34% (71% very satisfied, satisfied, or neutral)
3 year Average Hunter Satisfaction: 92%
3 year Average Landowner Satisfaction: unknown

Management Issues
In 2013 the Department conducted an objective review for the Project pronghorn herd unit. Previously the herd had a population objective of 400 pronghorn. The population objective was impractical because personnel were unable to collect adequate demographic data due to extensive interchange with the neighboring Wind River Reservation (WRR). Following an internal review, a public meeting and contact with numerous landowners the objective was changed in 2013 to manage for 60% hunter and 60% landowner satisfaction. Hunter satisfaction is taken directly from the harvest survey while landowner satisfaction in 2013 was determined by mailing a survey (Appendix A) to a number of landowners in the herd unit.

Habitat/Weather
This herd occupies a heavily agricultural area in central Wyoming as well as lands interspersed with the WRR. Land ownership patterns and extensive border with the WRR make it cost prohibitive to collect adequate demographic data in the herd unit. The highest densities of pronghorn are found along the northern portion of hunt area 97 and commonly move between the herd unit and the WRR. Drought conditions were extreme throughout the region in 2013, but adult pronghorn were not severely impacted due to the extensive agricultural feed resource in the area. Anecdotally there appears to have been a bit of a distribution shift over the past several years in response to drought conditions. There appear to be fewer antelope inhabiting the Muddy Ridge area and more antelope congregating further west along Muddy Creek closely associated with irrigated fields.

Field/Harvest Data/Population
The fawn/doe ratio in hunt area 97 was 55/100 in 2013. This was well below the 5 year average of 67/100. Taken in combination with a fawn/doe ratio of 43/100 in 2012, it demonstrates even animals in this area with extensive agriculture are not immune to impacts from harsh drought. The last 2 years of low recruitment likely resulted in a population decrease. This is also evidenced by a decrease in the buck/doe ratio from 89/100 in 2012 to 70/100 in 2013. Regardless of any recent population changes, the buck/doe ratio remains quite high and harvest success on Type 1 licenses in 97 was 90% in 2013. Combined with a days/animal statistic of 2.2, indications are recreational hunt quality continues to be good in the herd.

The population is considered to be at objective in 2013. Hunter satisfaction (satisfied or very satisfied) decreased from 94% in 2012 to 88% in 2013. This still represents a high rate of satisfaction and in combination with a 90% Type 1 success rate indicates hunt quality was good. This was the first year the landowner satisfaction survey was conducted so it is not possible to compare with previous years. While only 34% of landowners were satisfied or very satisfied with antelope numbers, 71% were satisfied, very satisfied, or neutral. In contrast only 29% were dissatisfied or very dissatisfied with numbers. Of dissatisfied landowners, 50% desired more antelope and 50% desired fewer antelope. Given the even split between landowners wishing for more or less antelope combined with a majority of satisfied hunters and landowners overall, the population is deemed to be at objective and management in 2014 will maintain the current population.

Management Summary

Given fairly low recruitment in 2013, the number of Type 6 licenses will remain unchanged in 2014. This number of licenses should provide adequate harvest for landowners who desire fewer antelope without significantly impacting the overall population. Type 1 licenses will be increased by 50 to provide a bit more recreational opportunity. Despite a decrease in the buck/doe ratio from 2012 to 2013, the ratio remains quite high at 70/100 and well above the desired level for a recreationally managed herd. Type 2 and 7 licenses will each be reduced by 50%. These licenses are issued to address specific damage problems in the herd unit and the affected landowners felt a reduction from 2013 levels was warranted. This management is intended to keep the population at the current level through 2014.

Appendix A
2013 landowner letter and satisfaction survey

December 12, 2013

Dear Landowner,

Starting in 2014, the Wyoming Game and Fish Department (Department) will begin utilizing landowner and hunter satisfaction surveys to manage deer (mule deer and white-tailed deer) in hunt areas 157 and 170 and antelope hunt areas 97and 117.

You are being asked to participate in this survey because you have allowed deer or antelope hunting on your property in the past (as indicated by your submission of landowner coupons). If you have an interest in deer and antelope management in these hunt areas, please take a minute to complete the survey below. Your answers, in combination with other landowners and hunters, will be considered when we develop hunt season structure for the coming year. If surveys indicate a majority of respondents are satisfied with deer and antelope numbers, it is likely upcoming hunting seasons will be very similar to last year's. If the majority of respondents feel there are too many or too few deer or antelope, we will likely recommend the Wyoming Game and Fish Commission consider issuing more or fewer licenses respectively.

Finally, if you have too many deer or antelope on your property and would like to see some reduction in numbers through doe/fawn harvest, please let us know and the Department will contact you to discuss potential options. If you have any questions, please contact your local game wardens, Allen Deru (856-4982) or Brad Gibb (856-9005), or wildlife biologist Greg Anderson (332-2688).

Please help us manage mule deer and white-tailed deer in hunt areas 157 and 170 and antelope in hunt areas 97and 117 by filling out the enclosed survey and returning it in the self-addressed envelope by ***January 31, 2014***.

The Department sincerely values your input, and we thank you for your time.

Sincerely,

Greg Anderson

Wildlife Biologist, North Lander

Mule Deer and White-tailed Deer – Hunt Areas 157 and 170
Antelope - Hunt Areas 97and 117

1. What is your level of satisfaction with mule deer numbers?

   Very satisfied ☐ Satisfied ☐ Neutral ☐ Unsatisfied ☐ Very unsatisfied ☐

2. If you are not satisfied with mule deer numbers, what would you like to see?

   Significantly more ☐ A few more ☐ Significantly fewer ☐ A few less ☐

3. What is your level of satisfaction with white-tailed deer numbers?

   Very satisfied ☐ Satisfied ☐ Neutral ☐ Unsatisfied ☐ Very unsatisfied ☐

4. If you are not satisfied with white-tailed deer numbers, what would you like to see?

   Significantly more ☐ A few more ☐ Significantly fewer ☐ A few less ☐

5. What is your level of satisfaction with antelope numbers?

   Very satisfied ☐ Satisfied ☐ Neutral ☐ Unsatisfied ☐ Very unsatisfied ☐

6. If you are not satisfied with antelope numbers, what would you like to see?

   Significantly more ☐ A few more ☐ Significantly fewer ☐ A few less ☐

7. Would you like to be contacted by the Department to discuss hunter access and increased doe/fawn deer or antelope harvest for the 2014 hunting season?

   Yes No

   If YES, please list your name, phone number, what hunt areas you own property in, and indicate the species you are interested in:

   ☐ Antelope ☐ White-tailed Deer ☐ Mule Deer

   Name _____

   Phone number _____

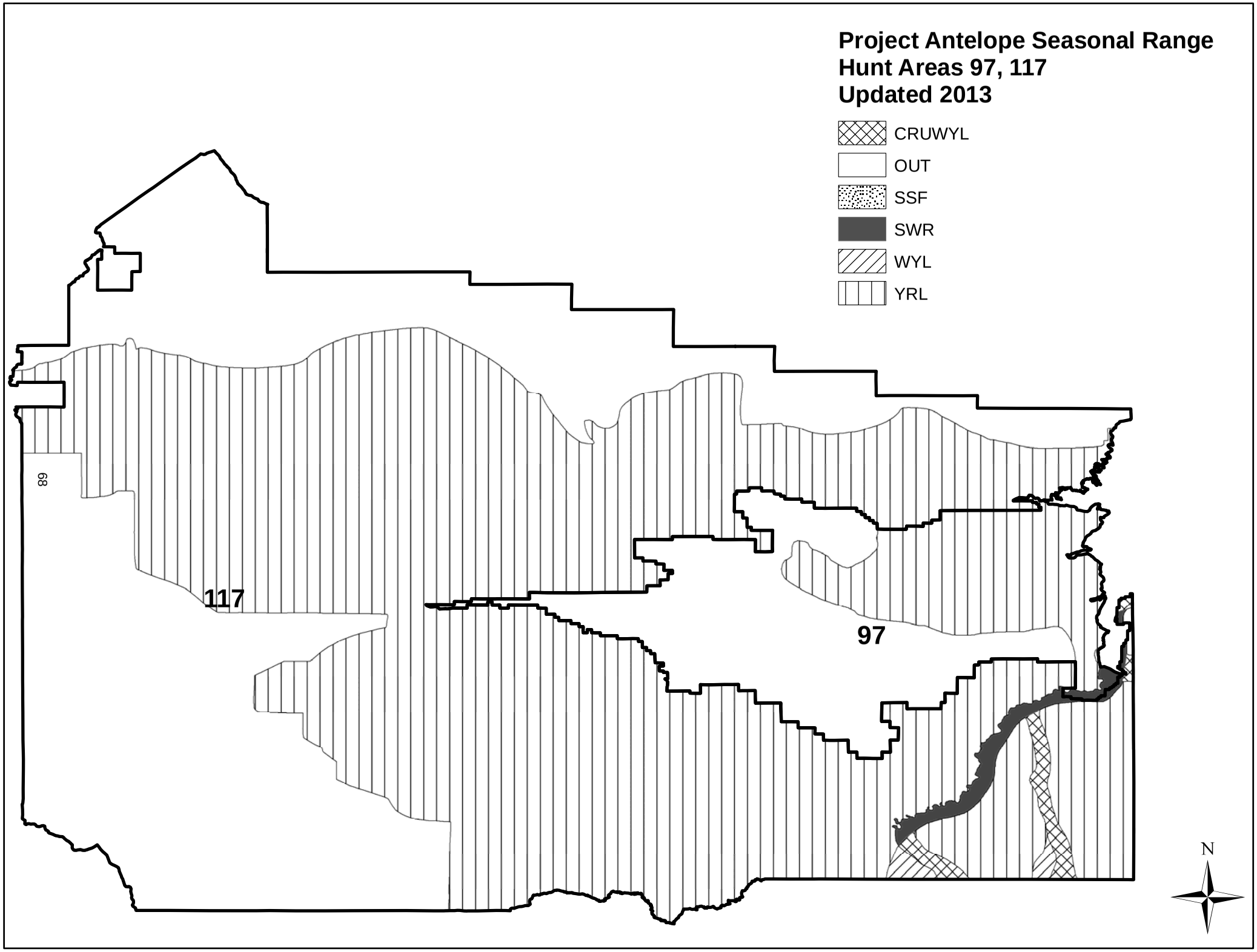
   In what antelope hunt area(s) is your property? _____

   In what deer hunt area(s) is your property? _____

In future years, we plan to conduct this survey electronically to reduce costs. Accordingly, if you have an interest in future participation, please provide us with an e-mail address. We will not share your e-mail address with any other entity.

Name _____

E-mail _____


Project Antelope Seasonal Range
Hunt Areas 97, 117
Updated 2013
CRUWYL
OUT
SSF
SWR
WYL
YRL
117
97
68
N

2013 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2013 - 5/31/2014

HERD: PR636 - NORTH FERRIS

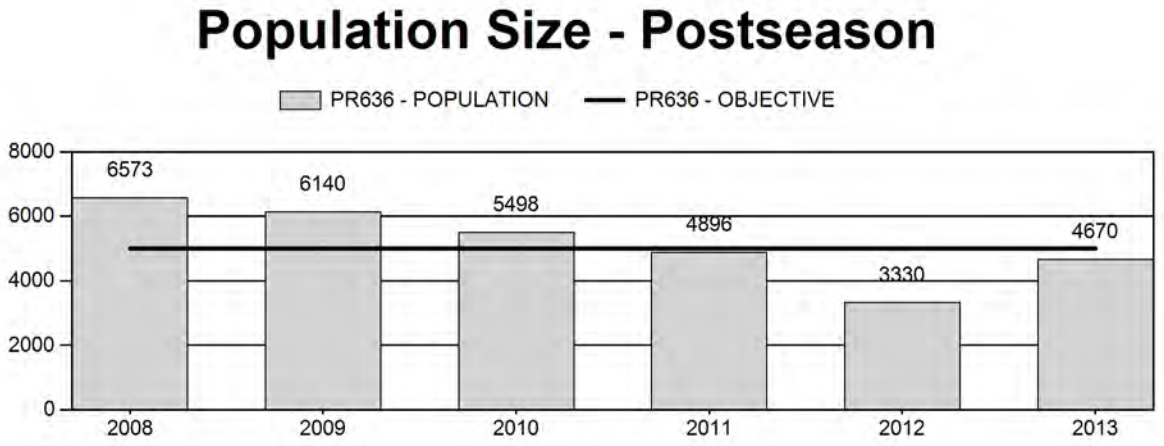
HUNT AREAS: 63 | PREPARED BY: GREG HIATT

	2008 - 2012 Average	2013	2014 Proposed
Population:	5,287	4,670	4,852
Harvest:	716	247	225
Hunters:	752	314	280
Hunter Success:	95%	79%	80 %
Active Licenses:	812	343	280
Active License Percent:	88%	72%	80 %
Recreation Days:	2,243	894	670
Days Per Animal:	3.1	3.6	3.0
Males per 100 Females	68	59	
Juveniles per 100 Females	53	45	

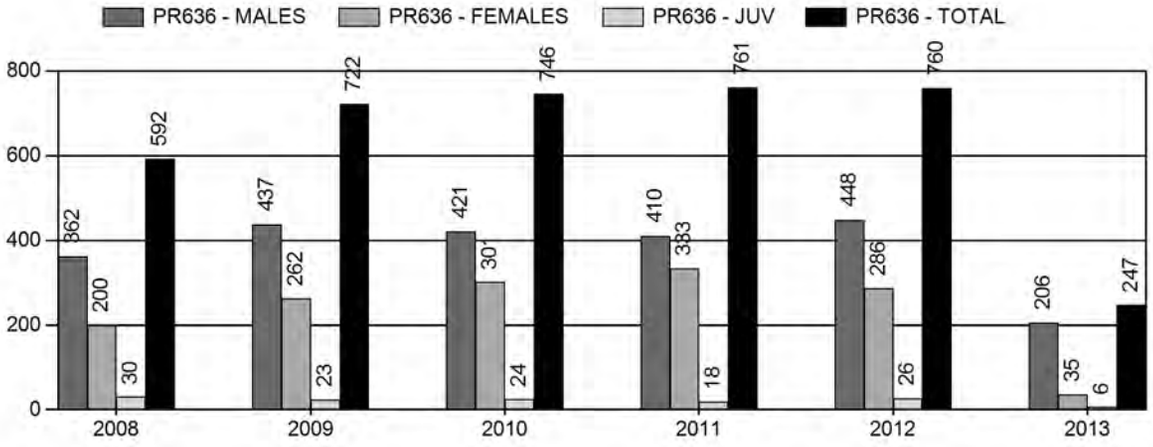
Population Objective:	5,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-6.6%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/5/2014

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

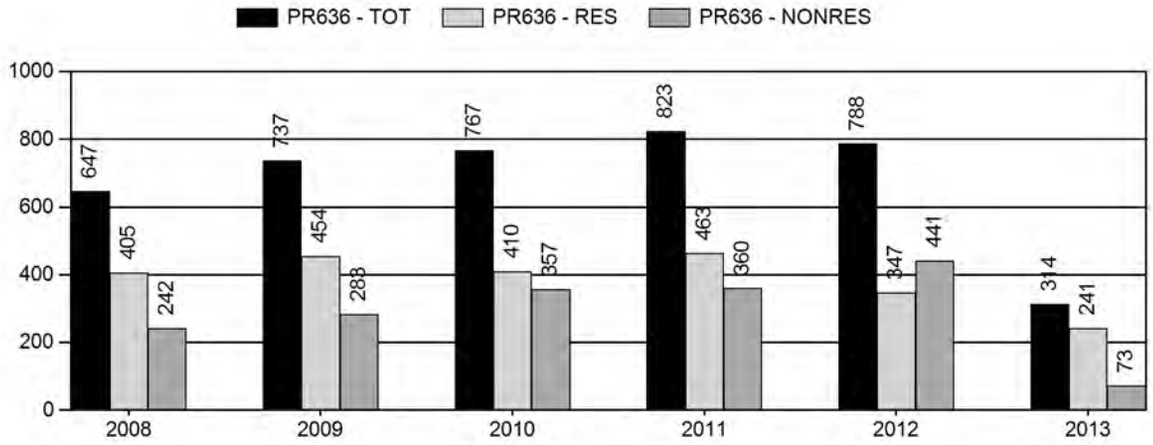
	JCR Year	Proposed
Females ≥ 1 year old:	2.2%	0%
Males ≥ 1 year old:	26.1%	16.0%
Juveniles (< 1 year old):	0.5%	0%
Total:	7.7%	4.4%
Proposed change in post-season population:	+1.7%	+3.9%



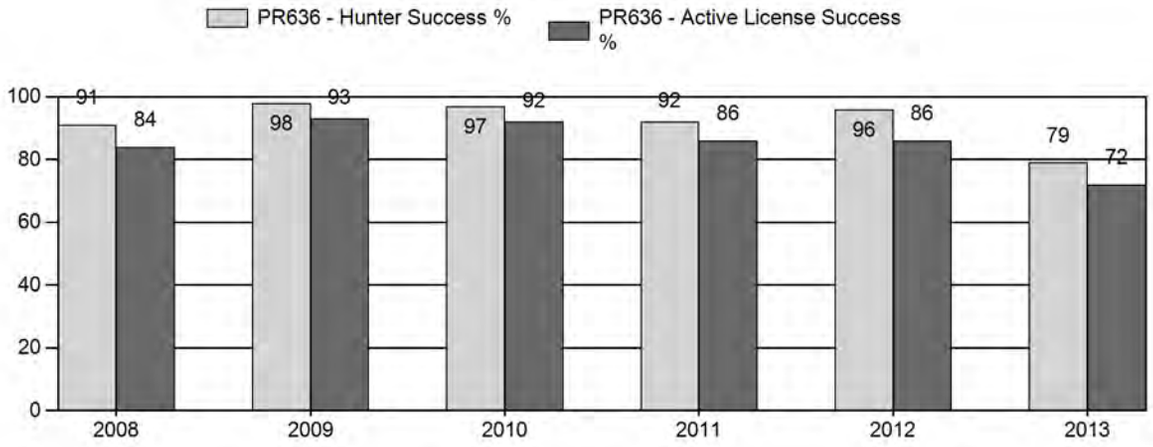
Harvest



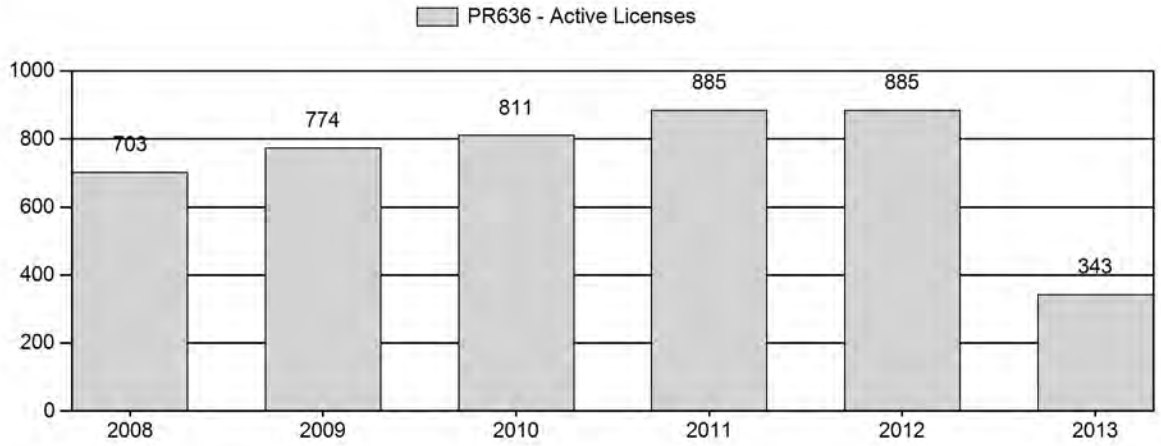
Number of Hunters



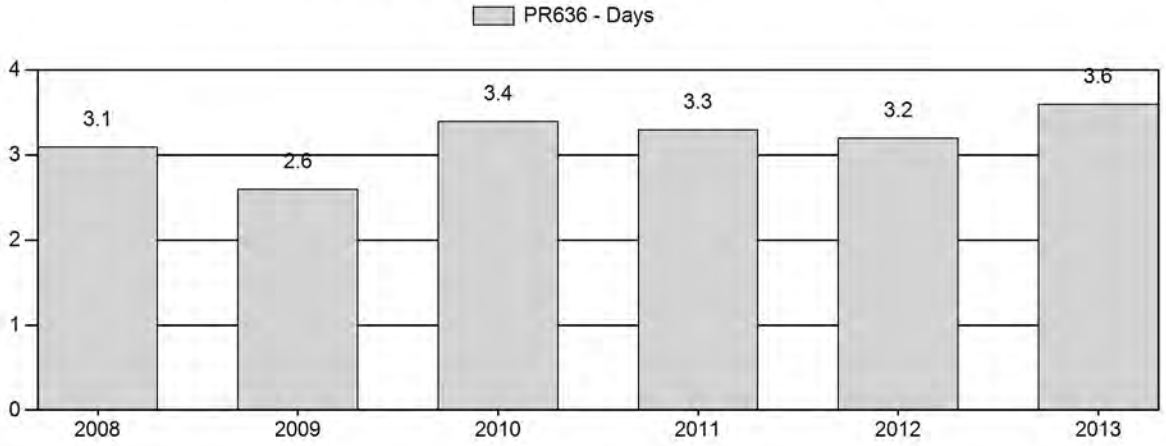
Harvest Success



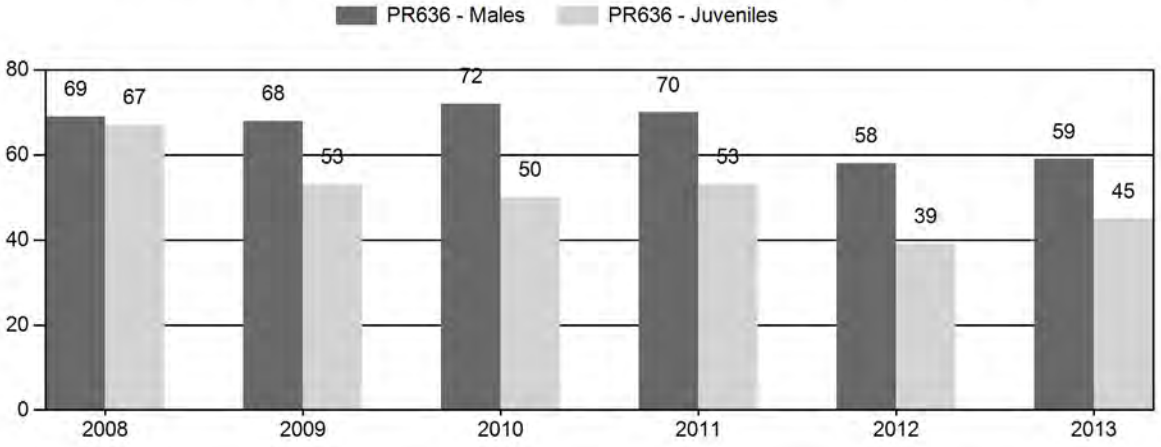
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR636 - NORTH FERRIS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	7,224	166	370	536	29%	775	42%	522	28%	1,833	2,190	21	48	69	± 6	67	± 5	40
2009	6,935	240	573	813	31%	1,192	45%	627	24%	2,632	2,040	20	48	68	± 4	53	± 3	31
2010	6,318	99	274	373	32%	519	45%	257	22%	1,149	2,145	19	53	72	± 7	50	± 6	29
2011	5,733	72	288	360	31%	516	45%	275	24%	1,151	1,914	14	56	70	± 7	53	± 6	31
2012	4,158	55	253	308	29%	534	51%	208	20%	1,050	1,330	10	47	58	± 6	39	± 5	25
2013	4,951	57	216	273	29%	459	49%	205	22%	937	1,460	12	47	59	± 7	45	± 6	28

2014 HUNTING SEASONS
NORTH FERRIS PRONGHORN HERD (PR636)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Limitations
63	1	Sep. 20	Oct. 31	100	Limited quota; any antelope
	2	Sep. 20	Oct. 31	200	Limited quota; any antelope valid east of the Buzzard Road (Natrona County Road 410 – Carbon County Road 497)
Archery 63		Aug. 15	Sep. 16		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
63	1	0
	2	0
	6	-25
	7	-25
Total	**1 & 2**	**0**
	6 & 7	**-50**

Management Evaluation
Current Management Objective: 5,000
Management Strategy: Recreation
2013 Postseason Population Estimate: ~4,670
2014 Proposed Postseason Population Estimate: ~4,850

The North Ferris pronghorn herd is managed toward a post-hunt population of 5,000, an objective last publicly reviewed in 1994. Population size is estimated using a spreadsheet model developed in 2012 and updated in 2013. The herd is in recreational management, with harvest quotas designed to maintain pre-hunt buck:doe ratios below 60:100. Public review of the management objectives for this herd is scheduled for 2014.

Herd Unit Issues

Historically, access has not been an issue in this herd unit which is mostly public lands, but access to some blocks of private land has become more difficult in recent years and may affect management ability to attain adequate harvests in the future. Potential for economic wind power exists within the herd unit, but appears unlikely when other resource issues such as T&E species

and sage-grouse Core Area are considered. Many miles of sheep-tight fences still stand in the herd unit, impeding pronghorn movements.

Weather

Following severe drought conditions in 2012, with almost no precipitation throughout the spring and summer, body condition of pronghorn checked in 2012 was poor. Given the poor condition of animals at the end of fall, mortality was expected to be above average during the 2012-13 winter, particularly following three severe winter storms in April. However, yearling buck:doe ratios in 2013 did not reflect unusual fawn losses that winter. Drought continued into 2013, reducing forage quantity and quality for a second year. Improved precipitation in late fall provided for some herbaceous plant growth, but was probably too late to improve production by forbs and shrubs.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have been minimal due to record drought. Two shrub transects have been established within this herd unit, primarily to monitor mule deer winter forage. One of these, on the Morgan Creek WHMA, was burned in the 2012 fires and the second was not read in 2013. New owners of the Pathfinder Ranch, which encompasses the north-central portion of this herd, have expressed interest in looking for opportunities for improving habitat conditions for wildlife, possibly as mitigation for wind power projects in other parts of the state. Habitat issues that would benefit pronghorn include shrub treatment on winter ranges, adjustments of grazing use, and modification of sheep-tight fences.

Field Data

Classification sample size declined again for the fourth year, was the smallest sample in over 30 years, and was only 35 percent the size of the sample from 2009. These data are collected from the ground along routes that have had only minor changes over the past two decades. Higher densities of pronghorn were again found in the eastern half of the area near Pathfinder Reservoir and along irrigated hayfields on the Buzzard and Sand Creek Ranches. Fawn production improved slightly, but was still the second lowest ratio in 20 years, a direct result of the exceptionally dry spring and summer.

Following exceptionally high recruitment of yearlings in 2005, buck:doe ratios exceeded the 60:100 maximum criterion for recreational management in this herd. Buck harvests were increased for the following seven years, often double or triple historic levels, and surplus bucks were successfully harvested prior to 2012 when the buck:doe ratio returned to an acceptable 58:100. The ratio recorded in 2013 was little changed, at 59:100. Much of this decline was in the supply of adult bucks, with that ratio dropping to its lowest level in eight years. As expected, hunter complaints about poor quality of bucks were common and the buck:doe ratio is expected to continue to decline in 2014.

Pronghorn herds to the south and west showed dramatically low yearling buck:doe ratios in 2013, suggesting fawn losses were high in the 2012-13 winter and April blizzards, but this ratio

was at 12:100 in Area 63, which is low for this herd but not surprising given the record low fawn production in 2012. It would appear winter survival was not unusually low in this herd that winter.

Harvest Data

Success for hunters with Type 1 licenses dropped again to its lowest level in 11 years, at just 78 percent, a consequence of both reduced numbers of pronghorn and the lowered buck:doe ratio. Success for hunters with Type 2 licenses was even worse, at only 71 percent. Doe/fawn hunters had the poorest success since doe/fawn licenses were reintroduced in this herd in 2006, again a result of fewer pronghorn in the herd. Success was markedly different between the Type 6 and Type 7 licenses. Field contacts suggest a large proportion of hunters with the Type 6 tags use them in the western portion of the area, and these hunters had only 38 percent success. Those with Type 7 licenses, which restricted them to the eastern portion where pronghorn densities are higher, had 79 percent success, which was still a record low.

The average effort required to harvest a pronghorn also indicates numbers are historically low, especially in the western portion where doe/fawn hunters averaged 8.5 days hunting for each pronghorn harvested.

Population

This herd was below objective size for most of the decade following the 1992-93 winter, occasionally by as much as 20 percent or more, a consequence of low fawn production and poor recruitment. High fawn production followed by an unusually mild winter in 2004 provided the first significant growth in herd size.

Prior to the development of a reasonable spreadsheet model in mid-2012, population estimates suggested this herd was well above objective size from 2006 up until 2012, and harvests were increased accordingly. The 2013 spreadsheet model predicts the increased harvests successfully reduced the herd to within 20 percent of objective by 2011 and dropped below objective in 2012. This revised model, however aligns with the maximum limit of the confidence interval on the most recent line transect survey and is probably over-estimating herd size. Hunter comments, classification data and harvest statistics all suggest there has been a greater decline in herd size than predicted by the latest model.

The Time-Specific Juvenile & Constant Adult Survival (TSJ,CAS) spreadsheet model provided the best fit with observed buck:doe ratios for this herd, particularly for the most recent seven years. The model behaved well when 2013 classification and harvest data were added and is considered a “Fair” model of the herd. Annual adult survival was predicted at 82 percent, a level slightly lower than models for some nearby pronghorn herds. Juvenile survival rates fluctuated within the allowed range but frequently hovered at maximum or minimum allowed values. The CJ,CA and SCJ,SCA models each had lower AIC values, but both models predicted herd sizes greatly exceeding past trend counts, without following count trends, and generated roughly stable buck:doe estimates that did not follow dips and rises in observed values. Estimated buck:doe ratios of these two models approximated observed values in only four or five of the past 20 years.

Due to the poor condition of animals going into this winter and poor browse conditions following two years of drought, fawn production in 2014 was projected to be similar to that seen in 2012 and 2013. The model was run using a median juvenile survival in 2014.

Losses to EHD were documented in pronghorn herds south and west of North Ferris in 2013, and reports of carcasses in Area 63 suggests the disease was here as well. Significant losses in late summer and early fall 2013 would have affected harvest statistics but would not yet affect estimates in the herd model, so it may be over-estimating herd size.

Management Summary

With record low fawn production and the herd estimated to be below objective, harvests need to be reduced to prevent further reduction in herd size. Since buck:doe ratios are at the maximum for recreational management, no reduction is recommended for either the Type 1 or Type 2 license quotas. But the recommendation is to eliminate the Type 6 and Type 7 doe/fawn licenses, which were at minimal quotas in 2013.

The expected harvest of roughly 225 bucks from the 2014 license quotas should provide only a minimal increase (<4 percent) in herd size, projected to be ~4,850 at post-hunt 2014. This assumes average survival through the 2013-14 winter and fawn production similar to the low level seen in 2012 and 2013. If either winter survival or fawn production exceeds expectations in 2014, the increase would be improved, and doe/fawn harvests from this herd would need to be restored.

Opening date is shifted back four days to fall on a Saturday for the first time in decades, synchronizing with Area 68 to the north. This change is compatible with the application booklet and, as opposed to the traditional day, will increase crowding on opening weekend. The closing date is the same as in 2012 and 2013 and extends to the closing of the local deer season. Archery season uses a standardized opening date and closes the day before the opening of the regular season.

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	North Ferris 636
Model date:	03/05/14

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	98	107	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	80	94	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	23	135	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	928	1565	3466	**5960**	928	1365	3464	**5757**	1535	3333	**4868**				5000
1994	1492	1505	3266	**6263**	1492	1321	3262	**6075**	1760	3422	**5182**				5000
1995	1533	1725	3353	**6611**	1533	1534	3346	**6412**	1956	3510	**5467**				5000
1996	2305	1917	3440	**7662**	2305	1737	3440	**7482**	1942	3404	**5346**				5000
1997	1622	1903	3336	**6861**	1622	1716	3333	**6671**	1655	3045	**4699**				5000
1998	2029	1621	2984	**6634**	2029	1349	2979	**6357**	1393	2810	**4203**				5000
1999	1748	1365	2754	**5867**	1748	1177	2752	**5677**	1221	2577	**3798**				5000
2000	1309	1197	2525	**5031**	1306	1025	2525	**4856**	1039	2328	**3367**				5000
2001	1676	1018	2282	**4976**	1676	854	2280	**4810**	1000	2225	**3225**				5000
2002	1543	980	2181	**4703**	1543	809	2181	**4533**	1272	2454	**3726**				5000
2003	1643	1247	2405	**5294**	1643	1062	2402	**5106**	1612	2769	**4381**				5000
2004	1923	1580	2714	**6217**	1923	1412	2714	**6050**	2038	3161	**5199**				5000
2005	2163	1998	3098	**7258**	2163	1828	3090	**7081**	2497	3585	**6081**				5000
2006	2110	2447	3513	**8070**	2110	2196	3470	**7777**	2767	3874	**6640**	6464	1033		5000
2007	2629	2711	3796	**9136**	2623	2370	3677	**8671**	2551	3688	**6239**				5000
2008	2434	2500	3614	**8548**	2401	2101	3394	**7897**	2677	3794	**6471**				5000
2009	1956	2623	3718	**8298**	1931	2143	3430	**7504**	2596	3712	**6308**	7186	1243		5000
2010	1801	2544	3638	**7983**	1775	2081	3306	**7163**	2148	3200	**5349**				5000
2011	1671	2105	3136	**6913**	1652	1654	2770	**6076**	1520	2573	**4092**				5000
2012	982	1489	2521	**4992**	956	997	2212	**4164**	1435	2493	**3929**	3367	539		5000
2013	1091	1407	2443	**4941**	1085	1180	2405	**4670**	1430	2552	**3982**				5000
2014	1196	1402	2501	**5098**	1196	1155	2501	**4852**							5000
2015															
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			0.82		
1994	0.90			0.82		
1995	0.90			0.82		
1996	0.44			0.82		
1997	0.30			0.82		
1998	0.30			0.82		
1999	0.30			0.82		
2000	0.32			0.82		
2001	0.37			0.82		
2002	0.79			0.82		
2003	0.90			0.82		
2004	0.90			0.82		
2005	0.90			0.82		
2006	0.90			0.82		
2007	0.47			0.82		
2008	0.81			0.82		
2009	0.90			0.82		
2010	0.54			0.82		
2011	0.30			0.82		
2012	0.83			0.82		
2013	0.90			0.82		
2014	0.60			0.82		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.822
Initial Total Male Pop/10,000 =	0.156
Initial Female Pop/10,000 =	0.347

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		26.79	1.89	45.15	43.91	2.58	182	2	0	184	12.8	0.1
1994		45.67	3.50	46.07	46.96	3.57	167	4	0	171	12.2	0.1
1995		45.71	3.42	51.45	53.24	3.78	174	7	0	181	11.1	0.2
1996		67.00	4.76	55.73	55.87	4.20	164	0	0	164	9.4	0.0
1997		48.63	3.42	57.05	61.07	3.99	170	3	0	173	9.8	0.1
1998		68.01	4.48	54.35	59.05	4.06	248	4	0	252	16.8	0.1
1999		63.49	3.93	49.57	45.90	3.16	171	2	0	173	13.8	0.1
2000		51.85	3.73	47.40	46.21	3.45	156	0	3	159	14.3	0.0
2001		73.47	4.60	44.61	44.61	3.27	149	2	0	151	16.1	0.1
2002		70.74	4.56	44.92	44.92	3.35	155	0	0	155	17.4	0.0
2003		68.31	4.15	51.83	50.37	3.36	168	3	0	171	14.8	0.1
2004		70.87	4.85	58.21	48.74	3.75	152	0	0	152	10.6	0.0
2005		69.81	4.28	64.49	73.68	4.45	154	7	0	161	8.5	0.2
2006		60.07	4.14	69.64	79.32	5.04	228	39	0	267	10.3	1.2
2007		69.24	3.95	71.42	76.03	4.22	310	108	5	423	12.6	3.1
2008		67.35	3.81	69.16	69.16	3.89	362	200	30	592	15.9	6.1
2009		52.60	2.59	70.55	68.20	3.10	437	262	23	722	18.3	7.8
2010		49.52	3.78	69.95	71.87	4.88	421	301	24	746	18.2	9.1
2011		53.29	3.98	67.13	69.77	4.79	410	333	18	761	21.4	11.7
2012		38.95	3.18	59.08	57.68	4.13			281	753	33.1	12.3
2013		44.66	3.75	57.58	59.48	4.55			35	247	16.1	1.6
2014		47.83	3.92	56.05	58.70	4.50			0	224	17.6	0.0
2015												
2016												
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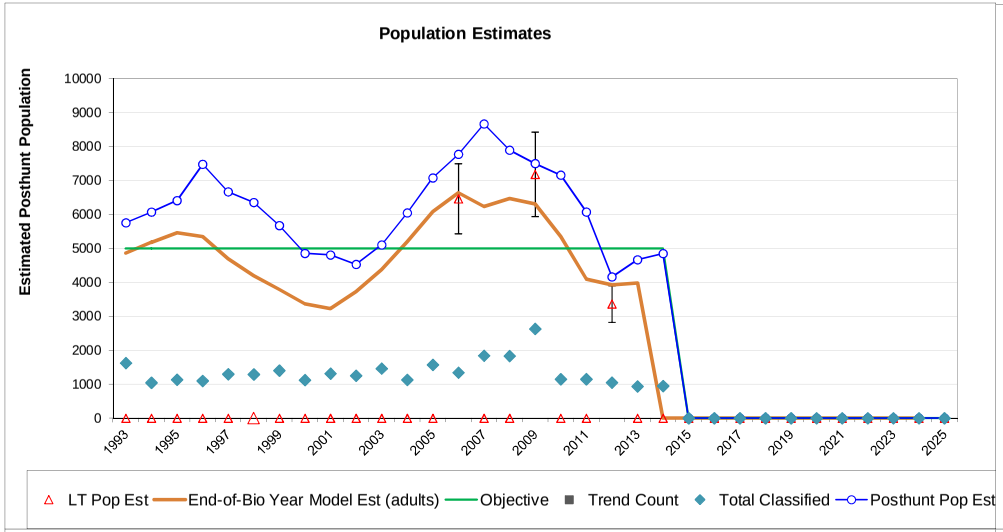
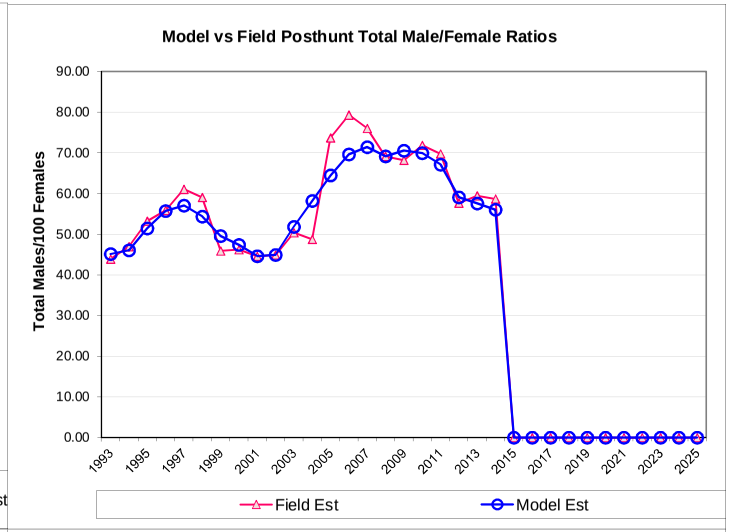
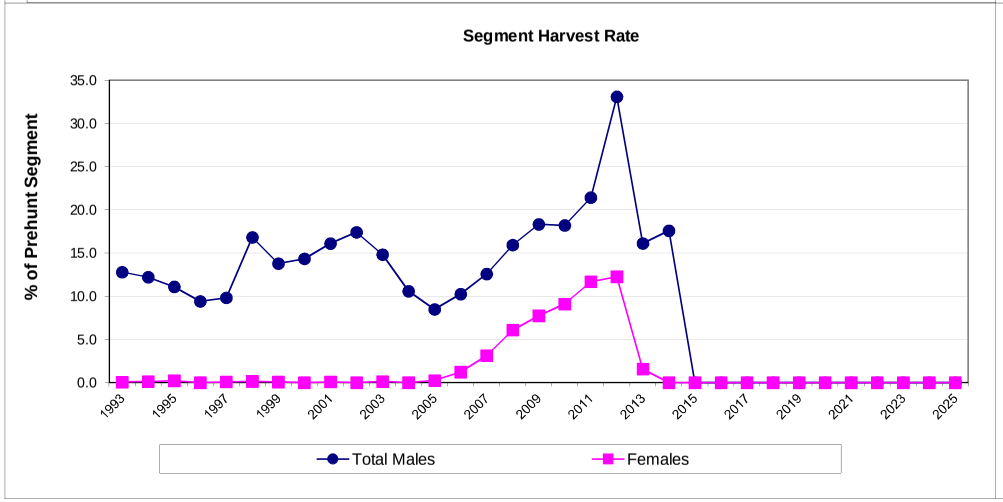
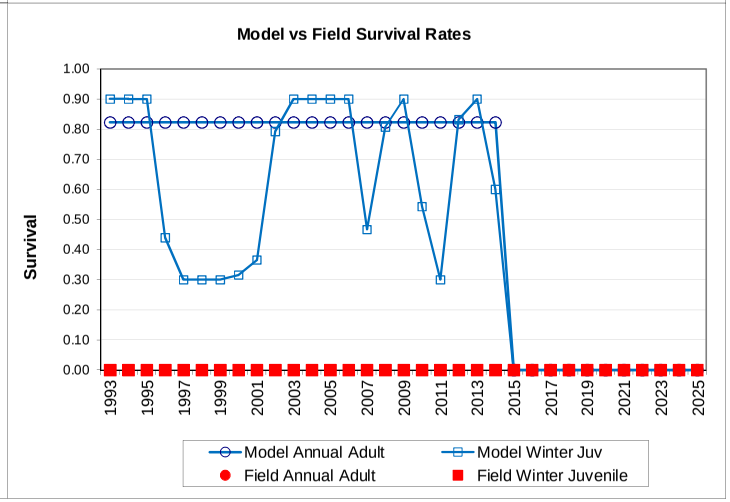
FIGURES









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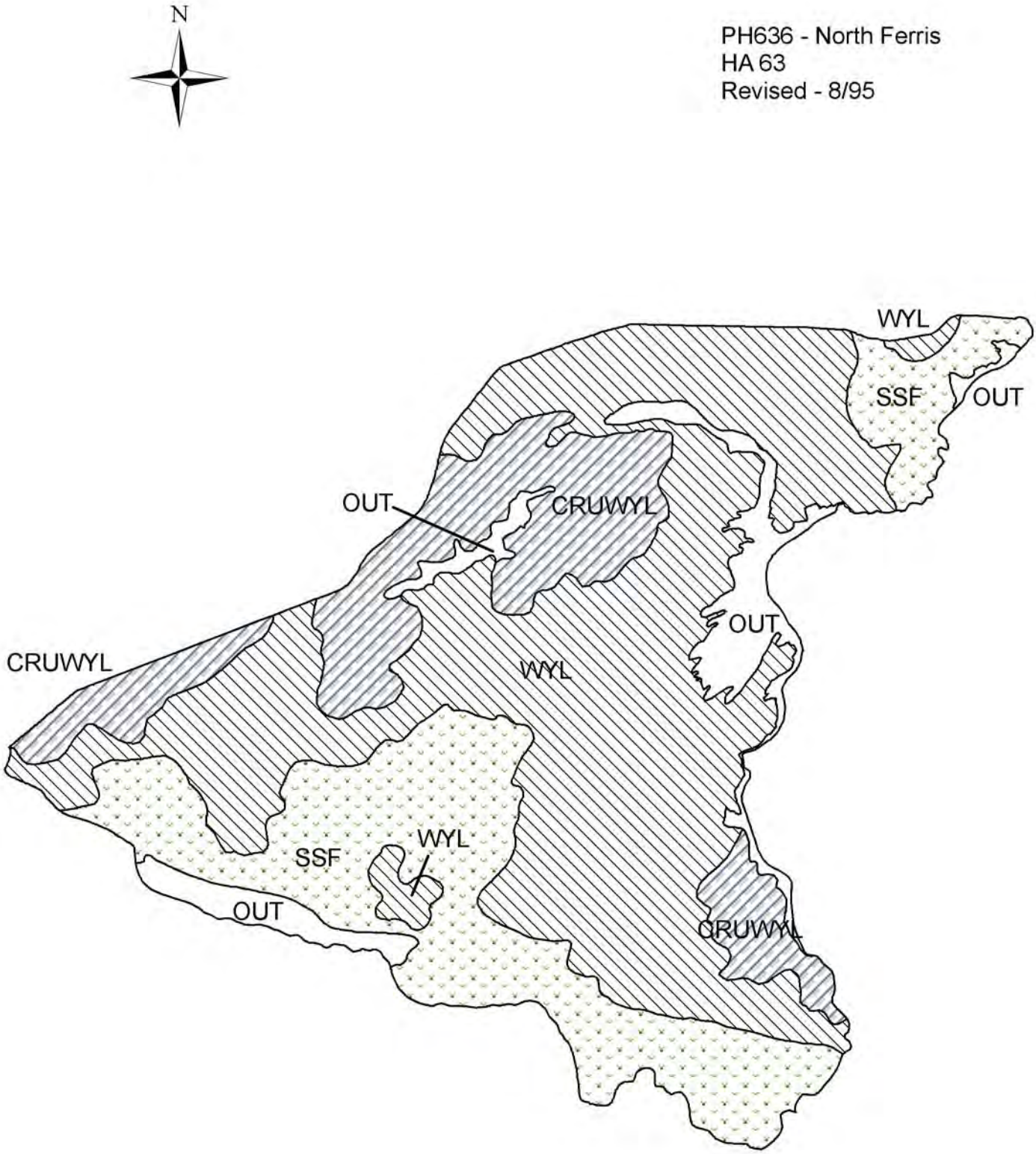
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PH636 - North Ferris
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2013 - JCR Evaluation Form

SPECIES: Pronghorn | PERIOD: 6/1/2013 - 5/31/2014

HERD: PR637 - SOUTH FERRIS

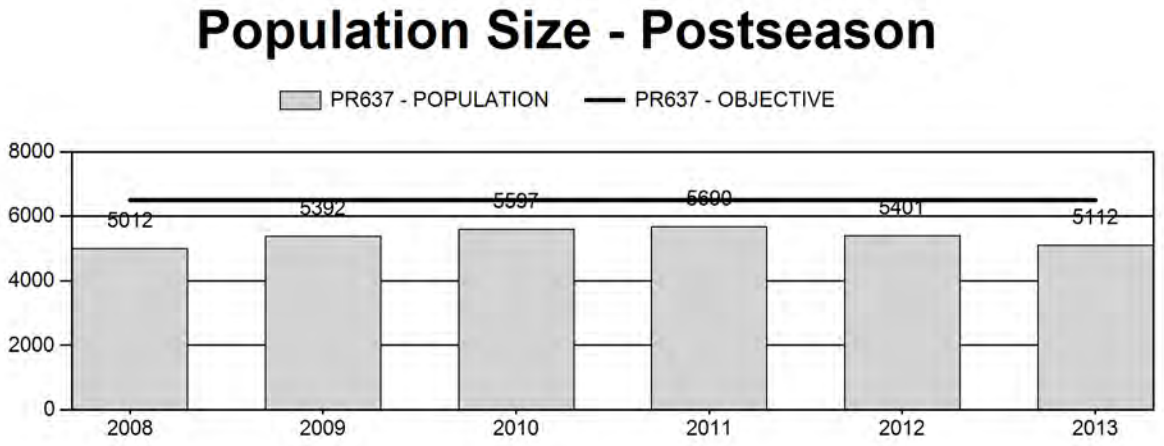
HUNT AREAS: 62 | PREPARED BY: GREG HIATT

	2008 - 2012 Average	2013	2014 Proposed
Population:	5,418	5,112	4,811
Harvest:	228	180	105
Hunters:	261	196	125
Hunter Success:	87%	92%	84 %
Active Licenses:	270	218	125
Active License Percent:	84%	83%	84 %
Recreation Days:	740	586	380
Days Per Animal:	3.2	3.3	3.6
Males per 100 Females	61	48	
Juveniles per 100 Females	42	42	

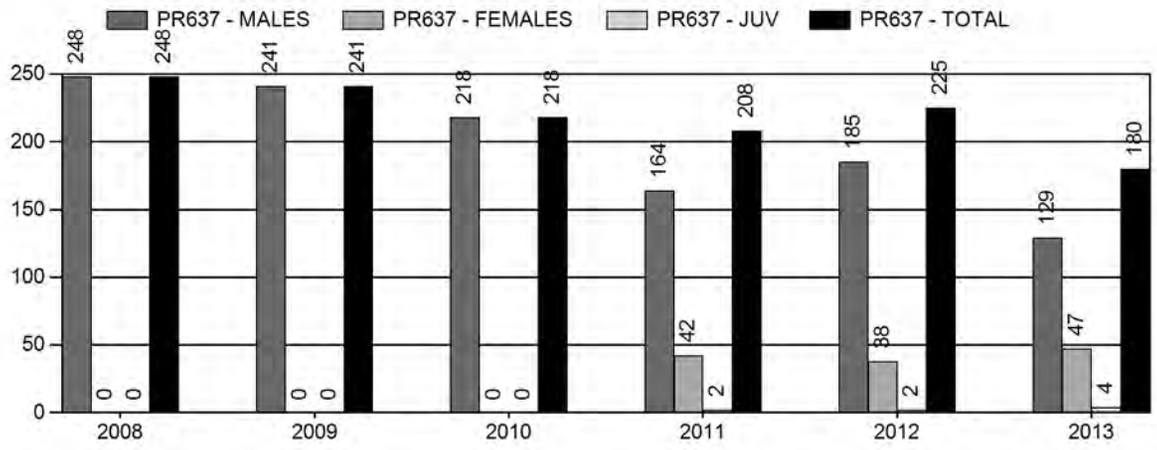
Population Objective:	6,500
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-21.4%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/5/2014

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

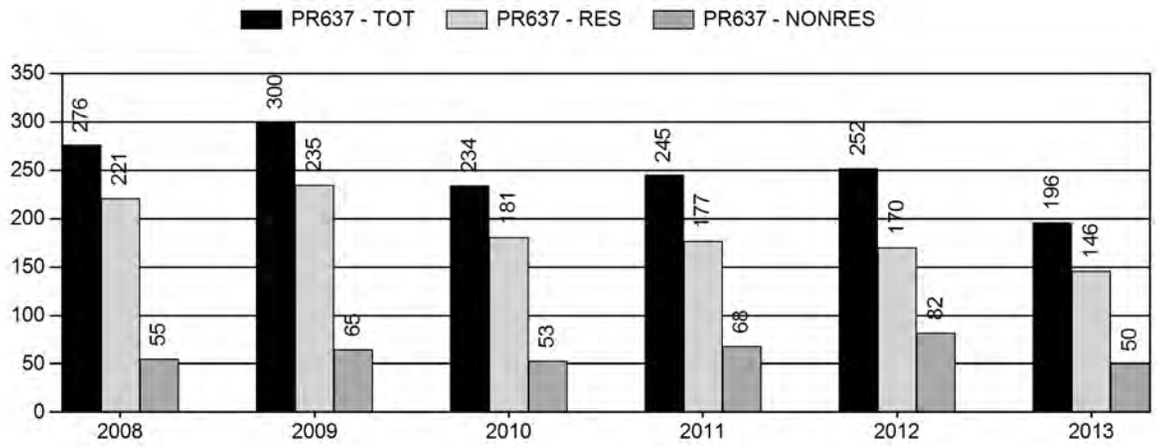
	JCR Year	Proposed
Females ≥ 1 year old:	1.7%	0.8%
Males ≥ 1 year old:	9.4%	6.6%
Juveniles (< 1 year old):	0%	0%
Total:	3.4%	2.1%
Proposed change in post-season population:	-8.3%	-7.2%



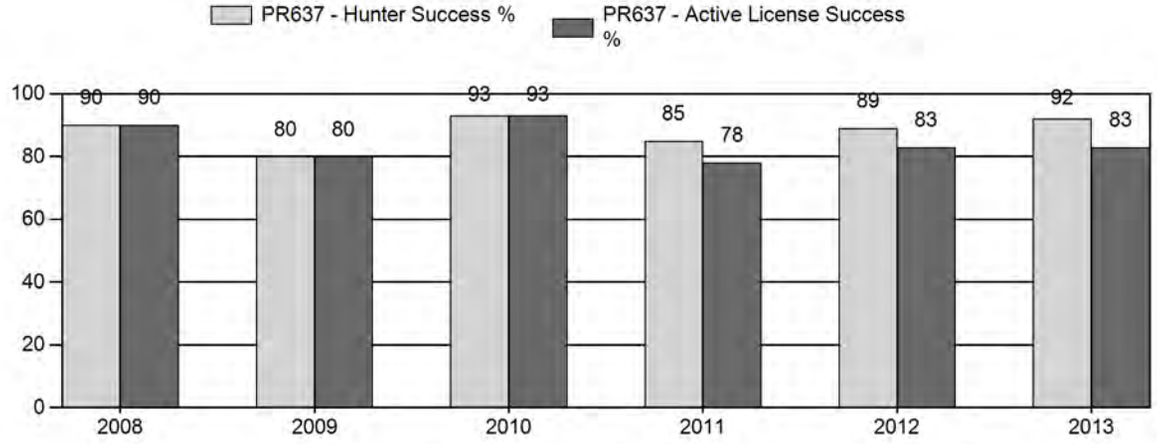
Harvest



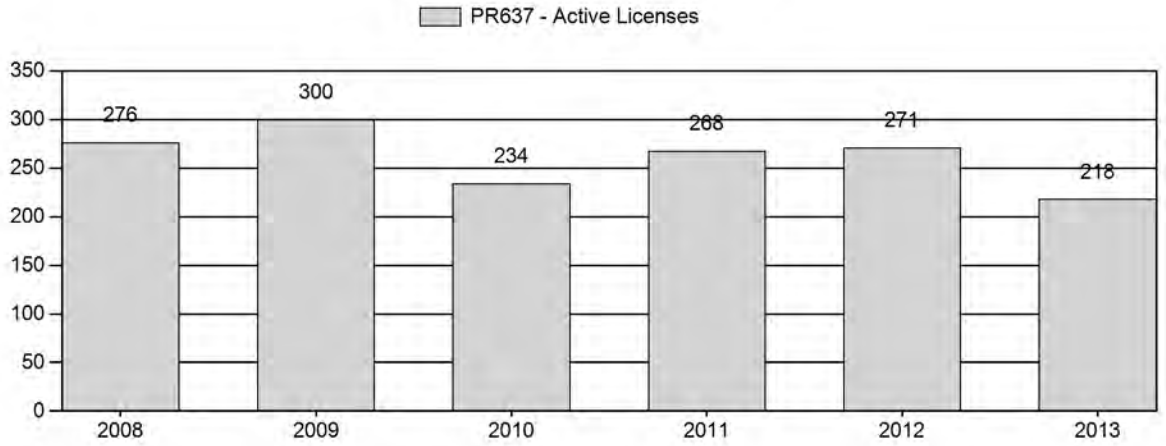
Number of Hunters



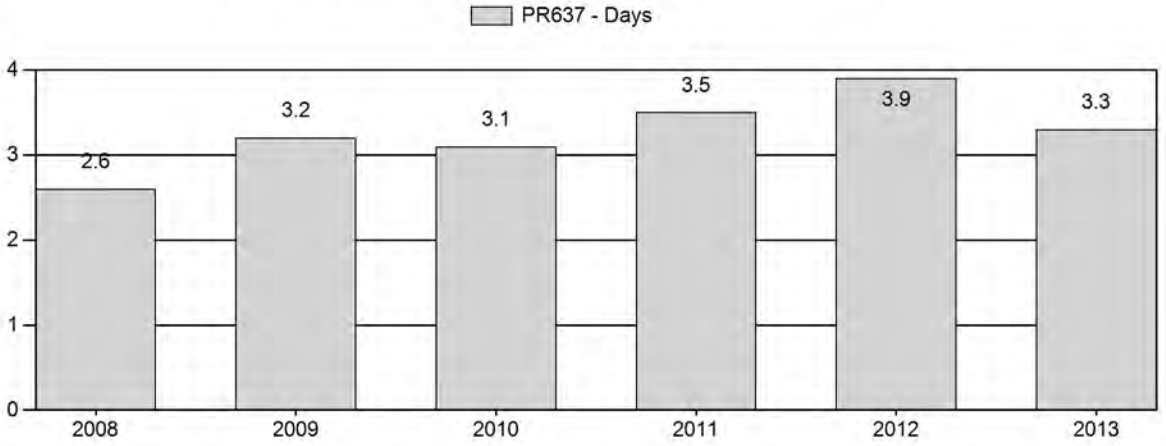
Harvest Success



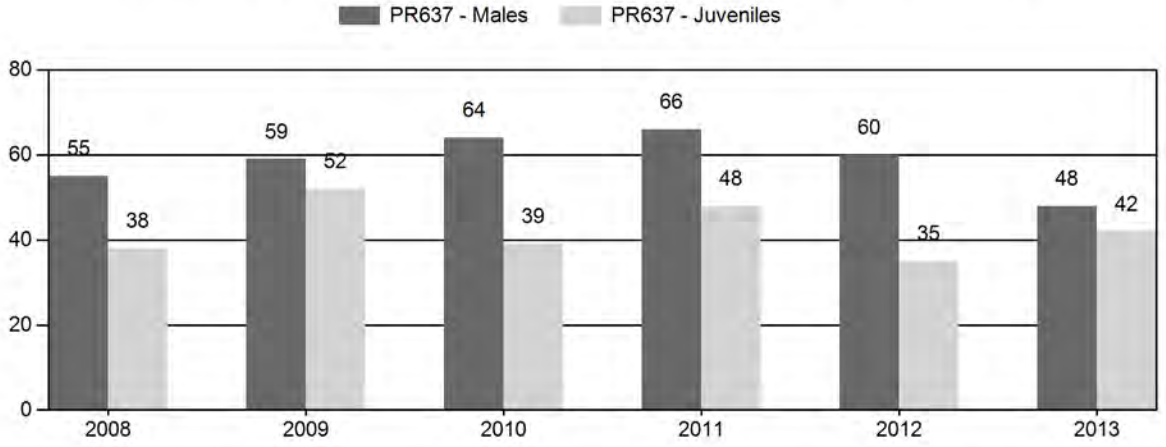
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR637 - SOUTH FERRIS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	5,285	171	440	611	28%	1,116	52%	419	20%	2,146	1,157	15	39	55	± 3	38	± 3	24
2009	5,657	127	495	622	28%	1,049	47%	543	25%	2,214	1,553	12	47	59	± 0	52	± 0	32
2010	5,836	209	578	787	31%	1,234	49%	481	19%	2,502	1,652	17	47	64	± 3	39	± 2	24
2011	5,919	144	477	621	31%	943	47%	451	22%	2,015	1,776	15	51	66	± 5	48	± 4	29
2012	5,790	47	452	499	31%	827	51%	293	18%	1,619	1,502	6	55	60	± 5	35	± 3	22
2013	5,310	53	312	365	25%	766	53%	319	22%	1,450	1,145	7	41	48	± 4	42	± 4	28

2014 HUNTING SEASONS
SOUTH FERRIS PRONGHORN HERD (PR637)

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Limitations
62	1	Sep. 13	Oct. 31	40	Limited quota; any antelope
	2	Sep. 13	Oct. 31	75	Limited quota; any antelope valid east of the Continental Divide and north of Wise Dugout Draw
	7	Aug. 15	Oct. 31	25	Limited quota; doe or fawn valid on private lands in the Muddy Creek drainage
Archery 62		Aug. 15	Sep. 12		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
62	1	-35
	2	-25
	6	-50
	7	0
Total	**1 & 2**	**-60**
	6 & 7	**-50**

<u>Management Evaluation</u>
Current Management Objective: 6,500
Management Strategy: Recreation
2013 Postseason Population Estimate: 5,300
2014 Proposed Postseason Population Estimate: 4,930

The South Ferris pronghorn herd is managed toward a post-hunt population of 6,500, an objective last publicly reviewed in 1994. Population size is estimated using two spreadsheet models developed in 2014, one each for the western and eastern portions of the herd unit. The herd is in recreational management, with harvest quotas designed to maintain pre-hunt buck:doe ratios below 60:100. Public review of the management objectives for this herd is scheduled for 2014.

Herd Unit Issues

Prior to 2012, population size was estimated using a Pop-II model with reasonable confidence. Attempts to develop a spreadsheet model for the entire herd since 2012 have been unsuccessful, presumably because buck:doe ratios vary widely between the lightly hunted eastern half and publicly accessible lands in the western half of the herd unit. Hunter access to much of the

eastern half of the herd has been severely limited by private landowners since the mid-1990s and has resulted in buck:doe ratios and pronghorn densities greatly skewed between the western and eastern portions.

Fawn crops have only ranged from 28 to 55:100 over the past 13 years, averaging ~40:100. In addition to limited access for much of the herd, poor production and recruitment has reduced harvest levels the herd can support.

The large Peterson Ranch in the south-central portion of the herd has changed hands twice in as many years, and it is not known how the newest owners will handle hunter access, or the large Walk-In area along US287.

Weather

Severe drought conditions in 2012, with almost no precipitation throughout the spring and summer, were followed by three severe late winter blizzards in April 2013. Based on low yearling ratios in 2013, losses appeared to be well above normal during the 2012-13 winter. The 2013 summer was also exceptionally dry, reducing browse availability for the 2013-14 winter. Precipitation increased in the fall, providing for some herbaceous plant growth, but appeared to be too late for most forbs and shrubs. The 2013-14 winter had numerous bitter cold spells, and high winds, but those winds also exposed forage on most winter ranges. Losses may still be above average because of the low browse production and poor body condition of animals going into the winter.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have been minimal due to record drought. Only one shrub transect has been established near this herd unit, on the Morgan Creek WHMA. This transect monitored bitterbrush growth and utilization in the Seminoe Mountains but was burned in the 2012 fires. Owners of the Pathfinder Ranch, which encompasses the north-central portion of this herd, have expressed interest in looking for opportunities for improving habitat conditions for wildlife, possibly as mitigation for wind power projects in other parts of the state. Habitat issues that would benefit pronghorn include treatment of browse on winter ranges, adjustments of grazing use, and modification of sheep-tight fences.

Field Data

Classification sample size declined again for the fourth year, to the smallest sample since 1979. Fawn production improved slightly, to 42:100, but was still well below normal. Fawn production was similar between the east and west portions of the herd, at 44:100 and 40:100 respectively.

Buck:doe ratio dropped from 60:100 in 2012 to only 48:100 in 2013. Not all of the decline was due to a shortage of yearlings, as the mature buck:doe ratio fell from 55:100 to 41:100. Buck:doe ratios have exceeded the 60:100 maximum criterion for recreational management in three of the past six years, but always due to high ratios in the east half of the herd which is largely unavailable to most hunters. Buck:doe ratios in the western portion only averaged 43:100 over

the previous five years, and remained poor at 40:100 in 2013, generating complaints of poor buck numbers and quality by hunters. Buck:doe ratios in the eastern portion, however, averaged 78:100 over those five years, dropping to 55:100 in 2013. The Type 2 licenses introduced in 2012 to address the disparity between buck densities between the two portions of the area have apparently been moderately successful. Not surprisingly, yearling buck:doe ratios were similar between the east and west portions, at 7:100. The eastern portion still has a significantly higher supply of mature bucks at 48:100 compared to 33:100 in the west.

Harvest Data

The difference in supply of bucks between the two halves of the herd unit was also apparent when looking at hunter success for the Type 2 licenses in 2012. Hunters with these tags, restricted to the eastern third of the area with limited public access, enjoyed 94 percent success, compared to only 73 percent for hunters with Type 1 tags that were valid for the entire area. In 2013, however, success for the Type 2 hunters declined. This could indicate success in harvesting surplus bucks from that segment of the herd, but it is more likely that hunter success was affected by significant losses to EHD in that part of the herd, documented in late summer. With the reduction in license quota in 2013, success for hunters with Type 1 licenses improved in 2013 and the average number of days hunted for each animal harvested returned to a more normal level of 3.3 days.

Type 7 doe/fawn licenses were introduced in this area in 2013 to address complaints about high concentrations of pronghorn on irrigated fields along Muddy Creek. It appears few hunters took advantage of the early opening date for those licenses, but 19 does were removed. Fewer pronghorn were found on the fields, but it is not known if that was due to harvest, hunter activity, EHD losses, or more forage opportunities on native ranges because of lessening of the drought.

Population

Efforts to develop a reasonable spreadsheet model for this herd have failed, presumably due to the highly skewed buck:doe ratios between the eastern and western portions of the herd unit. In 2012, the buck:doe ratio in the publicly available portion of the herd was only 36:100, whereas the portion with limited access had 89:100. Until 2012, half the herd unit has essentially been unhunted. As a result, when classification samples for the two halves are combined to determine herd ratios, changes in harvests do not necessarily result in predictable changes in buck:doe ratios, the key parameter used for running spreadsheet models.

A line transect survey in spring of 2013 estimated only 4,610 pronghorn in this herd, well below predictions of the best available spreadsheet model, and again found a noticeable disparity in pronghorn densities between the east and west portions.

Two separate spreadsheet models were created for the East and West portions of this herd. Classification data were sorted by drive routes, which have been relatively constant for more than 20 years. Harvests for the two halves were estimated assuming 90 percent of the area-wide harvest went to the west, and only 10 percent came from the east where access is greatly restricted. Where license restrictions limited hunters to one half or the other, all harvest from that

type went to that half. Unfortunately, splitting the herd eliminates the model's ability to use LT estimates to keep modeled herd size tied to independent estimates.

The resultant models are attached, along with a compilation of the two. The Time-Specific Juvenile & Constant Adult Survival (TSJ,CA) spreadsheet models were chosen for both halves of the herd unit. CJ,CA models for the East and West portions of the herd were rejected because each had high (>800) AICc values, did not track trends in observed buck:doe ratios and provided population estimates that were two to three times as large as the most recent LT estimate for the entire herd. SCJ,SCA models had the lowest AICc values (105 for East and 97 for West) and provided lower population estimates, but population estimates from the East model were sometimes lower than classification sample sizes. Neither SCJ,SCA model tracked well with buck:doe ratios. AICc values for the TSJ,CAS models were "Fair", at 162 and 158 respectively. The East TSJ,CAS model tracked classification sample sizes well and had excellent fit with buck:doe ratios for the first half of the 20-year model. The last 10 years followed observed trends, but did not match observed extremes. The West TSJ,CAS model tracks well with 20 years of observed buck:doe ratios, but greatly exceeds trends in classification sample sizes. It does mimic the observed downward trend in pronghorn numbers seen in LT data.

Fawn production in 2014 was projected to be similar to low 2012 and 2013 ratios for both the East and West models. Models were run with fawn survival values near the low end of their range.

Once population estimates of the two models are combined they track well with four trend counts and two of three line transect surveys, including the most recent in 2013.
The combined model also tracks well with observed buck:doe ratios for the first fifteen years of the model. For the most recent six years, observed values exceed simulated values, which would be expected if classification samples were truly skewed by high ratios in the lightly hunted eastern portion. These combined models predict the herd was about 18 percent below objective in 2013. Assuming continued low fawn production in 2014, these models predict the herd will continue to decline in size, despite the reduction in harvests proposed for 2014.

Neither herd model can yet address losses to EHD that were documented in this herd in 2013. By the number of reported and observed carcasses, losses appeared to be greatest along the west shore of Seminoe Reservoir, but spanned down to Rawlins and up towards Lamont.

Management Summary

With the population apparently well below objective, harvests need to be reduced to allow the herd to recover. The 2014 quota for Type 1 licenses, most of which are expected to be filled on public lands or Walk-In areas in the western portion of the area, is reduced by almost 50 percent. The quota for Type 2 licenses is reduced by 25 percent and the Type 6 licenses are eliminated. While no doe harvest is needed, the Type 7 doe/fawn licenses on private lands along Muddy Creek are retained to address high numbers of pronghorn on irrigated croplands in the northwestern corner of the herd. Most of these lands are enrolled in the Department's Walk-In program, so access to these private lands should not be a concern.

The expected harvest of roughly 85 bucks and 20 does and fawns from the proposed license quotas should allow some increase in herd size if fawn production or survival improves, otherwise the herd is likely to continue to decline. This herd is unlikely to reach objective size for several years without significant improvement in fawn production and survival.

Opening date falls on the traditional day of the week, is compatible with the application booklet and will synchronize with neighboring Area 61. The closing date is the same as in 2012 and 2013 and extends to the closing of the local deer season. A standardized opening date is used for the archery season, which closes the day before the opening of the regular season.

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	637=S.Ferris=EastOnly
Model date:	03/05/14

☑ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	799	808	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	71	105	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	39	162	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	366	736	1482	**2584**	365	697	1473	**2534**	662	1366	**2028**				6500
1994	407	648	1339	**2394**	407	620	1331	**2358**	598	1243	**1841**				6500
1995	427	586	1218	**2231**	427	567	1218	**2213**	554	1144	**1698**				6500
1996	440	543	1121	**2104**	440	524	1120	**2084**	516	1057	**1573**				6500
1997	503	506	1035	**2044**	503	487	1035	**2025**	489	987	**1476**				6500
1998	429	479	967	**1875**	429	454	967	**1850**	451	917	**1368**				6500
1999	475	442	899	**1816**	475	418	899	**1792**	585	1023	**1608**				6500
2000	374	574	1002	**1949**	374	552	997	**1922**	649	1053	**1701**				6500
2001	296	636	1032	**1963**	296	617	1032	**1944**	691	1068	**1758**				6500
2002	355	677	1046	**2078**	355	650	1046	**2051**	747	1108	**1855**				6500
2003	309	732	1086	**2127**	309	707	1086	**2103**	778	1123	**1901**				6500
2004	569	763	1101	**2433**	569	732	1101	**2402**	716	1052	**1768**				6500
2005	542	701	1031	**2274**	542	663	1031	**2236**	650	987	**1636**				6500
2006	271	637	967	**1874**	271	607	966	**1844**	605	932	**1537**				6500
2007	346	593	914	**1853**	346	560	914	**1820**	661	984	**1645**				6500
2008	281	647	965	**1893**	281	620	965	**1866**	686	1000	**1686**				6500
2009	384	672	980	**2037**	384	646	980	**2010**	757	1062	**1819**				6500
2010	368	741	1041	**2151**	368	717	1041	**2127**	814	1109	**1924**				6500
2011	532	798	1087	**2417**	532	780	1083	**2395**	675	994	**1669**				6500
2012	344	662	974	**1979**	342	564	932	**1837**	551	883	**1434**				6500
2013	378	540	866	**1783**	374	460	835	**1668**	461	821	**1282**				6500
2014	322	452	804	**1578**	322	388	804	**1514**							6500
2015															6500
2016															6500
2017															6500
2018															6500
2019															6500
2020															6500
2021															6500
2022															6500
2023															6500
2024															6500
2025															6500

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			0.89		
1994	0.20			0.89		
1995	0.20			0.89		
1996	0.20			0.89		
1997	0.20			0.89		
1998	0.20			0.89		
1999	0.87			0.89		
2000	0.80			0.89		
2001	0.90			0.89		
2002	0.90			0.89		
2003	0.90			0.89		
2004	0.20			0.89		
2005	0.20			0.89		
2006	0.43			0.89		
2007	0.90			0.89		
2008	0.90			0.89		
2009	0.90			0.89		
2010	0.90			0.89		
2011	0.20			0.89		
2012	0.20			0.89		
2013	0.20			0.89		
2014	0.40			0.89		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.885
Initial Total Male Pop/10,000 =	0.074
Initial Female Pop/10,000 =	0.148

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

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		24.68	2.08	49.71	49.79	3.24	36	8	1	45	5.4	0.6
1994		30.37	2.53	48.43	51.05	3.53	26	7	0	33	4.4	0.6
1995		35.07	2.78	48.11	47.96	3.40	17	0	0	17	3.2	0.0
1996		39.26	3.27	48.42	46.48	3.65	17	1	0	18	3.4	0.1
1997		48.57	3.71	48.85	49.52	3.76	17	0	0	17	3.7	0.0
1998		44.38	3.08	49.58	49.11	3.29	23	0	0	23	5.3	0.0
1999		52.88	3.37	49.17	48.52	3.18	22	0	0	22	5.5	0.0
2000		37.29	2.79	57.23	57.23	3.70	20	5	0	25	3.8	0.5
2001		28.66	2.35	61.62	59.10	3.75	17	0	0	17	2.9	0.0
2002		33.94	3.02	64.71	66.27	4.70	25	0	0	25	4.1	0.0
2003		28.50	2.53	67.37	63.99	4.28	22	0	0	22	3.3	0.0
2004		51.72	4.40	69.30	85.22	6.24	28	0	0	28	4.0	0.0
2005		52.56	4.32	68.01	79.07	5.74	35	0	0	35	5.5	0.0
2006		28.01	2.34	65.82	60.27	3.83	27	1	0	28	4.7	0.1
2007		37.88	2.74	64.85	56.67	3.57	30	0	0	30	5.6	0.0
2008		29.13	2.53	67.10	69.68	4.49	25	0	0	25	4.2	0.0
2009		39.20	3.30	68.54	80.60	5.40	24	0	0	24	3.9	0.0
2010		35.40	2.66	71.23	70.80	4.22	22	0	0	22	3.3	0.0
2011		48.91	3.81	73.39	80.52	5.38	16	4	0	20	2.2	0.4
2012		35.29	3.57	67.94	89.30	6.72			38	129	14.8	4.3
2013		43.65	3.99	62.36	55.08	4.66			28	105	14.9	3.6
2014		40.00	3.74	56.19	55.00	4.62			0	58	14.1	0.0
2015												
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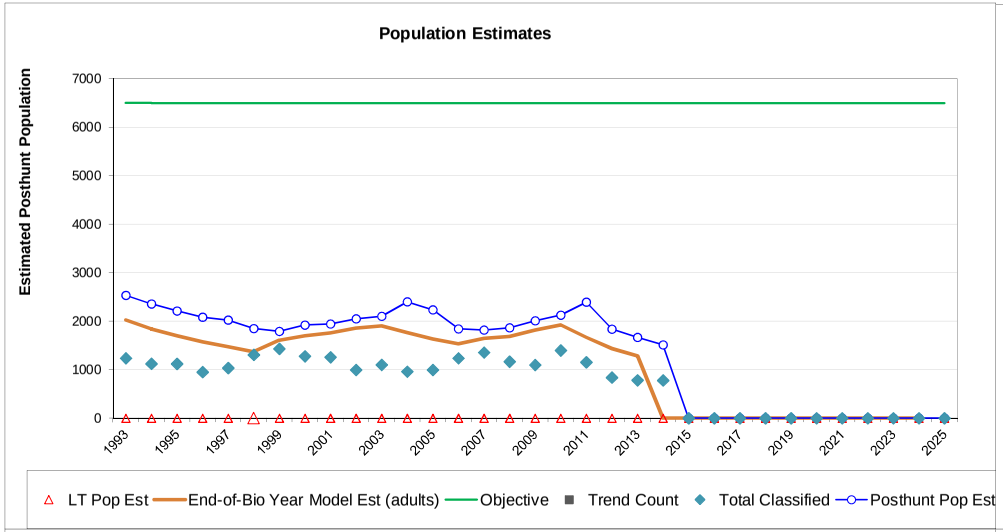
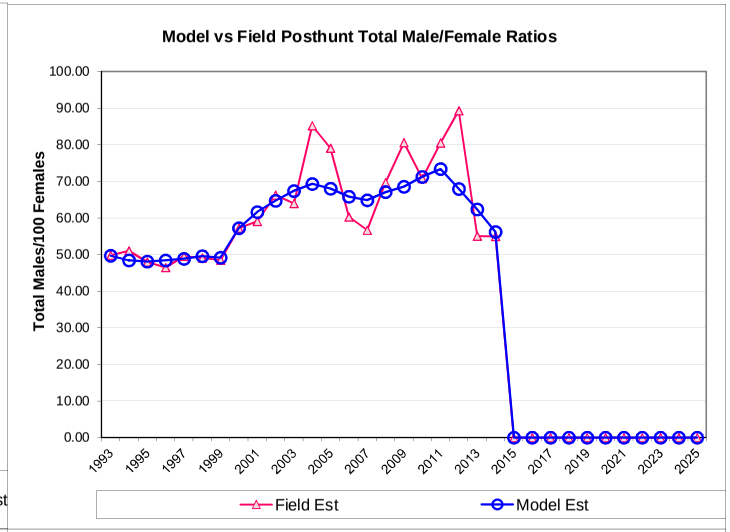
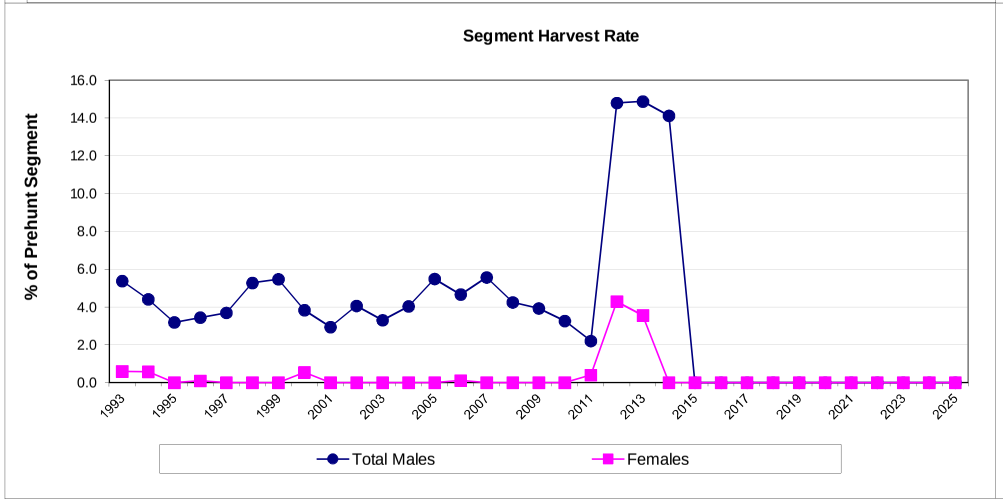
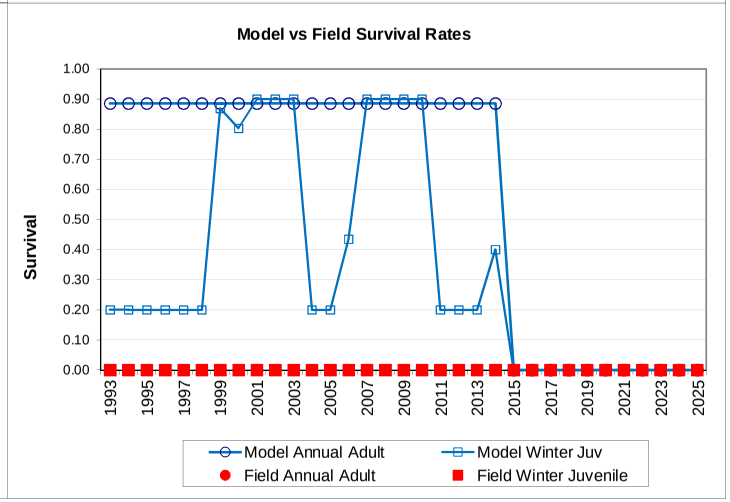
2025												

FIGURES









Comments:

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	637=S.Ferris=West-90%,ff>50%
Model date:	03/05/14

☑ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	Constant Juvenile & Adult Survival	828	837	☐ CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	63	97	☐ SCJ,SCA Mod	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	36	158	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year *i*)			Total	Predicted Posthunt Population (year *i*)			Total	Predicted adult End-of-bio-year Pop (year *i*)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females		Juveniles	Total Males	Females		Total Males	Females	Total Adults	Field Est	Field SE		
1993	1654	2028	3284	**6967**	1641	1637	3194	**6472**	1823	3168	**4992**				6500
1994	1640	1787	3105	**6532**	1636	1502	3025	**6162**	1937	3234	**5171**				6500
1995	1859	1898	3170	**6926**	1859	1705	3169	**6733**	1846	3092	**4938**				6500
1996	1911	1809	3030	**6750**	1911	1626	3024	**6561**	1796	2984	**4780**				6500
1997	1645	1760	2925	**6330**	1645	1567	2919	**6132**	1677	2831	**4508**				6500
1998	1197	1644	2774	**5615**	1197	1390	2768	**5355**	1404	2592	**3996**				6500
1999	1401	1376	2540	**5317**	1401	1137	2534	**5073**	1537	2736	**4273**				6500
2000	1469	1506	2681	**5656**	1465	1283	2622	**5370**	1689	2828	**4517**				6500
2001	1031	1655	2771	**5458**	1031	1463	2771	**5265**	1645	2763	**4408**				6500
2002	1107	1612	2708	**5427**	1107	1339	2708	**5154**	1562	2746	**4308**				6500
2003	722	1531	2691	**4944**	722	1284	2691	**4697**	1253	2463	**3715**				6500
2004	1195	1228	2413	**4836**	1195	919	2408	**4521**	1248	2537	**3785**				6500
2005	1409	1223	2486	**5118**	1409	840	2486	**4735**	1267	2701	**3968**				6500
2006	800	1241	2647	**4688**	789	943	2607	**4338**	920	2344	**3264**				6500
2007	1047	901	2297	**4245**	1047	566	2297	**3910**	883	2379	**3262**				6500
2008	1093	865	2331	**4289**	1093	592	2331	**4016**	938	2428	**3366**				6500
2009	1504	920	2379	**4803**	1504	654	2379	**4538**	1180	2656	**3836**				6500
2010	1128	1156	2603	**4888**	1128	916	2603	**4648**	998	2439	**3437**				6500
2011	1114	979	2390	**4482**	1111	798	2344	**4253**	885	2216	**3101**				6500
2012	772	867	2172	**3811**	770	664	2130	**3563**	851	1970	**2821**				6500
2013	763	834	1931	**3527**	763	772	1910	**3445**	851	1767	**2618**				6500
2014	785	834	1732	**3351**	785	802	1710	**3297**							6500
2015															6500
2016															6500
2017															6500
2018															6500
2019															6500
2020															6500
2021															6500
2022															6500
2023															6500
2024															6500
2025															6500

Survival and Initial Population Estimates

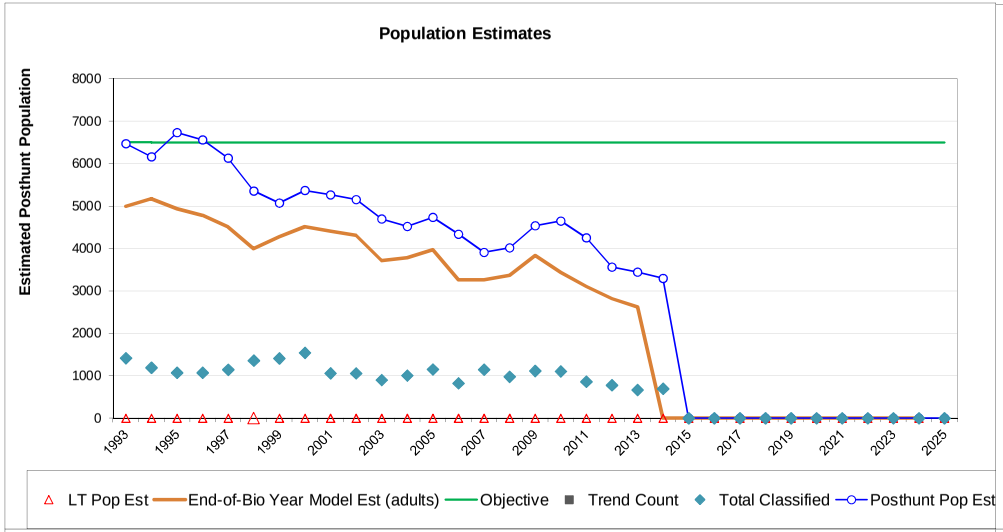
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.66			0.81		
1994	0.90			0.81		
1995	0.50			0.81		
1996	0.50			0.81		
1997	0.50			0.81		
1998	0.50			0.81		
1999	0.90			0.81		
2000	0.90			0.81		
2001	0.90			0.81		
2002	0.90			0.81		
2003	0.65			0.81		
2004	0.90			0.81		
2005	0.90			0.81		
2006	0.50			0.81		
2007	0.90			0.81		
2008	0.90			0.81		
2009	0.90			0.81		
2010	0.50			0.81		
2011	0.50			0.81		
2012	0.50			0.81		
2013	0.50			0.81		
2014	0.50			0.81		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

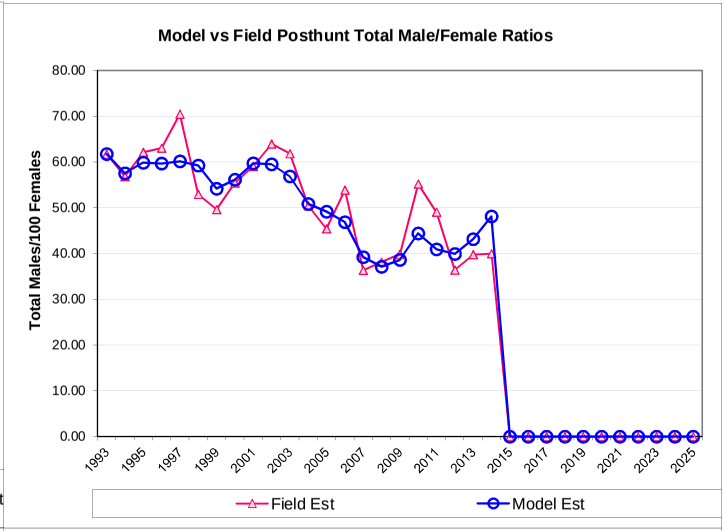
Parameters:	Optim cells
Adult Survival =	0.810
Initial Total Male Pop/10,000 =	0.203
Initial Female Pop/10,000 =	0.328

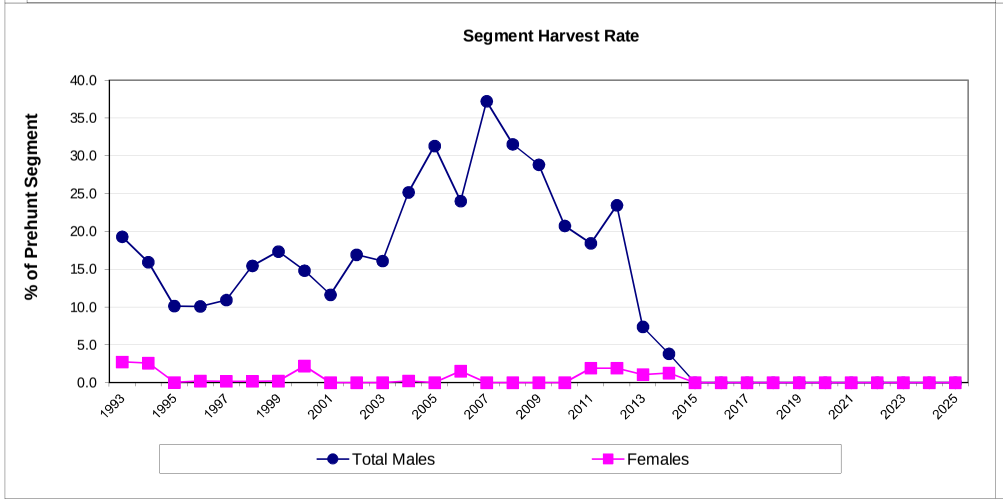
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult surviva	98%

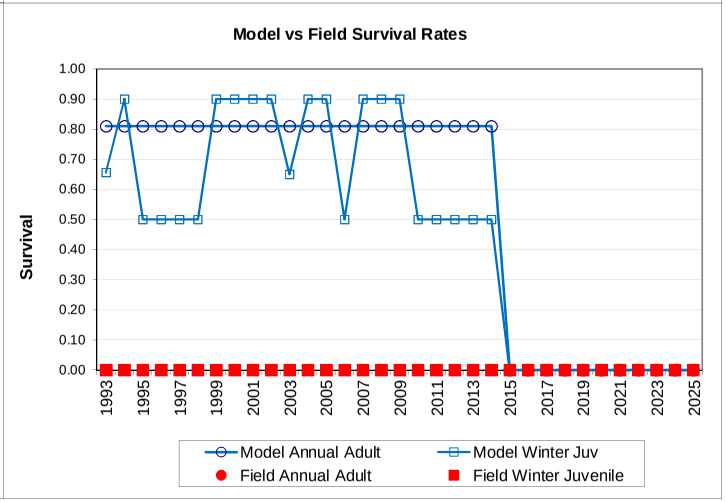
	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		50.37	3.37	61.77	61.77	3.87	356	82	12	450	19.3	2.7
1994		52.82	3.77	57.55	56.87	3.96	259	73	4	336	15.9	2.6
1995		58.64	4.38	59.88	62.14	4.55	175	1	0	176	10.1	0.0
1996		63.08	4.66	59.70	63.08	4.66	166	6	0	172	10.1	0.2
1997		56.24	4.17	60.17	70.50	4.88	175	5	0	180	10.9	0.2
1998		43.15	2.99	59.26	52.96	3.42	231	5	0	236	15.5	0.2
1999		55.15	3.52	54.18	49.64	3.28	217	5	0	222	17.3	0.2
2000		54.77	3.40	56.16	55.45	3.43	203	54	3	260	14.8	2.2
2001		37.22	3.08	59.74	59.07	4.17	175	0	0	175	11.6	0.0
2002		40.89	3.34	59.53	63.95	4.51	248	0	0	248	16.9	0.0
2003		26.83	2.67	56.88	61.84	4.58	224	0	0	224	16.1	0.0
2004		49.50	3.84	50.87	50.50	3.89	281	5	0	286	25.2	0.2
2005		56.67	3.95	49.17	45.44	3.40	348	0	0	348	31.3	0.0
2006		30.20	2.97	46.89	53.91	4.31	271	37	10	318	24.0	1.5
2007		45.56	3.24	39.23	36.35	2.80	305	0	0	305	37.2	0.0
2008		46.88	3.61	37.12	38.19	3.16	248	0	0	248	31.5	0.0
2009		63.21	4.33	38.65	39.89	3.19	241	0	0	241	28.8	0.0
2010		43.35	3.34	44.41	55.22	3.93	218	0	0	218	20.7	0.0
2011		46.59	3.94	40.94	49.09	4.08	164	42	2	208	18.4	1.9
2012		35.54	3.26	39.93	36.42	3.31			38	225	23.5	1.9
2013		39.52	3.85	43.18	39.78	3.87			19	75	7.4	1.1
2014		45.33	4.19	48.14	40.00	3.86			20	49	3.8	1.3
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



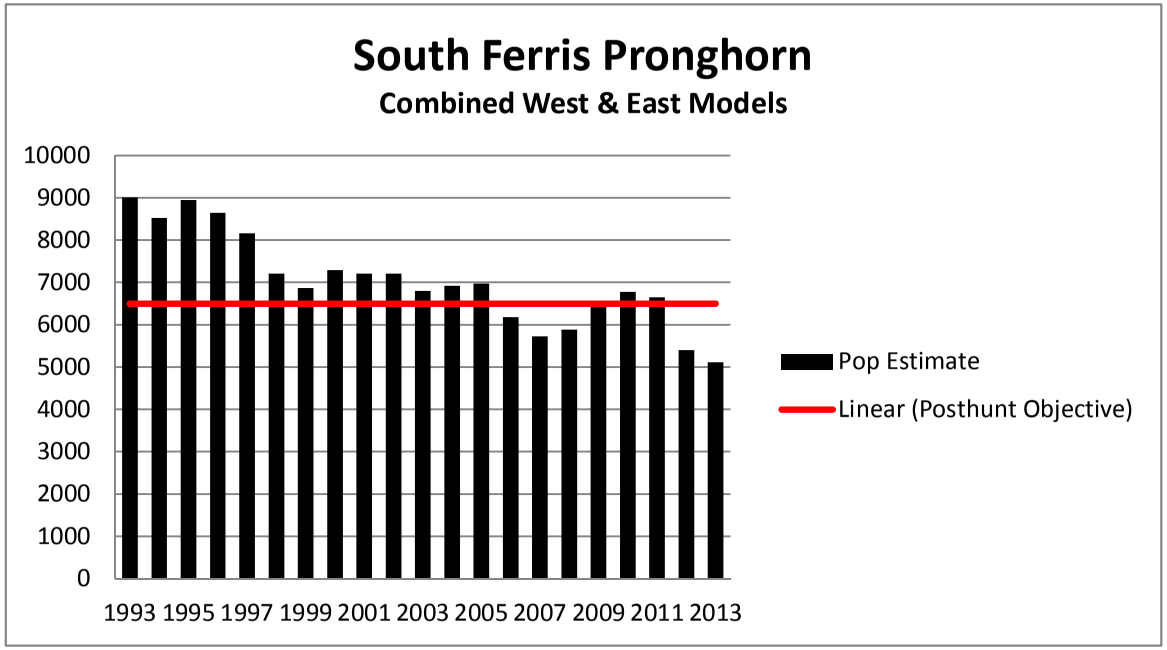


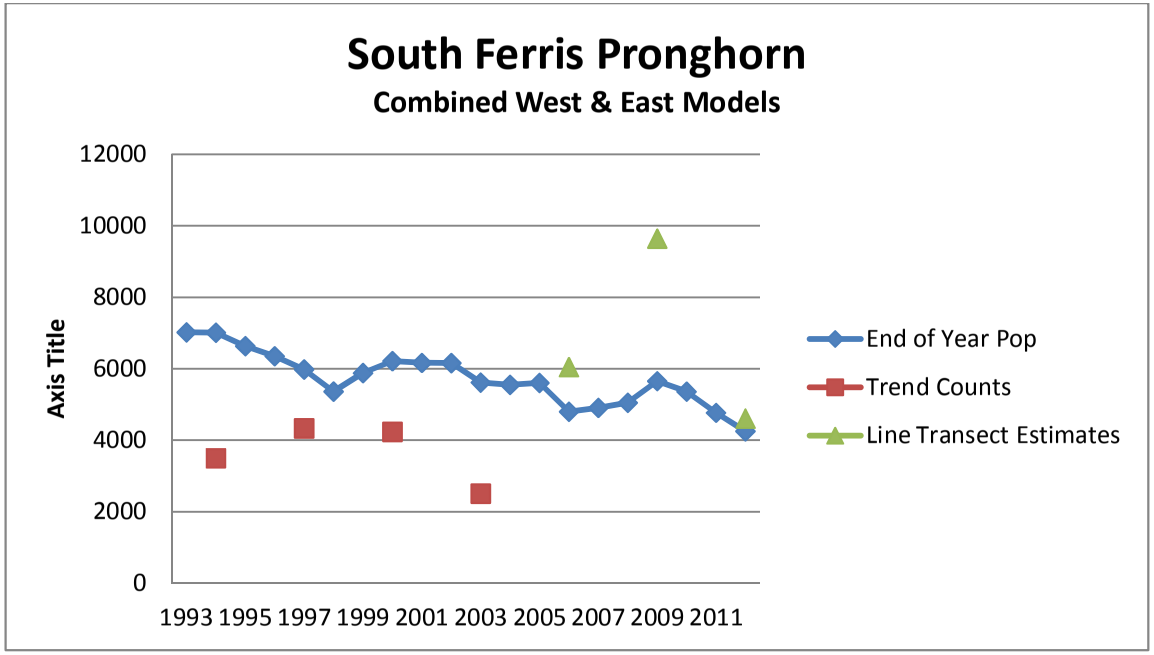


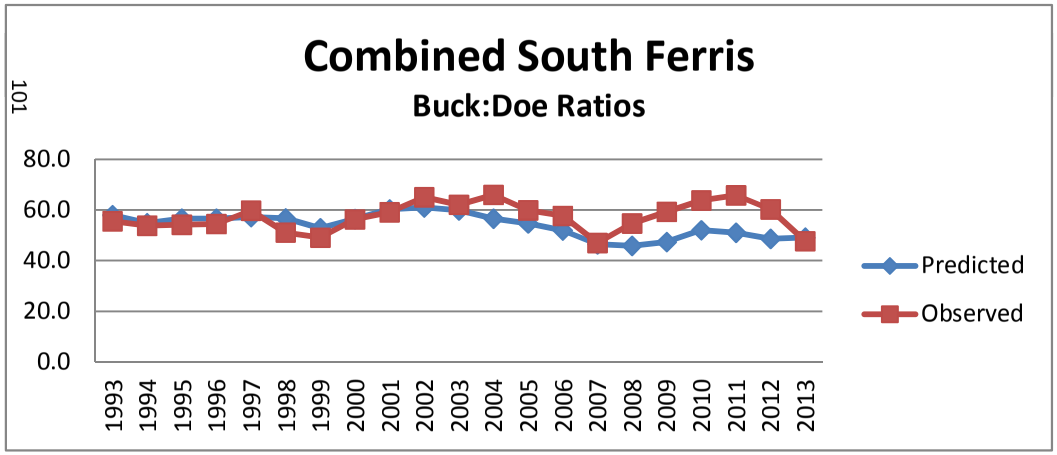


Comments:

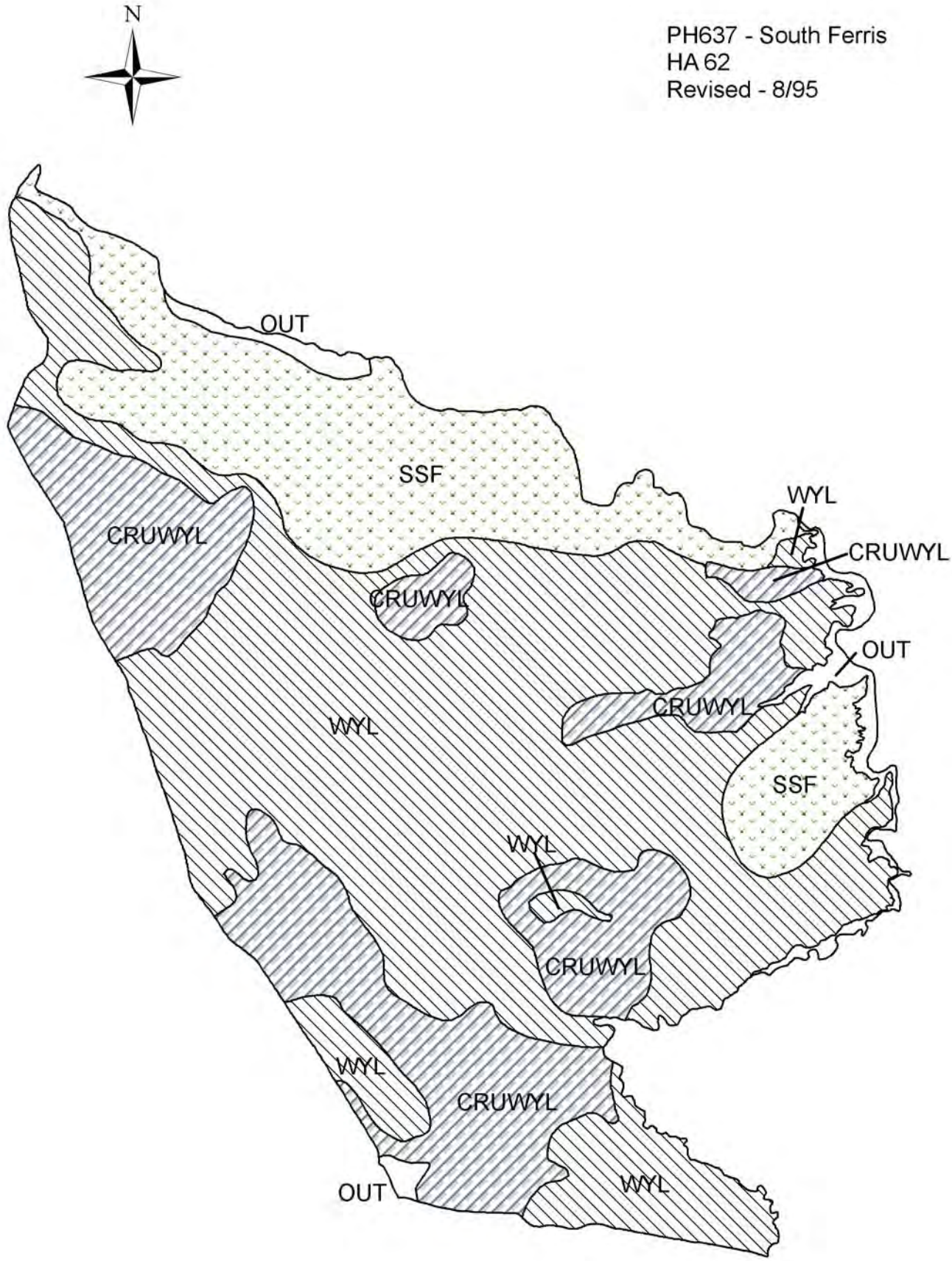
	West Model						East Model						Combined Models					
					10-Feb-14 AICc=149						27-Jan-14 AICc=158							
		PreSeason			Postseason	End-of-Year		PreSeason			Postseason	End-of-Year		PreSeason			Postseason	End-of-Year
Year	Fawn	Buck	Doe	Total	Population	Population	Fawn	Buck	Doe	Total	Population	Population	Fawn	Buck	Doe	Total	Population	Population
1993	1654	2028	3284	6967	6472	4992	366	736	1482	2584	2534	2028	2020	2765	4766	9551	9006	7020
1994	1640	1787	3105	6532	6162	5171	407	648	1339	2394	2358	1841	2047	2435	4444	8926	8520	7012
1995	1859	1898	3170	6926	6733	4938	427	586	1218	2231	2213	1698	2286	2484	4388	9158	8945	6636
1996	1911	1809	3030	6750	6561	4780	440	543	1121	2104	2084	1573	2352	2352	4151	8855	8646	6353
1997	1645	1760	2925	6330	6132	4508	503	506	1035	2044	2025	1476	2148	2266	3960	8374	8157	5984
1998	1197	1644	2774	5615	5355	3996	429	479	967	1875	1850	1368	1626	2123	3741	7490	7205	5364
1999	1401	1376	2540	5317	5073	4273	475	442	899	1816	1792	1608	1876	1818	3439	7133	6864	5881
2000	1469	1506	2681	5656	5370	4517	374	574	1002	1949	1922	1701	1842	2079	3684	7605	7292	6218
2001	1031	1655	2771	5458	5265	4408	296	636	1032	1963	1944	1758	1327	2291	3803	7421	7209	6166
2002	1107	1612	2708	5427	5154	4308	355	677	1046	2078	2051	1855	1462	2289	3754	7505	7205	6162
2003	722	1531	2691	4944	4697	3715	309	732	1086	2127	2103	1901	1032	2262	3777	7071	6800	5617
2004	1195	1228	2413	4836	4521	3785	569	763	1101	2433	2402	1768	1764	1990	3514	7268	6923	5553
2005	1409	1223	2486	5118	4735	3968	542	701	1031	2274	2236	1636	1951	1924	3518	7392	6971	5604
2006	800	1241	2647	4688	4338	3264	271	637	967	1874	1844	1537	1070	1878	3614	6562	6182	4801
2007	1047	901	2297	4245	3910	3262	346	593	914	1853	1820	1645	1393	1494	3211	6098	5729	4906
2008	1093	865	2331	4289	4016	3366	281	647	965	1893	1866	1686	1374	1513	3296	6182	5882	5052
2009	1504	920	2379	4803	4538	3836	384	672	980	2037	2010	1819	1888	1592	3360	6840	6548	5655
2010	1128	1156	2603	4888	4648	3437	368	741	1041	2151	2127	1924	1497	1898	3644	7039	6775	5361
2011	1114	979	2390	4482	4253	3101	532	798	1087	2417	2395	1669	1645	1776	3477	6899	6648	4770
2012	772	867	2172	3811	3563	2821	344	662	974	1979	1837	1434	1116	1529	3146	5790	5401	4255
2013	763	834	1931	3527	3445	2618	378	540	866	1783	1668	1282	1141	1373	2796	5310	5112	3900
2014	785	834	1732	3351	3297		322	452	804	1578	1514		1107	1286	2536	4929	4811	0




South Ferris Pronghorn
Combined West & East Models
Axis Title
12000
10000
8000
6000
4000
2000
0
1993 1995 1997 1999 2001 2003 2005 2007 2009 2011
End of Year Pop
Trend Counts
Line Transect Estimates


Combined South Ferris
Buck:Doe Ratios
80.0
60.0
40.0
20.0
0.0
1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013
Predicted
Observed

Trend Counts	LT Estim.	Buck/doe Ratios Predicte	Obs	Pop Obj
		58.0	55.6	6500
3499		54.8	53.8	6500
		56.6	54.2	6500
		56.7	54.5	6500
4336		57.2	59.8	6500
		56.8	51.1	6500
		52.9	49.1	6500
4238		56.5	56.3	6500
		60.2	59.1	6500
		61.0	65.1	6500
2511		59.9	62.1	6500
		56.6	66	6500
		54.7	59.9	6500
	6050	52.0	57.7	6500
		46.5	47	6500
		45.9	54.7	6500
	9642	47.4	59.3	6500
		52.1	63.8	6500
		51.1	65.8	6500
	4610	48.6	60.3	6500
		49.1	47.7	6500
		50.7		6500


N
PH637 - South Ferris
HA 62
Revised - 8/95
OUT
SSF
CRUWYL
CRUWYL
WYL
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OUT
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