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ACKNOWLEDGEMENT

The field data contained in these reports is the result of the combined efforts of the Lander Region Wildlife Division personnel including District Wildlife Biologists, District Game Wardens, the Habitat Biologist, the Wildlife Management Coordinator and Region Supervisor, and other Department personnel working at check stations. CWD technician, Clint Atkinson, collected CWD samples throughout the Region. The authors wish to express their appreciation to all those who assisted in data collection.

2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR615 - RED DESERT

HUNT AREAS: 60-61, 64

PREPARED BY: GREG HIATT

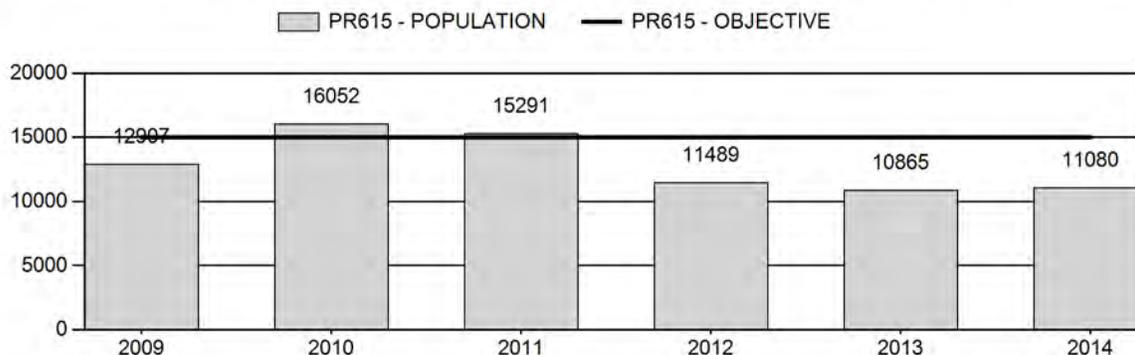
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	13,321	11,080	11,800
Harvest:	748	300	240
Hunters:	768	332	280
Hunter Success:	97%	90%	86%
Active Licenses:	838	354	280
Active License Success:	89%	85%	86%
Recreation Days:	2,285	1,321	740
Days Per Animal:	3.1	4.4	3.1
Males per 100 Females	62	49	
Juveniles per 100 Females	54	53	

Population Objective ($\pm 20\%$) :	15000 (12000 - 18000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-26.1%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/3/2015

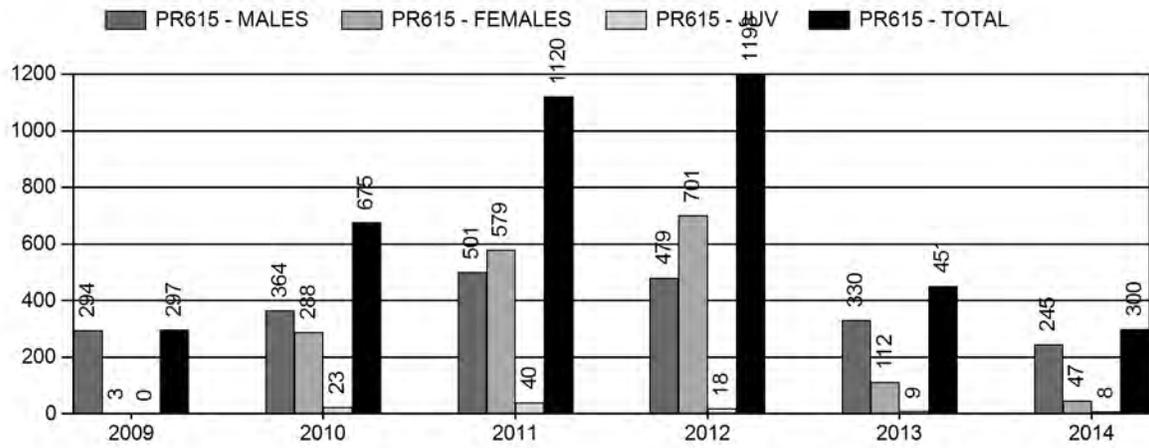
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1.5%	0.6%
Males ≥ 1 year old:	8.7%	6.5%
Juveniles (< 1 year old):	0.2%	0.5%
Total:	3.2%	2.0%
Proposed change in post-season population:	+0.8%	+6.5%

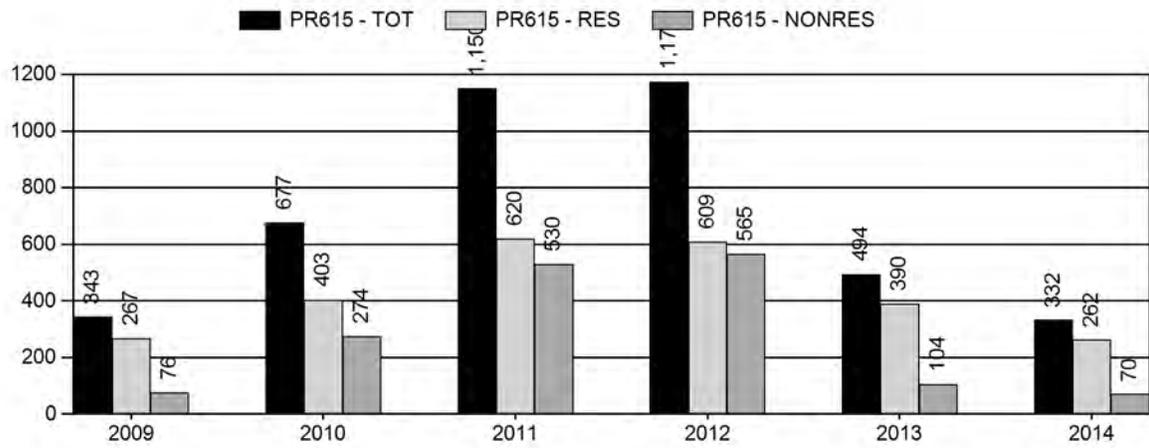
Population Size - Postseason



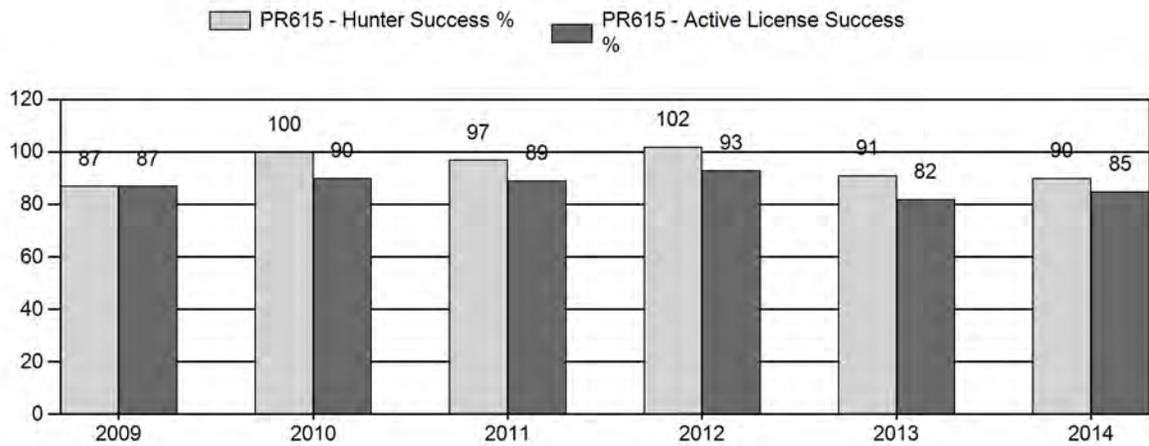
Harvest



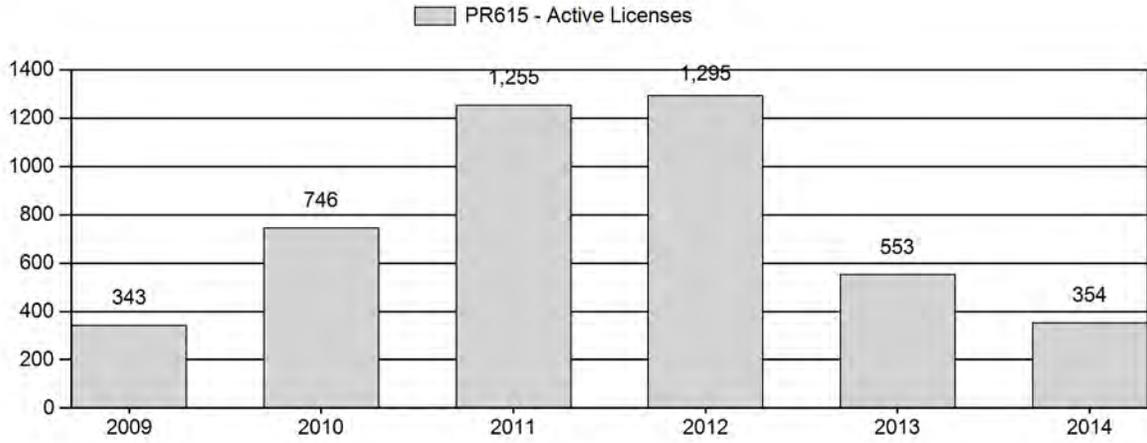
Number of Hunters



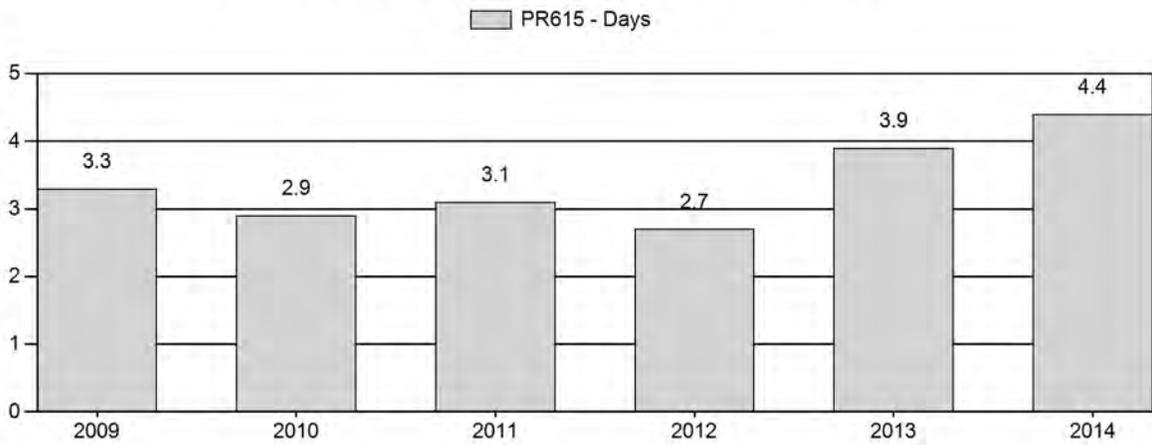
Harvest Success



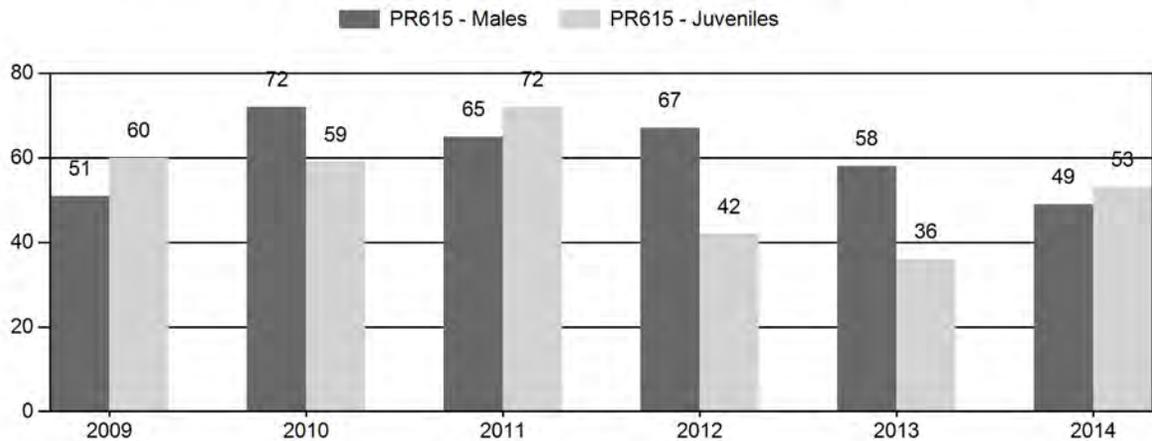
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR615 - RED DESERT

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	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	16,795	361	951	1,312	31%	1,823	43%	1,077	26%	4,212	2,595	20	52	72	± 4	59	± 3	34
2011	16,523	263	736	999	27%	1,540	42%	1,115	31%	3,654	2,650	17	48	65	± 4	72	± 4	44
2012	12,798	177	888	1,065	32%	1,600	48%	667	20%	3,332	2,103	11	56	67	± 4	42	± 3	25
2013	11,361	66	809	875	30%	1,517	52%	539	18%	2,931	1,629	4	53	58	± 3	36	± 3	23
2014	11,410	110	519	629	24%	1,285	49%	686	26%	2,600	1,535	9	40	49	± 3	53	± 4	36

**2015 HUNTING SEASONS
RED DESERT PRONGHORN HERD (PR615)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
60	1	Sep. 19	Oct. 31	50	Limited quota; any antelope
61	1	Sep. 12	Oct. 31	100	Limited quota; any antelope
	6	Sep. 12	Oct. 31	25	Limited quota; doe or fawn
64	1	Sep. 19	Oct. 31	100	Limited quota; any antelope
	6	Sep. 19	Oct. 31	25	Limited quota; doe or fawn
Archery					
60, 64		Aug. 15	Sep. 18		Refer to Section 2 of this Chapter
61		Aug. 15	Sep. 11		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
60	1	0
	6	-25
61	1	-50
	6	0
64	1	0
	6	-25
Total	1	-50
	6	-50

Management Evaluation

Current Management Objective: 15,000

Management Strategy: Special

2014 Postseason Population Estimate: ~11,100

2015 Proposed Postseason Population Estimate: ~11,800

The Red Desert pronghorn herd is managed toward a post-hunt population of 15,000 pronghorn, an objective last reviewed in 1994. Population size is estimated using a spreadsheet model developed in 2012 and updated in 2015. The herd is in special management, with harvest quotas designed to maintain pre-hunt buck:doe ratios above 60:100. Objectives for this herd are currently under public review, with no changes proposed.

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

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve fawn survival. Condition of pronghorn going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February. Losses may still be above average because many animals were dispersed off winter ranges prior to the late blizzards.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have improved due to improved precipitation in the latter half of the growing season. Only one shrub transect has been established near this herd unit, on the Chain Lakes WHMA, but was not read in 2014.

Habitat losses to uranium development have 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 improved to 53:100, near the five-year average for this herd after record lows in 2012 and 2013. Fawn production improved in all three hunt areas. As usual, production was lowest in Area 60 at 45:100. Production was similar between Areas 61 and 64, at 55:100 and 53:100 respectively.

The herd buck:doe ratio failed to meet the special management criterion of 60:100 for the second consecutive year, a result of poor recruitment from the 2012 and 2013 cohorts. None of the three hunt areas met the 60:100 criterion, ranging from 46:100 in Area 60 to 52:100 in Area 64.

Harvest Data

Hunter success improved slightly, to 85 percent, but was still below the five-year average of 88 percent. Hunter effort increased again, to a record high of 4.4 days per animal. Statistically, the past two years have seen the poorest hunting in this herd since it was delineated in 1976. Hunter success was highest in Area 60 and lowest in Area 64. The average days of effort required to

harvest an animal was a high in Area 61 and a near-record high in Area 64, but near normal levels in Area 60. The effort required to harvest on a Type 1 license in Area 61 was nearly twice that of either Area 60 or Area 64.

Population

The Time-Specific Juvenile & Constant Adult Survival (TSJ,CA) spreadsheet model provided the best fit with observed buck:doe ratios for this herd and behaved predictably when 2014 classification and harvest data were added. The model aligns with three out of five line transect estimates, but underestimates the two most recent. Because of these concerns, it is considered a “Fair” model of the herd. Annual adult survival was predicted at 89 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 2015 was projected to be near the five-year average and the model was run with median juvenile survival in 2015.

The model predicts the herd has been roughly 20 percent below objective for the past three years. Even with optimistic assumptions on fawn production and survival, the 2015 pre-hunt population should be less than seen in 2012 and herd growth will be minimal. Without major improvement in fawn production and survival, proposed reductions in harvest quotas for 2015 will provide minimal increase in herd 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 around 11,000.

With the population estimated to be 20 percent below objective and record poor harvest statistics, harvests need to be further reduced to allow the herd to recover. Proposed quotas for Type 6 doe/fawn licenses are eliminated in Area 60 and reduced to a minimal number in Area 64. Recommended quota for Type 1 licenses are also reduced in Area 61, where hunter effort was highest. With the projected harvest of roughly 205 bucks and 35 does and fawns, predicted herd size will increase by about 6 percent to 11,800 pronghorn. The herd is unlikely to reach objective in two or three years unless precipitation improves, raising both fawn production and survival.

INPUT	
Species:	Pronghorn
Biologist:	Greg Hiatt
Herd Unit & No.:	Red Desert
Model date:	02/23/15

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	Constant Juvenile & Adult Survival	225	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	232	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	88	

Clear form

Check best model to create report

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

Population Estimates from Top Model

Year	Predicted Prehunt Population (year /)		Predicted Posthunt Population (year /)		Predicted adult End-of-bio-year Pop (year /)		Total	Relative AICc	Fit	Notes	LT Population Estimate Field Est	Trend Count	Objective
	Juveniles	Total Males	Juveniles	Total Males	Total Males	Females							
1993	3802	2953	3737	2270	3716	6947	10664						15000
1994	3449	3642	3380	3062	3144	6111	9255						15000
1995	2806	3081	2783	2666	3263	6076	9339						15000
1996	3416	3198	3416	2769	2922	5835	8758						15000
1997	3122	2864	3122	2448	2593	5617	8210						15000
1998	3206	2541	3206	2126	3092	6211	9303			7414			15000
1999	3609	3030	3609	2616	4005	7217	11222						15000
2000	3774	3925	3759	3469	3597	6736	10334						15000
2001	3271	3525	3271	3177	3285	6454	9740			1700			15000
2002	2993	3219	2980	2765	3357	6474	9831						15000
2003	3402	3290	3386	2839	2974	5992	8966						15000
2004	4241	2915	4199	2463	4130	7063	11193						15000
2005	4324	4048	4303	3612	3798	6661	10459						15000
2006	3788	3722	3783	3288	3442	6382	9823						15000
2007	3166	3373	3166	2933	3039	6123	9162			1859			15000
2008	4026	2979	4026	2666	3622	6698	10321						15000
2009	3931	3550	3931	3227	4722	7805	12527						15000
2010	4519	4627	4493	4227	4386	7235	11621						15000
2011	5134	4299	5090	3748	4052	6358	10409			2911			15000
2012	2597	3971	2578	3447	3592	5903	9495						15000
2013	2056	3520	2046	3157	3206	5500	8706						15000
2014	2877	3142	2869	2873	3527	5779	9306						15000
2015	2945	3456	2939	3231									15000
2016													15000
2017													15000
2018													15000
2019													15000
2020													15000
2021													15000
2022													15000
2023													15000
2024													15000
2025													15000

Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.90		0.90	
1994	0.25		0.90	
1995	0.62		0.90	
1996	0.25		0.90	
1997	0.25		0.90	
1998	0.73		0.90	
1999	0.90		0.90	
2000	0.25		0.90	
2001	0.25		0.90	
2002	0.58		0.90	
2003	0.25		0.90	
2004	0.90		0.90	
2005	0.25		0.90	
2006	0.25		0.90	
2007	0.25		0.90	
2008	0.59		0.90	
2009	0.90		0.90	
2010	0.25		0.90	
2011	0.25		0.90	
2012	0.25		0.90	
2013	0.25		0.90	
2014	0.60		0.90	
2015	0.60		0.90	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:

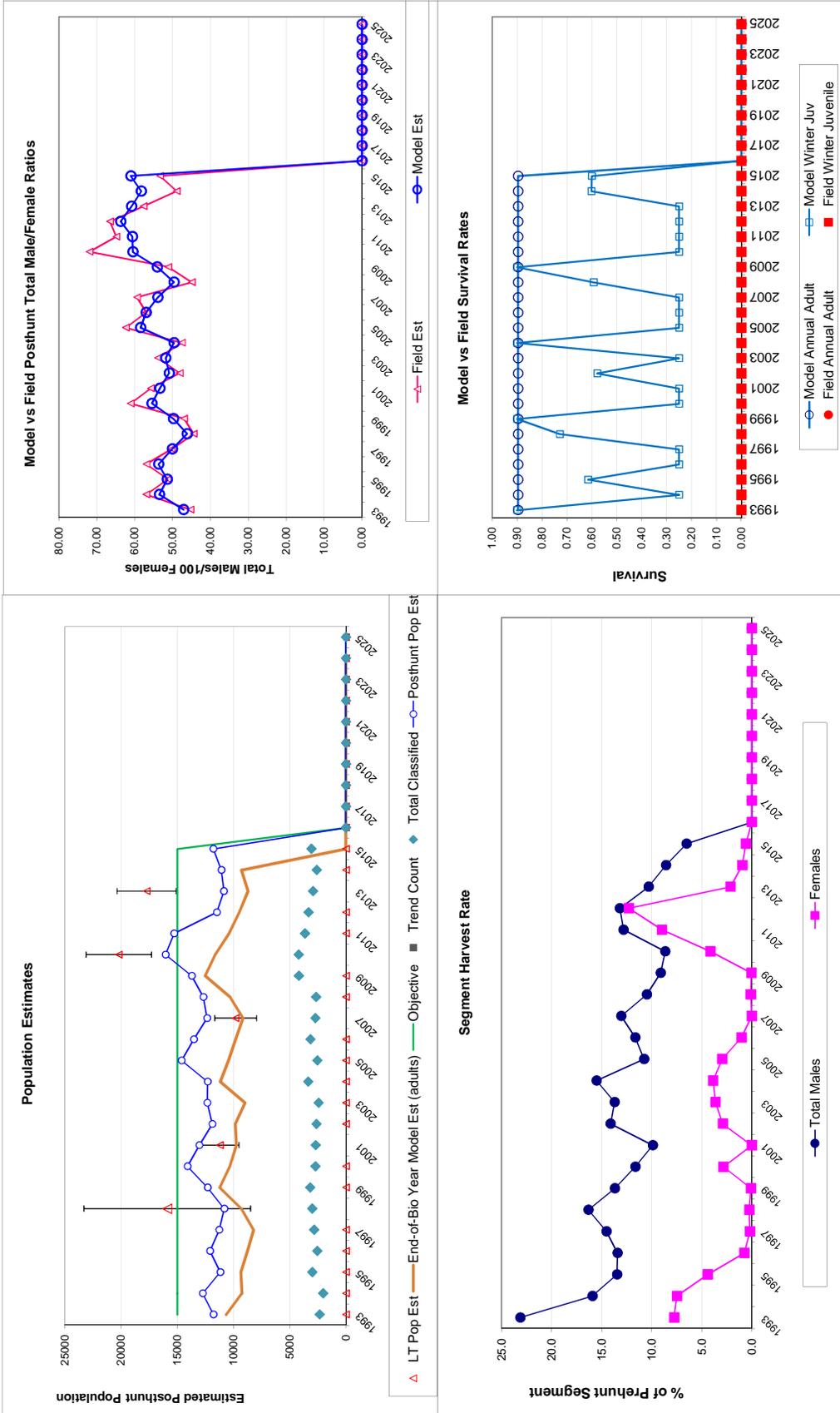
Adult Survival =	0.896
Initial Total Male Pop/10,000 =	0.295
Initial Female Pop/10,000 =	0.627

MODEL ASSUMPTIONS

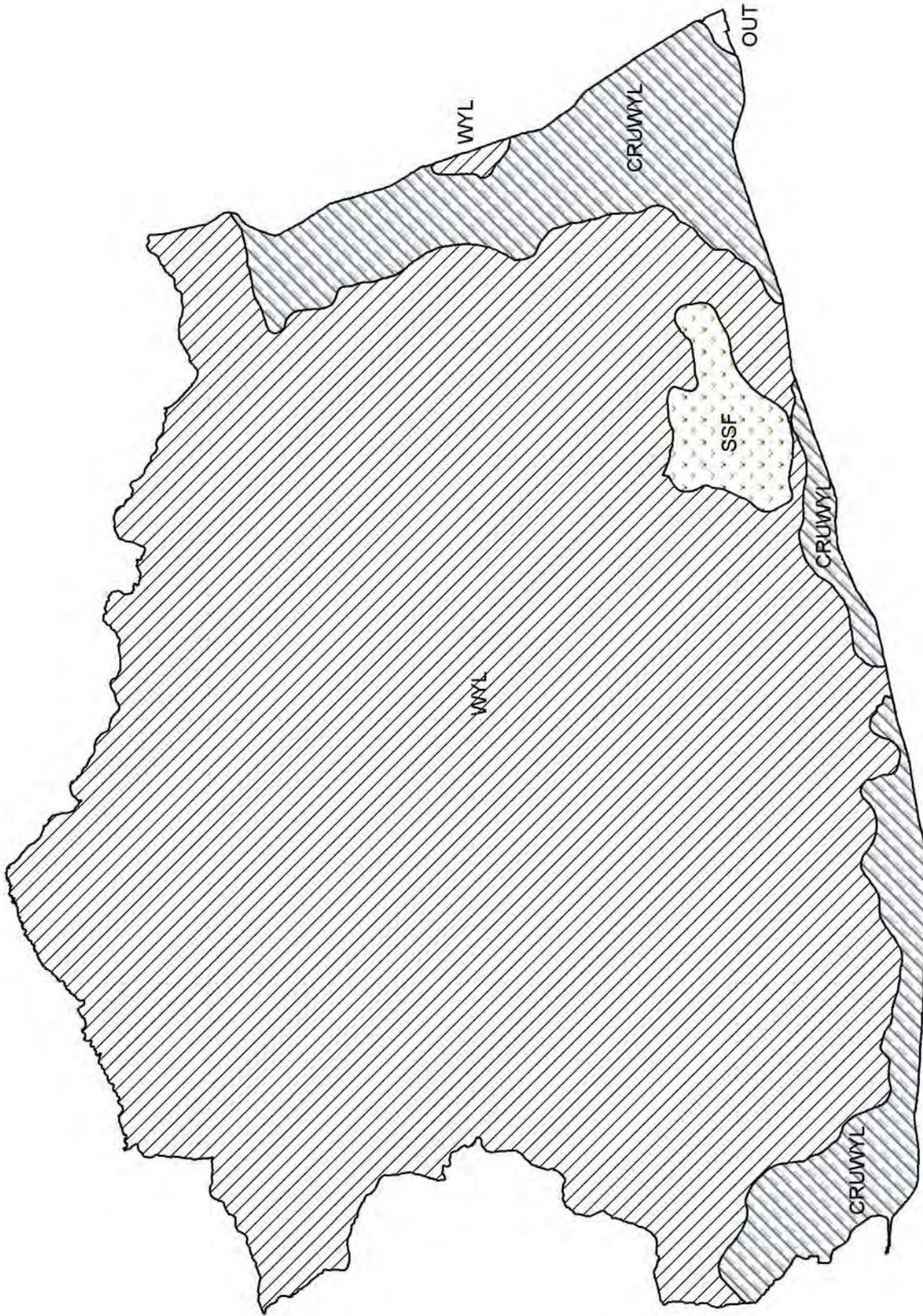
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%
Over-summer adult survival	98%

Year	Classification Counts				Harvest					
	Juvenile/Female Ratio		Total Male/Female Ratio		Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of	
	Derived Est	Field Est	Field Est	Field SE					Total Males	Females
1993	60.67	2.93	47.13	45.30	621	442	59	1122	23.1	7.8
1994	50.66	2.79	53.50	57.00	527	463	63	1053	15.9	7.5
1995	46.86	2.13	51.44	51.22	377	240	21	638	13.5	4.4
1996	57.37	2.75	53.70	56.95	390	41	0	431	13.4	0.8
1997	54.59	2.47	50.08	50.25	378	10	0	388	14.5	0.2
1998	58.25	2.49	46.17	44.44	377	13	0	390	16.3	0.3
1999	59.29	2.47	49.79	46.99	377	5	0	382	13.7	0.1
2000	53.36	2.54	55.49	61.11	415	183	14	612	11.6	2.8
2001	49.54	2.37	53.40	55.78	317	0	0	317	9.9	0.0
2002	47.33	2.28	50.90	48.14	413	167	12	592	14.1	2.9
2003	53.62	2.65	51.86	53.88	410	210	15	635	13.7	3.6
2004	72.22	2.85	49.64	47.58	411	207	38	656	15.5	3.9
2005	62.47	2.89	58.47	62.38	396	187	19	602	10.8	3.0
2006	58.03	2.50	57.01	57.01	394	61	5	460	11.6	1.0
2007	50.62	2.42	53.93	59.40	400	0	0	400	13.0	0.0
2008	67.09	2.99	49.64	44.94	284	6	0	290	10.5	0.1
2009	59.89	2.20	54.08	51.18	294	3	0	297	9.1	0.1
2010	59.08	2.27	60.50	71.97	364	288	23	675	8.7	4.1
2011	72.40	2.85	60.63	64.87	501	579	40	1120	12.8	9.0
2012	41.69	1.92	63.73	66.56			696	1190	13.2	12.3
2013	35.53	1.78	60.85	57.68			112	451	10.3	2.1
2014	53.39	2.52	58.30	48.95			47	300	8.6	1.0
2015	52.00	2.30	61.03	53.33			30	240	6.5	0.6
2016										
2017										
2018										
2019										
2020										
2021										
2022										
2023										
2024										
2025										

FIGURES



Comments:



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

2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR630 - IRON SPRINGS

HUNT AREAS: 52, 56, 108

PREPARED BY: GREG HIATT

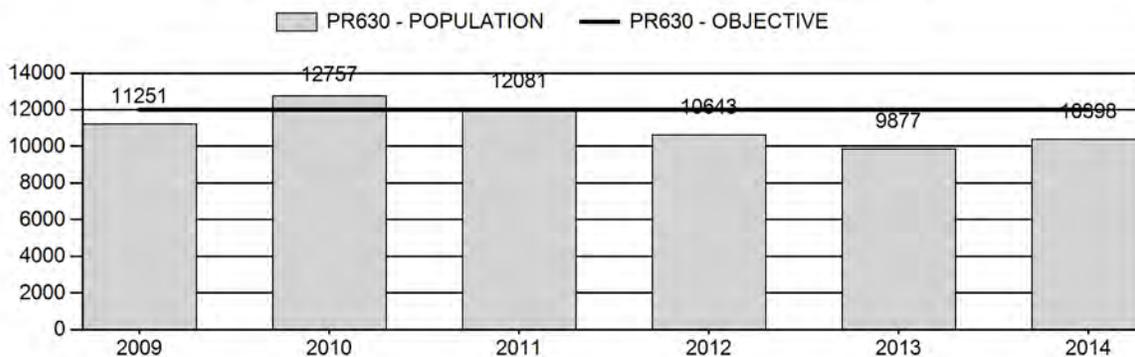
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	11,322	10,398	10,434
Harvest:	823	466	455
Hunters:	852	429	530
Hunter Success:	97%	109%	86 %
Active Licenses:	960	519	530
Active License Success:	86%	90%	86 %
Recreation Days:	2,858	1,424	1,520
Days Per Animal:	3.5	3.1	3.3
Males per 100 Females	44	45	
Juveniles per 100 Females	52	61	

Population Objective (± 20%) :	12000 (9600 - 14400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-13.4%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/3/2015

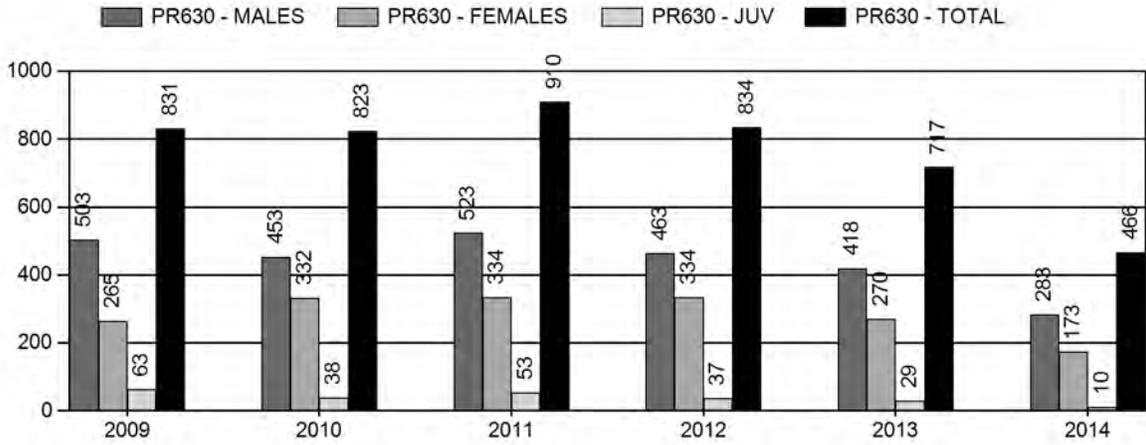
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3.1%	3.4%
Males ≥ 1 year old:	13.9%	9.6%
Juveniles (< 1 year old):	0.7%	0.7%
Total:	4.9%	4.2%
Proposed change in post-season population:	-4.5%	+0.3%

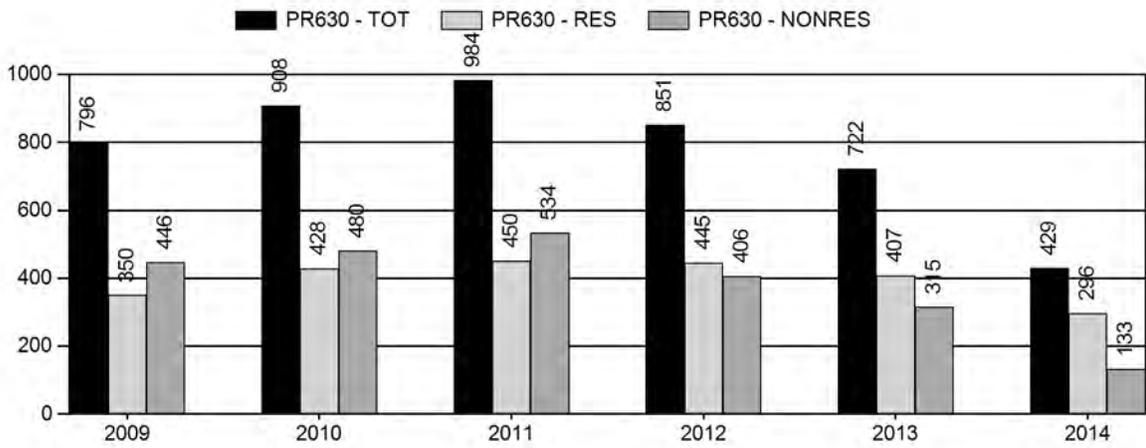
Population Size - Postseason



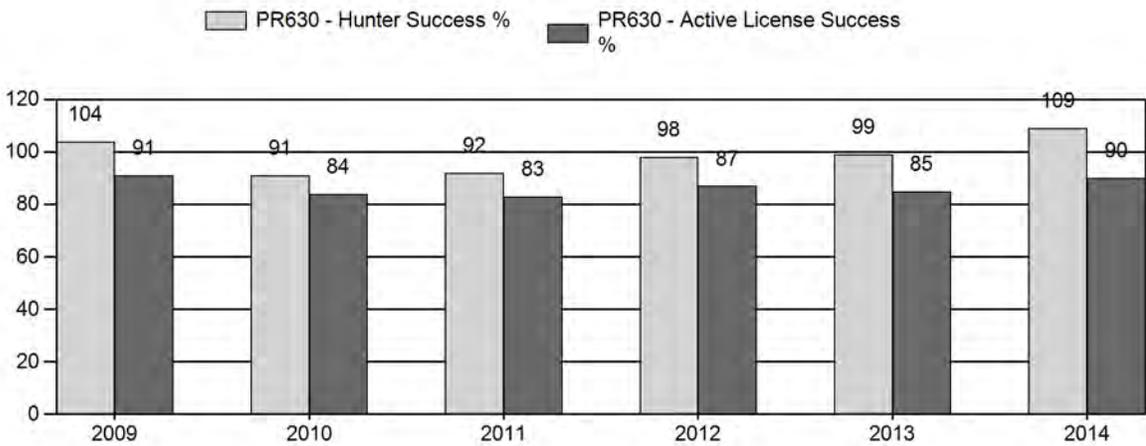
Harvest



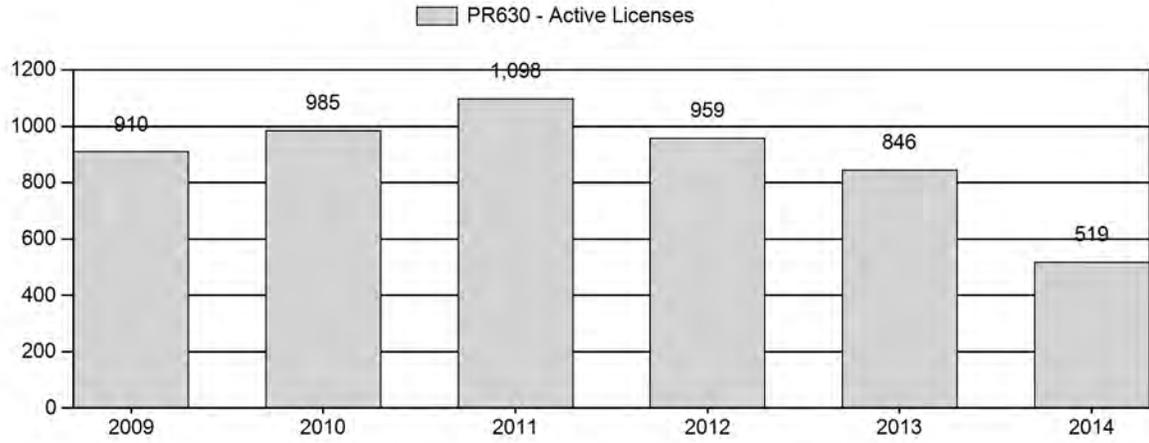
Number of Hunters



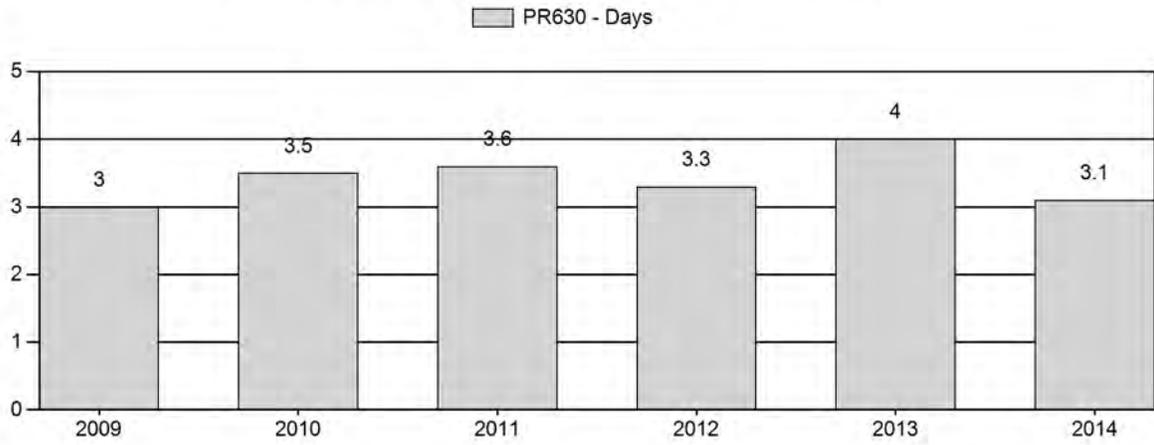
Harvest Success



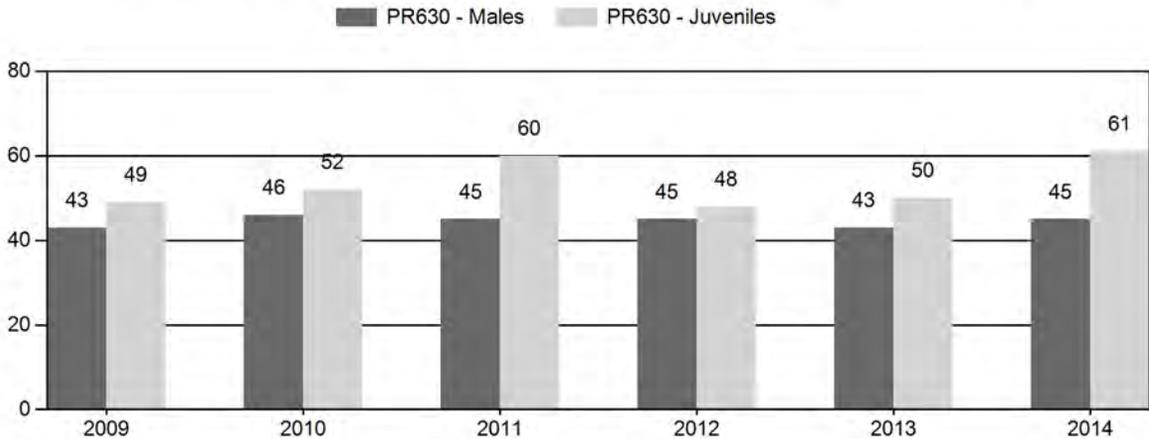
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR630 - IRON SPRINGS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	12,165	225	525	750	22%	1,764	52%	861	26%	3,375	1,343	13	30	43	± 3	49	± 3	34
2010	13,663	159	710	869	23%	1,874	50%	968	26%	3,711	1,477	8	38	46	± 3	52	± 3	35
2011	13,082	150	576	726	22%	1,627	49%	984	29%	3,337	1,791	9	35	45	± 3	60	± 3	42
2012	11,548	212	604	816	23%	1,801	52%	863	25%	3,480	1,295	12	34	45	± 3	48	± 3	33
2013	10,665	131	514	645	22%	1,488	52%	746	26%	2,879	1,336	9	35	43	± 3	50	± 3	35
2014	10,910	209	472	681	22%	1,518	49%	928	30%	3,127	1,823	14	31	45	± 3	61	± 4	42

**2015 HUNTING SEASONS
IRON SPRINGS PRONGHORN HERD (PR630)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
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. 14	50	Limited quota; any antelope
108	1	Sep. 20	Oct. 14	75	Limited quota; any antelope
	6	Sep. 20	Oct. 14	50	Limited quota; doe or fawn
	7	Sep. 20	Nov. 30	50	Limited quota; doe or fawn valid south of the Bridger Pass Road (B. L. M. Road 3301), east of the Continental Divide and north of the Miller Hill Road (Carbon County Road 505W)
Archery					
52		Aug. 15	Sep. 15		Refer to Section 2 of this Chapter
56, 108		Aug. 15	Sep. 19		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
52	1	0
	2	0
	6	0
	7	0
56	1	0
108	1	0
	6	0
	7	+50
Total	1&2	0
	6&7	+50

Management Evaluation

Current Management Objective: 12,000

Management Strategy: Recreation

2014 Postseason Population Estimate: ~10,400

2015 Proposed Postseason Population Estimate: ~10,430

The Iron Springs pronghorn herd is managed toward a post-hunt population size of 12,000 pronghorn, an objective last publicly reviewed in 1994. Population size is estimated using a spreadsheet model developed in 2012 and updated in 2015. The herd is in recreational management, with harvest quotas designed to maintain pre-hunt buck:doe ratios below 60:100. Objectives for this herd are currently under public review, with no changes proposed.

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. 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 through the northern half of the Iron Springs herd unit.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve fawn survival for the drier portions of the herd. Condition of pronghorn going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with

unusually warm periods, but little significant snowfall until late February. Losses may still be above average because some animals were dispersed off winter ranges prior to the late blizzards.

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 increased in 2014 but was still the second smallest sample in 11 years. Area 52 followed this pattern. Classification sample size also increased for Area 56, but the five smallest samples ever collected from that area were in the past five years. Only Area 108 had a sample size that remained relatively stable over the past five years.

With increased precipitation during the latter half of the summer, fawn production improved to 61 fawns:100 does, the highest since 2005. As is typical, fawn production was lowest in Area 56 at 36:100. Production improved in Area 52 to 76:100, the highest recorded for that area since 2001. Fawn production in Area 108 remained stable at 42:100, for the third consecutive year.

The buck:doe ratio improved slightly in 2014 to 45:100, mostly from an increased number of yearling bucks in the sample, but has varied little in the past six years. The yearling buck:doe ratio for this herd was the highest in seven years, suggesting fawn survival through the 2013-14 winter was high. Yearling buck:doe ratios were similar for Areas 52 and 108, and above the recent 5-year averages. But Area 56 had a record low yearling buck:doe ratio, at 5:100, a consequence of the extremely poor 15:100 fawn:doe ratio recorded in that area in 2013. Adult buck:doe ratios declined in all three hunt areas, were highest in Area 52 and lowest in Area 56. If

access continues to be denied after the wind project is constructed, buck:doe ratios will be expected to rise in Area 56 and may exceed the maximum for recreational management. Overall, buck:doe ratios for this herd over the past eight years have been less than would be desired in areas with large blocks of public land.

Harvest Data

With the reduction in license quotas in 2014, hunter success increased to its highest level in five years, and the average number of days hunted for each pronghorn harvest dropped to its lowest level in five years. Hunter success increased for almost all license types in each of the three areas. Success was lowest for the Type 6 licenses in Area 108, at only 81 percent. Type 2 and Type 7 hunters in the southern portion of Area 52 fared better, with 86 and 87 percent respectively.

Surprisingly, the average number of days of effort required to harvest an animal was lowest in Area 56, where access is most difficult. Necessary effort was highest for hunters with Type 2 licenses in the southern portion of Area 52.

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 ~40 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 and 2013.

Prior to the development of a reasonable spreadsheet model in mid-2012, population estimates suggested this herd was roughly at objective size through 2011. According to the spreadsheet model and a line transect survey flown in spring of 2012, the herd fell below objective in 2012. Continued doe/fawn harvest and poor fawn production have kept the herd at that level, roughly 17 percent below objective.

The Time-Specific Juvenile & Constant Adult Survival (TSJ/CA) spreadsheet model provided the best fit with observed buck:doe ratios for this herd and all three line transect estimates. It behaved predictably when 2014 classification and harvest data were added and is considered a "Fair" model of the herd. Annual adult survival is predicted at 90 percent, a reasonable value. 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 well above a 1993 line transect estimate. Both models generated roughly stable buck:doe estimates that did not track major dips and rises of observed values. Fawn production in 2015 was projected near the 5-year average. The model was run using a median juvenile survival in 2015.

Management Evaluation

With the population estimated to be more than 15 percent below objective, harvests should remain conservative to allow the herd to slowly recover. Recommended quotas were the same as in 2014 for all license types in Areas 52 and 56. To address concerns over high numbers of pronghorn in a localized area, 50 doe/fawn licenses were added for a portion of Area 108 using boundaries employed for the same purpose in 2003.

If fawn production and survival are near predicted levels, the expected harvest of roughly 255 bucks and 200 does and fawns from the 2015 license quotas should allow the herd to increase slightly, nearing 10,500 pronghorn.

Opening dates for licenses in Area 52 are the same as in 2013 and 2014 and coincide with seasons in neighboring Areas 50 and 51. As in the previous two years, 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 16 years and coincide with neighboring Areas 53 and 55 of the Baggs herd. Closing dates for most license types in Areas 56 and 108 are again extended to the end of October. Closing date for the new Type 7 doe/fawn licenses in a limited portion of Area 108 is extended to the end of November. Archery seasons use standardized opening dates and close the day before the regular season opens for each area.

INPUT
 Species: Pronghorn
 Biologist: Greg Hlatt
 Herd Unit & No.: 630 = Iron Springs
 Model date: 03/27/15

MODELS SUMMARY		Fit	Relative AICs	Notes
CJ,CA	Constant Juvenile & Adult Survival	100	109	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	106	126	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	30	136	

Year	Predicted Prehunt Population (year t)			Predicted Posthunt Population (year t)			Population Estimates from Top Model			Predicted adult End-of-bio-year Pop (Year t)			LT Population Estimate		Trend Count	Objective
	Juveniles	Total Males	Females	Juveniles	Total Males	Females	Total	Total Males	Females	Total	Total Males	Females	Total Adults	Field Est		
1993	2698	2925	5750	2620	2141	5285	11373	10045	3081	5996	9077	9382	1581	12000		
1994	3423	3019	5877	3321	2328	5421	12319	11070	2836	5697	8533			12000		
1995	2285	2780	5583	2207	2117	5180	10648	9505	2433	5268	7700			12000		
1996	2950	2384	5162	2896	1848	4977	10497	9722	2727	5633	8360			12000		
1997	2325	2673	5520	2292	2209	5424	10518	9925	2316	5303	7619			12000		
1998	2977	2270	5197	2953	1812	5135	10443	9900	2821	5909	8730			12000		
1999	3773	2765	5791	3760	2317	5704	12329	11781	3555	6698	10253			12000		
2000	3976	3484	6564	3966	3038	6480	14024	13484	3783	6977	10760			12000		
2001	4217	3707	6837	4200	3273	6761	14761	14234	4883	8119	13003			12000		
2002	4878	4786	7957	4861	4326	7831	17620	17017	4657	7905	12562			12000		
2003	4242	4564	7747	4219	3870	7553	16552	15641	4114	7543	11656			12000		
2004	4812	4031	7392	4791	3317	7221	16235	15329	3694	7329	11023			12000		
2005	4687	3620	7183	4668	2870	6887	15490	14525	4493	8325	12818			12000		
2006	4658	4403	8159	4625	3577	7941	17219	16143	3890	7954	11844			12000		
2007	4644	3812	7795	4613	3094	7585	16251	15292	3584	7754	11338			12000		
2008	3699	3512	7599	3667	3154	7441	14810	14282	3415	7366	10781	13621	1158	12000		
2009	3523	3347	7219	3454	2794	6927	14089	13175	3240	7057	10296			12000		
2010	3572	3175	6916	3530	2677	6550	13663	12757	2928	6493	9421			12000		
2011	3849	2869	6364	3790	2294	5996	13082	12081	2752	6105	8858			12000		
2012	2867	2697	5963	2825	2192	5625	11548	10643	2443	5622	8065			12000		
2013	2762	2394	5509	2730	1934	5212	10665	9877	2424	5404	7929			12000		
2014	3238	2376	5296	3227	2065	5106	10910	10398	2718	5480	8198			12000		
2015	2900	2664	5370	2878	2383	5172	10934	10434						12000		
2016														12000		
2017														12000		
2018														12000		
2019														12000		
2020														12000		
2021														12000		
2022														12000		
2023														12000		
2024														12000		
2025														12000		

Survival and Initial Population Estimates

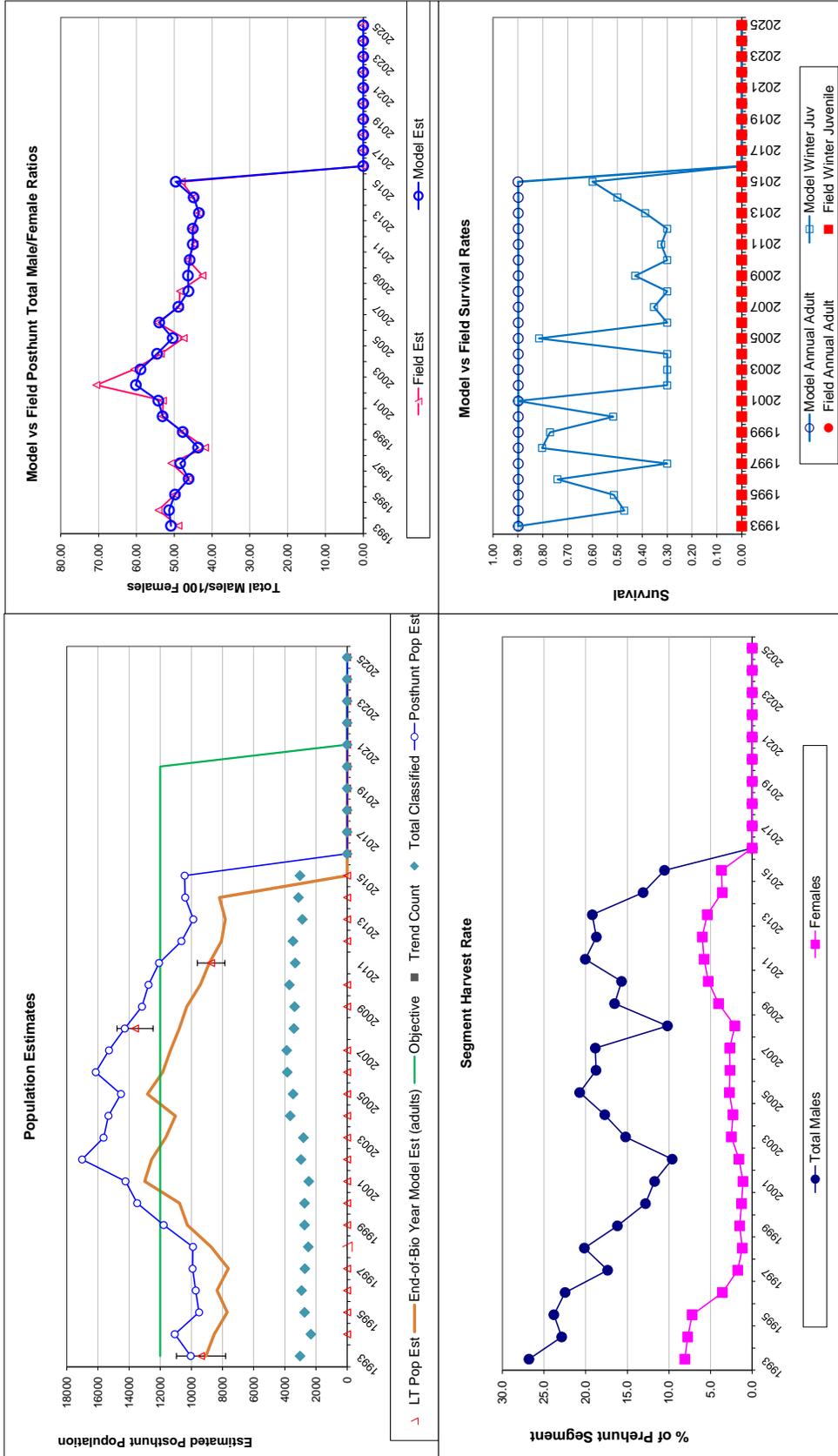
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.90		0.90	
1994	0.47		0.90	
1995	0.51		0.90	
1996	0.74		0.90	
1997	0.30		0.90	
1998	0.80		0.90	
1999	0.77		0.90	
2000	0.52		0.90	
2001	0.90		0.90	
2002	0.30		0.90	
2003	0.30		0.90	
2004	0.30		0.90	
2005	0.81		0.90	
2006	0.30		0.90	
2007	0.35		0.90	
2008	0.30		0.90	
2009	0.43		0.90	
2010	0.30		0.90	
2011	0.32		0.90	
2012	0.30		0.90	
2013	0.39		0.90	
2014	0.50		0.90	
2015	0.60		0.90	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Adult Survival =		0.899
Initial Total Male Pop/10,000 =		0.292
Initial Female Pop/10,000 =		0.575

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

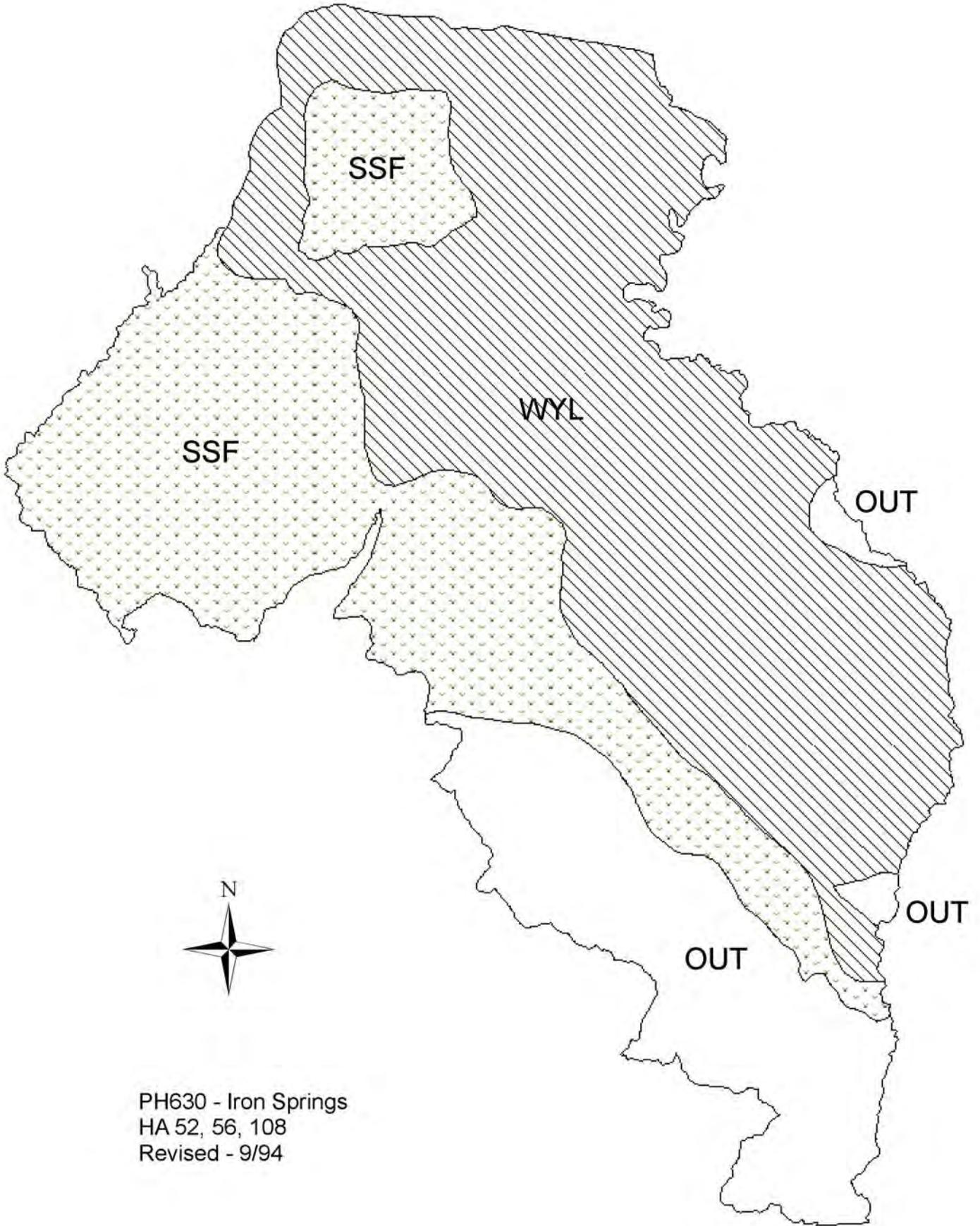
Year	Classification Counts						Harvest						
	Juvenile/Female Ratio			Total Male/Female Ratio			Total Harvest			Segment Harvest Rate (% of			
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females	
1993		46.93	2.11	50.87	48.87	2.17	713	423	71	1207	26.8	8.1	
1994		58.25	2.90	51.37	54.15	2.76	628	414	93	1135	22.9	7.7	
1995		40.93	2.01	49.79	49.79	2.28	602	366	71	1039	23.8	7.2	
1996		57.15	2.50	46.18	46.18	2.17	487	168	49	704	22.5	3.6	
1997		42.12	2.06	48.42	50.78	2.33	422	87	30	539	17.4	1.7	
1998		57.29	2.68	43.68	41.83	2.17	416	56	22	494	20.2	1.2	
1999		60.58	2.89	47.74	47.74	2.34	407	79	12	498	16.2	1.5	
2000		61.67	2.76	53.08	53.08	2.52	406	76	9	491	12.8	1.3	
2001		61.87	2.95	54.22	52.96	2.66	395	69	15	479	11.7	1.1	
2002		61.30	2.78	60.14	70.60	3.07	418	115	15	548	9.6	1.6	
2003		54.75	2.55	58.91	60.58	2.73	631	176	21	828	15.2	2.5	
2004		65.09	2.53	54.54	53.56	2.22	649	155	19	823	17.7	2.3	
2005		65.26	2.57	50.40	47.49	2.07	682	178	17	877	20.7	2.7	
2006		57.10	2.22	53.96	54.40	2.15	751	198	30	979	18.8	2.7	
2007		59.57	2.26	48.90	48.58	1.97	653	191	28	872	18.8	2.7	
2008		48.67	2.04	46.22	48.50	2.04	325	144	11	480	10.2	2.1	
2009		48.81	2.03	46.37	42.52	1.85	503	265	63	831	16.5	4.0	
2010		51.65	2.04	45.91	46.37	1.90	453	332	38	823	15.7	5.3	
2011		60.48	2.44	45.09	44.62	1.99	523	334	53	910	20.0	5.8	
2012		47.92	1.98	45.08	45.31	1.91	523	334	326	823	18.7	6.0	
2013		50.13	2.25	43.45	43.35	2.04	435	270	270	717	19.2	5.4	
2014		61.13	2.55	44.86	44.86	2.07	486	173	173	466	13.1	3.6	
2015		54.00	2.35	49.60	48.00	2.18	486	173	173	466	10.5	3.7	
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

FIGURES



Comments:

END



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

2014 - JCR Evaluation Form

SPECIES: Pronghorn

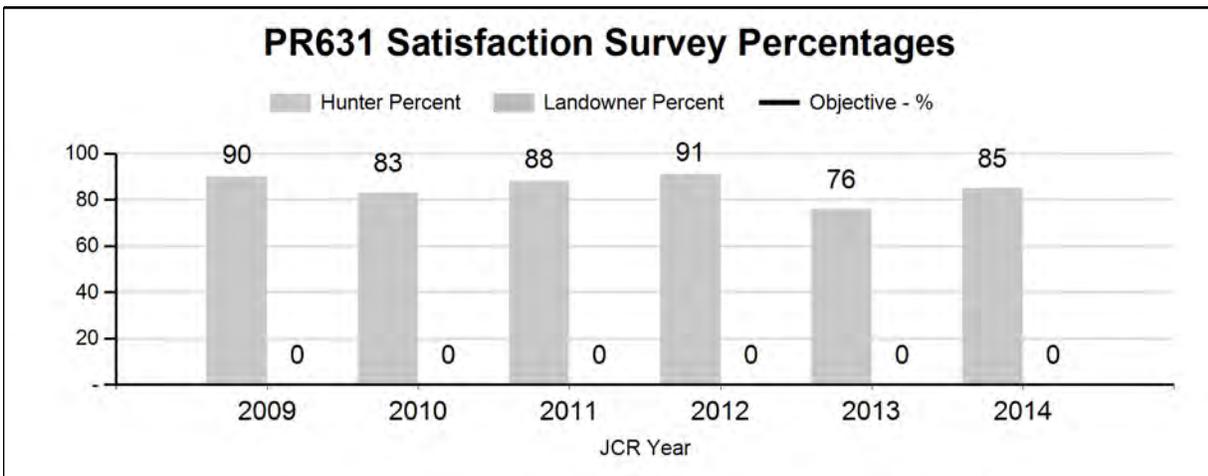
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HERD: PR631 - WIND RIVER

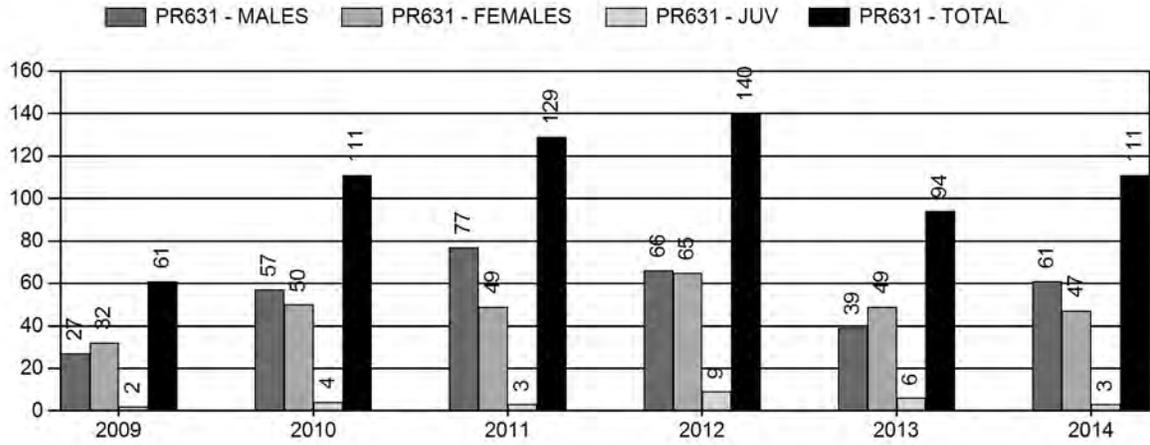
HUNT AREAS: 84

PREPARED BY: GREG ANDERSON

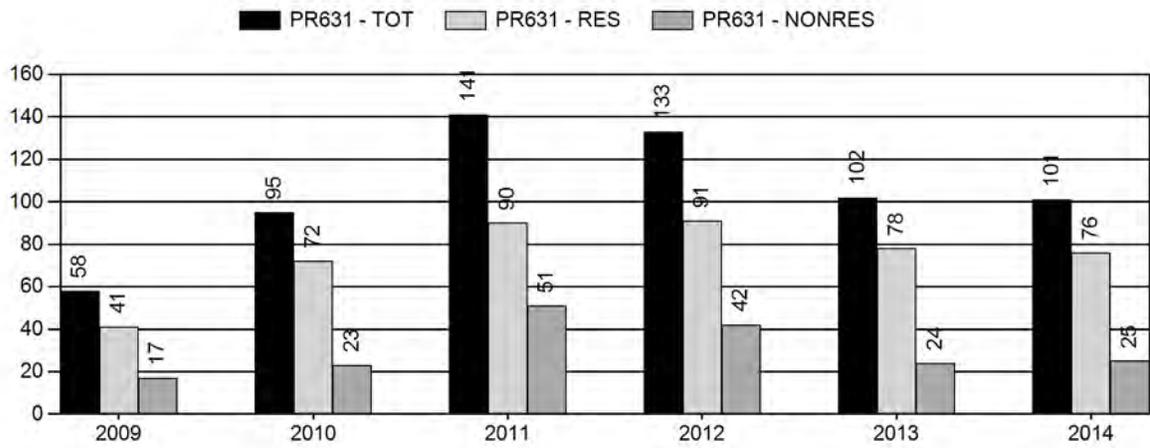
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent	85%	85%	85%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	107	111	120
Hunters:	106	101	110
Hunter Success:	101%	110%	109 %
Active Licenses:	132	130	140
Active License Success:	81%	85%	86 %
Recreation Days:	571	522	550
Days Per Animal:	5.3	4.7	4.6
Males per 100 Females:	32	20	
Juveniles per 100 Females	48	24	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			N/A%
Number of years population has been + or - objective in recent trend:			1



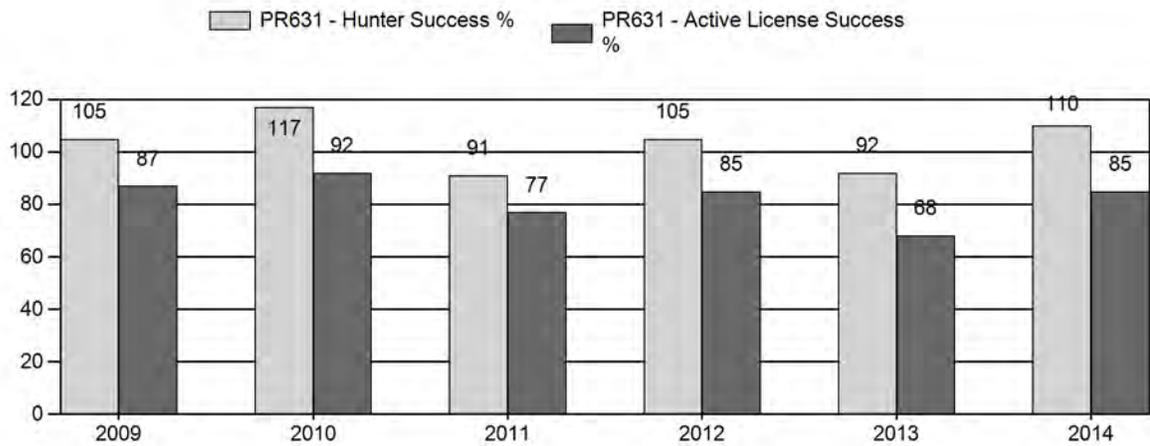
Harvest



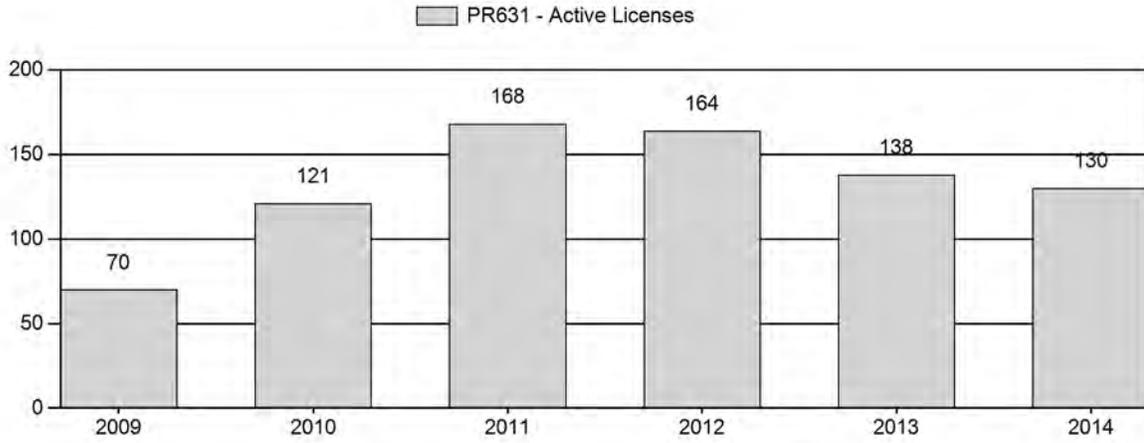
Number of Hunters



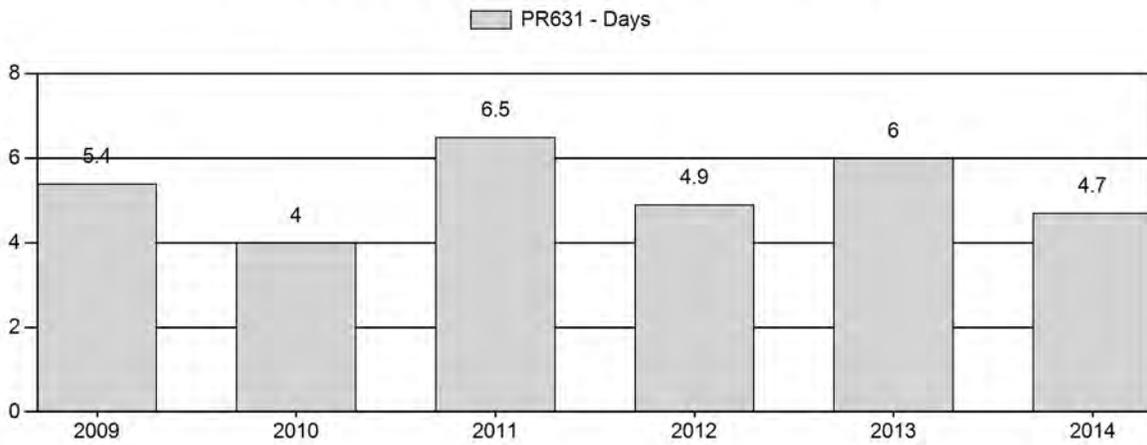
Harvest Success



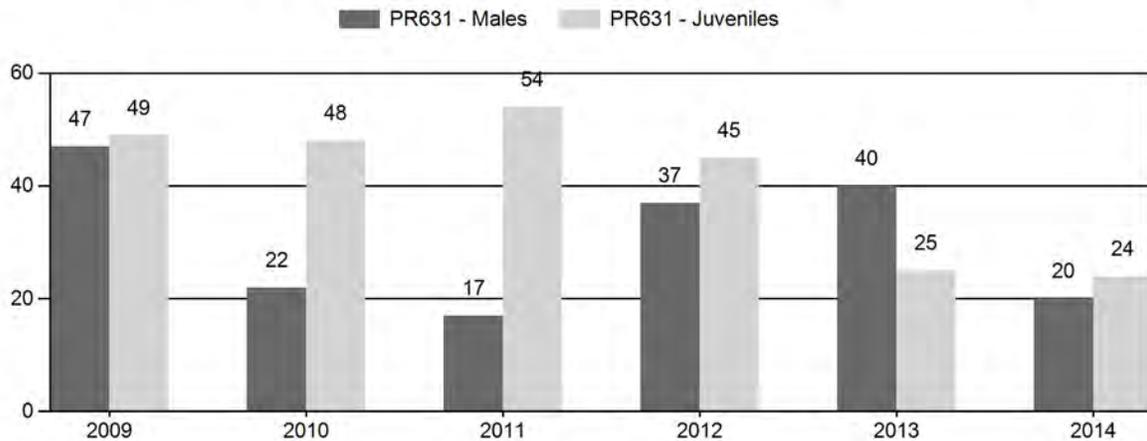
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR631 - WIND RIVER

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	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	0	7	15	22	14%	110	70%	26	16%	158	0	6	14	20	± 0	24	± 0	20

**2015 HUNTING SEASONS
WIND RIVER PRONGHORN (PR 631)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
84	1	Sep. 19	Oct. 22	100	Limited quota; any antelope
	6	Sep. 19	Oct. 22	75	Limited quota; doe or fawn
Archery		Aug. 15	Sep. 18		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
84	1	+25
Total	1	+25

Management Evaluation

Current Management Objective: Hunter Satisfaction 60%

Management Strategy: Recreational

2014 Hunter Satisfaction: 85%

3 year Average Hunter Satisfaction: 84%

Management Issues

The Wind River pronghorn management objective was reviewed and updated in 2014. The previous objective of 400 antelope had been in place since 1994. Due to a number of factors it was never possible to accurately estimate the antelope population in this herd. In response, the Department adopted an objective of maintaining 60% hunter satisfaction. Unlike other herd units with a satisfaction objective, the objective for this herd does not include a landowner satisfaction component for reasons outlined in the objective proposal. In conjunction with hunter satisfaction, this herd is managed for recreational opportunity.

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 mild conditions and good vegetation growth throughout the herd unit. Vegetation transects monitored to determine the amount of forage available on elk winter range revealed herbaceous vegetation production was well above levels observed over the

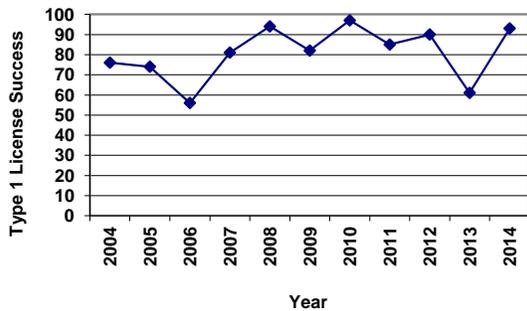
previous 2 years and was higher than the 20 year average for the area. No shrub data is collected in the herd unit, but the good growing conditions undoubtedly resulted in higher browse production than the previous 3 droughty years. Given the good feed resource in 2014, antelope in the herd unit undoubtedly entered winter in good shape. Fall weather was mild followed by significant snow and cold temperatures in December and January. After January, temperatures moderated and snow cover receded. Given mild to average winter conditions and excellent feed availability, antelope survival in 2014/15 is expected to be good.

Field/Harvest Data/Population

Classification samples have been collected from the ground and have been low over the past 4 years. Prior to that, classification data was collected aerially and sample sizes were much higher. In 2014 the classification sample was 158 antelope. Low classification samples are likely to remain the rule as long as ground classifications are conducted. Terrain, topography, and access to antelope summer range in the herd unit create difficulties. That said, the classification sample in 2014 yielded a very low fawn/doe ratio at 24/100. The buck/doe ratio was also extremely low at 20/100. Similar ratios were observed in 2013, but the sample size was even lower with only 86 antelope observed. Recent classification ratios should be viewed very skeptically given the low sample sizes.

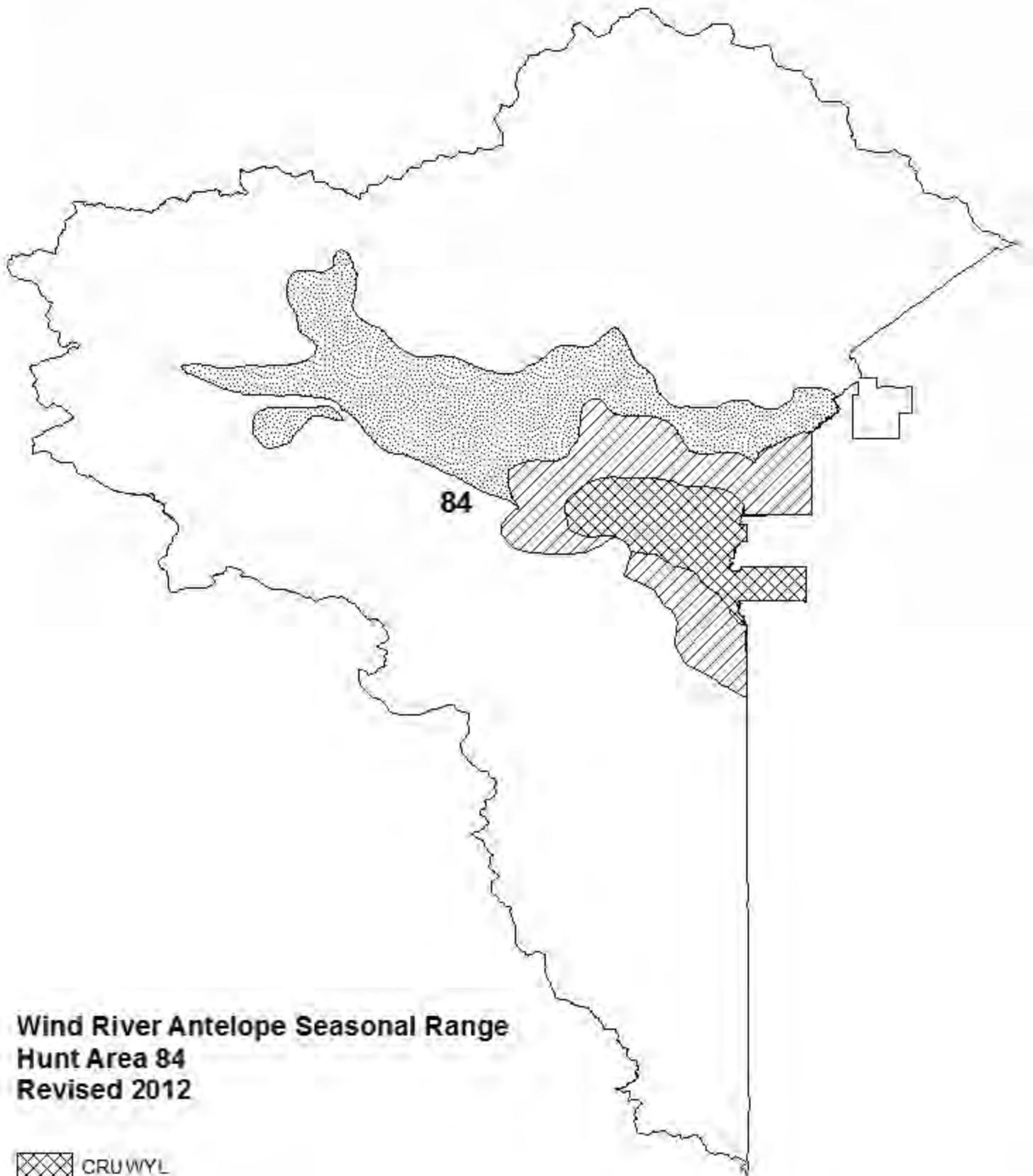
Despite the low buck/doe ratio observed during classification surveys, Type 1 license success was 93% in 2014. This was a significant increase over the 2013 success rate of 61%. It was also well above the 5 year average of 83%. The days/animal declined substantially from 7.1 in 2013 to 4.3 in 2014. Both of these statistics indicate hunters had an easier time harvesting an antelope in 2014. In conjunction with the higher success rate, hunter satisfaction increased from 76% in 2013 to 85% in 2014. The 2014 satisfaction rate was the same as the 5 year average for the herd unit.

Figure 1. Type 1 license success in the Wind River Antelope Herd



Management Summary

Given scarce demographic data it is difficult to determine trends 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, then increase again in 2014. Since hunter success and satisfaction both increased in 2014, additional recreational opportunity can be provided in 2015. In response to the increased satisfaction, Type 1 licenses will be increased by 25 in 2015.



84

**Wind River Antelope Seasonal Range
Hunt Area 84
Revised 2012**

-  CRUWYL
-  OUT
-  SSF
-  WYL
-  YRL



2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR632 - BEAVER RIM

HUNT AREAS: 65-69, 74, 106

PREPARED BY: STAN HARTER

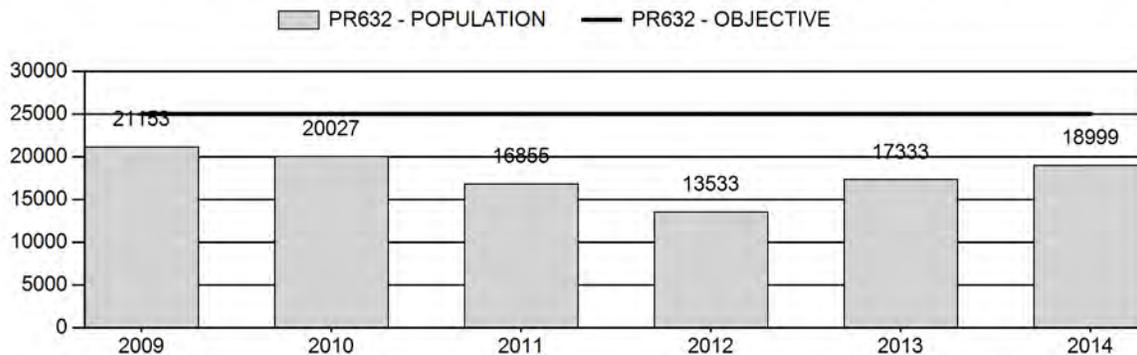
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	17,780	18,999	19,029
Harvest:	2,399	1,061	1,290
Hunters:	2,443	1,091	1,425
Hunter Success:	98%	97%	91%
Active Licenses:	2,747	1,212	1,400
Active License Success:	87%	88%	92%
Recreation Days:	7,751	3,746	4,000
Days Per Animal:	3.2	3.5	3.1
Males per 100 Females	54	55	
Juveniles per 100 Females	58	68	

Population Objective (± 20%) :	25000 (20000 - 30000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-24.0%
Number of years population has been + or - objective in recent trend:	7
Model Date:	2/25/2015

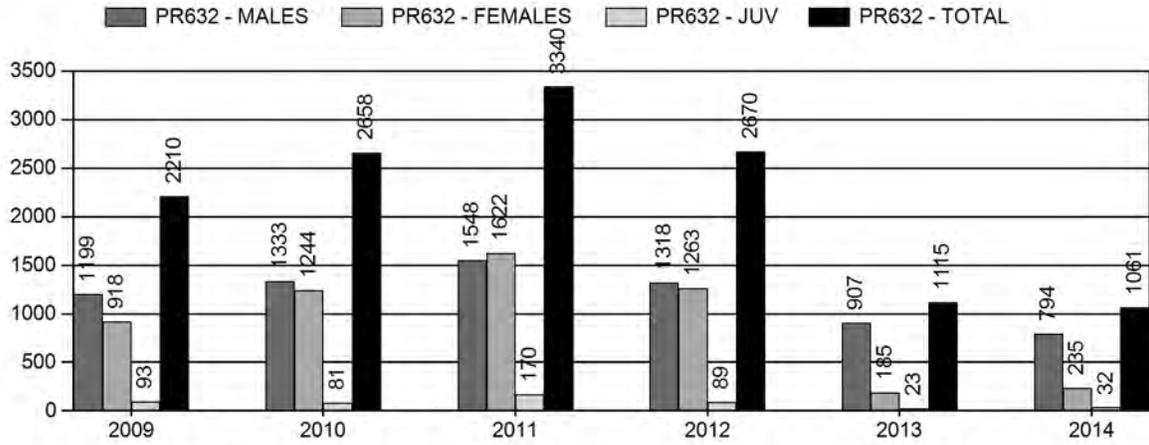
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	2.8%	3.2%
Males ≥ 1 year old:	18.8%	23.4%
Juveniles (< 1 year old):	0.2%	0.2%
Total:	5.3%	6.8%
Proposed change in post-season population:	+7.4%	+0.2%

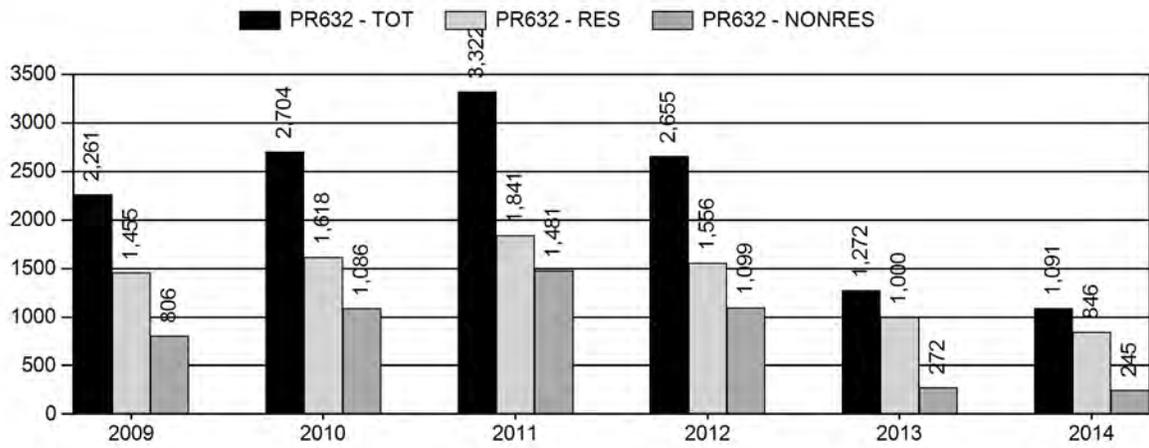
Population Size - Postseason



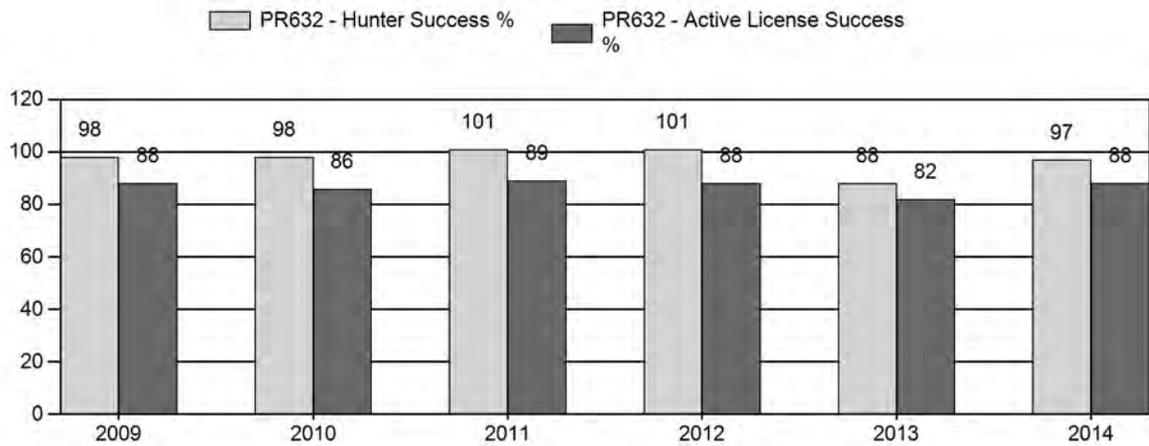
Harvest



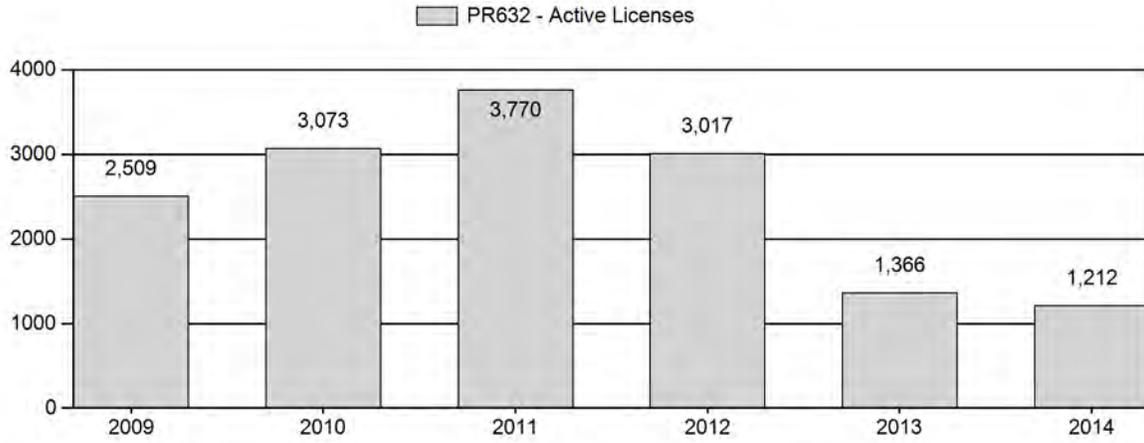
Number of Hunters



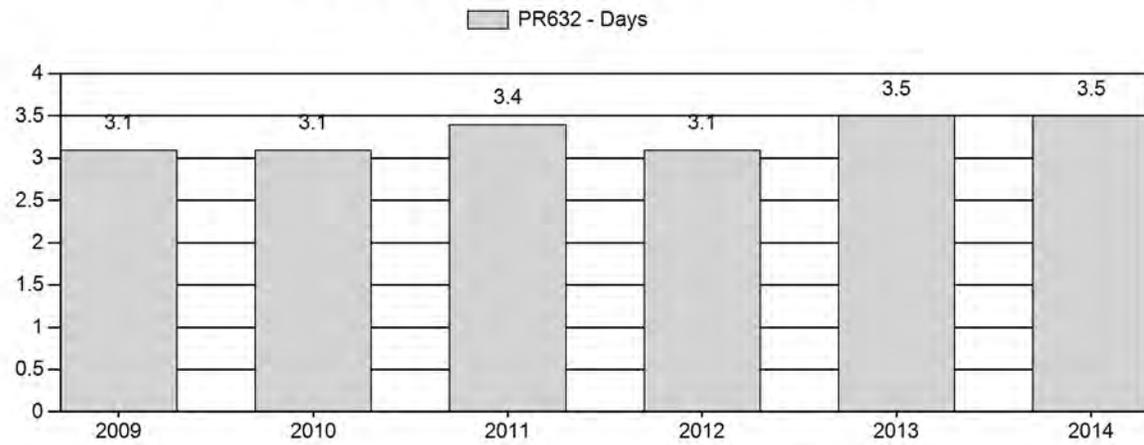
Harvest Success



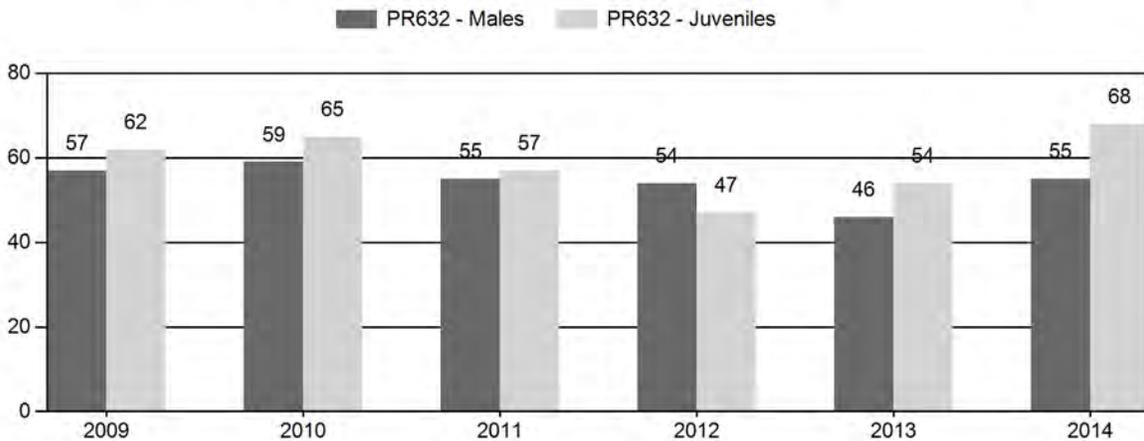
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR632 - BEAVER RIM

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	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	20,166	419	1,240	1,659	25%	3,003	45%	2,035	30%	6,697	2,408	14	41	55	± 2	68	± 3	44

2015 HUNTING SEASONS
Beaver Rim Pronghorn Herd Unit (PR 632)

HUNT AREA	TYPE	Season Dates		2015 Quota	LIMITATIONS
		OPENS	CLOSES		
65	1	Sept. 19	Oct. 22	75	Limited quota; any antelope
	6	Sept. 19	Oct. 22	25	Limited quota; doe or fawn
	7	Sept. 1	Nov. 15	75	Limited quota; doe or fawn valid north of the Little Popo Agie River
66	1	Sept. 19	Oct. 22	100	Limited quota; any antelope
	6	Sept. 19	Oct. 22	75	Limited quota; doe or fawn
67	1	Sept. 19	Oct. 22	275	Limited quota; any antelope
	6	Sept. 19	Oct. 22	25	Limited quota; doe or fawn
68	1	Sept. 19	Oct. 22	250	Limited quota; any antelope
	6	Sept. 19	Oct. 22	25	Limited quota; doe or fawn
69	1	Sept. 15	Oct. 31	100	Limited quota; any antelope
	6	Sept. 15	Oct. 31	25	Limited quota; doe or fawn
74	1	Sept. 19	Oct. 22	250	Limited quota; any antelope
	6	Sept. 19	Oct. 22	25	Limited quota; doe or fawn
106	1	Sept. 19	Oct. 22	50	Limited quota; any antelope
	6	Sept. 19	Oct. 22	25	Limited quota; doe or fawn

Archery

65-68, 74, 106	Aug. 15	Sept. 18	Refer to Section 3 of this Chapter
69	Aug. 15	Sept. 14	Refer to Section 3 of this Chapter

Hunt Area	Type	Change from 2014
66	1	+25
67	1	+25
69	1	+25
74	1	+50
106	1	-50
Total PR 632		+100

MANAGEMENT EVALUATION

Current Management Objective: 25,000

Management Strategy: Special (60-70 bucks/100 does)

2014 Post-season Population Estimate: ~19,000

2015 Post-season Population Estimate: ~19,000

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, reached objective in the mid-2000s, and has subsequently declined. The population increased in 2014 to about 19,000 pronghorn post-season, 24% below objective. The management objective has been reviewed, and a recommendation to maintain the population objective of 25,000 pronghorn is in process. This review included analyses of a potential combination of the Beaver Rim and Rattlesnake Pronghorn Herd Units, but data combinations did not lead to usable model or line-transect (LT) population estimates.

Weather/Habitat

Drought conditions were extreme to exceptional for most of 2011-13, 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 Beaver Rim Pronghorn Herd Unit. These storms were 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 inhibited production in herbaceous and shrub species across the Beaver Rim herd unit, although some improvement over 2012 conditions was noted. 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. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition. Consequently, this led to improved pre-season fawn/doe ratios and should result in improved pronghorn survival over winter 2014-15. Winter 2014-15 was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Lander and Jeffrey City, and ahead of last year’s pace. We anticipate habitat conditions will continue to improve as a result. Yet, due to long-term drought, many shrubs remain in poor condition and could contribute to pronghorn nutritional deficiencies and decreased survival.

Field Data

Fawn/doe ratios declined to a low of 47J/100F in 2012, but have recovered the past 2 years. The pre-season 2014 ratio of 68J/100F was the highest since 2004, and was 17% above the previous 5-year average. Buck/doe ratios recovered to 55M/100F in 2014, with the increase coming from recruitment of yearling bucks to a pre-season ratio of 14YM/100F. This followed an increase in the fawn/doe ratio in 2013 and favorable conditions through August 2014. Fawn/doe ratios varied by hunt area from 56J/100 to 73J/100F, while buck/doe ratios had higher variability between hunt areas, ranging from 37M/100F to 83M/100F. Conservative buck harvest is recommended for the near future to allow for replacement of younger age classes of bucks following low yearling buck/doe ratios in 2012 and 2013.

Harvest Data

License quotas were substantially reduced in 2013, with 2014 quotas remaining similar. Yet, harvest statistics indicated hunters in some hunt areas still had difficulty finding antelope. Hunter success in 2014 increased to 97% overall, along with active license success increasing from 82% to 88%. However, Type 1 (any antelope) hunters in hunt areas 69 and 106 had success rates of 72% and 76% respectively. Doe/fawn hunters saw overall good hunting success with a range of 85% to 100%. As a whole, it took 3.5 days of hunting for each animal harvested. This statistic was identical to that reported in 2013. Concerns about low pronghorn numbers were heard from hunters in a few areas, but less so than in 2013. Adjustments to the 2015 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. It has been updated utilizing 2014 pre-season classification and harvest data. The spreadsheet model (CJ/CA) works very well for Beaver Rim Pronghorn and tracks quite well with 7 line-transect (LT) estimates over the past 20 years. As such, we consider the model to be GOOD. The end-of-year estimates produced by the model run almost exactly through or very close to the LT estimates in 3 of 7 years, and through the confidence interval for 3 of the other 4 years (projected population is just below the last LT estimate's confidence interval in 2013). The model also produces post-season population estimates which closely follow trends observed by field personnel and the public. The population was at or slightly below objective for 7 years (2004 – 10), but declined sharply in 2011 and 2012, due to poor fawn recruitment as a result of intense drought. However, improved fawn/doe ratios in 2013 and 2014 indicate the population is recovering well and is moving back toward the current objective, with 19,000 pronghorn post-season 2014.

A line-transect survey was conducted in the Beaver Rim Pronghorn Herd Unit at the end of biological year 2013, with flights occurring on June 9-11, 2014 (Appendix 1). The survey required 21.7 hours to complete, including ferry time and travel to and from lines. Line-transect data were analyzed using DISTANCE (v6.2 Release 1). The half-normal/cosine estimator was selected based on minimum Akaike Information Criteria and ocular evaluation of model fit to the data histogram. The histogram for this analysis indicates detection of pronghorn was excellent (Figure 1). The best estimator had a low coefficient of variation (10.64), and the number of groups observed (333) exceeded the recommended minimum number of groups (100). The 2013 end-of-year population estimate derived by the Distance analysis of this line-transect survey was 16,521 pronghorn. This estimate represents a decline of 3,444 pronghorn (-17%) compared to the line-transect estimate derived at the end of biological year 2010. The post-season population estimate of 19,000 produced by the spreadsheet model utilizes this LT, but aligns the end-of-year model projection just below the LT estimate's confidence interval.

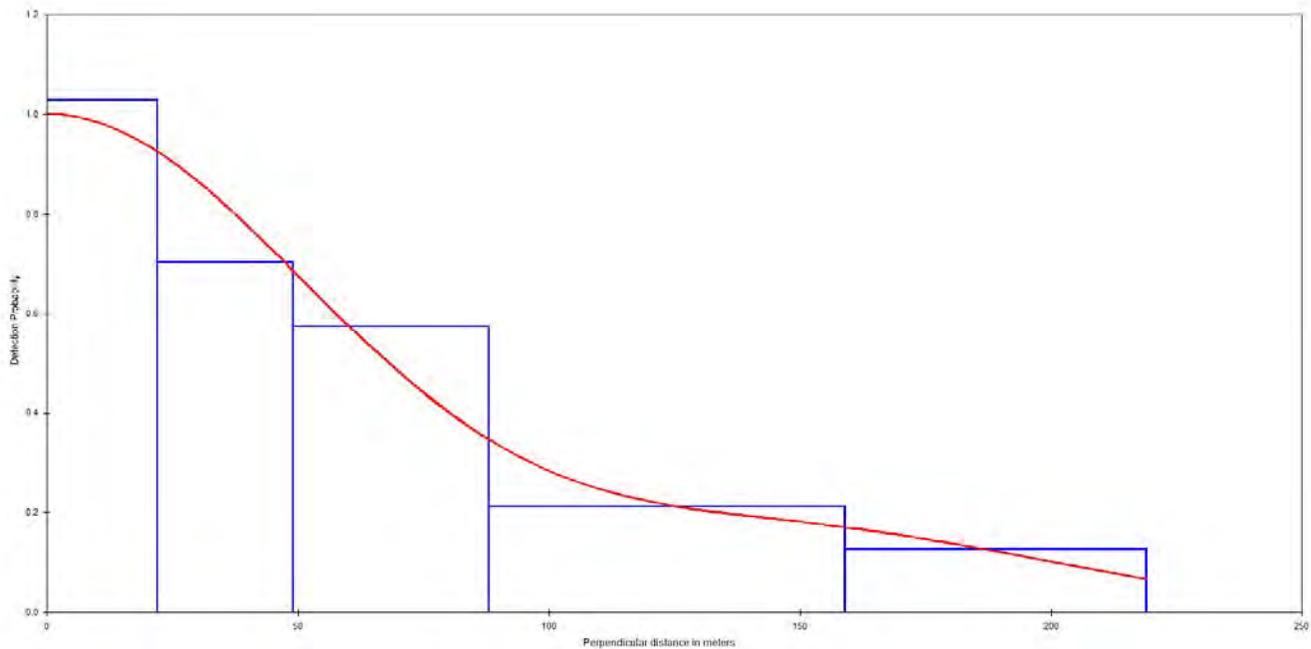


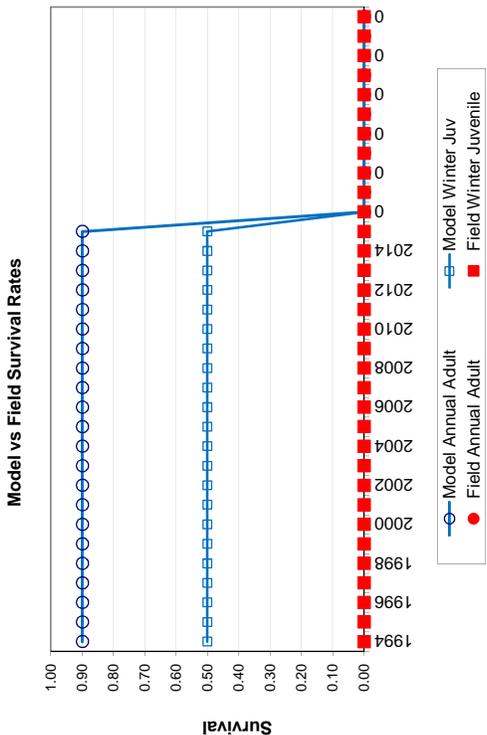
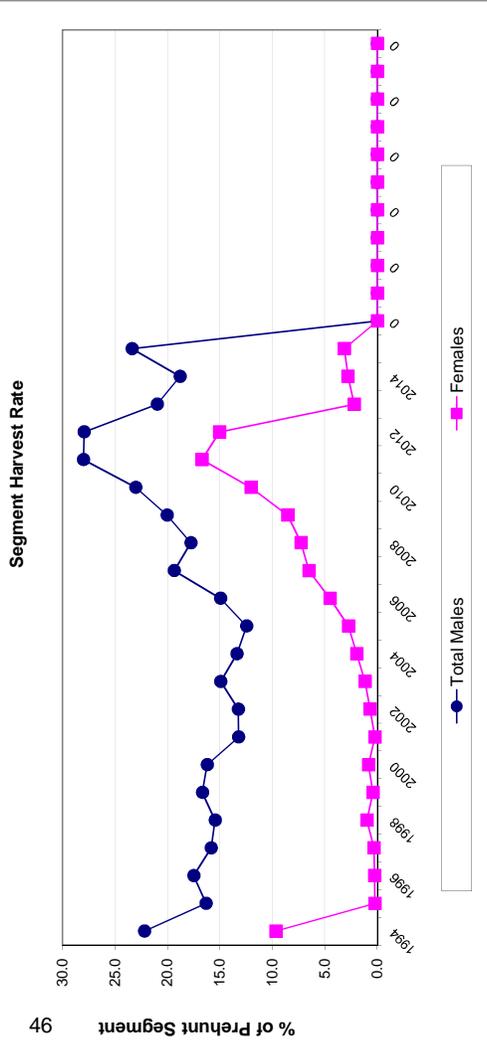
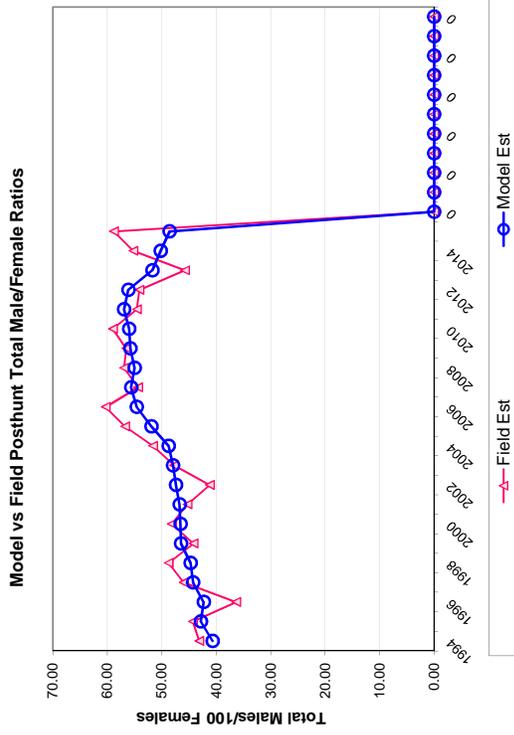
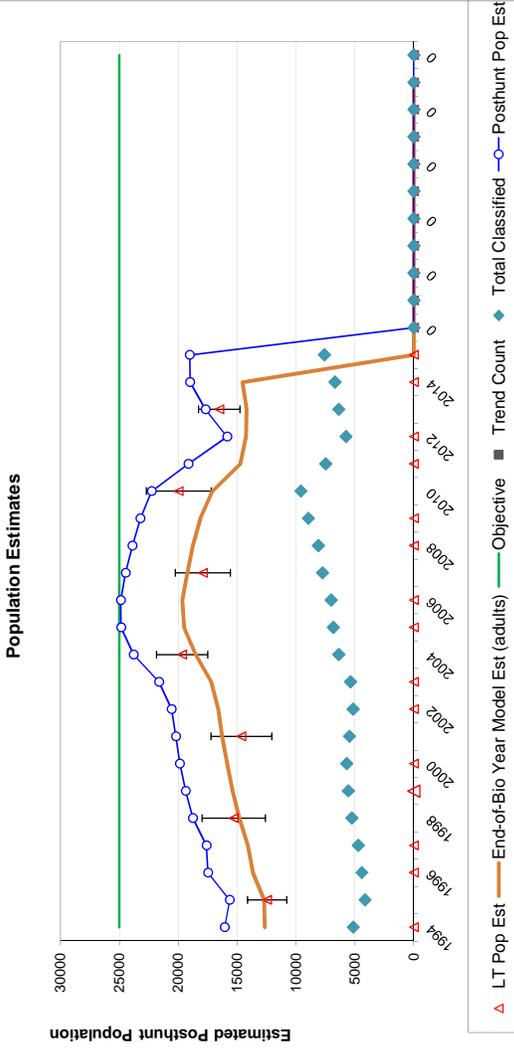
Figure 1. Histogram for line-transect (LT) Distance analysis completed at the end of bio-year 2013

Management Summary

For 2015, adjustments in license numbers were made to control localized private land damage situations, while providing hunter opportunity. 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 of 55M/100F is about 8% below the minimum of 60M/100F needed to keep this population within the Department's Special Management criteria. The number of Type 1 license adjustments made for 2015 are intended to allow for improvement of buck/doe ratios toward that secondary objective. Current license quotas remain consistent with public comments received during hunting seasons and at public meetings.

The 2015 seasons may allow population improvement, if the weather patterns observed since fall 2013 continue and fawn production/survival improves. Doe/fawn licenses remain a part of the 2015 hunting season structure to address localized damage to private land hay crops. While growth in the number of pronghorn in the Lander Foothills may have stabilized, the number of Hunt Area 65 Type 7 licenses will remain at 75. At the request of at least one landowner who will provide access, the season length for that license will increase, ending on November 15. A total of 1,100 any antelope and 300 doe/fawn licenses will be available for 2015, and should result in a harvest of nearly 1,300 animals. With average survival in combination with our harvest, we anticipate the population to remain relatively stable at 19,000 pronghorn.

FIGURES



Comments:

2013 PR632 - BEAVER RIM Pronghorn Line-Transect Summary

Survey Dates: 6/9/2014 - 6/11/2014
Survey Cost: \$ 5,875.00
Flight Service: LAIRD FLYING SERVICE
Aircraft: HUSKY AVIAT A1C
Observers: Harter, G. Anderson

Weather Conditions:

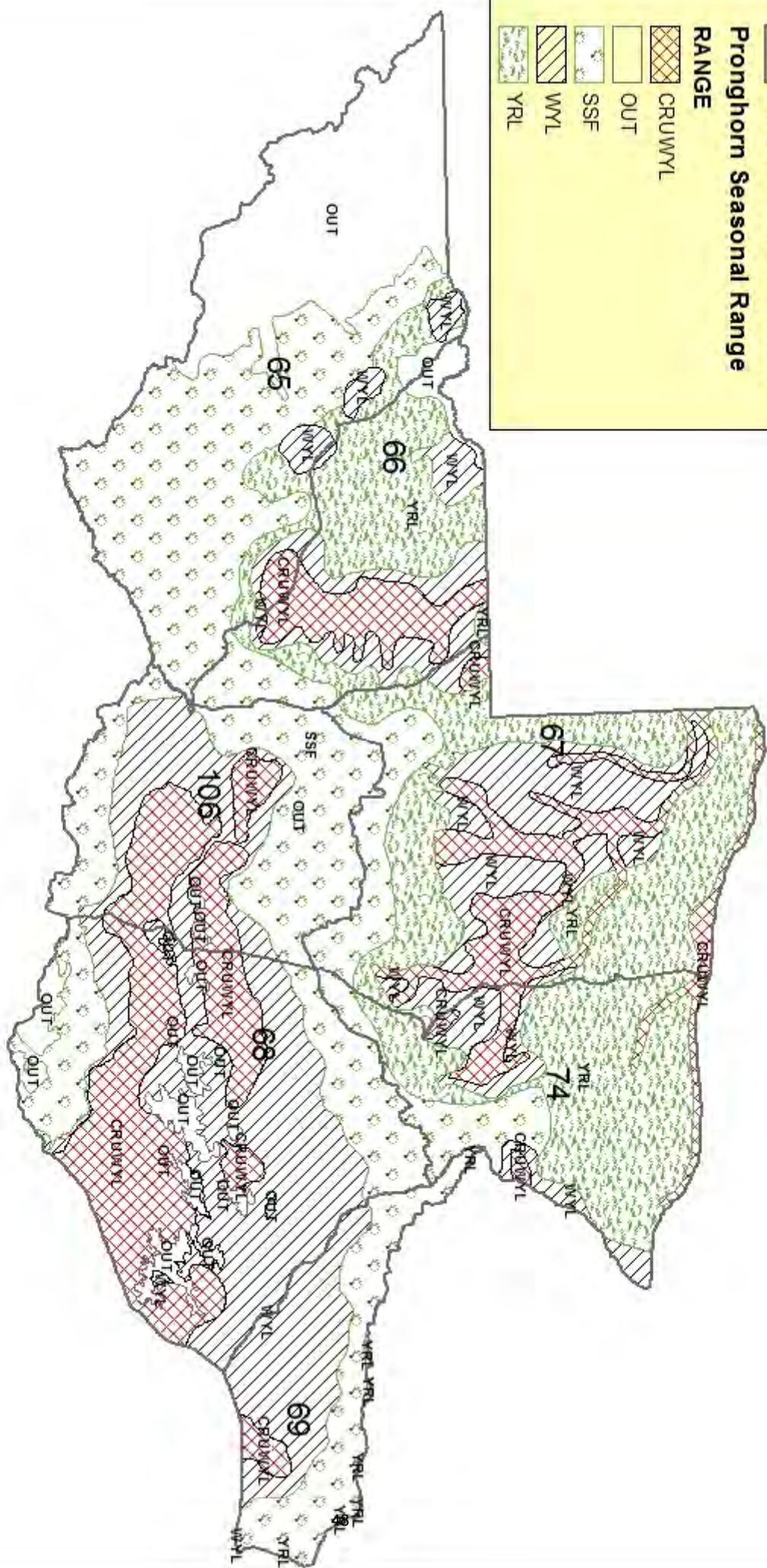
Temperature (Degrees Fahrenheit): 65
Cloud Cover (%): 0
Wind Speed (MPH): 0 - 20

Transect Limits: 106 50 to 108 46
Transect Direction: North/South
Transect Interval (Minutes of Longitude): 4
Transect Length: (Mi.): 1,032
Transect Altitude (AGL): 329 ft.

Occupied Habitat (mi²): 3,620
Density Estimate (Animals/mi² with Confidence Intervals): 4.56 (3.7 - 5.6)
Population Estimate (with Confidence Intervals): 16,521 (13,392 - 20,382)

**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



2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR634 - BADWATER

HUNT AREAS: 75

PREPARED BY: GREG
ANDERSON

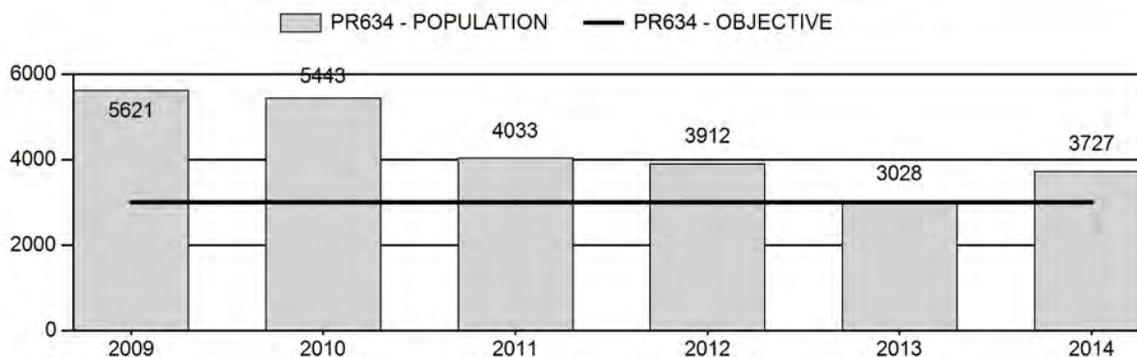
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	4,407	3,727	3,396
Harvest:	657	219	455
Hunters:	678	270	475
Hunter Success:	97%	81%	96 %
Active Licenses:	735	282	500
Active License Success:	89%	78%	91 %
Recreation Days:	2,175	560	1,600
Days Per Animal:	3.3	2.6	3.5
Males per 100 Females	62	67	
Juveniles per 100 Females	49	70	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	24%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/17/2015

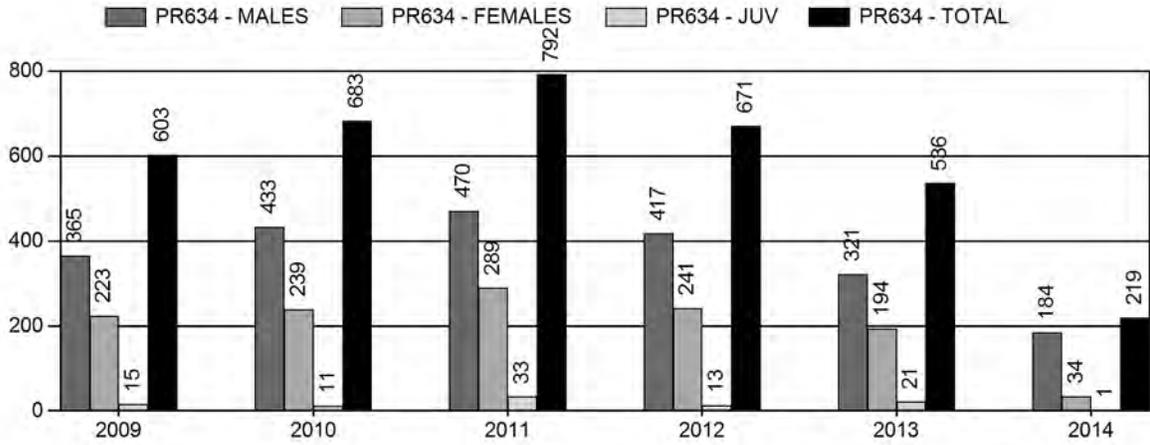
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	3%	8%
Males ≥ 1 year old:	41%	40%
Juveniles (< 1 year old):	1%	1%
Total:	8%	12%
Proposed change in post-season population:	-2%	-9%

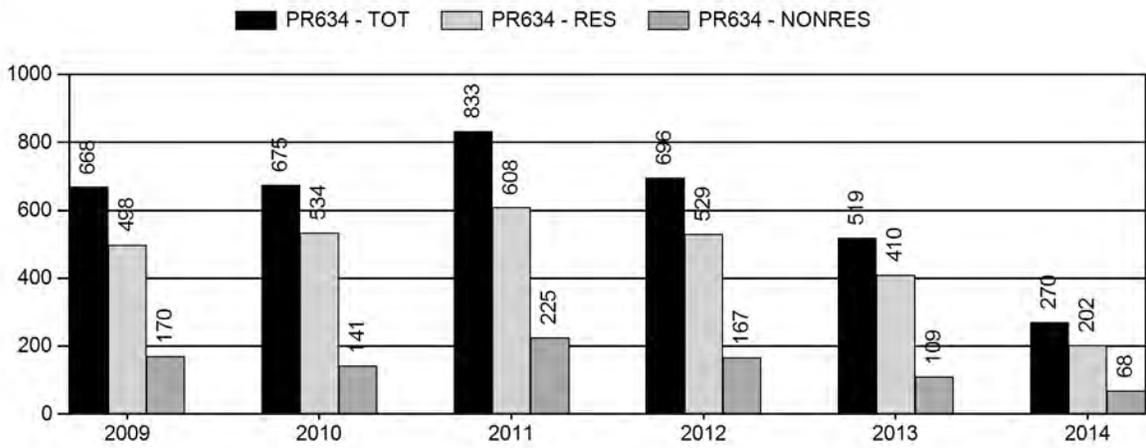
Population Size - Postseason



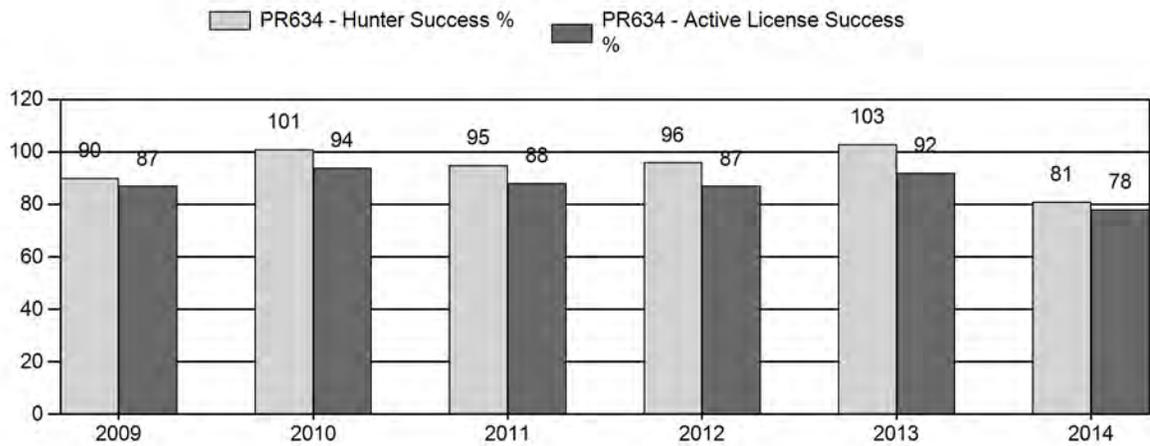
Harvest



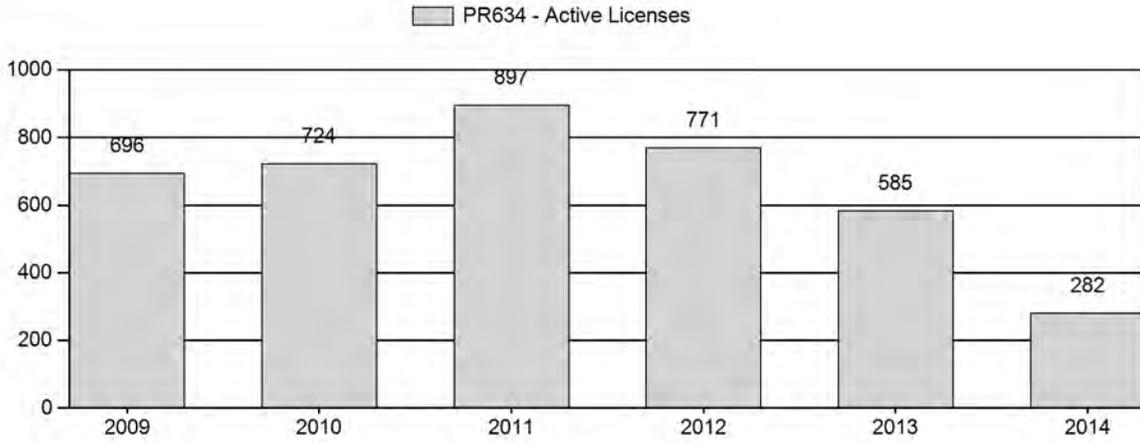
Number of Hunters



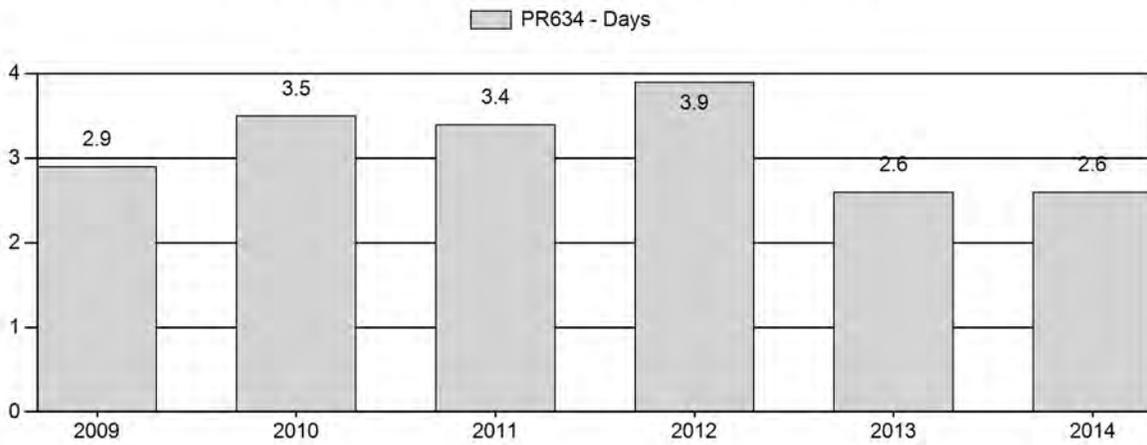
Harvest Success



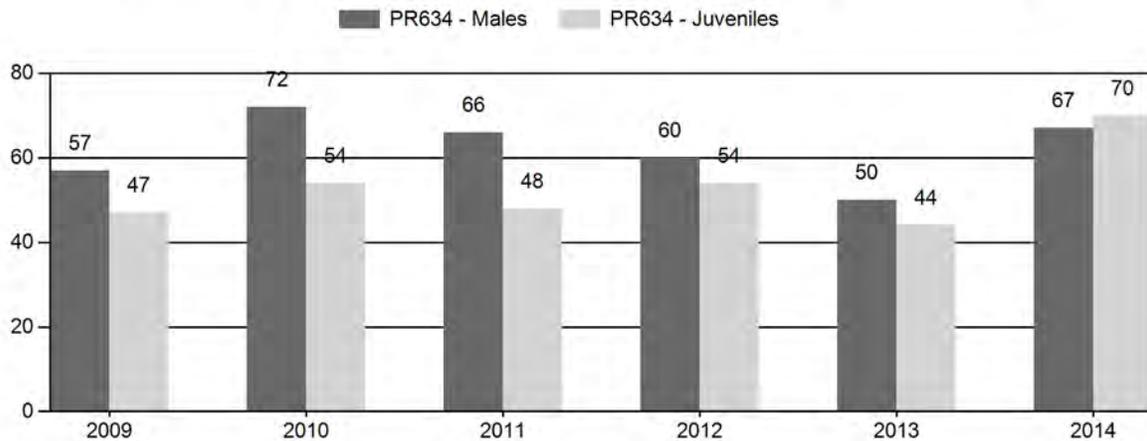
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR634 - BADWATER

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	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	3,968	87	142	229	28%	340	42%	237	29%	806	1,678	26	42	67	± 8	70	± 9	42

**2015 HUNTING SEASONS
BADWATER PRONGHORN (PR 634)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
75	1	Sep. 19	Oct. 22	350	Limited quota; any antelope
	6	Sep. 19	Oct. 22	175	Limited quota; doe or fawn
Archery		Aug. 15	Sep. 18		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
75	1	+50
	6	+150
Total	1	+50
	6	+150

Management Evaluation

Current Management Objective: 3,000

Management Strategy: Recreational

2014 Postseason Population Estimate: ~3,700

2015 Proposed Postseason Population Estimate: ~3,400

Management Issues

The Badwater pronghorn herd is managed toward a post-season population size 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 2014. During the 2014 review, it was noted the new spreadsheet model appeared to track the same population trend as the previous POP-II model. However, annual population estimates tended to be about 1,000 animals higher in the new spreadsheet model. Initial attempts to increase the objective to 4,000 to compensate for the apparent higher estimates produced by the spreadsheet model were met with resistance from landowners and the BLM. When noted that leaving the objective at 3,000 would in effect mean managing for fewer antelope than in the past, a number of landowners and representatives from the BLM felt that was appropriate given long-term drought and poor habitat conditions in the area.

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 4,500 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 be lost or degraded over the next 20 years.

Habitat/Weather

This area has been impacted by extreme drought for much of the last decade. Virtually no vegetation grew throughout the herd unit in 2012 and 2013. In 2014 weather conditions resulted in excellent herbaceous production throughout central Wyoming. Although no vegetation transects are monitored annually in this herd unit, observations suggested vegetation growth was better in 2014 than any other year in the past decade. Both deer and antelope in the area appeared to enter winter in excellent body condition. Given average winter temperatures and precipitation, antelope winter survival is expected to be good in 2014.

Field Data

Personnel observed fewer antelope along classification routes each of the last 4 years. The 2014 sample size of 806 antelope was significantly lower than the 2013 sample of 1,257. Some of the decline in sample size in 2014 can be attributed to personnel turnover, but the 4 year decrease in observed antelope along designated routes is indicative of a significant, multi-year population decline. Classification samples from the herd unit have historically been close to desired sample levels for calculating confidence intervals around age/sex ratios. The sample in 2014 was 50% of the desired sample size and yielded a fawn/doe ratio of 70/100. This was the highest ratio over the last 10 years and is undoubtedly attributable to the excellent feed availability during spring/summer 2014. Given average winter conditions, it is expected many of these fawns will survive the year since they entered winter in good body condition. Following 4 years of declining buck/doe ratios, the buck/doe ratio increased dramatically in 2014. The buck/doe ratio increased from 50/100 in 2013 to 67/100 in 2014. The adult buck/doe ratio was similar to 2013 so the marked increase in the overall buck/doe ratio is entirely attributable to an increase in yearling bucks. The yearling buck/doe ratio in 2014 was 26/100 and was the highest on record over the past 10 years. The dramatic increase in the yearling buck/doe ratio for 2014 is particularly remarkable since the fawn/doe ratio in 2013 was fairly low at 44/100. This indicates there was outstanding survival from 2013 to 2014.

Harvest Data

Despite the high buck/doe ratio in the herd unit, Type 1 license success was only 77% in 2014. This was the lowest success rate in over 15 years and well below the 5 year average of 88%. The low success rate is somewhat confounding given the high buck/doe ratio in the population. It may be indicative of Type 1 license holders not wanting to harvest a yearling buck which accounted for much of the buck population in 2014. The days/animal statistic for Type 1 license holders was unremarkable in 2014 at 2.7. This was almost identical to the 2013 figure of 2.8 but lower than the 5 year average of 3.2.

Population

In 2012, a spreadsheet model was developed for this population. The model behaved predictably with the addition of 2013 and 2014 data. The model appears to track population trends reliably but the actual population estimate appears questionable. The model tracks significantly higher than 5 of 6 line-transect (LT) estimates. Recalibrating juvenile and adult survival rates in various versions of the model does nothing to bring the end-of-year estimate closer to these estimates. LT estimates for this population tend to have very high coefficients of variation attributable to low small samples sizes and variable densities across the herd unit. Due to the high standard

errors associated with the line-transect estimates the population model deviance errors are very small. These numbers are calculated by dividing the difference of the model estimate and the LT estimate by the standard error of the LT estimate. A large standard error in the denominator of this calculation results in a small population deviance value even if the difference between the model estimate and LT estimate is quite large. Since the Solver function of these models is designed to minimize the population deviance, there is little need to account for already small deviances. The bottom line is Solver has little incentive to consider even large differences between model population estimates and LT estimates and therefore, the model essentially ignores the LT estimates.. Concurrently, differences in annual observed versus modeled buck/doe ratios are given undo consideration by Solver. To deal with this problem, population deviances (the difference between model and LT estimates) are multiplied by a factor of 4 in the current model. This forces the model closer to the most recent LT estimate. A correction factor of 4 was chosen because it forces the end-of-year population to model close to the lower end of the confidence interval of a 2010 line transect estimate and at least the upper end of the confidence interval for a 2012 estimate. Without the correction factor, the model population is well above the confidence interval for the 2012 estimate. It should be noted, the overall population trend remains the same with or without the use of a correction factor.

For 2014, the SCJ/SCA version of the model was selected to simulate the population. This was the same version of the model selected in 2013. The SCJ/SCA model had a slightly higher AIC value than the CJ/CA model, but the CJ/CA version does not compensate for suspected, low survival associated with severe drought in 2012 and 2013. 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 constrained to a maximum of 0.8. Without that constraint, the model consistently estimated juvenile survival higher than adult survival which is not biologically defensible. 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 constrained to a maximum of 0.4.

This model version produces a population trend mirroring field personnel impressions. The model indicates the population declined significantly from 2007 through 2013. This is supported by the decreased classification samples collected along standard routes since 2010 as well as declining buck/doe ratios from 2010 through 2013. The population was thought to be at objective in 2013. Given favorable conditions throughout the herd unit and good recruitment in 2014 it is likely the population increased. The model indicates an increase from around 3,300 antelope in 2013 to approximately 3,700 antelope in 2014. The estimated increase can be traced to the model's attempt to track a buck/doe ratio that increased from 50/100 in 2013 to 67/100 in 2014. The 2014 population estimate is 24% above objective. Given good recruitment in 2014 and excellent survival from 2013 (as indicated by the high yearling buck/doe ratio), the modeled increase is plausible. Reasons for poor Type 1 license success given high buck numbers are not known. Due to the lack of survival estimates, the model is considered a fair simulation.

Management Summary

Given the modeled population increase over the past year as well as the high buck/doe ratio, hunting opportunity in area 75 can be increased in 2015. Type 1 licenses will be increased by 50 to 350 to allow more recreational opportunity. Type 6 licenses will be increased to 175 to help manage the population toward objective. Given average recruitment, the population is predicted to decline to approximately 3,400 and be within 13% of objective.

INPUT	
Species:	Pronghorn
Biologist:	Greg Anderson
Herd Unit & No.:	Backwater
Model date:	02/17/15

Clear form

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	173	164	
SC,J,SCA	223	207	
TS,J,CA	227	122	

Population Estimates from Top Model

Year	Predicted Prehunt Population (year <i>t</i>)		Total	Predicted Posthunt Population (year <i>t</i>)		Total	Predicted adult End-of-bio-year Pop (year <i>t</i>)		Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females		
1993	889	1103	1583	841	647	1252	835	1381	2216	3000
1994	718	818	1353	701	466	1117	639	1224	1862	3000
1995	763	626	1199	740	380	1073	594	1216	1811	3000
1996	1090	582	2864	1090	391	1184	757	1477	2234	3000
1997	805	742	2994	805	520	1432	749	1575	2324	3000
1998	1018	734	1543	1014	542	1543	868	1760	2617	3000
1999	1197	840	1725	1197	671	1716	1049	1984	3032	3000
2000	1039	1028	1944	1039	846	1941	1135	2116	3252	3000
2001	907	1113	2074	907	930	2071	1154	2176	3330	3000
2002	985	1131	2133	985	951	2123	1205	2252	3457	3000
2003	1188	1181	2207	1188	975	2207	1305	2410	3715	3000
2004	1663	1279	2362	1663	1083	2357	1594	2734	4328	3000
2005	1881	1562	2679	1879	1283	2610	1844	3033	4877	3000
2006	1542	1807	2972	1537	1464	2795	1853	3039	4892	3000
2007	1877	1816	2978	1861	1452	2749	1971	3122	5093	3000
2008	1565	1931	3060	1552	1543	2831	1920	3067	4988	3000
2009	1410	1882	3006	1394	1480	2761	1799	2839	4738	3000
2010	1554	1763	2880	1542	1287	2617	1363	2555	3917	3000
2011	1205	1335	2503	1168	818	2186	1188	2405	3593	3000
2012	1266	1164	2357	1252	706	2091	914	2096	3010	3000
2013	906	895	2054	883	542	1841	759	1938	2698	3000
2014	1324	744	1900	1323	542	1862	853	2029	2882	3000
2015	1072	836	1988	1067	506	1823				3000
2016										
2017										
2018										
2019										
2020										
2021										
2022										
2023										
2024										
2025										

Survival and Initial Population Estimates

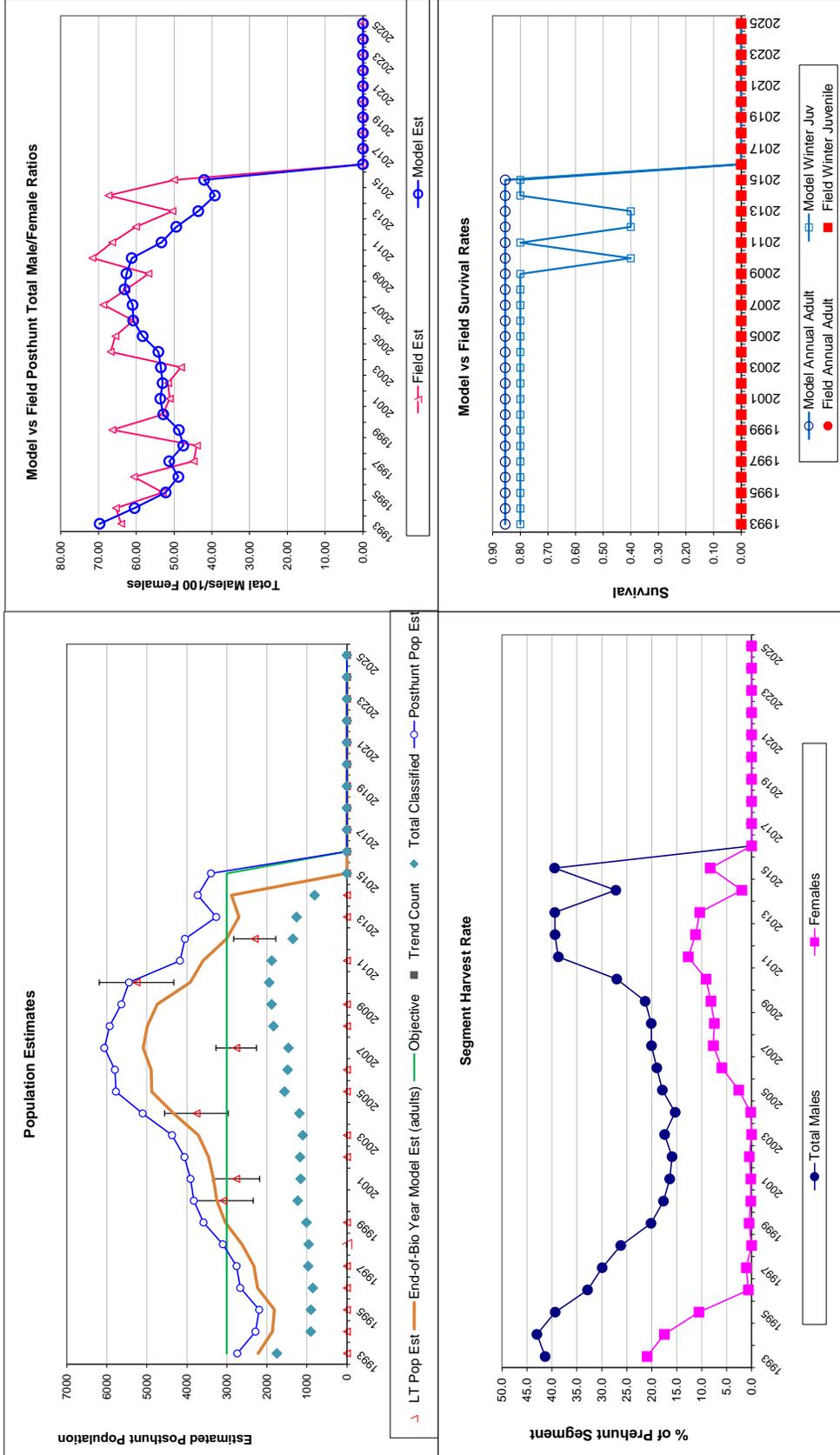
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.80		0.85	
1994	0.80		0.85	
1995	0.80		0.85	
1996	0.80		0.85	
1997	0.80		0.85	
1998	0.80		0.85	
1999	0.80		0.85	
2000	0.80		0.85	
2001	0.80		0.85	
2002	0.80		0.85	
2003	0.80		0.85	
2004	0.80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

Parameters:	Optim cells
Juvenile Survival =	0.8000
Adult Survival =	0.855
Initial Total Male Pop/10,000 =	0.110
Initial Female Pop/10,000 =	0.158

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

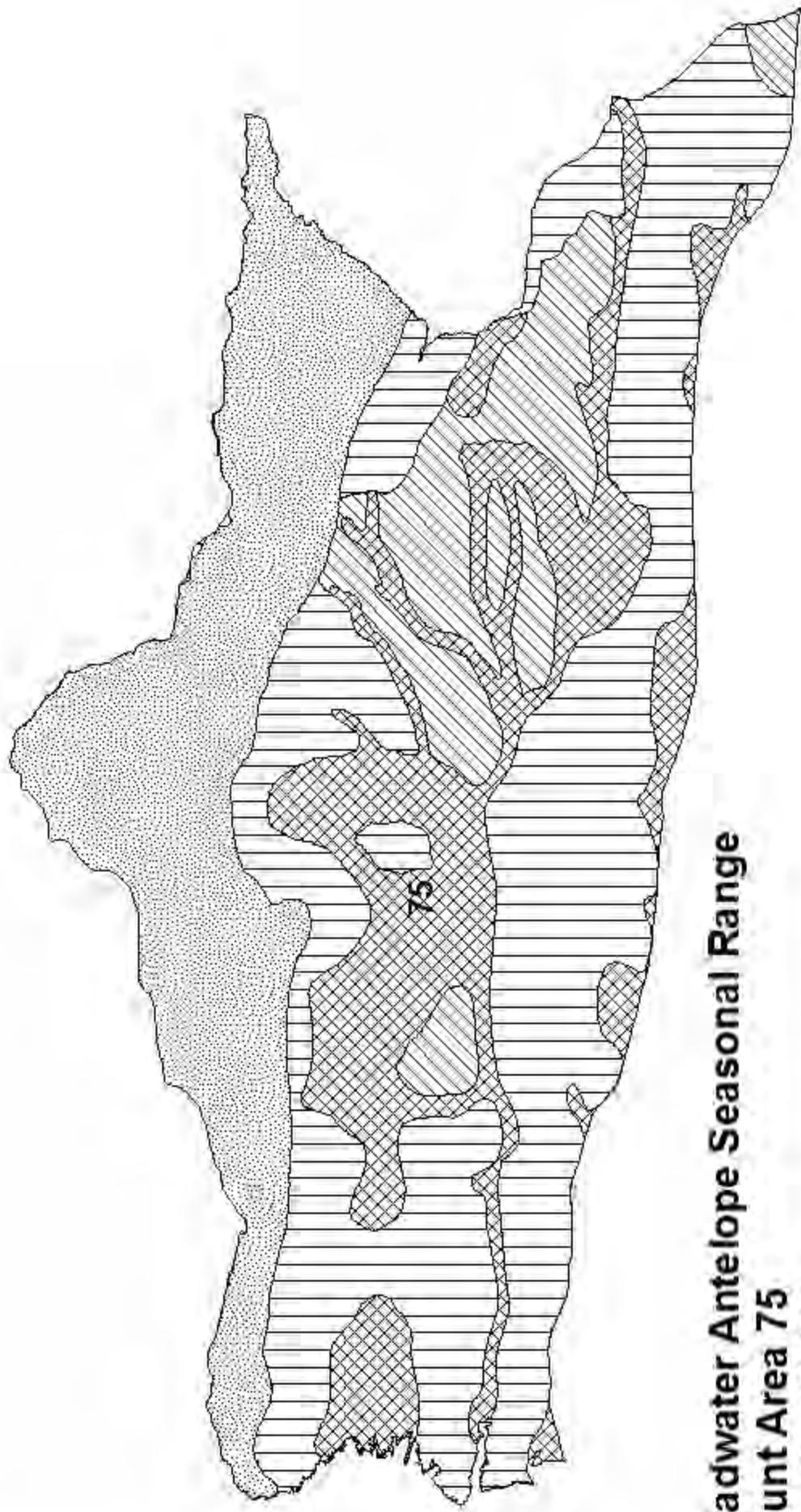
Year	Classification Counts										Harvest		
	Juvenile/Female Ratio					Total Male/Female Ratio					Segment Harvest Rate (% of		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females	
1993		56.17	3.32	69.70	63.98	3.64	44	415	301	760	41.4	20.9	
1994		53.03	4.43	60.44	65.38	5.12	15	320	215	550	43.0	17.5	
1995		63.61	5.01	52.21	53.01	4.42	21	224	115	360	39.4	10.5	
1996		91.42	7.20	48.85	60.65	5.37	0	174	7	181	32.9	0.6	
1997		55.60	4.24	51.29	44.81	3.67	0	202	14	216	29.9	1.1	
1998		65.93	4.90	47.56	43.96	3.73	3	175	0	178	26.2	0.0	
1999		69.39	5.24	48.73	66.36	5.08	0	154	8	162	20.2	0.5	
2000		53.45	3.71	52.86	52.94	3.69	0	165	3	168	17.7	0.2	
2001		43.75	3.26	53.64	51.18	3.62	0	166	3	169	16.4	0.2	
2002		46.19	3.38	53.05	51.61	3.64	0	164	9	173	15.9	0.5	
2003		53.85	3.90	53.50	48.17	3.62	0	187	0	187	17.4	0.0	
2004		70.40	4.90	54.15	66.80	4.72	0	178	4	182	15.3	0.2	
2005		70.20	4.25	56.31	65.51	4.05	2	254	63	319	17.9	2.6	
2006		51.87	3.36	60.81	60.78	3.75	4	312	161	477	19.0	6.0	
2007		63.02	4.04	60.98	68.73	4.29	14	331	208	553	20.0	7.7	
2008		51.17	3.00	63.12	62.59	3.44	12	353	208	573	20.1	7.5	
2009		46.91	2.73	62.61	56.77	3.11	15	365	223	603	21.3	8.2	
2010		53.95	3.11	61.22	71.63	3.78	11	433	239	683	27.0	9.1	
2011		48.11	2.85	53.34	66.40	3.55	33	470	289	792	38.7	12.7	
2012		53.72	3.62	49.41	60.06	3.90	13	417	241	671	39.4	11.2	
2013		44.12	3.14	43.59	50.46	3.43	21	321	194	536	39.4	10.4	
2014		69.71	5.90	39.18	67.35	5.76	1	184	34	219	27.2	2.0	
2015		53.92	3.72	42.03	50.00	4.08	5	300	150	455	39.5	8.3	
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

FIGURES

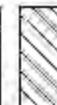


Comments:

END



**Badwater Antelope Seasonal Range
Hunt Area 75
Revised 2012**

-  CRUWYL
-  OUT
-  SSF
-  WYL
-  YRL

2014 - JCR Evaluation Form

SPECIES: Pronghorn

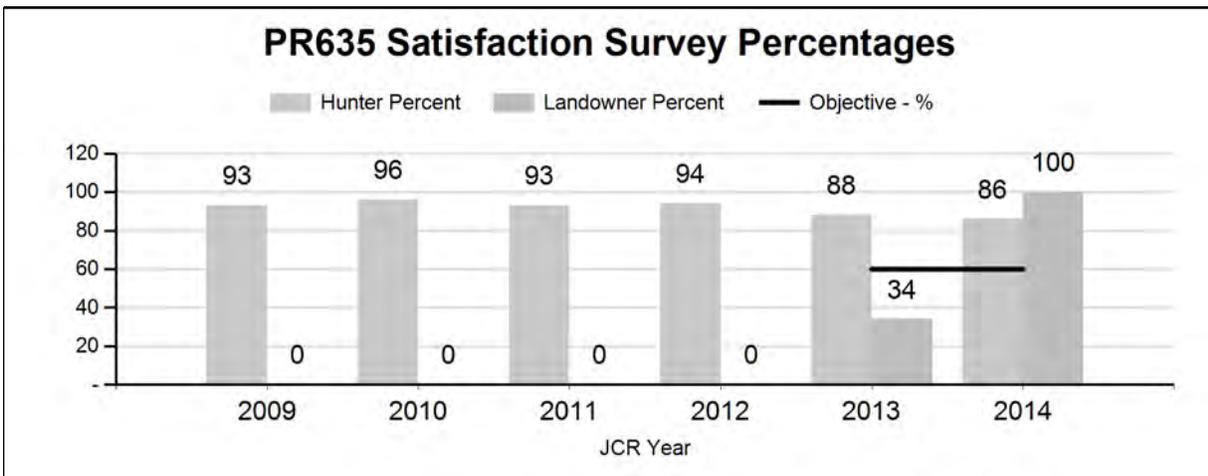
PERIOD: 6/1/2014 - 5/31/2015

HERD: PR635 - PROJECT

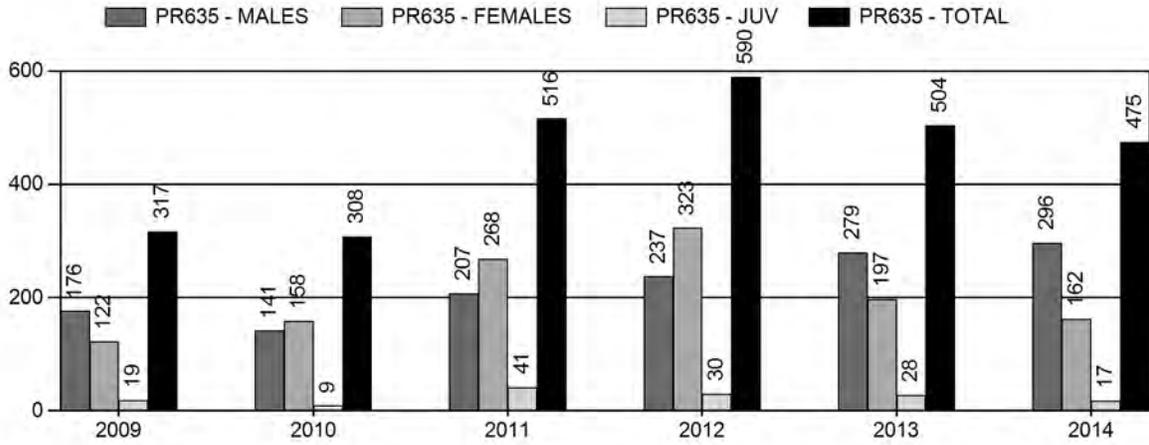
HUNT AREAS: 97, 117

PREPARED BY: GREG ANDERSON

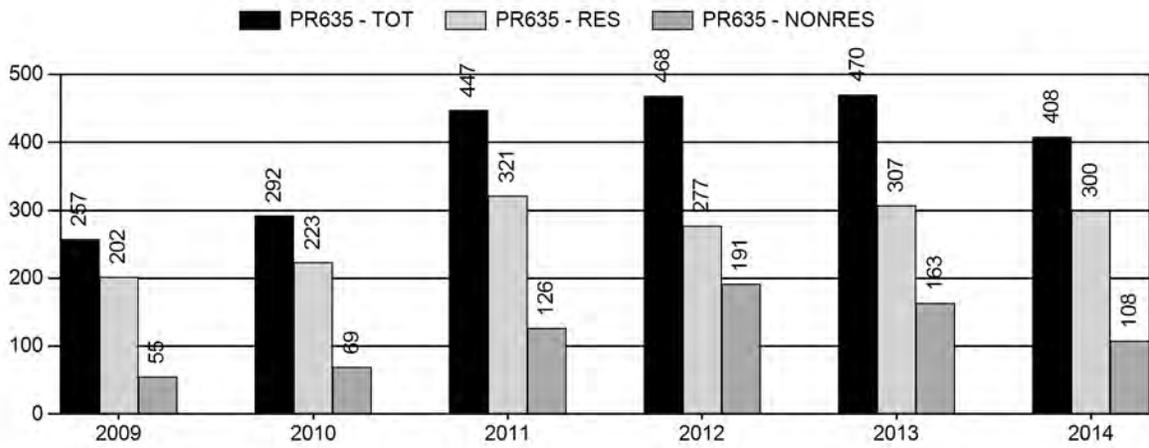
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent	93%	86%	90%
Landowner Satisfaction Percent	34%	100%	60%
Harvest:	447	475	475
Hunters:	387	408	400
Hunter Success:	116%	116%	119%
Active Licenses:	499	518	520
Active License Success:	90%	92%	91%
Recreation Days:	1,408	1,580	1,600
Days Per Animal:	3.1	3.3	3.4
Males per 100 Females:	66	69	
Juveniles per 100 Females	63	67	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			33%
Number of years population has been + or - objective in recent trend:			2



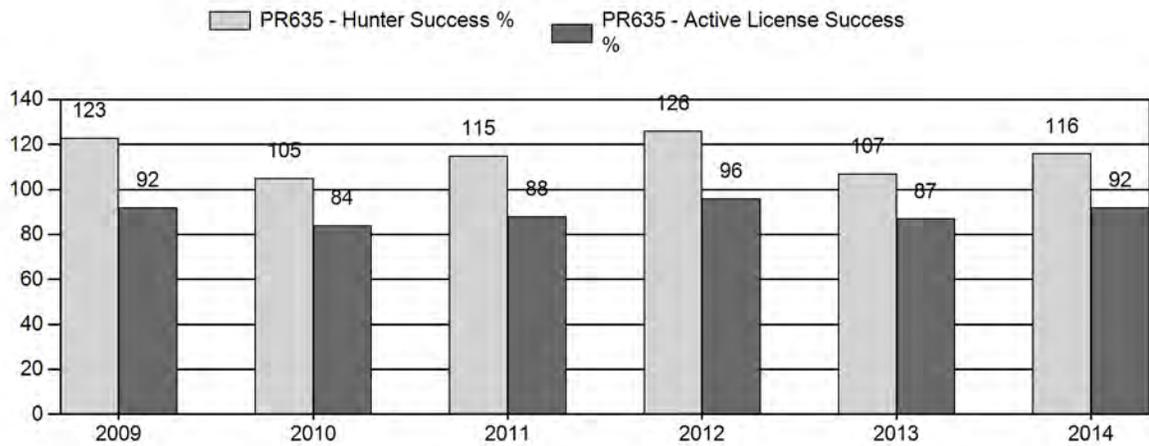
Harvest



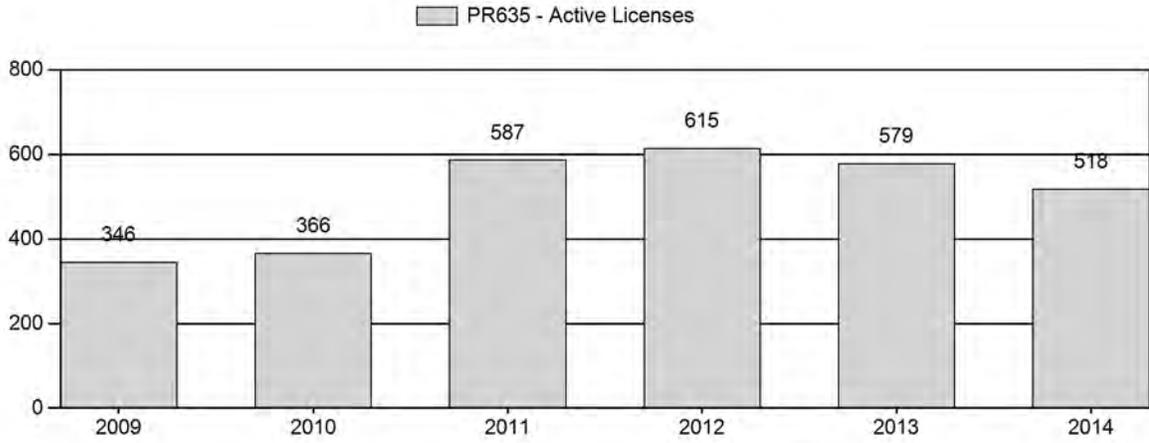
Number of Hunters



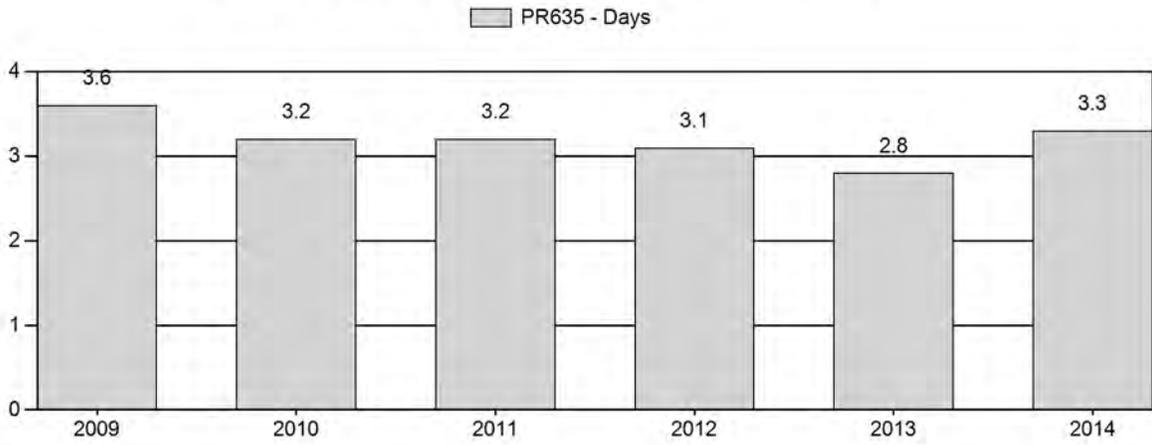
Harvest Success



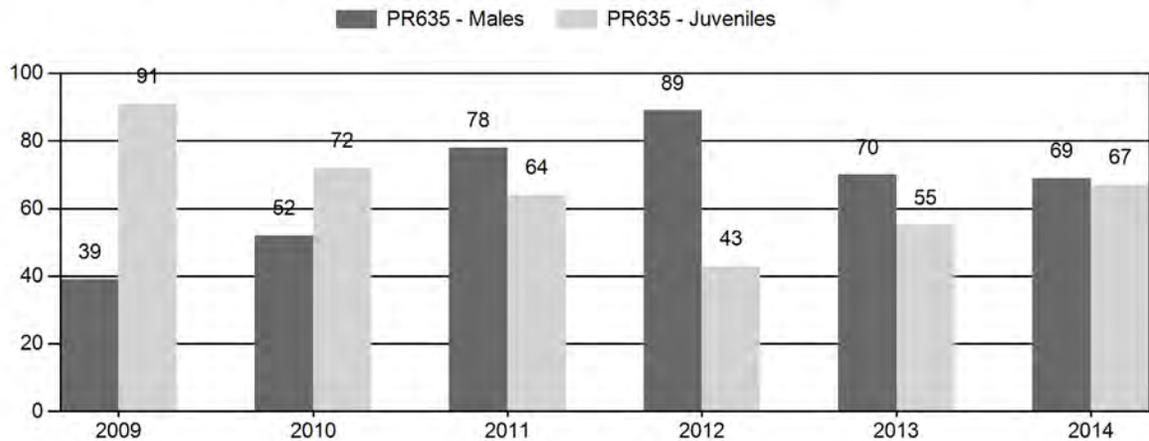
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR635 - PROJECT

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	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	0	21	62	83	29%	120	42%	80	28%	283	0	18	52	69	± 0	67	± 0	39

**2015 SEASONS
PROJECT PRONGHORN (PR 635)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
97, 117	1	Sep. 19	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. 19	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. 18		Refer to section 3 of this chapter

Hunt Area	Type	Quota change from 2014
97, 117		
Total		

Management Evaluation

Current Management Objective: Hunter/Landowner Satisfaction 60%

Management Strategy: Recreational

2014 Hunter Satisfaction: 86%

2014 Landowner Satisfaction: 100% *

3 year Average Hunter Satisfaction: 89%

3 year Average Landowner Satisfaction: unknown

*Note: the landowner satisfaction results are based on only 4 survey responses

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 to 98 landowners in the herd unit. From the 98 surveys, the Department received 46 responses. Of those, 21 landowners provided e-mail addresses and indicated they wished to receive the survey in future years. In 2014, 21 surveys were e-mailed to landowners and the Department received 4 responses. One of the respondents requested to no longer receive the survey.

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. During periods of drought, this herd has typically been impacted less than surrounding populations due to the abundance of feed associated with agricultural operations. In 2014, weather conditions were conducive to good vegetative production throughout the herd unit including upland, native range. As such, antelope were well dispersed throughout the area. Fall observations and field checks indicate antelope in the herd unit entered winter in excellent body condition.

Field/Harvest Data/Population

The fawn/doe ratio in hunt area 97 was 67/100 in 2014. This was nearly the same as the 5 year average of 65/100 but well above recruitment levels over the past 2 years. The buck/doe ratio changed insignificantly from 70/100 in 2013 to 69/100 in 2014. It should be noted the number of mature bucks did decline from 57/100 in 2013 to 52/100 in 2014. Thus, the stable buck/doe ratio was the result of increased yearling bucks in the population. Type 1 license numbers were increased for several years to provide recreational opportunity and decrease the high buck/doe ratio in the herd unit. It appears the number of licenses in 2014 did decrease the mature buck/doe ratio. It should also be noted there appears to be an uneven distribution of bucks throughout area 97 where most of the harvest occurs. Publicly accessible areas throughout the herd unit tend to have significantly fewer bucks than private land areas. The buck/doe ratio remains high in the surveyed areas of this herd unit and harvest success on Type 1 licenses in 97 was 96% in 2014. These factors indicate recreational hunting remains good in the herd unit.

The population is considered to be at objective in 2014. Hunter satisfaction (satisfied or very satisfied) remained essentially unchanged between 2013 and 2014 at 88% and 86% respectively. This represents a high rate of satisfaction and in combination with a 96% Type 1 success rate indicates hunt quality was good. This was the second year the landowner satisfaction survey was conducted so long term comparisons are not possible. That said, it appears landowners are somewhat ambivalent about the survey. As mentioned above, only 4 landowners responded to a

simple electronic survey in 2014. Obviously the paucity of responses doesn't inspire confidence in the results. Of the 4 respondents, all 4 felt antelope numbers were at a desirable level.

Management Summary

Given the high level of hunter satisfaction and no indication of landowner dissatisfaction, 2015 management will remain unchanged from 2014. With average survival for the year, the population is expected to remain unchanged in 2015.

Appendix A

Electronic message sent to landowners requesting survey input.

February 18, 2015

Dear Landowner,

Last year the Wyoming Game & Fish Department began using a survey to assess landowner satisfaction with deer numbers in hunt areas 157 and 170 and antelope in hunt areas 97 and 117. Responses to these surveys help us determine harvest management (hunting seasons) for the upcoming year. The survey in the link below contains the same questions asked last year. We would appreciate any input you have by March 10. 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 issuing more or fewer licenses respectively.

This survey will only be conducted electronically by clicking the link below. We try to survey all of the landowners in these areas who express an interest. If you hear of anyone who did not get this survey please have them contact one of the Department personnel listed below so we can get their e-mail address and ensure they receive the survey in future years. If you have any questions, again, feel free to contact one of the Department personnel listed below.

https://docs.google.com/a/wyo.gov/forms/d/1eFaCcqXQVsF_FDpa-nWGKIUs2EQmtgyn5_xOsVBnKfY/edit?usp=sharing

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

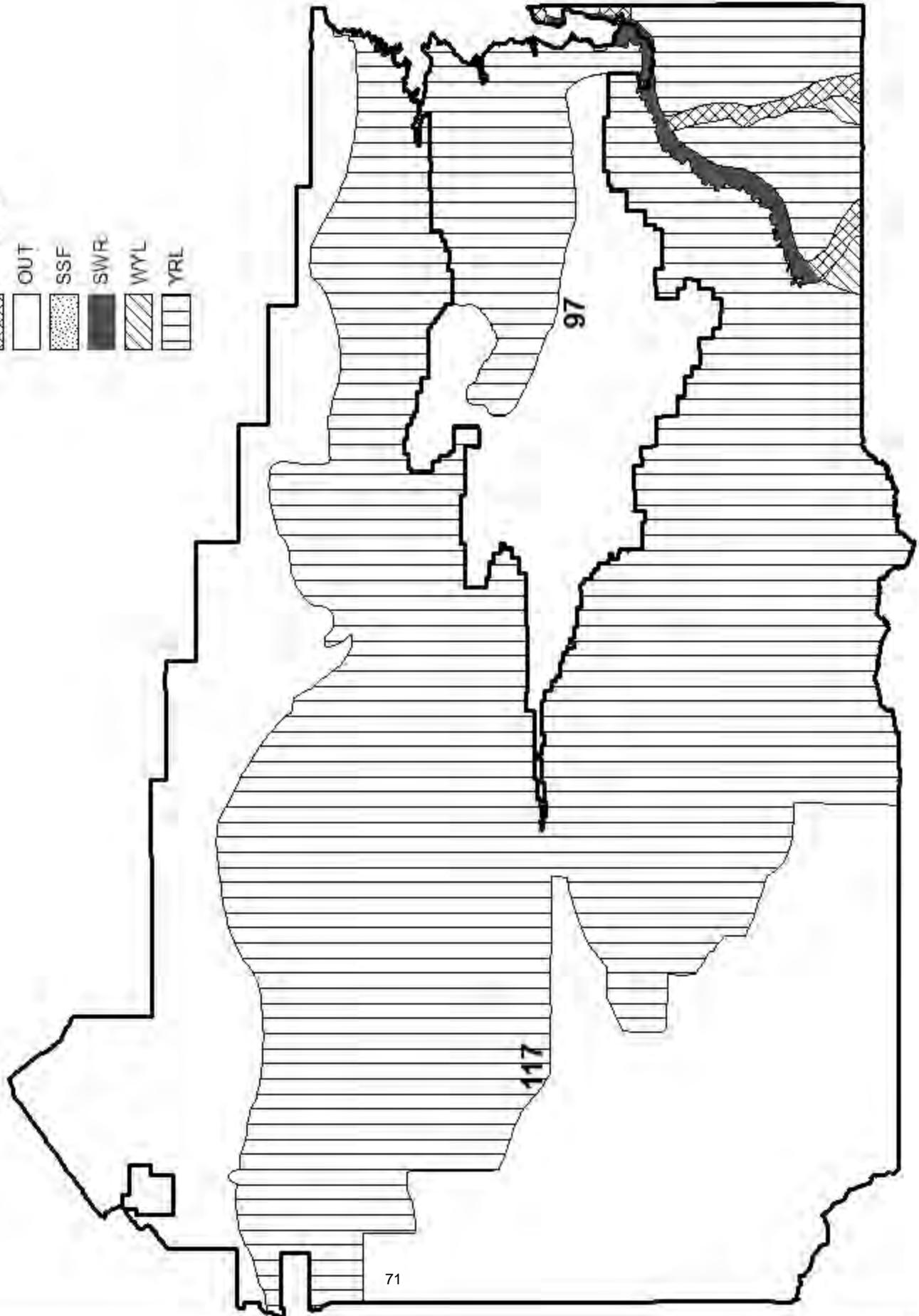
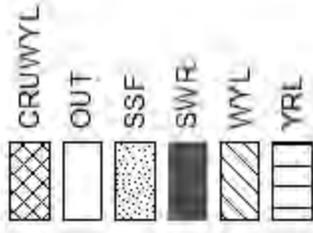
Sincerely,

Greg Anderson, North Lander Wildlife Biologist. 307-332-2688

Jessica Beecham, North Riverton Game Warden. 307-856-4982

Brad Gibb, South Riverton Game Warden. 307-856-9005

**Project Antelope Seasonal Range
Hunt Areas 97, 117
Revised 2012**



2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR636 - NORTH FERRIS

HUNT AREAS: 63

PREPARED BY: GREG HIATT

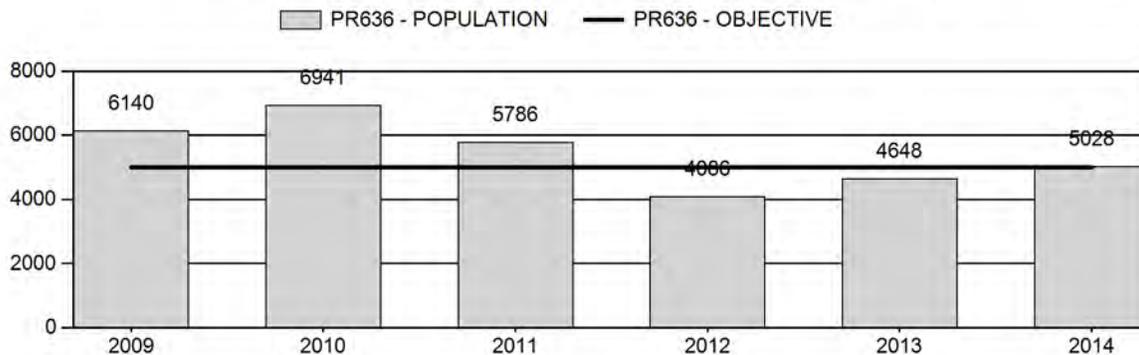
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	5,520	5,028	4,758
Harvest:	647	230	265
Hunters:	686	279	325
Hunter Success:	94%	82%	82 %
Active Licenses:	740	279	325
Active License Success:	87%	82%	82 %
Recreation Days:	2,060	762	900
Days Per Animal:	3.2	3.3	3.4
Males per 100 Females	66	61	
Juveniles per 100 Females	49	57	

Population Objective (± 20%) :	5000 (4000 - 6000)
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:	3/3/2015

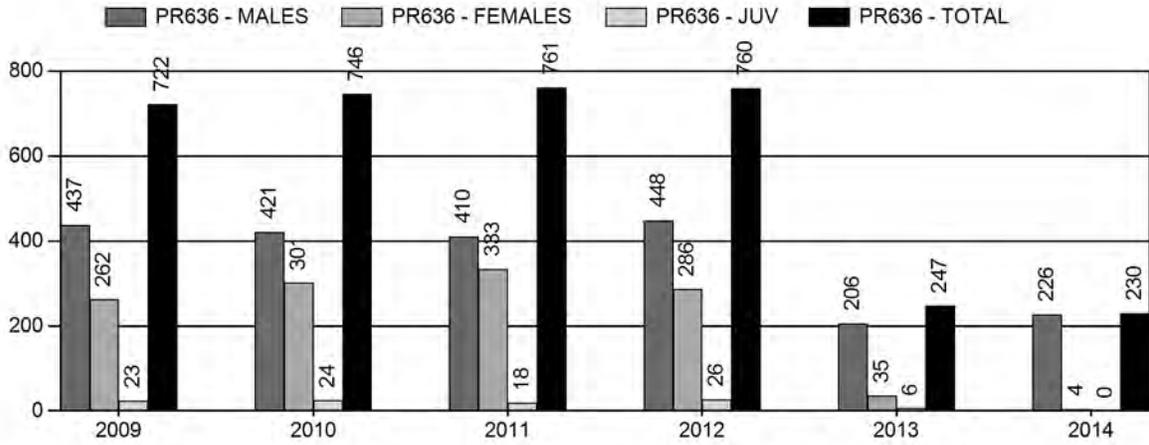
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	1.8%
Males ≥ 1 year old:	16.0%	18.2%
Juveniles (< 1 year old):	0%	0.4%
Total:	4.4%	5.2%
Proposed change in post-season population:	+3.9%	-5.4%

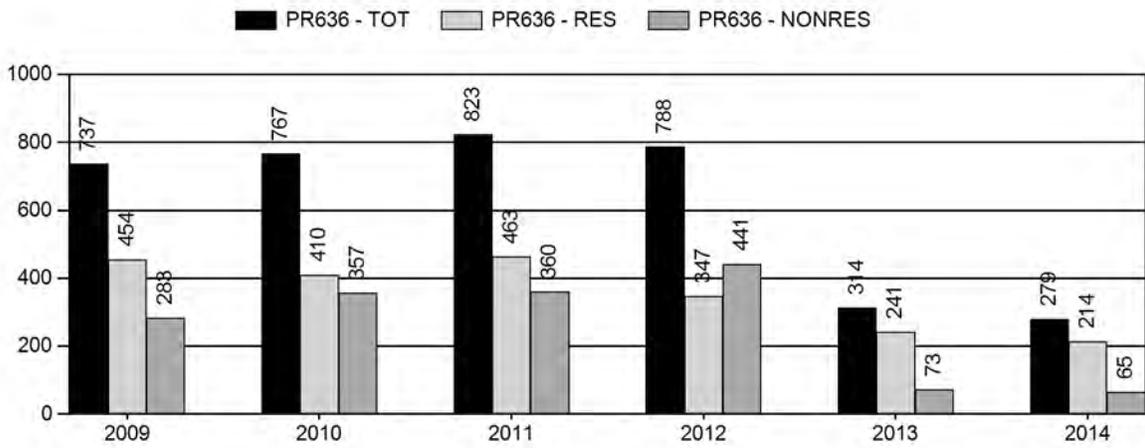
Population Size - Postseason



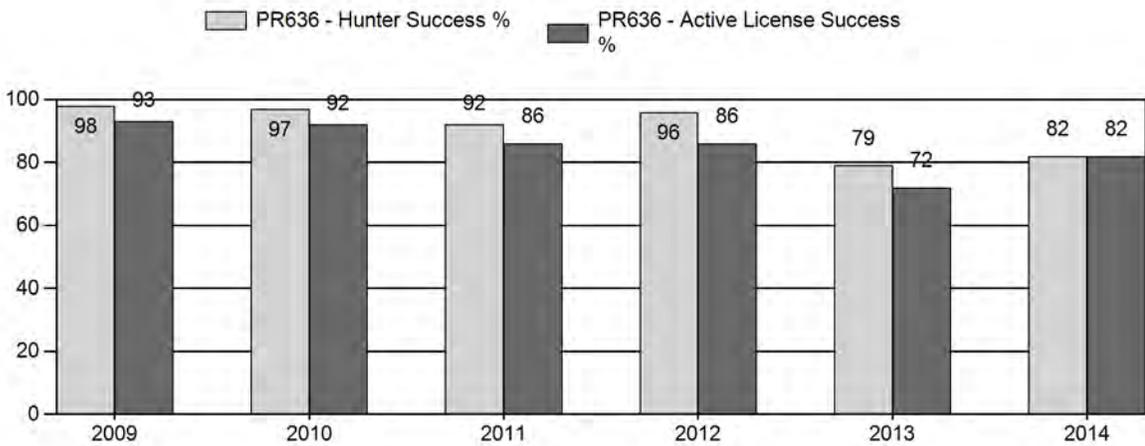
Harvest



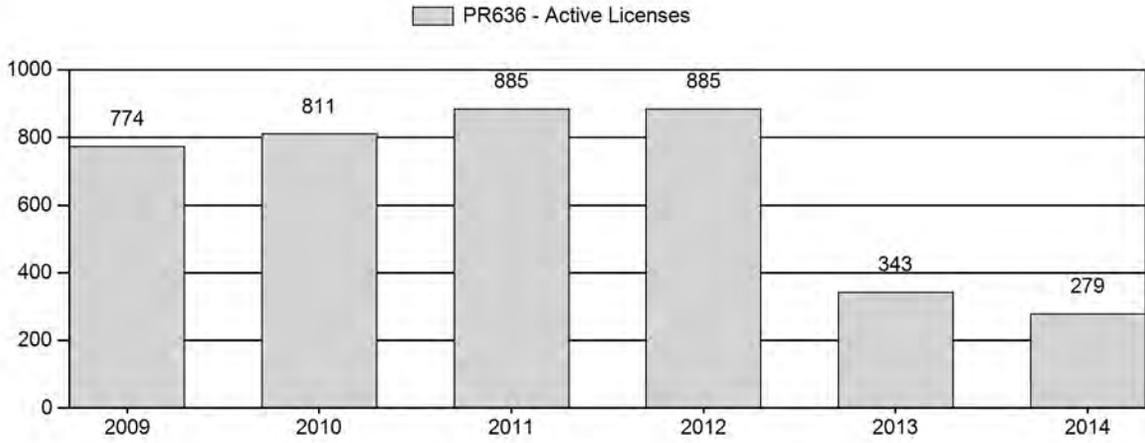
Number of Hunters



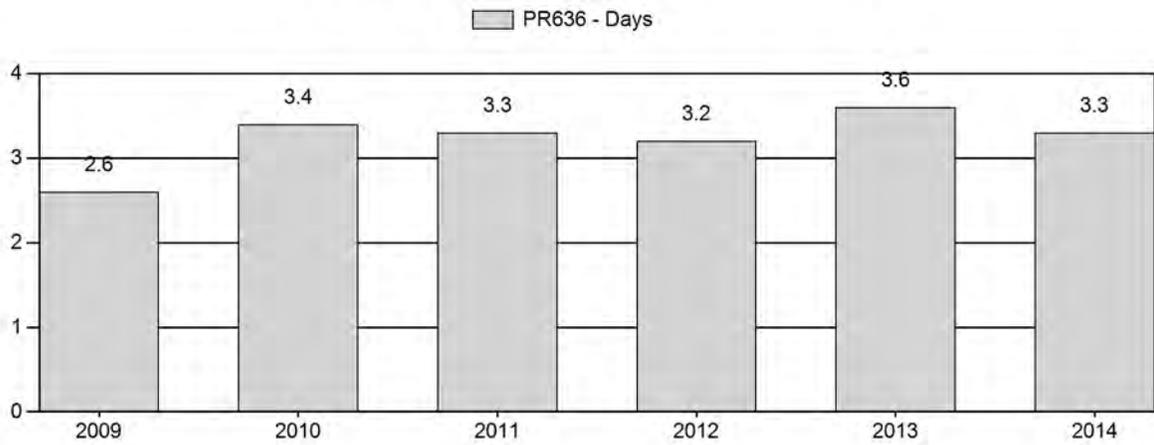
Harvest Success



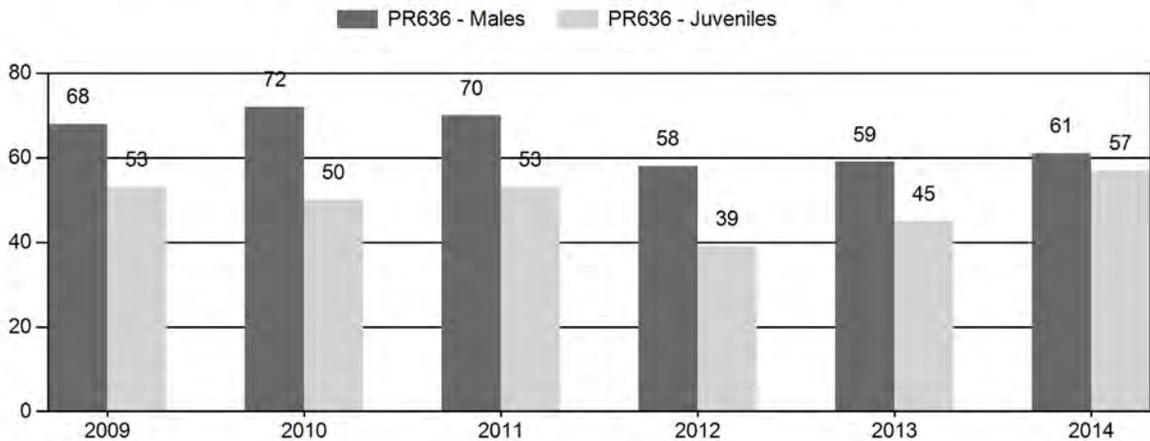
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR636 - NORTH FERRIS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	6,935	240	573	813	31%	1,192	45%	627	24%	2,632	2,040	20	48	68	± 4	53	± 3	31
2010	7,762	99	274	373	32%	519	45%	257	22%	1,149	2,145	19	53	72	± 7	50	± 6	29
2011	6,623	72	288	360	31%	516	45%	275	24%	1,151	1,914	14	56	70	± 7	53	± 6	31
2012	4,914	55	253	308	29%	534	51%	208	20%	1,050	1,330	10	47	58	± 6	39	± 5	25
2013	4,920	57	216	273	29%	459	49%	205	22%	937	1,460	12	47	59	± 7	45	± 6	28
2014	5,281	72	143	215	28%	350	46%	201	26%	766	0	21	41	61	± 8	57	± 8	36

**2015 HUNTING SEASONS
NORTH FERRIS PRONGHORN HERD (PR636)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
63	1	Sep. 19	Oct. 31	100	Limited quota; any antelope
	2	Sep. 19	Oct. 31	200	Limited quota; any antelope valid east of the Buzzard Road (Natrona County Road 410 – Carbon County Road 497)
	6	Sep. 19	Oct. 31	25	Limited quota; doe or fawn
	7	Sep. 19	Oct. 31	25	Limited quota; doe or fawn valid east of the Buzzard Road (Natrona County Road 410 – Carbon County Road 497)
Archery 63		Aug. 15	Sep. 18		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2012
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

2014 Postseason Population Estimate: ~5,030

2015 Proposed Postseason Population Estimate: ~4,760

The North Ferris pronghorn herd is managed toward a post-hunt population of 5,000, an objective last reviewed in 2014. 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

Historically, access has not been an issue in this herd unit which is mostly public lands, but access to some large 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

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve fawn survival. Condition of pronghorn going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February. Losses may still be above average because many animals were dispersed off winter ranges prior to the late winter blizzards.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have improved due to the increased precipitation in the latter half of the summer. 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 2014. 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. Shrub treatment on winter ranges, adjustments of grazing use, and modification of sheep-tight fences would benefit pronghorn in this herd unit.

Field Data

Classification sample size declined again for the fifth year, was the smallest sample since 1977, and was 40 percent less than the 5-year average. 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 to 57:100, the highest in six years, but was still below the long term average for this herd.

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, often double or triple historic levels, and surplus bucks were successfully harvested with the buck:doe ratio returning to an acceptable 58:100 in 2012. The ratio recorded in 2013 was little changed, at 59:100. Much of the decline was attributable to the supply of adult bucks, with that ratio dropping to its lowest level in nine years in 2014. As expected, hunter complaints about poor quality of bucks increased as the adult buck:doe ratio declined. Yearling recruitment was high again in 2014, producing a slight increase in the buck:doe ratio to 61:100, despite the reduced supply of adult bucks.

Harvest Data

Success for hunters with Type 1 licenses improved slightly, to 84 percent. Hunters with Type 2 licenses, which restricted them to the eastern portion where pronghorn densities are typically higher, also had improved success but were still low at 81 percent. The average effort required to harvest a pronghorn was unchanged for the Type 1 hunters, and improved slightly for those with Type 2 licenses.

Population

This herd was below objective size for most of the decade following the 1992-93 winter, 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.

Population estimates suggested this herd was well above objective size by 2006 and harvests were increased accordingly. The current spreadsheet model predicts the increased harvests successfully reduced the herd to objective size by 2011, and below objective in 2012. This current model, however, aligns near the maximum limit of the confidence interval on the most recent line transect survey and may be 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 model.

The Time-Specific Juvenile & Constant Adult Survival (TSJ,CA) 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 2014 classification and harvest data were added and falls within the confidence intervals of all 3 line transect estimates. Annual adult survival was predicted at 82 percent, a level slightly lower than in models for some nearby pronghorn herds. Juvenile survival rates fluctuated within the allowed range but frequently settled at maximum or minimum allowed values, exceeding adult survival rates in some years. This is difficult to accept biologically, and as a result the model is only considered to be a “Fair” representation of the herd. 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 five or six of the past 20 years.

Due to the improved condition of animals going into this winter and improved browse conditions following the late summer moisture, fawn production in 2015 was projected to be near the 5-year average. The model was run using a median juvenile survival in 2015.

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 present here as well. Effects of significant losses in late summer and early fall 2014 may not yet affect estimates in the model and it may be over-estimating herd size.

Management Summary

With slight improvement in fawn production and the herd estimated to be near objective size, doe harvest needs to be implemented to prevent any significant increase in herd size. As with the “any antelope” licenses, the recommendation is to restore both the Type 6 and Type 7 doe/fawn licenses which were eliminated in 2014, directing at least half the additional harvest to the eastern portion of the herd unit where pronghorn densities are typically higher and where most private lands are found. The model predicts even this slight increase in harvest will decrease herd size below 5,000 in 2015, unless fawn production exceeds average.

The expected harvest of roughly 220 bucks and 45 does and fawns from the 2015 license quotas should provide a slight decrease (~5 percent) in herd size, projected to be ~4,800 at post-hunt 2015. With the herd so close to objective, if either winter survival or fawn production exceeds expectations in 2015, harvests will probably need to be further increased in future years.

Opening date is shifted one day to remain on the third Saturday of September, synchronizing with Area 68 to the north and other areas in the Lander Region. Closing date is the same as in the previous three years 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 Hlatt
Herd Unit & No.:	North Ferris 636
Model date:	03/03/15

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	Constant Juvenile & Adult Survival	101	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	79	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	28	

Clear form

Check best model to create report

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

Population Estimates from Top Model

Year	Predicted Prehunt Population (year /)		Total	Predicted Posthunt Population (year /)		Total	Predicted adult End-of-bio-year Pop (year /)		Total Adults	LT Population Estimate	Trend Count	Objective
	Juveniles	Total Males		Females	Juveniles		Total Males	Females				
1993	800	1380	2988	800	1179	2986	4985	1316	2862	4178		5000
1994	1281	1290	2805	1281	1106	2800	5187	1478	2927	4406		5000
1995	1311	1449	2869	1311	1257	2861	5430	1618	2992	4609		5000
1996	1964	1585	2932	1964	1405	2932	6301	1615	2924	4539		5000
1997	1393	1582	2866	1393	1395	2862	5651	1416	2676	4091		5000
1998	1783	1388	2622	1783	1115	2618	5516	1245	2551	3796		5000
1999	1587	1220	2500	1587	1032	2497	5116	1152	2410	3562		5000
2000	1225	1129	2362	1221	957	2362	4540	1016	2222	3238		5000
2001	1600	996	2178	1600	832	2175	4607	991	2144	3135		5000
2002	1486	972	2101	1486	801	2101	4388	1240	2358	3598		5000
2003	1579	1215	2311	1579	1031	2308	4917	1552	2853	4205		5000
2004	1842	1521	2600	1842	1354	2600	5796	1946	3018	4965		5000
2005	2065	1907	2958	2065	1738	2950	6753	2369	3412	5781		5000
2006	2009	2322	3344	2009	2071	3301	7381	2607	3673	6279	6464	5000
2007	2492	2555	3599	2487	2214	3481	8181	2466	3566	6033		5000
2008	2354	2417	3495	2321	2019	3275	7615	2626	3709	6335		5000
2009	1912	2574	3635	1887	2093	3346	7326	2525	3608	6133		5000
2010	1751	2475	3536	1725	2012	3205	6941	2050	3071	5121		5000
2011	1604	2009	3010	1584	1558	2644	5786	1503	2527	4030		5000
2012	965	1473	2477	938	980	2168	4086	1443	2473	3916		5000
2013	1083	1414	2424	1076	1187	2385	4648	1425	2518	3943		5000
2014	1417	1396	2468	1417	1148	2463	5028	1354	2451	3805		5000
2015	1321	1327	2402	1316	1085	2358	4758					5000
2016												5000
2017												5000
2018												5000
2019												5000
2020												5000
2021												5000
2022												5000
2023												5000
2024												5000
2025												5000

Survival and Initial Population Estimates

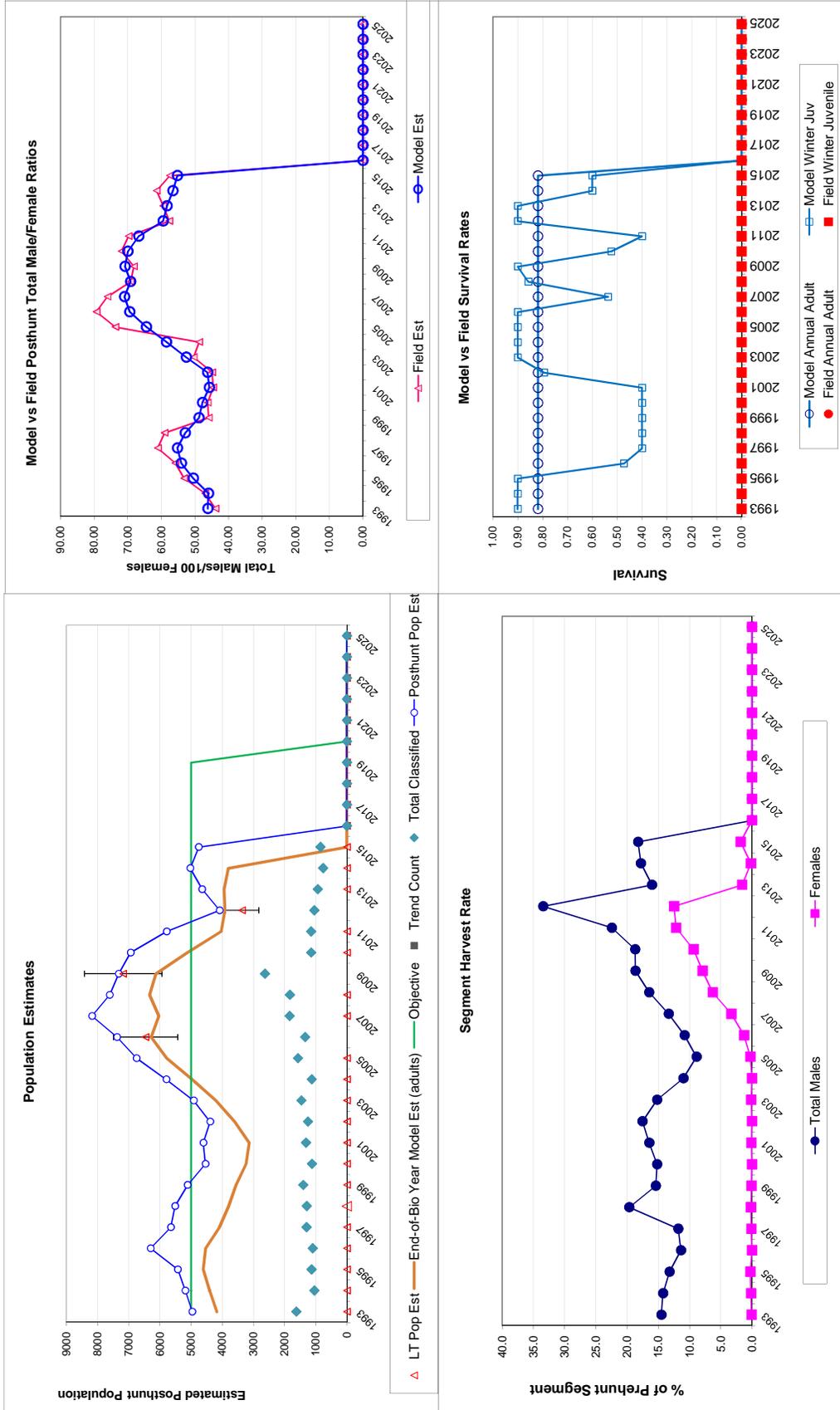
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.90		0.82	
1994	0.90		0.82	
1995	0.90		0.82	
1996	0.47		0.82	
1997	0.40		0.82	
1998	0.40		0.82	
1999	0.40		0.82	
2000	0.40		0.82	
2001	0.40		0.82	
2002	0.79		0.82	
2003	0.90		0.82	
2004	0.90		0.82	
2005	0.90		0.82	
2006	0.90		0.82	
2007	0.54		0.82	
2008	0.86		0.82	
2009	0.90		0.82	
2010	0.52		0.82	
2011	0.40		0.82	
2012	0.90		0.82	
2013	0.90		0.82	
2014	0.60		0.82	
2015	0.60		0.82	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Adult Survival =		0.819
Initial Total Male Pop/10,000 =		0.138
Initial Female Pop/10,000 =		0.299

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

Year	Classification Counts						Harvest					
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE					Total Males	Females
1993	26.79	1.89		43.91	2.58		182	2	0	184	14.5	0.1
1994	45.67	3.50		46.96	3.57		167	4	0	171	14.2	0.2
1995	45.71	3.42		53.24	3.78		174	7	0	181	13.2	0.3
1996	67.00	4.76		55.87	4.20		164	0	0	164	11.4	0.0
1997	48.63	3.42		61.07	3.99		170	3	0	173	11.8	0.1
1998	68.01	4.48		59.05	4.06		248	4	0	252	19.7	0.2
1999	63.49	3.93		45.90	3.16		171	2	0	173	15.4	0.1
2000	51.85	3.73		46.21	3.45		156	0	3	159	15.2	0.0
2001	73.47	4.60		44.61	3.27		149	2	0	151	16.5	0.1
2002	70.74	4.56		44.92	3.35		155	0	0	155	17.5	0.0
2003	68.31	4.15		50.37	3.36		168	3	0	171	15.2	0.1
2004	70.87	4.85		48.74	3.75		152	0	0	152	11.0	0.0
2005	69.81	4.28		73.68	4.45		154	7	0	161	8.9	0.3
2006	60.07	4.14		79.32	5.04		228	39	0	267	10.8	1.3
2007	69.24	3.95		76.03	4.22		310	108	5	423	13.3	3.3
2008	67.35	3.81		69.16	3.89		362	200	30	592	16.5	6.3
2009	52.60	2.59		68.20	3.10		437	262	23	722	18.7	7.9
2010	49.52	3.78		71.87	4.88		421	301	24	746	18.7	9.4
2011	53.29	3.98		69.77	4.79		410	333	18	761	22.5	12.2
2012	38.95	3.18		57.68	4.13				281	753	33.5	12.5
2013	44.66	3.75		59.48	4.55				35	247	16.0	1.6
2014	57.43	5.08		61.43	5.32				4	230	17.8	0.2
2015	55.00	4.62		57.50	4.76				40	265	18.2	1.8
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

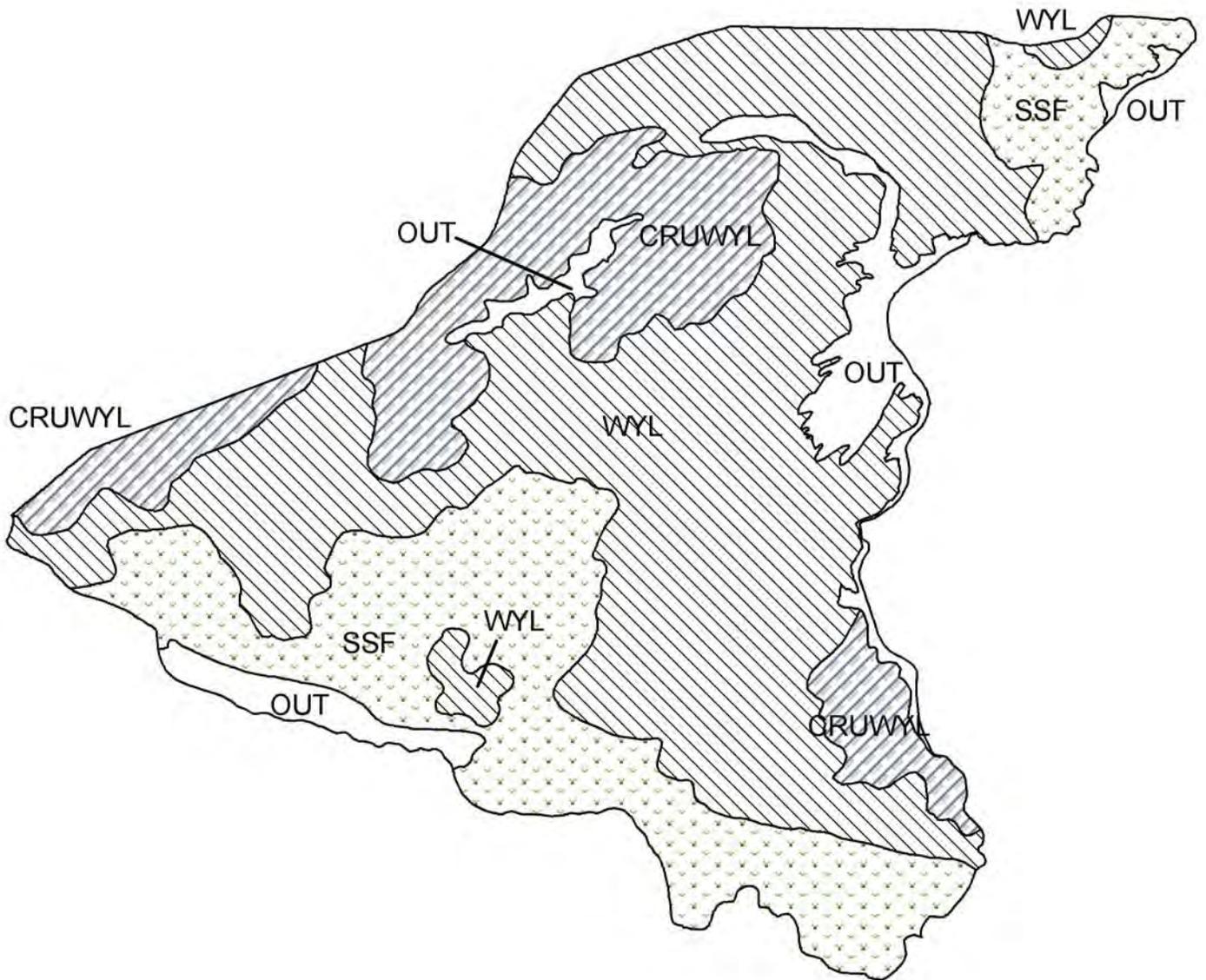
FIGURES



Comments:



PH636 - North Ferris
HA 63
Revised - 8/95



2014 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR637 - SOUTH FERRIS

HUNT AREAS: 62

PREPARED BY: GREG HIATT

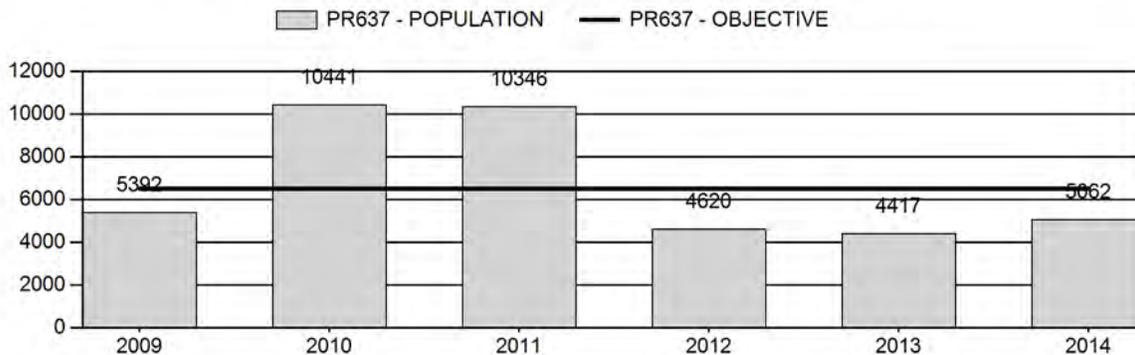
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	7,043	5,062	5,052
Harvest:	214	101	120
Hunters:	245	118	150
Hunter Success:	87%	86%	80 %
Active Licenses:	258	128	150
Active License Success:	83%	79%	80 %
Recreation Days:	727	510	450
Days Per Animal:	3.4	5.0	3.8
Males per 100 Females	60	64	
Juveniles per 100 Females	43	47	

Population Objective ($\pm 20\%$) :	6500 (5200 - 7800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-22.1%
Number of years population has been + or - objective in recent trend:	3
Model Date:	3/3/2015

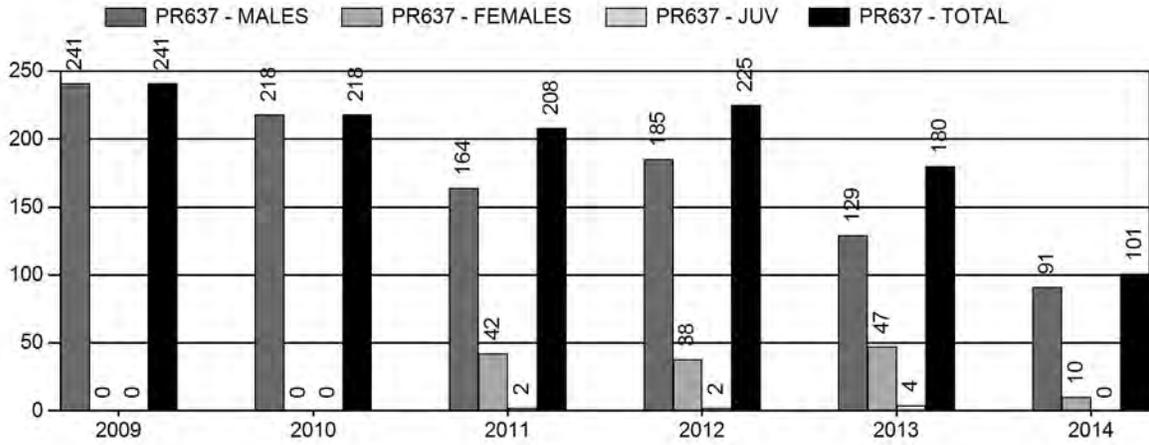
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0.8%	0.7%
Males ≥ 1 year old:	6.6%	7.6%
Juveniles (< 1 year old):	0%	0%
Total:	2.1%	2.3%
Proposed change in post-season population:	-7.2%	+0.2%

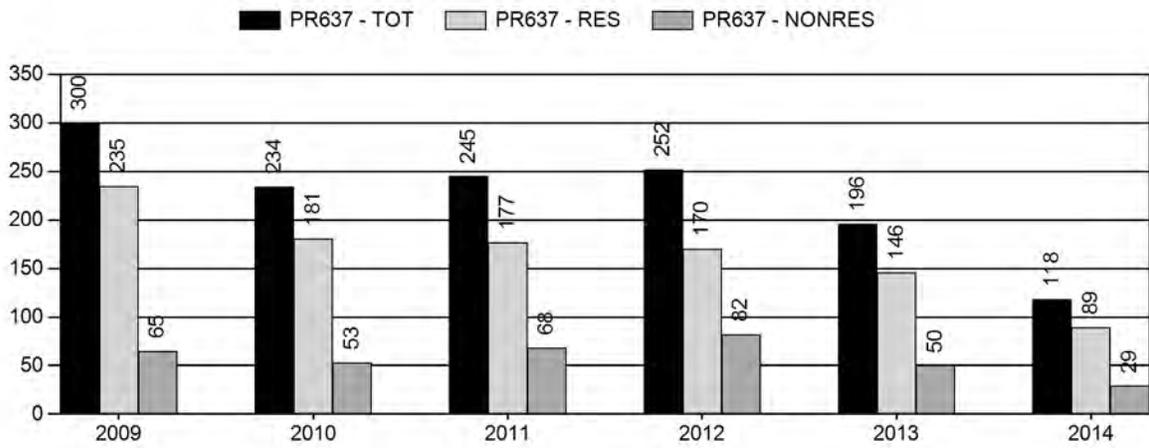
Population Size - Postseason



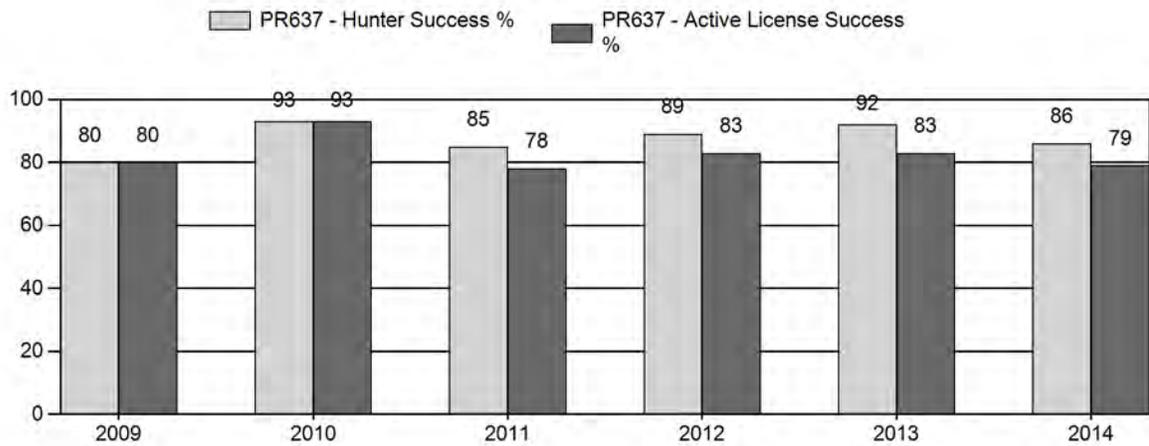
Harvest



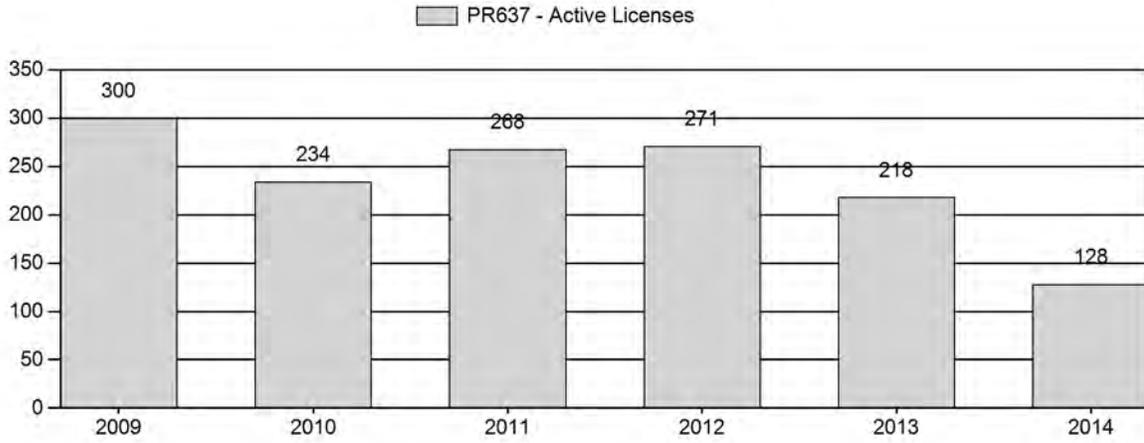
Number of Hunters



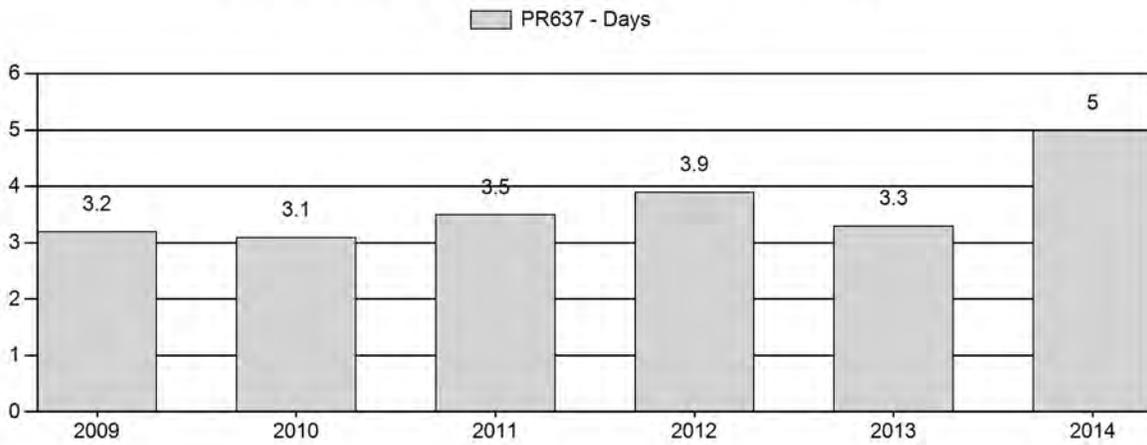
Harvest Success



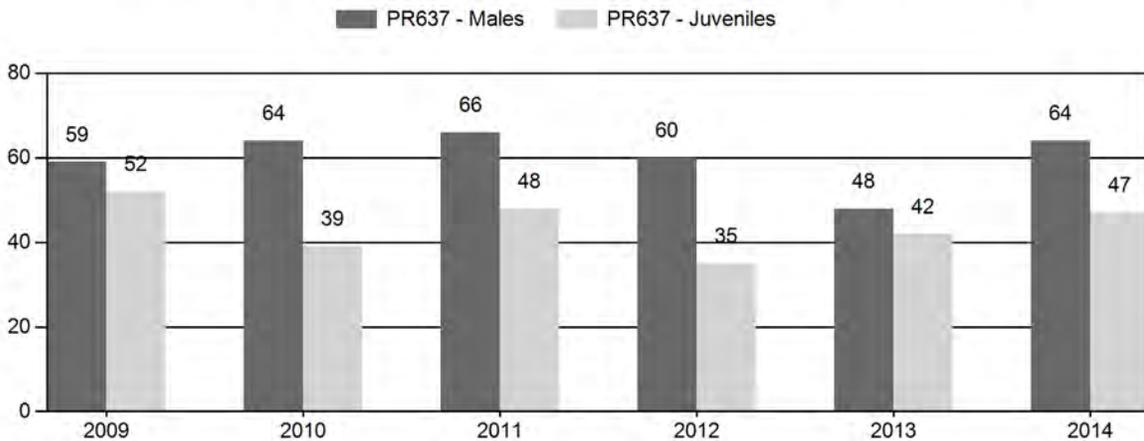
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2009 - 2014 Preseason Classification Summary

for Pronghorn Herd PR637 - SOUTH FERRIS

Year	Pre Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	5,657	127	495	622	28%	1,049	47%	543	25%	2,214	1,553	12	47	59	± 0	52	± 0	32
2010	10,681	209	578	787	31%	1,234	49%	481	19%	2,502	1,652	17	47	64	± 4	39	± 3	24
2011	10,574	144	477	621	31%	943	47%	451	22%	2,015	1,776	15	51	66	± 5	48	± 4	29
2012	4,868	47	452	499	31%	827	51%	293	18%	1,619	1,502	6	55	60	± 5	35	± 3	22
2013	4,615	53	312	365	25%	766	53%	319	22%	1,450	1,145	7	41	48	± 4	42	± 4	28
2014	5,173	82	354	436	30%	686	47%	324	22%	1,446	1,638	12	52	64	± 5	47	± 4	29

**2015 HUNTING SEASONS
SOUTH FERRIS PRONGHORN HERD (PR637)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
62	1	Sep. 12	Oct. 31	40	Limited quota; any antelope
	2	Sep. 12	Oct. 31	100	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. 11		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
62	1	0
	2	+25
	7	0
Total	1 & 2	+25
	7	0

Management Evaluation

Current Management Objective: 6,500

Management Strategy: Recreation

2014 Postseason Population Estimate: 5,060

2015 Proposed Postseason Population Estimate: 5,050

The South Ferris pronghorn herd is managed toward a post-hunt population size of 6,500 pronghorn, an objective last publicly reviewed in 2014. Population size is estimated using a spreadsheet model developed in 2015. The herd is in recreational management, with harvest quotas designed to maintain pre-hunt buck:doe ratios below 60:100.

Herd Unit Issues

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.

Prior to 2012, population size was estimated using a Pop-II model with reasonable confidence. Attempts to develop a spreadsheet model for the herd in 2012 and 2013 were 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. However, addition of the 2014 classification and harvest data allowed for a reasonable model of herd size and trend.

Fawn crops have only ranged from 28 to 55:100 over the past 14 years, averaging ~40:100. In addition to limited access to 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 recent years, and it is not known how the newest owners will handle hunter access. They have already decided to not renew the large Walk-In area along US287.

Losses to EHD 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 Seminole Reservoir, but spanned down to Rawlins and up towards Lamont. No similar mortalities were found in 2014, but the presence of the disease should remain a concern whenever drought conditions arise.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve fawn survival. Condition of pronghorn going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February. Losses may still be above average because many animals were dispersed off winter ranges prior to the late blizzards.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have improved from the increased late summer moisture. Only one shrub transect has been established near this herd unit, on the Morgan Creek WHMA. This transect used to monitor bitterbrush growth and utilization in the Seminole Mountains 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. Treatment of browse on winter ranges, adjustments of grazing use, and modification of sheep-tight fences would benefit pronghorn in this herd unit.

Field Data

Classification sample size in 2014 was essentially the same as in 2013, the smallest sample since 1979. Fawn production improved slightly, to 47:100, slightly above the 5-year average. Fawn production was significantly lower in the eastern portion of the herd at 36:100, compared to 55:100 in the west.

The buck:doe ratio jumped from 48:100 in 2013 to 64:100 in 2014. All of the increase in this ratio was in the eastern portion of the herd unit, where access is strictly limited. The eastern ratio rose from 55:100 in 2013 to 100:100 in 2014. Most of the increase was in the adult buck:doe ratio, which rose from 48:100 in 2013 to 80:100 in 2014, but the yearling buck ratio also increased, from 7:100 to 19:100. Buck:doe ratios in the western portion of the herd did not change, at 7:100 for yearling bucks and 33:100 for adult bucks in both 2013 and 2014. Buck:doe ratios have exceeded the 60:100 maximum criterion for recreational management in four of the past seven 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 42:100 over the previous five years, generating complaints of poor buck numbers and quality by hunters. Buck:doe ratios in the eastern portion, however, averaged 75:100 over those five years. The Type 2 licenses introduced in 2012 to address the disparity between buck densities between the two portions of the area have only been moderately successful.

Harvest Data

The difference in supply of bucks between the two halves of the herd unit is also apparent in the harvest statistics. While both Type 1 and Type 2 hunters had poor success in 2014, at 83 percent, those limited to the eastern portion of the herd unit only expended an average of 3.3 days to harvest an animal. The Type 1 hunters, able to hunt the entire area but usually only found in the western portion, expended a record 8.9 days for each pronghorn harvested.

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. Nineteen does were harvested the first year, but only 10 were removed in 2014. Pronghorn use of the irrigated fields appears to have lessened, but it is not known if that is due to harvest, hunter activity or more forage opportunities on native ranges due to increased precipitation in 2014.

Population

Efforts to develop a reasonable spreadsheet model for this herd in 2012 and 2013 failed, a failure attributed to the highly skewed buck:doe ratios between the eastern and western portions of the herd unit. Last year's population estimates were obtained using two separate spreadsheet models, one each for the east and west portions of the herd unit. While effective, these separate models could not be anchored to defensible line transect estimates. This year, however, the addition of the 2014 classification and harvest data allowed for a reasonable model, despite the highly skewed buck:doe ratios.

A line transect survey in spring of 2013 estimated only 4,600 pronghorn in this herd, and found a noticeable disparity in pronghorn densities between the east and west portions. The population estimate was less than half that of a similar survey three years earlier, and standard spreadsheet models were apparently unable to accommodate that steep of a decline in herd size. This year's model, however, incorporated one year of variable adult survival in the Time-Specific Juvenile & Constant Adult Survival (TSJ,CA) model, for the severe 2011-12 winter.

While costing a degree of freedom, the resultant model has a reasonable AICc value, aligns closely with all three line transect estimates, has a reasonable track compared to historic trend

counts, and aligns well with most observed buck:doe ratios. Adult mortality for the majority of years in the model is estimated at a reasonable 88 percent, while adult survival in 2011 drops to 40 percent. This also appears reasonable, given the losses noted that year and the severe decline in line transect estimates. However, juvenile survival rates exceeded adult survival rates in some years of the model. This is difficult to accept biologically, and as a result the model is only considered to be a “Fair” representation of the herd.

The CJ,CA model had a similar AICc value, but did not track observed buck:doe ratios, aligned with only the two older line transect estimates, and predicted unrealistic counting success for early trend counts and equally unrealistic poor counting success for later trend counts. The SCJ,SCA model had the lowest AICc value, but only aligned with two of three line transect estimates, fit poorly with historic trend counts, observed buck:doe ratios and required four years of variable survival rates instead of one.

The new TSJ,CA model predicts the herd was about 22 percent below objective in 2014. Fawn production in 2015 was projected to be near the 5-year average. Assuming a mid-range fawn survival of 60 percent, the model predicts the herd will essentially be stable in 2015.

Management Summary

With the population well below objective, harvests need to remain low to allow the herd to recover and no changes are recommended for the Type 1 license quota. The exceptionally high buck:doe ratio in the eastern portion of the herd indicates there is a surplus of bucks that can be harvested in that portion. The recommended quota for Type 2 licenses is increased by 33 percent. While no doe harvest is needed for the herd as a whole, 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 105 bucks and 15 does and fawns from the proposed license quotas should maintain herd size near the 2014 level of approximately 5,000 pronghorn.

Opening date falls on the traditional day of the week and will synchronize with neighboring Area 61. The closing date is the same as in the previous three years 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 Greg Hiatt
Herd Unit & No.:	637 = S.Ferris=good?
Model date:	03/03/15

MODELS SUMMARY			Notes
	Relative AICc	Fit	
CJ,CA	160	151	<input type="checkbox"/> Clear form Check best model to create report <input type="checkbox"/> CJ,CA Model <input type="checkbox"/> SCJ,SCA Mod <input checked="" type="checkbox"/> TSJ,CA Model
SCJ,SCA	119	87	
TSJ,CA	152	33	

Year	Predicted Prehunt Population (year /)		Predicted Posthunt Population (year /)		Predicted adult End-of-bio-year Pop (year /)		Total	Relative AICc	Fit	Notes	Trend Count	Objective
	Juveniles	Total Males	Juveniles	Total Males	Total Males	Females						
1993	1429	2139	1416	1748	1748	3758	6921					6500
1994	1602	2098	1598	1813	1813	3817	7228					6500
1995	1771	2111	1771	1919	1919	3892	7582					6500
1996	1941	2074	1941	1892	1892	3821	7654					6500
1997	1956	2024	1956	1832	1832	3732	7519					6500
1998	1602	1973	1602	1719	1719	3656	6978					6500
1999	1904	1796	1904	1557	1557	3520	6980					6500
2000	1855	2240	1852	2017	2017	3930	7798					6500
2001	1402	2620	1402	2427	2427	4317	8147					6500
2002	1668	2770	1668	2497	2497	4451	8616					6500
2003	1302	2948	1302	2702	2702	4694	8697					6500
2004	2390	2956	2390	2647	2647	4728	9765					6500
2005	2537	2761	2537	2378	2378	4622	9537					6500
2006	1317	2545	1306	2247	2247	4518	8071					6500
2007	1750	2191	1750	1855	1855	4214	7819					6500
2008	1699	2416	1699	2143	2143	4525	8367					6500
2009	2471	2652	2471	2387	2387	4774	9632					6500
2010	2089	3234	2089	2994	2994	5359	10441					6500
2011	2446	3013	2444	2632	2632	5069	10346					6500
2012	883	1491	881	1287	1287	2452	4620					6500
2013	962	1342	958	1200	1200	2259	4417					6500
2014	1168	1533	1168	1433	1433	2461	5062					6500
2015	1221	1520	1221	1405	1405	2426	5052					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

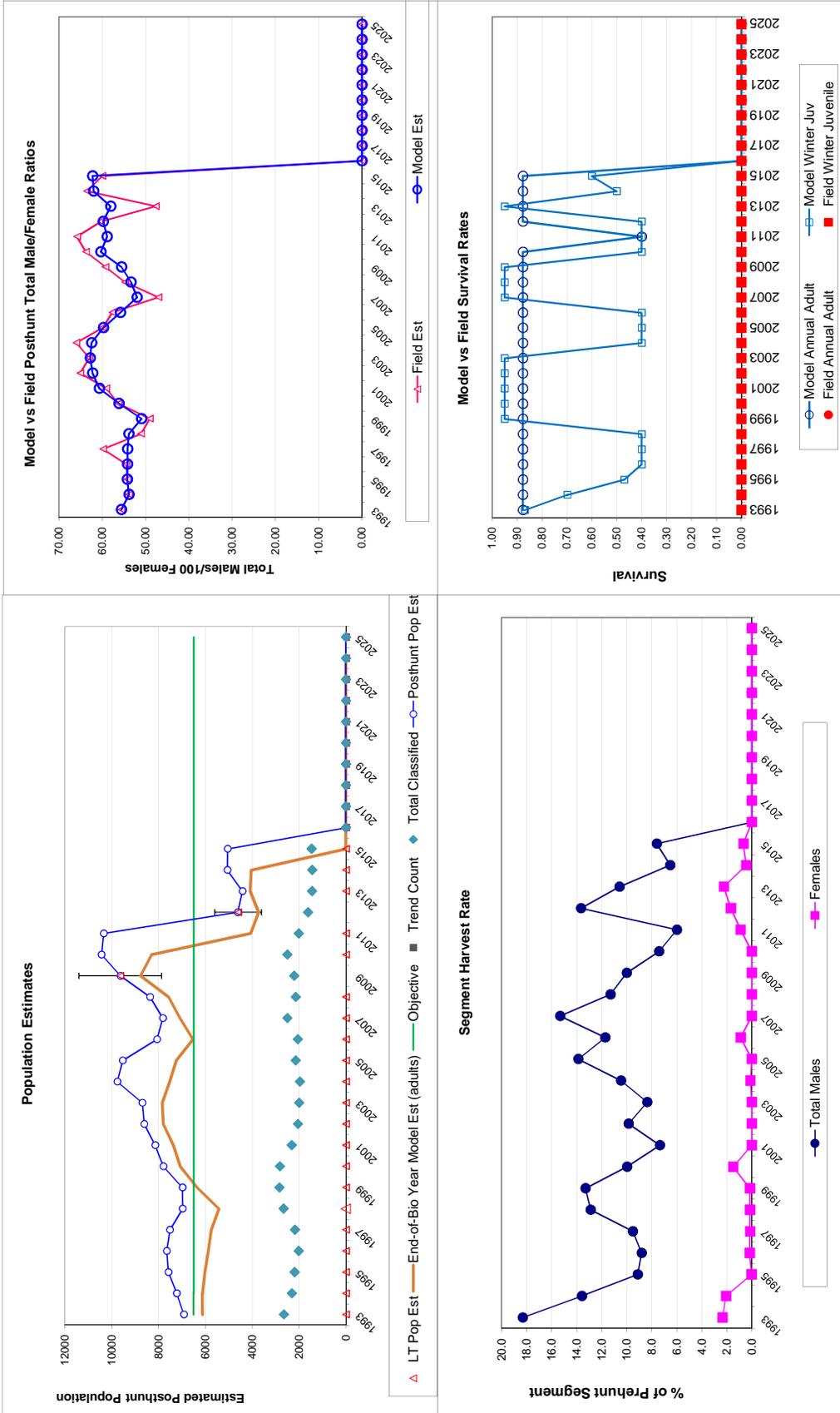
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.87		0.88	
1994	0.70		0.88	
1995	0.47		0.88	
1996	0.40		0.88	
1997	0.40		0.88	
1998	0.40		0.88	
1999	0.95		0.88	
2000	0.95		0.88	
2001	0.95		0.88	
2002	0.95		0.88	
2003	0.95		0.88	
2004	0.40		0.88	
2005	0.40		0.88	
2006	0.40		0.88	
2007	0.95		0.88	
2008	0.95		0.88	
2009	0.95		0.88	
2010	0.40		0.88	
2011	0.40		0.40	
2012	0.40		0.88	
2013	0.95		0.88	
2014	0.50		0.88	
2015	0.60		0.88	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Adult Survival =		0.877
Initial Total Male Pop/10,000 =		0.214
Initial Female Pop/10,000 =		0.385

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

Year	Classification Counts						Harvest					
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE					Total Males	Females
1993		37.14	1.92	55.60	55.60	2.51	356	82	12	450	18.3	2.3
1994		41.11	2.21	53.83	53.83	2.64	259	73	4	336	13.6	2.1
1995		45.50	2.45	54.23	54.23	2.76	175	1	0	176	9.1	0.0
1996		50.71	2.78	54.19	54.46	2.92	166	6	0	172	8.8	0.2
1997		52.33	2.78	54.16	59.82	3.05	175	5	0	180	9.5	0.1
1998		43.75	2.14	53.88	51.06	2.37	231	5	0	236	12.9	0.2
1999		54.00	2.44	50.95	49.07	2.29	217	5	0	222	13.3	0.2
2000		46.51	2.21	56.15	56.29	2.51	203	54	3	260	10.0	1.5
2001		32.48	1.89	60.69	59.09	2.79	175	0	0	175	7.3	0.0
2002		37.48	2.25	62.25	65.09	3.26	248	0	0	248	9.8	0.0
2003		27.74	1.84	62.81	63.01	3.13	224	0	0	224	8.4	0.0
2004		50.50	2.89	62.46	66.01	3.47	281	5	0	286	10.5	0.1
2005		54.90	2.82	59.73	59.90	3.09	348	0	0	348	13.9	0.0
2006		28.89	1.84	55.82	57.70	2.87	271	37	10	318	11.7	0.9
2007		41.52	2.10	51.99	47.02	2.28	305	0	0	305	15.3	0.0
2008		37.54	2.15	53.39	54.75	2.76	248	0	0	248	11.3	0.0
2009		51.76	2.74	55.55	59.29	3.00	241	0	0	241	10.0	0.0
2010		38.98	2.10	60.34	63.78	2.91	218	0	0	218	7.4	0.0
2011		47.83	2.74	58.89	65.85	3.40	164	42	2	208	6.0	0.9
2012		35.43	2.41	59.79	60.34	3.42			38	225	13.6	1.7
2013		41.64	2.78	58.06	47.65	3.03			47	180	10.6	2.2
2014		47.23	3.18	62.02	63.56	3.89			10	101	6.5	0.4
2015		50.00	3.27	62.25	60.00	3.70			15	120	7.6	0.7
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

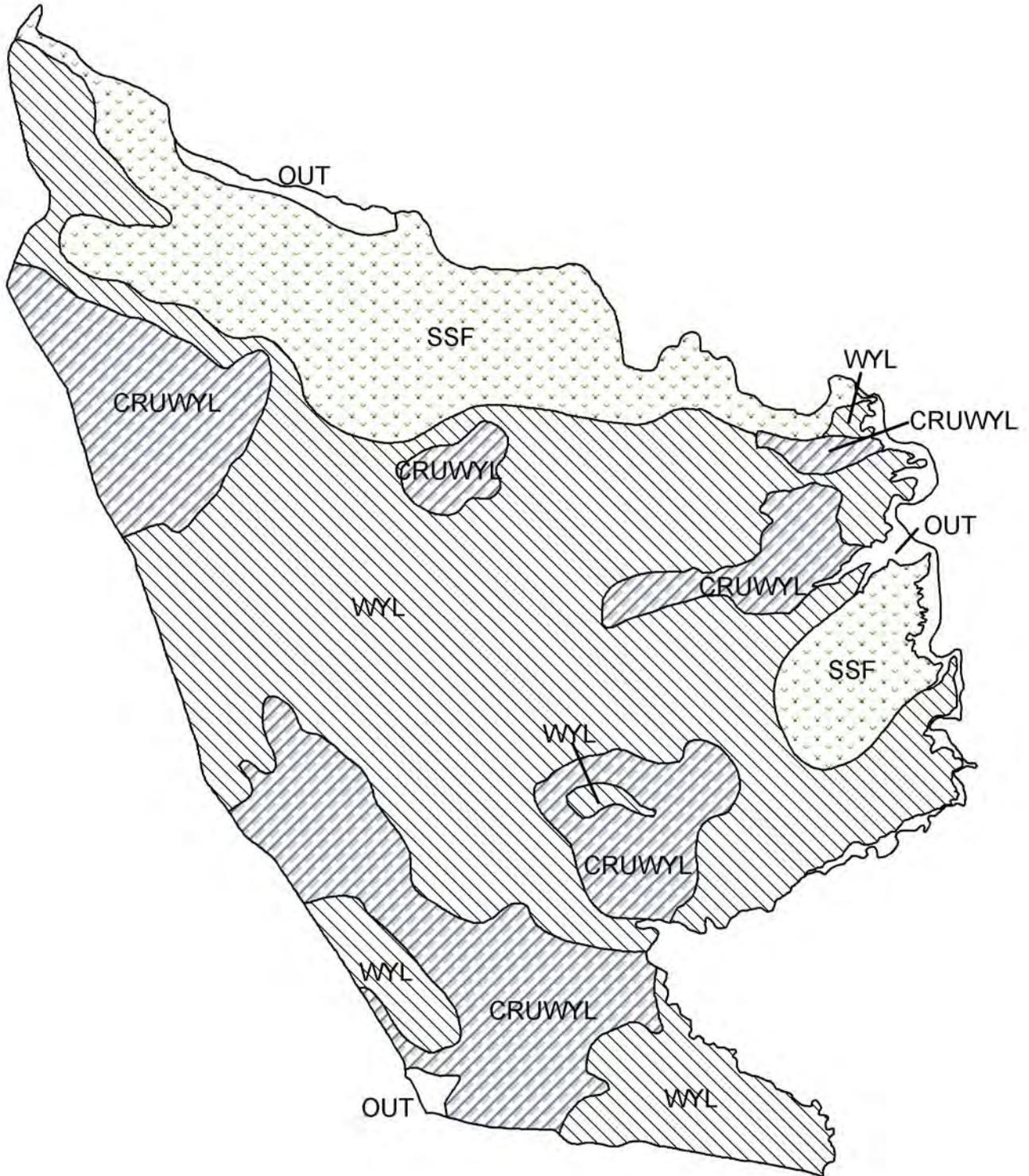
FIGURES



Comments:



PH637 - South Ferris
HA 62
Revised - 8/95



2014 - JCR Evaluation Form

SPECIES: Mule Deer
 HERD: MD642 - DUBOIS
 HUNT AREAS: 128, 148

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

 PREPARED BY: GREG
 ANDERSON

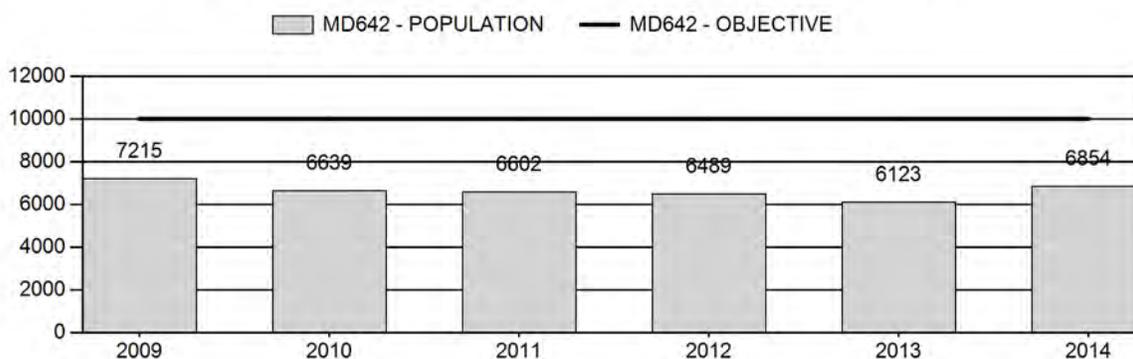
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	6,614	6,854	7,260
Harvest:	523	340	275
Hunters:	1,210	1,163	1,000
Hunter Success:	43%	29%	28 %
Active Licenses:	1,276	1,173	1,000
Active License Success:	41%	29%	28 %
Recreation Days:	7,156	6,587	5,500
Days Per Animal:	13.7	19.4	20
Males per 100 Females	26	32	
Juveniles per 100 Females	61	58	

Population Objective (± 20%) :	10000 (8000 - 12000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-31.5%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/20/2015

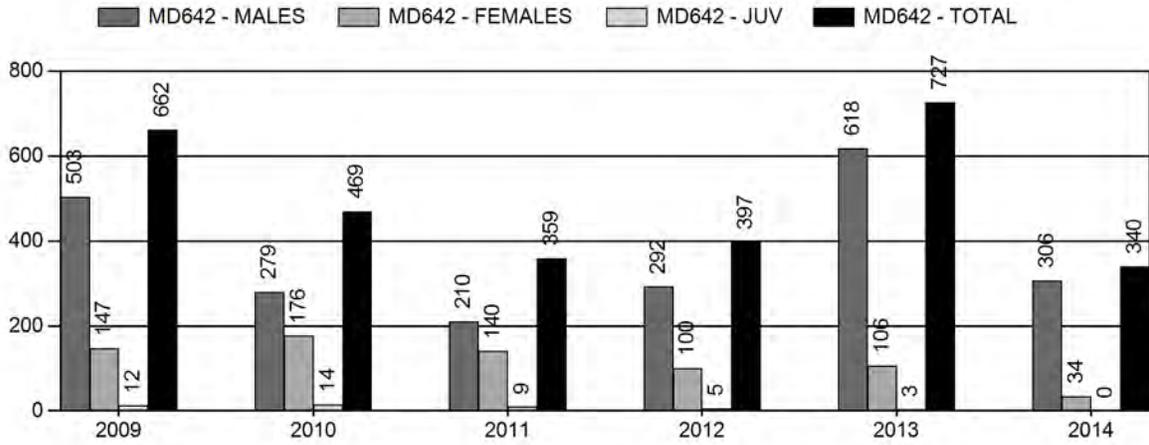
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	18%	17%
Juveniles (< 1 year old):	1%	0%
Total:	4%	4%
Proposed change in post-season population:	+16%	+6%

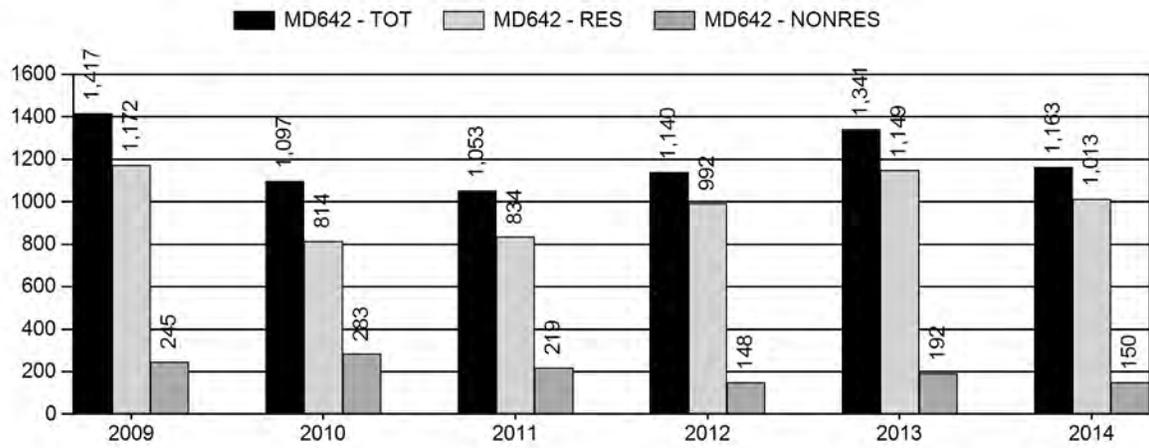
Population Size - Postseason



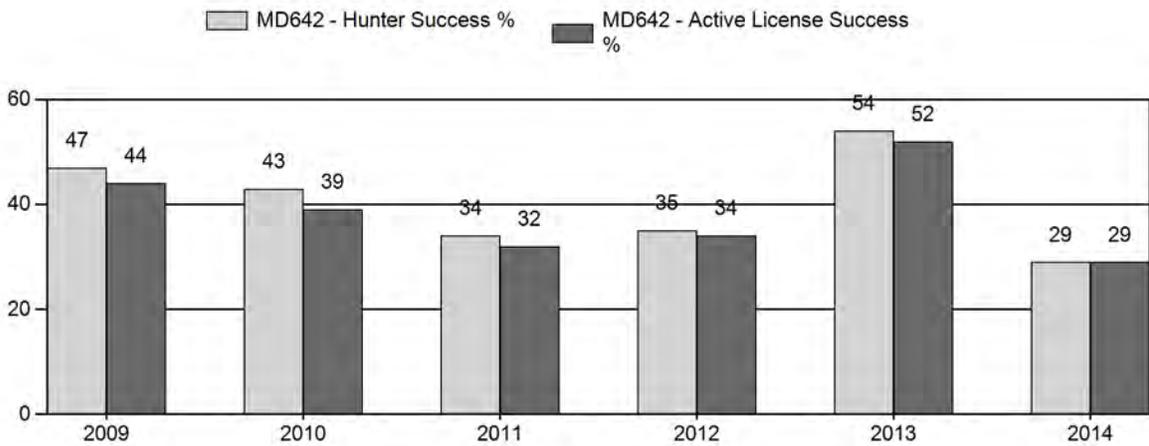
Harvest



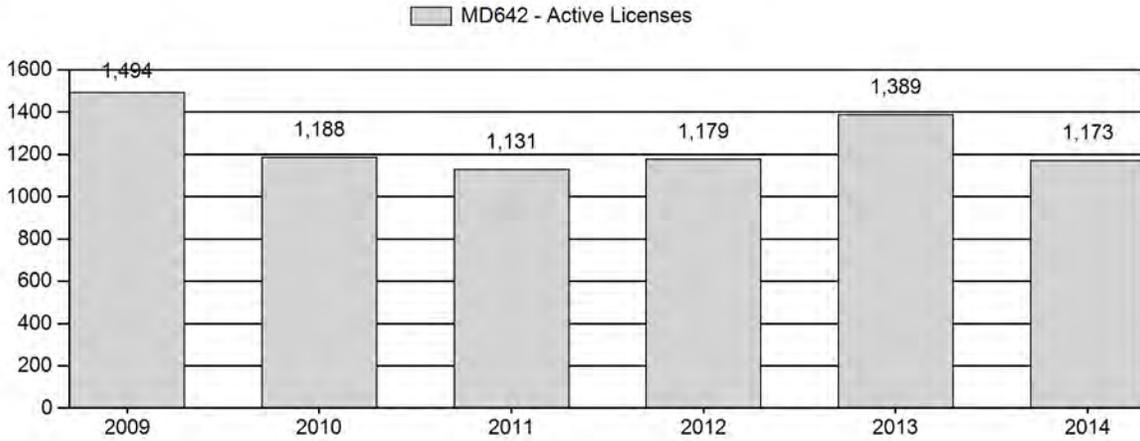
Number of Hunters



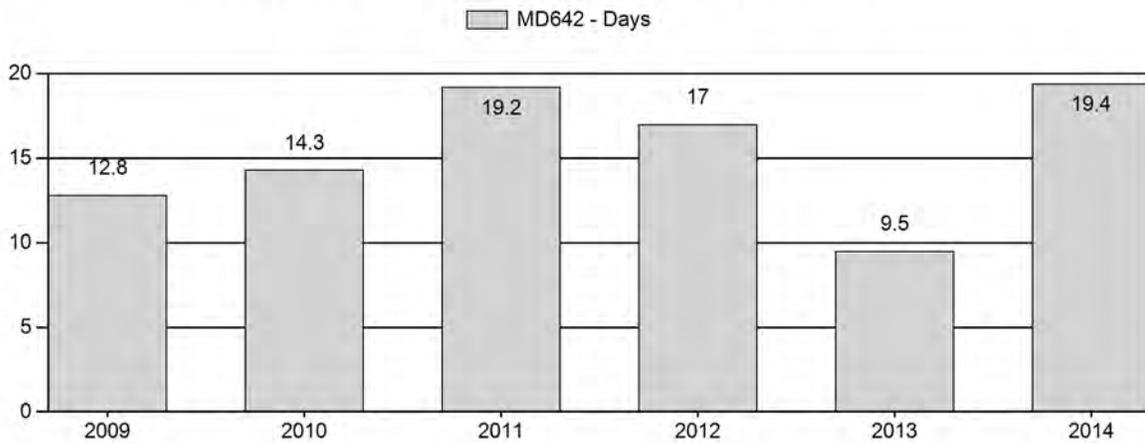
Harvest Success



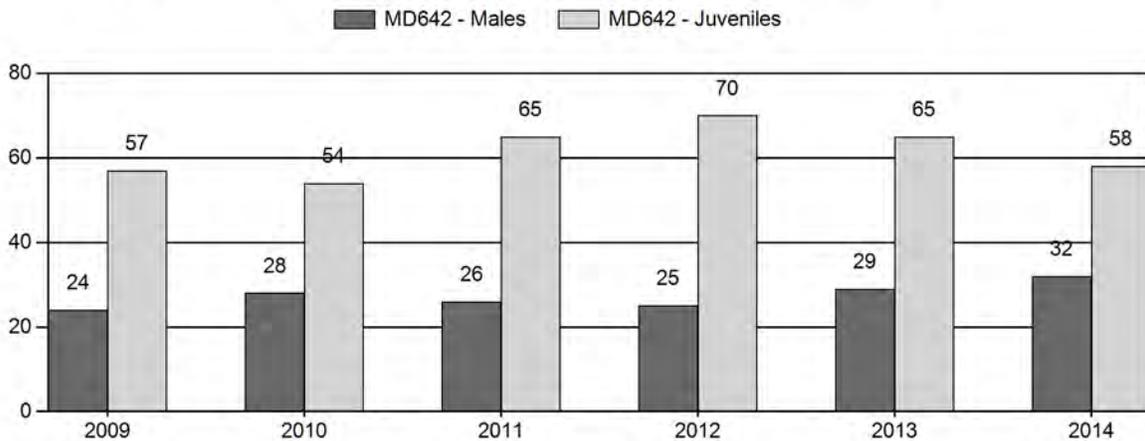
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD642 - DUBOIS

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	7,215	64	0	0	0	117	181	13%	765	55%	434	31%	1,380	928	8	15	24	± 2	57	± 4	46
2010	6,639	61	0	0	0	128	189	15%	683	55%	370	30%	1,242	876	9	19	28	± 3	54	± 4	42
2011	6,602	36	0	0	0	52	88	14%	340	52%	221	34%	649	1,073	11	15	26	± 4	65	± 7	52
2012	6,489	26	0	0	0	78	104	13%	415	51%	291	36%	810	1,232	6	19	25	± 3	70	± 6	56
2013	6,123	73	0	0	0	102	175	15%	605	51%	395	34%	1,175	1,117	12	17	29	± 3	65	± 5	51
2014	6,854	66	0	0	0	110	176	17%	555	53%	320	30%	1,051	980	12	20	32	± 3	58	± 5	44

**2015 HUNTING SEASONS
DUBOIS MULE DEER (MD 642)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
128		Oct. 1	Oct. 15		General; antlered mule deer or any white-tailed deer
	1	Nov. 1	Nov. 20	50	Limited quota; any deer
	3	Nov. 1	Nov. 20	50	Limited quota; any white-tailed deer
	7	Nov. 1	Nov. 20	25	Limited quota; doe or fawn valid on private land
148		Sep. 15	Oct. 25		General; antlered deer
Archery					
128		Sep. 1	Sep. 30		General; any deer. Limited quota; refer to license type.
148		Sep. 1	Sep. 14		General; any deer

Non Resident Region E Quota: 600

Hunt Area	Type	Quota change from 2014
Total		

Management Evaluation

Current Management Objective: 10,000

Management Strategy: Recreational

2014 Postseason Population Estimate: ~6,900

2015 Proposed Postseason Population Estimate: ~7,300

Management Issues

The Dubois mule deer herd has a post-season population size objective of 10,000 and a recreational management strategy. The objective has been in place since 1994.

Deer in this herd unit winter in hunt area 128. It is known many of the deer migrate out of the herd unit in late spring and do not return until early winter. Migration routes and the extent of summer range are unknown. Deer that do remain in the herd unit generally spend summers at high elevation sites. Much of the winter range utilized by deer overlaps elk and bighorn sheep winter range and remains relatively untouched by development.

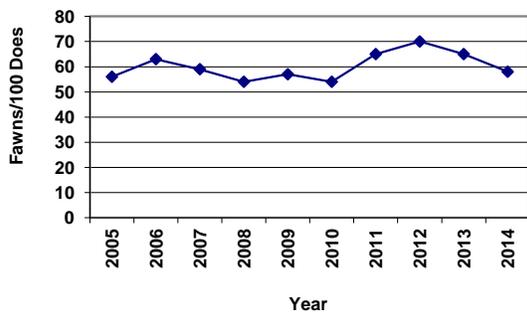
Habitat/Weather

The past year was characterized by mild conditions and good vegetation growth throughout the herd unit. Vegetation transects monitored to determine the amount of forage available on elk winter range revealed herbaceous vegetation production was well above levels observed over the previous 2 years and was higher than the 20 year average for the area. No shrub data is collected in the herd unit, but the good growing conditions undoubtedly resulted in high browse production. Given the good feed resource in 2014, mule deer in the herd unit undoubtedly entered winter in good shape. Fall weather was mild followed by significant snow and cold temperatures in December and January. After January, temperatures moderated and snow cover receded. Given mild to average winter conditions and excellent feed availability, mule deer survival in 2014 is expected to be good.

Field/Harvest Data/Population

In 2014, personnel classified 1,051 mule deer. The sample exceeded the desired sample size for calculating accurate confidence intervals around age/sex ratios. Annual classification samples generally meet or exceed desired sample sizes in this herd unit. The 2014 classification sample yielded a fawn/doe ratio of 58/100. This was lower than the 2013 ratio of 65/100 but well within the historical recruitment range typically recorded in this herd unit. Despite annual fluctuations, there are no long term recruitment trends evident in this population and fawn production appears stable (Fig. 1).

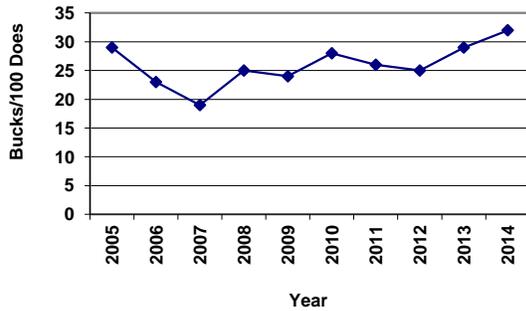
Figure 1. Ten year recruitment history for the Dubois mule deer herd.



Although the buck/doe ratio has been fairly stable long term in the herd unit, there was a noticeable increase in both 2013 and 2014 (Fig. 2). The 2014 ratio of 32/100 was the highest in the last 10 years. The high buck/doe ratio in 2014 is surprising given abnormally high buck harvest in 2013. Early winter conditions in 2013 forced deer onto winter ranges during the general, October season where they were quite vulnerable to harvest. The result was unusually high buck harvest in the herd. Given, higher buck harvest in 2013 combined with average recruitment we expected a lower buck/doe ratio in 2014. It is possible outstanding survival from 2013 through 2014 resulted in increased buck numbers. It should be noted two management

actions were taken in 2012 to facilitate an increase in buck numbers and quality. The general, October season was reduced 5 days that year to curtail pressure on bucks migrating into the herd unit in the second half of October. Also, Type 1 licenses were reduced by 50% to decrease pressure on bucks in November. It is possible these two actions have benefitted buck numbers despite the high harvest in 2013.

Figure 2. Ten year buck/doe ratio in the Dubois mule deer herd.



Hunter success during the general, October season tends to be quite low and is related to the fact many deer are not in the herd unit during that period. Deer typically migrate into the herd unit in late October and are present for the limited quota season in November. Due to the extensive immigration, success rates for November license holders are usually quite high.

In 2013, hunter success during the general, October season was well above any level seen during the past 30 years. General hunters had a 53% success rate in hunt area 128. This was nearly double the previous 10 year average. In 2014 the success rate for general license hunters was 24% and much closer to the 5 year average of 31%. The significant decline in success is likely due entirely to the difference in weather conditions between 2013 and 2014 and is not attributed to any demographic changes. The days/animal for general license hunters increased significantly from 2013 to 2014 from 8.7 to 24.2 respectively. Similar to the success statistics, this indication of more difficult hunting attributed to weather conditions, not demographic changes.

A new spreadsheet model was developed for the population in 2012. The model did not exhibit any erratic behavior with the addition of data in 2013 or 2014. For both 2013 and 2014, the TSJ/CA version of the model was selected to track the population. The model AIC value was essentially the same as the other 2 comparative models but the fit was much better. Also the other 2 models produce estimates nearly 2 times as high as the TSJ/CA or other historical models for the herd. The selected model simulates a population over the past 20 years fluctuating between 6,000 and 8,000 deer. More recently, the model indicates the population declined from 2006 through 2012. Since 2012, the population has been increasing slowly. The 2014 population estimate is 6,800 and 68% of objective. The model is considered fair given adequate age/sex ratio data but lacking survival estimates.

Management Summary

The 2015 hunting season is designed to maintain recreational opportunity at the same level as the 2014 season. With no season changes proposed, 2015 harvest is expected to be very similar to 2014 harvest. Given average winter conditions, the population is expected to increase to 7,300 deer in 2015.

INPUT	
Species:	Mule Deer
Biologist:	Greg Anderson
Herd Unit & No.:	Dubois Mule Deer
Model date:	02/20/15

Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
C,J,CA	Constant Juvenile & Adult Survival	128	137	<input type="checkbox"/> C,J,CA Model	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	128	137	<input type="checkbox"/> SC,J,SCA Mod	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	19	141	<input checked="" type="checkbox"/> TS,J,CA Model	

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population		Predicted Posthunt Population		Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Juveniles	Total Males		
1993			2061	1236	3669	1975	734	5731	10000
1994			2264	1517	3474	2251	636	6281	10000
1995			2323	1415	3775	2320	1064	7093	10000
1996			2654	1462	3724	2648	790	7087	10000
1997			2292	1205	3652	2284	878	6715	10000
1998			2443	1208	3496	2437	842	6748	10000
1999			2234	1298	3544	2234	820	6528	10000
2000			2298	1614	3883	2295	936	7030	10000
2001			1952	1380	3829	1950	728	6419	10000
2002			1698	1193	3771	1693	747	6109	10000
2003			1893	1066	3565	1882	661	6004	10000
2004			2064	1412	3807	2056	3734	6634	10000
2005			2256	1648	4119	2254	845	7261	10000
2006			2691	1688	4351	2687	984	7953	10000
2007			2407	1380	4201	2392	760	7186	10000
2008			2333	1643	4443	2311	1071	7636	10000
2009			2296	1462	4185	2282	909	7215	10000
2010			2022	1234	3898	2007	927	6639	10000
2011			2231	1195	3571	2221	964	6601	10000
2012			2289	1268	3367	2284	947	6488	10000
2013			2336	1713	3689	2332	1033	6938	10000
2014			2087	1484	3657	2087	1148	6854	10000
2015			2296	1576	3690	2291	1301	7260	10000
2016									10000
2017									10000
2018									10000
2019									10000
2020									10000
2021									10000
2022									10000
2023									10000
2024									10000
2025									10000

Survival and Initial Population Estimates

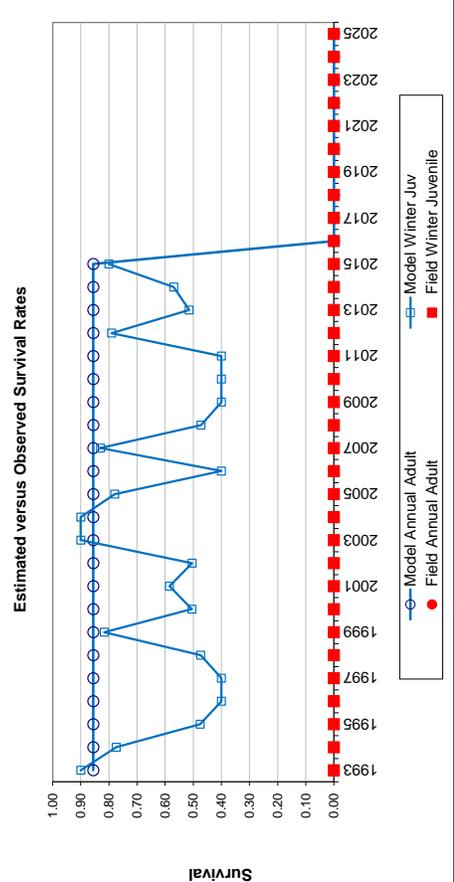
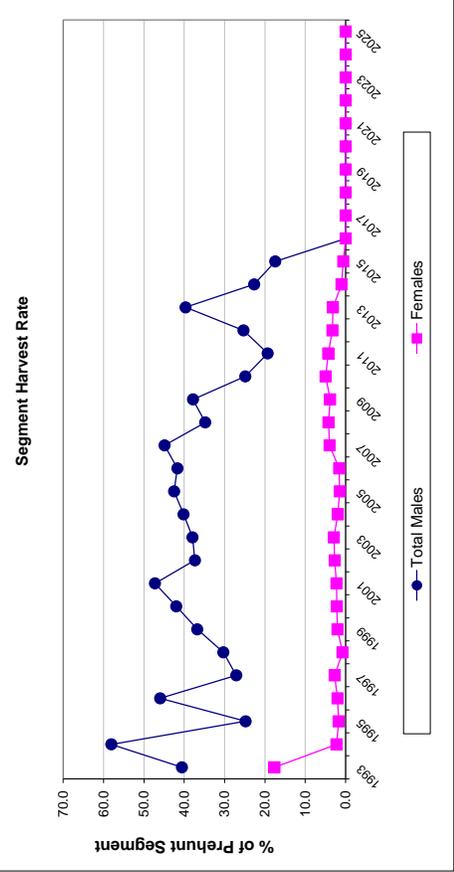
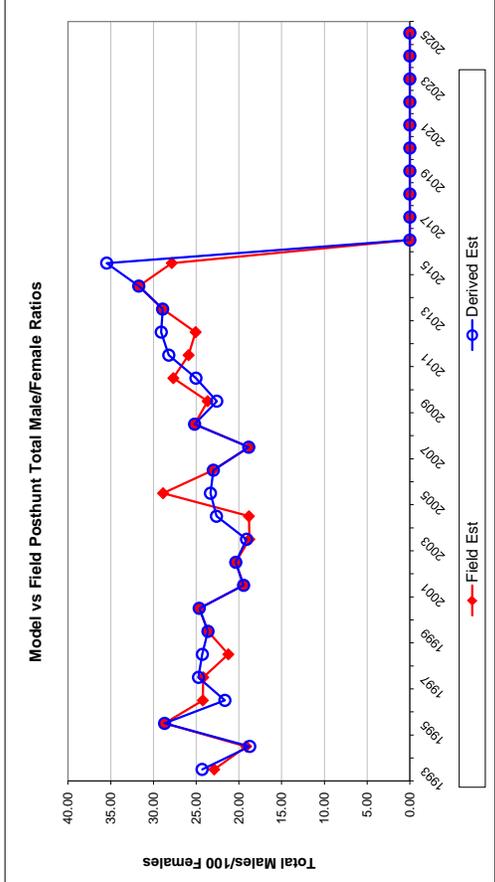
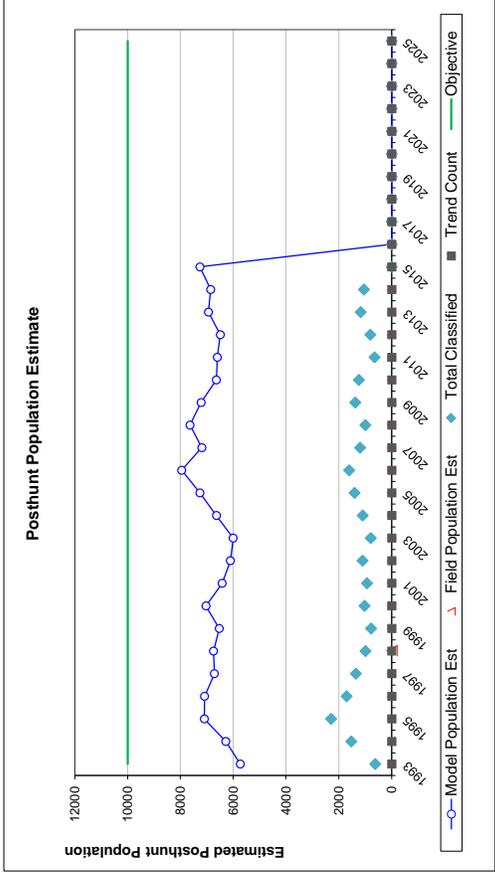
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.90		0.86	
1994	0.77		0.86	
1995	0.48		0.86	
1996	0.40		0.86	
1997	0.40		0.86	
1998	0.47		0.86	
1999	0.82		0.86	
2000	0.50		0.86	
2001	0.58		0.86	
2002	0.50		0.86	
2003	0.90		0.86	
2004	0.90		0.86	
2005	0.78		0.86	
2006	0.40		0.86	
2007	0.83		0.86	
2008	0.47		0.86	
2009	0.40		0.86	
2010	0.40		0.86	
2011	0.40		0.86	
2012	0.79		0.86	
2013	0.51		0.86	
2014	0.57		0.86	
2015	0.80		0.86	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.855
Initial Total Male Pop/10,000 =	0.073
Initial Female Pop/10,000 =	0.302

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

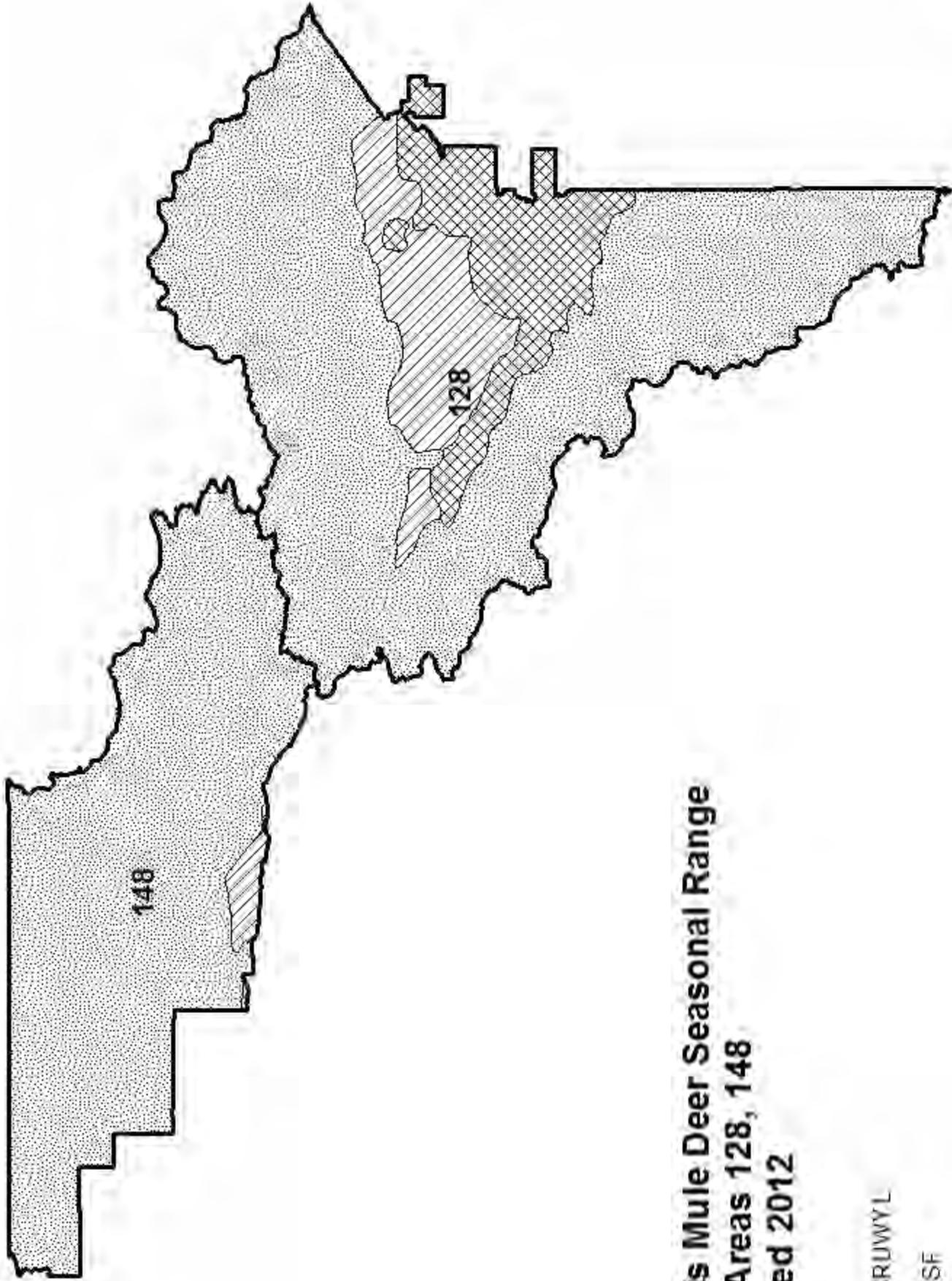
Year	Classification Counts						Harvest						
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Total Males	Females	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE							
1993		65.36	5.71	24.30	22.89	2.91	78	456	589	1123	40.6	17.7	
1994		66.30	3.66	18.73	19.15	1.66	12	801	72	885	58.1	2.3	
1995		62.55	2.91	28.69	28.69	1.75	3	319	60	382	24.8	1.7	
1996		72.55	3.80	21.64	24.22	1.86	6	611	68	685	46.0	2.0	
1997		64.31	3.83	24.72	24.17	2.04	7	297	90	394	27.1	2.7	
1998		70.27	4.81	24.28	21.24	2.23	5	333	25	363	30.3	0.8	
1999		64.34	5.05	23.62	23.61	2.65	0	434	65	499	36.8	2.0	
2000		60.43	4.18	24.64	24.64	2.35	2	616	77	695	42.0	2.2	
2001		52.11	3.81	19.45	19.45	2.06	2	593	79	674	47.3	2.3	
2002		46.15	3.19	20.36	20.36	1.92	4	405	93	502	37.4	2.7	
2003		54.37	4.28	19.11	18.78	2.21	10	368	95	473	38.0	2.9	
2004		55.06	3.68	22.62	18.83	1.88	7	516	67	590	40.2	1.9	
2005		55.51	3.37	23.33	28.87	2.21	2	637	54	693	42.5	1.4	
2006		62.75	3.43	22.99	23.07	1.81	4	640	63	707	41.7	1.6	
2007		59.31	3.75	18.85	18.78	1.82	13	563	152	728	44.9	4.0	
2008		54.32	3.88	25.18	25.18	2.38	20	520	172	712	34.8	4.3	
2009		56.73	3.41	22.69	23.66	1.96	12	503	147	662	37.8	3.9	
2010		54.17	3.50	25.02	27.67	2.27	14	279	176	469	24.9	5.0	
2011		65.00	5.62	28.20	25.88	3.10	9	210	140	359	19.3	4.3	
2012		70.12	5.36	29.08	25.06	2.75	5	292	100	397	25.3	3.3	
2013		65.29	4.22	28.92	28.93	2.48	3	618	106	727	39.7	3.2	
2014		57.66	4.05	31.71	31.71	2.74	0	306	34	340	22.7	1.0	
2015		62.45	4.55	35.47	27.85	2.67	5	250	20	275	17.4	0.6	
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

FIGURES

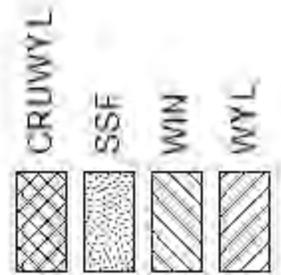


Comments:

END



**Dubois Mule Deer Seasonal Range
Hunt Areas 128, 148
Revised 2012**



2014 - JCR Evaluation Form

SPECIES: Mule Deer

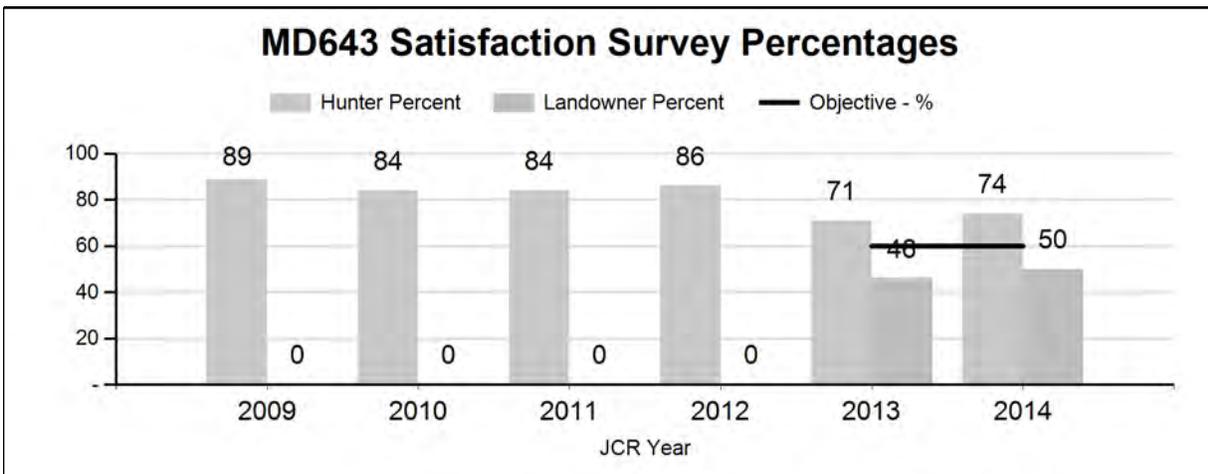
PERIOD: 6/1/2014 - 5/31/2015

HERD: MD643 - PROJECT

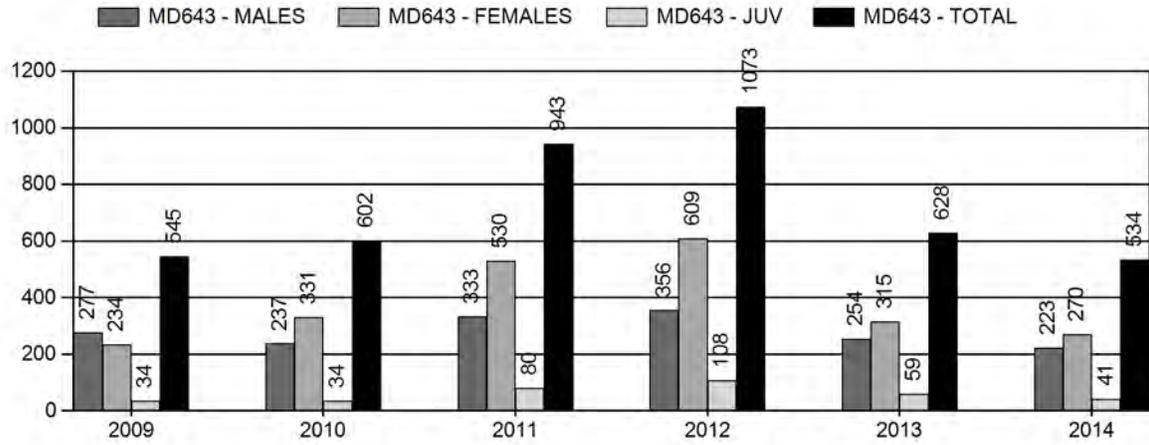
HUNT AREAS: 157, 170-171

PREPARED BY: GREG ANDERSON

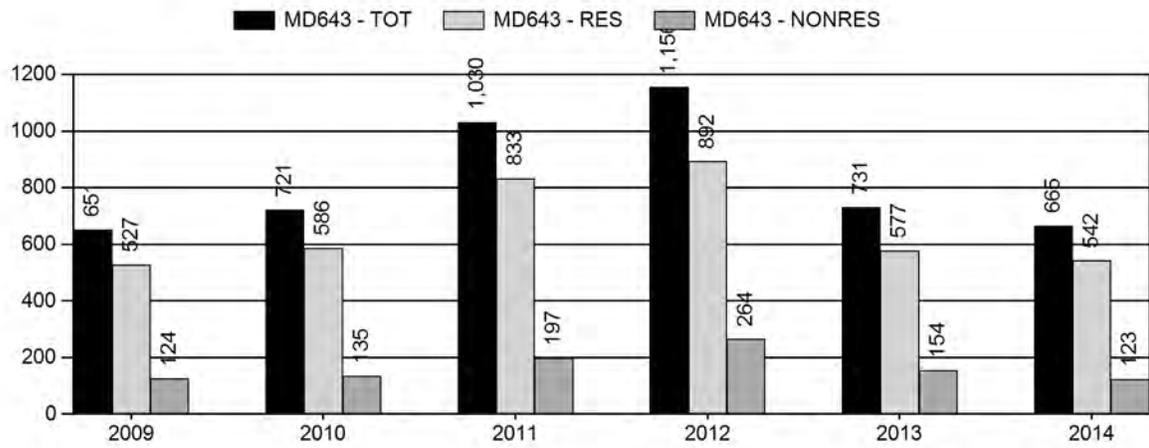
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Hunter Satisfaction Percent	83%	74%	80%
Landowner Satisfaction Percent	46%	50%	60%
Harvest:	758	534	400
Hunters:	858	665	425
Hunter Success:	88%	80%	94%
Active Licenses:	989	779	450
Active License Success:	77%	69%	89%
Recreation Days:	3,776	2,859	2,000
Days Per Animal:	5.0	5.4	5
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	
Satisfaction Based Objective			60%
Management Strategy:			Recreational
Percent population is above (+) or (-) objective:			2%
Number of years population has been + or - objective in recent trend:			1



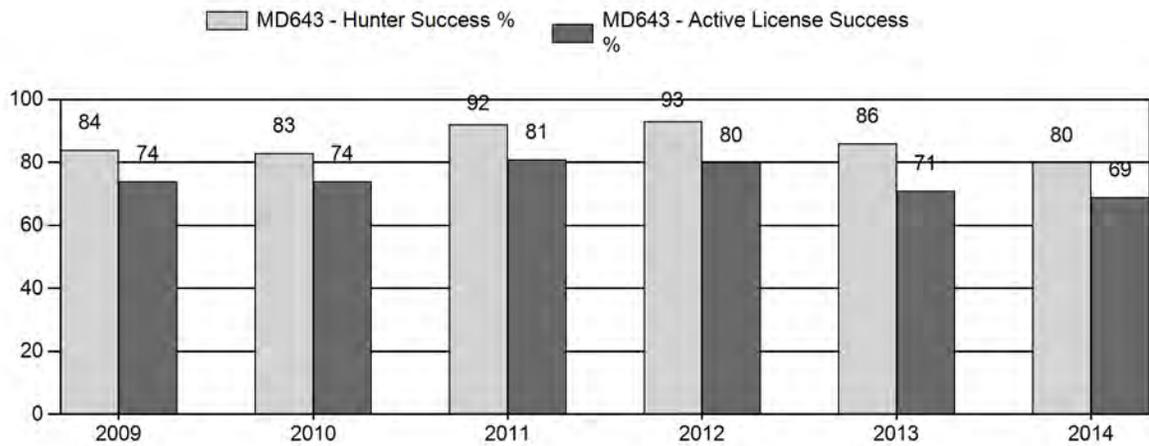
Harvest



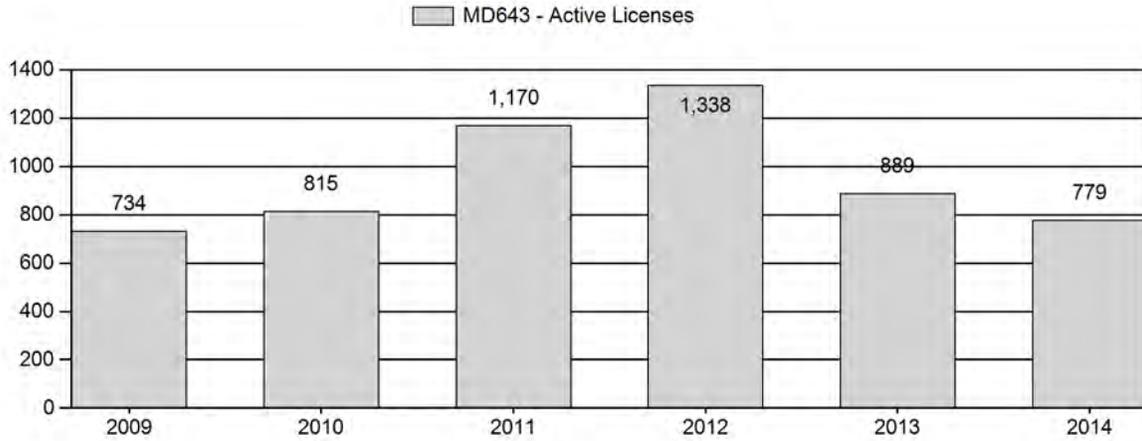
Number of Hunters



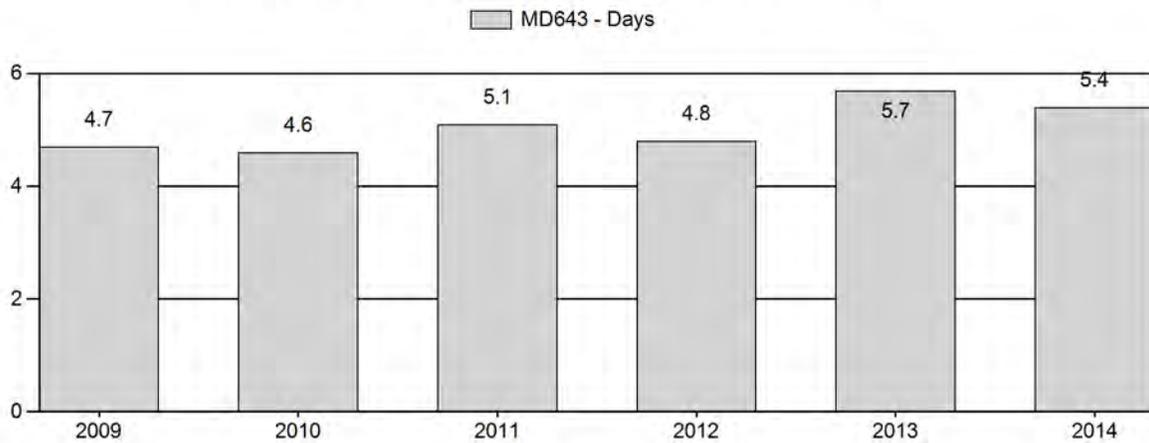
Harvest Success



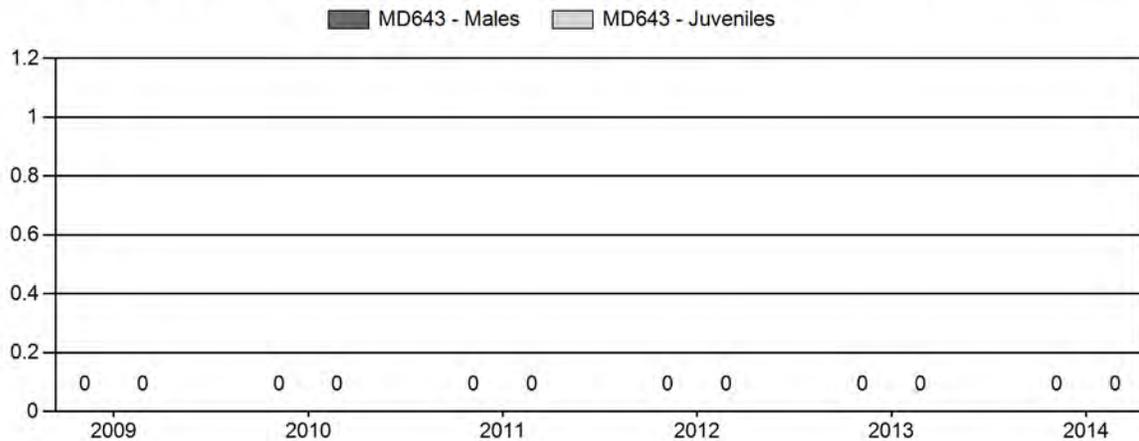
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**2015 HUNTING SEASONS
PROJECT MULE DEER (MD 643)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
157, 170	1	Oct. 1	Oct. 31	250	Limited quota; any deer
	3	Nov. 1	Nov. 30	75	Limited quota; any white-tailed deer
	6	Oct. 1	Nov. 10	250	Limited quota; doe or fawn
	8	Oct. 1	Oct. 31	75	Limited quota; doe or fawn white-tailed deer
			Nov. 1	Nov. 30	
171		Oct. 1	Oct. 31		General; any deer
	3	Nov. 1	Nov. 30	75	Limited quota; any white-tailed deer
	6	Oct. 1	Nov. 30	250	Limited quota; doe or fawn
Archery 157, 170 171		Sep. 1	Sep. 30		Refer to section 3 of this chapter General; any deer. Limited quota; refer to section 3 of this chapter
		Sep. 1	Sep. 30		

Hunt Area	Type	Quota change from 2014
157, 170	1	-50
	6	-150
Total	1	-50
	6	-150

Management Evaluation

Current Management Objective: Hunter/Landowner Satisfaction 60%

Management Strategy: Recreational

2014 Hunter Satisfaction: 74%

2014 Landowner Satisfaction: 50%*

3 Year Average Hunter Satisfaction: 77%

3 Year Average Landowner Satisfaction: unknown

*Note: the landowner satisfaction results are based on only 4 survey responses

Management Issues

In 2013 the Department conducted an objective review for the Project mule deer herd unit. Previously the herd had a population objective of 500 mule deer. 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 to 98 landowners in the herd unit. From the 98 surveys, the Department received 46 responses. Of those, 21 landowners provided e-mail addresses and indicated they wished to receive the survey in future years. In 2014, 21 surveys were e-mailed to landowners and the Department received 4 responses. One of the respondents requested to no longer receive the survey.

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. Deer densities are highest along the drainages throughout the herd unit, in particular the Wind River. As this is one of the main boundaries with the WRR, interchange is quite high. During periods of drought, this herd has typically been impacted less than surrounding populations due to the abundance of feed associated with agricultural operations. In 2014, weather conditions were conducive to good vegetative production throughout the herd unit including upland, native range. As such, mule deer were well dispersed throughout the area. Fall observations and field checks indicate mule deer in the herd unit entered winter in excellent body condition.

Field/Harvest Data/Population

Classification data have never been collected in this herd unit due to access issues throughout much of the herd unit. Personnel observations as well as numerous comments from landowners throughout the herd unit indicate this population grew significantly from the mid-2000's through 2012. In response to perceived growth and increased damage claims, harvest pressure increased steadily from 2000 through 2012. In 2012, an historic high number of licenses were issued in hunt area 157 where the majority of harvest in the herd unit occurs (Fig. 1). That year, over 1,000 mule deer were harvested in the herd unit. In 2013 harvest pressure was reduced, but harvest was still the third highest on record over the past 20 years at over 600 mule deer. The hunt season remained unchanged between 2013 and 2014. The result was another year of high deer harvest by historical standards with over 500 mule deer harvested (Fig. 2).

Figure 1. Deer area 157 historic license issuance

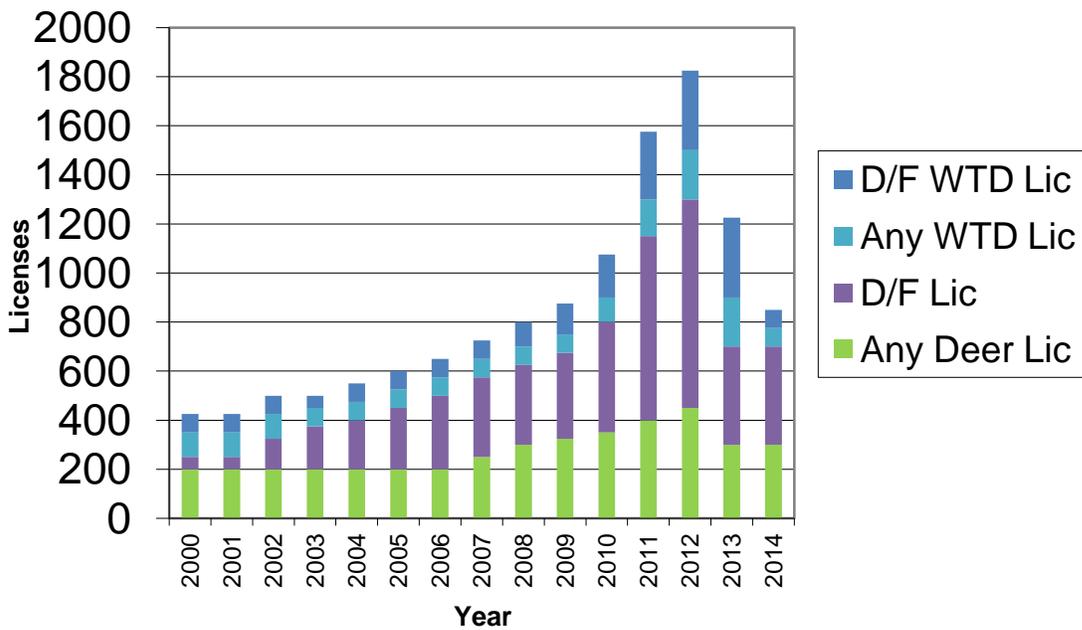
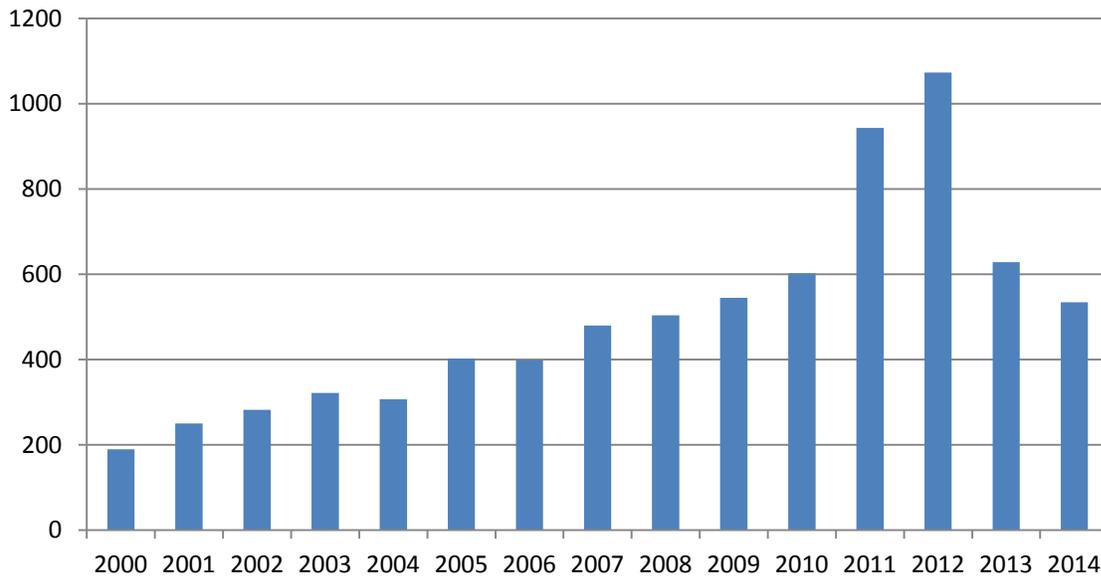


Figure 2. Project Mule Deer Harvest



Following 5 consecutive years of historically high harvest in the herd unit, the mule deer population appears to have declined significantly. While no demographic data is available for the population, harvest statistics in 2014 indicate hunters had a harder time harvesting deer.

Type 1 license success was 74% in 2014. That was a decline from 78% in 2013 and 85% in 2012 and below the 5 year average of 81%.

Hunter satisfaction was 74% in 2014. This was a slight increase from 71% in 2013, but significantly lower than the 86% satisfaction recorded in 2012. Comments from hunters in the field indicated they were generally seeing fewer deer than in previous years. This was the second year the landowner satisfaction survey was conducted so long term comparisons are not possible. That said, it appears landowners are somewhat ambivalent about the survey. As mentioned above, only 4 landowners responded to a simple electronic survey in 2014. Obviously the paucity of responses doesn't inspire confidence in the results. Of the 4 respondents, 2 felt mule deer numbers were at a desirable level and 2 felt the mule deer population was too high.

While mule deer numbers have declined in response to high harvest over the past several years, anecdotal information suggests the white-tailed deer population was significantly reduced by an EHD outbreak in 2013. White-tailed deer licenses were subsequently reduced for the 2014 season (Fig. 1).

Management Summary

Perceptions of hunters, landowners, and Department personnel are that the past 5 years' liberal seasons effectively reduced the deer population in the herd unit. Despite a significant reduction in the mule deer population, a number of landowners would like to have less deer. Given 74% of hunters are satisfied with deer numbers and 50% of landowners are satisfied regarding deer numbers, the population is considered close to objective. Considering hunter satisfaction and Type 1 license success declined significantly over the past 2 years, harvest pressure will be reduced in 2015 so as not to decrease the population further. Although harvest will be reduced in 2015, the season will include 250 Type 6 licenses to maintain hunting pressure in areas where some landowners still feel deer numbers are too high.

Appendix A

Electronic message sent to landowners requesting survey input.

February 18, 2015

Dear Landowner,

Last year the Wyoming Game & Fish Department began using a survey to assess landowner satisfaction with deer numbers in hunt areas 157 and 170 and antelope in hunt areas 97 and 117. Responses to these surveys help us determine harvest management (hunting seasons) for the upcoming year. The survey in the link below contains the same questions asked last year. We would appreciate any input you have by March 10. 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 issuing more or fewer licenses respectively.

This survey will only be conducted electronically by clicking the link below. We try to survey all of the landowners in these areas who express an interest. If you hear of anyone who did not get this survey please have them contact one of the Department personnel listed below so we can get their e-mail address and ensure they receive the survey in future years. If you have any questions, again, feel free to contact one of the Department personnel listed below.

https://docs.google.com/a/wyo.gov/forms/d/1eFaCcqXQVsF_FDpa-nWGKIUs2EQmtgyn5_xOsVBnKfY/edit?usp=sharing

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

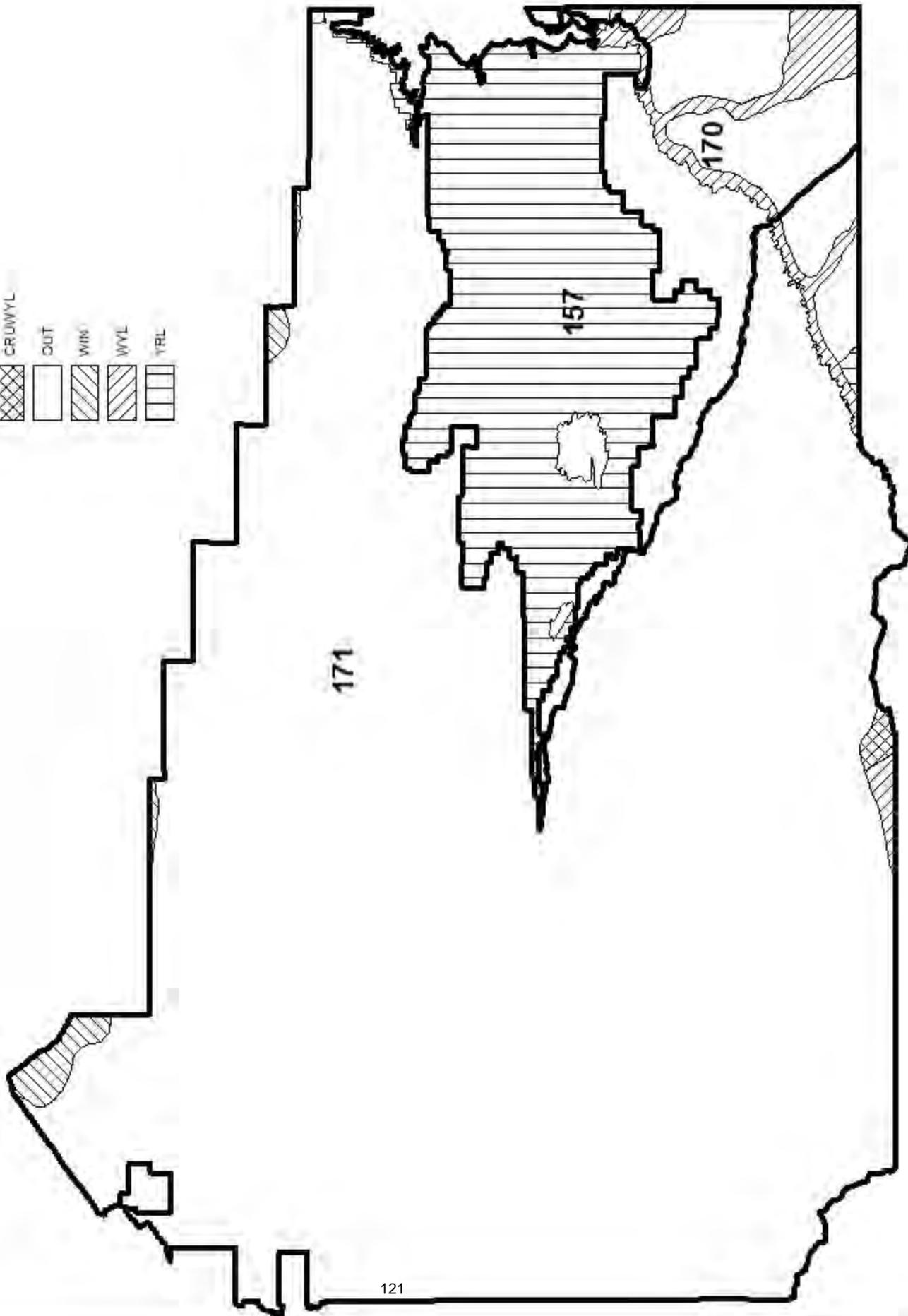
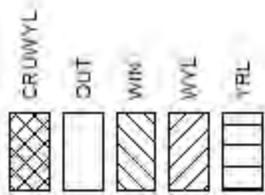
Sincerely,

Greg Anderson, North Lander Wildlife Biologist. 307-332-2688

Jessica Beecham, North Riverton Game Warden. 307-856-4982

Brad Gibb, South Riverton Game Warden. 307-856-9005

**Project Mule Deer Seasonal Range
Hunt Areas 157, 170, 171
Revised 2012**



2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD644 - SOUTH WIND RIVER

HUNT AREAS: 92, 94, 160

PREPARED BY: STAN HARTER

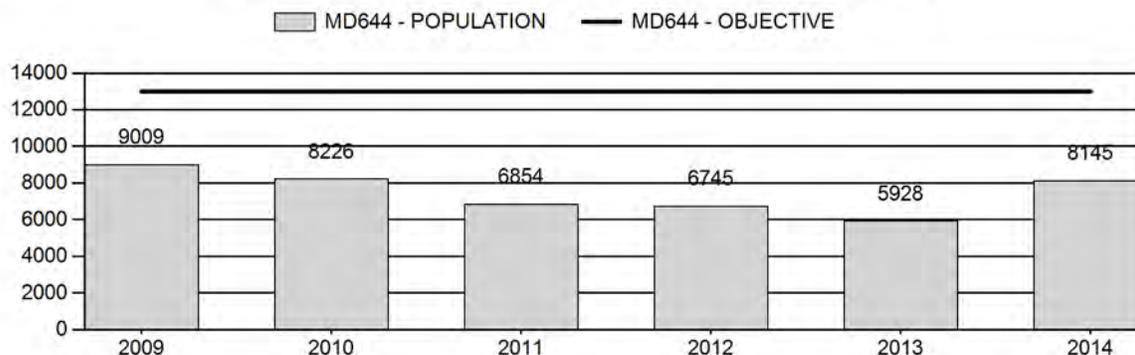
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	7,352	8,145	8,709
Harvest:	665	488	550
Hunters:	1,552	1,308	1,450
Hunter Success:	43%	37%	38%
Active Licenses:	1,645	1,312	1,455
Active License Success:	40%	37%	38%
Recreation Days:	6,410	5,863	6,000
Days Per Animal:	9.6	12.0	10.9
Males per 100 Females	25	27	
Juveniles per 100 Females	74	85	

Population Objective ($\pm 20\%$) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-37.3%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/19/2015

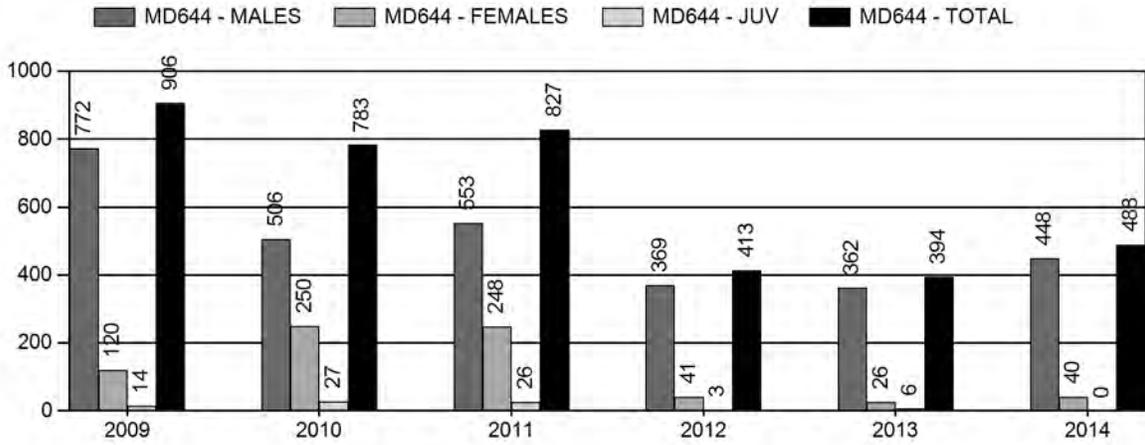
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1.2%	1.3%
Males ≥ 1 year old:	29.6%	27.5%
Juveniles (< 1 year old):	0.0%	0.0%
Total:	5.6%	5.9%
Proposed change in post-season population:	+21.4%	+6.9%

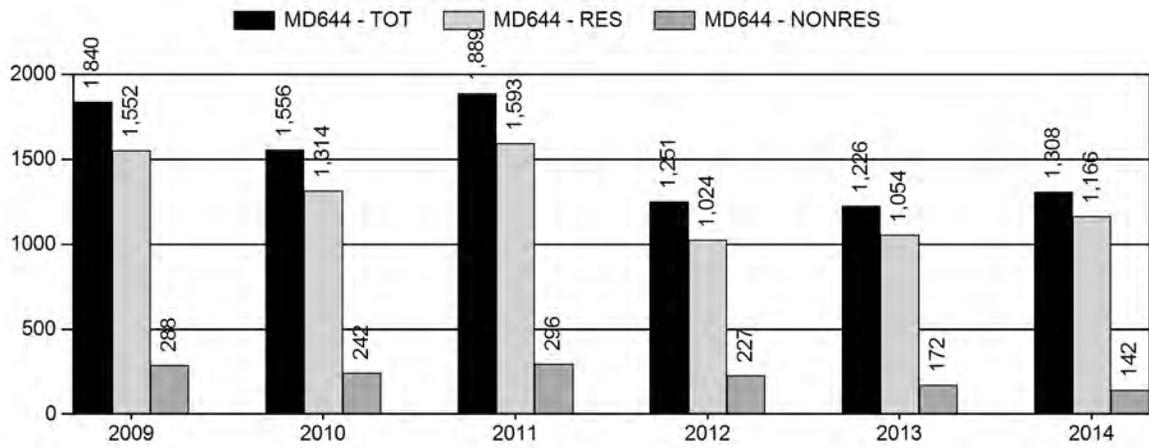
Population Size - Postseason



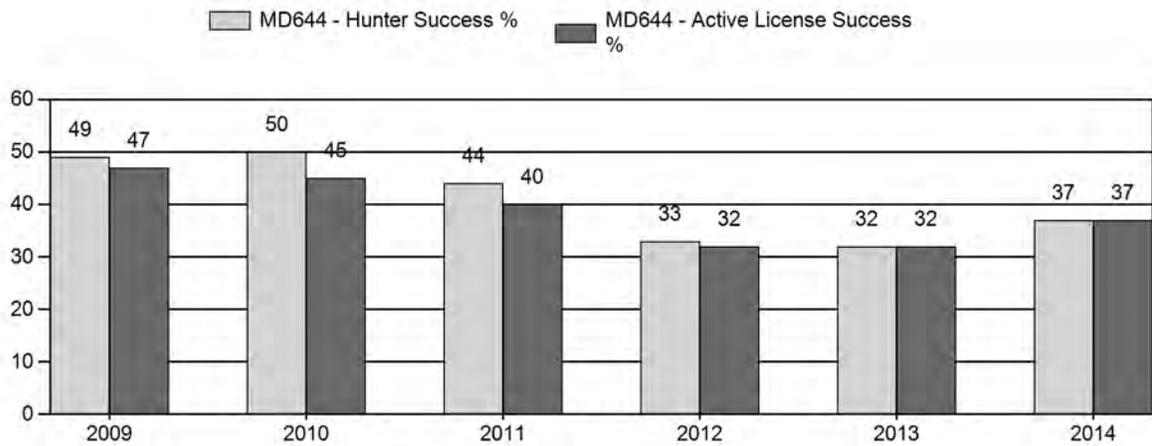
Harvest



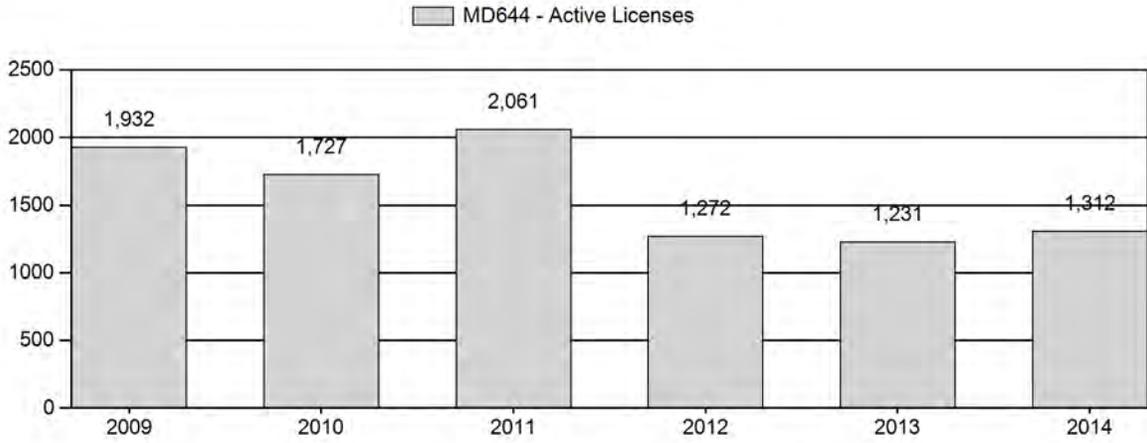
Number of Hunters



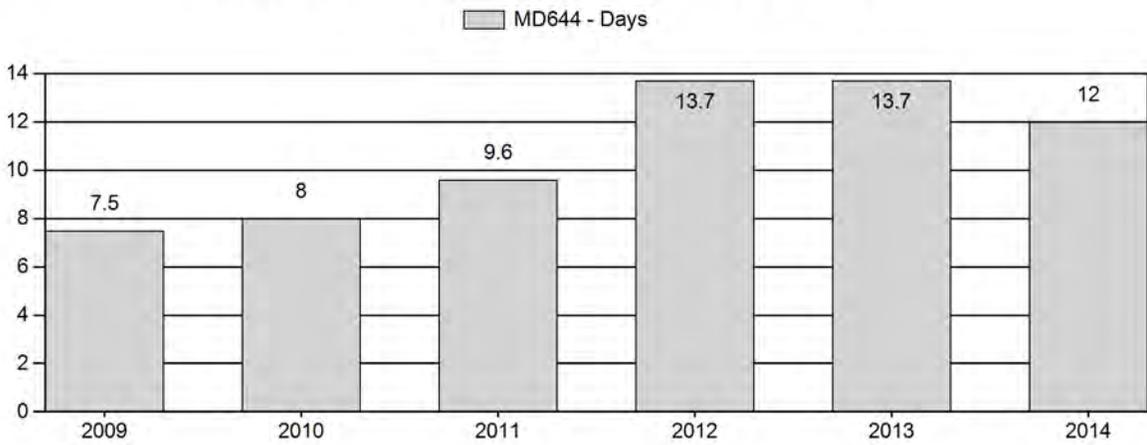
Harvest Success



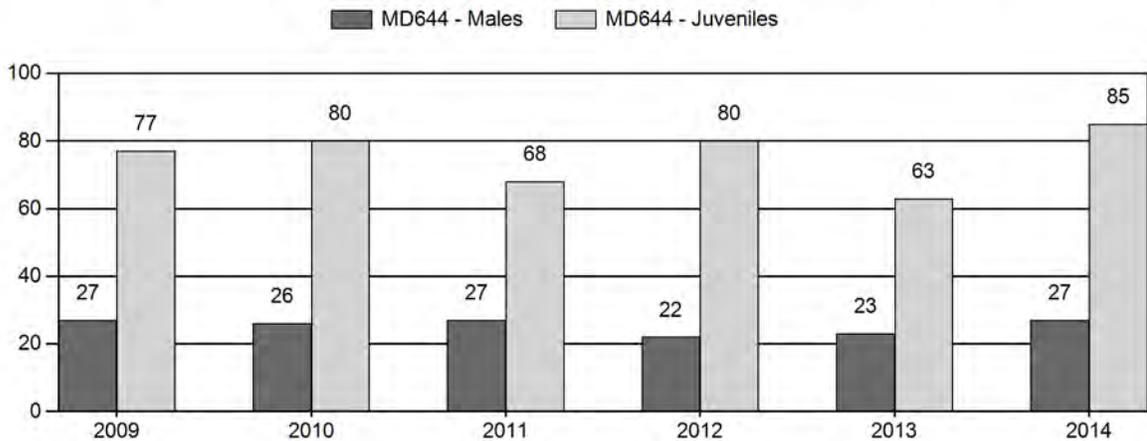
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD644 - SOUTH WIND RIVER

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	9,009	271	0	0	0	276	547	13%	2,007	49%	1,548	38%	4,102	1,587	14	14	27	± 1	77	± 2	61
2010	8,226	198	0	0	0	191	389	12%	1,512	49%	1,214	39%	3,115	1,695	13	13	26	± 1	80	± 3	64
2011	6,854	154	0	0	0	199	353	14%	1,319	51%	892	35%	2,564	1,277	12	15	27	± 2	68	± 3	53
2012	6,745	102	0	0	0	149	251	11%	1,129	49%	908	40%	2,288	1,543	9	13	22	± 2	80	± 4	66
2013	5,928	146	0	0	0	220	366	12%	1,581	54%	1,003	34%	2,950	1,036	9	14	23	± 1	63	± 2	52
2014	8,145	144	0	0	0	179	323	13%	1,184	47%	1,009	40%	2,516	1,761	12	15	27	± 2	85	± 4	67

2015 HUNTING SEASONS
South Wind River Mule Deer Herd Unit (MD 644)

HUNT AREA	TYPE	Season Dates		Limited Quota	LIMITATIONS
		OPENS	CLOSES		
92		Oct. 1	Oct. 14		General license; any white-tailed deer
92		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer
92		Oct. 1	Oct. 22		General youth license; any deer
92, 94, 160	3	Nov. 1	Nov. 30	50	Limited quota licenses; any white-tailed deer
92, 94, 160	8	Nov. 1	Nov. 30	100	Limited quota licenses; doe or fawn white-tailed deer
94		Oct. 1	Oct. 14		General license; any white-tailed deer
94		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer
94		Oct. 1	Oct. 22		General youth license; any deer
160		Oct. 1	Oct. 14		General license; any white-tailed deer
160		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer
160		Oct. 1	Oct. 22		General youth license; any deer
	6	Oct. 1	Oct. 22	25	Limited quota licenses; doe or fawn valid on private land
Archery		Sept. 1	Sept. 30		General License; any deer
92, 94, 160					Limited Quota; Refer to Section 3 of this Chapter

Region E Non-Resident Quota: 600

Hunt Area	Type	Change from 2014
92, 94, 160	3	+25
92, 94, 160	8	+75
	3	+25
	8	+75
Total MD644		+100

MANAGEMENT EVALUATION

Current Management Objective: 13,000

Management Strategy: Recreation (20-29 bucks/100 does)

2014 Post-season Population Estimate: ~8,100

2015 Post-season Population Estimate: ~8,700

Herd Unit Issues

The current management objective for the South Wind River Mule Deer Herd Unit is a post-season population of 13,000 mule deer. Population growth occurred from 2002 to 2009, but declined from 2010 to 2013, due to poor fawn recruitment as a result of intense drought. However, the 2014 fawn/doe ratio was significantly improved, indicating the population may quickly recover given continued improved habitat condition. The management objective has been reviewed, and a recommendation to reduce the population objective to 11,000 mule deer is in process.

Weather/Habitat

Drought conditions were extreme to exceptional for most of 2011-13, 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 South Wind River Mule Deer Herd Unit. These storms were 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 inhibited production in herbaceous and shrub species across the South Wind River herd unit, although some improvement over 2012 conditions was noted. 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. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition. Consequently, this led to improved post-season fawn/doe ratios and should result in improved survival over winter 2014-15, which was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Lander, and ahead of last year’s pace. We anticipate habitat conditions will continue to improve as a result. Yet, due to long-term drought, many shrubs remain in poor condition and could contribute to mule deer nutritional deficiencies and decreased survival.

Field Data

Good flying conditions allowed us to survey winter ranges thoroughly using a Bell 206B Jet Ranger helicopter in mid-November 2014, but deer were difficult to see due to varied snow cover and widely scattered distribution on early-winter ranges. In addition, we had a few isolated areas of high wind and avoided at least 2 locations after observing active elk hunts. We observed 2,516 mule deer, about 20% below the average sample size since changing to this helicopter type in 2004. The 2014 post-season observed total buck/doe ratio increased to 27M/100F. Three (3) point antler restrictions were implemented for the 2014 hunting season to reduce hunting pressure and buck harvest, which occurred. However, the buck/doe ratio increased less than expected, likely the result of poor fawn survival/yearling buck recruitment in 2012 and 2013. Despite protecting yearling bucks with this harvest restriction, the yearling buck/doe ratio remained at 9YM/100F. The fawn/doe ratio jumped to 85J/100F in 2014, likely a result of improved forage conditions following increased precipitation since fall 2013.

Antler width class data have been collected (Figure 1) during classification surveys the past 3 years. In 2014, over 85% of the mule deer bucks classified in the South Wind River Herd Unit were either yearlings or had Class 1 antler widths (an adult buck up to 18” wide), indicating an absence of older age-class bucks despite reduced harvest levels experienced with APRs.

The inaugural South Wind River mule deer sightability survey was completed in February 2015. A total of 6,640 mule deer were observed, with analysis details provided in the population section to follow.

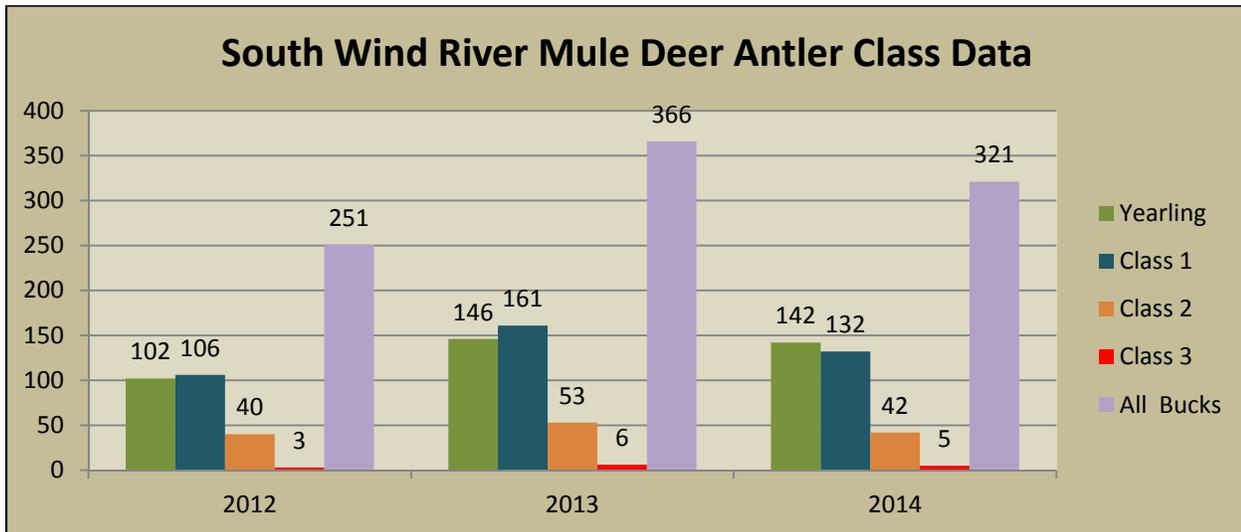


Figure 1. Antler class data from classification surveys in the South Wind River Mule Deer Herd Unit, 2012-14.

Harvest Data

Weather during fall 2014 was quite moderate in the South Wind River Herd Unit. Mostly dry conditions allowed mule deer and hunters to be dispersed across the herd unit. Hunters reported lower than desired numbers of mule deer overall, with few adult bucks; but they also reported good numbers of does and fawns. In response to public desire to reduce hunter densities and reduce buck harvest, we continued three (3) point antler restrictions in 2014 and kept the non-resident Region E general license quota at 600. These changes were successful in 2014, with the number of general license hunters being slightly above 2012 and 2013 levels and 37% fewer bucks harvested as compared with 2006-2011 levels. General license hunter success was up slightly to 36%. The “days per animal harvested” statistics for general licenses, as an indicator of hunter effort, dropped slightly to 12.0 days/animal in 2014. Doe/fawn mule deer hunting in response to damage issues in Hunt Areas 160 and youth and archery hunters allowed to hunt for “Any” deer, resulted in minimal harvest of 40 does and 0 fawns.

Antler width class data have been collected since 2012 during field checks and at check stations. This coincides with the 3 years of 3-point APRs in place for the South Wind River Herd Unit. Antler widths have not improved over the last 3 years, and the proportion of Class 1 bucks harvested has increased compared with Class 2 and Class 3 bucks (Figure 2). This mimics the trend in antler width classes observed in post-season classification surveys outlined in the previous section.

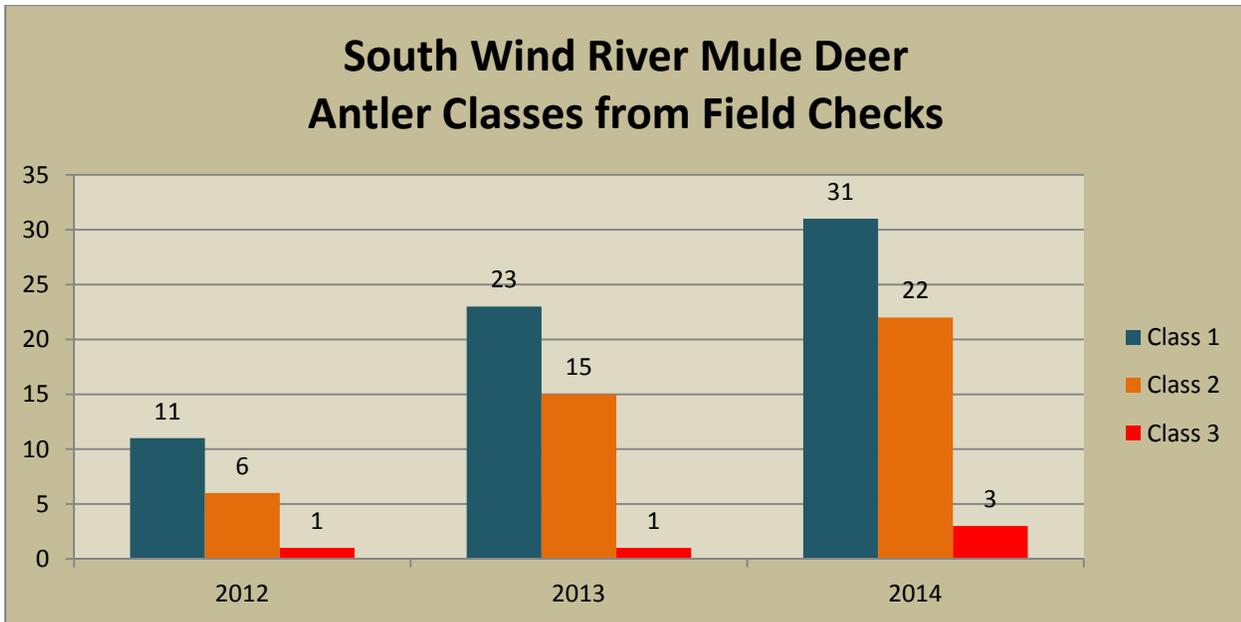


Figure 2. Antler width classes as measured during field checks and at check stations, 2012-14.

Population

A spreadsheet model was developed for this population in 2012, and updated utilizing 2014 post-season classification, 2014 harvest data, and a “sightability” estimate obtained in February 2015. The TSJ, CA model was again selected as the best fit model, with the lowest Relative AICc value and producing population estimates aligned with trends observed in buck harvest, fawn recruitment, and buck/doe ratios. It also matches the professional perceptions of field personnel and public opinion about mule deer population trends. In addition to traditional classification and harvest data, the 2014 model anchors to a population estimate derived from the first sightability survey completed for this herd unit in February 2015. This survey utilizes actual mule deer counts, along with snow and vegetation cover variables to provide a correction factor for each cluster of mule deer, thereby estimating the number of deer missed in the survey. The sightability model provides a total estimate of mule deer and the standard error for the estimate. In this inaugural survey, we observed 6,640 mule deer, with a model estimate of 8,517 (\pm 208). With traditional classification and harvest data, combined with the entry of this post-season estimate, the spreadsheet model produces a post-season 2014 estimate of 8,145 mule deer. This spreadsheet model (TSJ, CA), though lacking survival estimates, is considered GOOD.

Management Summary

Management changes have included implementation of antler point restrictions (4-point in 2004 and 2005 and 3-point in 2012-14), in response to declines in buck/doe ratios and population trends, and perceived increases in hunter numbers. Expectedly, both APR types resulted in lower hunter numbers and reduction of overall buck harvest. The 4-point APR implemented in 2004 and 2005 coincided with improved buck/doe ratios as a result of improved fawn survival/yearling buck recruitment with favorable weather patterns and improved, albeit short-term, habitat conditions. The recent 3-point APR seasons have not led to dramatic improvements in buck/doe ratios, largely due to drought concurrent with the first 2 years of APRs. In 2014, buck/doe ratios did improve, following improvements in fawn survival/yearling recruitment, with the total buck/doe ratio of 27M/100F near the upper end of the Recreational Management range.

Epizootic Hemorrhagic Disease (EHD) was present in the Lander Region in late summer 2013, especially in white-tailed deer and pronghorn. Recently, evidence of impacts to mule deer has been observed in a number of animals on Table Mountain and the Lander Foothills with hoof and antler abnormalities indicating exposure to EHD. No EHD was detected in 2014, but the long range impacts of EHD on mule deer populations are not as well known as for white-tailed deer or pronghorn, but due to the presence of EHD in the area, it is possible this has been directly or indirectly affecting the decline in mule deer numbers across Wyoming, and exacerbates problems related to habitat conditions.

This herd unit is part of the area being analyzed by the Lander/Green Mountain Mule Deer Working Group. Short-term recommendations for the South Wind River Mule Deer Herd Unit were presented to the Department in December 2014 and long-term recommendations to the Department are being developed at this time. Some of those recommendations are likely to include, but not limited to research, habitat management, and hunting season structure.

The 2015 hunting seasons discontinue the 3-point APR for general license hunts, as recommended by the working group after learning how continuing with APRs would be detrimental to building older age classes of buck mule deer. Another short-term recommendation carried forward in the 2015 season proposals was to restrict youth hunters from being allowed to harvest does or fawns. The working group very strongly feels any harvest of female mule deer should not be allowed until populations recover. However, the Department has decided to continue with all youth hunters being allowed to harvest “any deer” in seasons otherwise restricted to antlered deer.

Hunters, at public meetings and during field contacts, have repeatedly asked for ways to reduce hunter crowding, improve mule deer populations, buck numbers and quality, and have increasingly asked for the Department to change to limited quota seasons for the Sweetwater and South Wind River Mule Deer Herds.

Minimal numbers of doe/fawn licenses will also be available on private land in Area 160 to focus hunters into specific hayfield damage prone private lands along the Little Popo Agie River.

White-tailed deer hunts are again being offered, with 50 Type 3 (Any white-tailed deer) and 100 Type 8 (Doe or fawn white-tailed deer) licenses valid in Hunt Areas 92, 94, and 160 collectively in November. The Lander/Green Mountain Mule Deer Working Group recommended opening the General License season on October 1, for white-tailed deer only. We have included this recommendation in the 2015 season since white-tailed deer numbers have seemingly recovered from the 2013 EHD die-off. However, hunters will find most white-tailed deer hunting opportunities will be on privately owned lands.

The 2015 season structure should result in a harvest of approximately 550 mule deer, including 500 bucks, along with 50 does and fawns. This should allow population growth to about 8,700 mule deer following the 2015 hunting season.

INPUT	
Species:	Mule Deer
Biologist:	Stan Harter
Herd Unit & No.:	South Wind River (MD644)
Model date:	02/19/15

MODELS SUMMARY

	Fit	Relative AICc	Notes
CJ,CA	576	585	
SCJ,SCA	576	585	<input type="checkbox"/> CJ,CA Model <input type="checkbox"/> SCJ,SCA Model
TSJ,CA	25	115	<input checked="" type="checkbox"/> TSJ,CA Model

Check best model to create report

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count		Predicted Prehunt Population				Predicted Posthunt Population				Objective
	Field Est	Field SE	Juveniles	Total	Juveniles	Total Males	Females	Total	Juveniles	Total Males	Females	Total	
1994			2082	1283	1841	952	3493	6868	2082	655	3493	6230	13000
1995			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
1996			2155	1532	3960	1756	3508	7086	2249	682	3508	6437	13000
1997			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
1998			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
1999			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
2000			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
2001			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
2002			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
2003			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
2004			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
2005			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
2006			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
2007			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
2008			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
2009			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
2010			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
2011			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
2012			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
2013			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
2014	8517	208	2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
2015			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
0			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
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0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
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0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
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0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
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0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
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0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
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0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
0			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
0			1841	1329	2249	1198	3275	6068	1841	612	3275	5728	13000
0			2155	1532	3960	1756	3508	7086	2155	687	3508	6437	13000
0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
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0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
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0			3425	1709	2316	1498	3508	6860	2155	687	3508	6350	13000
0			2082	1329	1841	1198	3493	6868	2082	655	3493	6230	13000
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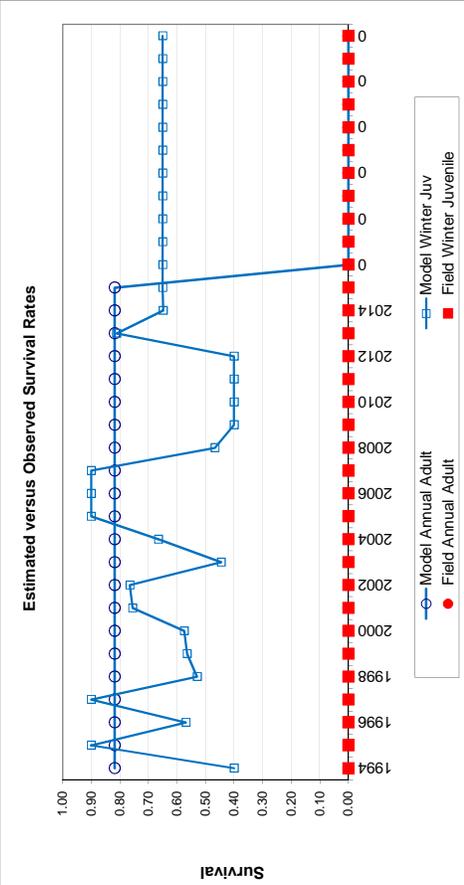
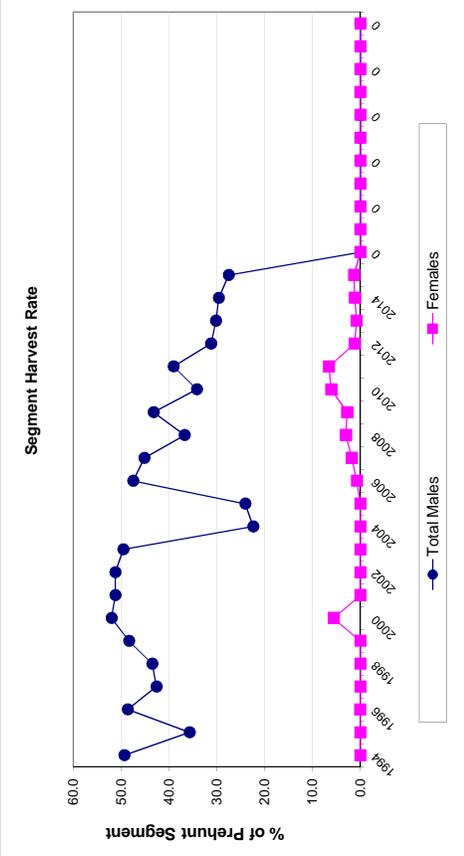
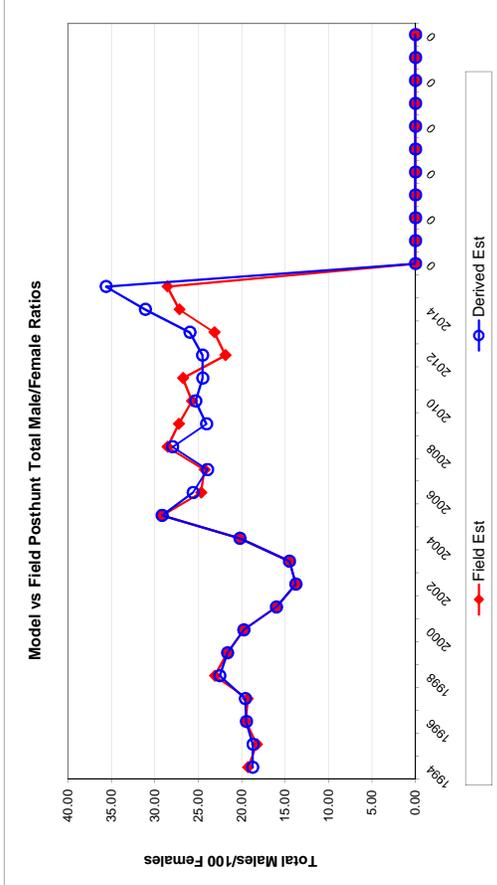
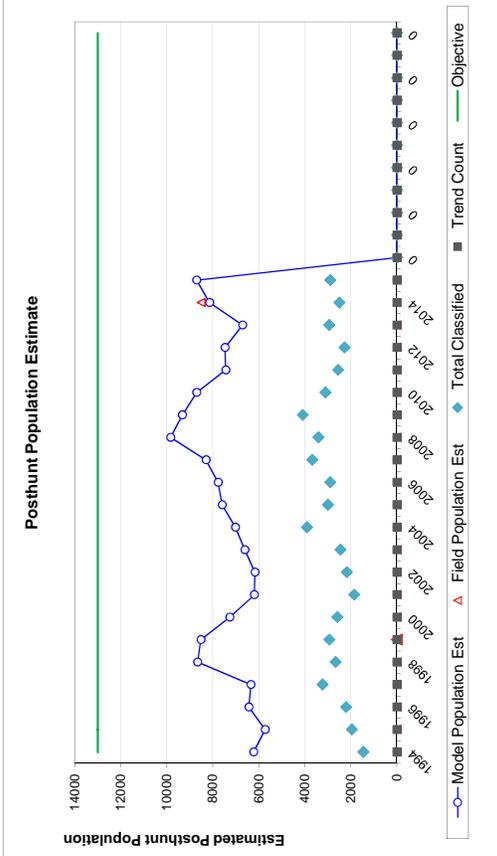
Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1994	0.40		0.82	
1995	0.90		0.82	
1996	0.57		0.82	
1997	0.90		0.82	
1998	0.53		0.82	
1999	0.56		0.82	
2000	0.57		0.82	
2001	0.76		0.82	
2002	0.76		0.82	
2003	0.45		0.82	
2004	0.66		0.82	
2005	0.90		0.82	
2006	0.90		0.82	
2007	0.90		0.82	
2008	0.47		0.82	
2009	0.40		0.82	
2010	0.40		0.82	
2011	0.40		0.82	
2012	0.40		0.82	
2013	0.81		0.82	
2014	0.65		0.82	
2015	0.65		0.82	
0	0			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			

Parameters:	Optim cells
Adult Survival =	0.818
Initial Total Male Pop/10,000 =	0.065
Initial Female Pop/10,000 =	0.349

MODEL ASSUMPTIONS
Sex Ratio (% Males) = 50%
Wounding Loss (total males) = 10%
Wounding Loss (females) = 10%
Wounding Loss (juveniles) = 10%

FIGURES

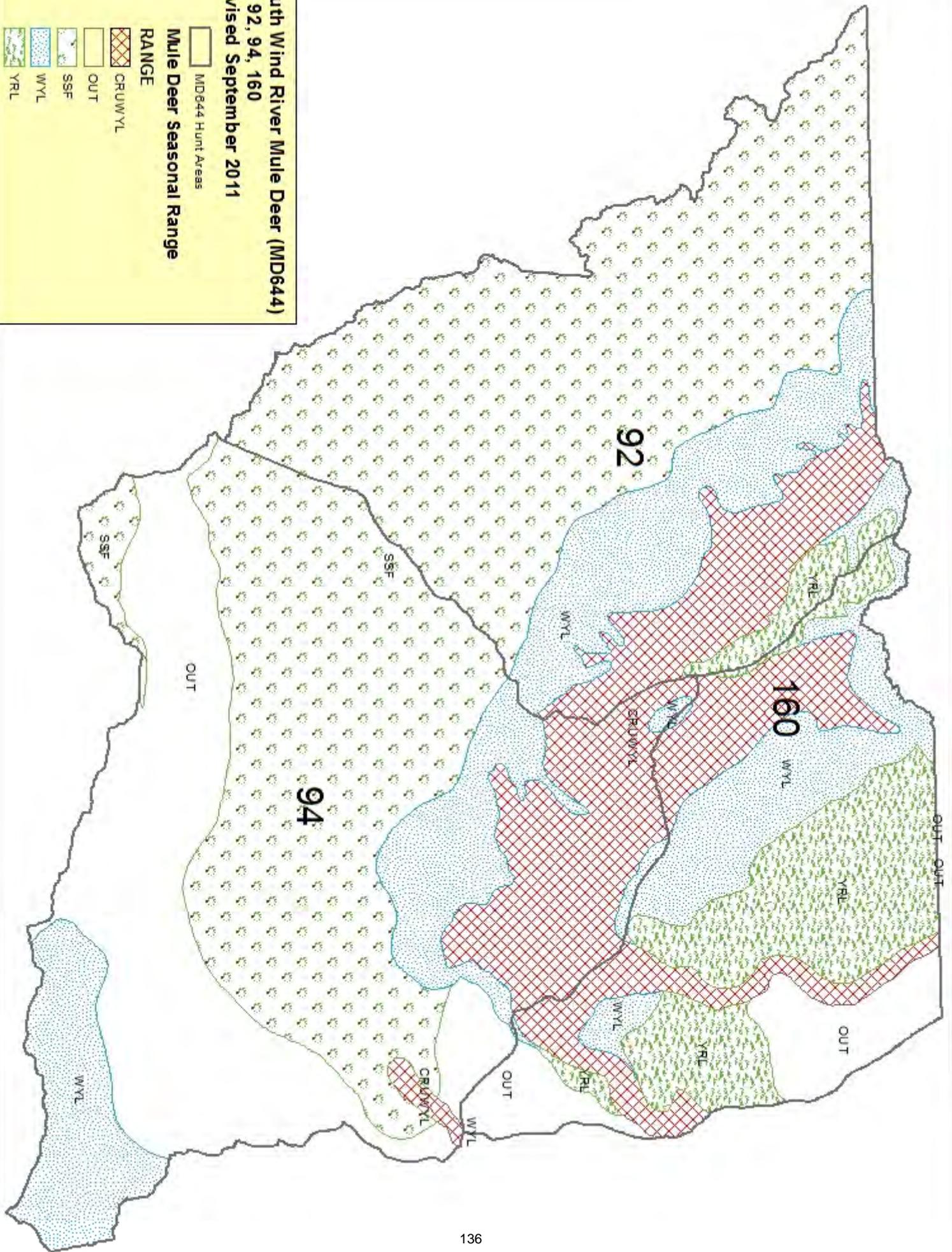


Comments:

END

South Wind River Mule Deer (MD644)
HA 92, 94, 160
Revised September 2011

-  MD644 Hunt Areas
- Mule Deer Seasonal Range**
- RANGE**
-  CRUWYL
-  OUT
-  SSF
-  WYL
-  YRL



2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD646 - SWEETWATER

HUNT AREAS: 96-97

PREPARED BY: STAN HARTER

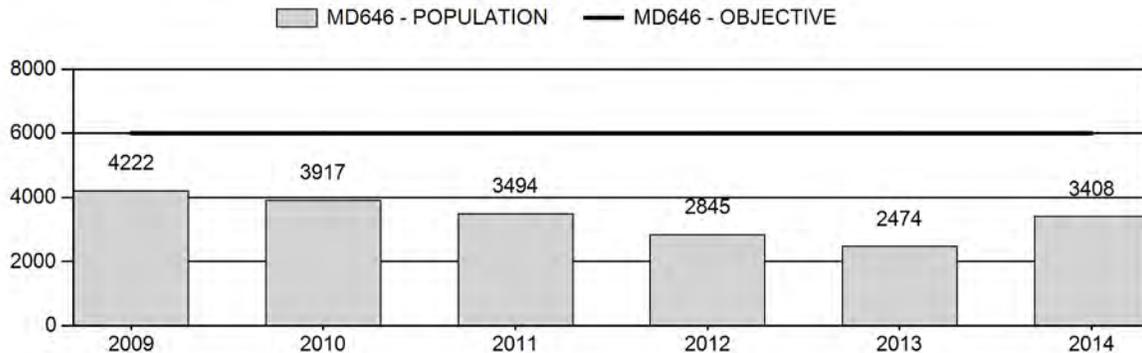
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	3,830	3,408	3,522
Harvest:	571	231	315
Hunters:	1,163	788	800
Hunter Success:	49%	29%	39%
Active Licenses:	1,231	788	800
Active License Success:	46%	29%	39%
Recreation Days:	4,386	3,798	4,000
Days Per Animal:	7.7	16.4	12.7
Males per 100 Females	23	21	
Juveniles per 100 Females	75	95	

Population Objective ($\pm 20\%$) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-43.2%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/20/2015

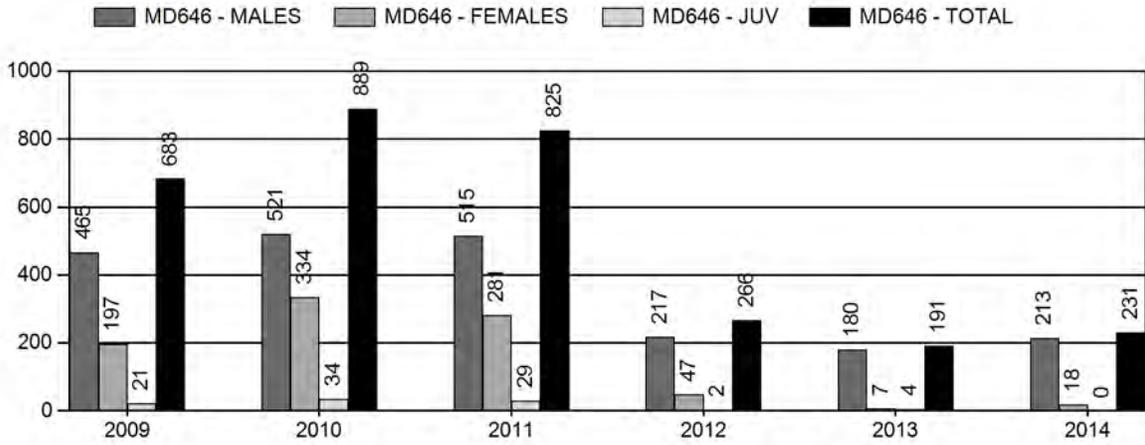
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1.2%	0.6%
Males ≥ 1 year old:	41.1%	45.6%
Juveniles (< 1 year old):	0%	0%
Total:	6.3%	8.1%
Proposed change in post-season population:	+15.9%	+3.3%

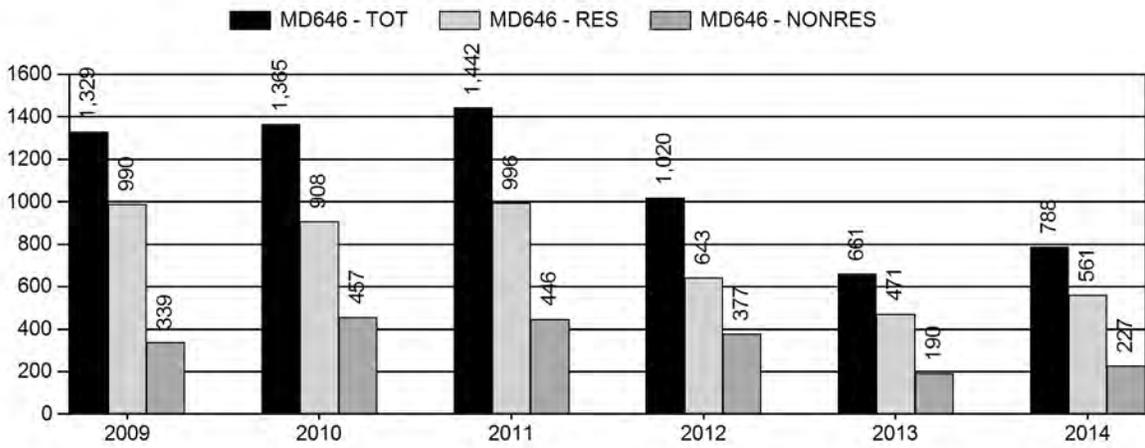
Population Size - Postseason



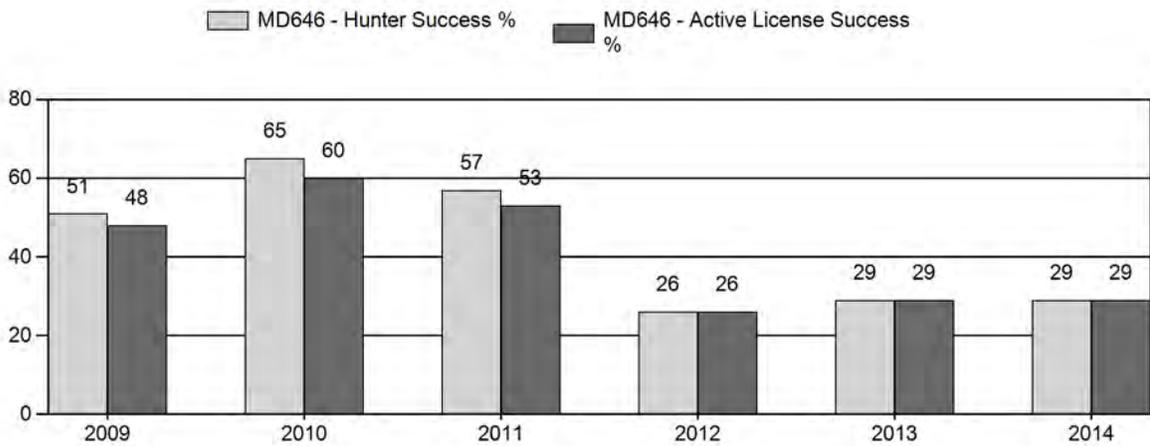
Harvest



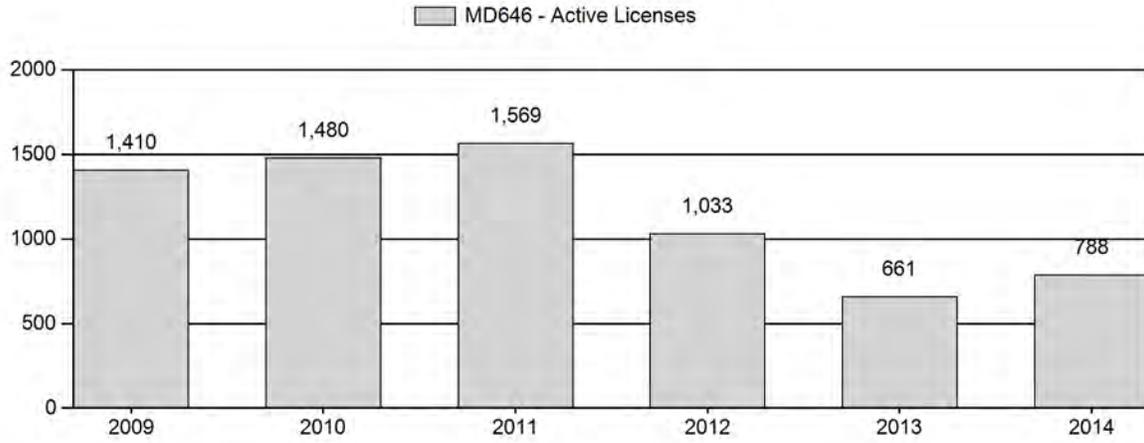
Number of Hunters



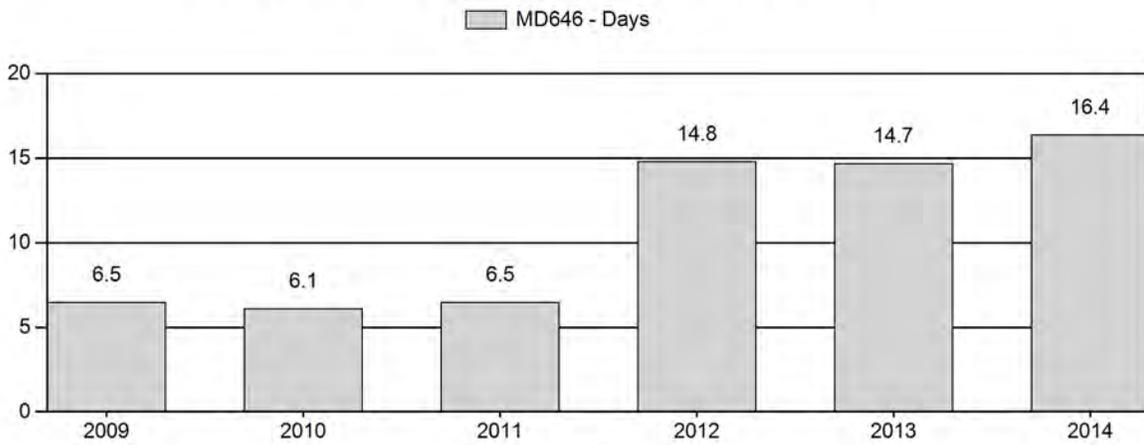
Harvest Success



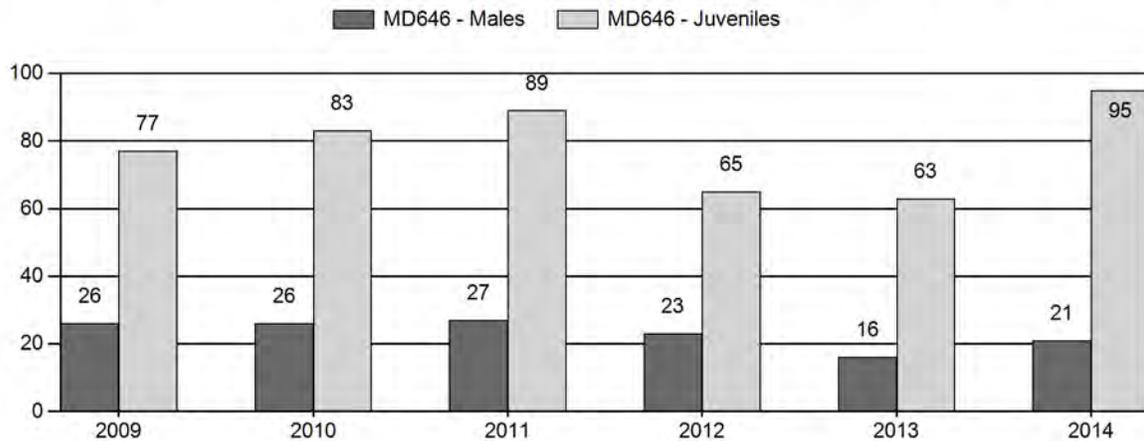
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD646 - SWEETWATER

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	4,222	138	0	0	0	167	305	13%	1,186	49%	909	38%	2,400	1,407	12	14	26	± 1	77	± 3	61
2010	3,917	72	0	0	0	82	154	12%	598	48%	494	40%	1,246	1,549	12	14	26	± 2	83	± 5	66
2011	3,494	49	0	0	0	101	150	13%	547	46%	486	41%	1,183	1,616	9	18	27	± 3	89	± 6	70
2012	2,845	48	0	0	0	58	106	12%	462	53%	302	35%	870	996	10	13	23	± 3	65	± 5	53
2013	2,474	67	0	0	0	61	128	9%	813	56%	514	35%	1,455	813	8	8	16	± 1	63	± 3	55
2014	3,408	52	0	0	0	44	96	10%	451	46%	429	44%	976	1,281	12	10	21	± 3	95	± 7	78

2015 HUNTING SEASONS
Sweetwater Mule Deer Herd Unit (MD 646)

HUNT AREA	TYPE	Season Dates		QUOTA	LIMITATIONS
		OPENS	CLOSES		
96		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer
96		Oct. 15	Oct. 25		General youth license; any deer
97		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer
97		Oct. 15	Oct. 25		General youth license; any deer
97	3	Nov. 1	Nov. 30	25	Limited quota; any white-tailed deer
97	8	Nov. 1	Nov. 30	25	Limited quota; doe or fawn white-tailed deer
Archery 96, 97		Sept. 1	Sept. 30		General license - any deer Limited quota; Refer to Section 3 of this Chapter

Region E Non-Resident Quota: 600
No Changes from 2014

MANAGEMENT EVALUATION

Current Management Objective: 6,000

Management Strategy: Recreation (20-29 bucks/100 does)

2014 Post-season Population Estimate: ~3,400

2015 Post-season Population Estimate: ~3,500

Herd Unit Issues

The current management objective for the Sweetwater Mule Deer Herd Unit is a post-season population of 6,000 mule deer. Population growth occurred from 2002 to 2009, but declined from 2010 to 2013, due to poor fawn recruitment as a result of intense drought. However, the 2014 fawn/doe ratio was significantly improved, indicating the population may quickly recover given continued improved habitat condition. The management objective has been reviewed, and a recommendation to reduce the population objective to 4,500 mule deer is in process.

Weather/Habitat

Drought conditions were extreme to exceptional for most of 2011-13, 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 Sweetwater Mule Deer Herd Unit. These storms were 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 inhibited production in herbaceous and shrub species across the Sweetwater herd unit, although some improvement over 2012 conditions was noted. 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. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition. Consequently, this led to improved post-season fawn/doe ratios and should result in improved survival over winter 2014-15. Consequently, this led to improved post-season fawn/doe ratios and should result in improved survival over winter 2014-15, which was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Jeffrey City, and ahead of last year’s pace. We anticipate habitat conditions will continue to improve as a result. Yet, due to long-term drought, many shrubs remain in poor condition and could contribute to mule deer nutritional deficiencies and decreased survival.

Field Data

Classification flights were conducted in December 2014, with winter ranges surveyed using a Bell 206B Jet Ranger helicopter. Snow cover was minimal and combined with reduced flight time due to high wind, the classification sample of 976 was lower than the needed sample of nearly 1,300 mule deer. The 2014 post-season fawn/doe ratio jumped to 95J/100F, the highest in over 20 years. Yearling bucks rebounded from 8YM/100F in 2013 to 12YM/100F in 2014, a result of the improved weather since fall 2013. Three (3) point antler restrictions (APRs) were again in place for the 2014 hunting season, thus protecting yearling bucks with this harvest restriction. APRs, combined with keeping a non-resident Region E quota of 600 (historically was 800) were somewhat successful in reducing hunting pressure and buck harvest. Antler width class data have been collected (Figure 1) during classification surveys the past 3 years. In 2014, nearly 90% of the mule deer bucks classified in the Sweetwater Herd Unit were either yearlings or have Class 1 antler widths (an adult buck up to 18” wide), indicating the absence of older age-class bucks despite reduced harvest levels experienced with APRs.

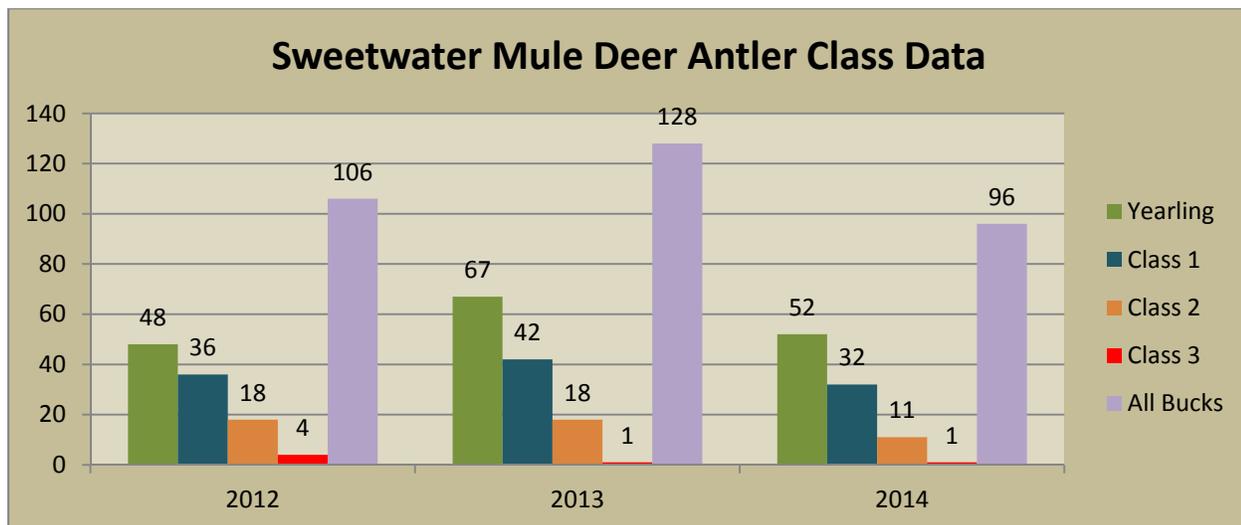


Figure 1. Antler class data from classification surveys in the Sweetwater Mule Deer Herd Unit, 2012-14.

Harvest Data

Weather during fall 2014 was quite moderate in the Sweetwater Herd Unit. Mostly dry conditions allowed mule deer and hunters to be dispersed across the herd unit. Hunters reported lower than desired numbers of mule deer overall, with few adult bucks; but they also reported good numbers of does and fawns. In response to public desire to reduce hunter densities and reduce buck harvest, we continued three (3) point antler restrictions in 2014 and kept the non-resident Region E general license quota at 600. These changes were successful in 2014, with the number of general license hunters being about 25% lower than average and 58% fewer bucks harvested as compared with 2006-2011 levels. General license hunter success was stable at 29%. The “days per animal harvested” statistics for general licenses, as an indicator of hunter effort, increased to a 20 year high of 16.4 days in 2014. Doe/fawn mule deer harvest, since youth hunters and archers are allowed to hunt for “Any” deer, resulted in minimal harvest of 18 does and 0 fawns. Antler width class data have been collected since 2012 during field checks and at check stations. This coincides with the 3 years of 3-point APRs in place for the Sweetwater Herd Unit. Antler widths have not improved over the last 3 years, and the proportion of Class 1 bucks harvested has increased compared with Class 2 and Class 3 bucks (Figure 2). This mimics the trend in antler width classes observed in post-season classification surveys outlined in the previous section.

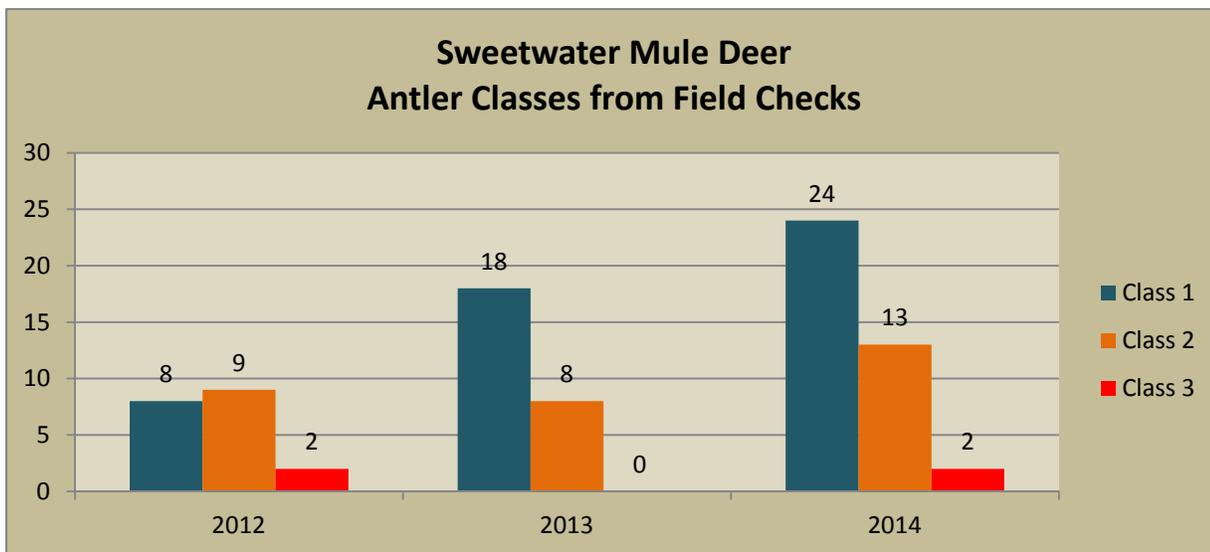


Figure 2. Antler class data as measured during field checks and at check stations, 2012-14.

Population

A spreadsheet model was developed for this population in 2012, and has been updated utilizing 2014 post-season classification and harvest data. The TSJ, CA model was selected as the best fit model, with the lowest Relative AICc value and producing population estimates and trends aligned with trends observed in buck harvest, fawn recruitment, and buck/doe ratios. The estimates produced by the spreadsheet model are about 30-40% below those garnered from the previous POP-II model, and are likely more accurate based on observations from field personnel and the public. The population was believed to increase and reach the current objective in 2008 and 2009, based on POP-II, but it now seems clear there were fewer deer than that model projected. This spreadsheet model (TSJ, CA) is considered FAIR, and should be used for bio-year 2014 with a post-season estimate of about 3,400 mule deer.

Management Summary

Management changes have included implementation of antler point restrictions (4-point in 2004 and 2005 and 3-point in 2012 through 2014), in response to declines in buck/doe ratios and population trends, and perceived increases in hunter numbers. Expectedly, both APR types resulted in lower hunter numbers and reduction of overall buck harvest. The 4-point APR implemented in 2004 and 2005 coincided with improved buck/doe ratios as a result of improved fawn survival/yearling buck recruitment with favorable weather patterns and improved, albeit short-term, habitat conditions. The recent 3-point APR seasons have not led to dramatic improvements in buck/doe ratios, largely due to drought concurrent with the first 2 years of APRs. Buck/doe ratios did improve in 2014 to 21M/100F, following improvements in fawn survival/yearling recruitment, but remain at the low end of the Recreational Management range.

This herd unit is part of the area being analyzed by the Lander/Green Mountain Mule Deer Working Group. Short-term recommendations for the Sweetwater Mule Deer Herd Unit were presented to the Department in December 2014 and long-term recommendations to the Department are being developed at this time. Some of those recommendations are likely to include, but not limited to research, habitat management, and hunting season structure. Hunters, at public meetings and during field contacts, have repeatedly asked for ways to reduce hunter crowding, improve mule deer populations, buck numbers and quality, and have increasingly asked for the Department to change to limited quota seasons for the Sweetwater Mule Deer Herd.

The 2015 hunting seasons discontinue the 3-point APR for general license hunts, as recommended by the working group after learning how continuing with APRs would be detrimental to building older age classes of buck mule deer. Another short-term recommendation carried forward in the 2015 season proposals was to restrict youth hunters from being allowed to harvest does or fawns. The working group very strongly feels any harvest of female mule deer should not be allowed until populations recover. However, the Department has decided to continue with all youth hunters being allowed to harvest “any deer” in seasons otherwise restricted to antlered deer.

White-tailed deer hunts are again being offered for Hunt Area 97, with 25 Type 3 licenses (Any white-tailed deer) along with 25 Type 8 doe/fawn white-tailed licenses valid in November. The Lander/Green Mountain Mule Deer Working Group recommended opening the General License season on October 1, for white-tailed deer only, in both herd units. However, we chose not to implement that recommendation for either hunt area in the Sweetwater Mule Deer Herd Unit. Hunt Area 96 has very low numbers of white-tailed deer and opening a deer season on October 1 could lead to hunter crowding issues during elk season, which has a tradition of over-crowding. Hunt Area 97 has more white-tailed deer, but following the EHD outbreak in 2013, we don't believe the population needs additional pressure, since Hunt Area 97 is open for any white-tailed deer during the October 15-22 General License season, and has Type 3 and Type 8 licenses valid only for white-tailed deer open the entire month of November.

The 2015 season structure should result in a harvest of approximately 300 buck mule deer and about 15 does and fawns (with archery hunters being allowed to harvest “Any” deer). If habitat conditions continue to show improvement with enhanced weather, the population should begin to slowly recover. With anticipated fawn survival, this should allow for a stable population of about 3,500 mule deer after the 2015 hunting season.

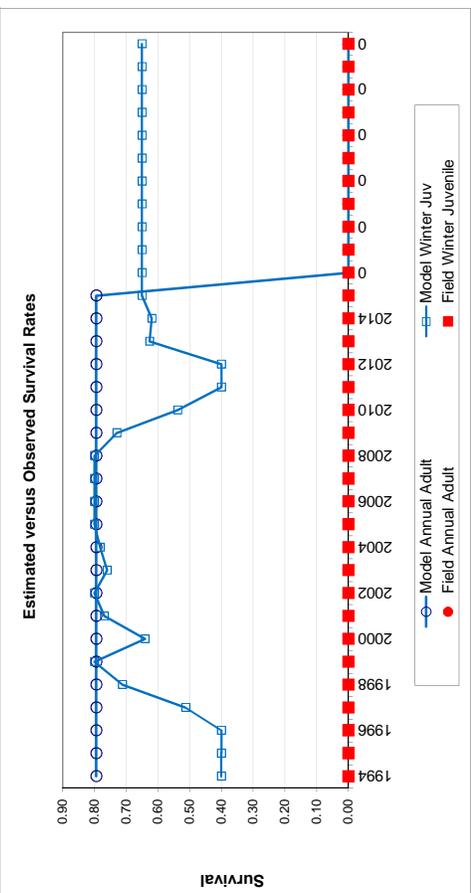
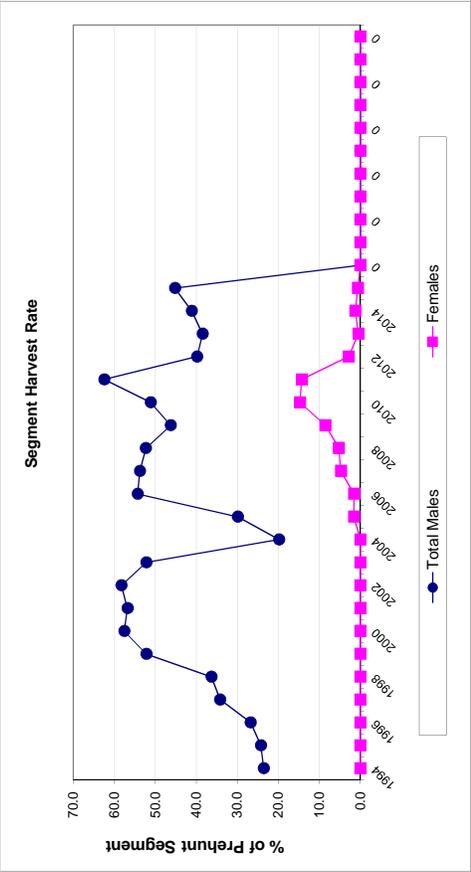
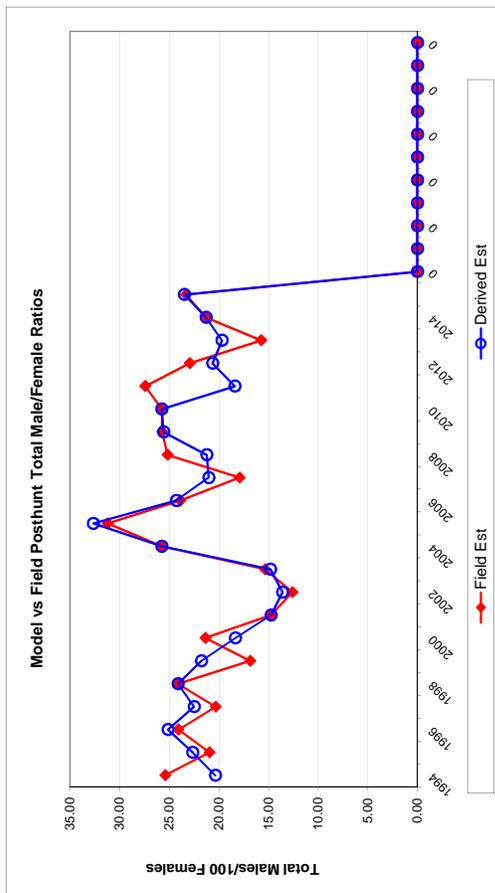
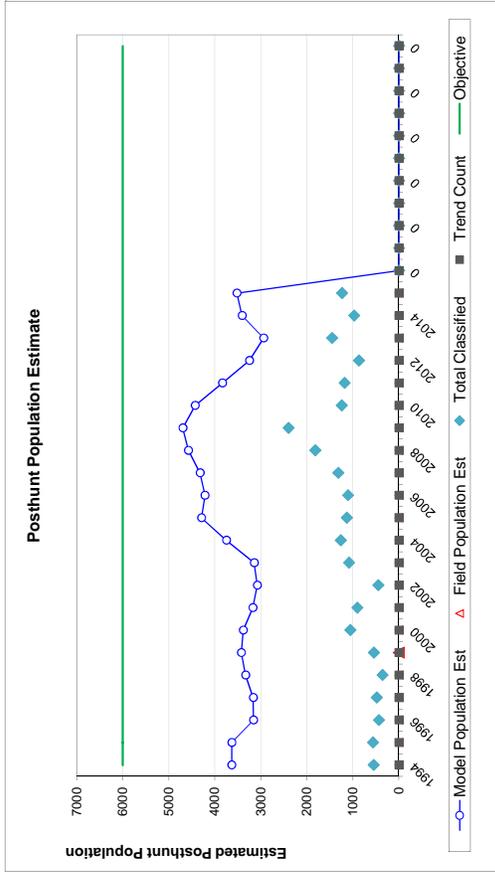
Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1994	0.40		0.79	
1995	0.40		0.79	
1996	0.40		0.79	
1997	0.51		0.79	
1998	0.71		0.79	
1999	0.80		0.79	
2000	0.64		0.79	
2001	0.77		0.79	
2002	0.80		0.79	
2003	0.76		0.79	
2004	0.78		0.79	
2005	0.80		0.79	
2006	0.80		0.79	
2007	0.80		0.79	
2008	0.80		0.79	
2009	0.73		0.79	
2010	0.54		0.79	
2011	0.40		0.79	
2012	0.40		0.79	
2013	0.63		0.79	
2014	0.62		0.79	
2015	0.65		0.79	
0	0			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			
0	0.65			

Parameters:	Optim cells
Adult Survival =	0.794
Initial Total Male Pop/10,000 =	0.042
Initial Female Pop/10,000 =	0.208

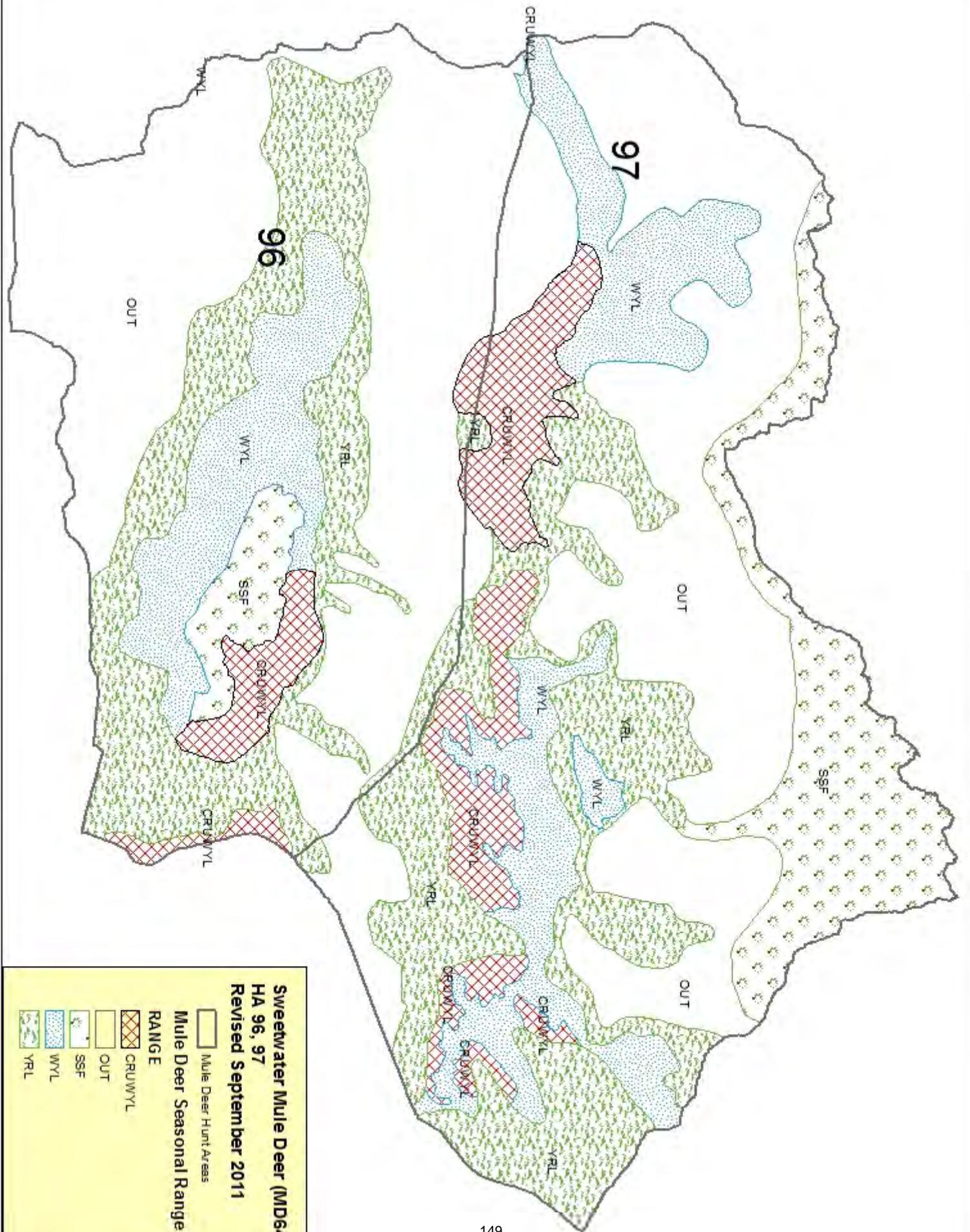
MODEL ASSUMPTIONS
Sex Ratio (% Males) = 50%
Wounding Loss (total males) = 10%
Wounding Loss (females) = 10%
Wounding Loss (juveniles) = 10%

FIGURES



Comments:

END



2014 - JCR Evaluation Form

SPECIES: Mule Deer
 HERD: MD647 - FERRIS
 HUNT AREAS: 87

PERIOD: 6/1/2014 - 5/31/2015
 PREPARED BY: GREG HIATT

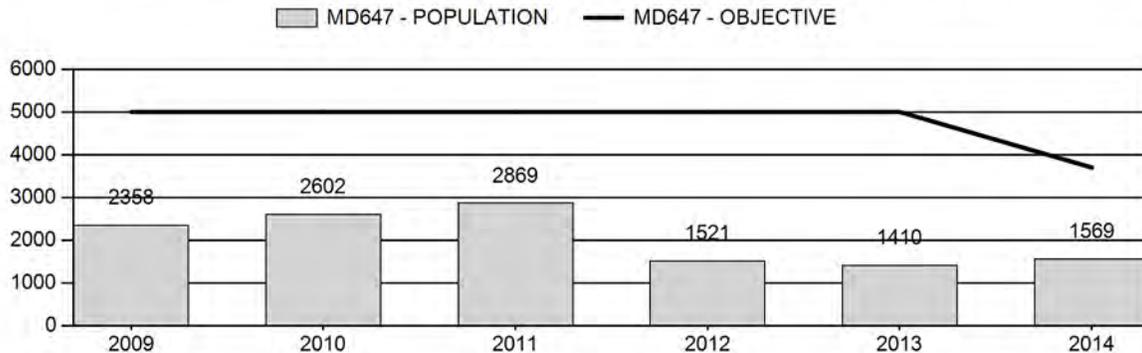
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	2,152	1,569	1,817
Harvest:	95	15	40
Hunters:	122	20	45
Hunter Success:	78%	75%	89%
Active Licenses:	122	20	45
Active License Success:	78%	75%	89%
Recreation Days:	655	55	210
Days Per Animal:	6.9	3.7	5.2
Males per 100 Females	37	38	
Juveniles per 100 Females	51	61	

Population Objective ($\pm 20\%$) : 3700 (2960 - 4440)
 Management Strategy: Special
 Percent population is above (+) or below (-) objective: -57.6%
 Number of years population has been + or - objective in recent trend: 21
 Model Date: 3/3/2015

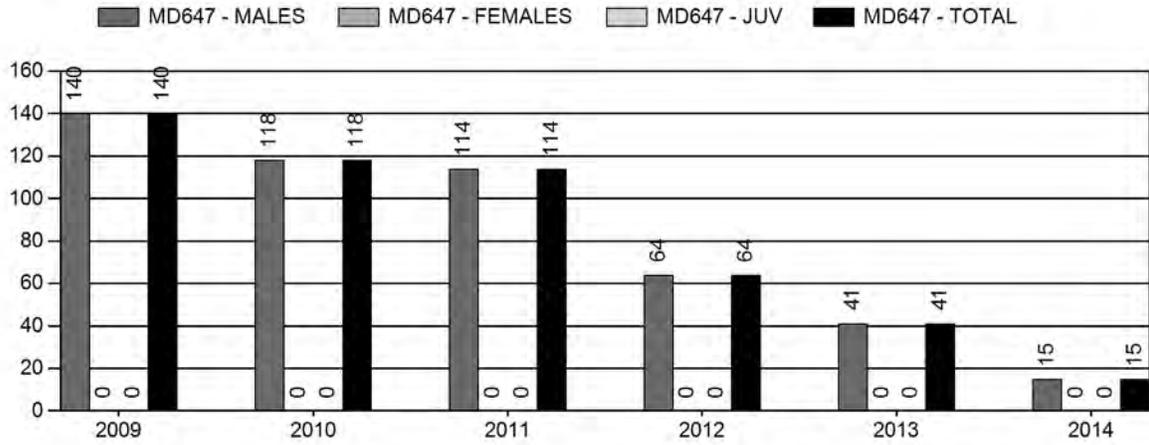
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	4.3%	8.8%
Juveniles (< 1 year old):	0%	0%
Total:	1.0%	2.1%
Proposed change in post-season population:	+2.4%	+1.1%

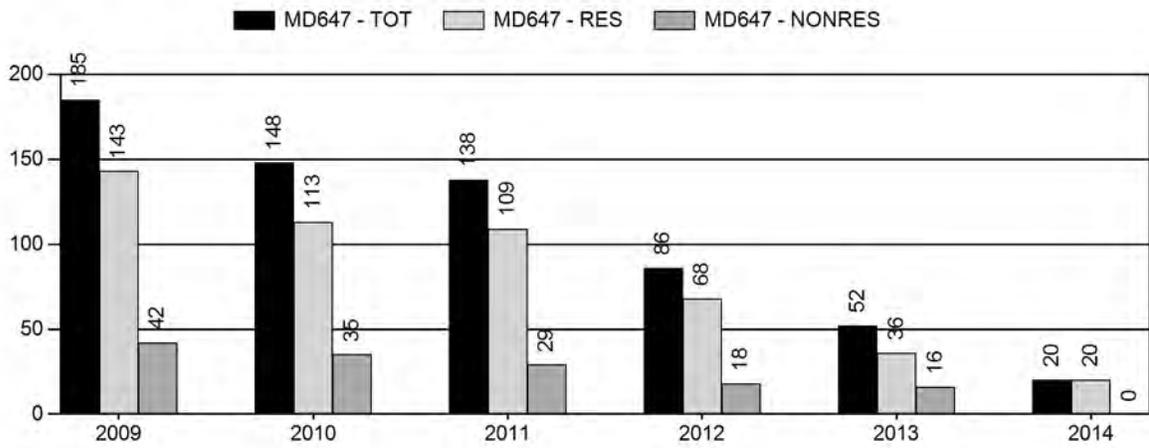
Population Size - Postseason



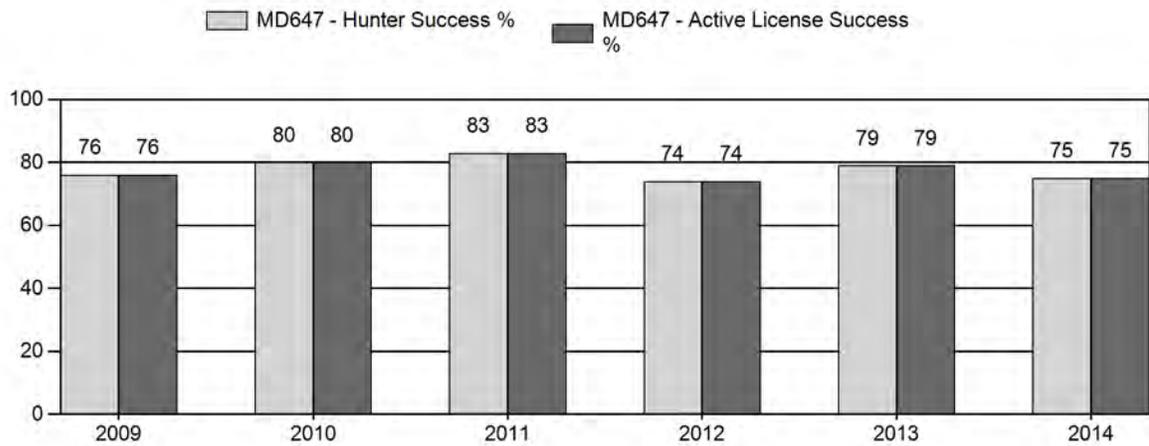
Harvest



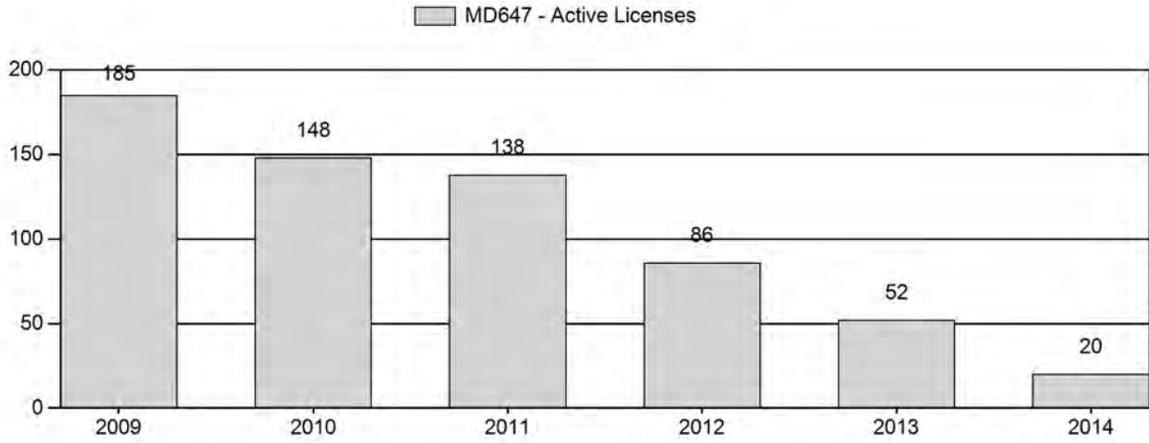
Number of Hunters



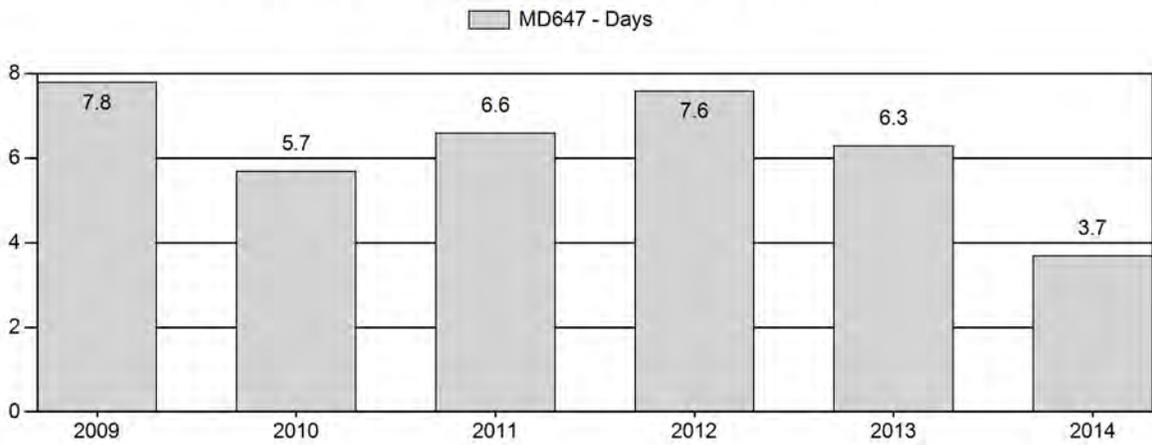
Harvest Success



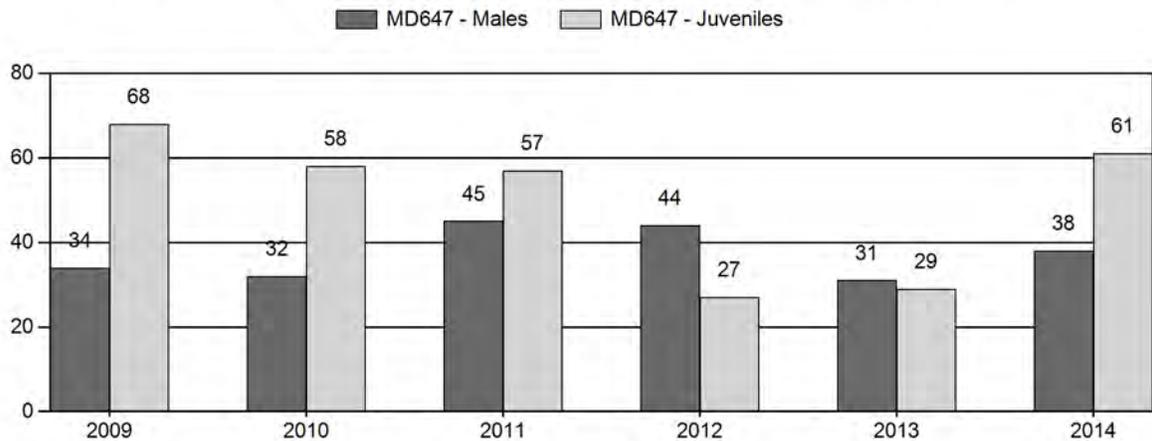
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD647 - FERRIS

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	2,358	55	0	0	0	87	142	17%	419	49%	286	34%	847	923	13	21	34	± 3	68	± 5	51
2010	2,602	51	0	0	0	71	122	17%	381	53%	222	31%	725	771	13	19	32	± 4	58	± 5	44
2011	2,869	50	0	0	0	111	161	22%	356	49%	204	28%	721	790	14	31	45	± 5	57	± 6	39
2012	1,521	0	0	0	0	0	125	26%	281	58%	75	16%	481	528	0	0	44	± 5	27	± 4	18
2013	1,410	14	0	0	0	58	72	20%	230	62%	66	18%	368	347	6	25	31	± 5	29	± 4	22
2014	1,569	42	0	0	0	105	147	19%	386	50%	234	31%	767	695	11	27	38	± 3	61	± 5	44

**2015 HUNTING SEASONS
FERRIS MULE DEER HERD (MD647)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
87	1	Oct. 15	Oct. 31	50	Limited quota; antlered mule deer or any white-tailed deer
Archery 87		Sep. 1	Sep. 30		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
87	1	+25
Total	1	+25

Management Evaluation

Current Management Objective: 3,700

Management Strategy: Special

2014 Postseason Population Estimate: 1,570

2015 Proposed Postseason Population Estimate: 1,820

The management objective for the Ferris Mule Deer Herd Unit is a post-season population size objective of 3,700 deer. The current management strategy is special management, with buck:doe ratios allowed to exceed 29:100. The objective and management strategy were last publicly reviewed in 2014.

Herd Unit Issues

The 2014 post-season population estimate was about 1,570 deer with the population climbing slowly upward from a low of about 1,400 deer in 2013. The herd was last near objective size in 2007, with the previous peak being prior to the 1992-93 winter. Restricted hunting access to major blocks of private and checkerboarded lands has concentrated hunting pressure on the remaining portions of the area, making it difficult to manage buck numbers and quality in the accessible portions of the herd.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve fawn survival. Condition of mule deer going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little

significant snowfall until late February. Losses may still be above average because many animals were dispersed off winter ranges prior to the late blizzards.

Habitat

Lack of fire has resulted in decadent shrub stands encroached by conifer in large portions of this herd unit. Prolonged, severe drought has reduced the quantity and quality of forage for mule deer. Two browse transects have been established in this herd unit, but one was burned by fire in 2012 and the other was not read in 2014.

Over the past several years the Rawlins BLM has implemented prescribed burns in the Seminoe and Ferris Mountains, partly to address conifer encroachment while also rejuvenating decadent mountain mahogany and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminoe Mountains and the eastern Ferris Mountains burned thousands of acres, including crucial mule deer winter habitat as well as year round habitats. These prescribed burns should benefit mule deer productivity with the return of young vigorous shrub complexes, but benefits from the wildfires will be longer term.

The Seminoe Fire burned over 3,800 acres in the Seminoe Mountains including areas within Morgan Creek WHMA. As in 2012 and 2013, the Rawlins BLM again coordinated and funded aerial application of Plateau® in 2014 to mitigate cheatgrass spread on BLM and WGFD managed areas within the fire perimeter. The wildfire enveloped several previously planned prescribed burns, although not with the desired prescriptions.

Plans for additional prescribed fires in the Seminoe Mountains, particularly on the Morgan Creek WHMA, have been accelerated to take advantage of the secure fire breaks provided by the 2012 wildfire.

Field Data

Despite conservative seasons, deer numbers have slowly declined over the past two decades due to several severe winters and persistent drought conditions. Poor habitat conditions on most seasonal ranges have prevented the rapid population response seen after similar weather events in previous decades. Fawn:doe ratios have remained exceptionally low in most recent years, preventing recovery of the population, but improved in 2014 to 61:100. Sample size in 2014 doubled over the 2013 survey, without changing the winter ranges covered or the number of helicopter survey effort.

The buck:doe ratio increased to 38:100 in 2014, but was still below ratios recorded in 2011 and 2012. Most of the increase was in the yearling ageclass, from 6:100 in 2013 to 11:100 in 2014, despite the exceptionally poor fawn crop in 2013. Apparently fawn survival was high during the 2013-2014 winter. Hunter access is greatly restricted to large portions of this herd, yielding segments of the population that are essentially unhunted. Rapid fluctuations in buck:doe ratios early in the previous decade are suspected to have been caused by changes in how observers surveyed between hunted and unhunted segments of the herd. Classification surveys the past eight years have attempted to uniformly cover all winter ranges, yielding more representative ratios. While ratios may no longer be as skewed, a significant proportion of the bucks in the

sample still come from areas with limited or no public access. Less than 7 percent of the bucks in the sample were Class 3. More than 60 percent were yearlings or Class 1.

Harvest Data

Despite indications of increased numbers of buck deer, hunter success declined slightly, from 79 percent to 75 percent. Hunter effort, however, declined to its lowest level since 1992, suggesting more deer were available for harvest. With the increasing high demand for licenses in this herd, hunters appear to be more selective about the quality of bucks they are willing to harvest, and this would be expected to affect hunter success when the supply of higher class bucks is limited. Only half as many licenses were issued in 2014 as in the previous year, so the remaining hunters would be expected to enjoy better hunting conditions. Only 15 deer were harvested, the smallest harvest from this herd in over forty years, including several years with 4-point or better antler point restrictions.

Population

The Time-Specific Juvenile & Constant Adult Survival (TSJ/CA) spreadsheet model provided the best fit with observed buck:doe ratios for this herd. The model behaved predictably when 2014 classification and harvest data were added. Best fit was attained by altering the model to allow adult survival rates to fluctuate independently in 2007 and 2011, two years with severe winters. In addition, the initial population was limited to at least twice the classification sample for that year. The resulting model is considered “fair” and matched well with observed buck:doe ratios and predicted annual adult survival at 87 percent, a reasonable level. It also tracks more closely with classification sample sizes. AICc value for the model was slightly improved over the simpler SCJ,SCA model and vastly improved over the CJ,CA model. This model, which mimics changes in adult survival during severe winters, predicts population sizes roughly 15 percent lower than the simpler TSJ/CA model without the fluctuating adult survival rates during the 2007 and 2011 winters.

Fawn production in 2015 was projected at a 5-year average, which may be optimistic considering the poor snowpack going into the 2015 spring. The model predicts a slight increase in herd size, but also predicts an increase in the buck:doe ratios. As with many mule deer herds, herd growth appears to be limited by fawn production and survival. If drought conditions abate, the large acreages of treated habitat may improve fawn production and survival and provide for some degree of herd growth in the future.

Management Summary

With the low numbers of permits allowed in this herd, hunters have come to expect better opportunities to see and harvest larger bucks than available in neighboring general license, more productive herds. High demand for these licenses is attributed as much to an expectation of high buck quality as it is for a less crowded hunting experience. To take advantage of the improved buck:doe ratio and apparent increase in deer numbers, the recommended license quota is increased by 25 licenses in 2015.

Expected harvest would be roughly 40 buck deer. As in the previous 19 years, these licenses are valid only for antlered deer during the regular season, but the recommendation for 2015 would also allow harvest of any white-tailed deer. The quota is double that available in 2014, matching the 2013 quota. With the herd so far below objective, no doe harvest is warranted and no doe/fawn licenses are available. Youth hunters and archers in the special archery season will still be able to harvest antlerless deer.

Opening date is traditional, coincides with hunts in neighboring areas in Regions D and E, and is consistent with the application booklets. Closing date is the same as in the previous 15 years. Archery season dates are standard and the same as used in previous years.

INPUT	
Species:	Mule Deer
Biologist:	Gregg Hiatt
Herd Unit & No.:	MD647 Ferris
Model date:	03/03/15

MODELS SUMMARY

	Fit	Relative AICc	Notes
CJ,CA	605	614	
SCJ,SJA	204	227	<input type="checkbox"/> CJ,CA Model <input type="checkbox"/> SCJ,SJA Mod
TSJ,CA	55	207	<input checked="" type="checkbox"/> TSJ,CA Model

Check best model to create report

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count		Predicted Prehunt Population				Predicted Posthunt Population				Objective
	Field Est	Field SE	Juveniles	Total	Juveniles	Total Males	Females	Total	Juveniles	Total Males	Females	Total	
1993			713	365	1372	376	1277	2450	709	268	1300	2277	5000
1994			615	376	1277	376	1277	2268	615	268	1249	2132	5000
1995			743	387	1213	387	1213	2314	743	269	1213	2226	5000
1996			784	417	1242	417	1242	2443	784	297	1242	2323	5000
1997			760	519	1344	519	1344	2624	760	381	1344	2485	5000
1998			1097	485	1326	485	1326	2907	1097	364	1326	2786	5000
1999			996	537	1377	537	1377	2911	996	336	1377	2710	5000
2000			886	614	1524	614	1524	3025	886	392	1524	2802	5000
2001			1004	520	1508	520	1508	3032	1004	372	1508	2885	5000
2002			881	526	1518	526	1518	2926	881	382	1518	2781	5000
2003			1189	538	1530	538	1530	3257	1189	382	1530	3101	5000
2004			918	572	1574	572	1574	3064	918	379	1551	2848	5000
2005			799	767	1790	767	1790	3357	799	533	1790	3123	5000
2006			887	845	1943	845	1943	3676	887	633	1943	3463	5000
2007			1125	802	1947	802	1947	3874	1125	554	1947	3626	5000
2008			732	681	1377	681	1377	2789	732	522	1377	2631	5000
2009			921	602	1349	602	1349	2872	921	448	1349	2718	5000
2010			794	576	1362	576	1362	2732	794	446	1362	2602	5000
2011			845	674	1475	674	1475	2994	845	549	1475	2869	5000
2012			242	443	906	443	906	1592	242	373	906	1521	5000
2013			241	374	840	374	840	1455	241	329	840	1410	5000
2014			474	336	782	336	782	1591	474	314	782	1569	3700
2015			454	499	908	499	908	1861	454	455	908	1817	3700
2016													3700
2017													3700
2018													3700
2019													3700
2020													3700
2021													3700
2022													3700
2023													3700
2024													3700
2025													3700

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	0.40		0.87	
1994	0.40		0.87	
1995	0.49		0.87	
1996	0.66		0.87	
1997	0.40		0.87	
1998	0.40		0.87	
1999	0.64		0.87	
2000	0.40		0.87	
2001	0.40		0.87	
2002	0.46		0.87	
2003	0.40		0.87	
2004	0.95		0.87	
2005	0.95		0.87	
2006	0.56		0.87	
2007	0.72		0.50	
2008	0.40		0.87	
2009	0.40		0.87	
2010	0.72		0.87	
2011	0.40		0.50	
2012	0.40		0.87	
2013	0.40		0.87	
2014	0.95		0.87	
2015	0.65		0.87	
2016	0.65		0.80	
2017	0.65			
2018	0.65			
2019	0.65			
2020	0.65			
2021	0.65			
2022	0.65			
2023	0.65			
2024	0.65			
2025	0.65			

Parameters:

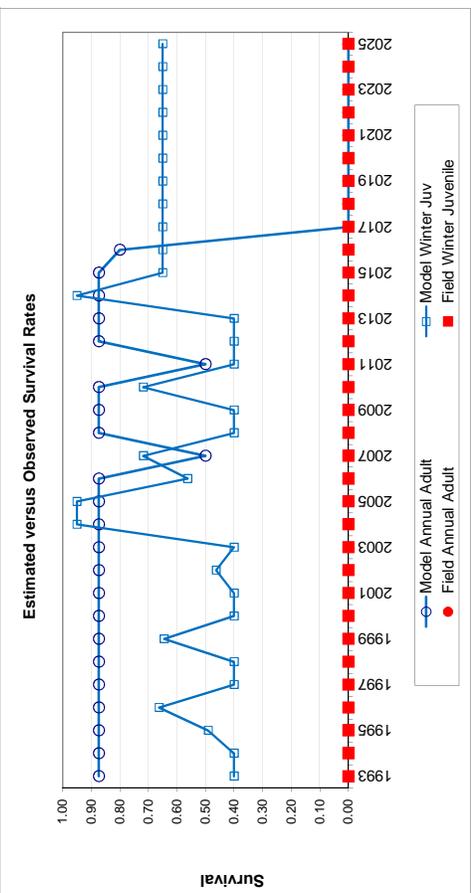
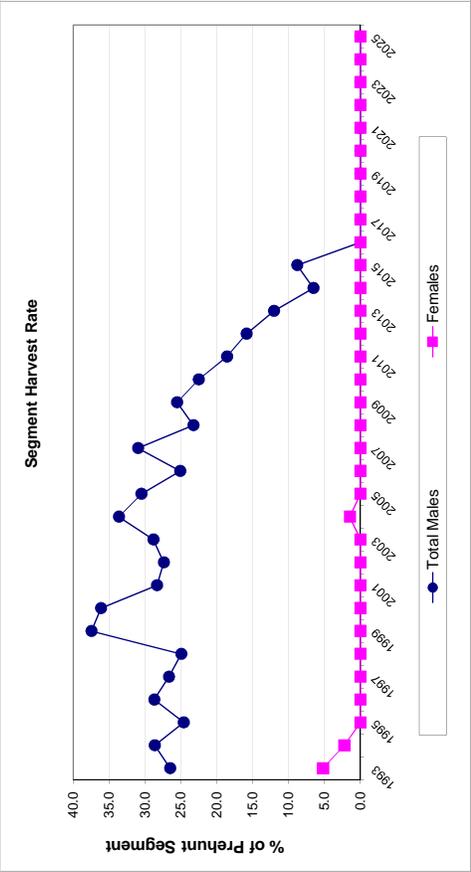
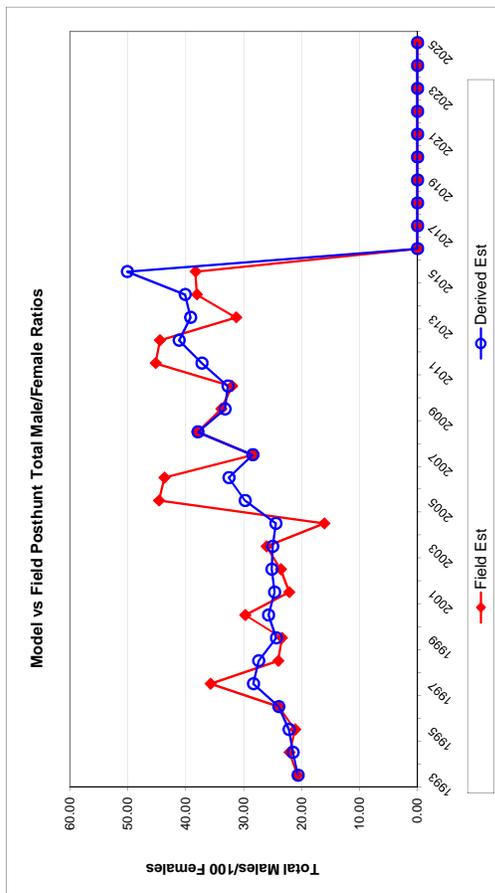
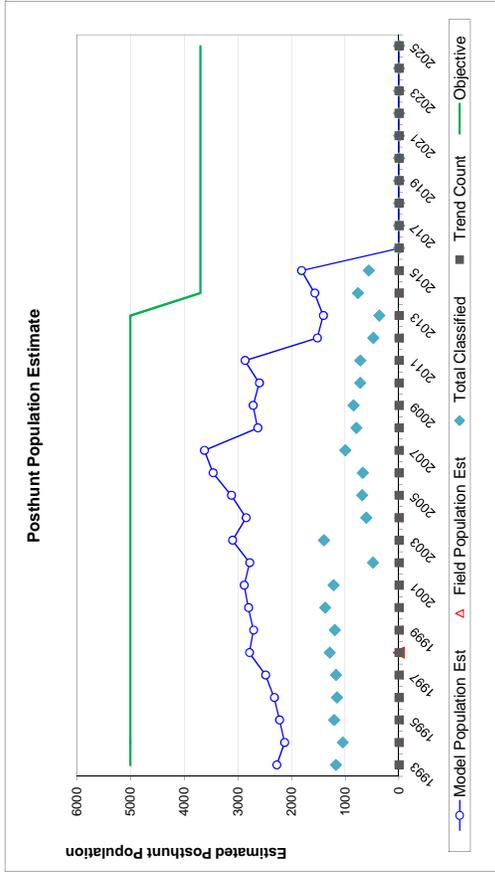
Adult Survival =	Optim cells
Initial Total Male Pop/10,000 =	0.873
Initial Female Pop/10,000 =	0.027
	0.130

MODEL ASSUMPTIONS

Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

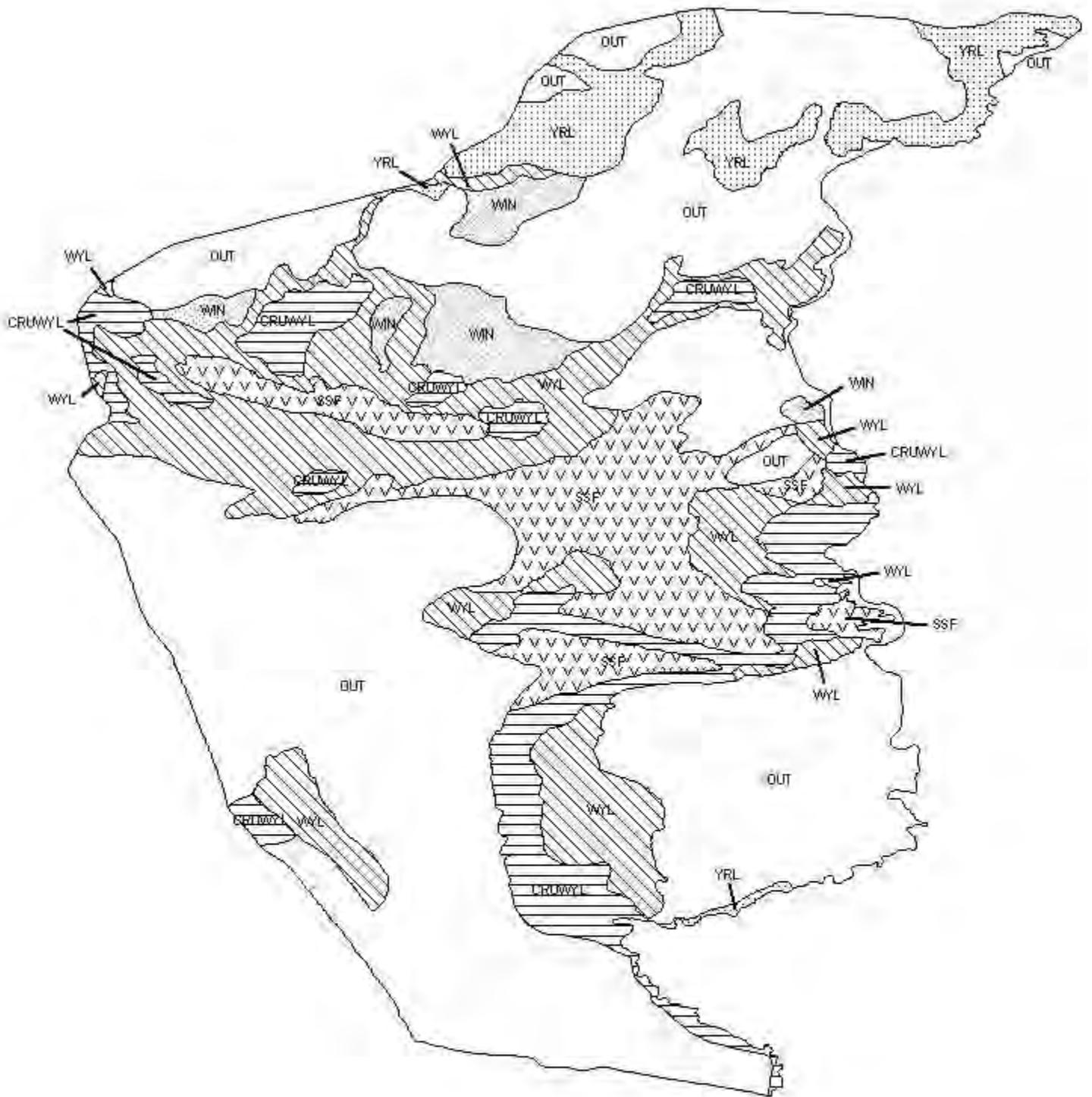
Year	Classification Counts										Harvest	
	Juvenile/Female Ratio					Total Male/Female Ratio					Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		54.55	3.54	20.62	20.72	1.93	4	88	65	157	26.5	5.2
1994		49.26	3.47	21.48	22.09	2.10	0	98	26	124	28.7	2.2
1995		61.24	3.86	22.19	21.12	1.96	0	80	0	80	24.6	0.0
1996		63.11	4.08	23.95	23.95	2.19	0	109	0	109	28.7	0.0
1997		56.56	3.81	28.33	35.74	2.82	0	126	0	126	26.7	0.0
1998		82.69	4.92	27.42	24.04	2.19	0	110	0	110	25.0	0.0
1999		72.34	4.52	24.36	23.40	2.17	0	183	0	183	37.5	0.0
2000		58.12	3.54	25.73	29.74	2.29	0	202	0	202	36.2	0.0
2001		66.56	4.14	24.68	22.14	2.05	0	134	0	134	28.4	0.0
2002		58.05	3.86	25.16	23.60	3.30	0	131	0	131	27.4	0.0
2003		77.73	4.48	25.00	26.06	2.19	0	141	0	141	28.9	0.0
2004		59.20	5.20	24.46	16.09	2.32	0	175	21	196	33.7	1.5
2005		44.63	4.22	29.77	44.63	4.22	0	213	0	213	30.5	0.0
2006		45.66	4.32	32.56	43.70	4.19	0	193	0	193	25.1	0.0
2007		57.81	4.12	28.44	28.44	2.61	0	226	0	226	31.0	0.0
2008		53.13	4.42	37.92	37.98	3.55	0	144	0	144	23.3	0.0
2009		68.26	5.24	33.24	33.89	3.29	0	140	0	140	25.6	0.0
2010		58.27	4.92	32.73	32.02	3.33	0	118	0	118	22.5	0.0
2011		57.30	5.03	37.23	45.22	4.30	0	114	0	114	18.6	0.0
2012		26.69	4.78	41.16	44.48	4.78	0	64	0	64	15.9	0.0
2013		28.70	4.01	39.18	31.30	4.23	0	41	0	41	12.1	0.0
2014		60.62	5.02	40.12	38.08	3.69	0	20	0	20	6.6	0.0
2015		50.00	5.00	50.12	38.33	4.20	0	40	0	40	8.8	0.0
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



Comments:

END



Mule Deer (MD647) - Ferris
 HA 87
 Revised - 3/91



2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD648 - BEAVER RIM

HUNT AREAS: 90

PREPARED BY: GREG
ANDERSON

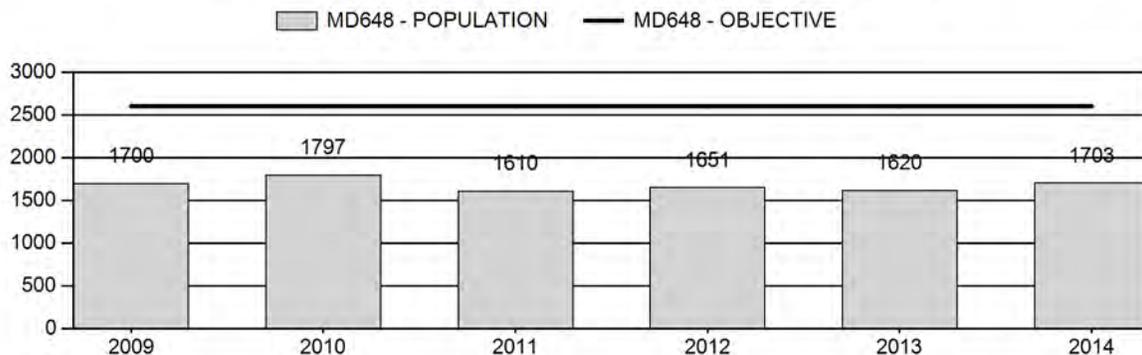
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	1,676	1,703	1,893
Harvest:	88	29	35
Hunters:	112	42	50
Hunter Success:	79%	69%	70 %
Active Licenses:	112	42	50
Active License Success:	79%	69%	70 %
Recreation Days:	695	250	300
Days Per Animal:	7.9	8.6	8.6
Males per 100 Females	34	39	
Juveniles per 100 Females	42	80	

Population Objective (± 20%) :	2600 (2080 - 3120)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-34.5%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/20/2015

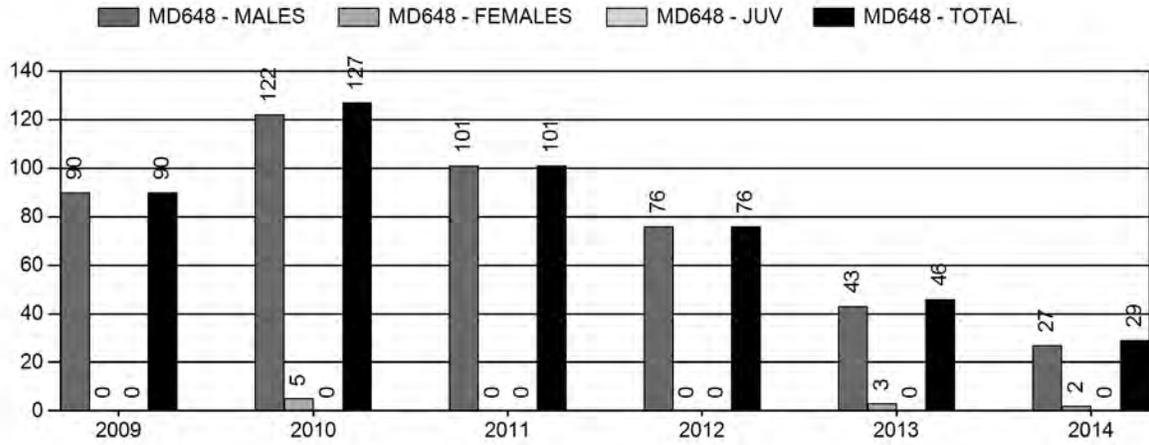
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	12%	8%
Juveniles (< 1 year old):	0%	0%
Total:	2%	2%
Proposed change in post-season population:	+11%	+11%

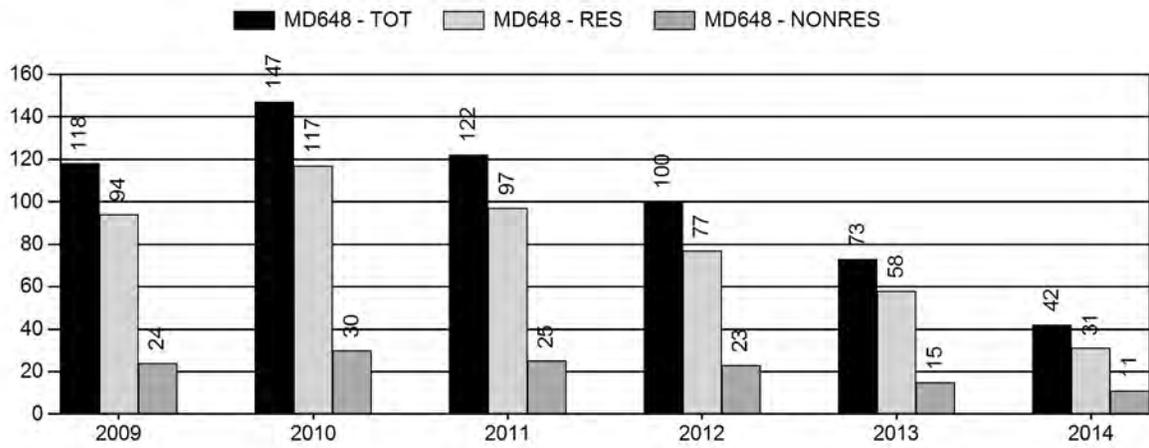
Population Size - Postseason



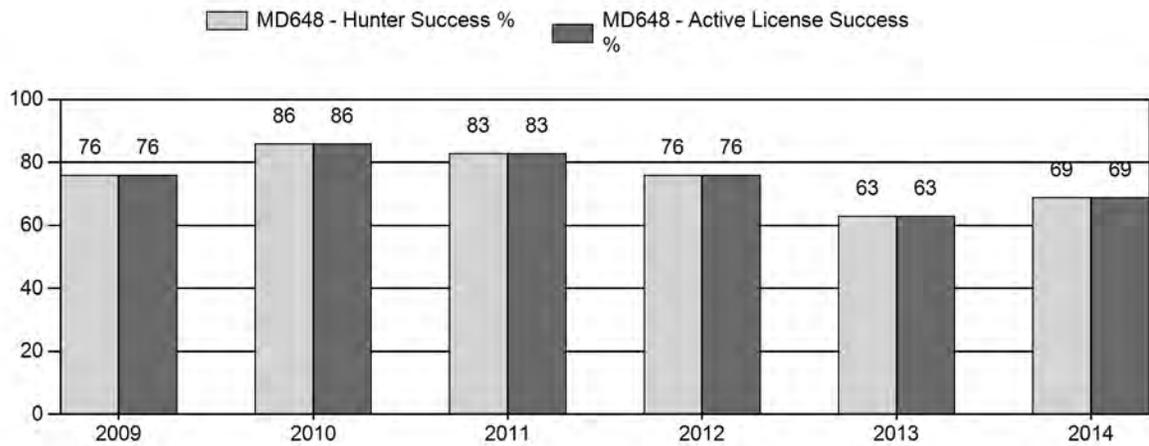
Harvest



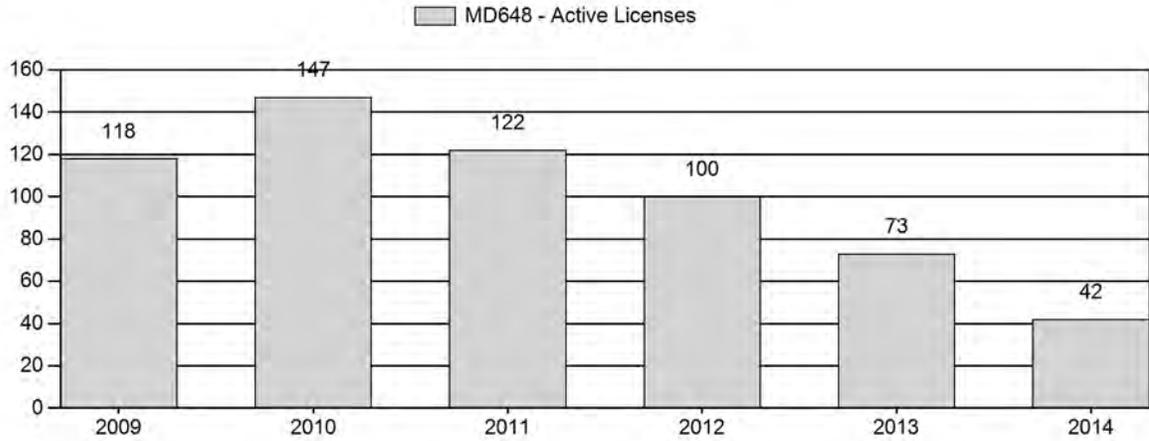
Number of Hunters



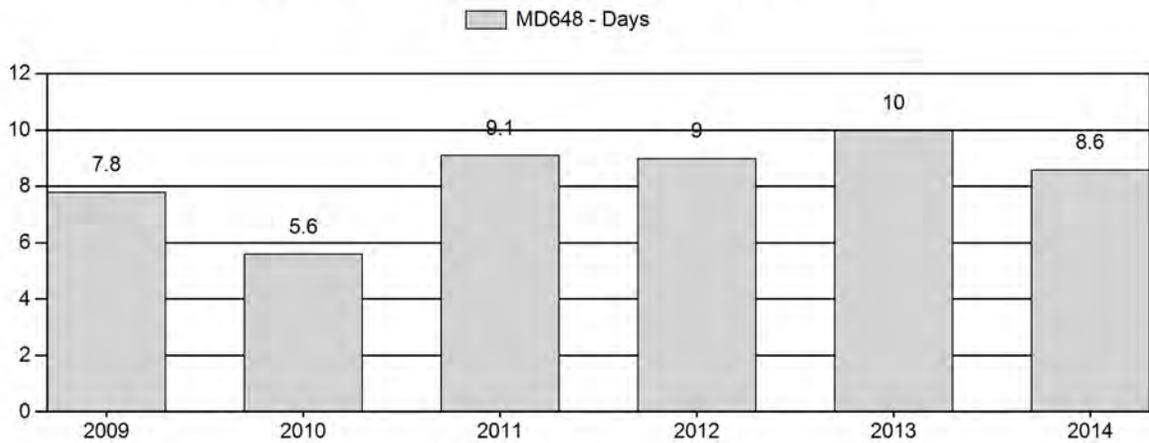
Harvest Success



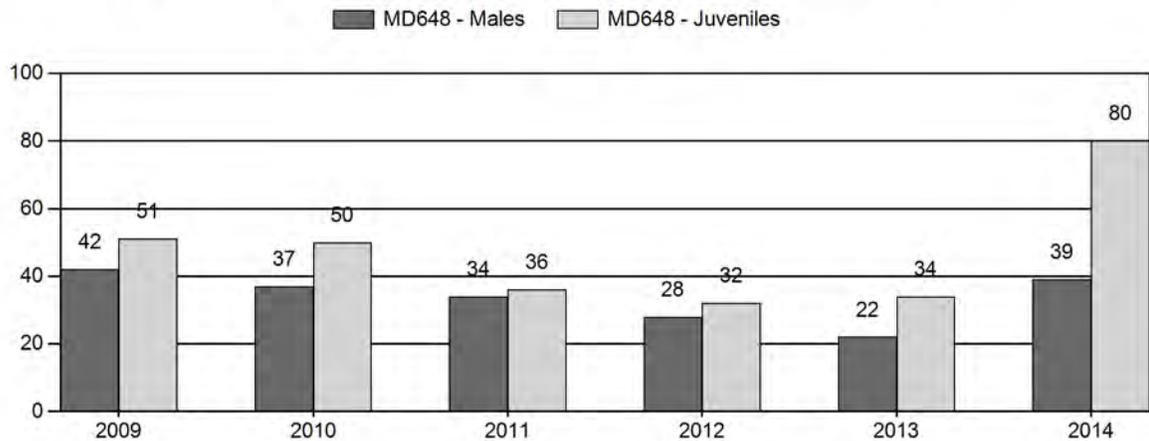
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD648 - BEAVER RIM

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot CIs	CIs Obj	Males to 100 Females			Young to			
		Ylg	2+ CIs 1	2+ CIs 2	2+ CIs 3	2+ UnCIs	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	1,700	25	0	0	0	51	76	22%	182	52%	93	26%	351	552	14	28	42	± 7	51	± 7	36
2010	1,797	13	0	0	0	35	48	20%	129	54%	64	27%	241	582	10	27	37	± 8	50	± 9	36
2011	1,610	10	0	0	0	31	41	20%	119	59%	43	21%	203	389	8	26	34	± 7	36	± 8	27
2012	1,651	4	0	0	0	29	33	17%	120	62%	39	20%	192	362	3	24	28	± 7	32	± 7	25
2013	1,620	3	0	0	0	17	20	14%	90	64%	31	22%	141	362	3	19	22	± 7	34	± 9	28
2014	1,703	17	0	0	0	27	44	18%	114	46%	91	37%	249	936	15	24	39	± 8	80	± 13	58

**2015 HUNTING SEASONS
BEAVER RIM MULE DEER (MD 648)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
90	1	Oct. 1	Oct. 31	50	Limited quota; any deer
Archery		Aug. 15	Sep. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
Total		

Management Evaluation

Current Management Objective: 2,600

Management Strategy: Special

2014 Postseason Population Estimate: ~1,700

2015 Proposed Postseason Population Estimate: ~1,900

Management Issues

The Beaver Rim mule deer herd has a post-season population size objective of 2,600 and has a special management designation. The population objective has been in place since 1994.

The landscape in this herd unit has remained relatively undisturbed compared to neighboring herd units. That said, vegetation throughout much of the area has been in poor condition for a number of years due to drought. In particular, the mid-2000's, 2012, and 2013 were extremely dry. No vegetation data is collected in the herd unit, but casual observation indicated new growth was almost non-existent in both 2012 and 2013. It is believed the most recent drought conditions resulted in a substantial population decline over the past several years.

Habitat/Weather

This population was once significantly larger than it currently is. The population declined dramatically in the early 1990's following a catastrophic winter die-off. Deer numbers then languished for over a decade. The population showed signs of a slow, steady increase from 2000 through 2010. A harsh winter in 2010 followed by extreme drought in 2012 and 2013 resulted in a population decline through 2013. While no vegetation data is collected in the herd unit, casual observations suggest vegetation production in 2014 was outstanding. Most of the areas in central Wyoming saw excellent herbaceous as well as browse production in 2014. Above average feed

availability combined with a mild fall contributed to deer entering winter in excellent body condition.

Field/Harvest Data/Population

Due to low deer densities in the herd unit, classification sample sizes have generally been far below desired levels for the population. That said, deer seen during classification surveys declined consistently from 2010 through 2013 concurrent with a perceived population decline. In 2014 personnel classified 249 mule deer. The sample size was less than 1/3 of the desired number for accurately calculating confidence intervals around age/sex ratios. Low classification samples have been the norm for well over a decade in this herd. As such, all age/sex ratio data should be viewed with caution. Indications are the fawn/doe ratio was quite good in 2014. The small classification sample yielded a fawn/doe ratio of 80/100. This is well above the 5 year average of 41/100. While the ratio is suspect due to the low sample size, it is likely this population had improved recruitment in 2014 associated with favorable weather and feed conditions. Other game populations in the vicinity also saw improved recruitment in 2014. Concurrent with the high fawn/doe ratio, the buck/doe ratio also increased significantly from 2013 to 2014 from 22/100 to 39/100 respectively. Much of the increase is attributable to a greater number of yearling bucks indicating good survival from 2013 to 2014. This same trend was also observed in other game populations throughout the region.

Both harvest success and the days/animal statistic indicate hunt quality has declined in the last few years. Most notably, Type 1 license success was 63% and 69% in 2013 and 2014 respectively and are the lowest in the past 10 years (Fig. 1). In conjunction with declining license success over the past 5 years, the days/animal statistic has increased significantly and been much higher than that in the early 2000's (Fig. 2). The decrease in success, increase in days/animal and low classification sample sizes over the past 5 years all indicate this population declined.

Figure 1. Type 1 license success in deer area 90.

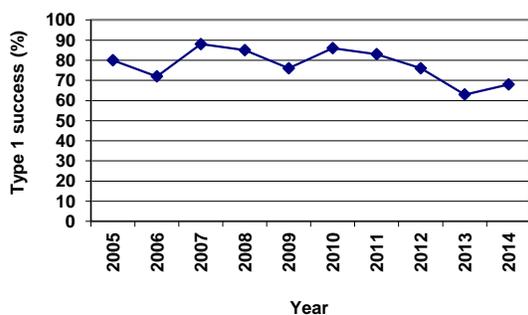
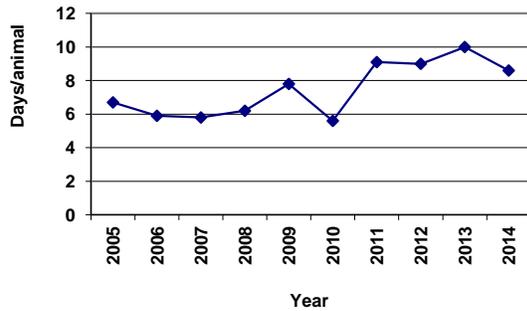


Figure 2. Type 1 license days/animal statistic



A spreadsheet model was developed for this population in 2012. The addition of 2013 and 2014 data did not dramatically change the estimates produced by the model. The SCJ/SCA model appeared to provide the best fit in both 2013 and 2014. The SCJ/SCA had a significantly lower AIC value than the TSJ/CA model but nearly as good of fit. Both models produce a similar trend over the past 10 years and population estimates are not markedly different. The CA/CJ version models a population increase annually for the past 20 years and fails to track the most recent decline from 2010 through 2013. Given other data for the area it is clear the population declined markedly over the past several years invalidating the CA/CJ model version. The SCJ/SCA model tracks perceived trends well up to 2010 indicating slow, steady growth from 2000 through 2010. Past 2010, the model shows a slight decline through 2013. In 2014 the model indicates significant growth from 1,200 deer to 1,700 deer. While it is likely the population did increase from 2013 to 2014 due to favorable weather conditions and good feed, the modeled increase of 37% seems somewhat optimistic. This model is considered poor quality due to the fact age/sex ratio data are based on minimal samples and are also missing several years.

Management Summary

All factors with the exception of the spreadsheet model indicate this population declined significantly from 2010 through 2013. Although the model indicates growth in 2014, the population is still well below objective and other factors indicate hunting remains poor compared to more recent years. Given average winter conditions, it is expected this population will increase again in 2015 to 1,900 deer. No changes are proposed for the 2015 hunt season. With the same number of licenses and some population growth, hunt quality should be a bit better in 2015.

INPUT	
Species:	Mule Deer
Biologist:	Greg Anderson
Herd Unit & No.:	Beaver Rim Mule Deer
Model date:	02/20/15

Clear form

MODELS SUMMARY		Relative AICc	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival	30	21	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	32	18	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	133	11	

CJ,CA Model
 SCJ,SCA Model
 TSJ,CA Model

Check best model to create report

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Predicted Posthunt Population			Objective		
	Field Est	Field SE		Juveniles	Total Males	Females	Total	Juveniles	Total Males		Females	
1993				69	147	175	391	67	25	129	221	2600
1994				58	49	143	250	58	23	126	208	2600
1995				86	44	137	267	85	30	136	251	2600
1996				93	62	156	311	93	48	155	297	2600
1997				101	81	177	359	101	55	177	333	2600
1998				149	90	200	439	149	69	200	418	2600
1999				191	123	240	554	191	85	240	515	2600
2000				133	154	293	580	133	117	287	537	2600
2001				128	159	312	599	128	125	312	565	2600
2002				138	164	332	634	138	131	329	598	2600
2003				198	174	351	723	198	142	349	689	2600
2004				223	208	394	825	223	157	394	774	2600
2005				250	232	444	926	250	181	442	872	2600
2006				364	264	498	1126	364	226	493	1083	2600
2007				386	351	591	1327	386	280	591	1257	2600
2008				313	409	687	1408	313	315	684	1312	2600
2009				379	410	741	1529	379	311	741	1430	2600
2010				403	433	818	1655	403	299	813	1515	2600
2011				292	349	808	1449	292	238	808	1338	2600
2012				274	332	843	1449	274	250	843	1367	2600
2013				267	248	780	1296	267	201	777	1245	2600
2014				641	289	805	1735	641	260	803	1703	2600
2015				456	495	981	1931	456	456	981	1893	2600
2016												2600
2017												2600
2018												2600
2019												2600
2020												2600
2021												2600
2022												2600
2023												2600
2024												2600
2025												2600

Survival and Initial Population Estimates

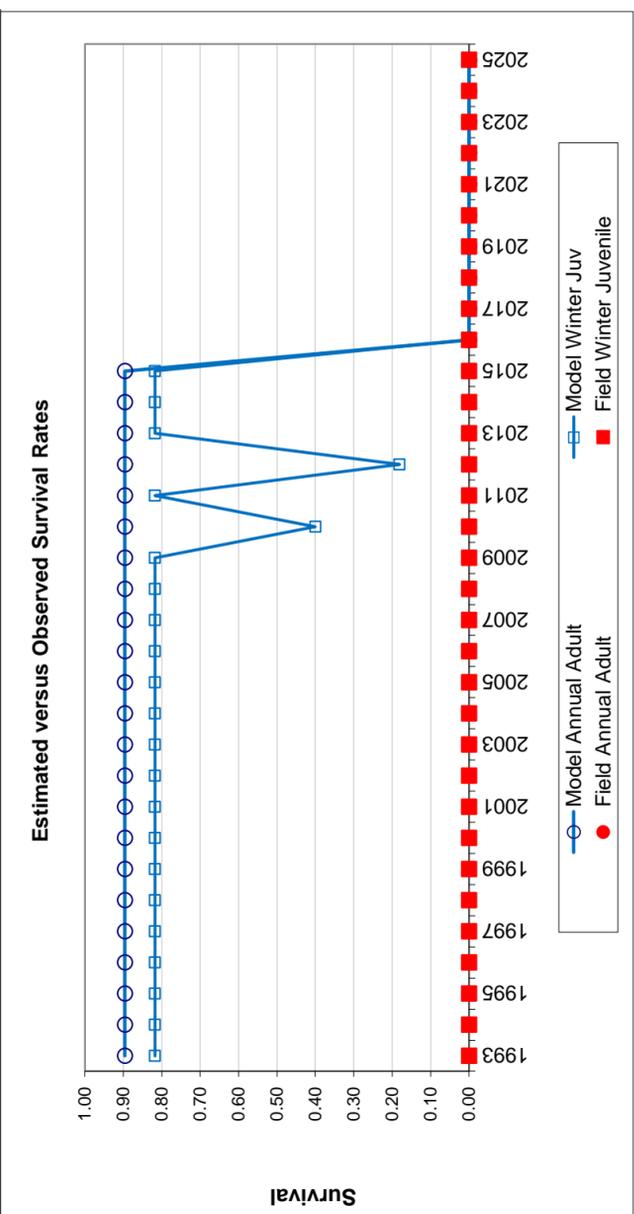
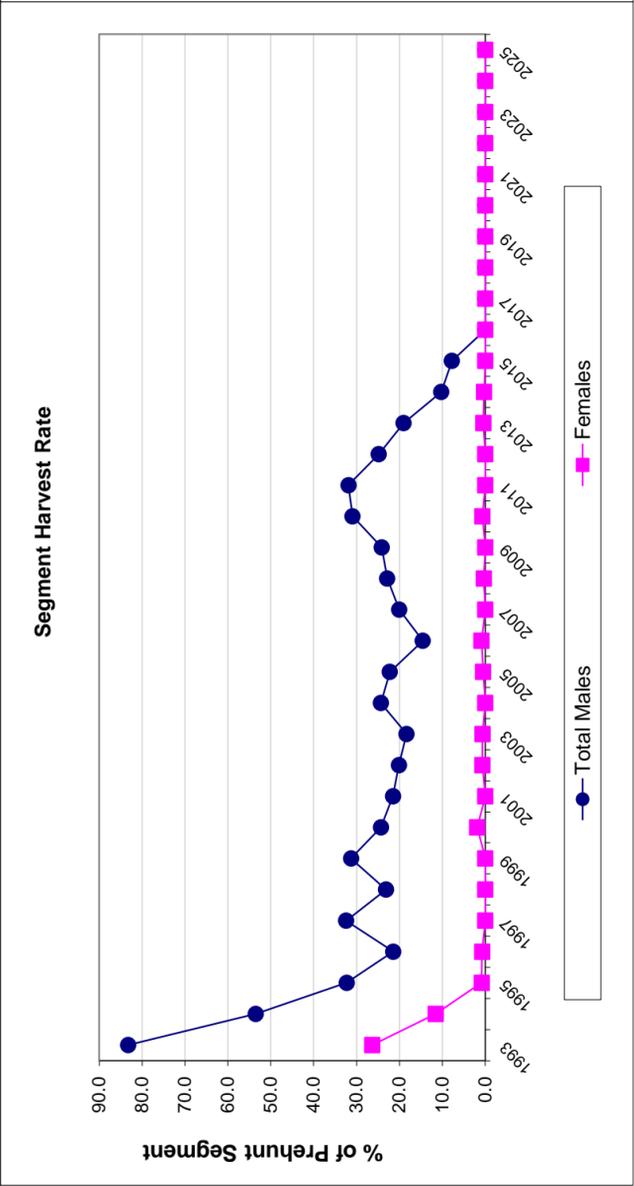
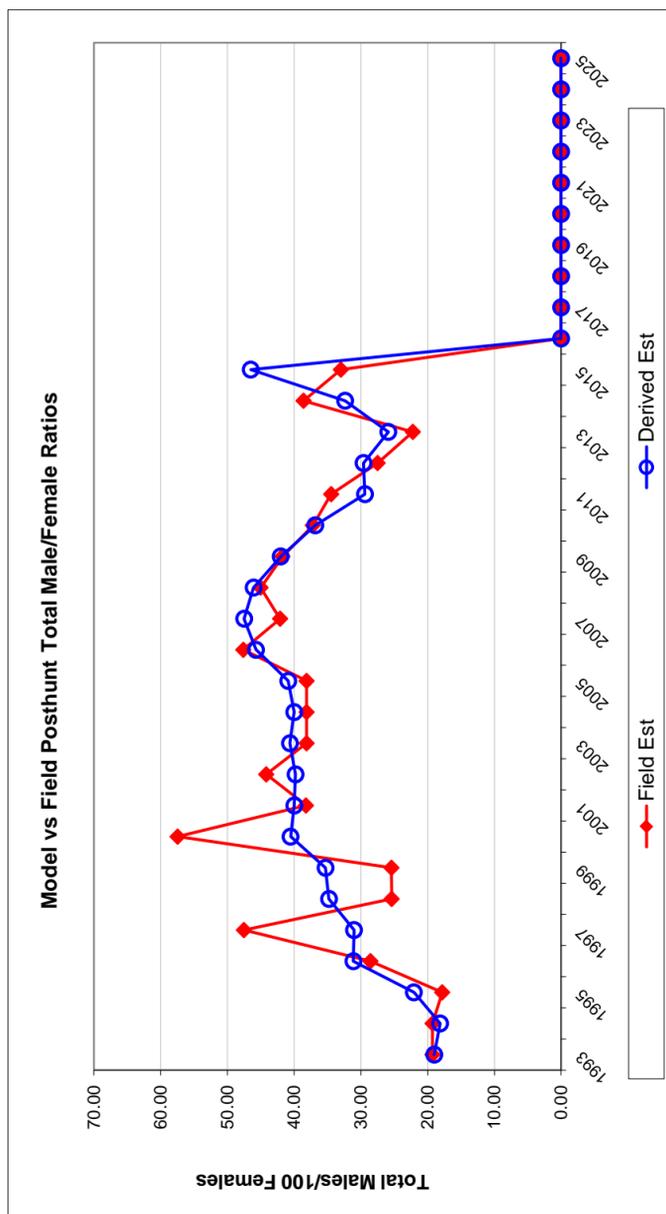
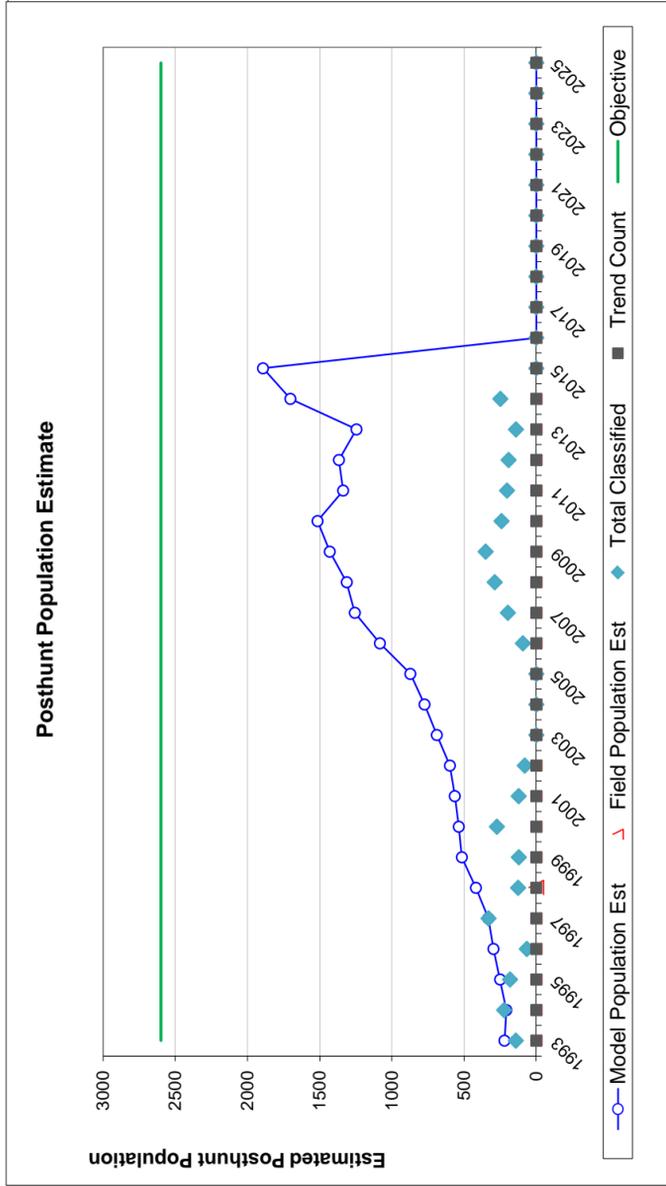
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.82		0.90	
1994	0.82		0.90	
1995	0.82		0.90	
1996	0.82		0.90	
1997	0.82		0.90	
1998	0.82		0.90	
1999	0.82		0.90	
2000	0.82		0.90	
2001	0.82		0.90	
2002	0.82		0.90	
2003	0.82		0.90	
2004	0.82		0.90	
2005	0.82		0.90	
2006	0.82		0.90	
2007	0.82		0.90	
2008	0.82		0.90	
2009	0.82		0.90	
2010	0.40		0.90	
2011	0.82		0.90	
2012	0.18		0.90	
2013	0.82		0.90	
2014	0.82		0.90	
2015	0.82		0.90	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		0.818
Adult Survival =		0.895
Initial Total Male Pop/10,000 =		0.002
Initial Female Pop/10,000 =		0.013

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

Year	Classification Counts										Harvest		
	Juvenile/Female Ratio					Total Male/Female Ratio					Total Harvest	Segment Harvest Rate (% of	Females
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females				
1993		51.81	9.73	19.00	19.28	5.26	2	111	42	155	83.3	26.4	
1994		45.93	7.05	18.13	19.26	4.12	0	24	15	39	53.5	11.5	
1995		62.38	10.01	22.06	17.82	4.56	1	13	1	15	32.3	0.8	
1996		60.00	16.56	31.12	28.57	10.24	0	12	1	13	21.5	0.7	
1997		56.79	7.41	31.03	47.53	6.58	0	24	0	24	32.4	0.0	
1998		74.60	14.38	34.77	25.40	7.11	0	19	0	19	23.1	0.0	
1999		79.66	15.57	35.29	25.42	7.35	0	35	0	35	31.3	0.0	
2000		46.27	7.11	40.55	57.46	8.22	0	34	5	39	24.3	1.9	
2001		41.18	9.25	39.98	38.24	8.82	0	31	0	31	21.5	0.0	
2002		41.86	11.75	39.79	44.19	12.17	0	30	2	32	20.1	0.7	
2003		56.71	11.61	40.63	38.14	8.73	0	29	2	31	18.4	0.6	
2004		56.71	11.61	39.99	38.14	8.73	0	46	0	46	24.3	0.0	
2005		56.71	11.61	40.88	38.14	8.73	0	47	2	49	22.3	0.5	
2006		73.81	17.48	45.71	47.62	12.94	0	35	4	39	14.6	0.9	
2007		65.26	10.66	47.48	42.11	7.94	0	64	0	64	20.1	0.0	
2008		45.70	6.64	46.07	45.03	6.58	0	85	2	87	22.9	0.3	
2009		51.10	6.51	42.02	41.76	5.70	0	90	0	90	24.1	0.0	
2010		49.61	7.59	36.83	37.21	6.29	0	122	5	127	31.0	0.7	
2011		36.13	6.43	29.39	34.45	6.24	0	101	0	101	31.9	0.0	
2012		32.50	5.99	29.60	27.50	5.41	0	75	0	75	24.8	0.0	
2013		34.44	7.17	25.89	22.22	5.49	0	43	3	46	19.0	0.4	
2014		79.82	11.22	32.36	38.60	6.85	0	27	2	29	10.3	0.3	
2015		46.50	7.68	46.51	33.00	6.06	0	35	0	35	7.8	0.0	
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

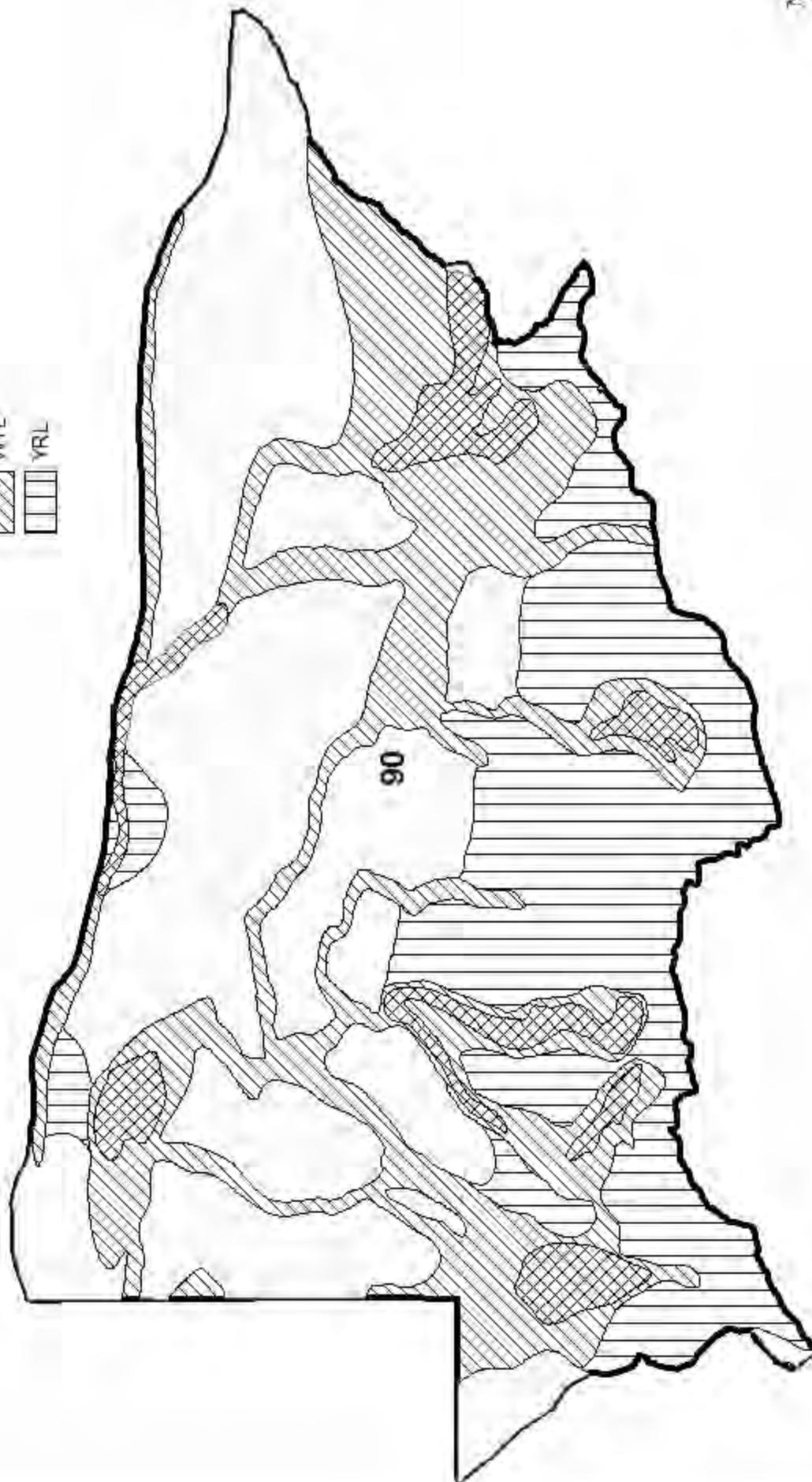
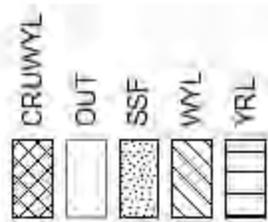
FIGURES



Comments:

END

**Beaver Rim Mule Deer Seasonal Range
Hunt Area 90
Revised 2012**



2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD650 - CHAIN LAKES

HUNT AREAS: 98

PREPARED BY: GREG HIATT

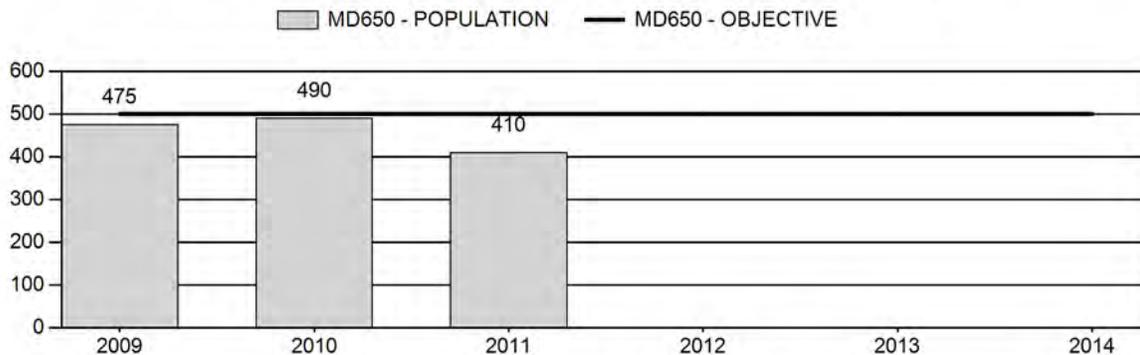
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	275	N/A	N/A
Harvest:	34	44	35
Hunters:	124	88	110
Hunter Success:	27%	50%	32 %
Active Licenses:	124	88	110
Active License Success:	27%	50%	32 %
Recreation Days:	532	280	550
Days Per Animal:	15.6	6.4	15.7
Males per 100 Females	0	0	
Juveniles per 100 Females	0	0	

Population Objective ($\pm 20\%$) :	500 (400 - 600)
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

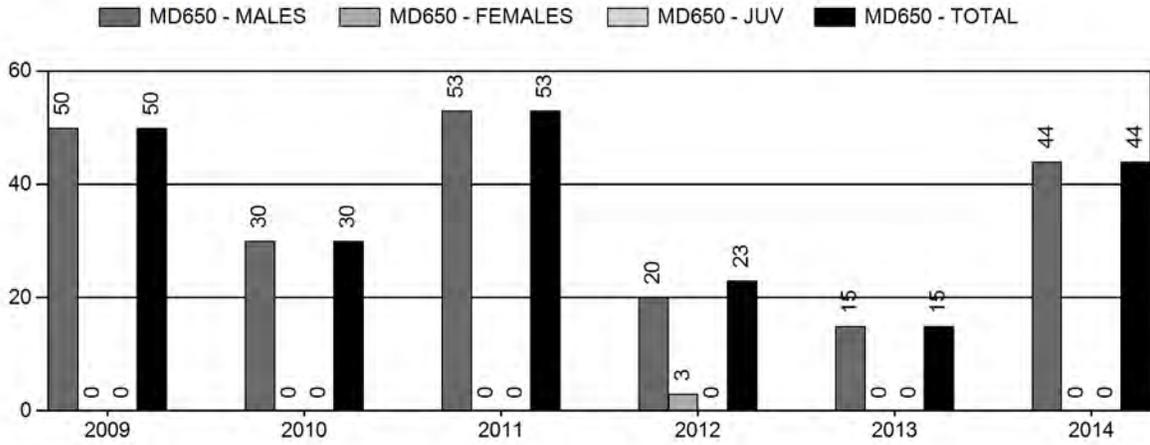
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

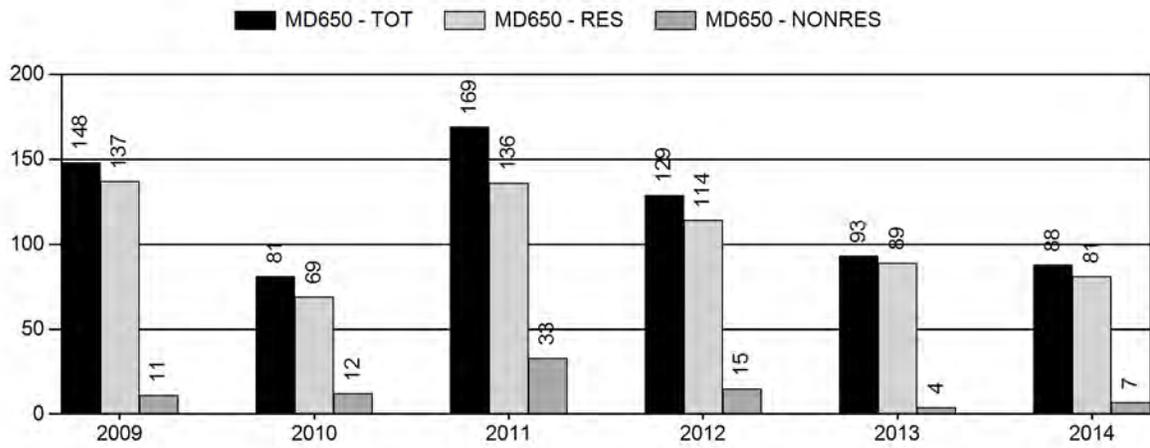
Population Size - Postseason



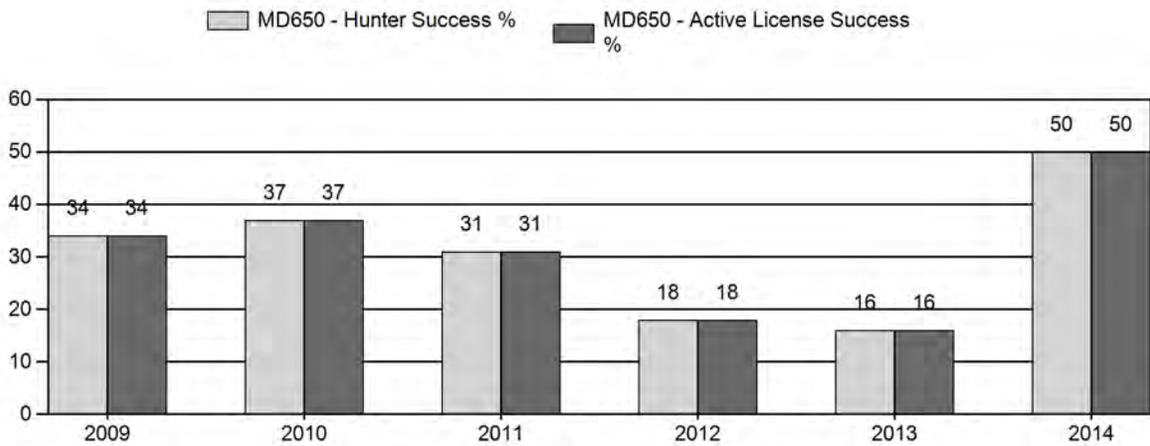
Harvest



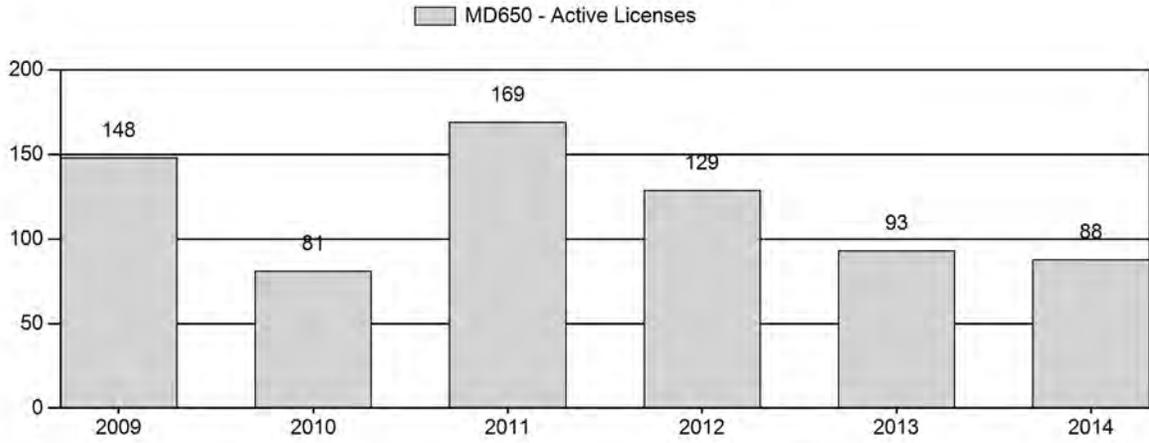
Number of Hunters



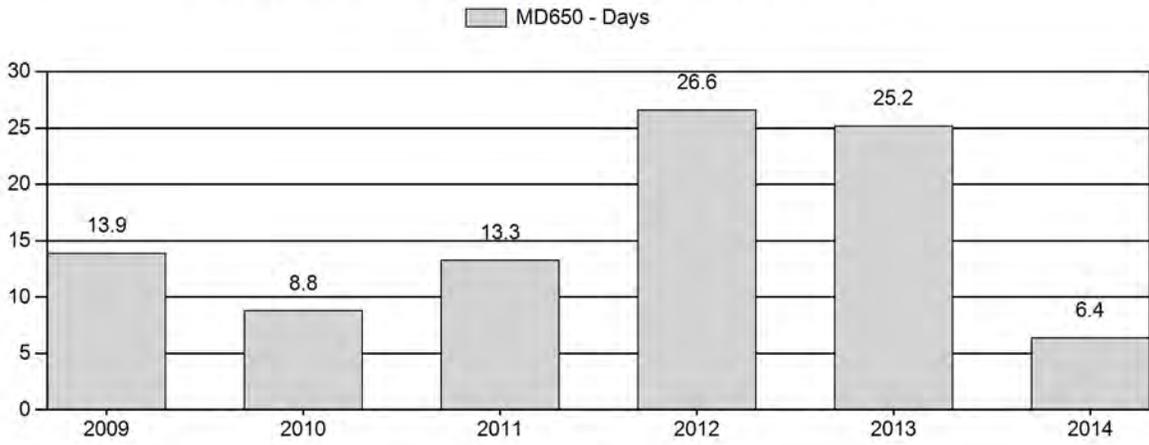
Harvest Success



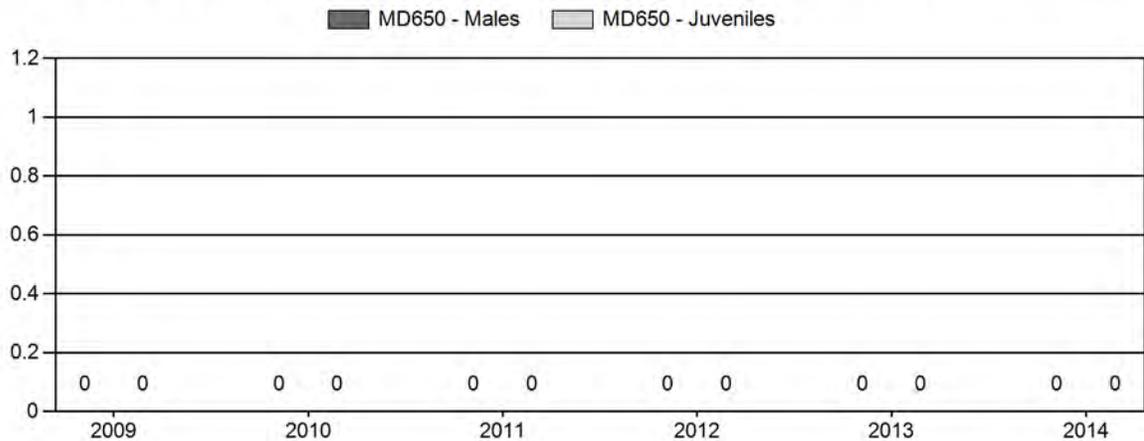
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD650 - CHAIN LAKES

Year	Post Pop	MALES							FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	475	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2010	490	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2011	410	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2012	0	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2013	0	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2014	0	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0

**2015 HUNTING SEASONS
CHAIN LAKES MULE DEER HERD (MD650)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
98		Oct. 15	Oct. 22		General license; antlered mule deer or any white-tailed deer, archery or muzzleloading firearms only
Archery 98		Sep. 1	Sep. 30		Refer to Section 2 of this Chapter

Region E Non-Resident Quota: 600

Hunt Area	Type	Quota change from 2014
98	Gen	No change
Total		

Management Evaluation

Current Management Objective: 500

Management Strategy: Recreation

2014 Postseason Population Estimate: N/A

2015 Proposed Postseason Population Estimate: N/A

The management objective for the Chain Lakes Mule Deer Herd Unit is a post-season population size objective of 500 deer. The management strategy is recreational management. The objective and management strategy are currently under public review with a proposed change to a landowner and hunter satisfaction objective.

Herd Unit Issues

Dispersal of these deer in small bands across hundreds of square miles of sagebrush makes both aerial and ground classifications prohibitively expensive. Without reliable estimates of herd ratios, herd size cannot be modeled and objectives based on population size cannot be evaluated.

Concern has arisen that improved range, accuracy and faster reloading times of modern in-line muzzle-loading firearms is increasing hunter success, rather than increases in numbers of deer. If true, a redefinition of legal weapons allowed in this season may be necessary in the future to prevent excessive harvests from these vulnerable small bands of deer.

Weather

Drought conditions seen in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three

months produced good vegetative growth, but was probably too late to significantly improve fawn survival. Condition of deer going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February. Winter losses are expected to be near average.

Habitat

Only one shrub transect has been established in this herd unit, on the Chain Lakes WHMA, but was not read in 2014. Shrub production presumably improved with the increased moisture and some sagebrush plants that had appeared dead from drought produced small but viable sprouts of green growth.

Field Data

All classification samples for this herd have been statistically inadequate and no posthunt classification data were collected again this year. Increased summer and fall moisture improved fawn production in neighboring herds and fawn production in this desert herd is presumed to have improved as well. Despite increased fawn production, the herd is still expected to be below objective size due to losses during the previous two years.

Harvest Data

General license seasons with weapons restrictions allowed this herd to recover from severe losses in the past and continuing that strategy is proposed in 2015. These combined muzzleloader and archery seasons, used for the past 32 years, have been popular with both resident and nonresident hunters. Hunter numbers declined for the third year to 88 in 2014, presumably because of the 3-point restriction, low deer numbers, and the poor success seen in 2012 and 2013.

Hunter success improved in 2014, to 50 percent, despite the 3-point antler restriction. This was the highest hunter success since 2007. No antlerless deer were reported in the 2014 harvest, even though archers in the special archery season and youth hunters in the regular season were allowed to harvest any deer. The average number of days hunted for each harvested deer dropped to 6 days, the lowest since 2007 and roughly a fourth the effort required in each of the previous two years. These data suggest deer numbers have increased in this herd, as reported in neighboring herds with more population data available.

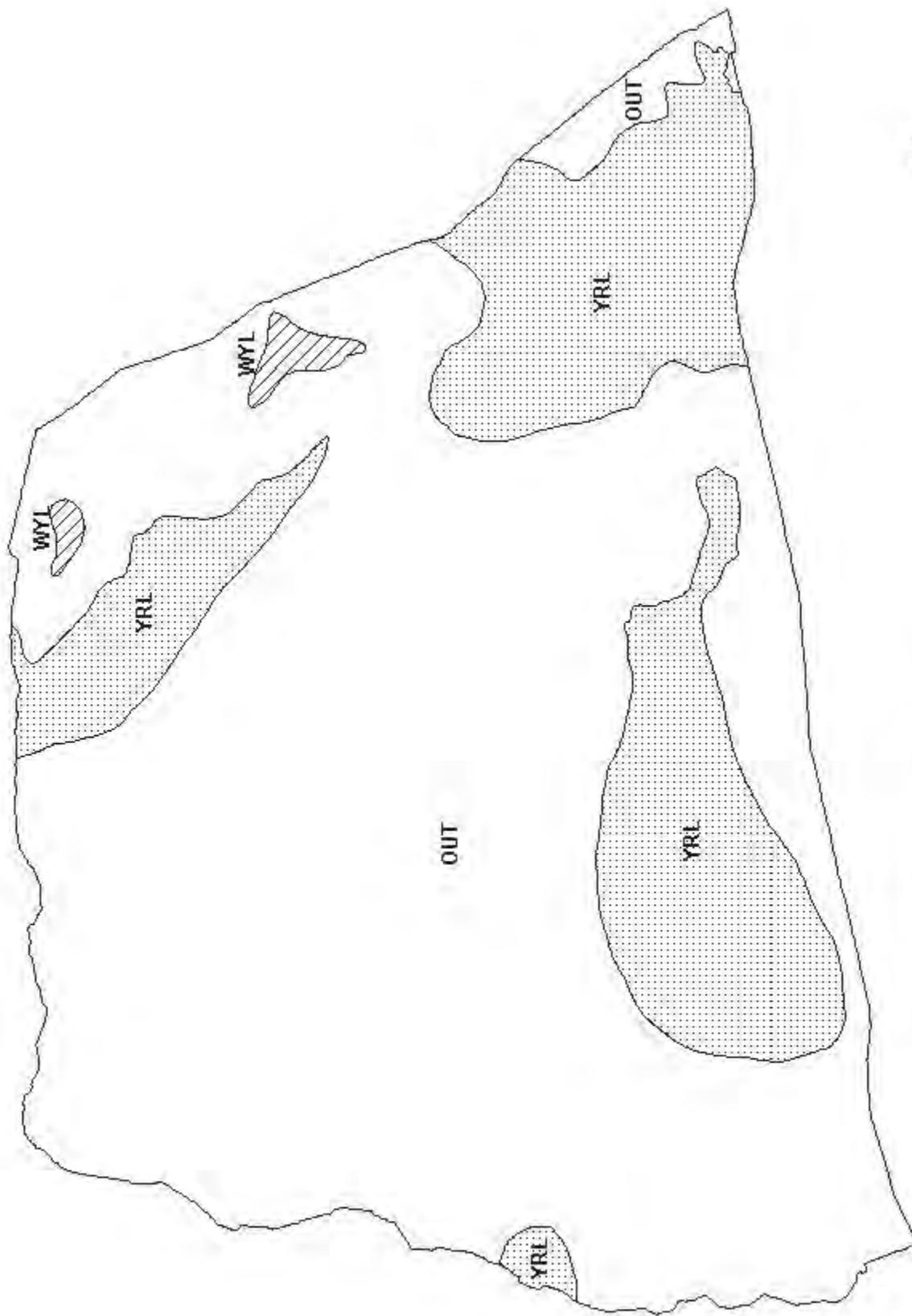
Population

This herd consists of small bands of deer residing yearlong in pockets of suitable habitat in the eastern Red Desert. No reliable population estimate is available for this herd, nor is one likely under current manpower and budget constraints. A simplistic population model was developed that supported the reported harvests, but its accuracy could not be evaluated because of the absence of classification data and limited harvest field check samples. Instead, population trends are monitored through harvest data and classification ratios of neighboring herds.

Management Evaluation

Deer in this desert herd unit have few options for finding green forage during dry conditions, with no high elevation habitats available. Body condition of deer entering the 2014-15 winter is expected to have improved because of increased moisture. Survival through the 2014-15 winter is expected to be near average.

Expected harvest from the 2015 season would be about 35 antlered deer by roughly 110 hunters. The opening date is the same used in the past 19 years and opens simultaneously with neighboring areas in Region E. As in 2014, the closing date is aligned with general license hunts in neighboring areas in Region E. As in 19 of the previous 20 years, most hunters during the regular season would be restricted to harvesting only antlered deer. With neighboring general license areas to the north and south dropping 3-point antler point restrictions in 2015, there is no need for a similar restriction in Area 98. Opportunities for archery hunting will again be available during the October season in addition to the special archery season in September. Archers will be allowed to harvest any deer during September to follow the statewide standard special archery season.



Mule Deer (MD650) - Chain Lakes
HA 98
Revised - 3/94

2014 - JCR Evaluation Form

SPECIES: Elk
 HERD: EL635 - WIGGINS FORK
 HUNT AREAS: 67-69, 127

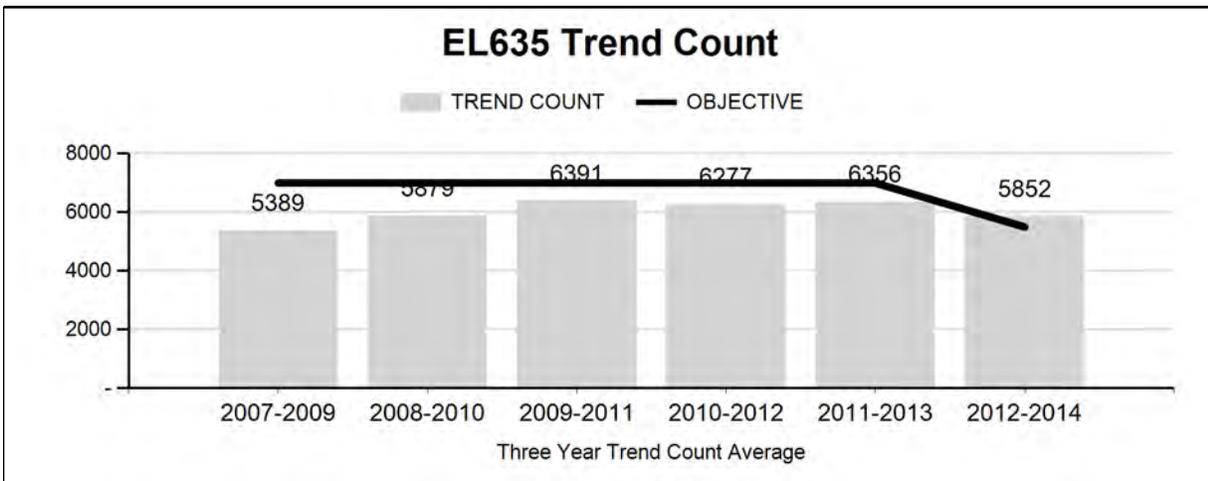
PERIOD: 6/1/2014 - 5/31/2015
 PREPARED BY: GREG ANDERSON

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Trend Count:	6,240	5,528	5,500
Harvest:	936	1,077	950
Hunters:	2,298	2,829	2,600
Hunter Success:	41%	38%	37%
Active Licenses:	2,363	2,928	2,700
Active License Success	40%	37%	35%
Recreation Days:	15,180	20,215	19,000
Days Per Animal:	16.2	18.8	20
Males per 100 Females:	9	20	
Juveniles per 100 Females	25	26	

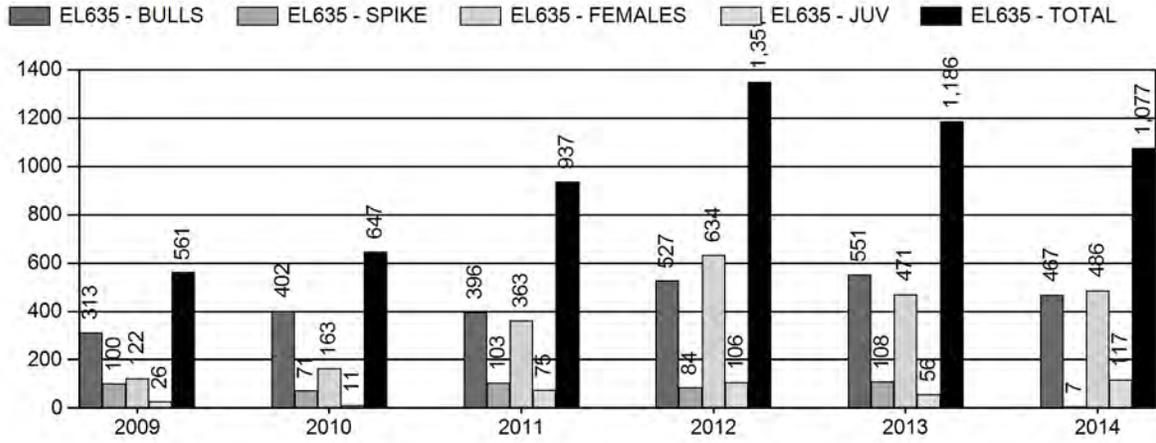
Trend Based Objective ($\pm 20\%$) 5,500 (4400 - 6600)
 Management Strategy: Recreational
 Percent population is above (+) or (-) objective: 1%
 Number of years population has been + or - objective in recent trend: 3

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

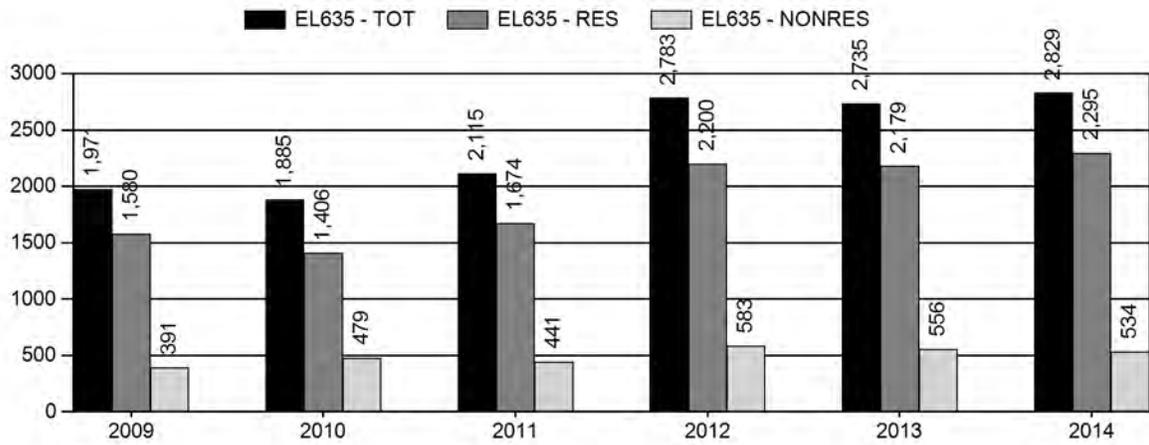
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



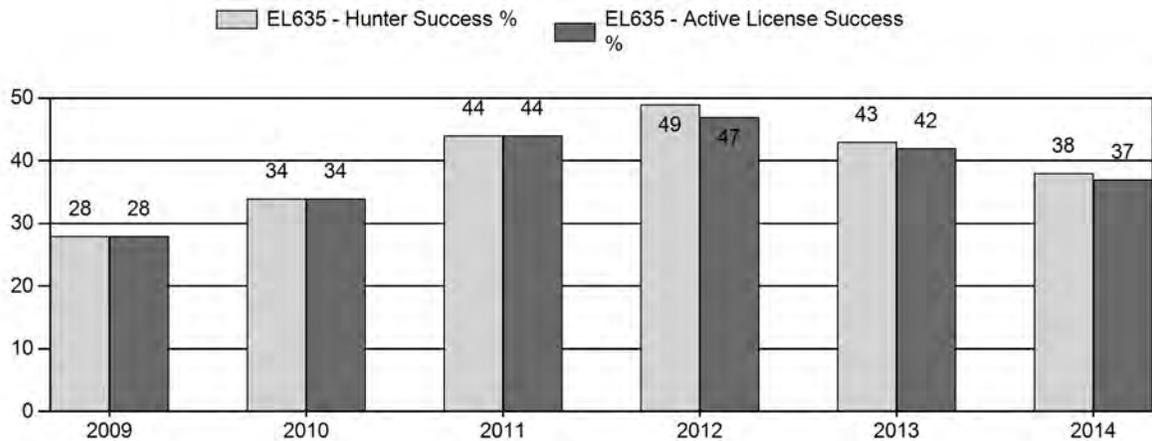
Harvest



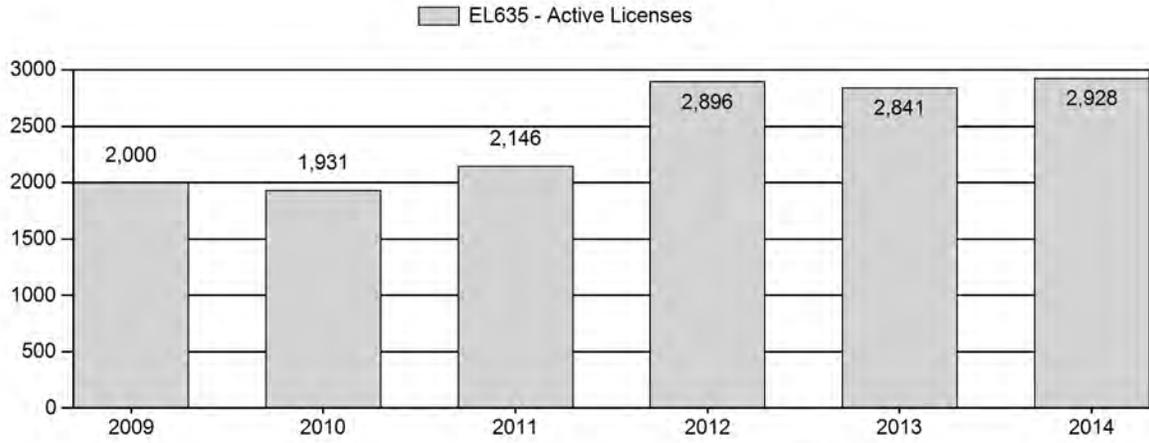
Number of Hunters



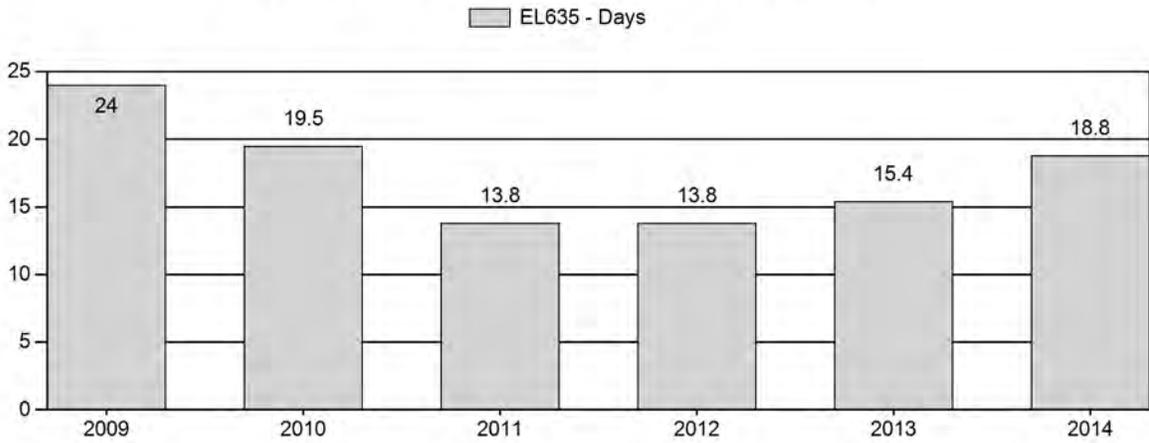
Harvest Success



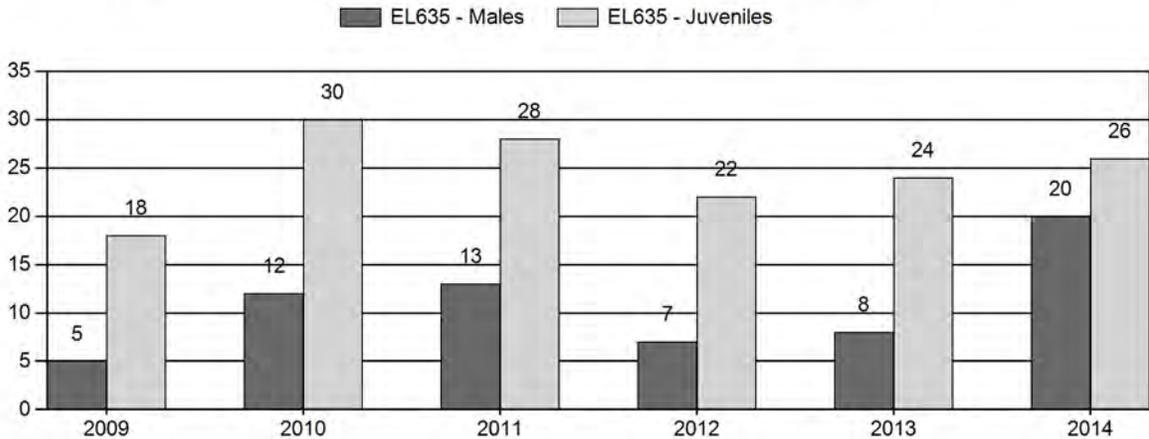
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Elk Herd EL635 - WIGGINS FORK

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	7,899	117	13	130	4%	2,524	81%	456	15%	3,110	168	5	1	5	± 0	18	± 1	17
2010	7,777	276	114	390	8%	3,388	71%	1,019	21%	4,797	346	8	3	12	± 0	30	± 1	27
2011	9,083	202	28	230	9%	1,802	71%	498	20%	2,530	321	11	2	13	± 1	28	± 2	25
2012	0	138	22	160	6%	2,143	77%	463	17%	2,766	0	6	1	7	± 0	22	± 0	20
2013	0	135	23	158	6%	1,881	76%	451	18%	2,490	0	7	1	8	± 0	24	± 0	22
2014	0	304	256	560	14%	2,817	69%	720	18%	4,097	0	11	9	20	± 0	26	± 0	21

**2015 HUNTING SEASONS
WIGGINS FORK ELK (EL 635)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
67		Oct. 1	Oct. 31		General; antlered elk, spikes excluded
	4	Nov. 1	Dec. 15	200	Limited quota; antlerless elk
	6	Nov. 15	Dec. 15	400	Limited quota; cow or calf valid west of the Wiggins Fork and west of the East Fork downstream from the confluence with the Wiggins Fork
67, 68, 69	9	Sep. 1	Sep. 30	125	Limited quota; any elk, archery only
68		Oct. 1	Oct. 31		General; antlered elk, spikes excluded
	6	Nov. 1	Nov. 30	200	Limited quota; cow or calf
69		Oct. 1	Oct. 31		General; any elk
	6	Oct. 1	Nov. 30	100	Limited quota; cow or calf
127		Oct. 1	Oct. 31		General; any elk
		Nov. 1	Dec. 31		General; antlerless elk
Archery 67, 68, 69		Sep. 15	Sep. 30		General; any elk. Limited quota; refer to section 3 of this chapter
127		Sep. 1	Sep. 30		General; any elk

Hunt Area	Type	Quota change from 2014
67	4	-100
	6	-100
69	6	+25
Total	4	-100
	6	-75

Management Evaluation

Mid-winter trend count objective: 5,500

Management strategy: Recreational 2014

mid-winter trend count: ~5,500

3-Year running average trend count: ~5,800

Management Issues

The Wiggins Fork elk herd is managed based on a winter trend count. The trend count management objective has been in place since 2002. The original, 2002, objective sought to maintain 6,000 to 7,000 wintering elk in the herd. The number of elk was determined by multiplying an annual trend count by a constant sightability factor to calculate a population estimate. Over time, the extra step of calculating an estimate confused the public. In response, the objective was reviewed in 2014 and the Department decided to base a new objective on actual trend count numbers eliminating the use of a sightability factor and population estimate. The new objective set in 2014 is to maintain 5,500 wintering elk in the herd unit with a recreational management strategy. Annual trend counts are conducted each January to assess the population.

The Wiggins Fork elk herd occupies the upper Wind River drainage west of the Wind River Reservation (WRR). There is good documentation elk wintering in the herd unit migrate into a number of other northwest Wyoming elk herd units in the summer and early fall. Given the amount of interchange with neighboring herd units, the number of elk present can vary significantly throughout the hunting season. Seasons structured to reduce the elk population generally need to include antlerless elk harvest after mid-November to allow elk to migrate into the herd unit from neighboring areas.

Habitat/Weather

Herbaceous vegetation production was quite high throughout the herd unit in 2014. Following 2 years of extreme drought, vegetation production increased significantly this year. Production averaged 576 lbs/acre across monitoring sites on elk winter range. This was 63% greater production than the previous 5-year average. Although no vegetation monitoring is conducted at high elevation summer range, it appeared vegetation growth was outstanding on summer and transitional ranges as well. Fall weather was warm and dry through much of the hunting season. The combination of abundant feed and mild, fall weather resulted in elk entering winter in

excellent body condition. Snowfall in December forced elk onto low elevation winter ranges. Continued snow cover and cold temperatures through January pushed elk to even lower elevations than typical. After January, temperatures moderated and snow receded.

Field/Harvest Data/Population

Trend counts to estimate the wintering population are conducted each January/February. Trend count numbers declined from 1997 through 2003. From 2004 through 2007, the population appeared to stabilize. Winter count numbers fluctuated year-to-year but did not indicate any consistent population trends. In 2008, personnel counted a significantly higher number of elk (5,504). This was the highest count since 1998. In 2009 and 2010, personnel again counted a significantly greater number of elk; 6,110 and 6,023 respectively (Fig. 1). In 2011 the trend count increased significantly again to 7,039. Following a liberal season in 2012, the trend count declined to 5,768. The count increased again in 2013 by 500 elk to 6,260 followed by a decline to 5,528 in 2014 (Fig. 1). Overall, the herd has been fairly stable over the past 5 years and is at objective.

The trend count objective includes sub-objective for 3 areas in the herd unit. The sub-objectives were set to recognize reasonably well-defined, spatially segregated elk groups wintering in the area. The sub-groups include the East Fork, Dunoir/Spring Mountain, and South Dubois groups. While there is a significant amount of interchange, elk from the three groups tend to segregate themselves on winter range and utilize different spring/fall migration routes. Since elk in the three sub-groups are subjected to different demographic influences, sub-objectives were set for each of the three groups (Table 1). One of the sub-groups (East Fork) has been below objective for the past decade. Two of the sub-groups (Dunoir/Spring Mtn and South Dubois) have been above objective for the past 7 years. The South Dubois segment has consistently been above objective for the past decade. Liberal seasons on an annual basis provide the opportunity for significantly greater harvest in this herd segment but lack of hunter desire to harvest cow elk in this rugged area precludes greater harvest. Despite the lack of necessary harvest, the population in this segment has remained fairly stable over the past 5 years. In contrast, elk numbers in the Dunoir/Spring Mtn herd segment increased dramatically for a period after 2007. The 2012 and 2013 hunting seasons were designed to reduce cow numbers in this herd segment. The number of elk in this segment did decline over the last several years in response to the liberal cow harvest.

Between 2006 and 2009, recruitment in this herd unit was well below historic levels (Fig. 2). Despite low recruitment between 2006 and 2009, the number of elk counted still increased. In 2010 and 2011 recruitment increased significantly and likely contributed to some of the trend count increase. Since 2012, recruitment increased annually and the calf/cow ratio was 26/100 in 2014. This was slightly higher than the 5 year average of 24/100.

Figure 1. Wiggins Fork Elk trend count

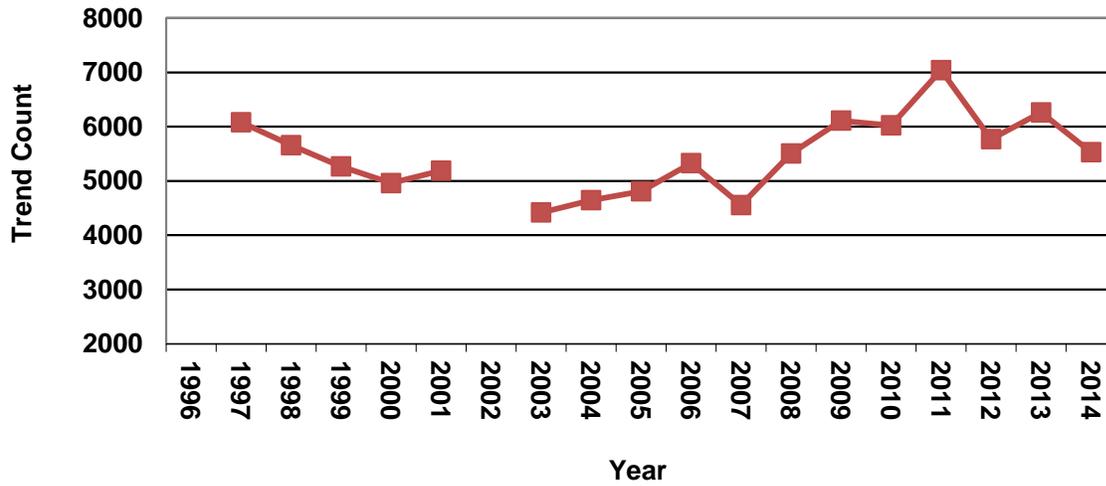
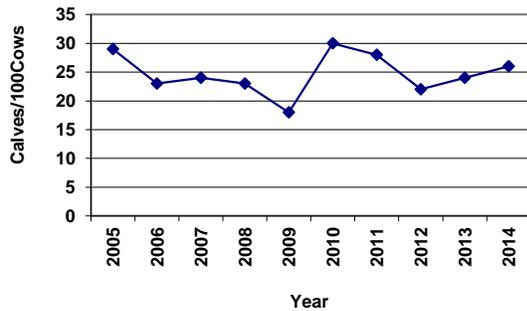


Table 1. Trend count numbers from sub-groups in the Wiggins Fork Elk Herd Unit.

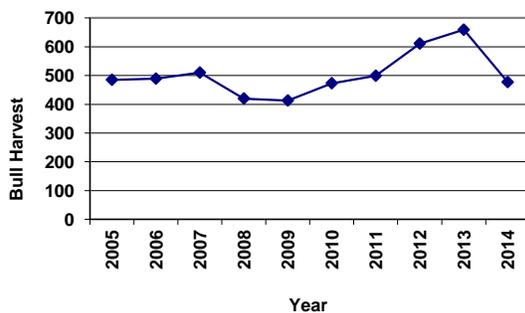
Year	East Fork	Dunoir/Spring Mountain	South Dubois	Wiggins Fork Herd Unit	
	Objective: 2,200 Count	Objective: 2,200 Count	Objective: 1,100 Count	Objective: 5,500 Count	3 Year Average
1998	2154	2457	1046	5657	
1999	2180	2109	977	5266	
2000	1883	2014	1061	4958	5294
2001	2100	1818	1269	5187	5137
2002	nc	nc	nc	nc	5073
2003	1857	1666	895	4418	4803
2004	1832	1601	1211	4644	4531
2005	1669	1807	1331	4807	4623
2006	1623	2297	1406	5326	4926
2007	1478	1634	1441	4553	4895
2008	1294	2620	1590	5504	5128
2009	1457	3186	1467	6110	5389
2010	1930	2704	1389	6023	5879
2011	1765	3680	1594	7039	6391
2012	1834	2580	1354	5768	6277
2013	1713	3022	1525	6260	6356
2014	1620	2551	1357	5528	5852

Figure 2. Ten year recruitment history in the Wiggins Fork Elk Herd.



Unfortunately, bull/cow ratio data for this herd are very unreliable. Classification surveys are conducted on the ground throughout the DAU. Since mature bulls generally winter in timber at the fringes of the winter ranges, the number of bulls seen is quite low and mature bull/cow ratios for the herd are not considered accurate. Despite the lack of classification data, members of the public and Department personnel suspected the bull/cow ratio in the herd declined concurrently with low recruitment in the mid-2000s. Despite this speculation, bull harvest has not declined over the past 10 years (Fig. 3). Over the past 4 years, bull harvest has increased annually. Antlered elk harvest in both 2012 and 2013 was the highest in the past 20 years. The high bull harvest in 2013 is not indicative of any demographic changes in the population. Instead, the high harvest can be directly linked to environmental conditions. Heavy snows in late September forced elk (including bulls) onto winter range where they were extremely vulnerable to harvest throughout the general, October season. Likewise, the significant decline in bull harvest in 2014 is certainly more closely tied to difficult hunting conditions due to hot, dry weather throughout the fall. Thus, the precipitous decline in bull harvest from 2013 to 2014 should not be linked to demographic changes. That said, bull harvest over the past 5 years has generally been high indicating bull numbers in the population are stable.

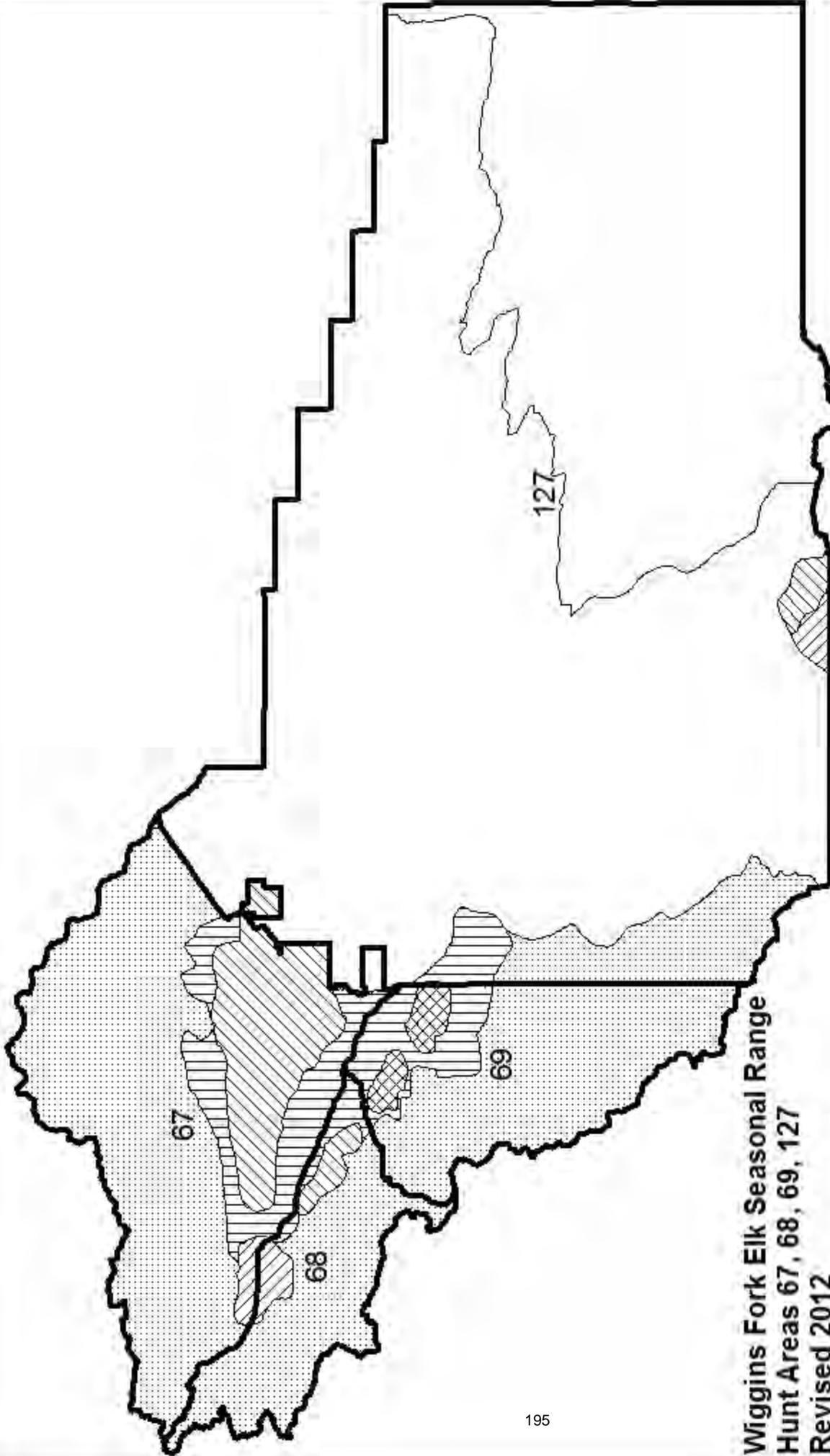
Figure 3. Antlered elk harvest in the Wiggins Fork Elk Herd.



Management Summary

The 2014 trend count indicates the Wiggins Fork elk population is at objective. The population appears to have declined slightly over the past 5 years in response to higher antlerless elk harvest

in the herd unit. Since the population is at objective the number of antlerless elk licenses in the herd unit will be reduced in 2015. Both Type 4 and 6 licenses in hunt area 67 will be reduced by 100 in 2015. License numbers will remain unchanged in hunt area 68 to continue reducing the number of elk wintering in the area. Historically, hunt area 69 has had some form of general hunting available into November. That management strategy appears to have been ineffective at reducing the elk population in difficult to access winter ranges in hunt area 69. In 2015, the hunt area 69 general season will end on October 31. Type 6 licenses will still be valid in the area through the end of November. This new management strategy will be tracked for several years to determine if type 6 license holders have increased success without crowding from general license hunters on easily accessible winter ranges. To compensate for the reduction in general license hunting, hunt area 69 type 6 licenses will be increased by 25.



**Wiggins Fork Elk Seasonal Range
Hunt Areas 67, 68, 69, 127
Revised 2012**

-  CRUWIN
-  CRUWYL
-  OUT
-  SSF
-  WIN
-  WYL

2014 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL637 - SOUTH WIND RIVER

HUNT AREAS: 25, 27-28, 99

PREPARED BY: STAN HARTER

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Trend Count:	2,688	2,513	2,600
Harvest:	681	630	600
Hunters:	2,165	2,131	2,100
Hunter Success:	31%	30%	29%
Active Licenses:	2,258	2,157	2,120
Active License Success	30%	29%	28%
Recreation Days:	16,144	16,404	16,000
Days Per Animal:	23.7	26.0	26.7
Males per 100 Females:	28	24	
Juveniles per 100 Females	33	27	

Trend Based Objective (\pm 20%)

2,600 (2080 - 3120)

Management Strategy:

Recreational

Percent population is above (+) or (-) objective:

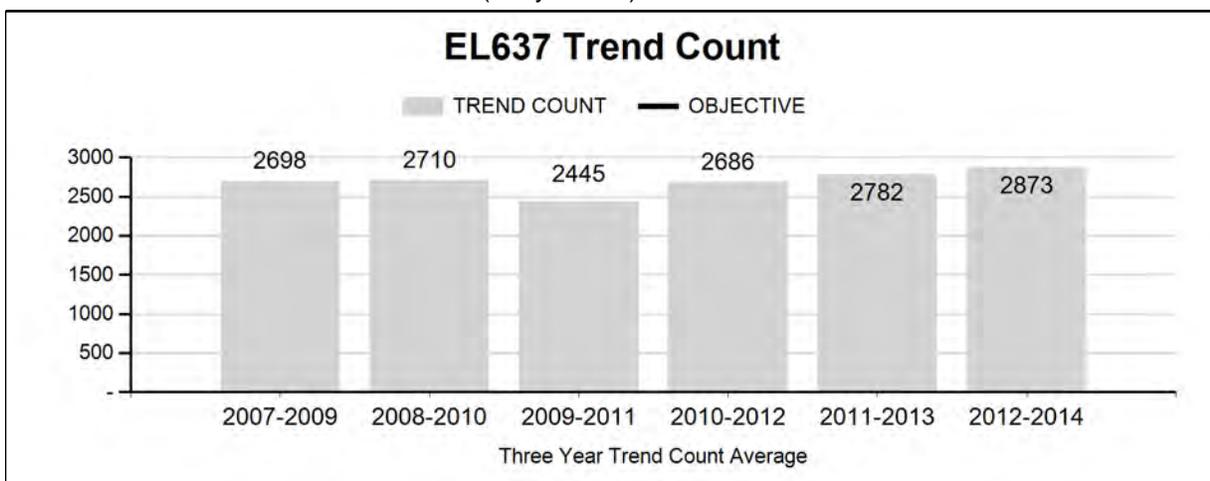
-3.3%

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

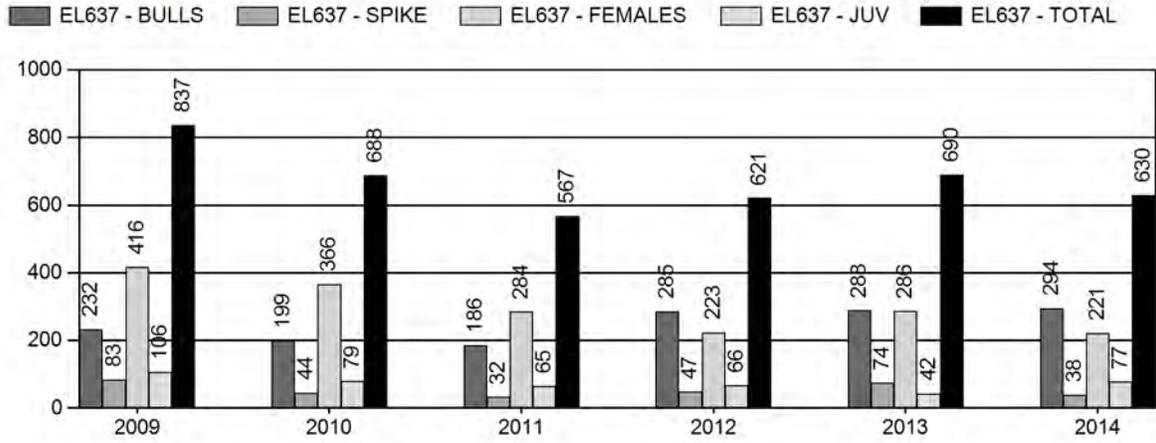
3

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

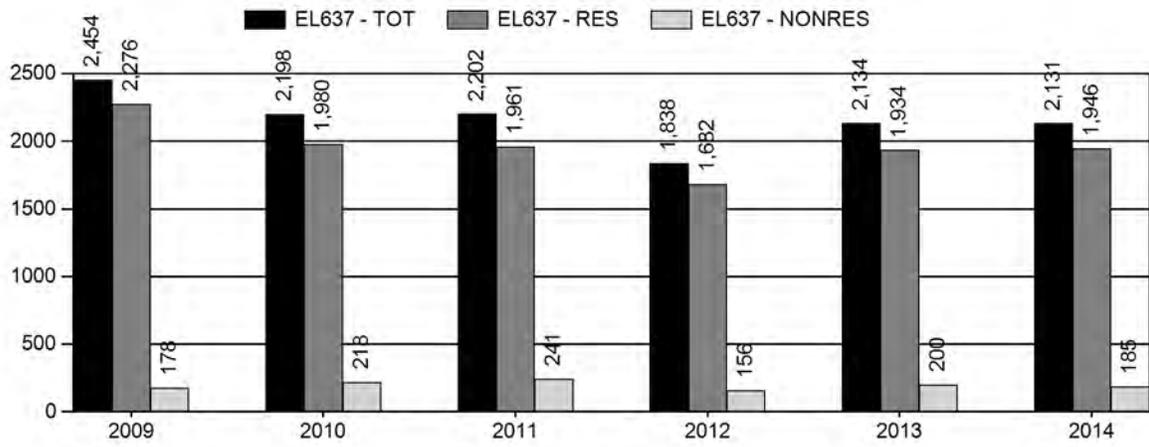
	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	0%	0%
Males \geq 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



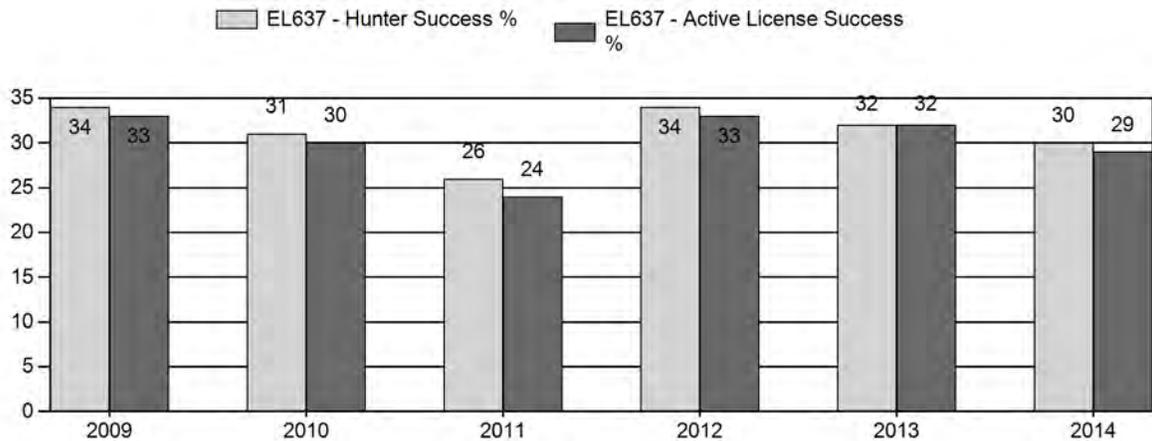
Harvest



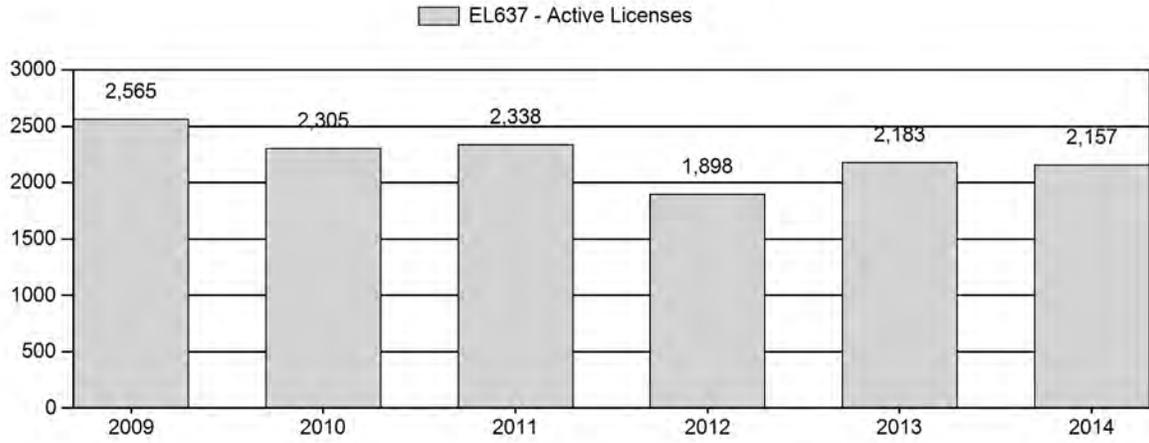
Number of Hunters



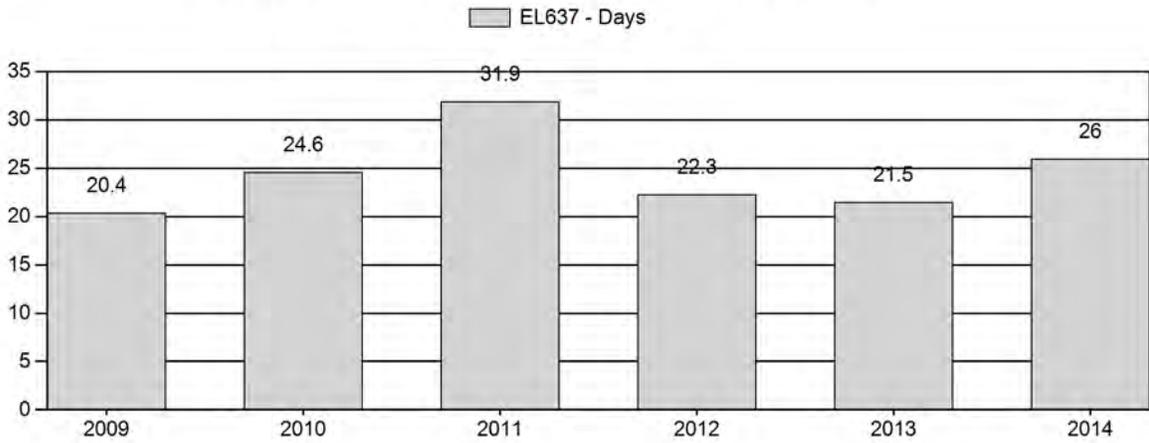
Harvest Success



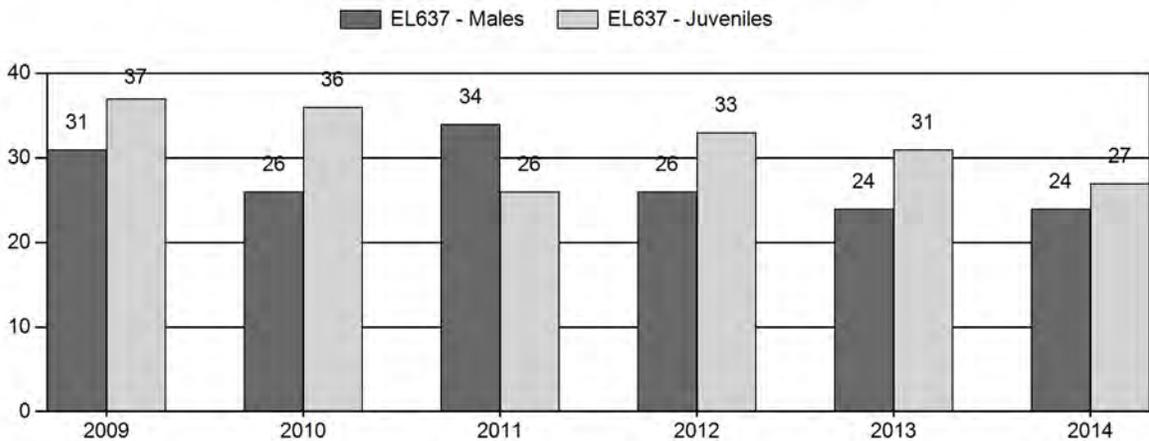
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Elk Herd EL637 - SOUTH WIND RIVER

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	0	193	263	456	19%	1,460	60%	537	22%	2,453	491	13	18	31	± 1	37	± 1	28
2010	0	174	231	405	16%	1,554	62%	563	22%	2,522	460	11	15	26	± 1	36	± 1	29
2011	0	179	299	478	21%	1,397	62%	365	16%	2,240	0	13	21	34	± 2	26	± 1	19
2012	0	183	356	539	16%	2,066	63%	691	21%	3,296	0	9	17	26	± 1	33	± 1	27
2013	0	165	228	393	16%	1,623	65%	499	20%	2,515	0	10	14	24	± 0	31	± 0	25
2014	0	149	226	375	16%	1,550	66%	420	18%	2,345	0	10	15	24	± 0	27	± 0	22

2015 HUNTING SEASONS
South Wind River Elk Herd Unit (EL 637)

HUNT AREA	TYPE	Season Dates		Quota	LIMITATIONS
		OPENS	CLOSES		
25, 27	1	Oct. 1 Nov. 1	Oct. 31 Nov. 20	200	Limited quota; any elk Unused Area 25, 27 Type 1 licenses valid for antlerless elk
25	4	Oct. 15	Nov. 20	200	Limited quota; antlerless elk
25	6	Nov. 1	Nov. 20	100	Limited quota; cow or calf
27	4	Oct. 1	Nov. 20	100	Limited quota; antlerless elk
28		Oct. 1	Oct. 9		General license; Any elk
		Oct. 10	Oct. 22		General license; Antlered elk
	4	Nov. 1	Nov. 20	200	Limited quota; antlerless elk
99	1	Oct. 1 Nov. 1	Oct. 31 Nov. 20	175	Limited quota; any elk Unused Area 99 Type 1 licenses valid for antlerless elk
	4	Oct. 1	Nov. 20	200	Limited quota; antlerless elk

Archery

28		Sept. 1	Sept. 30		General License; Any elk Limited quota; Refer to Section 3 of this Chapter
25,27,99		Sept. 1	Sept. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota Change from 2014
99	1	-25
	4	-25
Total EL637		-50

MANAGEMENT EVALUATION

Current Management Objective: Mid-winter Trend Count = 2,600

Management Strategy: Recreation (15 – 29 bulls/100 cows)

2014 Mid-winter Trend Count: 2,513

Most Recent 3-year Running Average Trend Count: 2,873

Herd Unit Issues/Population Model

The management objective for the South Wind River Elk Herd Unit was changed in 2014, and is a mid-winter trend count of 2,600 elk, based on a running 3-year average. All attempts to create a spreadsheet model for South Wind River Elk were unsuccessful. Trend count data vary due to annual changes in snow depth, light and wind conditions during flights, and condition of habitats each winter. A key factor in our ability to detect elk in winter is the extreme variability and extent of winter habitats, which range from mixed aspen/conifer/sagebrush habitats to open sagebrush/grassland habitats. It is likely elk are inhabiting larger areas than currently designated/documentated, with distances travelled subject to changes in weather, competition from other wild and domestic ungulates, hunting pressure, and annual timing of surveys. Plus, elk have been documented crossing hunt area and herd unit boundaries into vast expanses of open sagebrush/grassland habitats making detection difficult. Thus, we use a 3-year running average of the trend counts to avoid abrupt management decisions based solely on a single year's observations. The 2014 trend count/classification survey of 2,513 was lower than expected, as we believe we missed elk groups in Hunt Areas 25 and 27.

Weather/Habitat

Drought conditions were extreme to exceptional for most of 2011-13, 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 South Wind River Elk 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 inhibited production in herbaceous and shrub species across the South Wind River herd unit, although some improvement over 2012 conditions was noted. 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. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition, especially for grass. Winter 2014-15 was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Lander, and ahead of last year's pace. We anticipate habitat conditions will continue to improve as a result. We expect elk survival over winter was good, as the grasses they rely on had exceptional growth in 2014.

Field Data

Classification flights were conducted in mid-January with a Bell Jet Ranger 206 helicopter in Areas 25 and 28. Personnel from the Pinedale Region surveyed Areas 27 and 99 in early-March with a Bell 47 Soloy helicopter. A total of 2,345 elk were classified, with an additional 168 elk observed during a mule deer sightability survey in early-February 2015, bringing the total trend count to 2,513. Elk moved frequently between Areas 25 and 28 in January and February, and approximately 1,200-1,300 elk were observed on the Red Canyon WHMA in late-February, which exceeds the sum of elk observed in that area during the previous flights. We have not seen any large groups in the portion Area 25 south of the Sweetwater River in a few years, despite knowledge of expanding elk numbers there. The observed post-season calf/cow ratio of 27J/100F and bull ratio of 24M/100F were below the previous 5-year average.

Harvest Data

Weather during fall 2014 was quite variable in the South Wind River Herd Unit. Fall weather was moderate with above average temperatures and below average snowfall, until the second week of November when temperatures plunged more than 70 degrees and nearly a foot of snow fell across the herd unit in a 24-hour period. Harvest was below average in 2014, as mild weather conditions kept elk scattered in small groups in many parts of the herd unit. Adult bull harvest increased slightly to 294 bulls in 2014, the highest since 2006. However, cow harvest was about 30% below the previous 5-year average. Based on harvest survey results, total harvest dropped 9% in 2014 to 630 elk. Hunter success rates have remained fairly stable, with the 2014 success rate of 29% being slightly below the 5-year average of 31%. Increases in hunter effort data indicate hunters were less able to find elk compared with the previous 5 years (26.0 days/harvest in 2014 vs. 23.7 days per harvest since 2009).

Management Summary

Public meetings have been held in December each of the past 3 years, in addition to traditional season setting meetings held in March. Several changes to recent hunting seasons were made to increase elk harvest in managing toward the current objective, provide appropriate hunting opportunities, and where deemed appropriate to accommodate public concerns expressed at these meetings regarding hunter crowding. For the past 2 hunting seasons, we dealt with concerns about over-crowding and increased cow harvest. We continued with an antlerless season in Area 27 not tied to Area 25, with 100 Type 4 licenses valid only in Area 27. To increase female harvest in Area 25, we shifted the opening date for Type 6 licenses to November 1 to create a 3rd opening date and reduce crowding for the Type 1 and Type 4 seasons. These changes have been mostly successful and hunter complaints have diminished.

While considering options for future management, there seems to be overall support from hunters and land managers for the current number of elk. This led to adoption of an alternative objective of a mid-winter trend count close to the current number of elk. As such, there is less need for increased cow harvest to maintain this population where it stands. Therefore, for the 2015 seasons, we made only a few changes to the hunting season structure, with reductions of 25 Type 1 and 25 Type 4 licenses in Area 99. The past liberalization of seasons (increased quotas and season length extensions for cows) since 2009 has reduced elk in Area 99, and hunter crowding has increased while success has decreased. This hunt area is relatively small when it comes to occupied elk habitat during the hunting season (forested portions of the hunt area). We've heard increased interest in going back to an Any Elk season for Area 28 General Licenses, but also heard concerns about the potential for attracting too many hunters during that season. Therefore, we decided to reintroduce Any Elk hunting in Area 28 for the first 9 days of October for General License holders, then switching to Antlered only from October 10-22. This will allow us to gauge hunter numbers, increase cow harvest in Area 28 where winter counts have increased over the past several years, and hopefully reduce pressure on bulls which may lead to improved bull quality over time.

In an attempt to better delineate elk movements off the southeastern end of Area 25, we extended the hunt area boundary southerly to encompass the Cyclone Rim area south to the Rocky Crossing Road for the 2015 season (Figure 3). Seasonal ranges will need to be updated to match our understanding of elk use of the extended area.

We expect the 2015 seasons outlined above should result in a harvest of at least 600 elk with a stable cow harvest. If calf recruitment remains near the average, this harvest should stabilize or slightly reduce the population following the 2015 season.

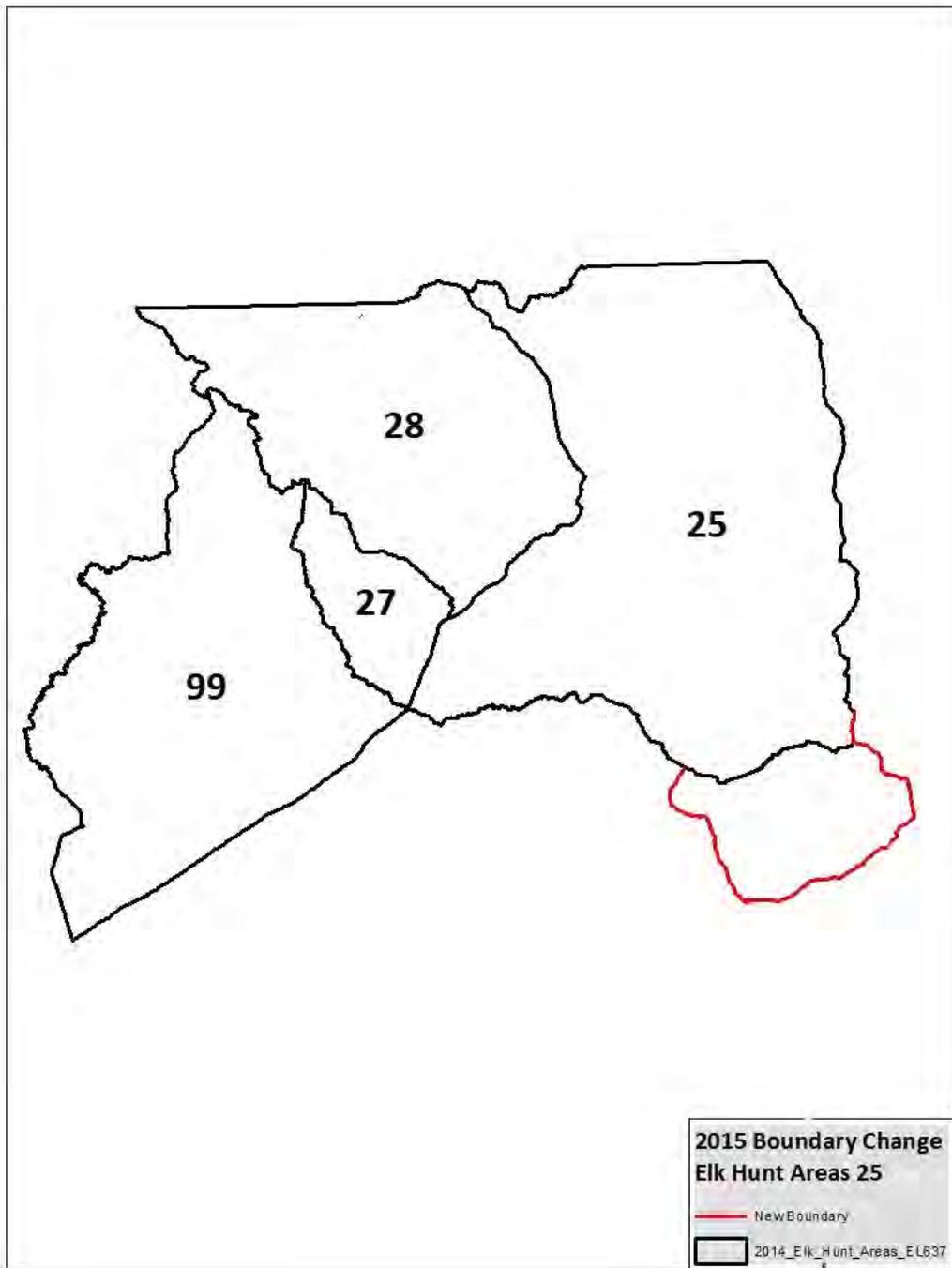
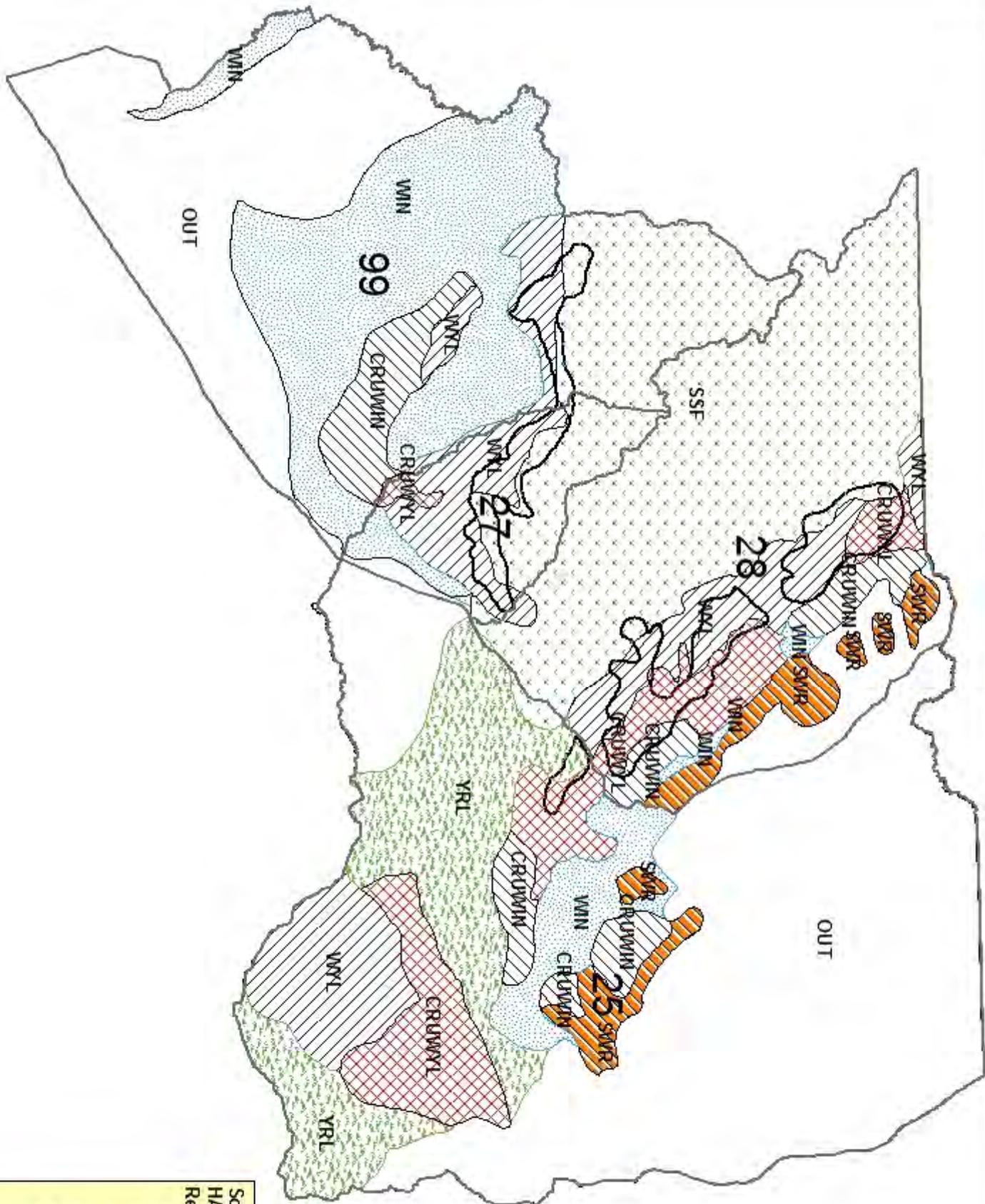


Figure 3. Boundary change effective in 2015 for South Wind River Elk Herd Unit and Elk Hunt Area 25 (red line).



South Wind River Elk (EL637)
 HA 25, 27, 28, 99
 Revised September 2011

Elk Hunt Area Boundaries

Elk Seasonal Range

RANGE

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

2014 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL638 - GREEN MOUNTAIN

HUNT AREAS: 24, 128

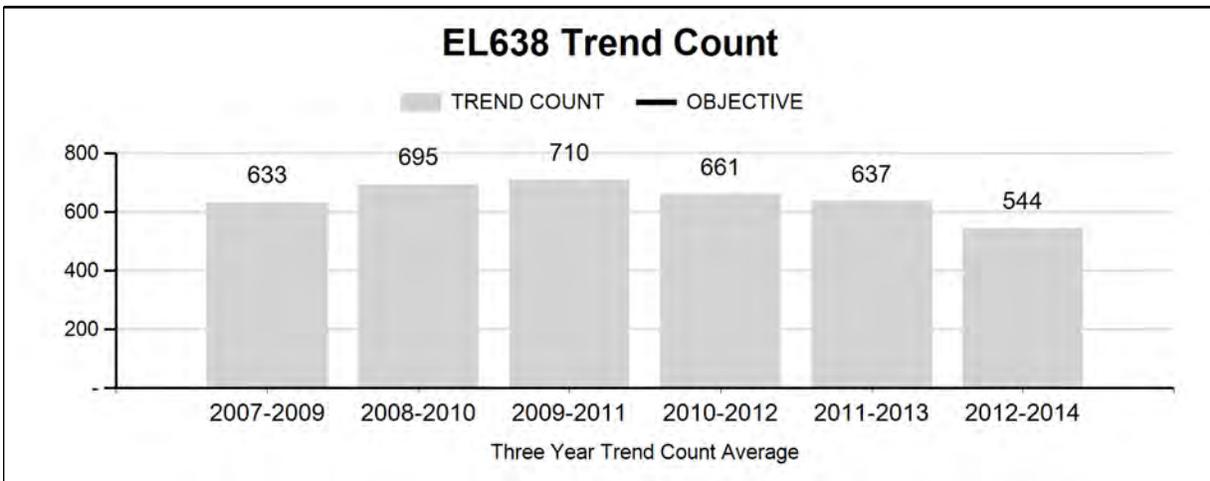
PREPARED BY: STAN HARTER

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Trend Count:	676	385	500
Harvest:	280	208	225
Hunters:	691	580	525
Hunter Success:	41%	36%	43%
Active Licenses:	697	584	550
Active License Success	40%	36%	41%
Recreation Days:	3,420	3,543	3,500
Days Per Animal:	12.2	17.0	15.6
Males per 100 Females:	40	13	
Juveniles per 100 Females	41	46	

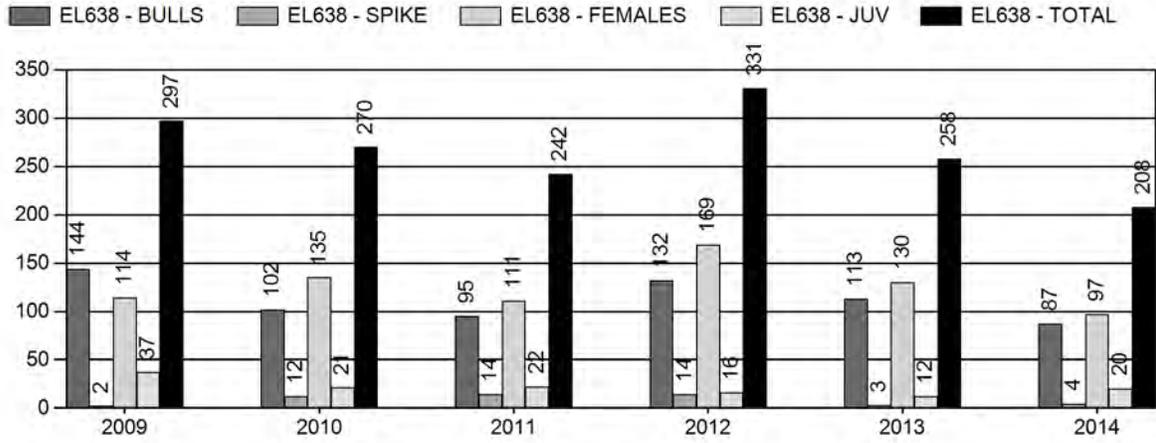
Trend Based Objective (\pm 20%) 500 (400 - 600)
 Management Strategy: Recreational
 Percent population is above (+) or (-) objective: -23%
 Number of years population has been + or - objective in recent trend: 0

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

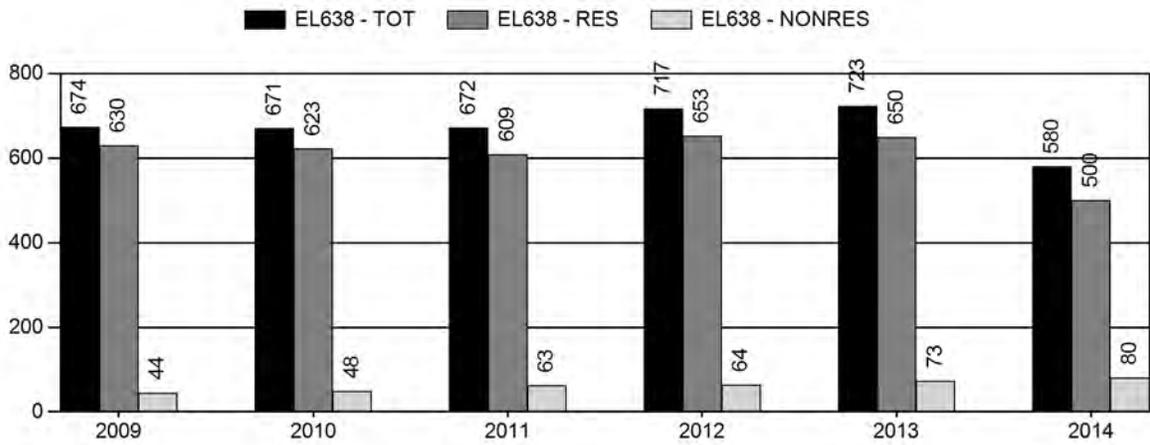
	<u>JCR Year</u>	<u>Proposed</u>
Females \geq 1 year old:	0%	0%
Males \geq 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



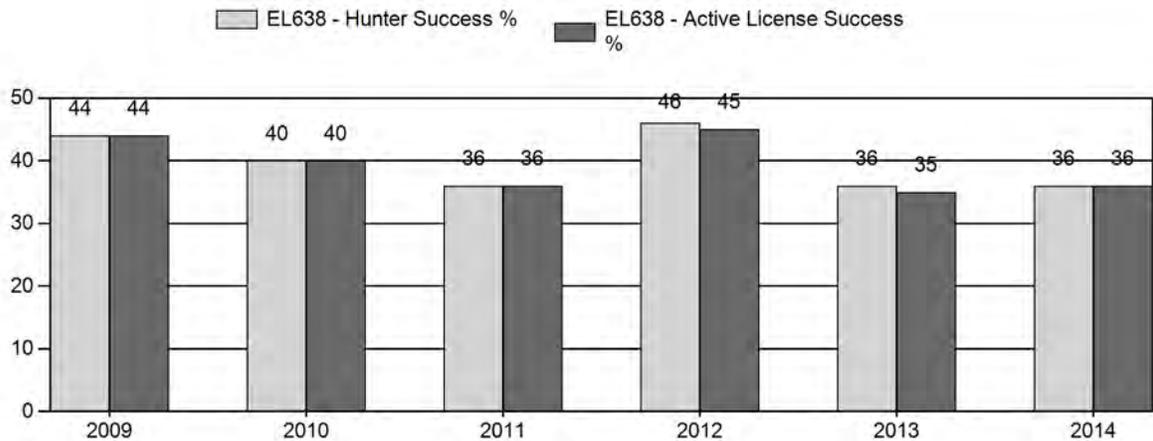
Harvest



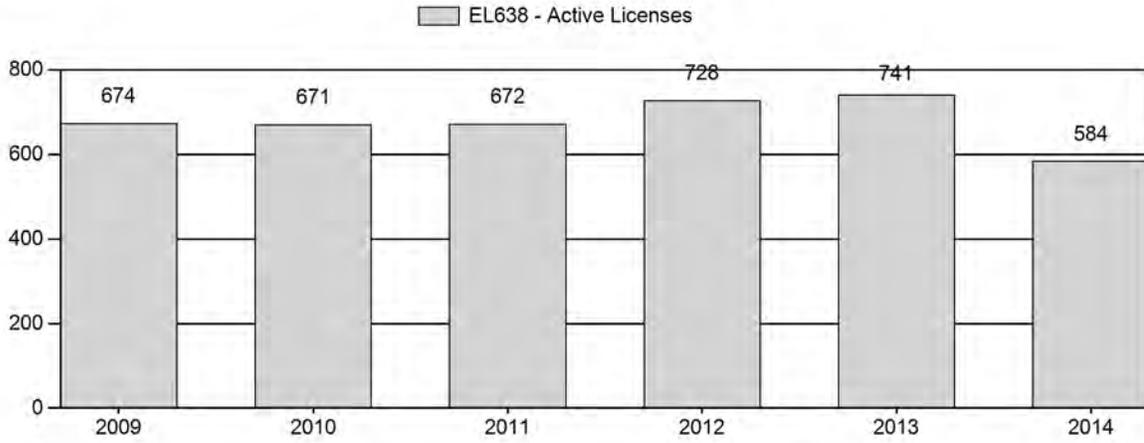
Number of Hunters



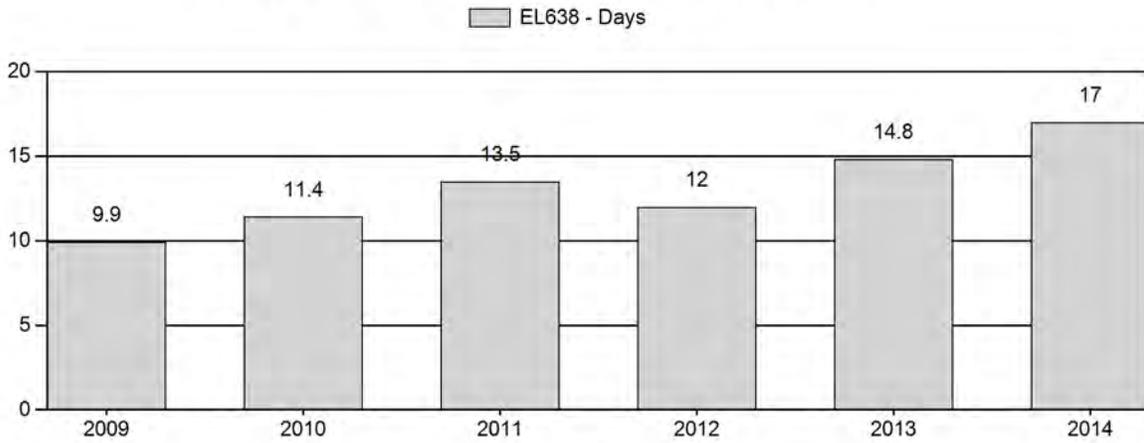
Harvest Success



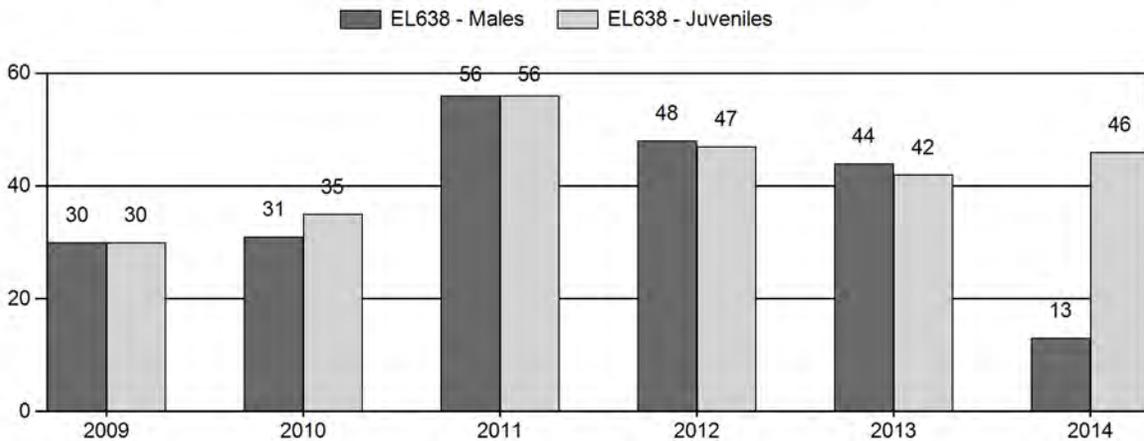
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Elk Herd EL638 - GREEN MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	0	55	96	151	19%	503	63%	149	19%	803	0	11	19	30	± 0	30	± 0	23
2010	0	61	62	123	18%	401	60%	141	21%	665	0	15	15	31	± 0	35	± 0	27
2011	0	47	127	174	26%	313	47%	176	27%	663	0	15	41	56	± 0	56	± 0	36
2012	0	49	111	160	24%	336	51%	158	24%	654	0	15	33	48	± 0	47	± 0	32
2013	0	41	99	140	24%	319	54%	135	23%	594	0	13	31	44	± 0	42	± 0	29
2014	0	19	12	31	8%	243	63%	111	29%	385	0	8	5	13	± 0	46	± 0	41

**2015 HUNTING SEASONS
Green Mountain Elk Herd Unit (EL 638)**

HUNT AREA	TYPE	Season Dates		Quota	LIMITATIONS
		OPENS	CLOSES		
24	1	Oct. 1	Oct. 14	175	Limited quota; any elk Unused Area 24 Type 1 licenses valid for antlerless elk, also valid in Area 128
		Nov. 1	Nov. 30		
	4	Oct. 1	Oct. 14	50	Limited quota; antlerless elk Unused Area 24 Type 4 licenses, also valid in Area 128
		Nov. 1	Nov. 30		
24, 128	5	Nov. 1	Nov. 30	100	Limited quota; antlerless elk
128		Oct. 1	Oct. 14		General license; antlered elk
Archery 24, 128		Sept. 1	Sept. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota Changes from 2014
24	1	-25
Net Change	1	-25
Total EL638		-25

MANAGEMENT EVALUATION

Current Management Objective: 500 Mid-Winter Trend Count

Management Strategy: Recreation (15 – 29 bulls/100 cows)

2014 Mid-Winter Trend Count: 385

Most Recent 3-year Running Average Trend Count: 544

Herd Unit Issues/Population

The management objective for the Green Mountain Elk Herd Unit was changed in 2014 to a mid-winter trend count of 500 elk, based on a running 3-year average. All attempts to create a spreadsheet model for Green Mountain Elk were unsuccessful. Trend count data vary due to annual changes in snow depth, light and wind conditions during flights, and condition of habitats each winter. A key factor in our ability to detect elk in winter is the extreme variability and extent of winter habitats, which range from mixed aspen/conifer/sagebrush habitats to open sagebrush/grassland habitats. It is likely elk are inhabiting larger areas than currently designated/documented, with distances travelled subject to changes in weather, competition from other wild and domestic ungulates, hunting pressure, and annual timing of surveys. Plus, elk have been documented crossing hunt area and herd unit boundaries into vast expanses of open sagebrush/grassland habitats making detection difficult. Thus, we use a 3-year running average of the trend counts to avoid abrupt management decisions based solely on a single year's observations.

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 in Jeffrey City, with more at higher elevations such as Green Mountain and Beaver Rim. 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 0.2 inches of precipitation recorded in Jeffrey City 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. Rain and snow returned to the area in September and October 2013, with nearly 300% of normal precipitation recorded in Jeffrey City with warm temperatures between early storms. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition. Consequently, this led to improved post-season fawn/doe ratios and should result in improved survival over winter 2014-15. Winter 2014-15 was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Jeffrey City, and ahead of last year's pace. We anticipate habitat conditions will continue to improve as a result. We expect elk survival over winter was good, as the grasses they rely on had exceptional growth in 2014.

Field Data

The 2014 trend count/classification was conducted in early-December 2014 using a Bell 206 Jet Ranger helicopter while classifying mule deer. This year's flight was conducted with very light snow cover. Tracks of large groups of elk were observed in higher elevation conifer stands on Green Mountain without finding the elk groups. No elk were detected in Hunt Area 128, despite reports of elk there. Therefore, the 2014 trend count of 385 represents a minimum number of elk in the Green Mountain Herd Unit. The 3-year running average trend count of 544 elk (Figure 1) remains about 9% above objective. The resulting post-season calf/cow ratio of 46J/100F is about 12% above the previous 5-year average, while the observed bull/cow ratio of 13M/100F was well below average. With such poor survey conditions, we know we missed some large groups of elk, and likely missed several groups of bulls, making these ratios suspect.

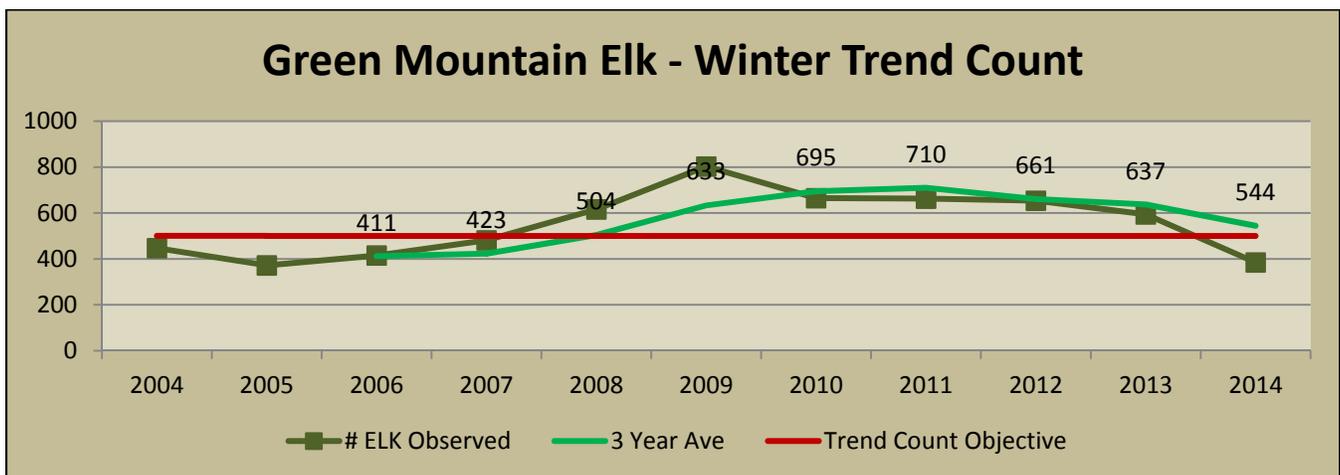


Figure 1. Trend count data for Green Mountain Elk, 2004 – 2014.

Harvest Data

In all, 208 elk were harvested in 2014, 50 less than in 2013. Hunter success increased in Area 24 this year, with 52% for the Type 1 any elk season, 31% and 52% respectively for Type 4 and Type 5 antlerless elk hunters. We made several modifications to the 2014 season structure, including reductions in license numbers in response to hunter crowding concerns and allowing Type 1 and 4 hunters to hunt in November if unsuccessful in October. This reduced crowding concerns overall and likely led to improved hunter success, along with better weather than in 2013. Even with increased hunter success, the number of days/animal harvested again increased in 2014 to 17 days/elk killed, causing concern elk may have left the herd unit during the hunting season.

Management Summary

In response to numerous public complaints regarding hunter crowding and the early cow/calf season, the 2014 hunting seasons were adjusted quite dramatically to maintain or increase harvest, and reduce hunter crowding. In the past 10 years, we had nearly doubled license numbers in Area 24 to increase harvest and manage toward objective. Yet, as illustrated in Figure 2, increasing license numbers did not result in similar increases in harvest.

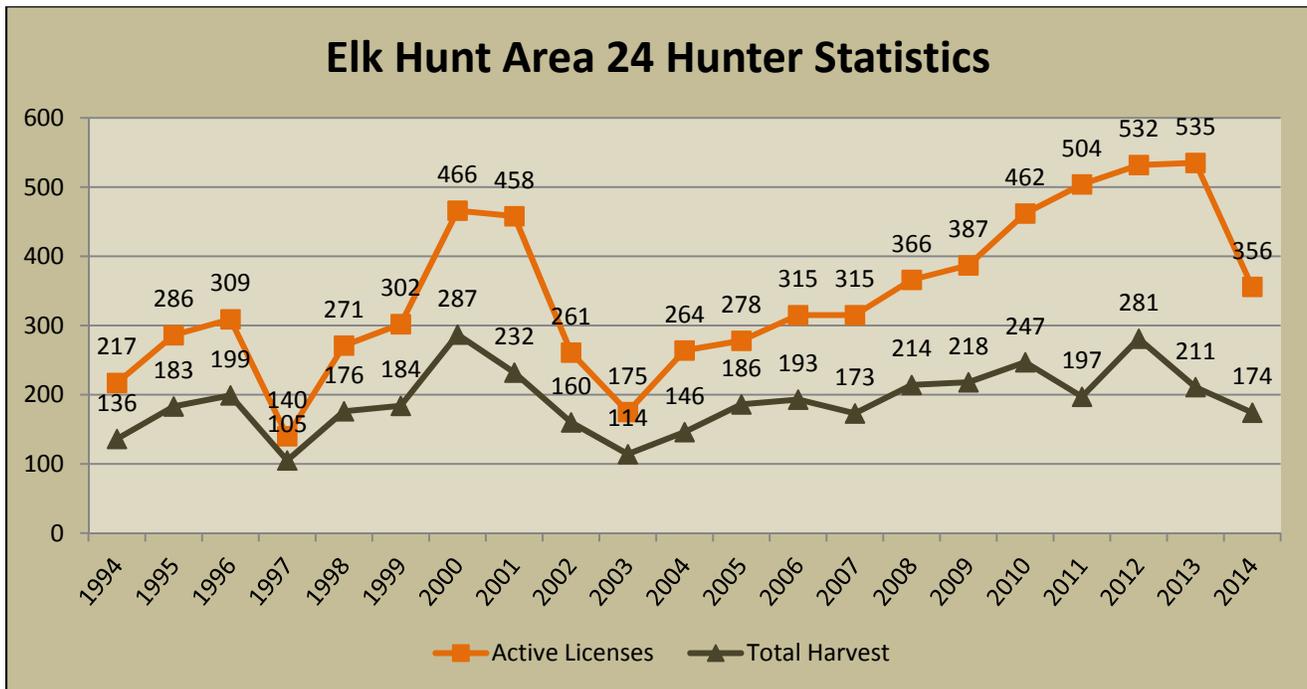


Figure 2. Comparison of elk license numbers and elk harvest trends in Elk Hunt Area 24, 1994-2014.

The 2014 post-season bull/cow ratio of 13M/100F seems quite low and is not believed to be a true representation of the number or proportion of bulls in Area 24. But, to avoid overharvesting bulls in Hunt Area 24 and in response to Type 1 hunter success in 2014 being among the lowest in 10 years, we reduced Type 1 any elk licenses by 25 in 2015. Due to an administrative error prior to the Commission meeting in April, hunters with unused Area 24 Type 1 licenses will be allowed to harvest Any Elk in November 2015 rather than antlerless only as intended. While this could increase bull harvest counter to our intent, we don't believe the increase will be substantial and the 2015 season should maintain bull numbers at or near "recreational" management levels.

To continue to tackle hunter crowding concerns from the public, but still place emphasis on harvesting female elk, we are maintaining the number of Area 24 Type 5 licenses at 100, and allowing Area 24 Type 1 and 4 hunters who are not successful in October to hunt in November in both Hunt Areas 24 and 128. Similarly, some Area 23 (Rattlesnake Elk Herd Unit) hunters will have the ability to hunt in Area 128 from mid-November to mid-December, mostly targeting elk that move off the Rattlesnake Hills into the Gas Hills/Beaver Rim area. Anticipated harvest levels should continue to reduce the population. We are changed the General License season in Hunt Area 128 from Any elk to Antlered in 2015 in response to observed high hunter densities in portions of the hunt area, which prompted some concerns from area landowners, especially in the west half of the hunt area. We are focusing cow harvest in Area 128 with late-season opportunities as described above. In an attempt to better manage elk movements off the southwestern end of Area 24, we extended the hunt area boundary southerly to encompass the Lost Creek area south to the Osborne Road for the 2015 season (Figure 3). Seasonal ranges will need to be updated to match our understanding of elk use of the extended area. The expected 2015 harvest should consist of at least 225 elk, mostly from Area 24, and continue to decrease the population.

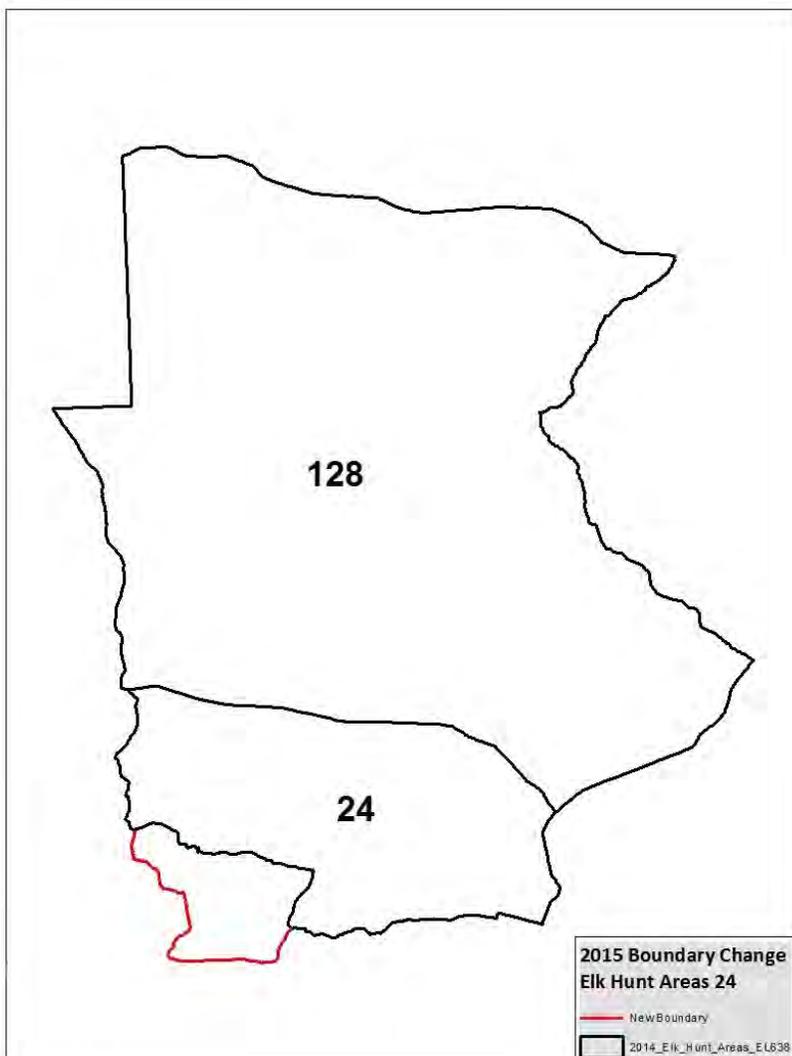
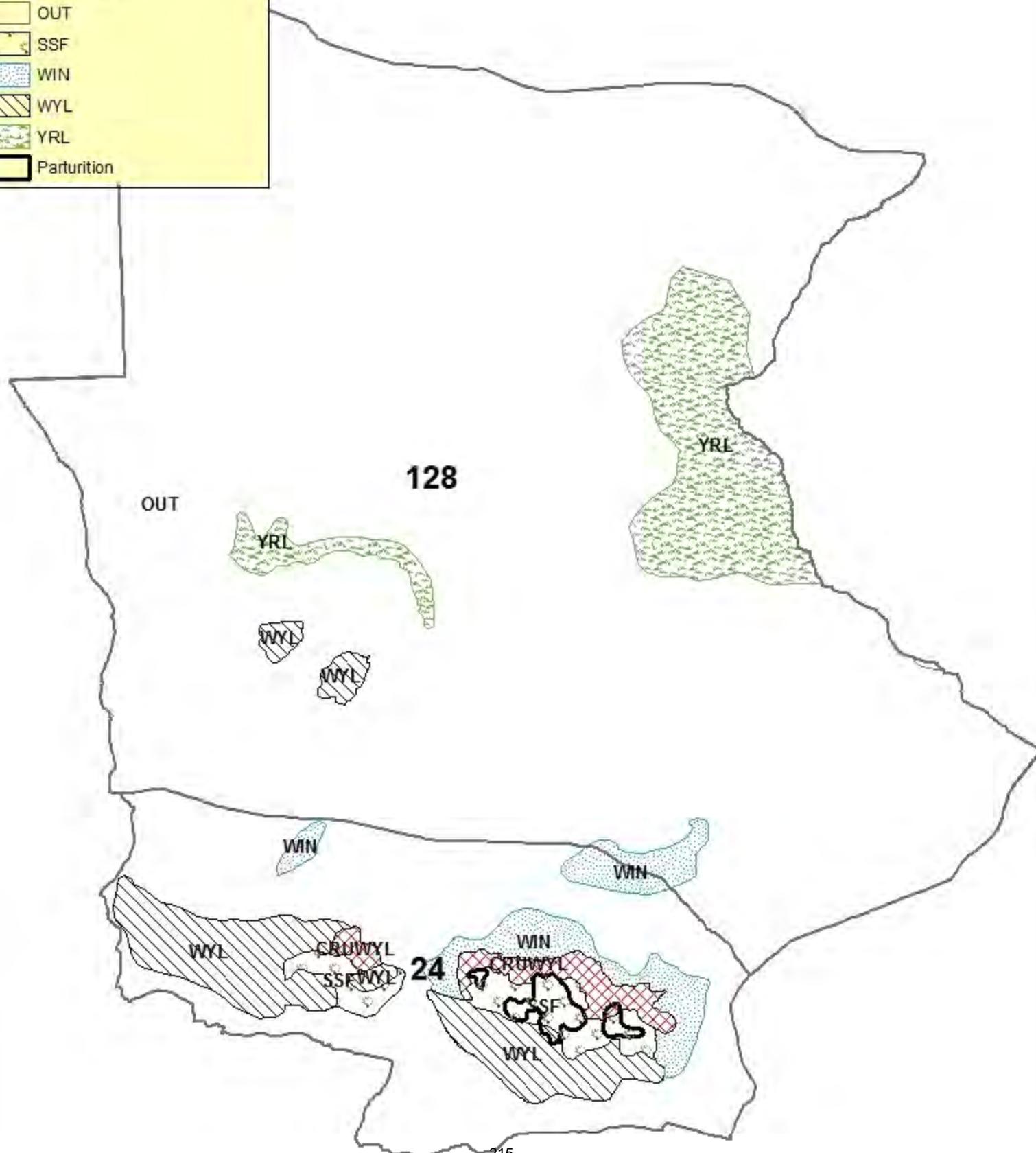


Figure 3. Boundary change effective in 2015 for Green Mountain Elk Herd Unit and Elk Hunt Area 24 (red line).

Green Mountain Elk (EL638)
HA 24, 128
Revised January 2012

 ELK Hunt Area Boundaries
Elk Seasonal Range
RANGE
 CRUWYL
 OUT
 SSF
 WIN
 WYL
 YRL
 Parturition



2014 - JCR Evaluation Form

SPECIES: Elk
 HERD: EL639 - FERRIS
 HUNT AREAS: 22, 111

PERIOD: 6/1/2014 - 5/31/2015
 PREPARED BY: GREG HIATT

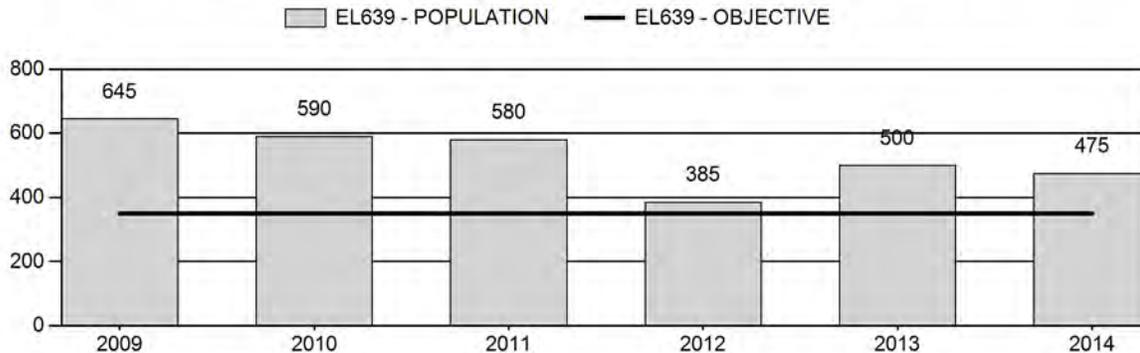
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	540	475	440
Harvest:	151	96	105
Hunters:	273	188	205
Hunter Success:	55%	51%	51 %
Active Licenses:	282	191	205
Active License Success:	54%	50%	51 %
Recreation Days:	1,878	1,285	1,620
Days Per Animal:	12.4	13.4	15.4
Males per 100 Females	48	87	
Juveniles per 100 Females	36	50	

Population Objective (± 20%) : 350 (280 - 420)
 Management Strategy: Special
 Percent population is above (+) or below (-) objective: 36%
 Number of years population has been + or - objective in recent trend: 34
 Model Date: None

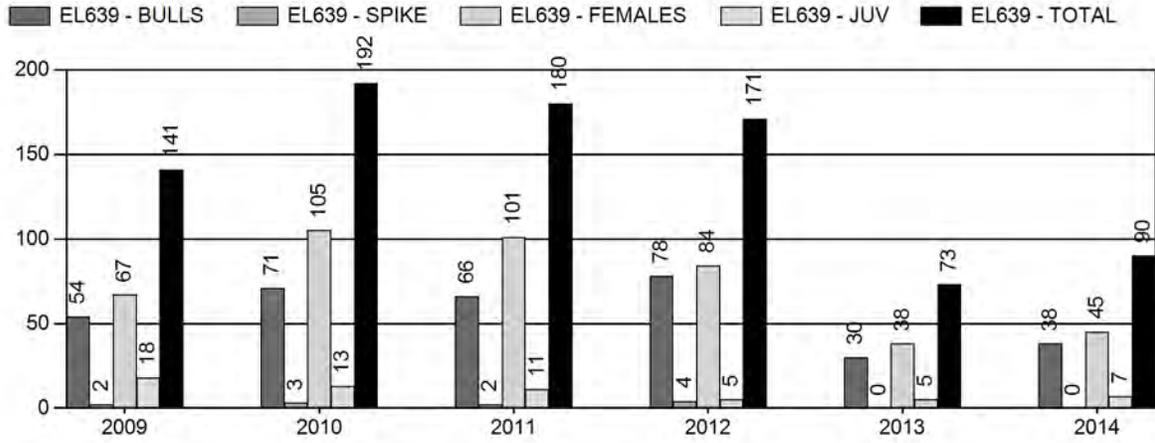
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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:	-3%	-7%

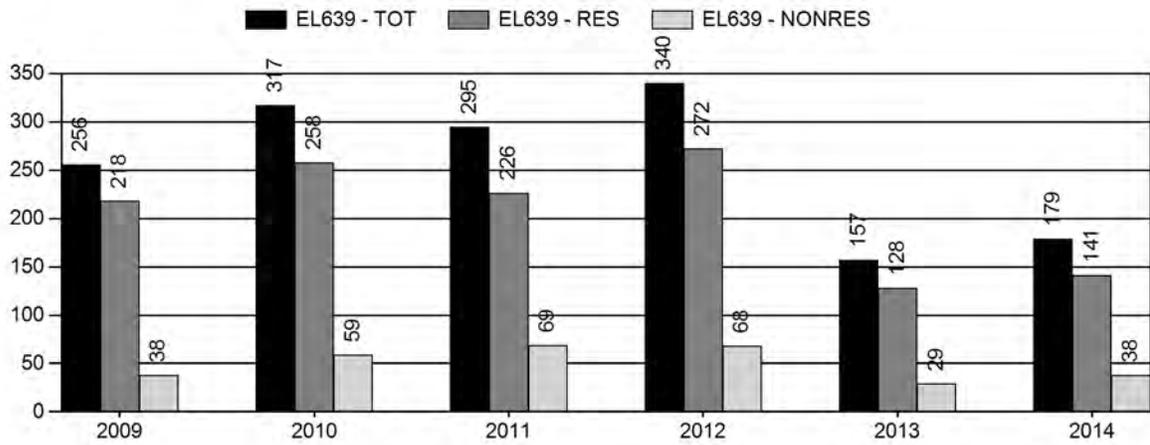
Population Size - Postseason



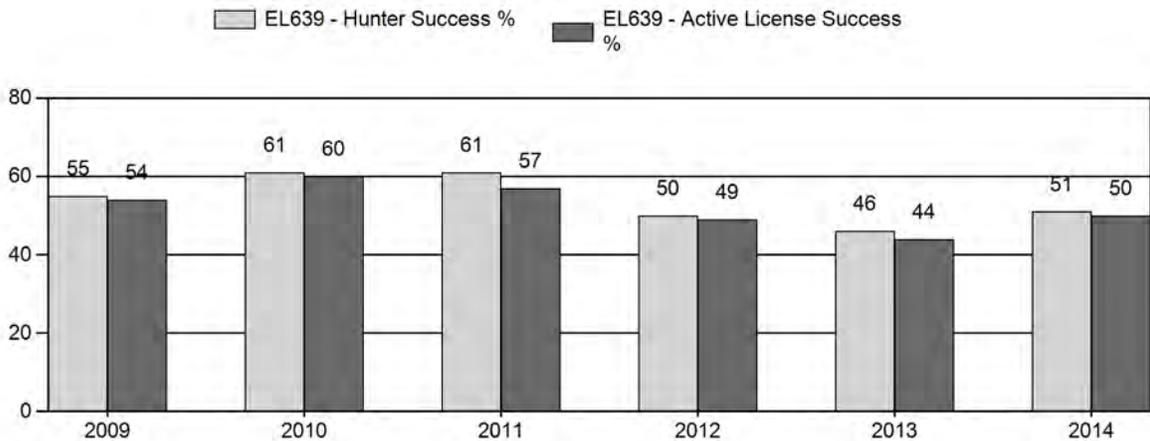
Harvest



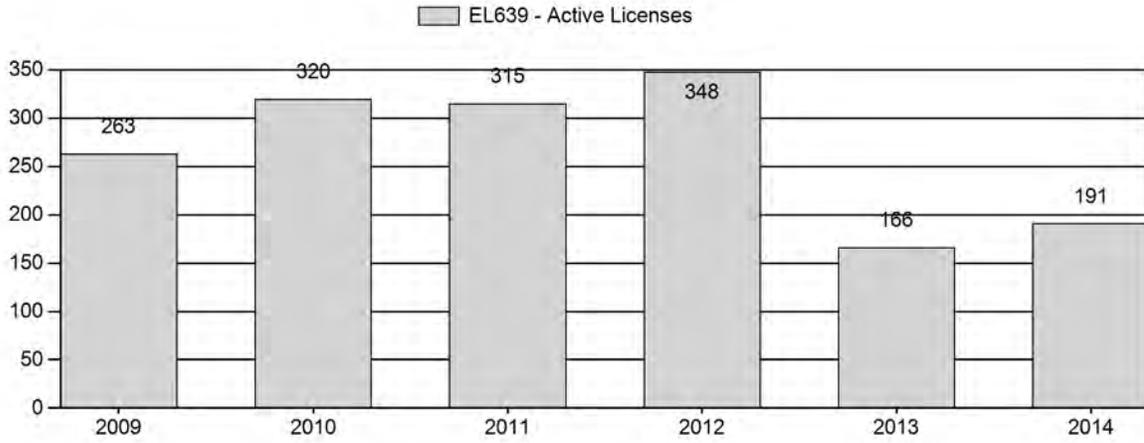
Number of Hunters



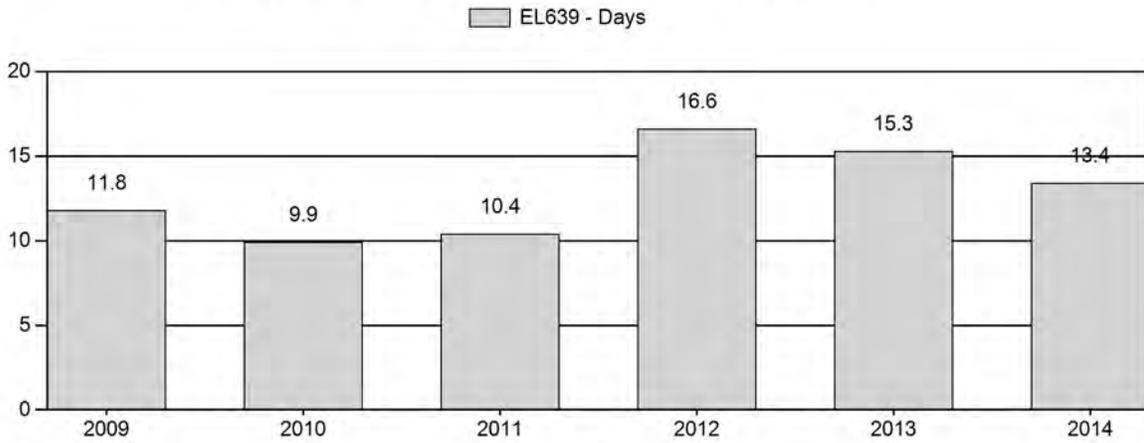
Harvest Success



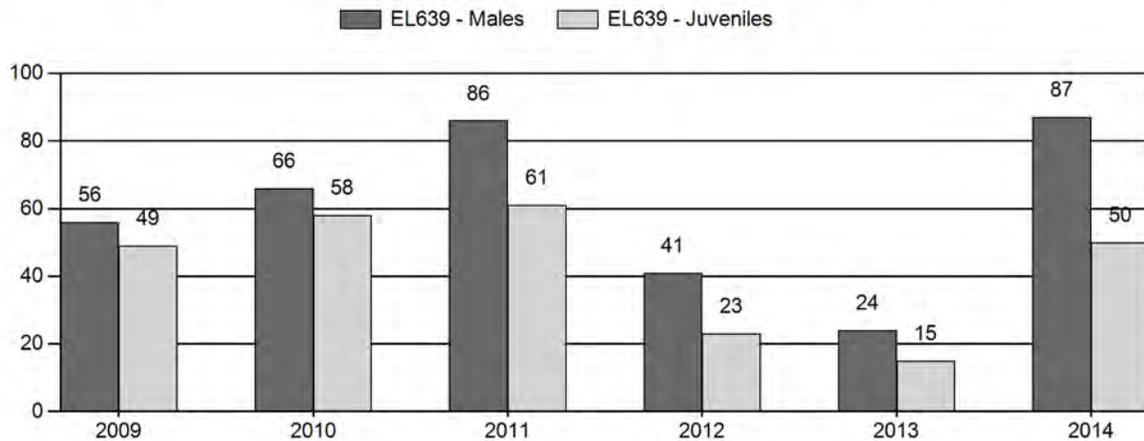
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Elk Herd EL639 - FERRIS

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	645	56	116	172	27%	305	49%	150	24%	627	416	18	38	56	± 0	49	± 0	31
2010	590	25	53	78	29%	119	45%	69	26%	266	432	21	45	66	± 9	58	± 8	35
2011	580	23	87	110	35%	128	41%	78	25%	316	474	18	68	86	± 10	61	± 8	33
2012	385	25	50	75	25%	182	61%	42	14%	299	237	14	27	41	± 3	23	± 2	16
2013	500	34	49	83	17%	353	72%	54	11%	490	176	10	14	24	± 1	15	± 0	12
2014	475	39	112	151	37%	174	42%	87	21%	412	400	22	64	87	± 5	50	± 3	27

**2015 HUNTING SEASONS
FERRIS ELK HERD (EL639)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
22	1	Oct. 8 Nov. 1	Oct.-31 Jan. 31	40	Limited quota; any elk Unused Area 22 Type 1 licenses valid for antlerless elk
	6	Oct. 8 Nov. 1	Oct. 31 Jan. 31	25	Limited quota; cow or calf valid in the Muddy Creek drainage Unused Area 22 Type 6 licenses valid in the entire area
111	1	Oct. 10	Oct. 31	25	Limited quota; any elk
	4	Oct. 10 Nov. 1	Oct. 31 Jan. 31	25	Limited quota; antlerless elk Unused Area 111 Type 1 and Type 4 licenses valid for antlerless elk in that portion of Area 111 off the Wyoming Game and Fish Commission's Morgan Creek Wildlife Habitat Management Area
	6	Nov. 1	Jan. 31	125	Limited quota; cow or calf valid in that portion of Area 111 off the Wyoming Game and Fish Commission's Morgan Creek Wildlife Habitat Management Area
Archery 22, 111		Sep. 1	Sep. 30		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
22	1	+15
	6	0
111	1	0
	4	0
	6	0
Total	1	+15
	4	0
	6	0

Management Evaluation

Current Management Objective: 350

Management Strategy: Special

2014 Postseason Population Estimate: ~475

2015 Proposed Postseason Population Estimate: ~440

The management objective for the Ferris Elk Herd Unit is a post-season population objective of 350 elk. The management strategy is “special” management, with bull:cow ratios allowed to exceed 30:100 and the proportion of branch-antlered bulls expected to exceed 66 percent of the antlered harvest. The population objective and management strategy were last publicly reviewed in 2012. All affected major landowners strongly endorsed keeping the population objective of 350 elk.

Herd Unit Issues

Access is a major issue with this herd unit. While there are large blocks of accessible, public land, refugia created by several large ranches that are either closed to hunting or greatly limit hunter numbers have prevented harvest from most of the elk in this herd unit, particularly in Area 111. As license quotas are increased to reduce elk numbers to objective, the lack of hunter access to these animals leads to over-harvest of public land areas while still preventing the harvest necessary to reach the population objective.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve calf survival. Condition of elk going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February. Large numbers of elk were found outside crucial winter ranges during a December classification flight, indicative of a mild winter.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have improved in 2014 due to increased precipitation during late summer and fall. Two browse transects have been established in this herd unit, but one was burned by fire in 2012 and the other was not read in 2014.

Over the past several years the Rawlins BLM has implemented prescribed burns in the Seminole and Ferris Mountains, partly to address conifer encroachment while also rejuvenating decadent mountain mahogany and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminole Mountains and the eastern Ferris Mountains burned thousands of acres. These prescribed burns and the recent wildfires should benefit elk as herbaceous forage reclaims burned areas.

The Seminole Fire burned over 3,800 acres in the Seminole Mountains including areas within Morgan Creek WHMA. As in 2012 and 2013, the Rawlins BLM again coordinated and funded aerial application of Plateau® in 2014 to mitigate cheatgrass spread on BLM and WGFD managed areas within the fire perimeter. The wildfire enveloped several previously planned prescribed burns, although not with the desired prescriptions.

Plans for additional prescribed fires in the Seminole Mountains, particularly on the Morgan Creek WHMA, have been accelerated to take advantage of the secure fire breaks provided by the 2012 wildfire.

Field Data

Obtaining reliable classification samples from small populations is difficult because, statistically, the majority of the population must be included in the sample to have any confidence in the resulting ratios. Ratios collected for this herd are further skewed because elk in this herd are not distributed randomly among the winter bands. Missing any of a handful of bachelor bull herds will significantly under-estimate bull:cow ratios. Failure to classify even one of the large cow/calf bands will greatly over-estimate bull:cow ratios, as happened in 2011. Without reliable, consistent herd ratios, spreadsheet modeling for this small herd does not work.

Conditions during a helicopter trend count in December 2014 were good, and all 412 elk counted were also classified, yielding the second largest sample since 2009. Unlike the 2013 survey, elk numbers were nearly evenly split between the two hunt areas in 2014, with 217 being found in Area 22 and 195 in Area 111. More than 70 percent of the antlered elk were found in Area 22, many of these on the south side of the Ferris Mountains, outside normal wintering areas. At least one large cow/calf band reported in Area 111 was not found, suggesting the heavily skewed bull:cow ratios seen in 2011 may have been repeated this year.

Calf production increased to 50:100, well above the record low ratios recorded in 2012 and 2013. Improved precipitation increased calf production in both areas, at 57:100 in Area 22 and 45:100 in Area 111.

Since most bull groups appear to have been located, and at least one cow/calf group was not, the bull:cow ratio from the 2014 classification sample is probably skewed high. The 2014 ratio of 87:100 is well above the minimum for special management, and more than triple the 24:100 ratio recorded in 2013 with a better sample. Bull:cow ratios were similar between the two areas in 2013, but in 2014 Area 111 had 42:100 while Area 22 had an incredible 153:100 bull:cow ratio. Both areas met the special management criterion.

The spike:cow ratio rose to 22:100, the highest in at least nine years, despite record low calf production in 2013. This ratio also differed between the two hunt areas, with Area 22 again having an exceptional 40:100 and Area 111 having only 10:100. Since the two areas had similar calf production in 2013 and essentially no spike harvest, this disparity suggests a large number of antlered elk were wintering in Area 22 that normally would be in Area 111.

Harvest Data

Success for hunters with Type 1 licenses increased in both hunt areas in 2014. The 77 percent success seen for these license types in Area 111 was near normal levels, but Type 1 hunters in Area 22 reported an exceptional 96 percent success. This, coupled with a decline in the average number of days hunted for each elk taken, suggests many of the bulls seen in Area 22 during the classification survey were also there during the hunt. The proportion of antlerless elk taken on Type 1 licenses increased slightly, to 9 percent. The average number of days hunted per elk harvested off this license type declined for both areas, and was the lowest for each in ten years. Like the classification data, these harvest statistics suggest the supply of bulls in this herd has improved, particularly in Area 22.

Beginning in 2010, Type 6 licenses in Area 22 were restricted to the Muddy Creek drainage for the first portion of the 5-week season to address damage concerns on irrigated hayfields. Initial success for hunters with these licenses was high, at 72 percent, but has steadily declined and was only 21 percent in 2013 and 25 percent in 2014. The average number of days hunted per elk harvested on these licenses began at 5 days in 2010 and has steadily risen to 28 days in 2013 and 26 days in 2014. This license strategy has apparently successfully reduced the number of elk found on these irrigated fields in the fall.

To address a problem of inadequate harvests resulting from poor license sales, most of the antlerless licenses in Area 111 were converted into reduced price cow/calf licenses beginning in 2009. To address crowding issues in the Seminole Mountains and to direct harvest to the segments of the herd protected by ranches with limited access during the fall hunt, those cow/calf licenses were not valid on the Morgan Creek WHMA. Success for hunters with these licenses had dropped off each year since, yielding only 39 percent success in 2014, despite the extended season. Hunters able to hunt the entire area with Type 4 antlerless elk had even poorer success, at 32 percent.

Population

Past efforts to model this herd using standardized values for some parameters in POP-II failed, as did recent efforts to employ spreadsheet modeling. As a result, population estimates and harvest recommendations have been based on winter trend counts. In years when counting conditions were not favorable, estimates of herd size are made using the most recent reliable trend count, adding annual calf production and subtracting harvest for each intervening year. Conditions were ideal during the 2013 winter trend count, when 490 elk were found. Snow cover was less ideal in 2014 and only 412 elk were recorded. Based on the past two trend counts, the herd is still well above objective but reduced by 20-35 percent from high numbers seen in 2009. Bands of antlered elk appear to cross the boundary between the two areas frequently, but Area 111 had at least 60 percent of the cows in the 2014 trend count. Most of the surplus elk are still in Area 111 where access is limited, with numbers of cows in Area 22 remaining low.

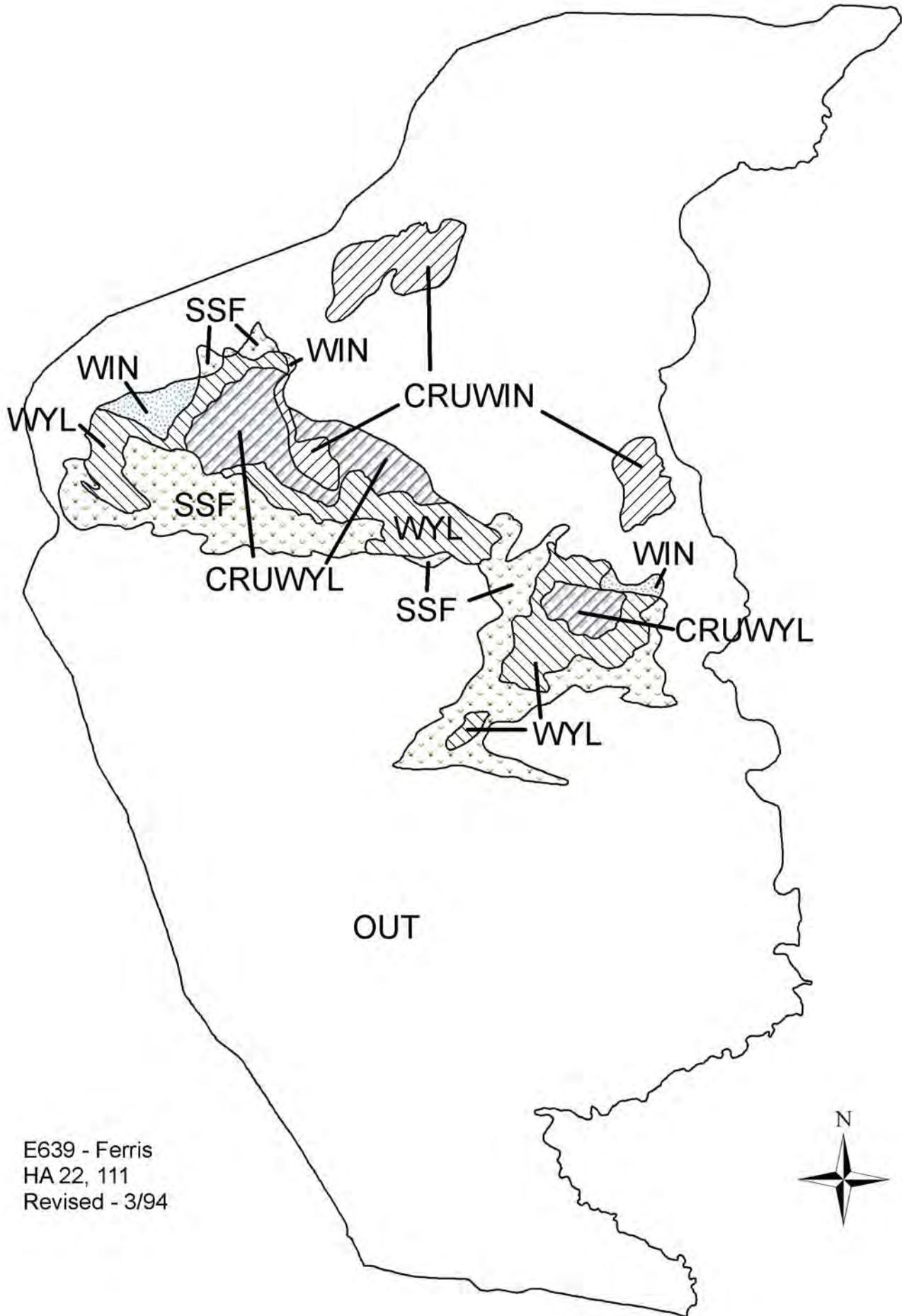
Management Evaluation

License quotas were reduced in 2013 in response to the low 2012 trend count, poor hunter success and low calf production, intended to maintain herd reduction while providing reasonable chances of success for hunters applying for such tags. This was the proper response for Area 22,

but elk numbers were still above objective in Area 111 and quotas for that area were increased by 75 in 2014. While the high bull:cow ratio seen in Area 22 is probably skewed by elk dispersing outside normal wintering areas, hunter success for the Type 1 licenses indicate there was a good supply of bulls in that area. An increase of 15 Type 1 licenses is proposed for that area, with other quotas remaining unchanged to continue reduction of this herd towards objective of 350. Expected harvest from the 2015 seasons would be about 105 elk, with roughly 60 percent being antlerless. About 60 percent of the harvest should come from Area 111. Assuming normal calf production and hunter success, the herd should be reduced to approximately 440 elk in 2015.

Comments from several major landowners indicated they want elk harvested from this herd, but do not want public hunters on their lands. This herd offers an unusual opportunity where large portions of summer/fall habitats are on private lands with limited or no public access, but many winter ranges are on accessible public lands. Hence a strategy was initiated with an emergency regulation in 2012 and continued in 2013 and 2014 to allow hunters to pursue antlerless elk as late as January, where most of the elk are expected to be on public land. The intent is to achieve harvest of the reproductive segment of most of the elk herd, not just the segments which are publicly available in the fall. This same strategy is repeated in the 2015 seasons. Barring changes in access across private lands, elk occupying the Haystack Mountains in checker-boarded lands in Area 111 will continue to be unavailable to most hunters.

All 2015 license types are consistent with the application booklets. Opening dates in both areas are consistent with the application booklets. Closing dates are the same as in the 2014 season. Archery seasons coincide with local deer archery seasons and archery seasons in neighboring elk areas.



2014 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL643 - SHAMROCK

HUNT AREAS: 118

PREPARED BY: GREG HIATT

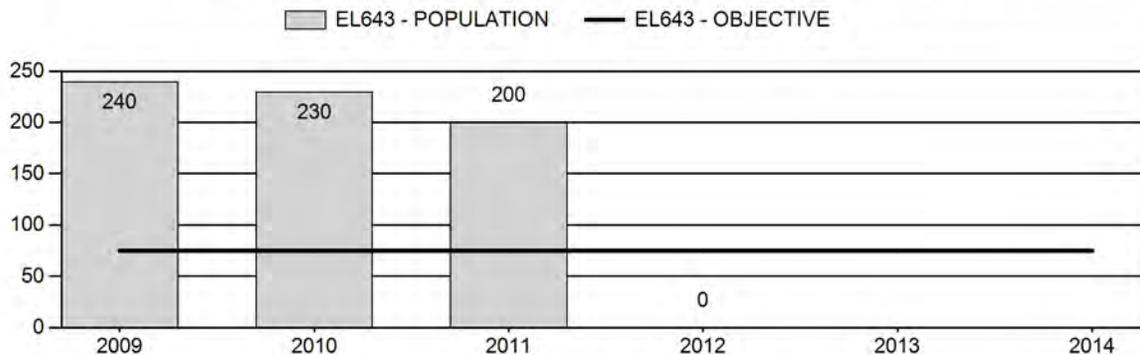
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	134	N/A	N/A
Harvest:	61	47	40
Hunters:	99	66	70
Hunter Success:	62%	71%	57 %
Active Licenses:	102	72	70
Active License Success:	60%	65%	57 %
Recreation Days:	486	351	350
Days Per Animal:	8.0	7.5	8.8
Males per 100 Females	0	0	
Juveniles per 100 Females	0	0	

Population Objective (± 20%) :	75 (60 - 90)
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

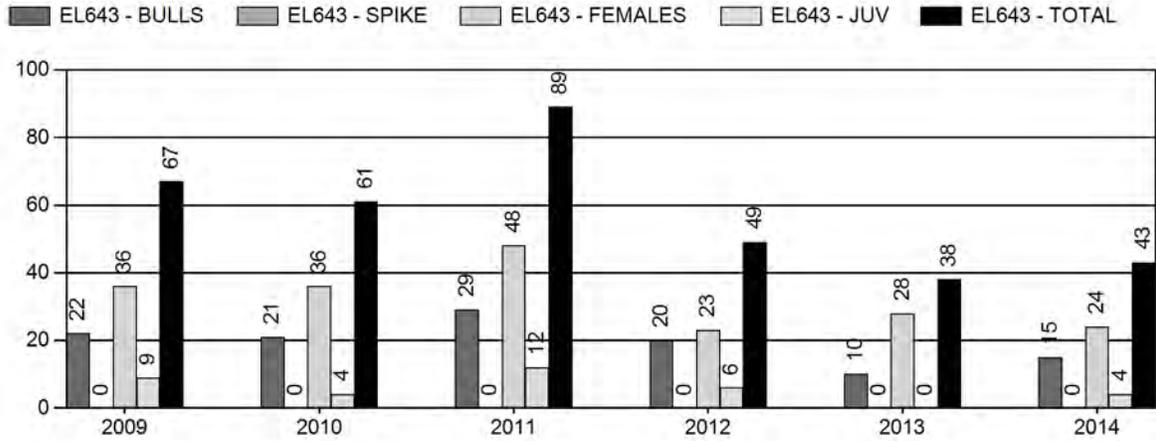
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
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%

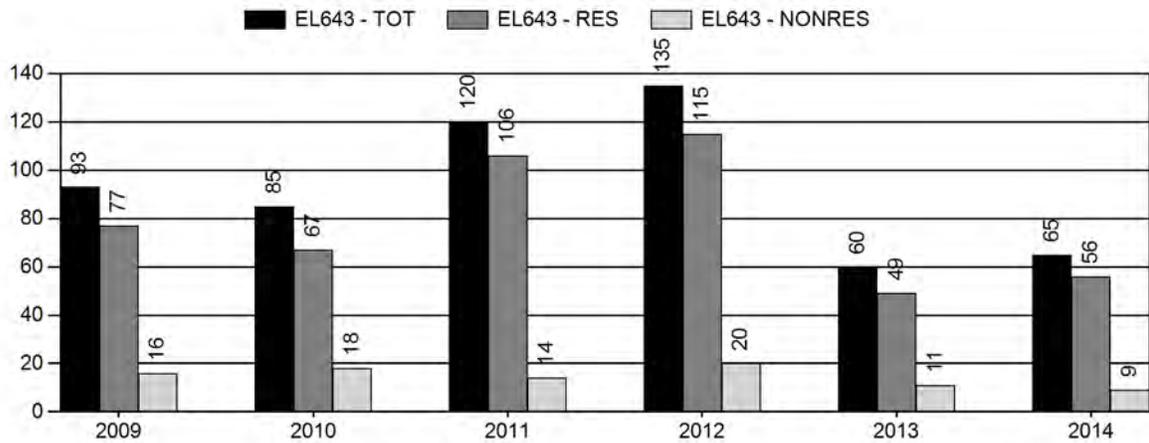
Population Size - Postseason



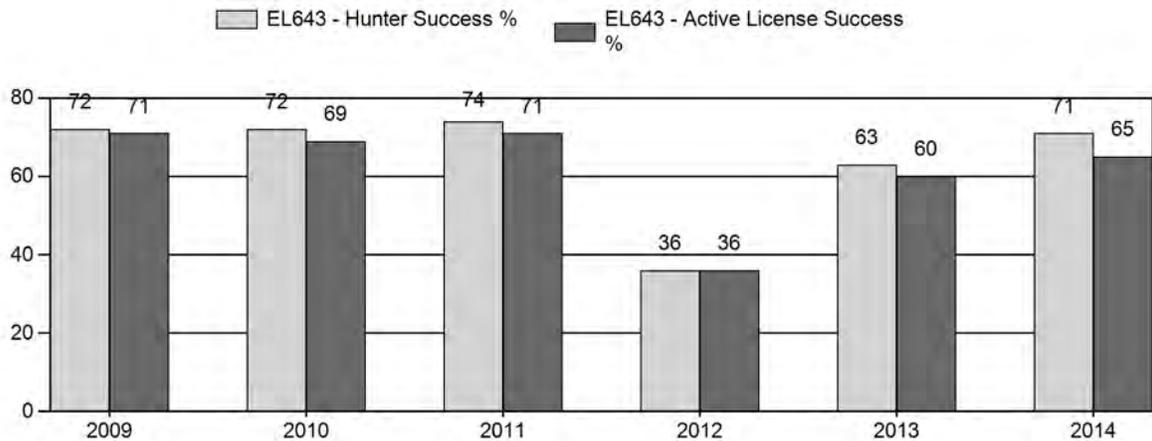
Harvest



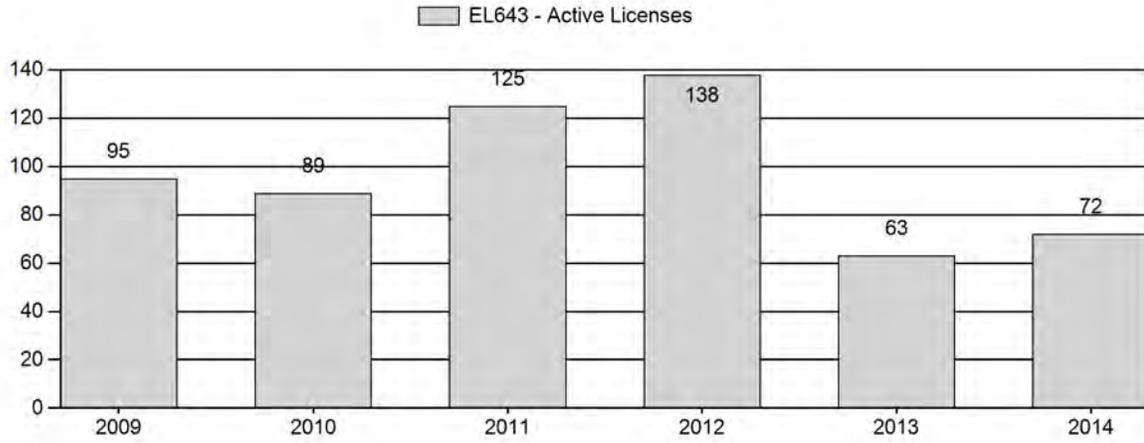
Number of Hunters



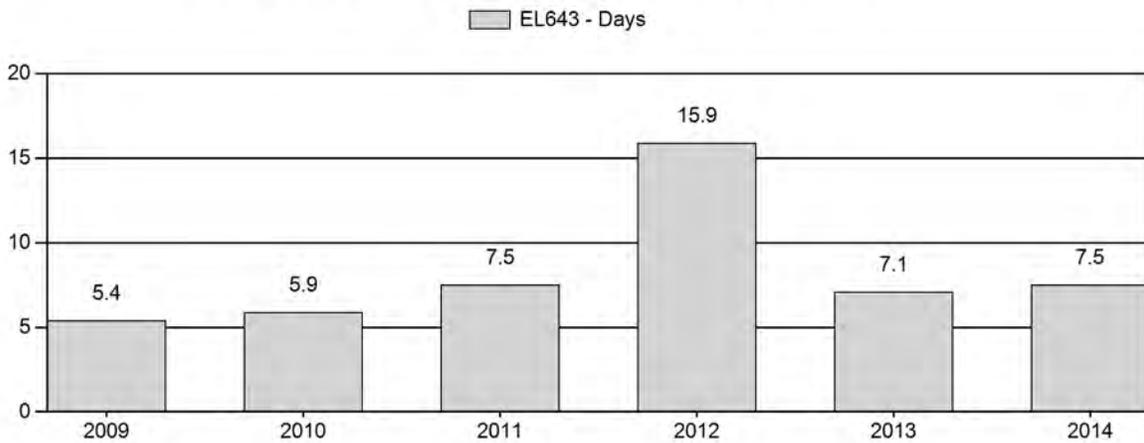
Harvest Success



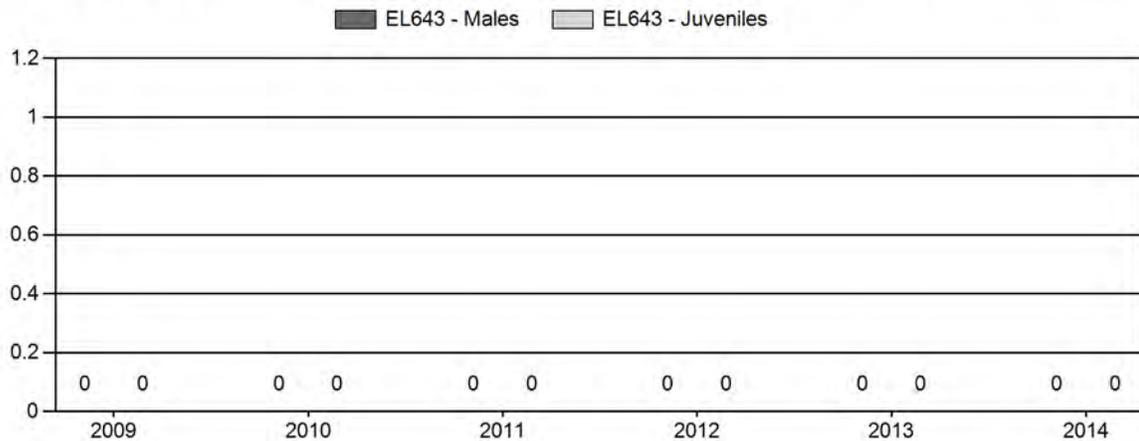
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Elk Herd EL643 - SHAMROCK

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	240	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2010	230	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2011	200	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2012	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2013	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2014	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0

**2015 HUNTING SEASONS
SHAMROCK ELK HERD (EL643)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
118	1	Oct. 23	Nov. 12	25	Limited quota; antlered elk
	4	Oct. 23	Nov. 12	25	Limited quota; antlerless elk
	6	Oct. 1	Nov. 30	25	Limited quota; cow or calf valid south of the Mineral X Road (Sweetwater County Road 63 and BLM Road 3206)
Archery					
118		Sep. 1	Sep. 30		Refer to Section 2 of this Chapter

Hunt Area	Type	Quota change from 2014
118	1	0
	4	0
	6	0
Total	1	0
	4 & 6	0

Management Evaluation

Current Management Objective: 75

Management Strategy: Recreation

2014 Postseason Population Estimate: N/A

2015 Proposed Postseason Population Estimate: N/A

The management objective for the Shamrock Elk Herd Unit is a post-season population objective of 75 elk. The management strategy is recreational management. This objective and management strategy were first established in 1984, when elk were found almost exclusively in the southeastern quarter of the herd unit, and were last publicly reviewed in 1994. The objective and management strategy are currently under public review with a change to a landowner and hunter satisfaction objective proposed.

Herd Unit Issues

This herd consists of bands of elk scattered in open sagebrush desert with three main areas of concentration in the southeast, southwest and the northeast corners of the herd unit. Observations have documented movement of bands of elk between these three concentration areas, as well as into Area 100 to the west, producing uncertainty on the actual numbers of elk in the population. Aerial trend counts have been attempted, but often failed to find elk in all three areas simultaneously. Snow cover is rarely adequate for good visibility of elk from an aircraft.

Classification samples have been too small and inconsistent to allow for a reliable herd population model to guide management. As a result, license quotas have been based upon harvest statistics and simple assumptions of annular herd growth and harvest.

These bands of elk are highly mobile, and observations before and during the 2012 hunt suggested a significant number of elk from the southwestern portion of the herd may have moved west into more mesic habitats in the eastern edge of Area 100. This shift into Area 100 was noted again in 2014, but appeared to be due to hunting pressure from cow/calf hunters rather than weather or drought.

A cow elk died of lichen toxicity just a few miles into Area 100 in September of 2012, presumably induced into consuming lichen as a result of extremely poor forage conditions that year. Elk in the southeast corner of this herd also left orange and red urine stains, an indication of lichen consumption, during the 2007-08 winter when elk were dying of lichen toxicity immediately to the south on Red Rim. No incidences of lichen toxicity in elk were noted in 2014, however roughly 150 elk wintering along the border between Areas 118 and 100 were reported to have left orange urine stains during early February.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve calf survival. Condition of elk going into the winter is expected to have been good. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February.

Habitat

While no herbaceous habitat transects are established within this herd unit, herbaceous forage production is expected to have improved due to increased precipitation in late summer and early fall. Only one shrub transect has been established near this herd unit, on the Chain Lakes WHMA, but was not read in 2014.

Habitat losses to uranium development increased with the opening of the *Ur in situ* uranium mine near the center of the herd unit. It is not in or near crucial elk ranges. Habitat losses to gas development have slowed due to low gas prices and demand for drilling rigs in the Bakken fields.

Field Data

All classification samples for this herd have been statistically inadequate and no posthunt classification data were collected again this year. Dispersal of these elk in small bands across hundreds of square miles of sagebrush makes both aerial and ground classifications prohibitively expensive. Increased precipitation during summer and fall of 2014 improved calf production in neighboring herds and production in this desert herd probably increased as well.

Harvest Data

Hunter success is typically quite high in this herd unit due to the open terrain and limited cover, but was exceptionally poor in 2012 and 2013. Success for bull hunters improved to 58 percent in 2014, but was still below the long term average. Success for Type 4 “antlerless elk” hunters, who could hunt the entire area, declined to 67 percent, but was still within the normal range for this license type. Success for cow/calf hunters, limited to the southern half of the area, was 72 percent, typical for these licenses. This was the second year these hunters were free to hunt the entire south half, rather than just the southeastern corner. Concern was expressed by some bull hunters that early harvest by cow/calf hunters may have harassed significant numbers of elk out of the hunt area into Area 100 prior to the opening of the regular season.

The average number of days hunted per elk harvested remained at normal levels in 2014, for all three license types, after record highs in 2012. While many hunters complained about low elk numbers on opening day, success and effort statistics suggest most were able to find elk to harvest without having to expend many extra days of effort.

Because of improved success, harvest in 2014 was nearly the same as in 2012, despite significantly lower numbers of licenses.

Population

While initially found only in the southeastern portion of the herd unit, over the past 20 years elk have expanded into most portions of Area 118, at least for some seasons of the year. Numbers increased as well, with Department personnel being able to confirm at least 270 elk in this area prior to the 2010 hunting season. Harvests were increased, and the herd was estimated at about 200 elk following the 2011 hunt. Harvest from Type 6 licenses was most effective at reducing elk numbers in the southeast corner where elk use of private lands has been a concern.

Localized movement of elk westward into Area 100 cannot explain the difficulty hunters had finding elk to harvest in the entire area in 2012, nor those restricted to the southeastern corner. Increased harvests in recent years, coupled with what was presumably a poor calf crop in 2012, have likely reduced elk numbers across the herd unit.

Management Evaluation

Expected harvest from the 2015 season would be about 40 elk, with roughly two-thirds being antlerless elk. In previous years, cow/calf licenses were restricted to the southeastern portion of the area to address landowner concerns about elk numbers on private lands close to Rawlins. This strategy was successful, and the restricted area for those Type 6 licenses was expanded to include all of the hunt area south of the Mineral X Road in 2013 and 2014, which will encompass most private lands within the checkerboard. A similar delineation is proposed in 2015.

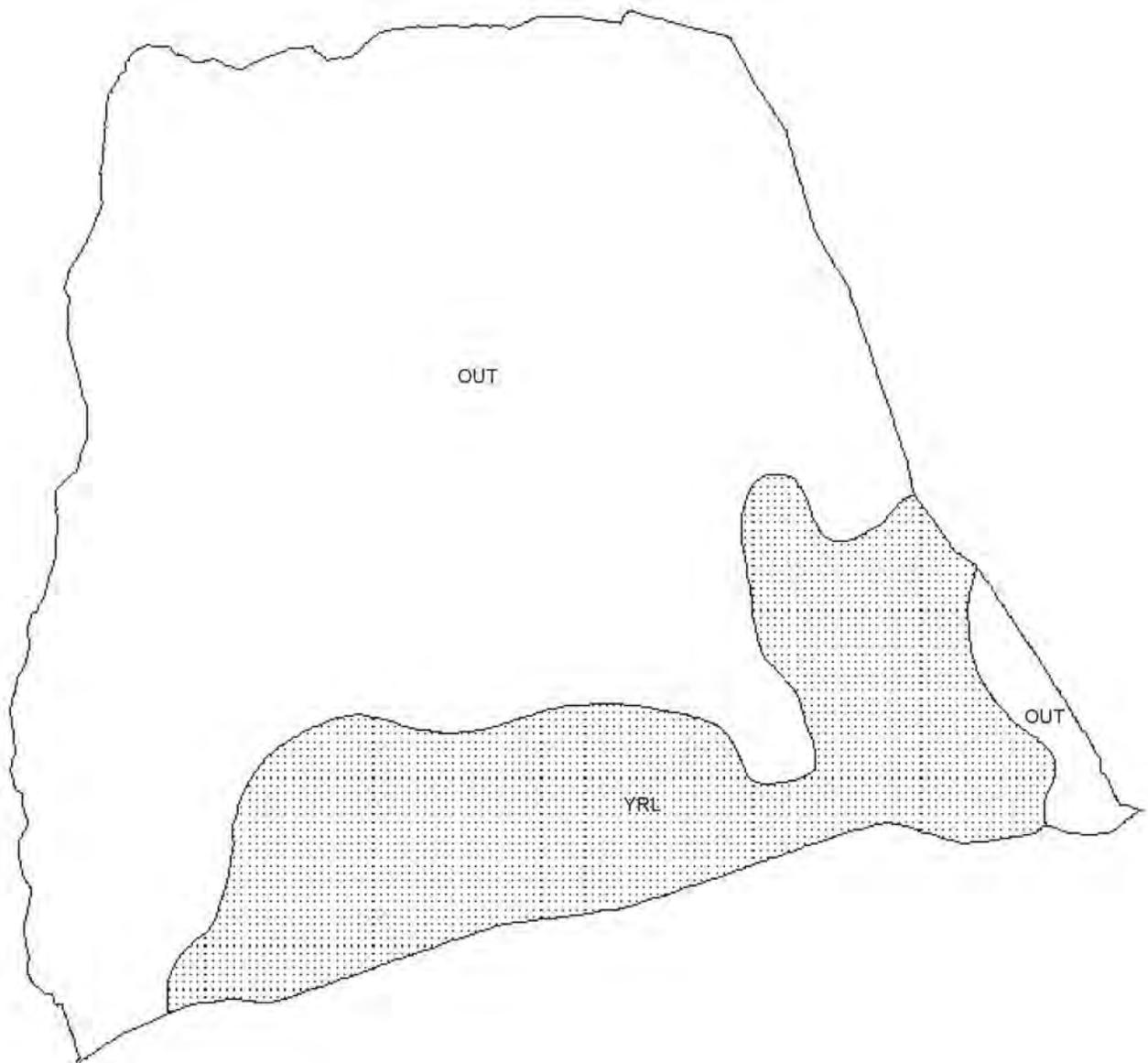
Opening date in this hunt area has been in the third week of October since it was reopened to hunting in 1992. Recently, there have been years when significant numbers of elk moved west out of the southwestern portion of this herd unit into Area 100 before or during hunting season, reducing harvests. In an attempt to compensate for this movement, the opening date for this area was synchronized with Area 100 in 2011 and 2012, on Oct 15. The attempt failed, with a large

number of elk still moving west in 2012. There simply is not enough hunting pressure in the eastern end of Area 100 to shift elk back into Area 118. Complaints about the earlier opening date were received from nearly every hunter contacted, most being upset about crowding due to the season opener coinciding with that for the deer season. Others commented on the lack of a Department presence in the field on opening day, and subsequent poor hunting behavior (chasing with vehicles, herd shooting) by some participants.

Following hunter complaints about low elk numbers at the beginning of the regular season, the Type 4 licenses were removed from application booklets. With normal success being reported after the end of the season, these licenses are restored to maintain harvest on the reproductive part of the herd. Opening date in 2014 was returned to the traditional third week of October, avoiding overlap with the general license deer hunt in the same area, and the same is proposed for 2015. Closing date of Nov. 12 is the same as in 2013 and 2014. The archery season uses standardized dates and is comparable to those in neighboring areas.

The population objective of 75 elk adopted for this herd unit in 1984 may have been appropriate when elk were only resident in the checkerboard, primarily in the southeast corner near Rawlins. With increased elk numbers in the habitats shared with Area 100 to the west and expansion of the population into mostly public lands north of the Mineral X Road, it may be reasonable to consider a different objective, particularly since collection of adequate data to model the herd is unlikely with current budgetary restraints. To address concerns over elk use on private lands, a commitment to restrain elk numbers within the checkerboard may be beneficial. Realignment herd unit and hunt area boundaries with Area 100 to the west may also improve management of elk in this portion of the Red Desert.

E643 - Shamrock
HA 118
Revised - 5/88



2014 - JCR Evaluation Form

SPECIES: Moose
 HERD: MO620 - LANDER
 HUNT AREAS: 2, 30, 39

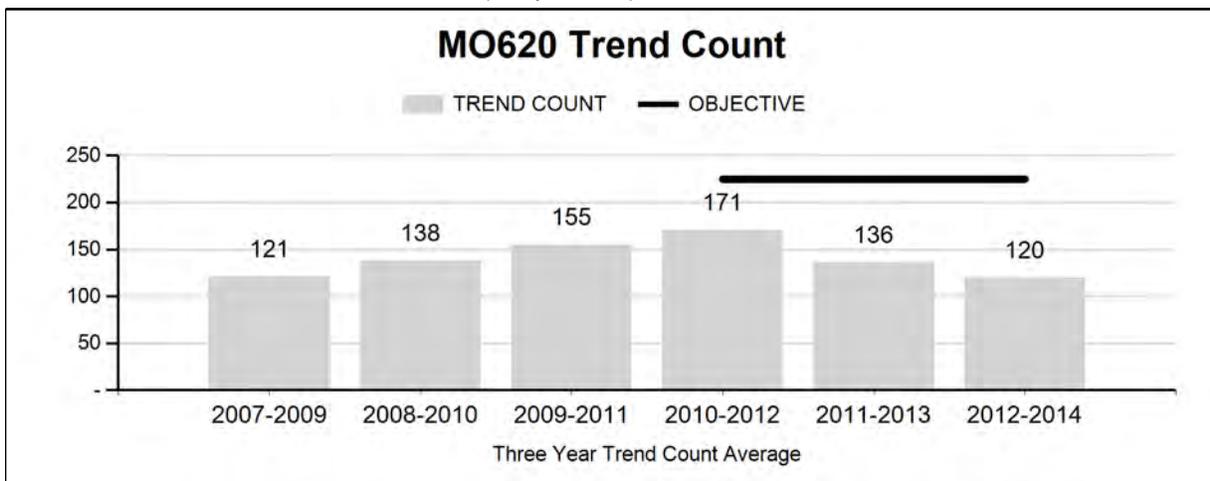
PERIOD: 6/1/2014 - 5/31/2015
 PREPARED BY: STAN HARTER

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Trend Count:	142	113	175
Harvest:	8	8	10
Hunters:	11	10	10
Hunter Success:	73%	80%	100%
Active Licenses:	11	10	10
Active License Success	73%	80%	100%
Recreation Days:	98	129	150
Days Per Animal:	12.2	16.1	15
Males per 100 Females:	69	49	
Juveniles per 100 Females	36	33	

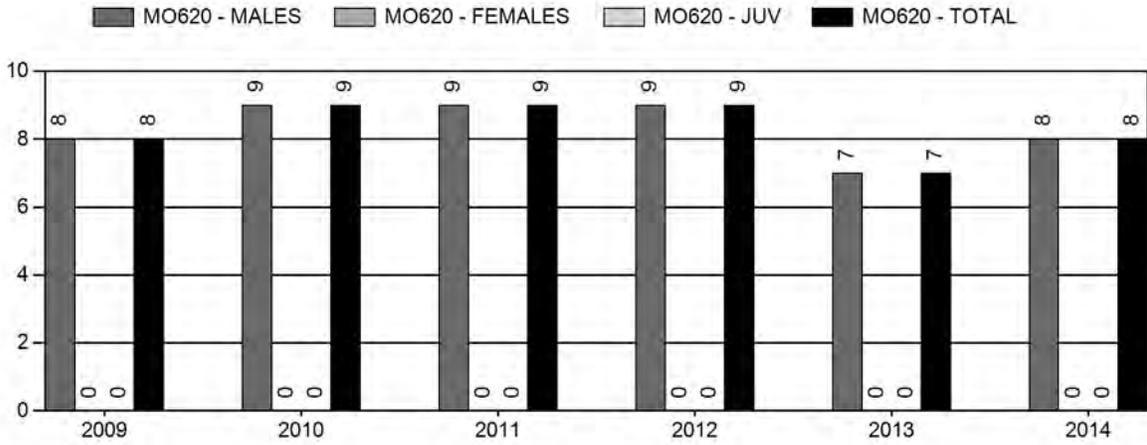
Trend Based Objective ($\pm 20\%$) 225 (180 - 270)
 Management Strategy: Special
 Percent population is above (+) or (-) objective: -49.8%
 Number of years population has been + or - objective in recent trend: 3

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

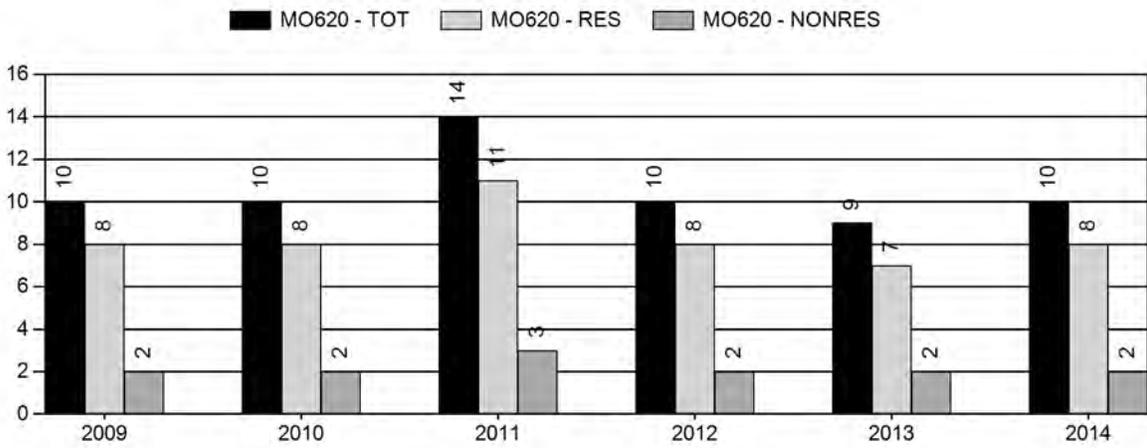
	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



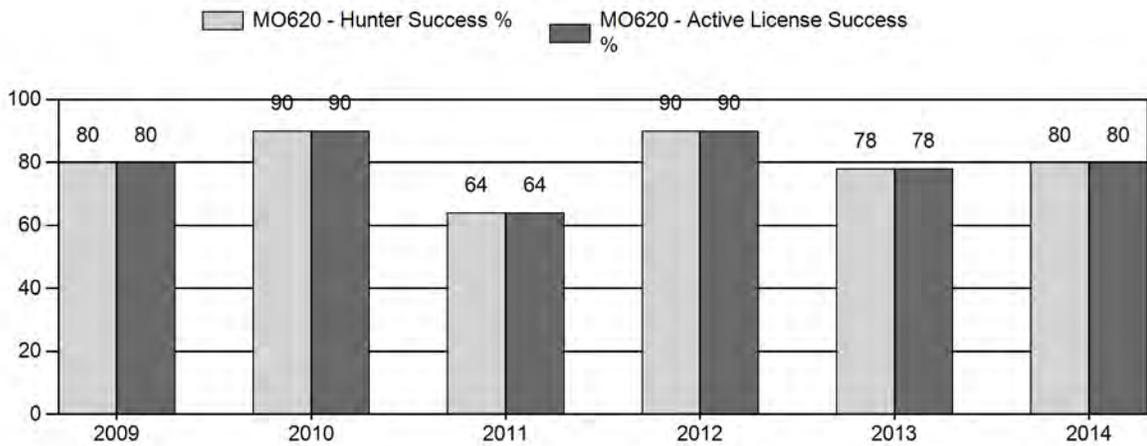
Harvest



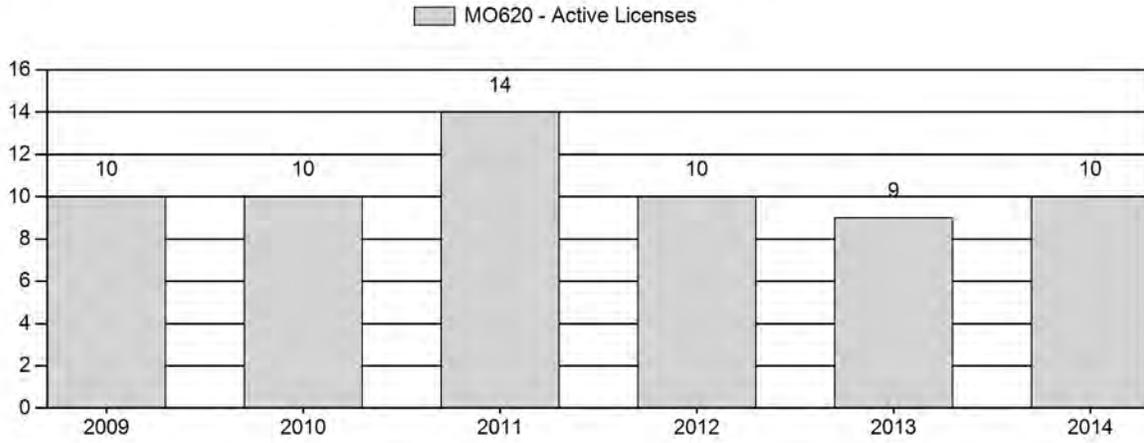
Number of Hunters



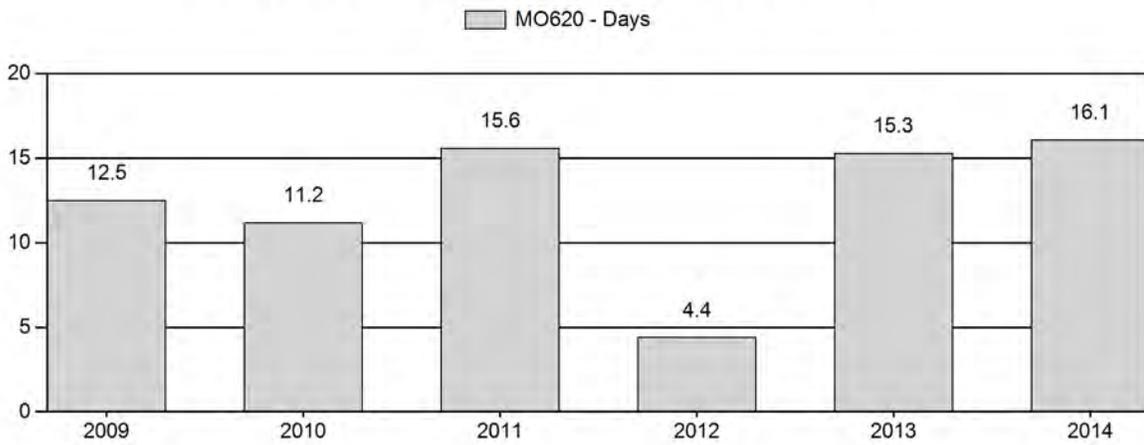
Harvest Success



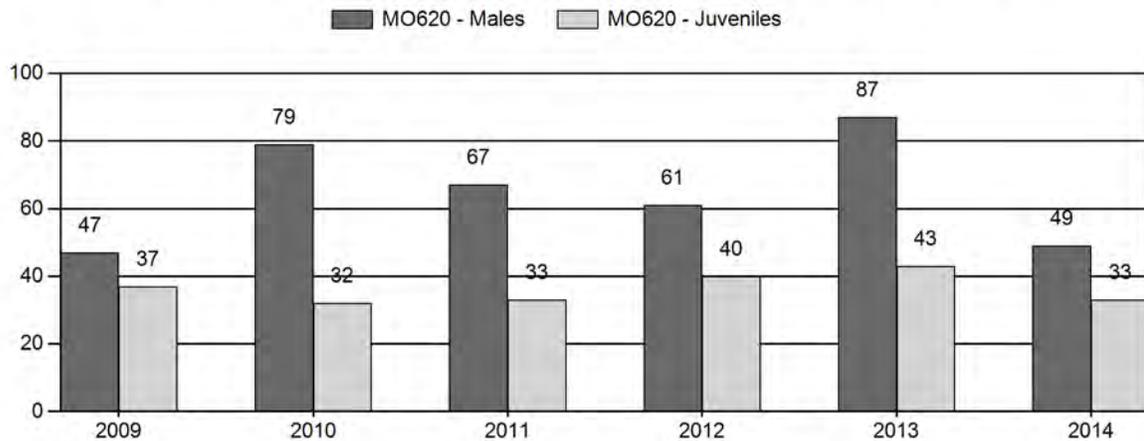
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Moose Herd MO620 - LANDER

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	0	0	0	24	26%	51	54%	19	20%	94	234	0	0	47	± 13	37	± 11	25
2010	0	0	0	78	37%	99	47%	32	15%	209	281	0	0	79	± 9	32	± 5	18
2011	0	0	0	54	33%	81	50%	27	17%	162	263	0	0	67	± 11	33	± 7	20
2012	0	0	0	43	30%	70	50%	28	20%	141	0	0	0	61	± 12	40	± 9	25
2013	0	0	0	40	38%	46	43%	20	19%	106	0	0	0	87	± 0	43	± 0	23
2014	0	0	0	30	27%	61	55%	20	18%	111	0	0	0	49	± 0	33	± 0	22

**2015 HUNTING SEASONS
Lander Moose Herd Unit (MO 620)**

HUNT AREA	TYPE	Season Dates		Quota	LIMITATIONS
		OPENS	CLOSES		
2	1	Oct. 1	Nov. 20	5	Limited quota; antlered moose
30	1	Oct. 1 Nov. 1	Oct. 31 Nov. 20	5	Limited quota; antlered moose Unused Area 30 Type 1 licenses also valid in Area 2
39		CLOSED			

2, 30 Sept. 1 Sept. 30 Archery Season; Refer to license type

No Changes from 2014

MANAGEMENT EVALUATION

Current Management Objective: Mid-winter Trend Count = 225

Management Strategy: Special (50-70 bull/100 cows)

2014 Trend Count = 113

Most Recent 3-year Running Average Trend Count = 120

Herd Unit Issues/Population

This population has experienced a general decline beginning in 1995. Recent trend counts show a general upward trend since 2004, peaking in 2010, an excellent year for detecting moose with near optimal snow cover and flight conditions. Starting in 2011, sample sizes have declined rather sharply, due in part to less favorable snow cover and/or flight conditions. While this decline is possibly only the result of reduced detection of moose, it may also indicate a real decline in moose numbers. Calf/cow ratios were seemingly on the rise, but with such small sample sizes, this statistic could be misleading, especially in light of several hunters and other members of the public and Department reporting seeing few cow moose with calves at their sides the past few years.

Moose throughout their range are susceptible to a variety of diseases, parasites, and other maladies. Presence of carotid artery worms (*Elaeophora schneideri*) has been increasingly documented in most herd units in Wyoming recently. However, at least 2 moose from the Lander Herd Unit were sampled for this parasite in fall 2014, with no worms found. In fact, no presence of *Elaeophora* worms has been detected in this herd unit since it was first discovered in 1999 and 2000. No confirmed cases of winter ticks have been reported in bio-year 2014, but most cases of winter ticks don't manifest themselves until late winter or early spring.

Attempts to develop a spreadsheet model for Lander Moose were not successful. In the absence of an accurate, or even usable, population estimate for the Lander Moose Herd Unit, a change to an alternative objective was necessary. Mid-winter trend counts, collected as classification

survey data were deemed the best alternative, and seem to be a reliable trend indicator as we fly all available winter ranges annually. Therefore, the management objective was changed in 2013 to a trend count of 225 moose (range of 180-270 moose). In all, 113 moose were counted in the Lander Herd Unit in 2014/15 trend counts, providing a 3-year running average of 120 moose.

Field Data

Moose winter range trend count/classification surveys were conducted in combination with elk and deer classifications, using a Bell Jet Ranger helicopter along the Sweetwater River and major streams along the southern Wind River mountains. Personnel from the Pinedale Region flew Area 30 west of the Sweetwater River with Savage Air’s Bell 47 Soloy helicopter. Most moose in Area 2 were observed in traditional willow riparian areas or aspen stands. However, due to very light snow cover in most of Area 2 and increasing winds affecting flight safety, we did not observe as many moose as we anticipated in several locations, particularly in the Middle Popo Agie drainage, Maxon Basin, and Pass Creek burn areas. The Area 2 classification sample of 91 moose was 50% above the 2013 sample, but remains below the average of 96 moose since 2004 (range 60-145). The observed post-season calf/cow ratio of 33J/100F was just below the previous 5-year herd unit average and the observed bull/cow ratio of 49M/100F was the lowest since 2010 (Figure 1). Due to a sizeable increase in the number of cows in the sample, both ratios fluctuated more widely than did the actual number of calves or bulls. This is a common issue for this herd unit, with very low sample sizes even in “good” years.

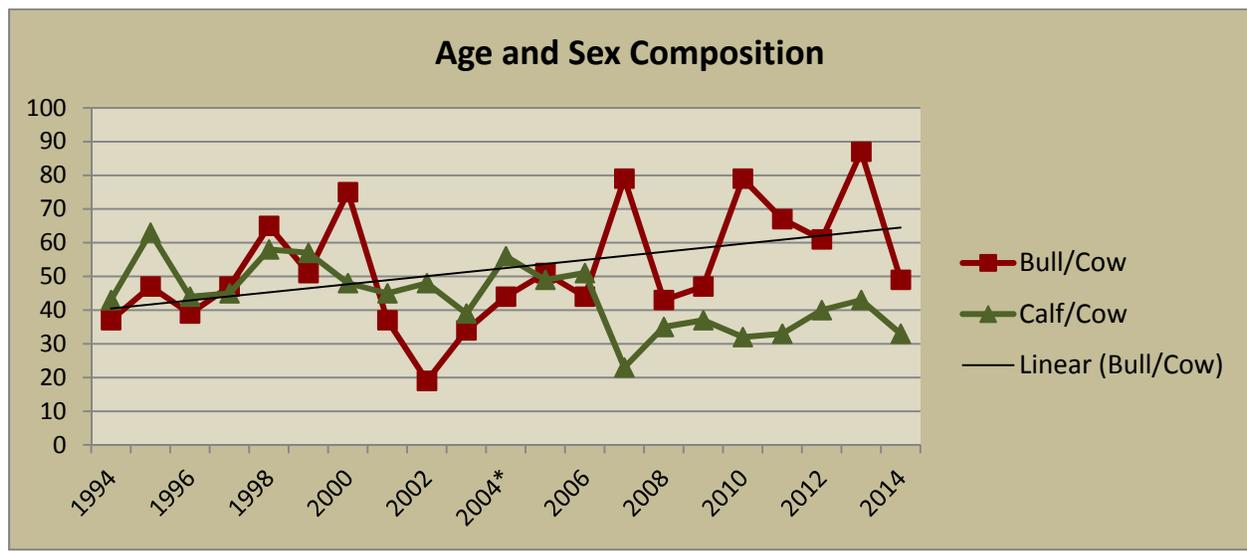


Figure 1. Age and sex composition for Lander Moose, 1994 – 2014.

Weather/Habitat

Drought conditions were extreme to exceptional for most of 2011-13, 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 Lander Moose 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 inhibited production in herbaceous and shrub species across the Lander herd unit, although some improvement over 2012 conditions was noted. 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. Although winter 2013-14 had lower than average snowfall, the increase in soil moisture from the fall 2013 precipitation carried over into spring and was followed by good rainfall throughout most of the herd unit over summer 2014, leading to improvement in vegetation condition. Winter 2014-15 was fairly mild, with above average temperatures and slightly below average snowfall/precipitation. Precipitation from April 1 through early May 2015 has been above average in Lander, and ahead of last year’s pace. We anticipate habitat conditions will continue to improve as a result.

Future management of Lander Moose will also include evaluation and monitoring of habitat conditions on key moose winter ranges. Willow transects were measured in fall 2013, to attempt gauging moose winter habitat use and condition. A modified live/dead (LD) index was initiated at 2 of the transect sites previously monitored by Hanna, et al. (1989). However, the amount of time required to conduct the modified LD monitoring seems excessive and alternatives are being considered. Additional transects will be established to detect winter habitat use in areas such as the Pass Creek Burn of 2002 and elsewhere if necessitated by recent updates to seasonal ranges. Habitat management and monitoring strategies are being deliberated by the Department’s Moose Working Group, and we are awaiting direction from them before moving forward with establishing transects. In the absence of specific vegetation monitoring, we will visit several old monitoring locations in 2015 and establish photo points, as well as at selected new locations.

Harvest Data

Hunter success was only 80% in 2014, but average age and antler width of harvested bulls, along with numbers of moose reported by moose and elk hunters, has generally improved over recent years, especially in Hunt Area 2. In 2014, ten hunters harvested 8 moose (5 in Area 2 and only 3 in Area 30), and the number of days per moose harvested increased to 16.1 days, 4 days longer than the previous 5-year average. Possibly due to more time spent in the field by each hunter, the number of moose observed by hunters increased from 80 in 2013 to 126 in 2014, with 86 seen in Area 2 and 40 in Area 30. At least one unsuccessful hunter from Area 30 reported not harvesting a bull, due to his own choice to find a large moose. No hunters from Area 30 reported hunting or harvesting moose in November in Area 2, despite that option being available.

According to the tooth aging report, teeth were submitted from 6 of the 8 harvested bull moose, with one set the lab was unable to age. The average age of 5 harvested bulls via cementum annuli was 5 years (range 2 – 10 years). This was identical to the 2013 season, and higher than that of several prior hunting seasons. Antler width averaged 35 inches (range 14 – 45 inches) for the 6 moose from which we received width measurements.

Management Summary

Hunting seasons remain conservative in 2015 with 5 Type 1 Antlered Moose licenses in Hunt Area 2 and with 5 Type 1 licenses in Hunt Area 30. The bull/cow ratio has been increasing in recent years, but experienced a steep decline this year. Also, calf/cow ratios remain low (average of 36/100 since 2006, range 32 – 51) and with lower trend counts, we don't believe this population can yet sustain an increase in bull harvest. Hunter success has averaged less than 80% in the past several years, in spite of increases in bull/cow ratios.

Given relatively poor detection of moose, it is likely the actual number of moose is much higher than that observed in the 2014 classification/trend survey. Regardless, the population appears to be experiencing an increasing trend since 2004 (Figure 2). However, decreasing counts since 2010 cause concern this population may once again be declining. Nonetheless, even with marginal flying and observation conditions, the 2014 trend count was slightly higher than in 2013.

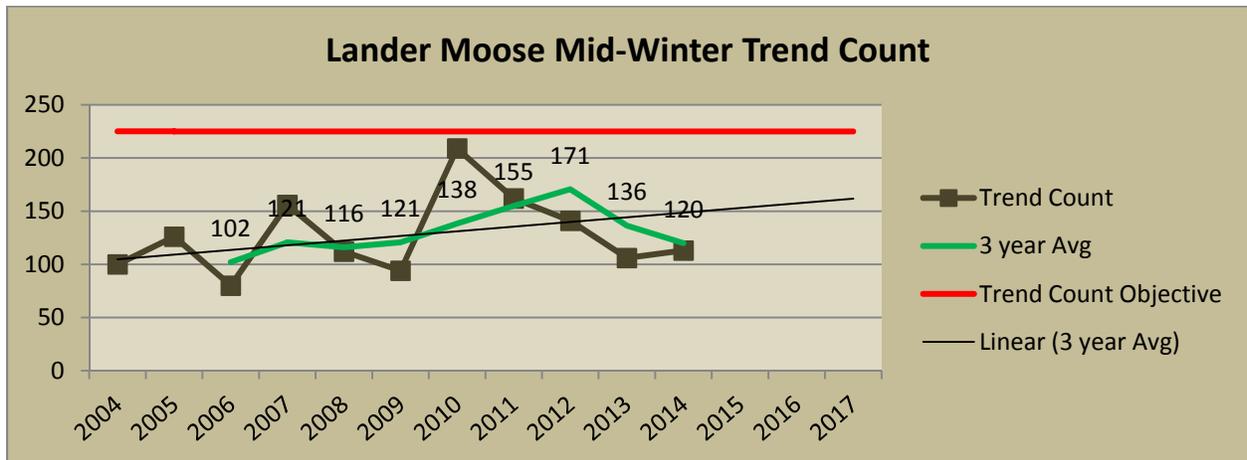
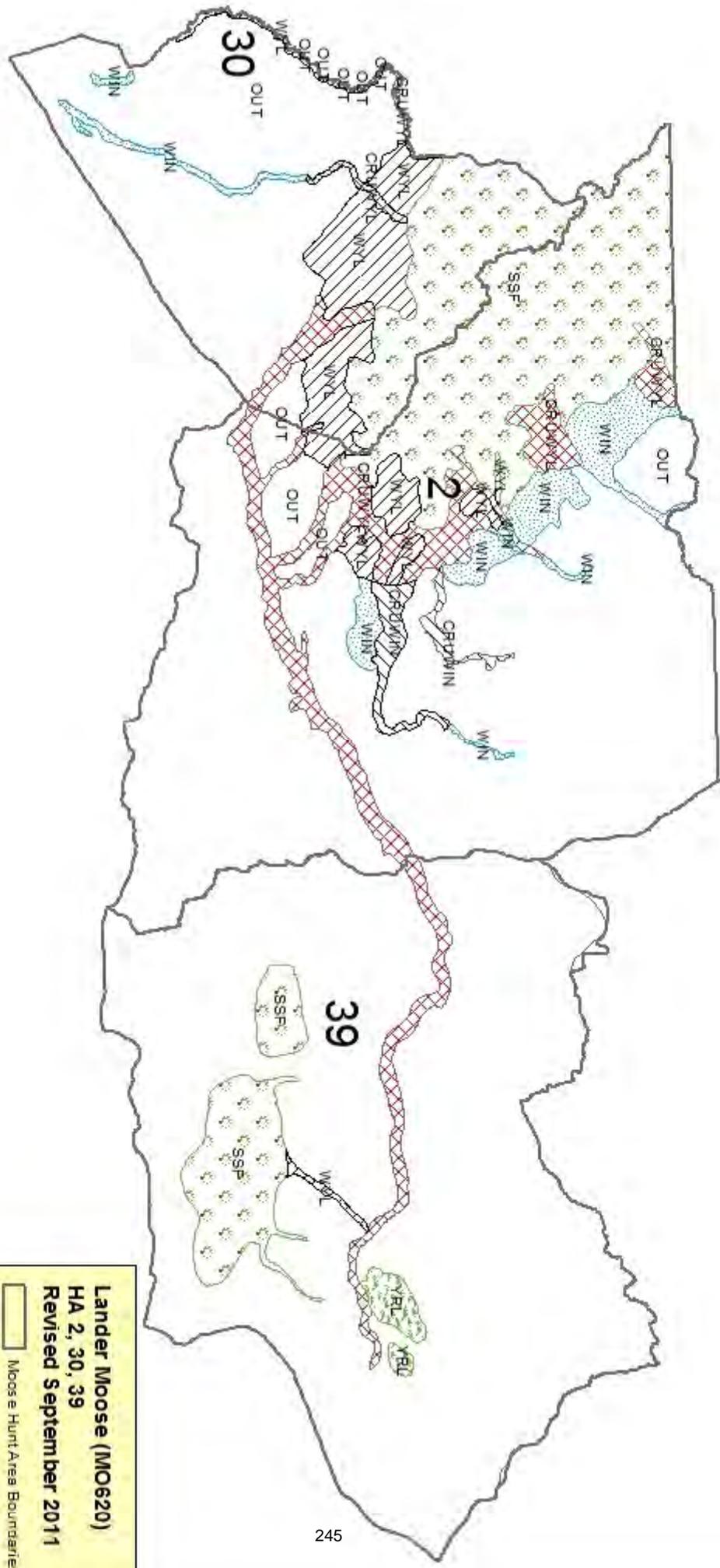


Figure 2. Mid-winter trend count data for Lander Moose (2004-2014) with projected trend through 2017 based on 3-year running average.

In response to hunters reporting difficulty in finding and harvesting moose in Area 30 in recent years, Area 30 hunters will continue to be allowed to hunt in Area 2 after November 1, if they are unsuccessful in Area 30 during October. This was done the past 2 seasons, but none of the Area 30 hunters have reported hunting or harvesting moose in Area 2.

The 2015 seasons should provide a quality experience for moose hunters and improved hunter statistics. We expect hunter success to be 100%, resulting in a harvest of 10 bulls.



Lander Moose (MO620)
HA 2, 30, 39
Revised September 2011

	Moose Hunt Area Boundaries
	Moose Seasonal Range
	CRUWIN
	CRUWYL
	OUT
	SSP
	WIN
	WYL
	YRL

2014 - JCR Evaluation Form

SPECIES: Moose
 HERD: MO621 - DUBOIS
 HUNT AREAS: 6

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

 PREPARED BY: GREG
 ANDERSON

	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	0	N/A	N/A
Harvest:	5	5	5
Hunters:	5	5	5
Hunter Success:	100%	100%	100 %
Active Licenses:	5	5	5
Active License Success:	100%	100%	100 %
Recreation Days:	36	78	65
Days Per Animal:	7.2	15.6	13
Males per 100 Females	0	0	
Juveniles per 100 Females	0	0	

Population Objective (± 20%) : 400 (320 - 480)
 Management Strategy: Special
 Percent population is above (+) or below (-) objective: N/A%
 Number of years population has been + or - objective in recent trend: 0
 Model Date: 1/1/2015

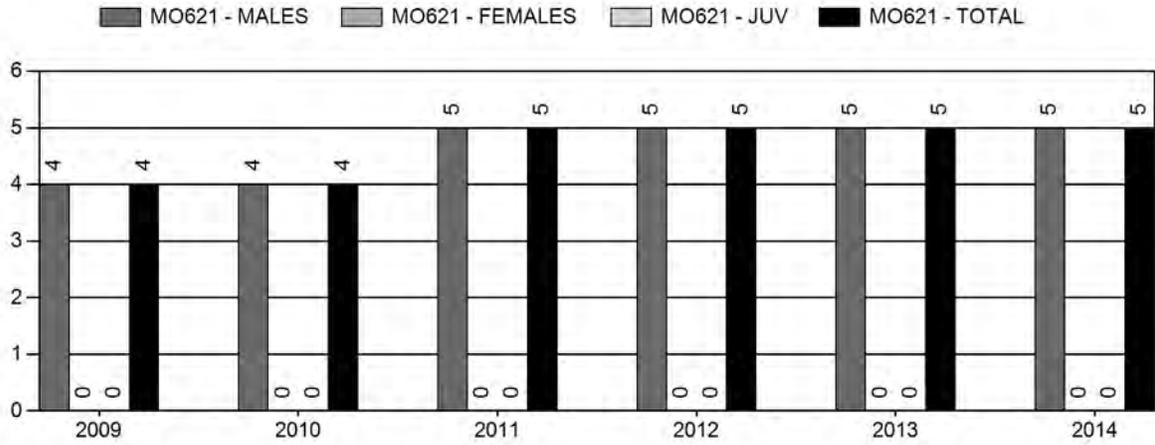
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	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%

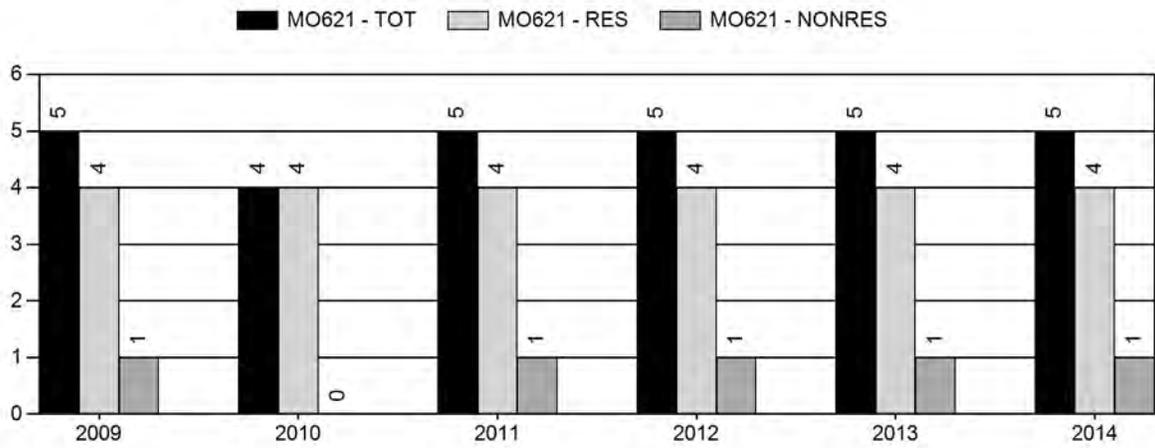
Population Size - Postseason



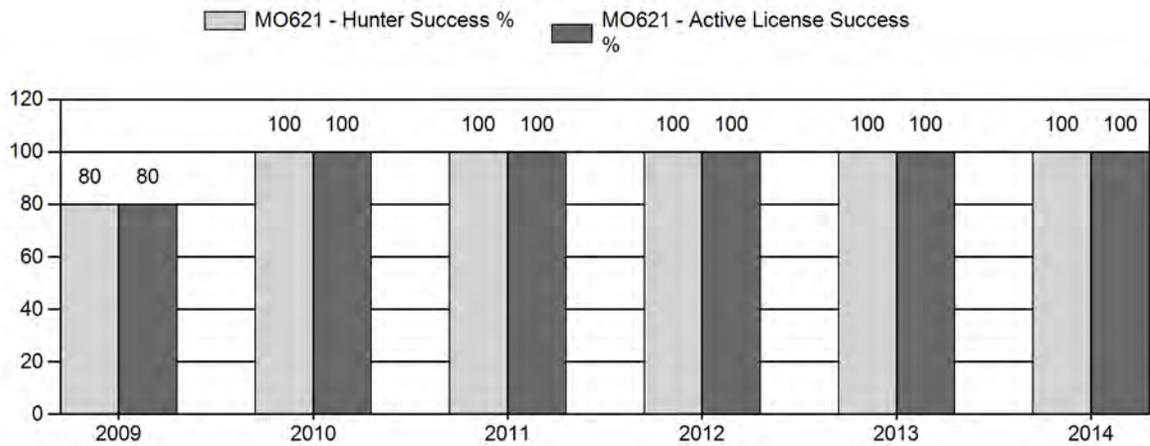
Harvest



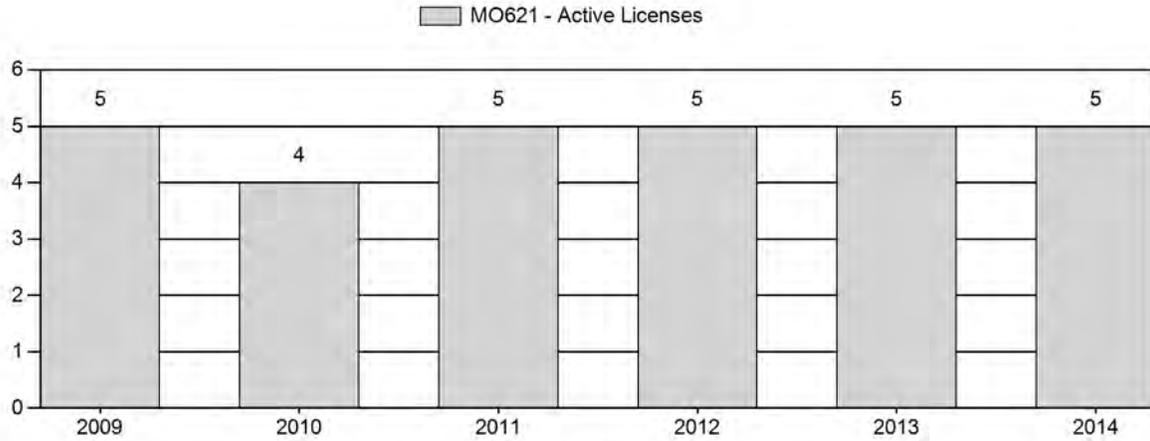
Number of Hunters



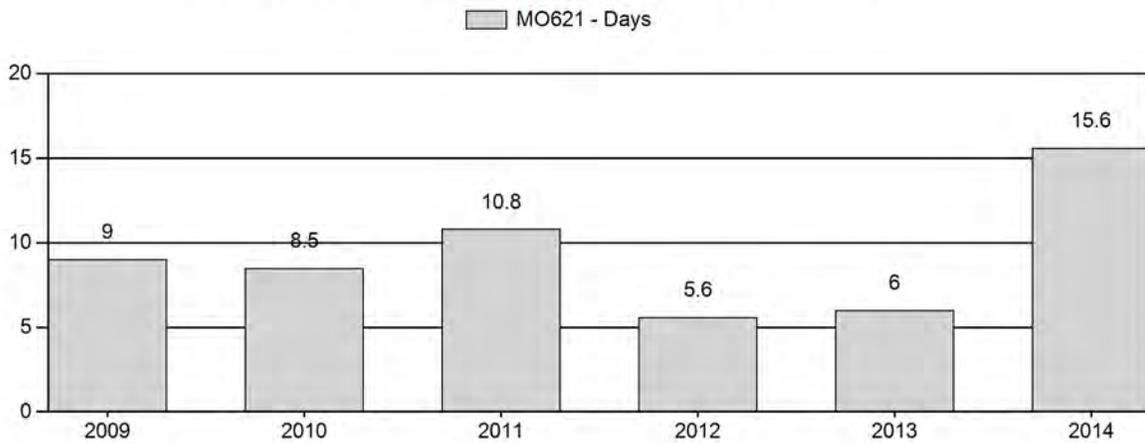
Harvest Success



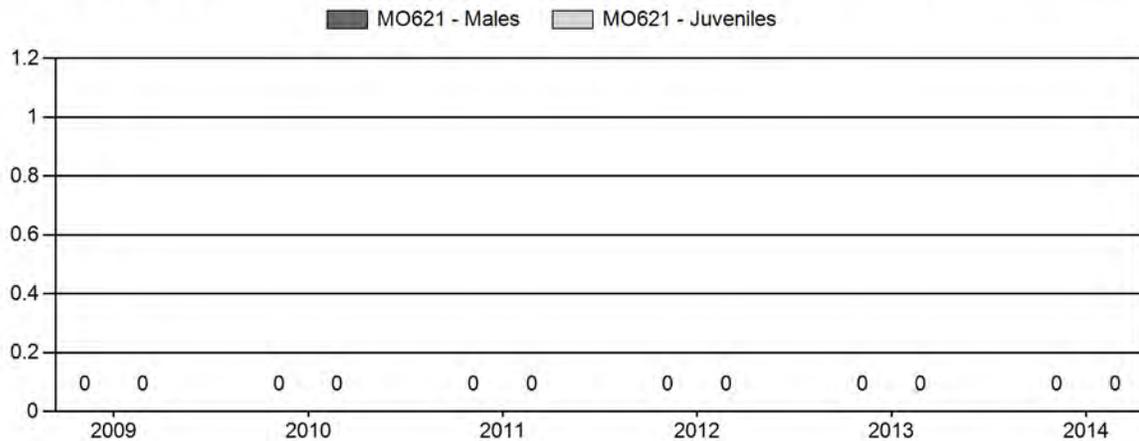
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



**2015 HUNTING SEASONS
DUBOIS MOOSE (MO 621)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
6	1	Oct. 1	Nov. 20	5	Limited quota; antlered moose
Archery		Sep. 1	Sep. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
6		
Total		

Management Evaluation

Current Management Objective: 400

Management Strategy: Special

2014 Postseason Population Estimate: unknown

2015 Proposed Postseason Population Estimate: unknown

Management Issues

The Dubois moose herd has a postseason population size objective of 400 and a special management designation. The objective has been in place since 1994. Despite having a numerical objective, the herd has never been modeled effectively and no model has been constructed over the past 10 years due to the lack of demographic data. Given the low density of moose in the herd unit, managers stopped collecting demographic data over the past several years due to costs relative to the amount of data collected. To maintain a small amount of data useful in analyzing long term population trends, managers began collecting winter count data on 5 select wintering sites in the herd unit in January, 2015.

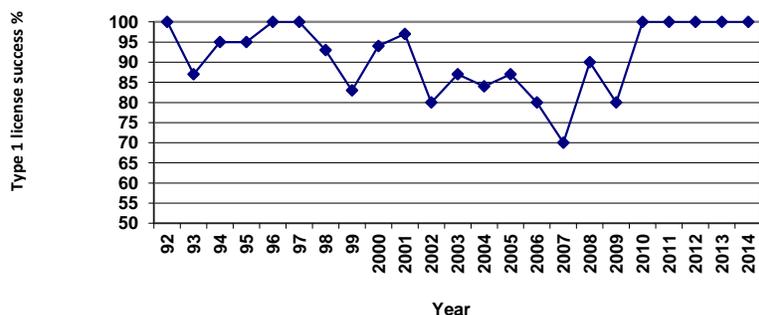
Habitat/Weather

No specific data regarding moose habitat is collected within this herd unit on an annual basis. Vegetation monitoring transects on both sheep and elk winter range indicated herbaceous vegetation production was quite good in 2014. Good moisture and growing conditions should have resulted in high feed production for moose on both low elevation winter sites and mid-elevation summer range. Moose observed throughout winter appeared to be in excellent body condition. It is likely this population has been and will continue to be impacted by large tracts of beetle killed timber across the herd unit. The effects of this natural successional change on moose in this herd unit should manifest themselves over the next decade.

Harvest Data/Population

Anecdotal evidence suggests this population declined significantly over the past decade. As the population declined it became progressively more difficult and expensive to collect a reasonable amount of demographic data. Concurrently, harvest pressure was reduced and the small amount of harvest data collected annually became less useful for making management decisions. The Department has not actively managed this herd based on the postseason population size objective for a number of years due to the lack of demographic data and the cost prohibitive nature of collecting an appropriate amount of classification data. Instead, personnel have used anecdotal information as well as Type 1 license success data to formulate hunt season recommendations. For the past 5 years recreational opportunity has been provided by issuing 5 Type 1 licenses annually. The reduction to 5 Type 1 licenses occurred in 2009 in response to declining success on over the previous decade (Fig. 1). Success on the Type 1 licenses has been 100% each of the last 5 years including 2014.

Figure 1. Type 1 license success in the Dubois Moose Herd



In January, 2015, personnel began counting moose at five distinct wintering areas within this herd unit (Table 1). In theory, these counts will provide a useful year-to-year comparison in the future. Significant population changes should be evident based on the presence of more or less moose at these sites.

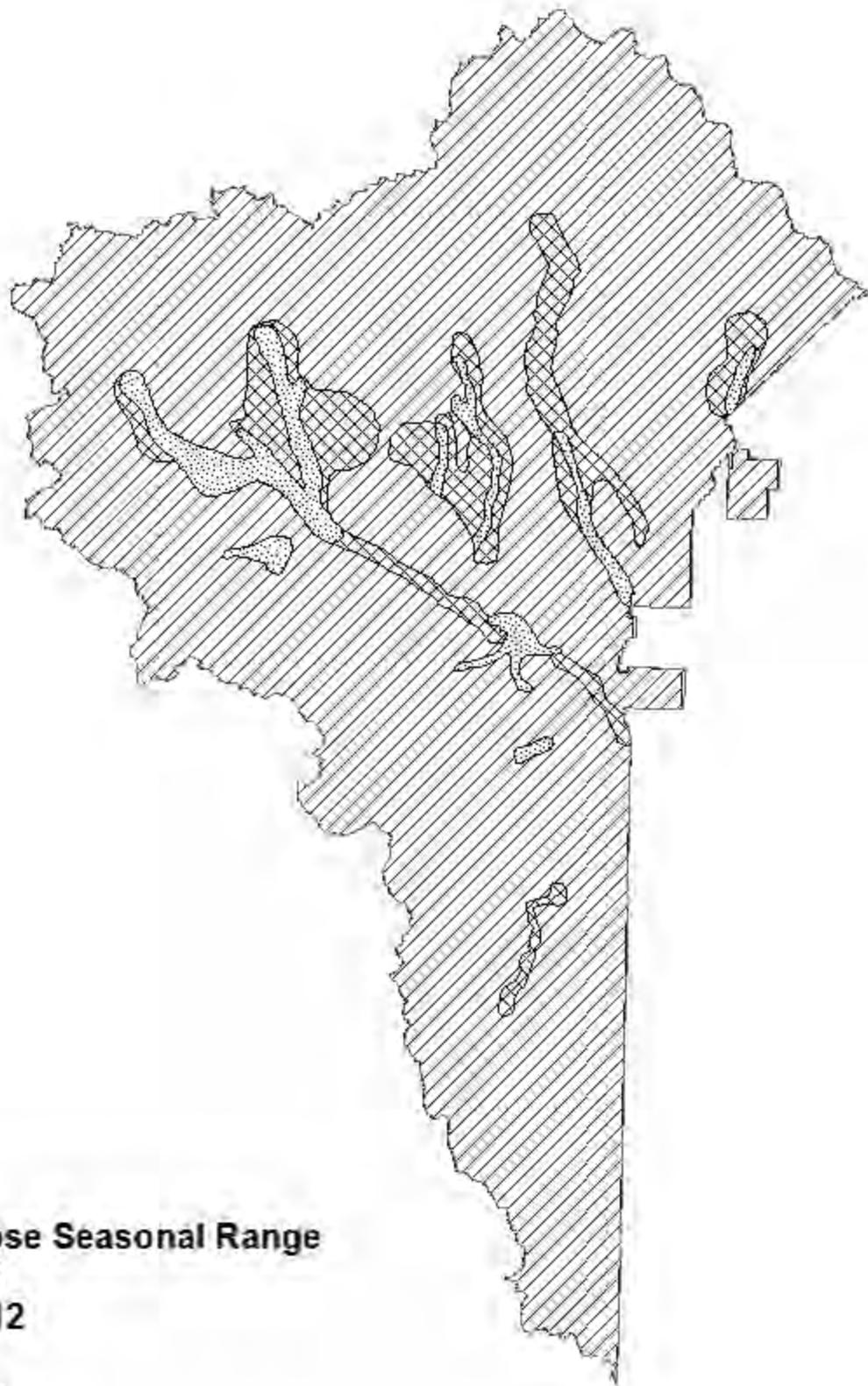
Table 1. Moose numbers at select wintering sites in the Dubois Moose Herd.

Location	2015
East Fork Basin	6
Lower Horse Creek	3
Double Cabin	2
Upper Dunoir	10
Upper Wind River	8
Total	29

Management Summary

While hunter success has been high the past 5 years, there is no indication the moose population increased dramatically. A significant population increase should be indicated by greater moose numbers on key, highly visible winter ranges throughout the herd unit. Several years of data collection at the sites listed in Table 1 should provide some anecdotal information on the moose

population in the area. Given no good information suggesting population growth in this herd unit, the 2015 hunt season will remain unchanged with the issuance of 5 Type 1 licenses.



**Dubois Moose Seasonal Range
Hunt Area 6
Revised 2012**

-  CRUWYL
-  SSF
-  WYL



2014 - JCR Evaluation Form

SPECIES: Bighorn Sheep

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

HERD: BS609 - WHISKEY MOUNTAIN

HUNT AREAS: 8-10, 23

PREPARED BY: GREG
ANDERSON

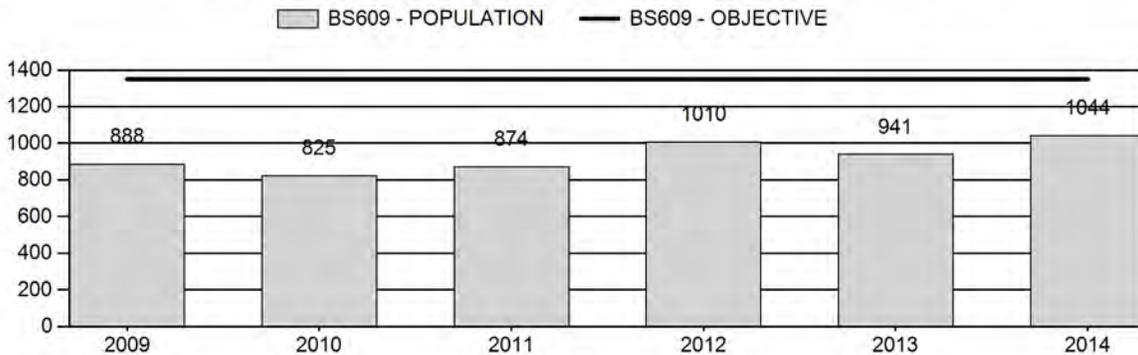
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	908	1,044	1,000
Harvest:	14	15	15
Hunters:	24	23	24
Hunter Success:	58%	65%	62%
Active Licenses:	24	23	24
Active License Success:	58%	65%	62%
Recreation Days:	215	203	210
Days Per Animal:	15.4	13.5	14
Males per 100 Females	40	59	
Juveniles per 100 Females	29	36	

Population Objective (± 20%) : 1350 (1080 - 1620)
 Management Strategy: Special
 Percent population is above (+) or below (-) objective: -22.7%
 Number of years population has been + or - objective in recent trend: 10
 Model Date: 02/17/2015

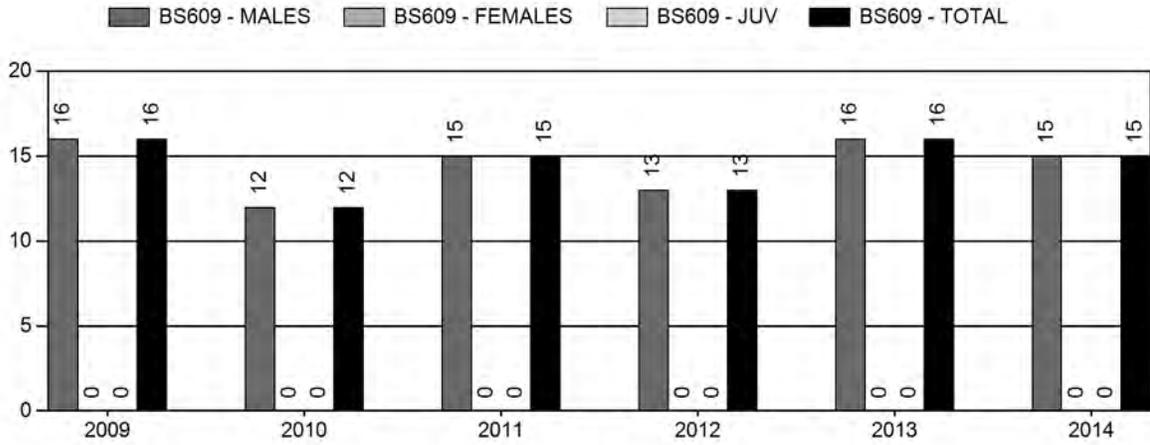
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	6%	6%
Juveniles (< 1 year old):	0%	0%
Total:	1%	1%
Proposed change in post-season population:	0%	-4%

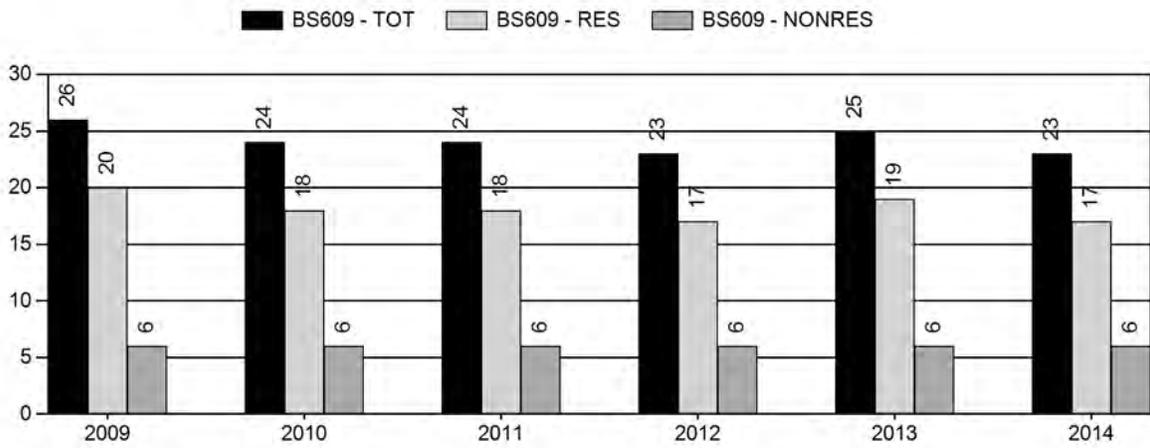
Population Size - Postseason



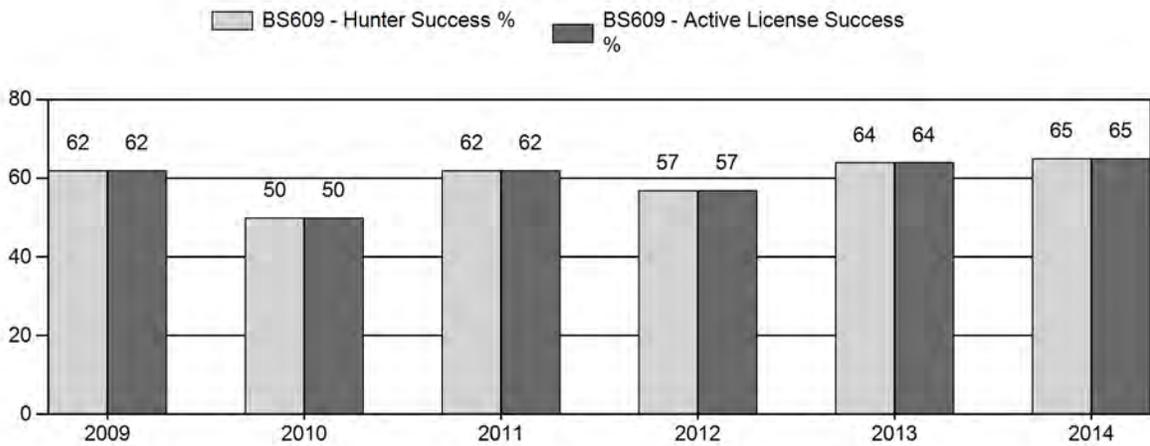
Harvest



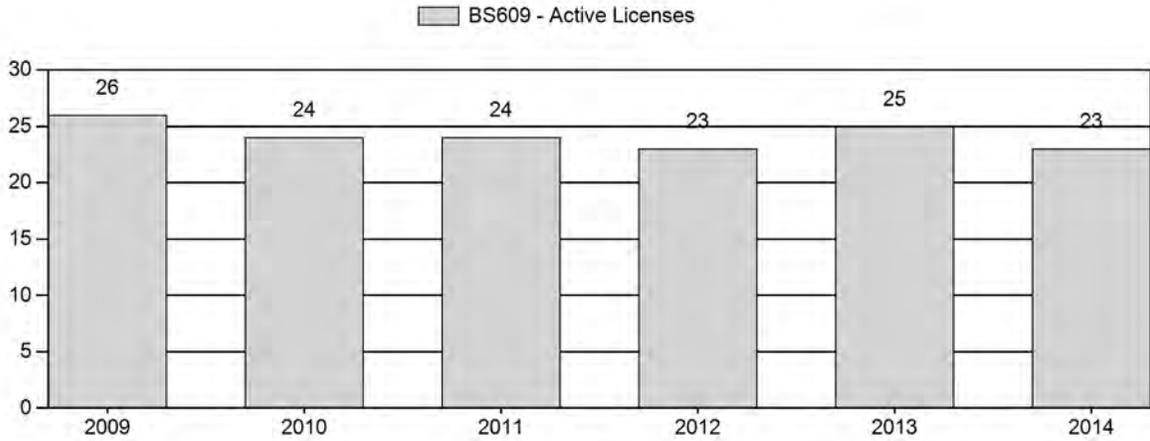
Number of Hunters



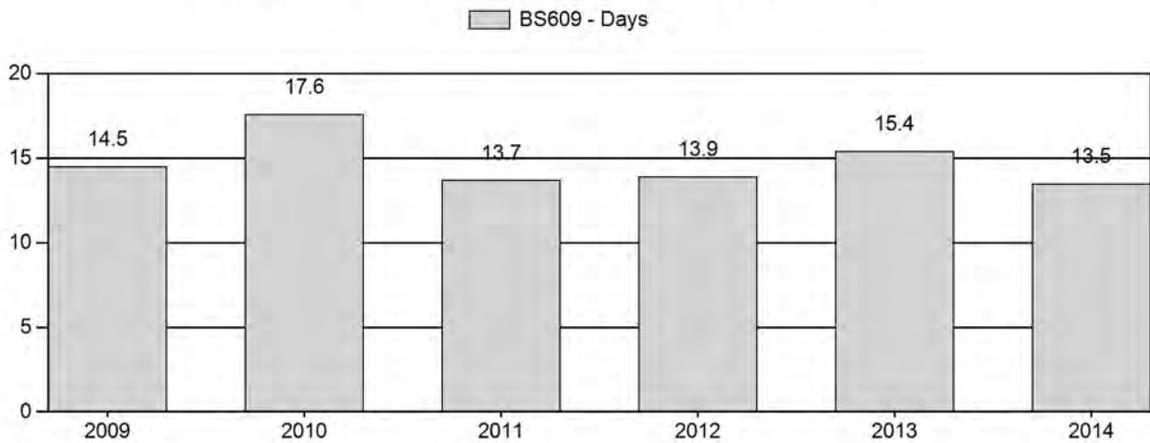
Harvest Success



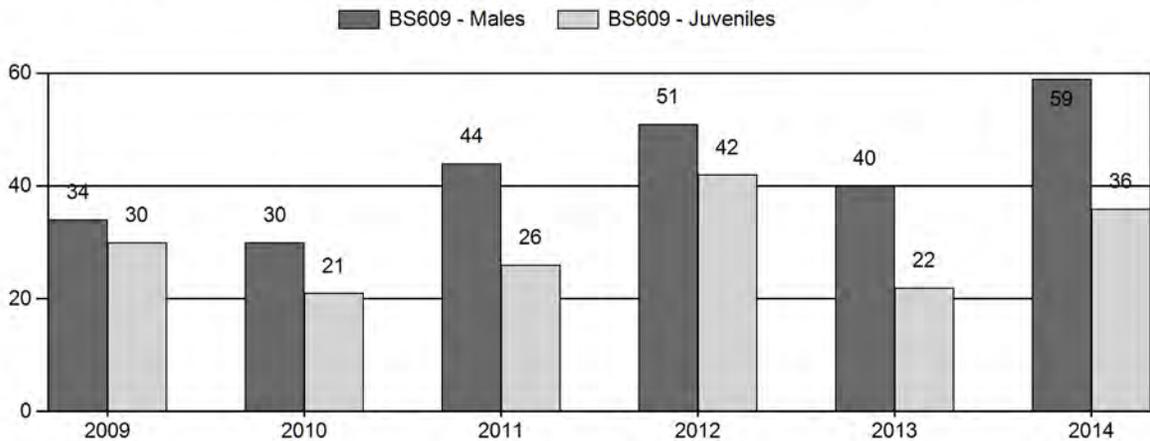
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Bighorn Sheep Herd BS609 - WHISKEY MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	888	1	26	119	21%	348	61%	106	18%	573	264	0	7	34	± 3	30	± 3	23
2010	825	0	0	77	20%	255	66%	53	14%	385	240	0	0	30	± 4	21	± 3	16
2011	874	15	83	98	26%	223	59%	58	15%	379	328	7	37	44	± 5	26	± 4	18
2012	1,010	14	149	163	26%	320	52%	133	22%	616	496	4	47	51	± 4	42	± 3	28
2013	941	16	79	95	24%	240	62%	53	14%	388	365	7	33	40	± 5	22	± 3	16
2014	1,044	16	111	127	30%	215	51%	78	19%	420	559	7	52	59	± 7	36	± 5	23

**2015 HUNTING SEASONS
WHISKEY MOUNTAIN BIGHORN SHEEP (BS 609)**

Hunt Area	Type	Season Dates		Quota	Limitations
		Opens	Closes		
8, 23	1	Sep. 1	Oct. 15	12	Limited quota; any ram
9	1	Aug. 15	Oct. 15	4	Limited quota; any ram
10	1	Aug. 15	Oct. 15	8	Limited quota; any ram
Archery					
8, 23		Aug. 15	Aug. 31		Limited quota; refer to license type
9		Aug. 1	Aug. 14		Limited quota; refer to license type
10		Aug. 1	Aug. 14		Limited quota; refer to license type

Hunt Area	Type	Quota change from 2014
Total		

Management Evaluation

Current Management Objective: 1,350

Management Strategy: Special

2014 Postseason Population Estimate: ~1,000

2015 Proposed Postseason Population Estimate: ~1,000

Management Issues

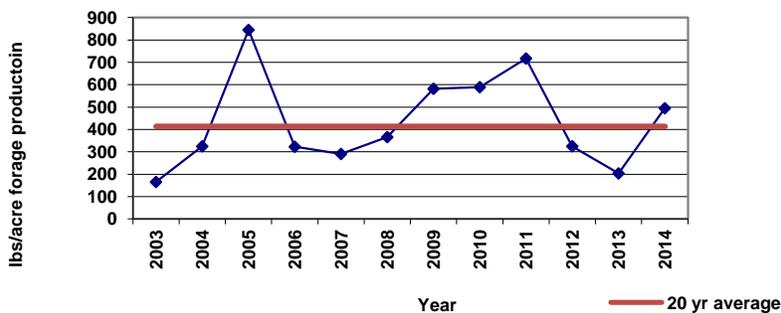
The post-season population objective for this herd is 1,350 sheep and it is classified as special management. The current objective was originally adopted in 2002. In 2013 the Department conducted an objective evaluation and review including a public meeting. The objective was left at 1,350 following the 2013 review. The herd has been below objective for over two decades following a catastrophic, all-age pneumonia die-off in 1991. The population continues to languish below objective primarily due to low recruitment associated with persistent lamb pneumonia. The Department collected blood samples from 47 sheep in 2012 and 22 sheep in 2014 to document the presence and frequency of various pathogens (see Appendix I for a summary of the 2014 results).

Habitat/Weather

The Whiskey Mountain bighorn sheep herd occupies the northern Wind River Mountain Range. The majority of sheep winter at sites located along the very northern tip of the Wind River Mountains. Some sheep winter at high elevation along the continental divide and scattered throughout the west slope of the mountains. Sheep disperse from the wintering sites to populate the entire northern portion of the Wind River Mountains in the summer and fall. Much of the sheep habitat is located in wilderness areas and remains undisturbed. Important winter range sites in the upper Wind River Valley are part of the Department's Whiskey Mountain WHMA and are also relatively undisturbed.

Despite protection from development and disturbance, the condition of key winter range throughout this herd unit is still subject to change based on environmental conditions. In 2012 and 2013, sheep range throughout the herd unit was impacted by extreme drought. Casual observations both years suggest vegetation production was quite low at high elevation summer range. Based on data from vegetation monitoring transects, herbaceous production on winter range in both 2012 and 2013 was well below average for the area (Fig. 1). In contrast to the previous 2 years, vegetation production throughout the herd unit was quite good in 2014. Average production across all monitoring sites on winter range was 495 lbs/acre and above the 20 year average of 413 lbs/acre. Again, based on casual observations, it appeared forage production was also good at high elevation summer range sites. Body condition of sheep entering winter appeared to be very good.

Figure 1. Annual, herbaceous forage production on bighorn sheep winter range



Field/Harvest Data/Population

Lamb recruitment was outstanding for this population with a lamb/ewe ratio of 36/100 in 2014 (Fig. 2). The high lamb/ewe ratio can be attributed at least in part to the excellent forage conditions throughout the year. Although low lamb recruitment has been a persistent problem in this herd, the lamb/ewe ratio for 5 of the last 10 years has been above 25/100. Average recruitment is still well below the levels typically seen prior to the 1990-91 pneumonia die-off

but the herd has had 2 good recruitment years in the last 3. Despite low recruitment for much of the last 20 years, the ram/ewe ratio has remained fairly stable over that time period. Since 2011 the ram/ewe ratio steadily increased and peaked at 59/100 in 2014 (Fig. 3). The higher ram/ewe ratios over the last several years can in part be attributed to good recruitment in both 2009 and 2012.

A population model developed in 2012 behaved predictably with the addition of data in 2013 and 2014. For 2014, the TSJ/CA version of the model was selected to track the population. While this model had a higher AIC value than 2 other models, it was the only version to produce reasonable population estimates. Both the CJ/CA and SCJ/SCA models produce estimates of less than 500 sheep annually for the past 10 years and show a declining population. Many of the estimates produced by these 2 models are well below the number of sheep personnel classified on a given year. Indications are the TSJ/CA model does a fair job of simulating the population. The model simulates a long, steady decline in the sheep population from the late 1990's through 2010. The population then increased in 2012 following a good recruitment year. Overall, the model indicates the population has been stable over the past 4 years. The 2014 population estimate is approximately 1,000 sheep.

Harvest success in the herd unit was 65% in 2014 which was nearly identical to success of 64% in 2013. This included success rates of 75% in hunt area 9, 88% in hunt area 10, and 45% in hunt areas 8/23. Area 9 success was significantly higher than it has been over the past several years, but success rates in the other areas were close to 2013 rates. The average age of rams harvested did change in each hunt area in 2014 but none of the changes are indicative of any demographic trends (Fig. 4). The most notable change is the significant decline in age of harvested rams in hunt area 9. On closer inspection, this decline is due to the fact only 1 ram was killed in each of 2012 and 2013. Both were older rams, thus the high age of harvest for those years. The average age of 6 for rams harvested in 2014 is well within the historic range for this area. Areas 10, 8/23 saw minor decreases and increases in average harvest age respectively. Neither change is remarkable as the average harvest age for these areas is within the historical range.

Figure 2. Ten-year recruitment history in the Whiskey Mountain Bighorn Sheep Herd

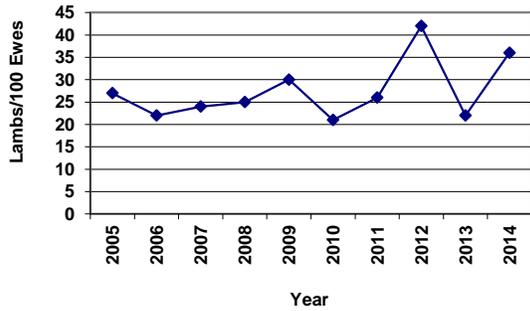


Figure 3. Ten-year history of the ram/ewe ratio in the Whiskey Mountain Bighorn Sheep Herd.

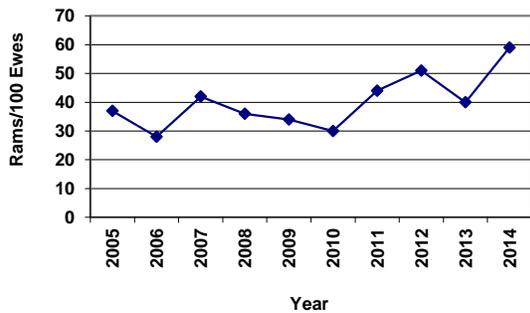
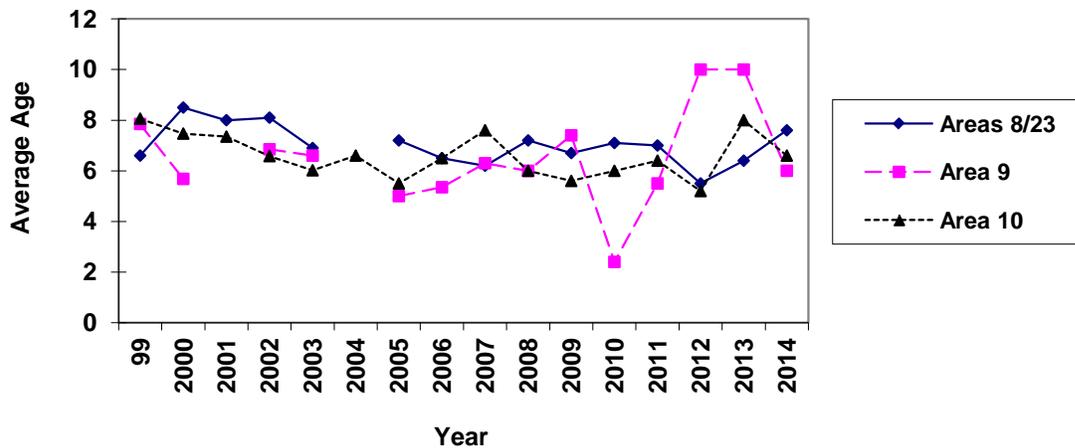


Figure 4. Average age of rams harvested in the Whiskey Mountain Bighorn Sheep Herd.



Management Summary

Overall, indications are there was little demographic change in this population over the past year. This population remains well below objective. Given no indications of significant population

growth, the 2015 hunting season is unchanged. With 24 licenses issued throughout the herd unit, hunters are expected to harvest 15 rams in 2014. The population is expected to remain stable in 2015 at about 1,000 animals.

INPUT	
Species:	Bighorn Sheep
Biologist:	Greg Anderson
Herd Unit & No.:	Whiskey Mountain
Model date:	02/17/15

Clear form

MODELS SUMMARY		Relative AICc	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival	65	56	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	66	56	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	159	37	

Year	Posthunt Population Est. Field Est	Trend Count	Predicted Prehunt Population			Predicted Posthunt Population			Total	Objective	
			Juveniles	Total Males	Females	Juveniles	Total Males	Females			
1993			190	273	724	1186	190	223	724	1137	
1994			161	243	702	1106	161	186	702	1049	
1995			127	243	717	1087	127	217	717	1061	
1996			181	250	709	1141	181	223	709	1113	
1997			197	286	732	1216	197	258	732	1188	
1998			136	279	714	1130	136	249	714	1100	
1999			201	271	698	1170	201	241	698	1140	
2000			112	268	687	1067	112	232	687	1031	
2001			109	235	653	996	109	204	653	965	
2002			63	209	621	893	63	181	621	865	
2003			154	194	598	946	154	169	598	921	
2004			164	186	580	930	164	166	580	910	
2005			159	208	587	954	159	191	587	937	
2006			125	207	571	903	125	186	571	882	
2007			140	227	580	947	140	205	580	925	
2008			142	216	560	919	142	201	560	903	
2009			165	213	543	921	165	195	543	903	
2010			110	212	531	854	110	199	531	841	
2011			140	232	537	909	140	216	537	893	
2012			231	261	556	1048	231	247	556	1034	
2013			123	273	552	952	123	255	556	934	
2014			205	289	566	1061	205	273	566	1044	
2015			164	291	561	1016	164	275	561	1000	
2016											
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											

Survival and Initial Population Estimates

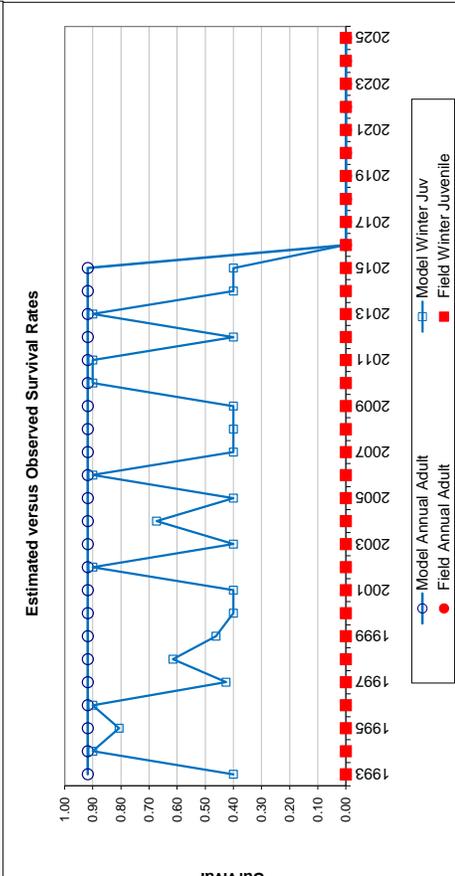
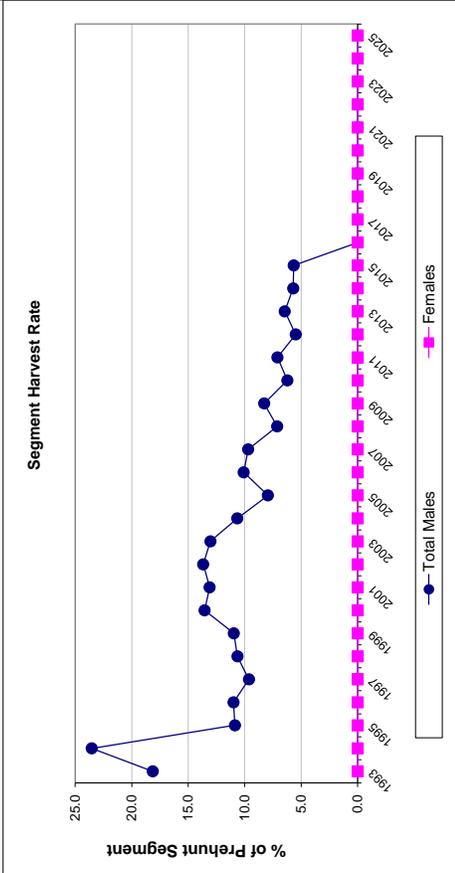
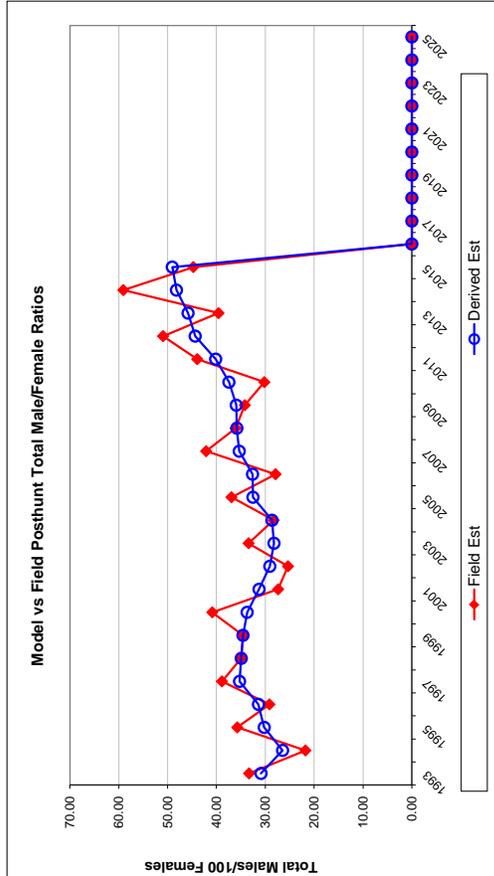
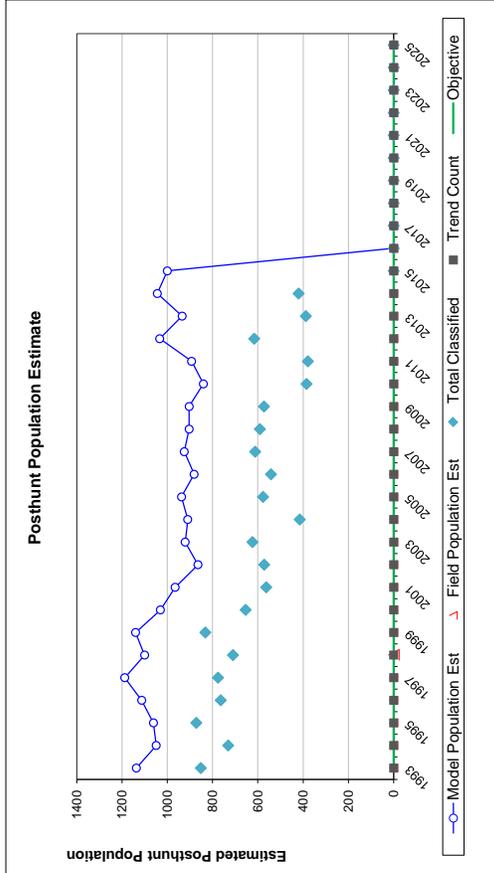
Year	Winter Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.40		0.92	
1994	0.90		0.92	
1995	0.81		0.92	
1996	0.90		0.92	
1997	0.43		0.92	
1998	0.61		0.92	
1999	0.46		0.92	
2000	0.40		0.92	
2001	0.40		0.92	
2002	0.90		0.92	
2003	0.40		0.92	
2004	0.67		0.92	
2005	0.40		0.92	
2006	0.90		0.92	
2007	0.40		0.92	
2008	0.40		0.92	
2009	0.40		0.92	
2010	0.90		0.92	
2011	0.90		0.92	
2012	0.40		0.92	
2013	0.90		0.92	
2014	0.40		0.92	
2015	0.40		0.92	
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.918
Initial Total Male Pop/10,000 =	0.022
Initial Female Pop/10,000 =	0.072

MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

Year	Classification Counts				Harvest								
	Juvenile/Female Ratio		Total Male/Female Ratio		Segment Harvest Rate (% of Prehunt Segment)		Total Males	Females					
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE	Juv	Yri males	2+ Males	Females	Total Harvest		
1993		26.22	2.49	30.87	33.33	2.88	0	0	45	0	45	18.1	0.0
1994		22.97	2.37	26.46	21.78	2.29	0	0	52	0	52	23.5	0.0
1995		17.78	1.92	30.22	35.74	2.92	0	0	24	0	24	10.9	0.0
1996		25.51	2.55	31.40	29.15	2.76	0	0	25	0	25	11.0	0.0
1997		26.92	2.70	35.27	38.89	3.40	0	0	25	0	25	9.6	0.0
1998		19.09	2.22	34.92	34.92	3.20	0	0	27	0	27	10.6	0.0
1999		28.88	2.70	34.58	34.58	3.02	0	0	27	0	27	11.0	0.0
2000		16.35	2.14	33.72	40.87	3.72	0	0	33	0	33	13.6	0.0
2001		16.62	2.23	31.29	27.37	2.99	0	0	28	0	28	13.1	0.0
2002		10.19	1.63	29.08	25.36	2.74	0	0	26	0	26	13.7	0.0
2003		25.77	2.88	28.23	33.42	3.37	0	0	23	0	23	13.0	0.0
2004		28.30	3.70	28.63	28.30	3.70	0	0	18	0	18	10.7	0.0
2005		26.99	3.12	32.53	36.93	3.79	0	0	15	0	15	7.9	0.0
2006		21.82	2.71	32.62	27.90	3.14	0	0	19	0	19	10.1	0.0
2007		24.18	2.86	35.34	42.12	4.03	0	0	20	0	20	9.7	0.0
2008		25.41	2.95	35.83	36.07	3.66	0	0	14	0	14	7.1	0.0
2009		30.46	3.38	35.95	34.20	3.63	0	0	16	0	16	8.3	0.0
2010		20.78	3.14	37.45	30.20	3.93	1	1	11	0	12	6.2	0.0
2011		26.01	3.83	40.17	43.95	5.33	0	0	15	0	15	7.1	0.0
2012		41.56	4.29	44.36	50.94	4.90	0	0	13	0	13	5.5	0.0
2013		22.08	3.35	45.82	39.58	4.80	0	0	16	0	16	6.5	0.0
2014		36.28	4.80	48.20	59.07	6.61	0	0	15	0	15	5.7	0.0
2015		29.34	3.88	49.05	44.75	5.11	0	0	15	0	15	5.7	0.0
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

FIGURES



Comments:

END

Appendix I. Results from 2014 sheep disease sampling in Hunt Areas 10 and 22.

In 2014, Department personnel sampled a total of 30 bighorn sheep in the Dubois area. The largest number of biological samples (22 sheep sampled) came from Torrey Rim in conjunction with a trapping operation in the Whiskey Mountain Bighorn Sheep Herd. In addition, Department employees placed GPS collars on five sheep wintering on Dennison Mountain and Spring Mountain. The main purpose for the collars was to track sheep movement in the southern Absaroka mountains over the summer, but blood samples were taken as well. Finally, in March, personnel sampled 3 sheep in the Torrey Rim group with what appeared to be skin lesions caused by scabies. These 3 sheep were darted to check for mites and administer anti-parasite medication. While they were immobilized personnel also took blood samples.

As seen in Table 1, all 30 sheep sampled had *B. trehalosi*. In 2012, 46 of 47 sheep sampled had *B. trehalosi*. Based on this information, it is likely all the sheep sampled in 2012 had this bacteria but the lab was unable to isolate it in one sheep. Clearly this bacteria is ubiquitous in sheep around Dubois. Again, it is likely fairly benign, but the 2 leukotoxic + samples are a concern.

Table 1. Bacteria isolated from samples taken from sheep near Dubois in winter, 2014.

	<i>Bibersteinia trehalosi</i>		<i>Pasturella multocida</i>	<i>Mannheimia spp.</i>		<i>Mycoplasma ovipneumoniae</i>
		leukotoxic +			leukotoxic +	
# of sheep with bacteria	30	2	3	13	12	12

In contrast, *P. multocida* was present at a fairly low level in only 3 of the 30 sheep. This particular bacteria was also present at a very low level in 2012 and found in only 2 of 47 sheep sampled.

Close to 50% of the sheep sampled had a Mannheimia species. As mentioned previously, many researchers have been focusing on *M. haemolytica* in the belief it may be a primary culprit in catastrophic all-age die-offs. It is interesting to note, our lab folks continue to isolate other Mannheimia bacteria in addition to *M. haemolytica*. Speculation is our sheep have *Mannheimia glucosida*, but we do not have the analytical tools to identify this bacteria consistently. In 2012, 1 of the 47 samples was identified to have *M. glucosida*. Of note, 12 of the 13 samples with Mannheimia bacteria were leukotoxic +.

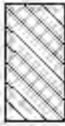
Finally, 12 of 30 sheep sampled had *Mycoplasma ovipneumoniae*. This was a little higher prevalence rate than in 2012 when 14 of 47 sheep were found to be infected.

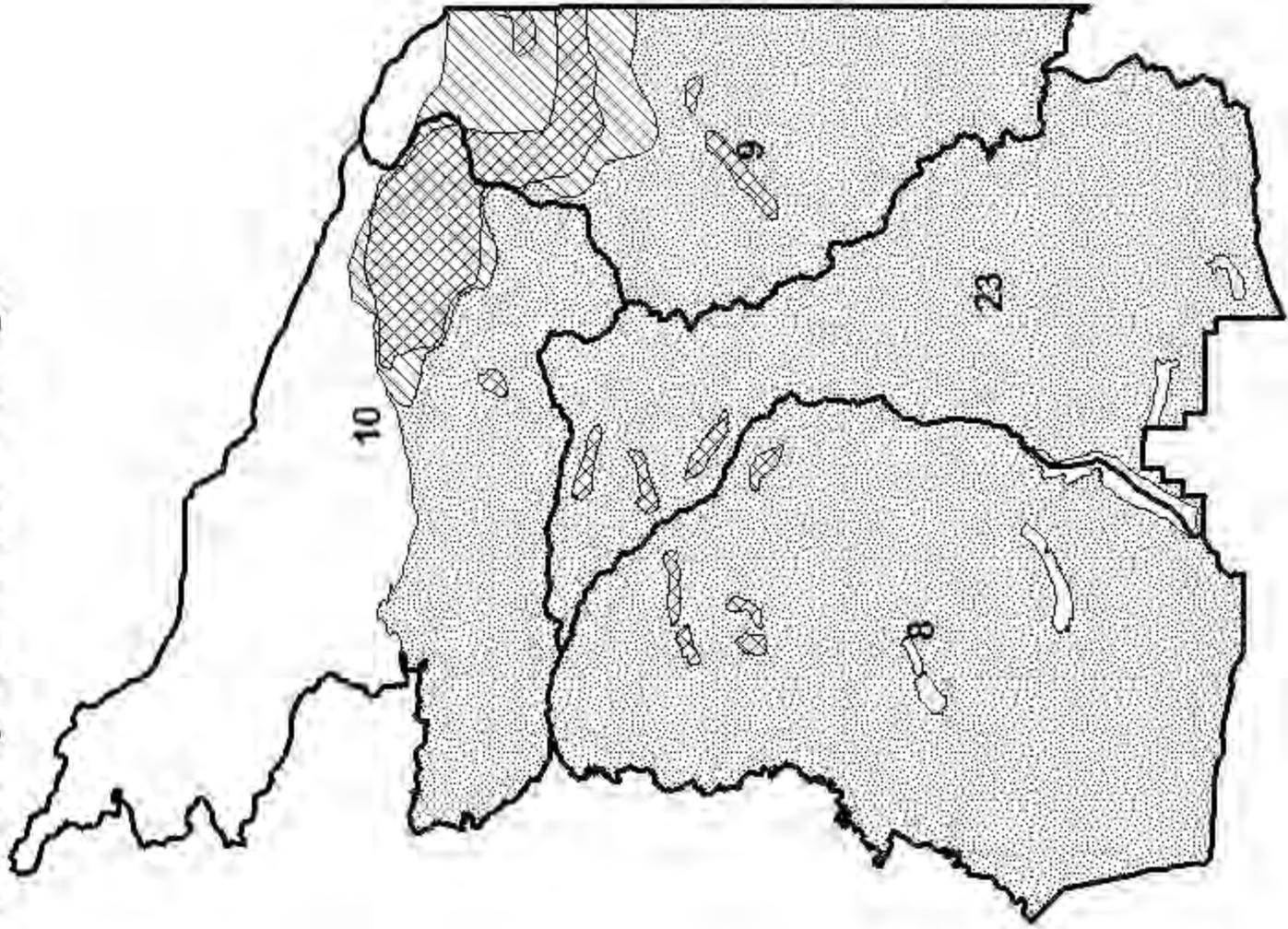
To summarize, the Whiskey Mountain sheep are infected with a number of bacterial pathogens likely connected to pneumonia outbreaks. It appears 2 bacteria of great concern (*Mannheimia spp.* and *Mycoplasma ovipneumoniae*) are present at fairly high levels. Also of note, high levels of *Mannheimia haemolytica* were not found, but it appears we have a different species of Mannheimia present in our sheep. Speculation is our sheep have *M. glucosida*. Of the Mannheimia bacteria present, a fair number appear to be leukotoxic +.

None of this is particularly surprising given the history of the Whiskey Mountain sheep herd. Also, the results from 2014 are fairly similar to those from 2012. The more we know about the prevalence of pathogens in our sheep, the more likely we will be able to identify proactive disease management in the future.

On a positive note, we did not find any Psoroptes mites (scabies) in the sheep that had skin lesions or in any of the sheep we trapped. Our veterinarians are not sure the cause of the lesions but it seems to be affecting only a few animals. Thus we will not have to battle a scabies outbreak in addition to pneumonia over the next year.

**Whiskey Mountain Bighorn Sheep Seasonal Range
Hunt Areas 8, 9, 10, 23
Revised 2012**

-  CRUWYL
-  OUT
-  SSF
-  WYL



2014 - JCR Evaluation Form

SPECIES: Bighorn Sheep

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

HERD: BS615 - FERRIS-SEMINOE

HUNT AREAS: 17, 26

PREPARED BY: GREG HIATT

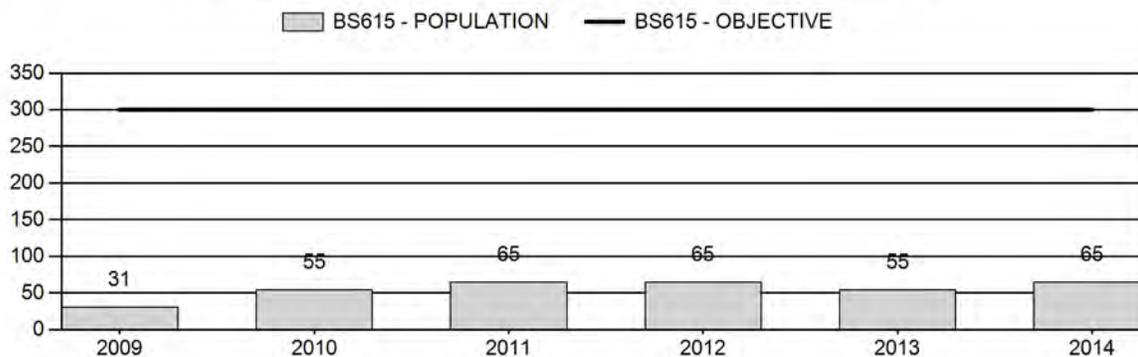
	<u>2009 - 2013 Average</u>	<u>2014</u>	<u>2015 Proposed</u>
Population:	54	65	100
Harvest:	0	1	1
Hunters:	0	1	1
Hunter Success:	0%	100%	100 %
Active Licenses:	0	1	1
Active License Success:	0%	100%	100 %
Recreation Days:	1	1	4
Days Per Animal:	0	1	4
Males per 100 Females	38	0	
Juveniles per 100 Females	10	0	

Population Objective ($\pm 20\%$) :	300 (240 - 360)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-78.3%
Number of years population has been + or - objective in recent trend:	30
Model Date:	None

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

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	6%	5%
Juveniles (< 1 year old):	0%	0%
Total:	0%	0%
Proposed change in post-season population:	18%	54%

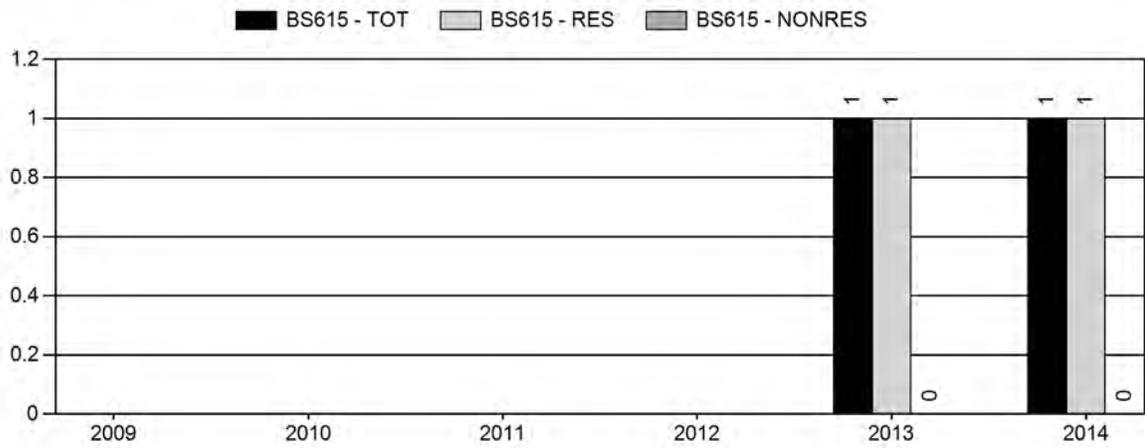
Population Size - Postseason



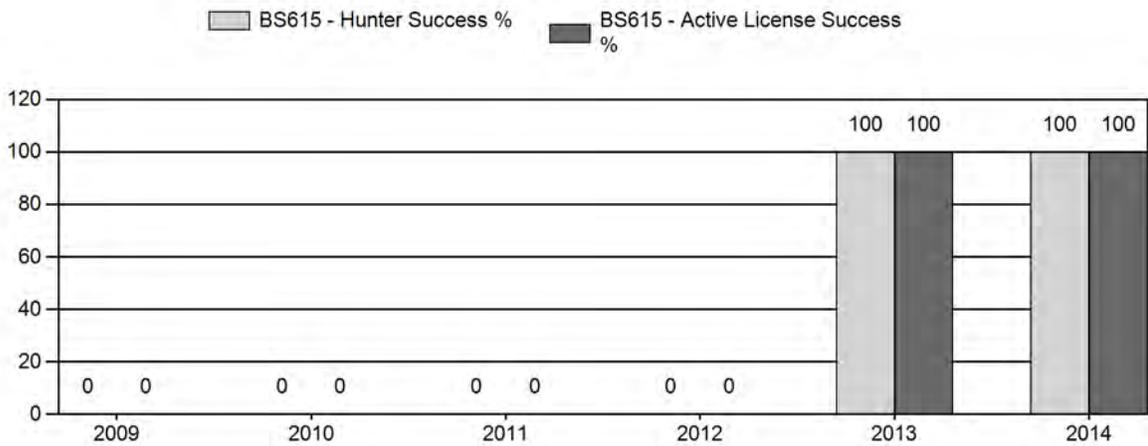
Harvest



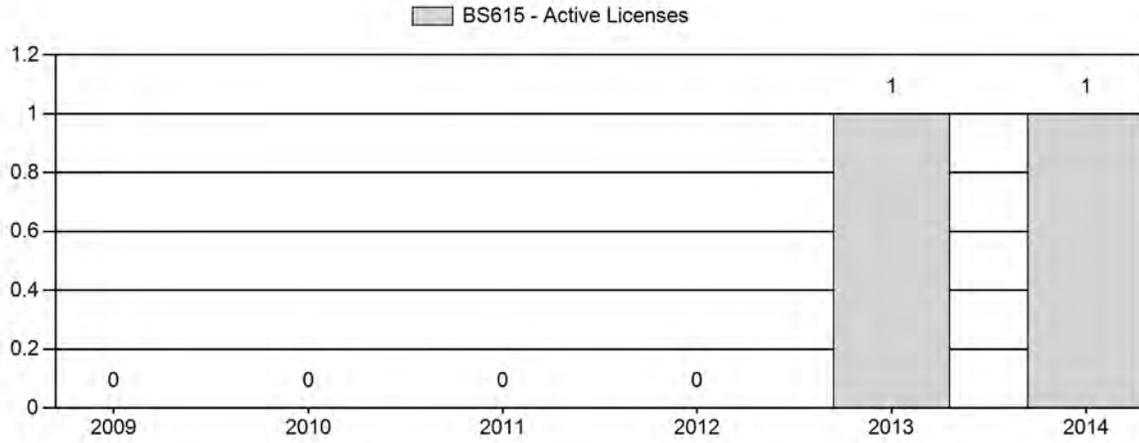
Number of Hunters



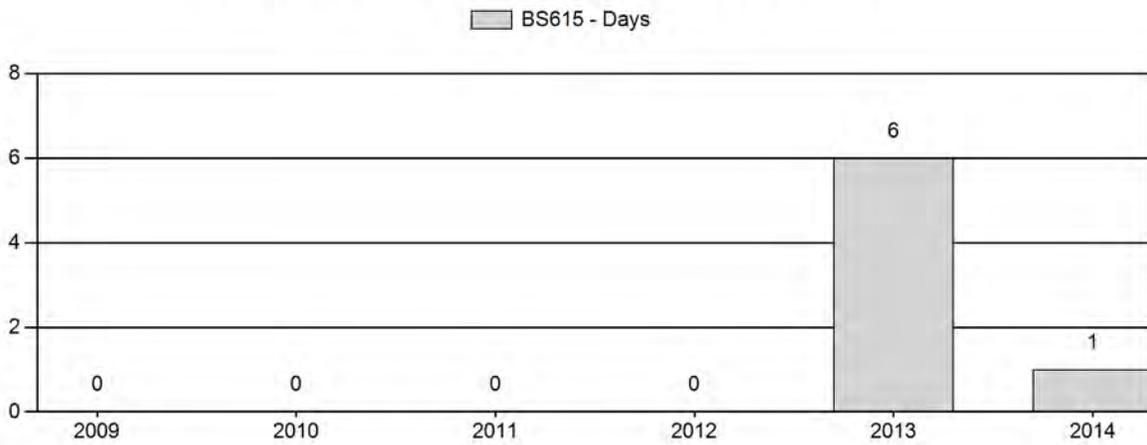
Harvest Success



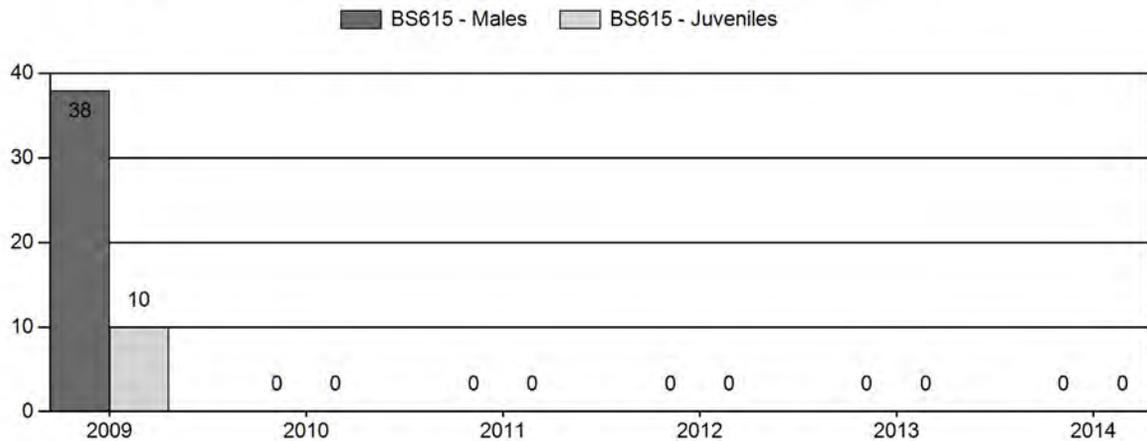
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Bighorn Sheep Herd BS615 - FERRIS-SEMINOE

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2009	31	2	6	8	26%	21	68%	2	6%	31	0	10	29	38	±0	10	±0	7
2010	55	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2011	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2012	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2013	55	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0
2014	65	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	±0	0	±0	0

**2015 HUNTING SEASONS
FERRIS-SEMINOE BIGHORN SHEEP HERD (BS615)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
17	1	Sep. 1	Oct. 31	1	Limited quota; any ram (resident only)
Archery 17		Aug. 15	Aug. 31		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2014
17	1	0
Total	1	0

Management Evaluation

Current Management Objective: 300

Management Strategy: Special

2014 Postseason Population Estimate: ~65

2015 Proposed Postseason Population Estimate: ~100

The management objective for the Ferris-Seminole Bighorn Sheep Herd Unit is a post-season population objective of 300 sheep, established in 1984. As with all bighorn sheep herds, management strategy is “special” management. The objective and management strategy were last publicly reviewed in 1994.

Herd Unit Issues

Bighorn sheep were first reintroduced into the Ferris Mountains in the late 1940's with two small transplants, one of which consisted of desert bighorns from Nevada. Neither produced a viable population. Slightly larger transplants were made into the Seminole Mountains in the 1950's and 1960's, but numbers never increased appreciably. A total of one hundred bighorn sheep from the Whiskey Mountain herd were released on the Morgan Creek Unit in the Seminole Mountains in 1978 and 1980 and, after initial losses and dispersal, a reproducing population was established. Survival of transplanted animals was high, and animals were successfully recruited into the population, but growth rate for the herd was low. To expand the herd's size and range, another 100 bighorn sheep from Whiskey Mountain were released in the Muddy Creek drainage of the Ferris Mountains in January of 1985. Dispersal was high, but roughly 40 to 60 of the sheep remained in the herd unit. As with the Seminole transplant, survival of transplanted animals was good.

Poor lamb survival during summer months was a major problem for this reintroduced herd, in both the Seminole and Ferris portions, with few yearling bighorns recruited each year. Three

summers of intensive monitoring identified poor forage quality as the most likely cause of lamb loss. Few losses to predation were found, with numerous lambs dying untouched on lambing grounds. No herd threatening diseases were identified. The source population for these transplanted sheep was the Whiskey Mountain herd by Dubois, where sheep are adapted to high elevation summer habitats and lambled in the first half of June. In the Ferris and Seminoe Mountains, sheep were in essentially low elevation year-long range where much of the lush spring growth is cured and gone by the time lambs were born. Low recruitment failed to replace natural mortality and the herd steadily declined. By 2003, there were estimated to be fewer than 15 sheep remaining in this population.

Forty low elevation, non-migratory bighorn sheep from Oregon and 12 surplus sheep from the Devil's Canyon herd in Wyoming were transplanted into the Seminoe Mountains in 2009 and 2010. These animals typically lamb 4-6 weeks earlier than the high-elevation migratory sheep brought in from Dubois and lambing appears to be better synchronized with spring green-up for the Seminoe and Ferris habitats. About a half dozen of these sheep established themselves in the Bennett Mountains east of Seminoe Reservoir and have successfully reproduced and recruited young animals. Habitats there appear to be suitable for bighorns, but the herd unit boundary will need to be expanded to encompass these animals.

Weather

Drought conditions in 2012 and 2013 continued into the first half of 2014, with significant precipitation not arriving until the last quarter of July. Precipitation during the following three months produced good vegetative growth, but was probably too late to significantly improve lamb survival. Condition of bighorn sheep going into the winter is expected to have been good. Thirteen sheep were captured for disease sampling and monitoring on 13 February 2015 and all were in good physical condition. The 2014-15 winter had numerous bitter cold spells, coupled with unusually warm periods, but little significant snowfall until late February.

Habitat

Decades without fire resulted in decadent shrub stands encroached by conifer in this herd unit. Severe drought reduced the quantity and quality of forage in 2012 and 2013. Two browse transects have been established in this herd unit, but one was burned by fire in 2012 and the other was not read in 2014. No transects have been established for herbaceous forage.

Over the past several years the Rawlins BLM has implemented prescribed burns in the Seminoe and Ferris Mountains, partly to address conifer encroachment while also rejuvenating decadent mountain mahogany and bitterbrush stands. In the summer of 2012, two large wildfires in the Seminoe Mountains and the eastern Ferris Mountains burned thousands of acres, including occupied bighorn habitat. In addition to opening habitats adjacent to rocky escape cover, the prescribed burns should benefit bighorn sheep productivity with herbaceous cover and return of young vigorous shrub complexes. Forage benefits from the wildfires will be longer term.

The Seminoe Fire burned over 3,800 acres in the Seminoe Mountains including areas within Morgan Creek WHMA. As in 2012 and 2013, the Rawlins BLM again coordinated and funded aerial application of Plateau® in 2014 to mitigate cheatgrass spread on BLM and WGFDF managed areas within the fire perimeter. The wildfire enveloped several previously planned

prescribed burns, although not with the desired prescriptions. Plans for additional prescribed fires in the Seminole Mountains, particularly on the Morgan Creek WHMA, have been accelerated to take advantage of the secure fire breaks provided by the 2012 wildfire.

Field Data

Obtaining reliable classification samples from small populations is difficult because, statistically, the majority of the population must be included in the sample to have any confidence in the resulting ratios. These low elevation sheep do not congregate in restricted, well-defined winter ranges like many herds in high mountain valleys, having instead the option to move wherever winds have exposed forage. All telemetry collars have dropped off these sheep, so bands are more difficult to locate.

Fifty-one bighorn sheep were found during helicopter surveys for mule deer in the Seminole Mountains in December 2014, including at least 5 lambs. Twenty-four sheep were found on the south side of the Seminoes on Sheep Ridge, near the Seminole Road. The other 27 were together in a draw below power lines immediately west of Kortez Canyon, so not all could be classified. The survey did confirm only 5 lambs out of the 51 bighorn sheep. The survey did not include the Bennett Mountains to the east, which are presumed to number ~12-15 sheep.

Harvest Data

The single resident hunter in this area harvested a 4-year old ram on the opening day of the regular season. It was not eartagged, and is presumed to have been born in the Seminole Mountains. The hunter reported a single day of hunting, compared to six days for the single resident hunter in 2013. As in 2013, the ram was harvested from the ridges on the south face of the Seminole Mountains.

Population

No model exists for this small herd, and with limited classification data, one is not likely in the near future. Current population estimates are based upon limited observations of bands in the Seminole Mountains. Based upon known mortality of telemetered bighorns, losses during the 2012-13 winter were probably high, and the herd was estimated to be between 60 to 70 sheep at post-hunt 2014, roughly the same size as after the 2010 transplants. Lamb production did not appear to be high in 2014, with five lambs confirmed in the northern band along the Miracle Mile and two in the band on the southern slopes, so growth of the herd in 2014 was low. Recovery of burned areas should improve the quantity and quality of forage available for gestating and lactating ewes, despite drought conditions, and lamb production is expected to improve.

Twenty-five low-elevation, non-migratory bighorn sheep from the Devil's Canyon herd near Lovell were released in the Seminole Mountains west of Seminole State Park on 7 March 2015. The release consisted of 21 ewes, 1 male lamb and three young rams. All but the lamb and one young ram were marked with telemetry collars, 13 VHS collars and ten GPS collars that will drop off for data recovery in May 2017. A few of these crossed Seminole Reservoir into the Bennett Mountains again, with the rest appearing to settle in the Seminoes in the same habitats occupied by earlier transplants. Assuming most of these sheep remain in the Seminole Mountains,

as with the previous three transplants, and adding recruitment from the 2015 lamb crop, the herd is expected to reach 100 animals by fall of 2015. This supplemental release should essentially make up for losses during the 2012-13 winter.

Management Evaluation

The population was first hunted in 1983, with two rams being harvested by four hunters. Minimal hunts with only four licenses were held each year through 1989, with a total of 21 rams being harvested by 28 hunters. Illegal killing of both rams and ewes was a problem during this period, but decline of the herd was attributed to lambing of the high elevation sheep used to re-establish this population being asynchronous with plant phenology in these lower mountain ranges. With better adapted “low-elevation sheep” introduced into this herd, that issue appears to be resolved.

Non-consumptive use of this herd is high, particularly in the Seminole Mountains. A single resident license for “any ram” was issued in both 2013 and 2014. Department and BLM personnel, and the 2013 and 2014 hunters, all report seeing at least 8-10 rams in the Seminole Mountains, several of which are nearing true trophy ageclasses. With these numbers of trophy animals available, a limited harvest by a single license is warranted again in 2015.

Opening and closing dates are the same used in this herd during the 1980s, the same as in 2013 and 2014 and comparable to most other sheep areas in the state. Archery season dates are standard for most areas.

Initial indications are the low-elevation, non-migratory sheep are reproducing well in the Seminole and Bennett Mountains, and consideration should be given to transplanting similar sheep into the Ferris Mountains to expand their range. The 2011 prescribed natural fire and 2012 wildfire on the eastern end of the Ferris Mountains should provide improved habitats for bighorn.

Bighorn Sheep
Ferris (615)
08/1999

