2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD642 - DUBOIS

HUNT AREAS: 128, 148

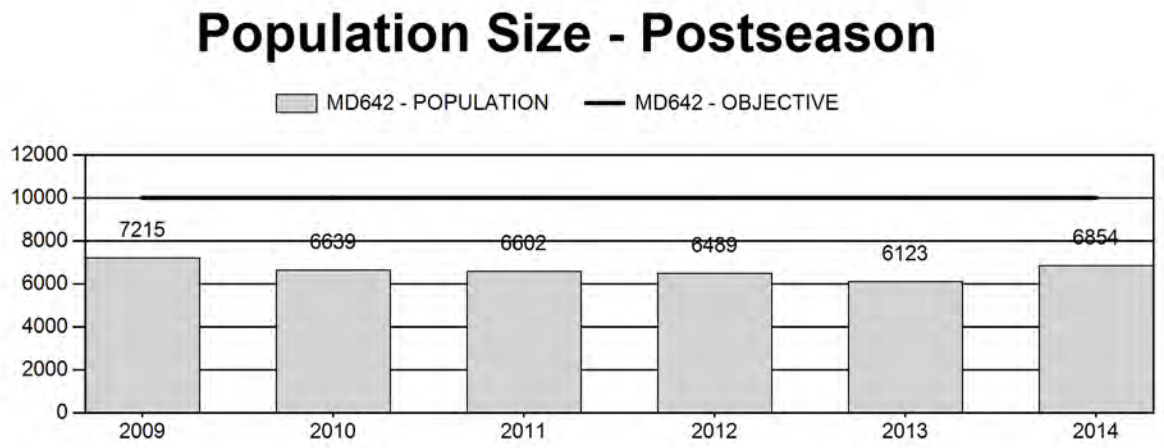
PREPARED BY: GREG ANDERSON

	2009 - 2013 Average	2014	2015 Proposed
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	

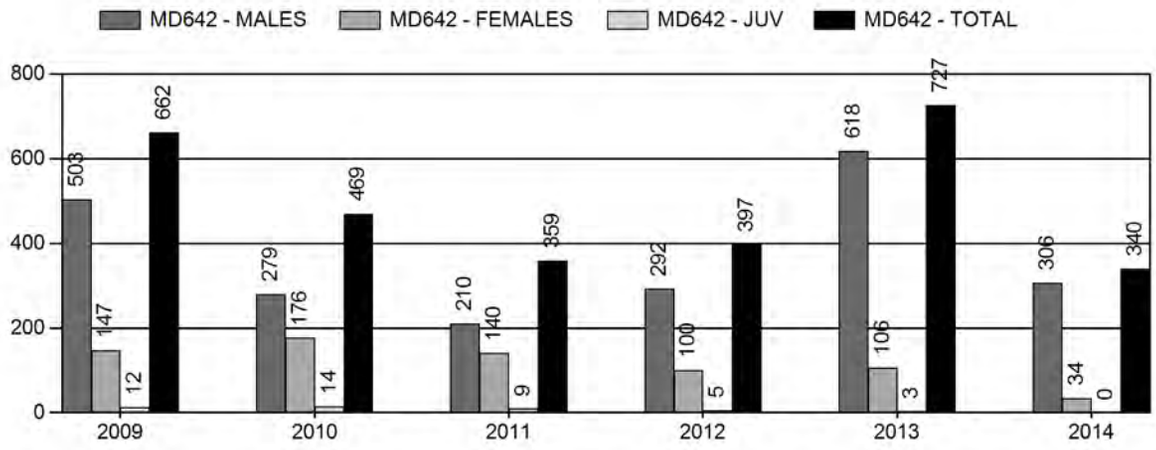
Population Objective (± 20%) :	10000 (8000 - 12000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-31.5%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/20/2015

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

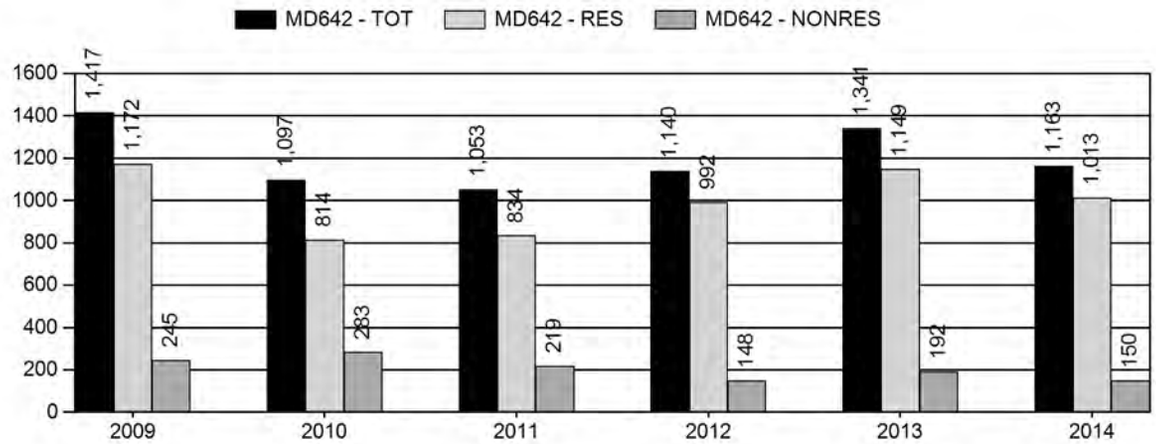
	JCR Year	Proposed
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	18%	17%
Juveniles (< 1 year old):	1%	0%
Total:	4%	4%
Proposed change in post-season population:	+16%	+6%



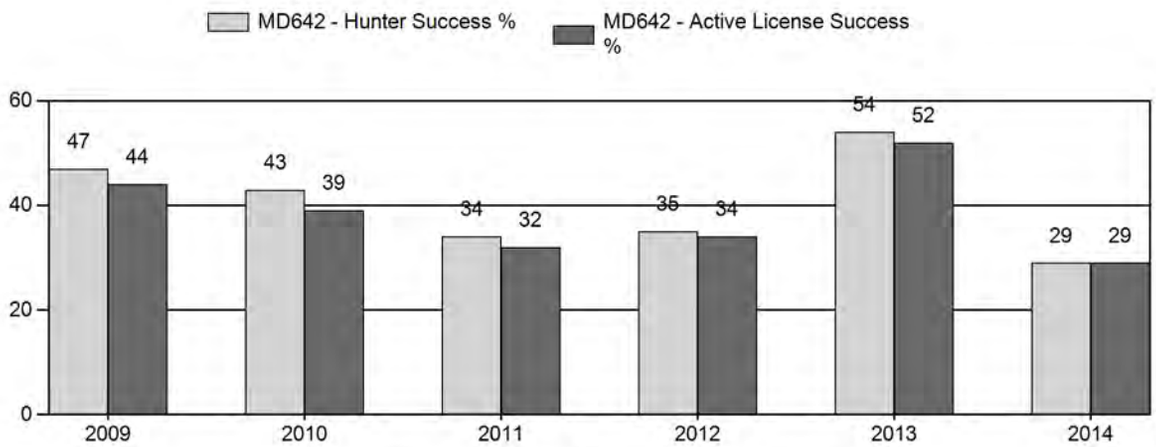
Harvest



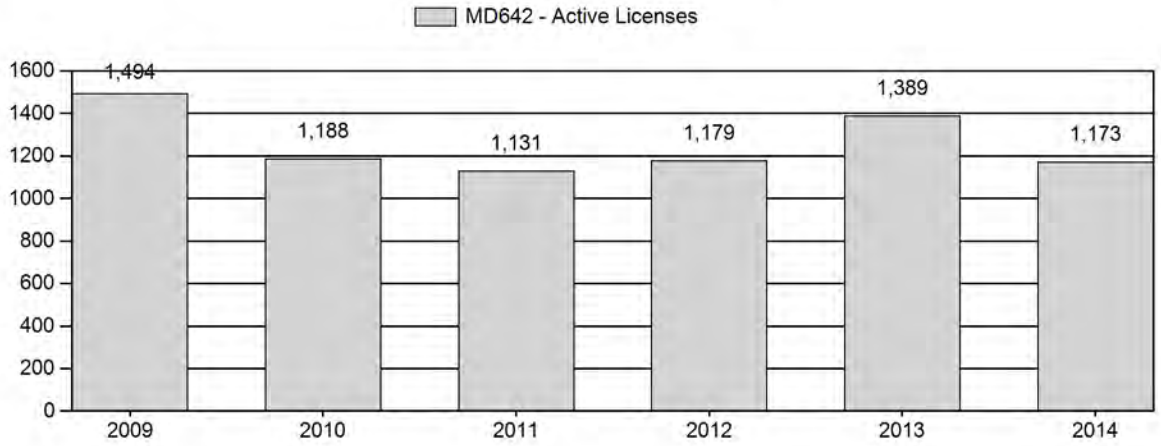
Number of Hunters



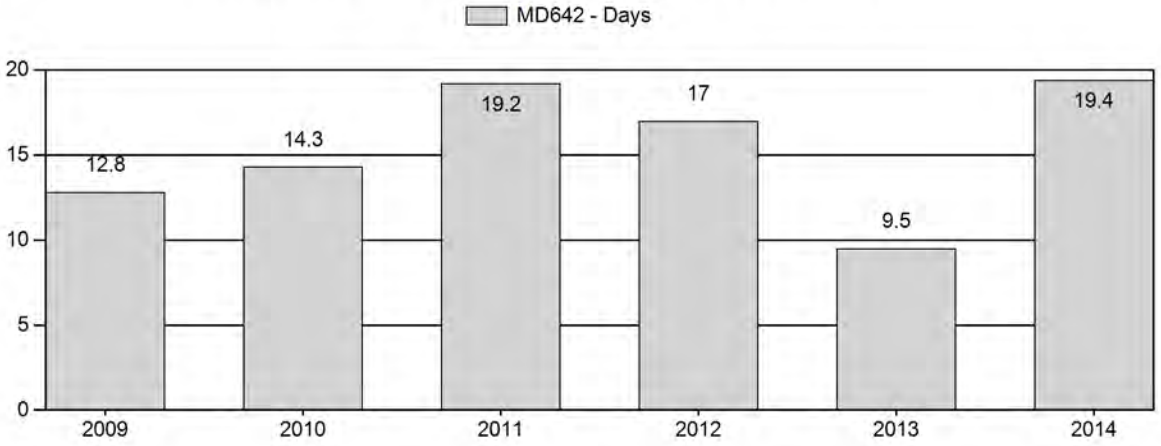
Harvest Success



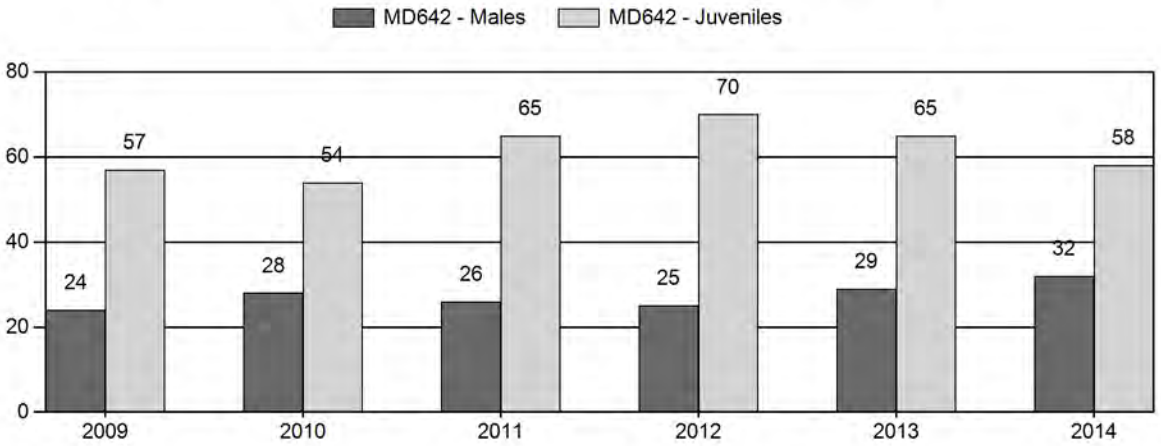
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD642 - DUBOIS

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 Opens	Closes	Quota	Limitations
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		

<u>Management Evaluation</u>
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.

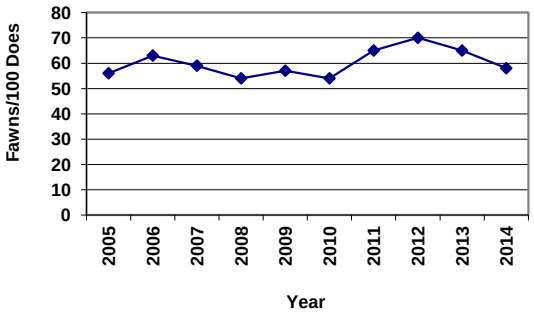
Habitat/Weather

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).

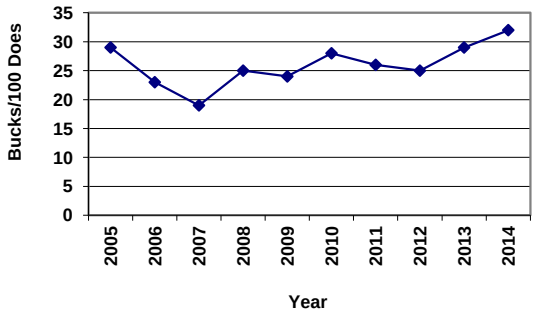
Figure 1. Ten year recruitment history for the Dubois mule deer herd.



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
CJ,CA	**Constant Juvenile & Adult Survival**	128	137	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	128	137	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	19	141	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				2061	1236	3669	6966	1975	734	3022	5731	10000
1994				2264	1517	3474	7254	2251	636	3394	6281	10000
1995				2323	1415	3775	7513	2320	1064	3709	7093	10000
1996				2654	1462	3724	7840	2648	790	3649	7087	10000
1997				2292	1205	3652	7149	2284	878	3553	6715	10000
1998				2443	1208	3496	7147	2437	842	3469	6748	10000
1999				2234	1298	3544	7076	2234	820	3473	6528	10000
2000				2298	1614	3883	7794	2295	936	3798	7030	10000
2001				1952	1380	3829	7161	1950	728	3742	6419	10000
2002				1698	1193	3771	6661	1693	747	3669	6109	10000
2003				1893	1066	3565	6524	1882	661	3461	6004	10000
2004				2064	1412	3807	7283	2056	845	3734	6634	10000
2005				2256	1648	4119	8023	2254	947	4060	7261	10000
2006				2691	1688	4351	8731	2687	984	4282	7953	10000
2007				2407	1380	4201	7987	2392	760	4033	7186	10000
2008				2333	1643	4443	8419	2311	1071	4254	7636	10000
2009				2296	1462	4185	7943	2282	909	4023	7215	10000
2010				2022	1234	3898	7155	2007	927	3705	6639	10000
2011				2231	1195	3571	6996	2221	964	3417	6601	10000
2012				2289	1268	3367	6925	2284	947	3257	6488	10000
2013				2336	1713	3689	7738	2332	1033	3573	6938	10000
2014				2087	1484	3657	7228	2087	1148	3619	6854	10000
2015				2296	1576	3690	7562	2291	1301	3668	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

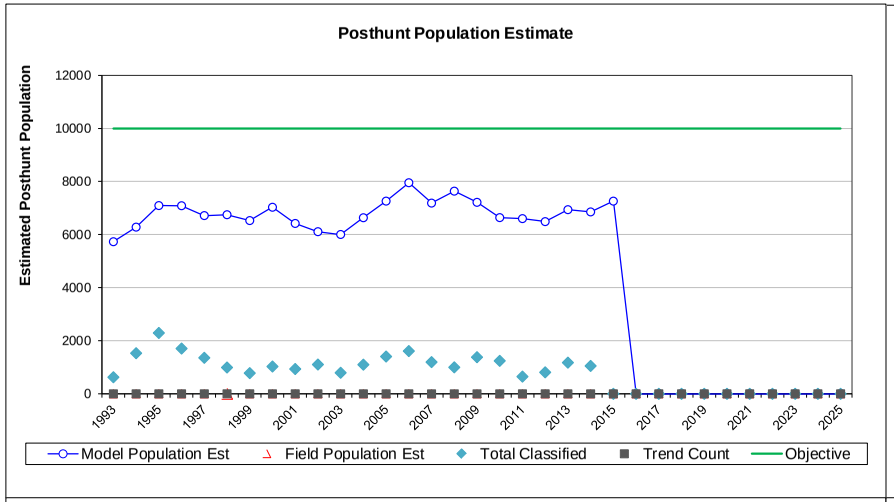
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.90			0.86		
1994	0.77			0.86		
1995	0.48			0.86		
1996	0.40			0.86		
1997	0.40			0.86		
1998	0.47			0.86		
1999	0.82			0.86		
2000	0.50			0.86		
2001	0.58			0.86		
2002	0.50			0.86		
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						

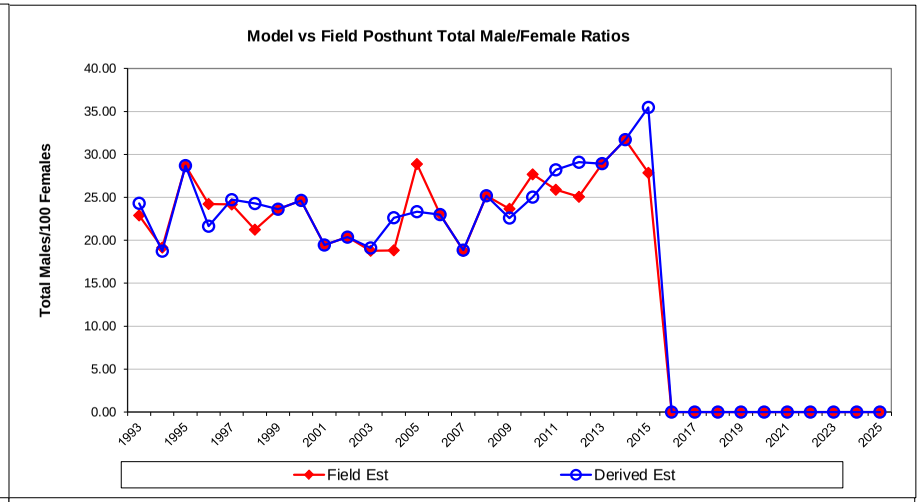
Parameters:	Optim cells
Adult Survival =	0.855
Initial Total Male Pop/10,000 =	0.073
Initial Female Pop/10,000 =	0.302

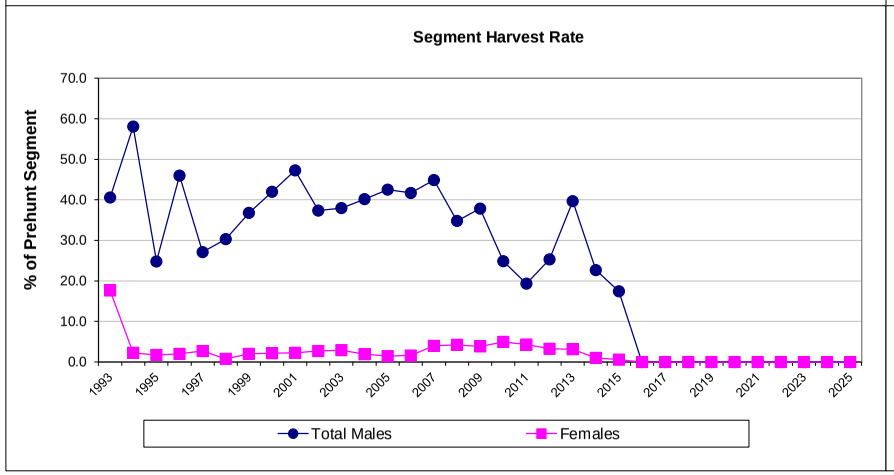
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

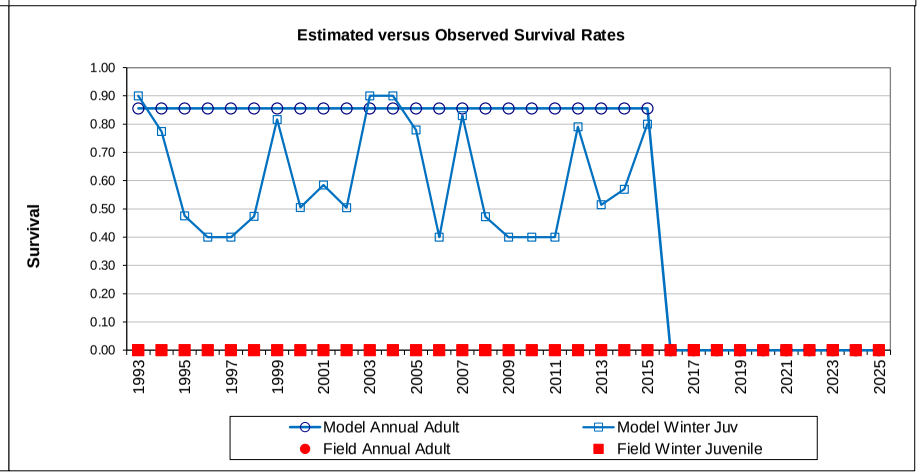
	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		65.36	5.71	24.30	22.89	2.91	78	456	589	1123	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	22.59	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:

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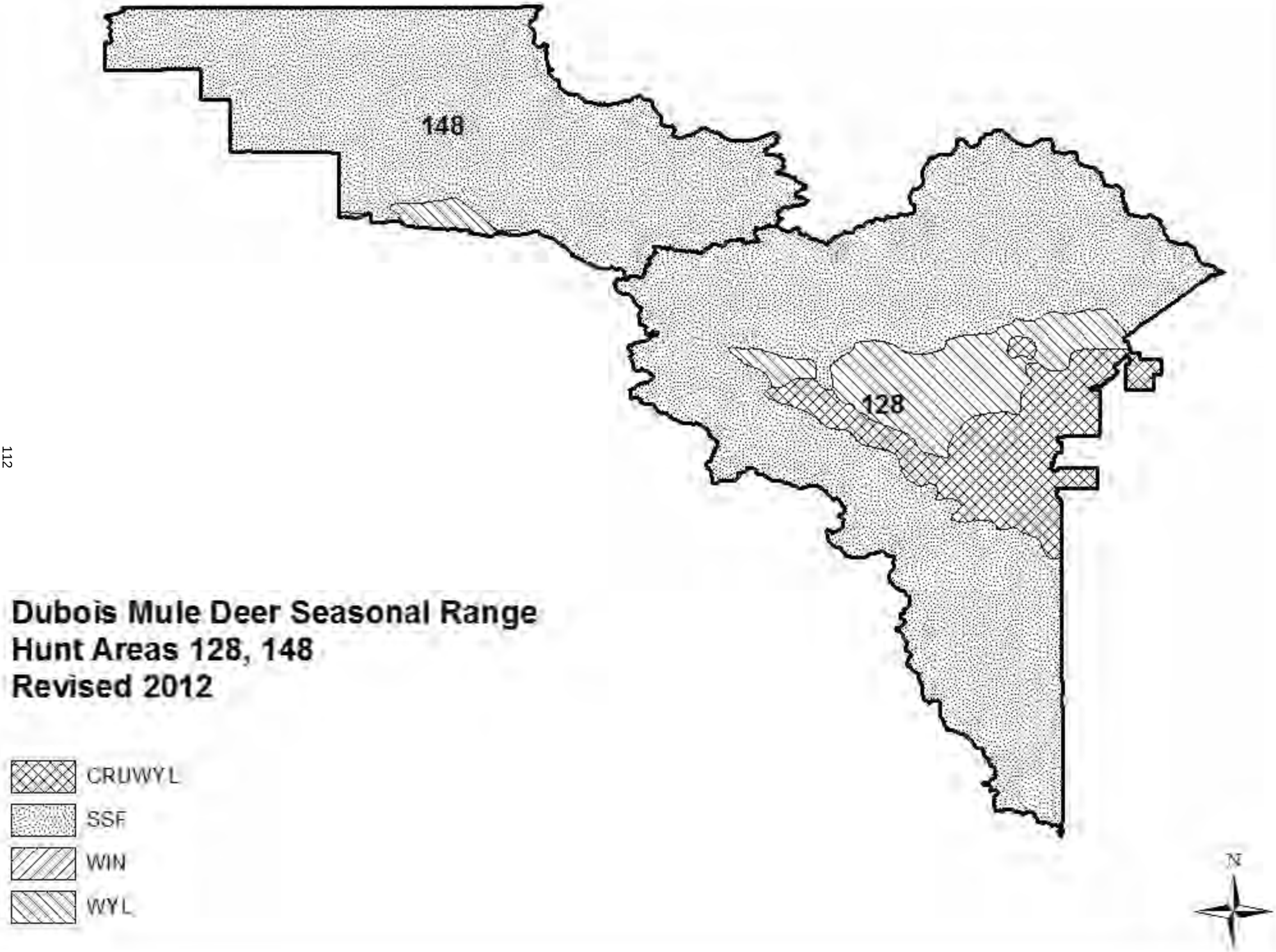

148
128
Dubois Mule Deer Seasonal Range
Hunt Areas 128, 148
Revised 2012
CRUWYL
SSF
WIN
WYL
N

2014 - JCR Evaluation Form

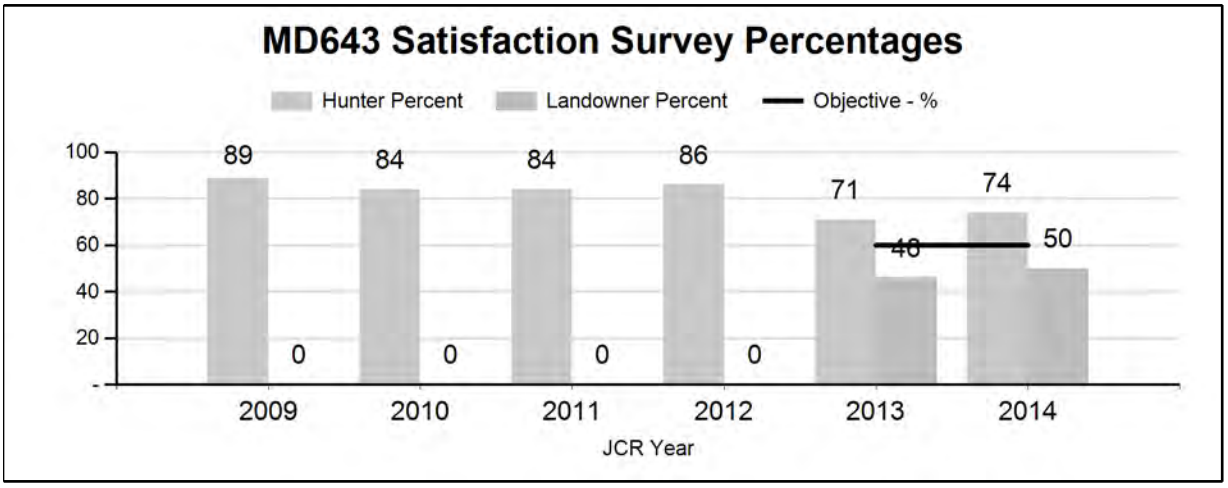
SPECIES: Mule Deer
HERD: MD643 - PROJECT
HUNT AREAS: 157, 170-171

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

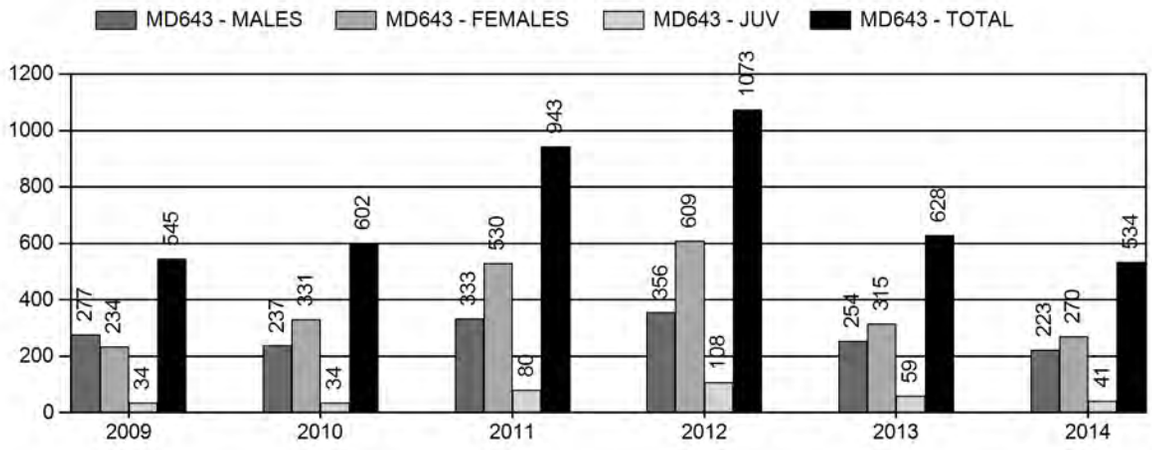
PREPARED BY: GREG ANDERSON

	2009 - 2013 Average	2014	2015 Proposed
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	

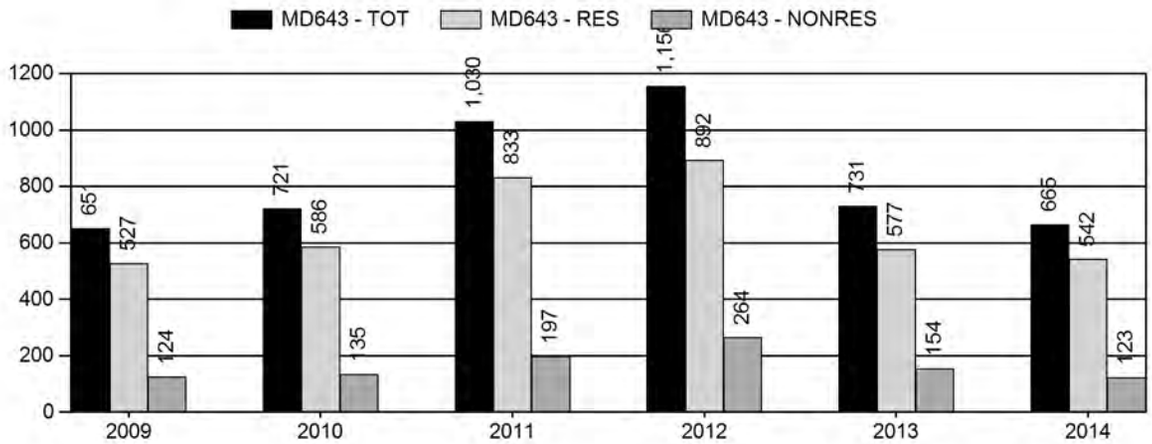
Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	2%
Number of years population has been + or - objective in recent trend:	1



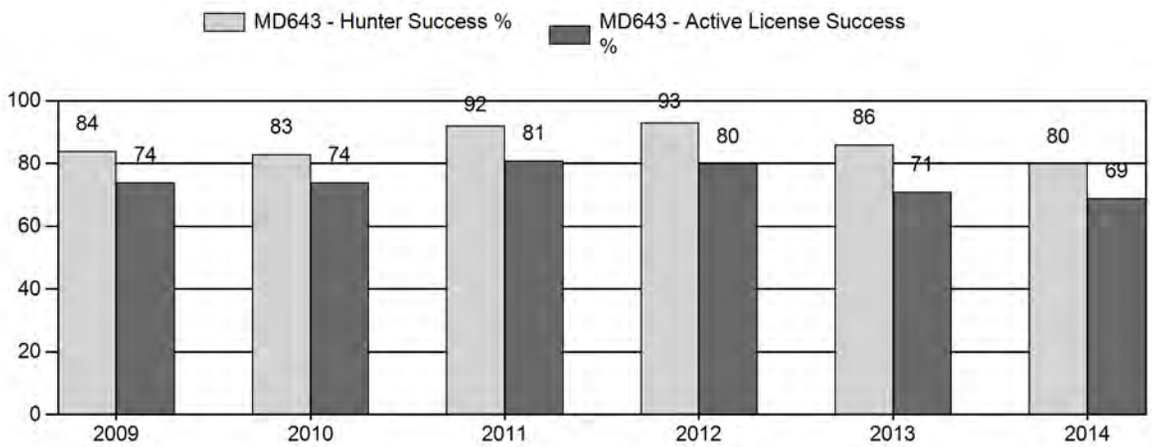
Harvest



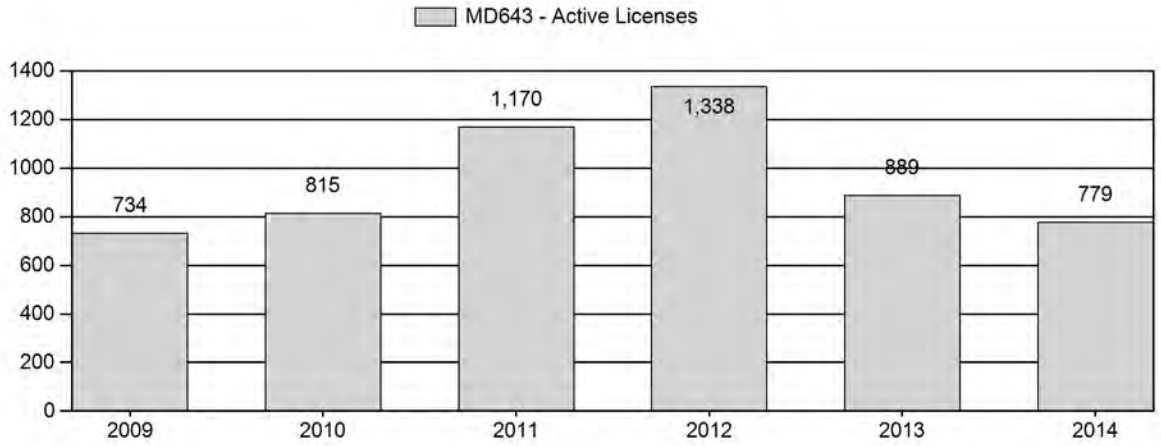
Number of Hunters



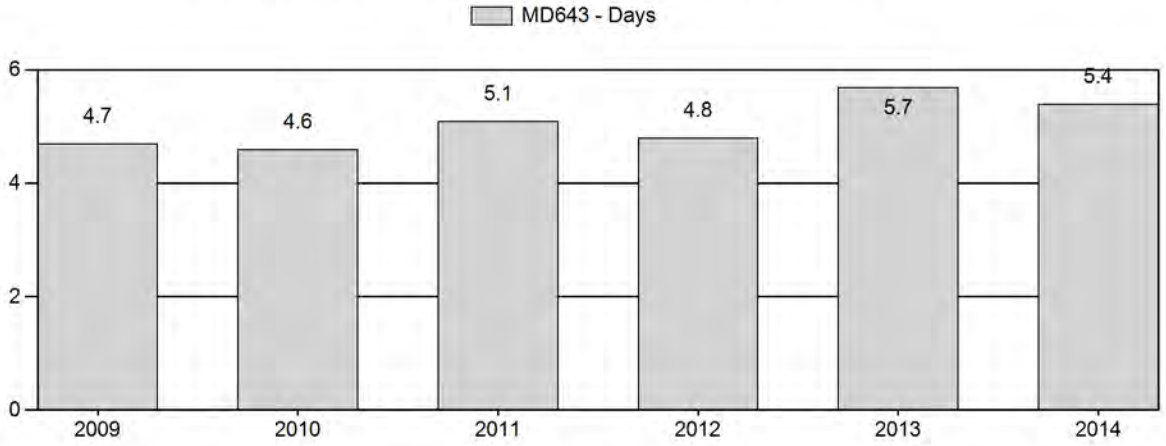
Harvest Success



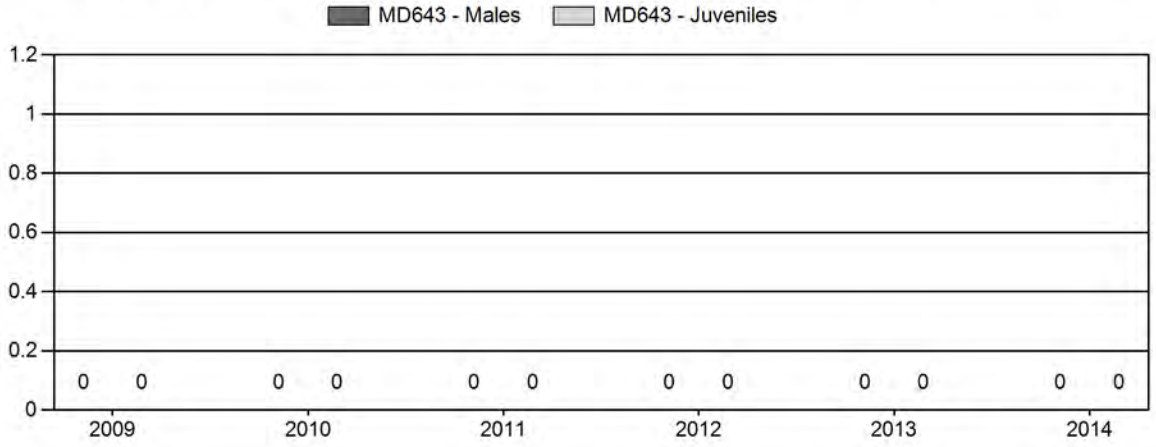
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2015 HUNTING SEASONS
PROJECT MULE DEER (MD 643)

Hunt Area	Type	Season Dates Opens	Closes	Quota	Limitations
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		Unused Area 157, 170 Type 8 licenses valid on private land
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		Sep. 1	Sep. 30		Refer to section 3 of this chapter
171		Sep. 1	Sep. 30		General; any deer. Limited quota; refer to section 3 of this chapter

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

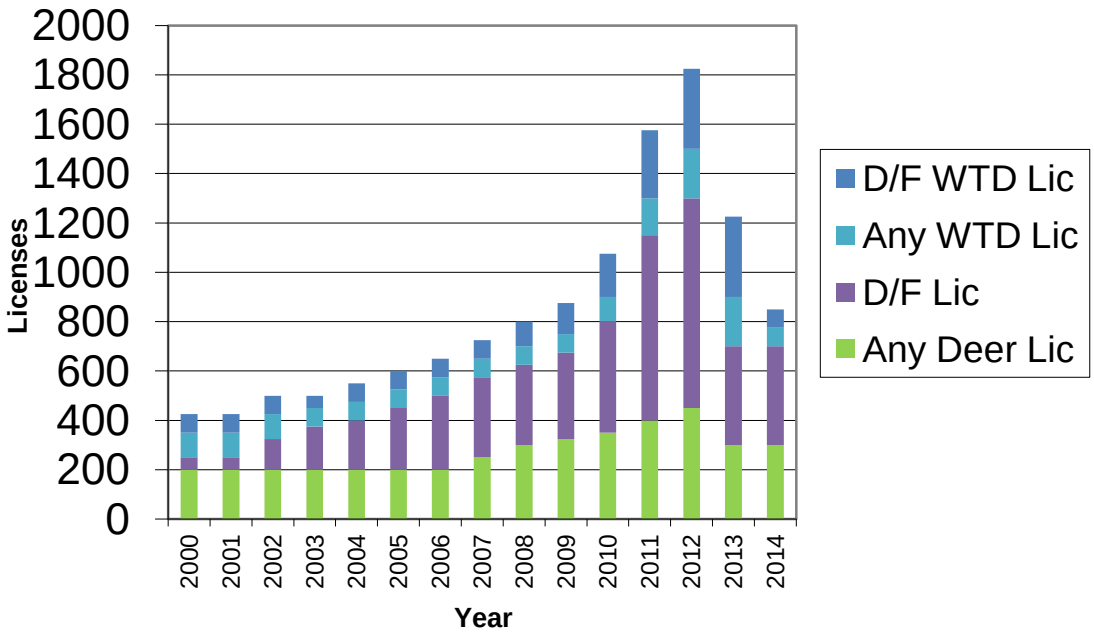
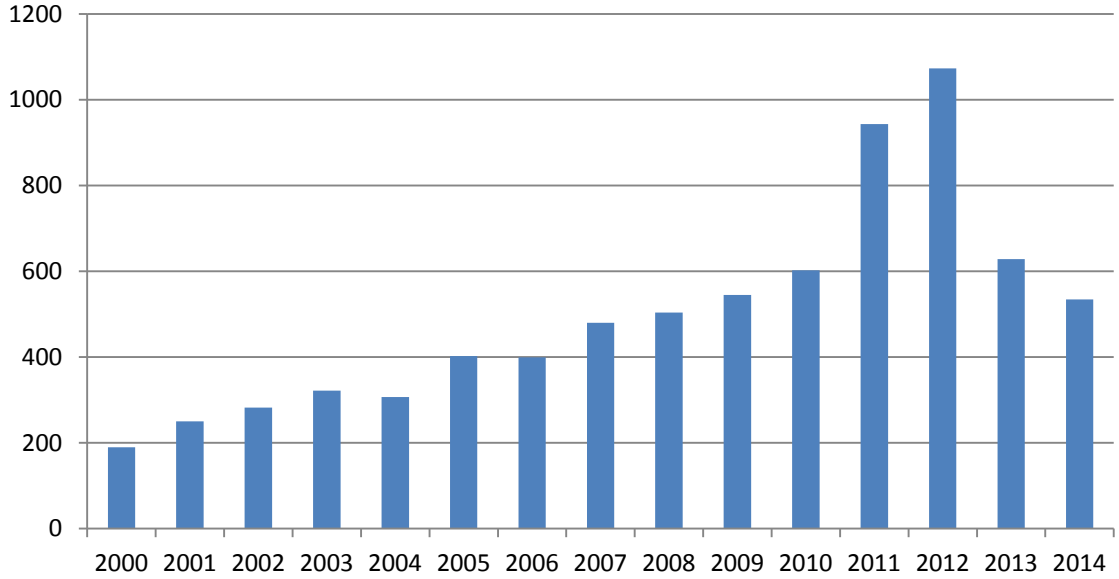


Figure 2. Project Mule Deer Harvest



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

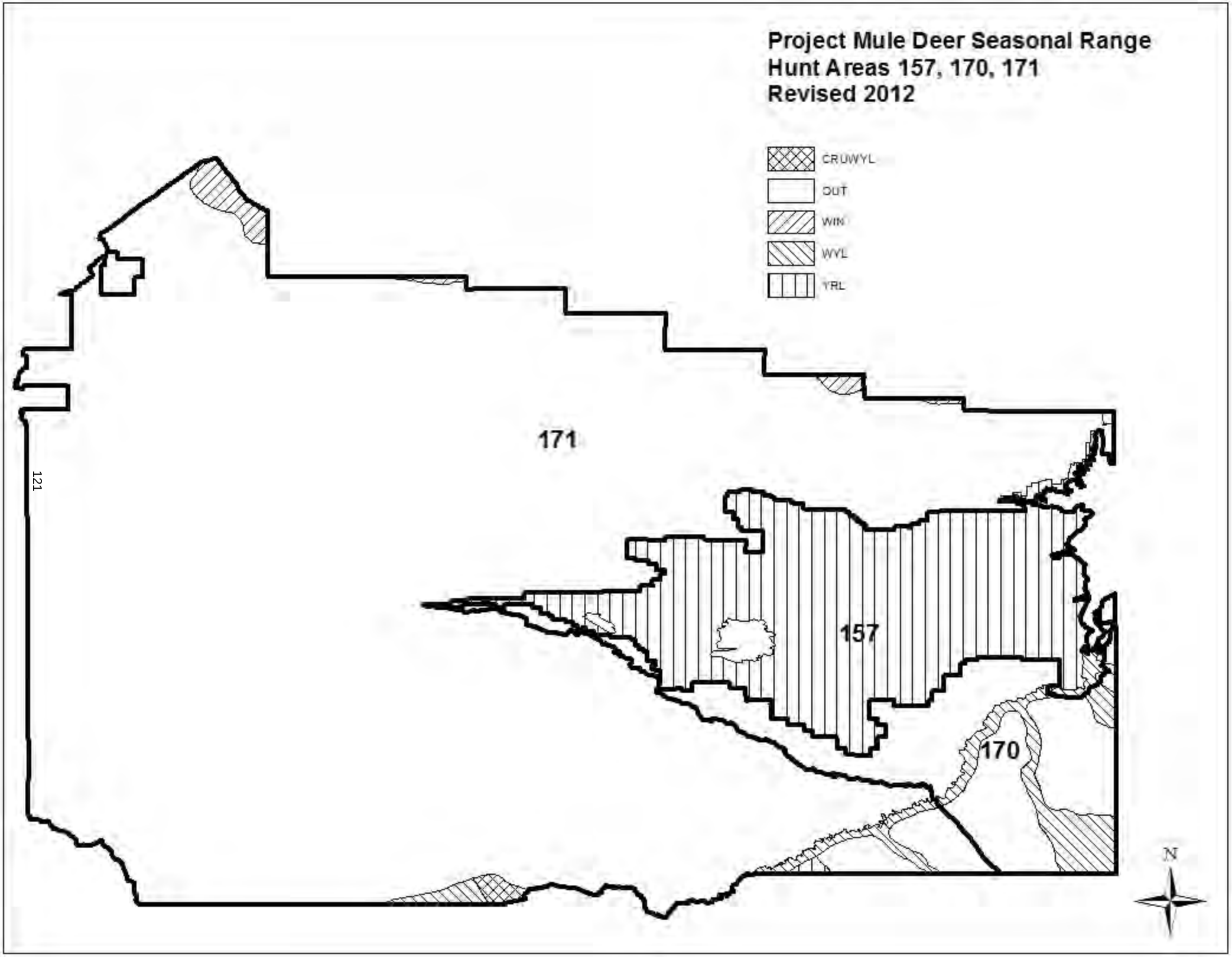
The Department sincerely values your input, and we thank you for your time.

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
CRUWYL
OUT
WIN
WYL
YRL
171
157
170
N

2014 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2014 - 5/31/2015

HERD: MD644 - SOUTH WIND RIVER

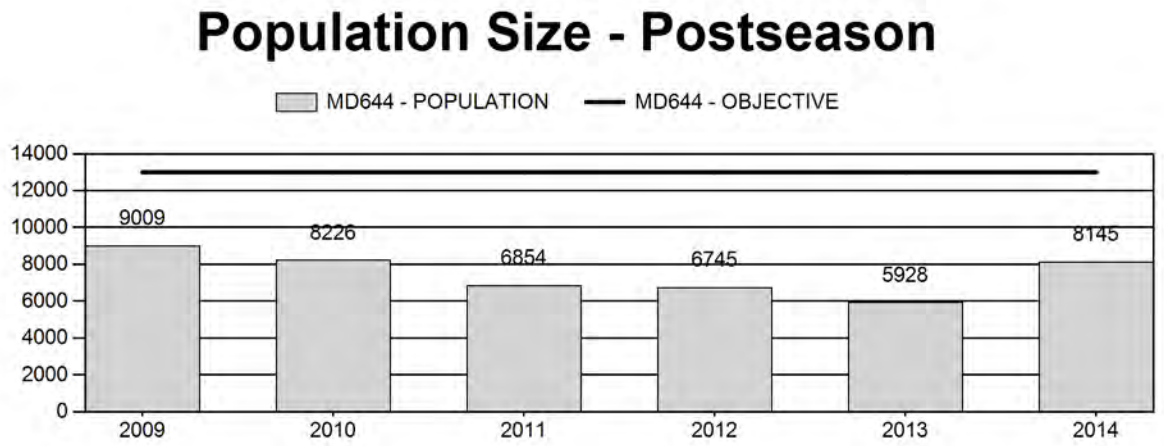
HUNT AREAS: 92, 94, 160 | PREPARED BY: STAN HARTER

	2009 - 2013 Average	2014	2015 Proposed
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	

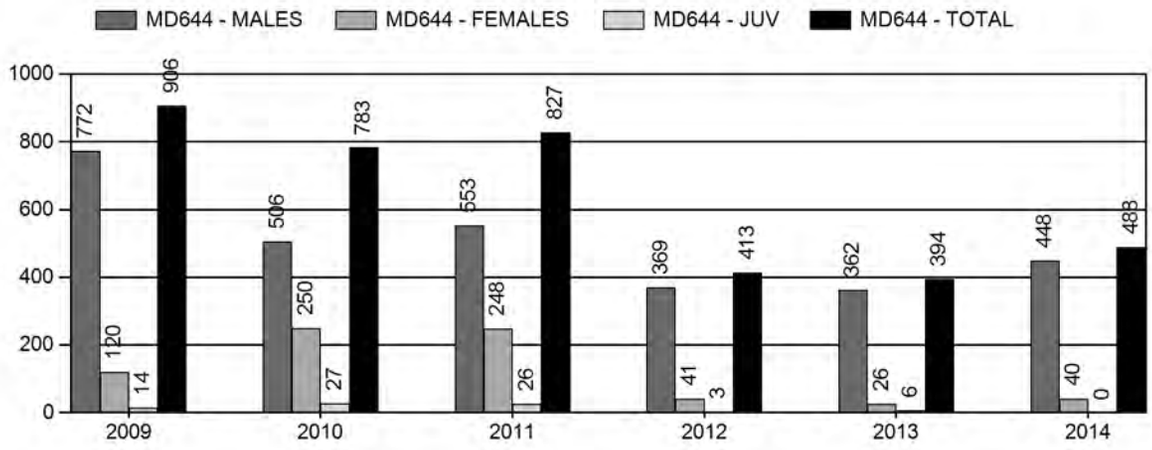
Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-37.3%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/19/2015

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

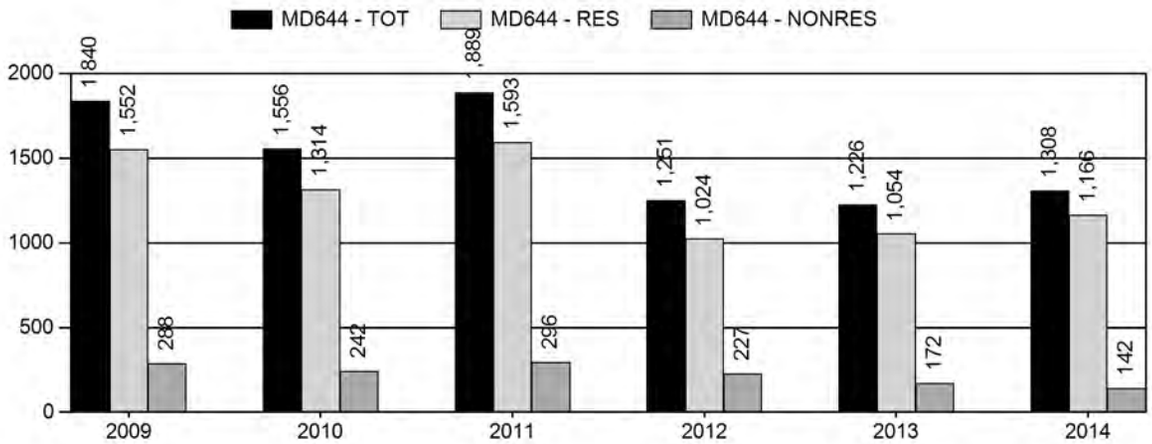
	JCR Year	Proposed
Females ≥ 1 year old:	1.2%	1.3%
Males ≥ 1 year old:	29.6%	27.5%
Juveniles (< 1 year old):	0.0%	0.0%
Total:	5.6%	5.9%
Proposed change in post-season population:	+21.4%	+6.9%



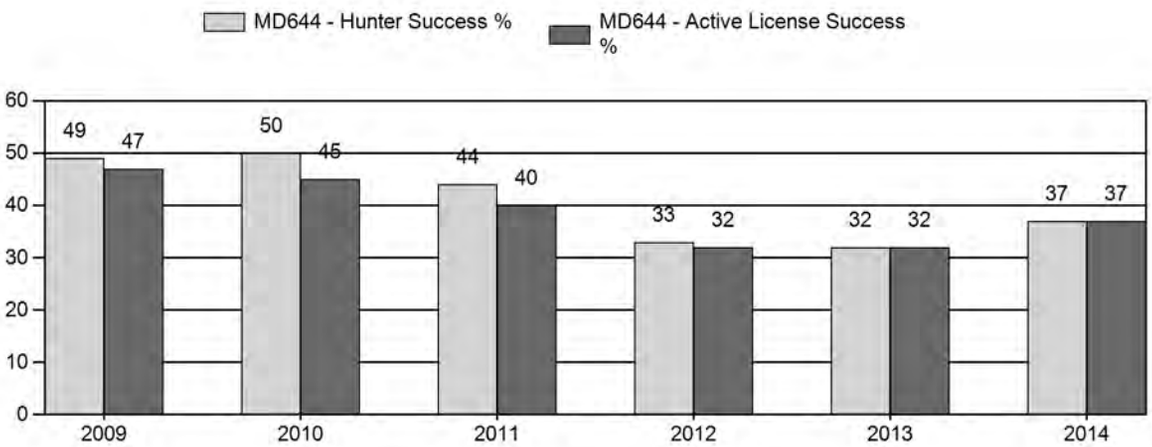
Harvest



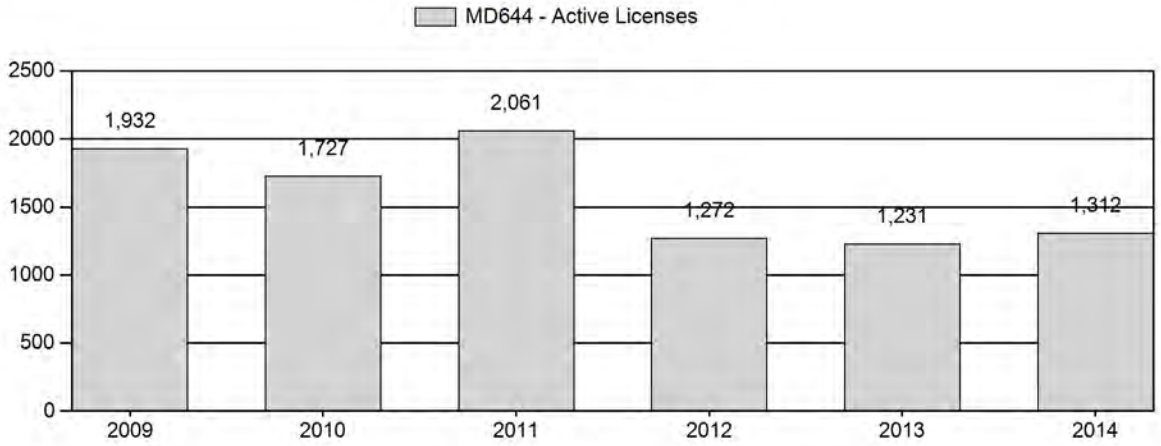
Number of Hunters



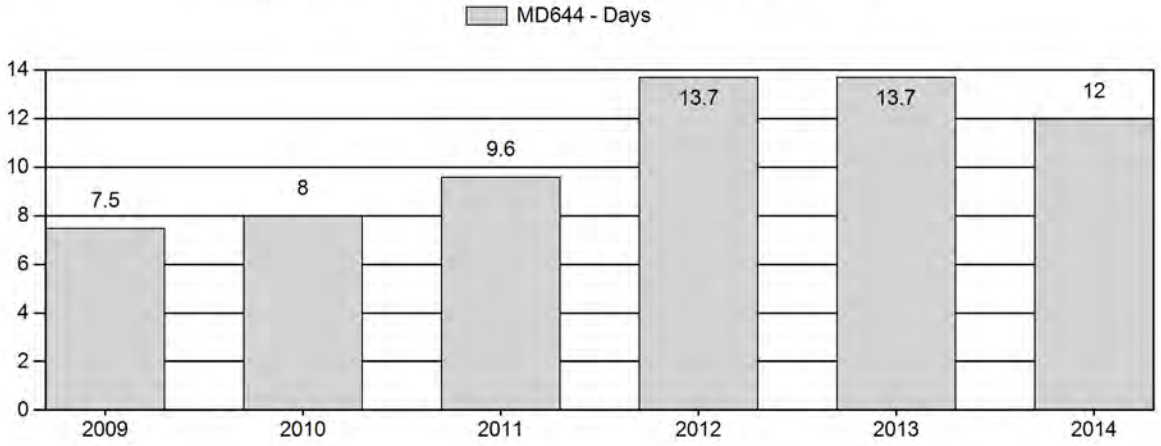
Harvest Success



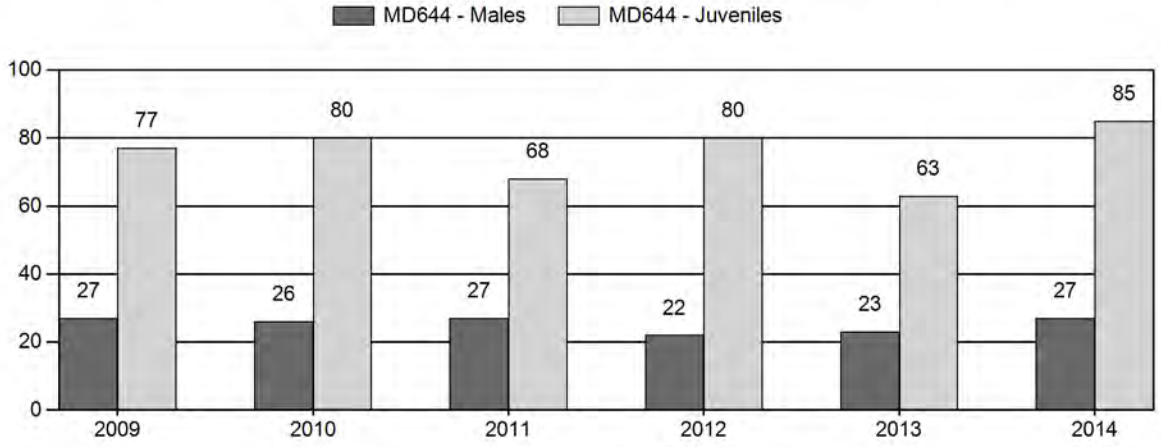
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD644 - SOUTH WIND RIVER

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 OPENS	CLOSES	Limited Quota	LIMITATIONS
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 **8**	**+25** **+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.

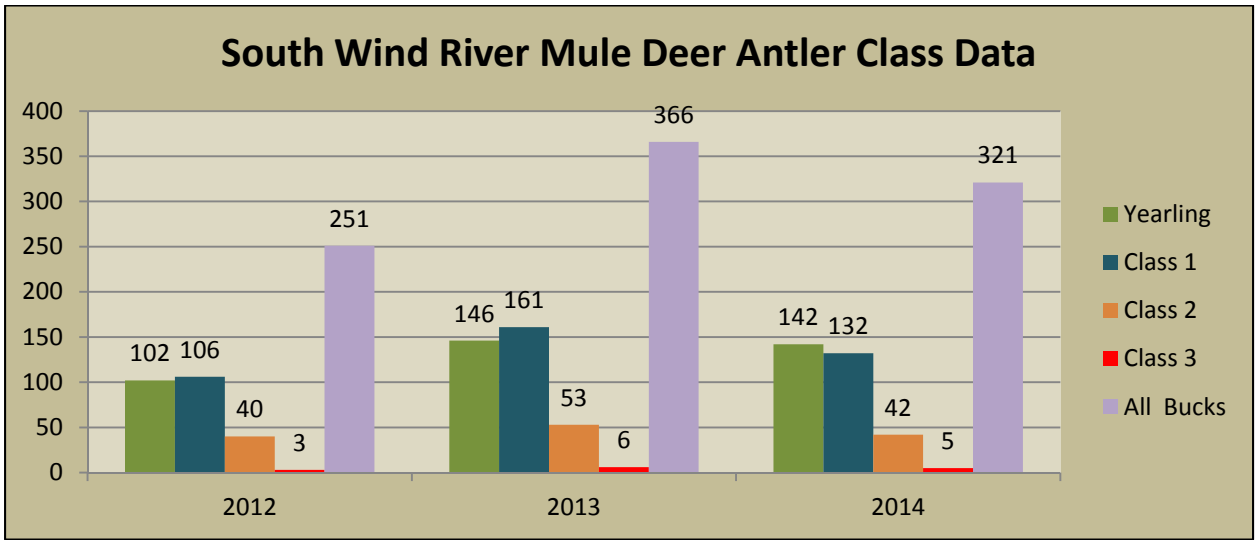


Figure 1. Antler class data from classification surveys in the South Wind River Mule Deer Herd Unit, 2012-14.

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.

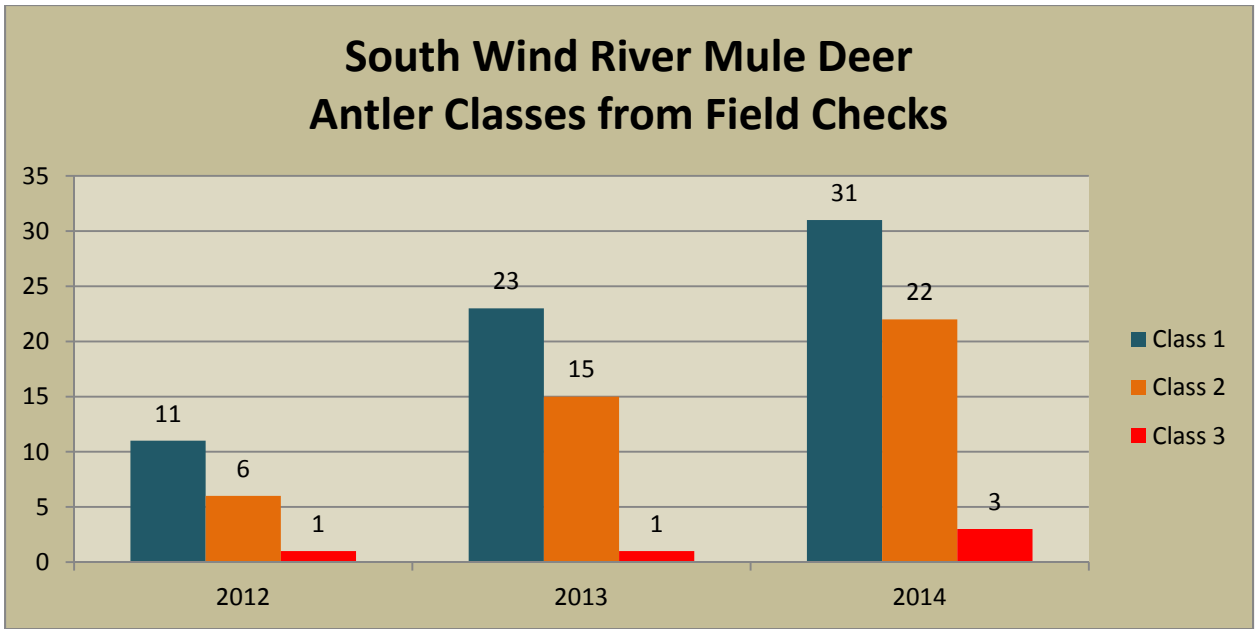


Figure 2. Antler width classes as measured during field checks and at check stations, 2012-14.

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 (± 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

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	576	585	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	576	585	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	25	115	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1994				2082	1293	3493	6868	2082	655	3493	6230	13000
1995				1841	952	3275	6068	1841	612	3275	5728	13000
1996				2249	1329	3508	7086	2249	682	3506	6437	13000
1997				2155	1198	3508	6860	2155	687	3508	6350	13000
1998				3960	1532	3840	9332	3960	865	3840	8665	13000
1999				3425	1756	4190	9370	3425	907	4190	8521	13000
2000				2316	1709	4395	8420	2298	820	4149	7267	13000
2001				1498	1331	4055	6884	1498	649	4055	6202	13000
2002				1752	1097	3883	6732	1752	535	3883	6170	13000
2003				2207	1107	3847	7161	2207	558	3847	6612	13000
2004				2647	948	3639	7234	2647	736	3639	7021	13000
2005				2615	1482	3857	7955	2615	1126	3857	7598	13000
2006				2370	2098	4333	8801	2370	1101	4301	7773	13000
2007				2717	1968	4586	9270	2714	1079	4505	8298	13000
2008				3761	2104	4907	10773	3749	1331	4759	9839	13000
2009				3592	1965	4770	10327	3577	1116	4638	9330	13000
2010				3430	1628	4510	9568	3400	1072	4235	8707	13000
2011				2647	1557	4145	8350	2619	949	3872	7440	13000
2012				2937	1300	3692	7929	2933	894	3647	7475	13000
2013				2254	1318	3571	7143	2247	920	3542	6710	13000
2014	8517	208		3208	1664	3810	8682	3208	1171	3766	8145	13000
2015				3195	1998	4121	9314	3195	1448	4066	8709	13000
0												13000
0												13000
0												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	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
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%

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1994		59.58	3.41	18.75	19.29	1.68	0	580	0	580	49.3	0.0
1995		56.21	2.79	18.70	18.26	1.38	0	309	0	309	35.7	0.0
1996		64.16	2.95	19.47	19.54	1.39	0	588	2	590	48.7	0.1
1997		61.44	2.35	19.59	19.31	1.13	0	464	0	464	42.6	0.0
1998		103.13	4.21	22.54	23.10	1.55	0	606	0	606	43.5	0.0
1999		81.74	3.21	21.65	21.65	1.35	0	772	0	772	48.4	0.0
2000		55.40	2.41	19.77	19.77	1.26	16	808	224	1048	52.0	5.6
2001		36.95	2.04	16.01	16.01	1.23	0	620	0	620	51.2	0.0
2002		45.12	2.18	13.77	13.78	1.07	0	511	0	511	51.2	0.0
2003		57.36	2.51	14.52	14.52	1.08	0	499	0	499	49.6	0.0
2004		72.73	2.49	20.22	20.22	1.09	0	193	0	193	22.4	0.0
2005		67.80	2.73	29.18	29.18	1.57	0	324	0	324	24.1	0.0
2006		55.10	2.30	25.60	24.68	1.38	0	906	29	935	47.5	0.7
2007		60.26	2.20	23.95	24.27	1.23	2	808	74	884	45.2	1.8
2008		78.79	2.92	27.97	28.55	1.49	11	703	135	849	36.7	3.0
2009		77.13	2.61	24.06	27.25	1.31	14	772	120	906	43.2	2.8
2010		80.29	3.09	25.31	25.73	1.46	27	506	250	783	34.2	6.1
2011		67.63	2.93	24.50	26.76	1.60	26	553	248	827	39.1	6.6
2012		80.43	3.59	24.51	21.88	1.54	3	369	41	413	31.2	1.2
2013		63.44	2.56	25.97	23.15	1.34	6	362	26	394	30.2	0.8
2014		85.18	3.65	31.10	27.18	1.71	0	448	40	488	29.6	1.2
2015		78.57	3.17	35.62	28.57	1.62	0	500	50	550	27.5	1.3
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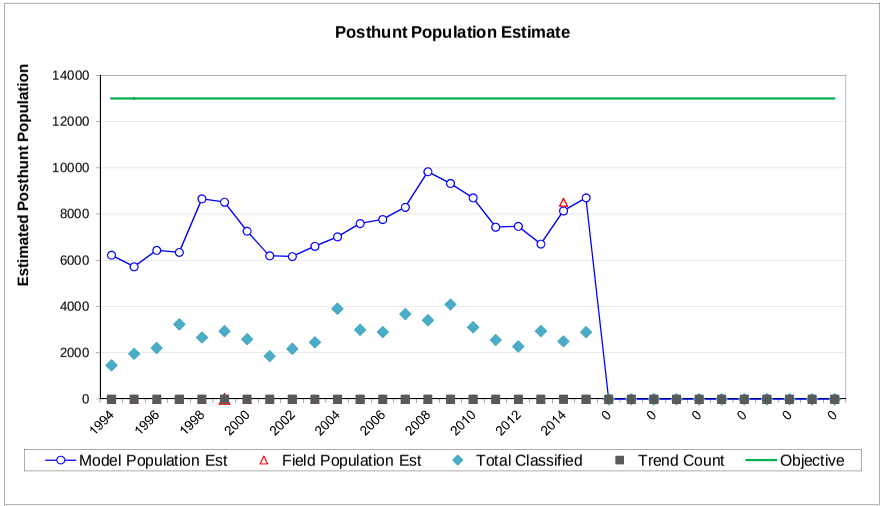
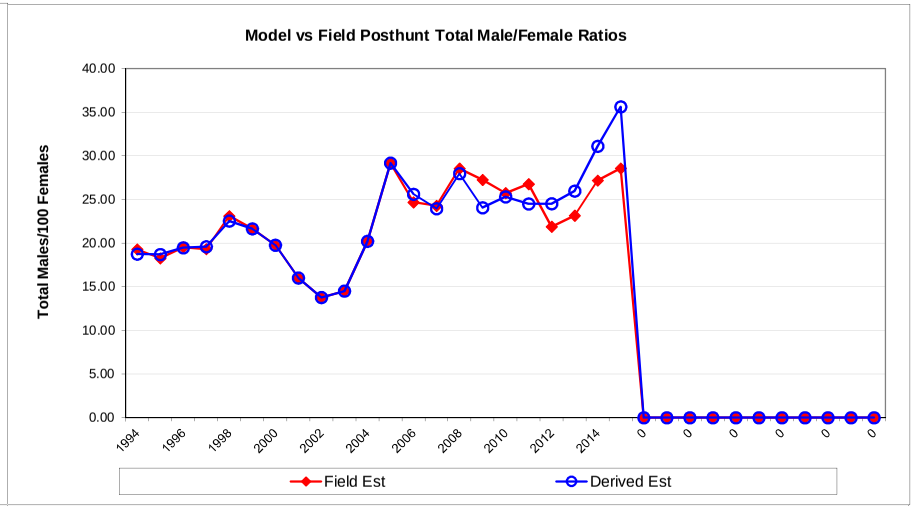
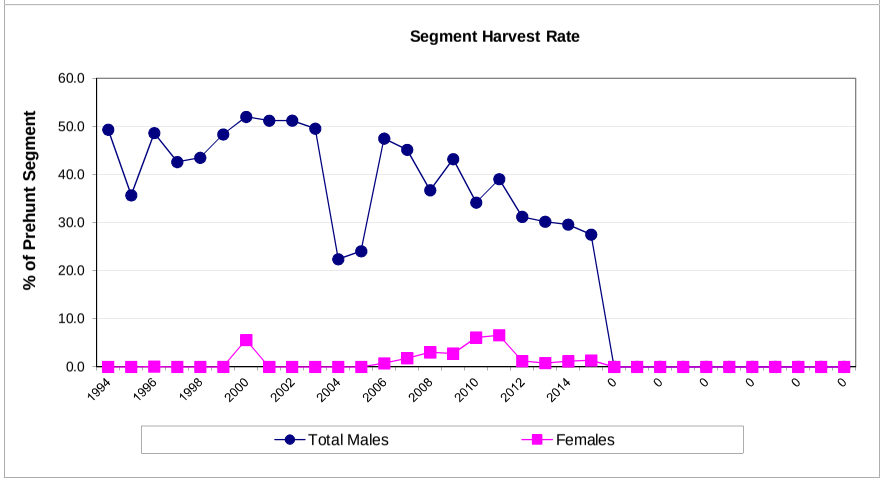
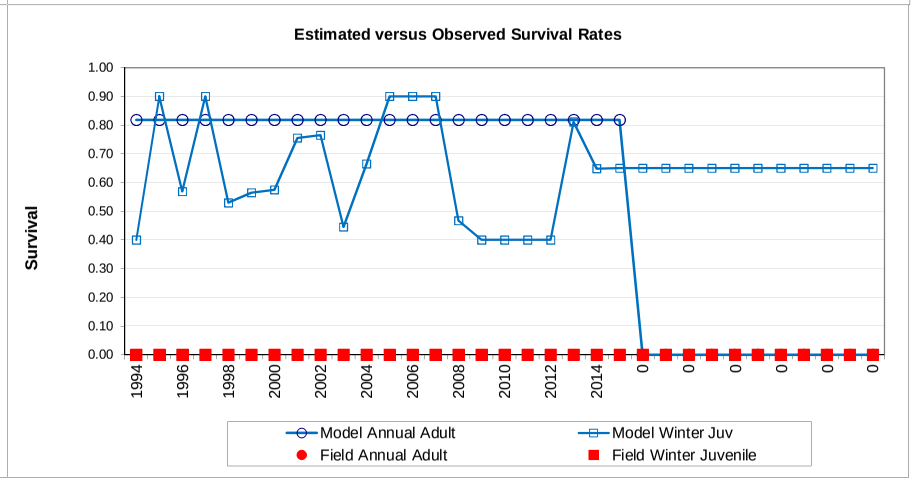
FIGURES









Comments:

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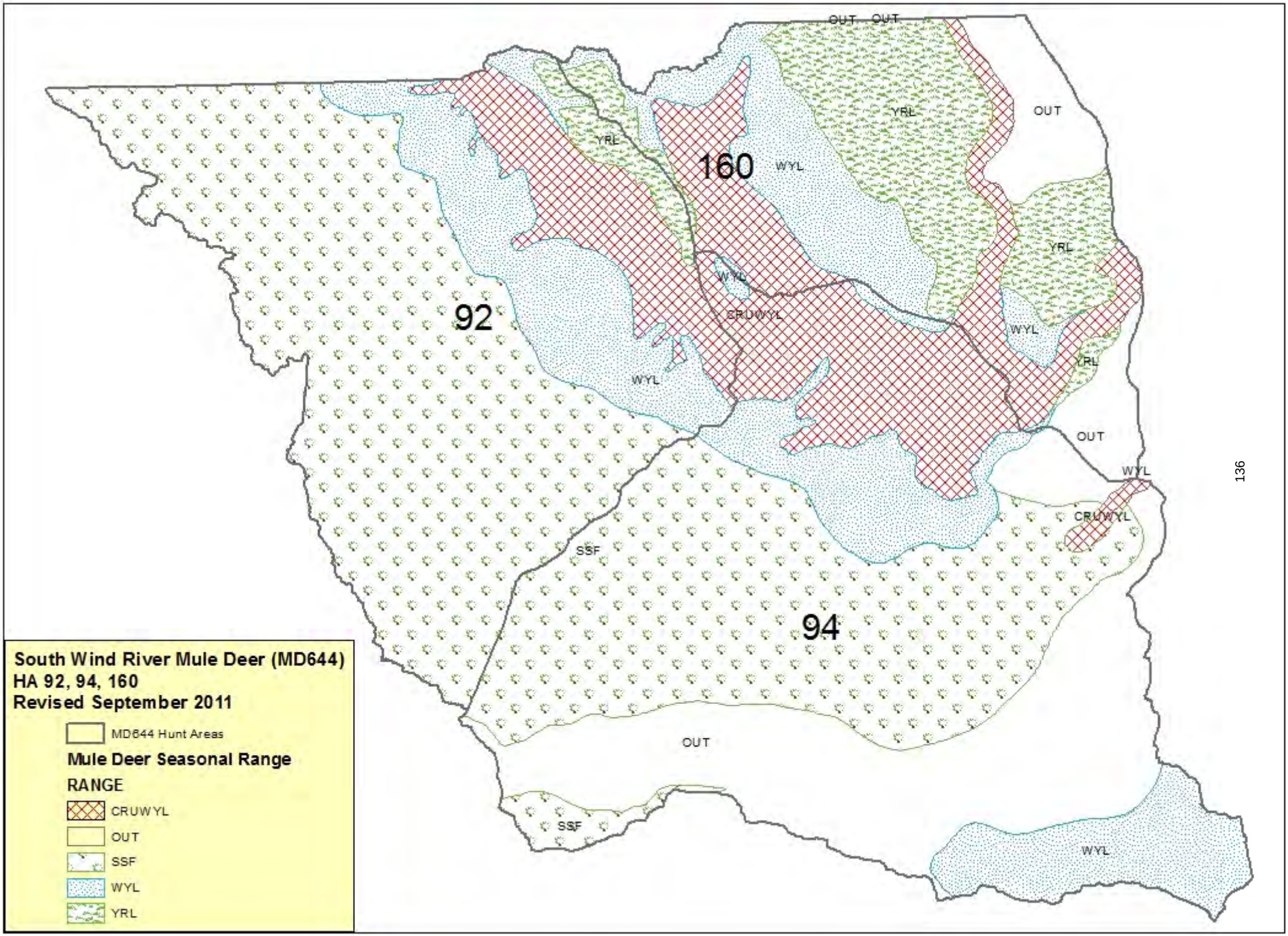

South Wind River Mule Deer (MD644)
HA 92, 94, 160
Revised September 2011
MD644 Hunt Areas
Mule Deer Seasonal Range
RANGE
CRUWYL
OUT
SSF
WYL
YRL
92
94
160
OUT
OUT
OUT
OUT
OUT
YRL
YRL
YRL
YRL
WYL
WYL
WYL
WYL
WYL
WYL
CRUWYL
CRUWYL
SSF
SSF

2014 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2014 - 5/31/2015

HERD: MD646 - SWEETWATER

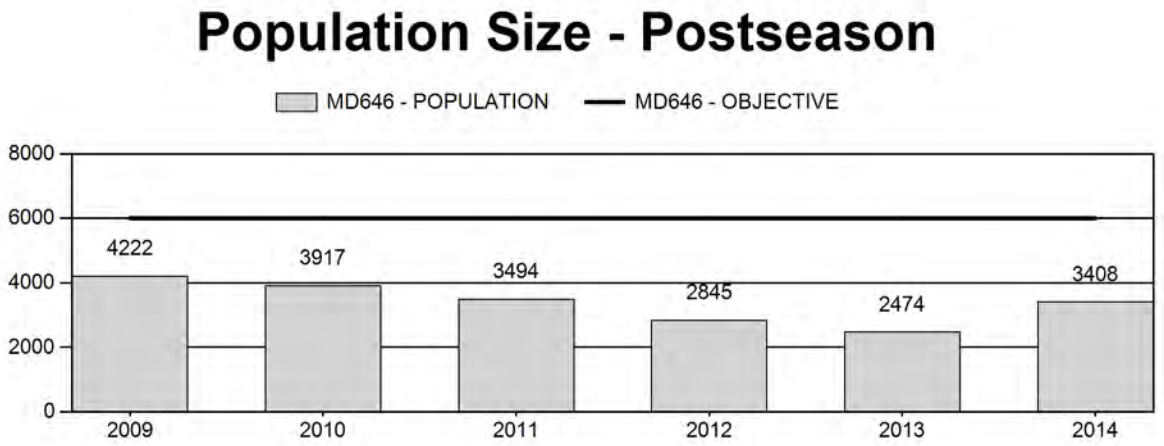
HUNT AREAS: 96-97 | PREPARED BY: STAN HARTER

	2009 - 2013 Average	2014	2015 Proposed
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	

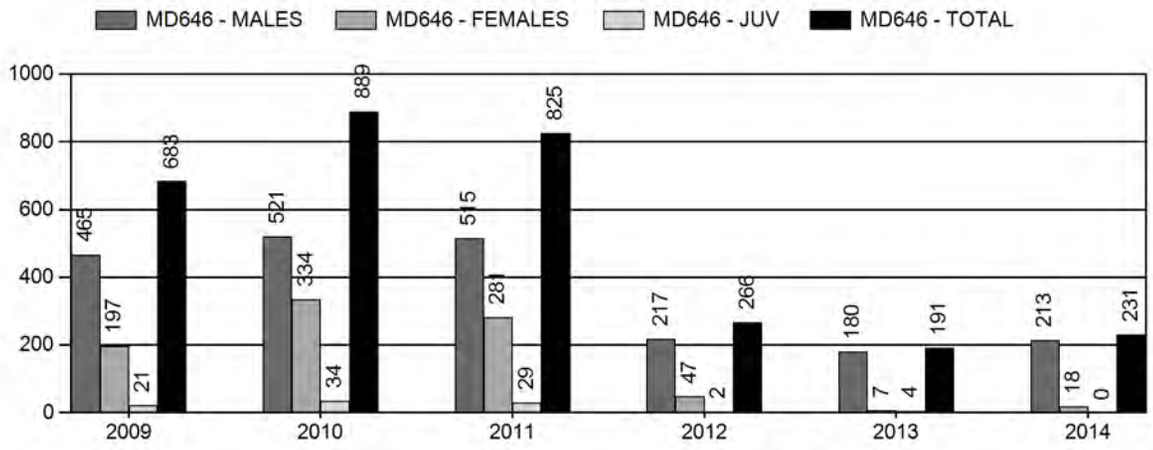
Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-43.2%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/20/2015

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

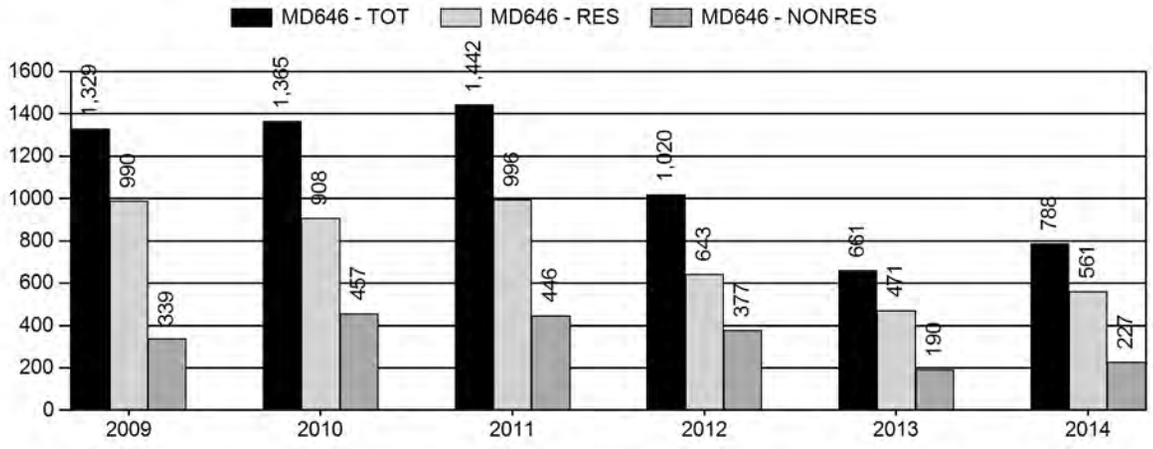
	JCR Year	Proposed
Females ≥ 1 year old:	1.2%	0.6%
Males ≥ 1 year old:	41.1%	45.6%
Juveniles (< 1 year old):	0%	0%
Total:	6.3%	8.1%
Proposed change in post-season population:	+15.9%	+3.3%



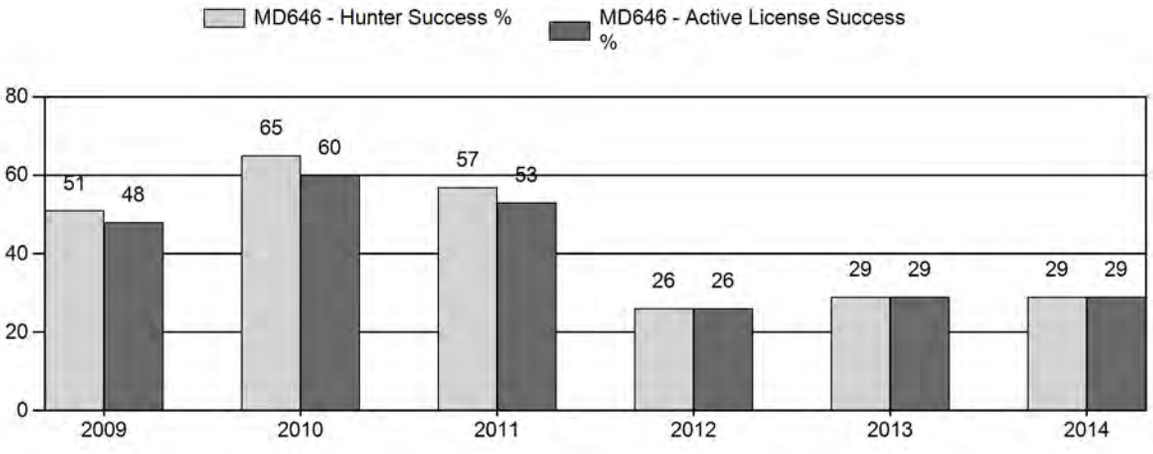
Harvest



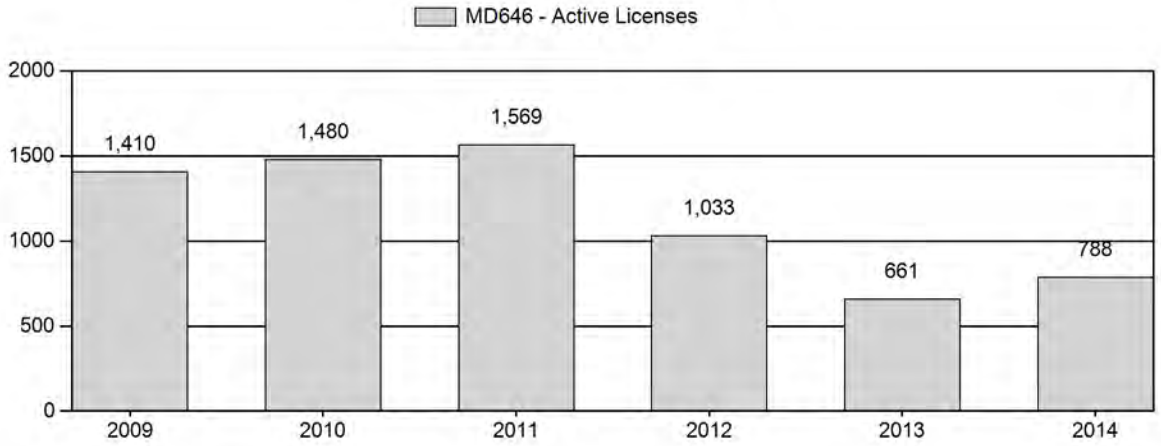
Number of Hunters



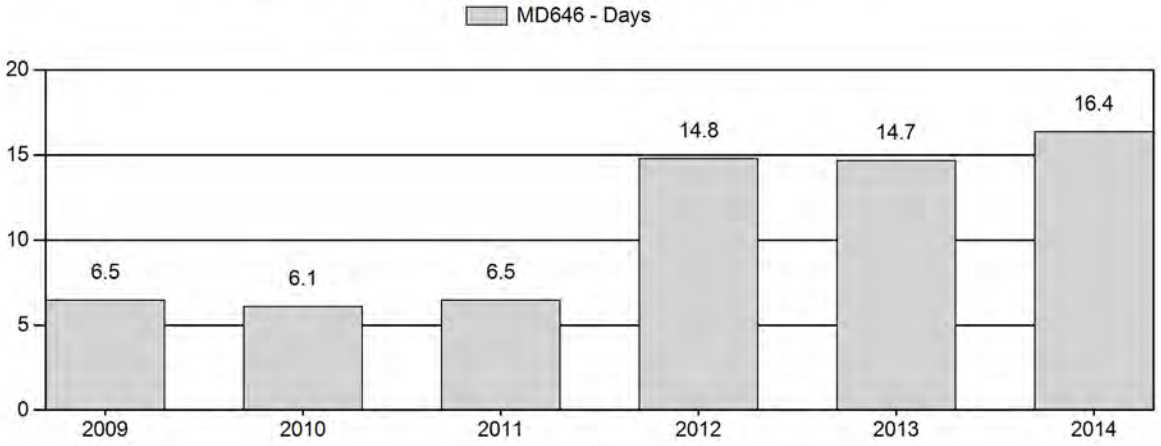
Harvest Success



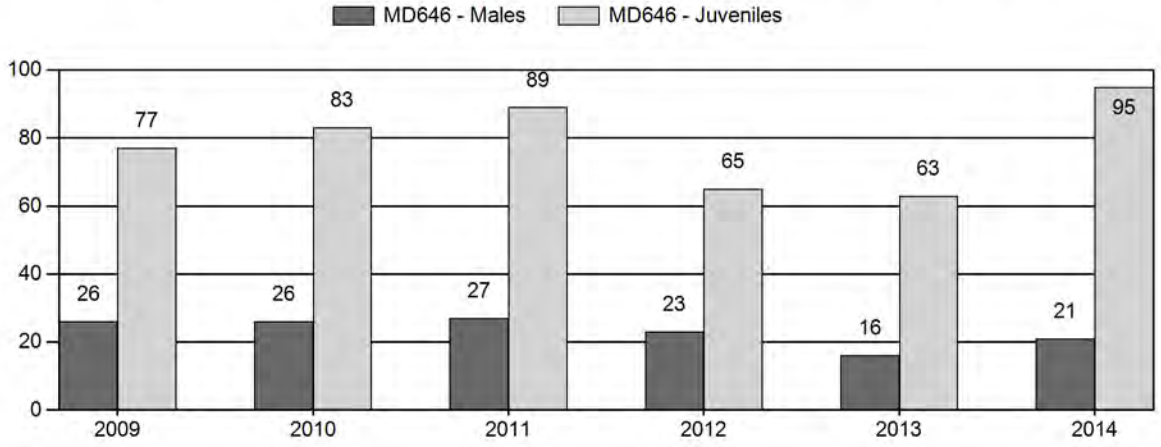
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD646 - SWEETWATER

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 OPENS	CLOSES	QUOTA	LIMITATIONS
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.

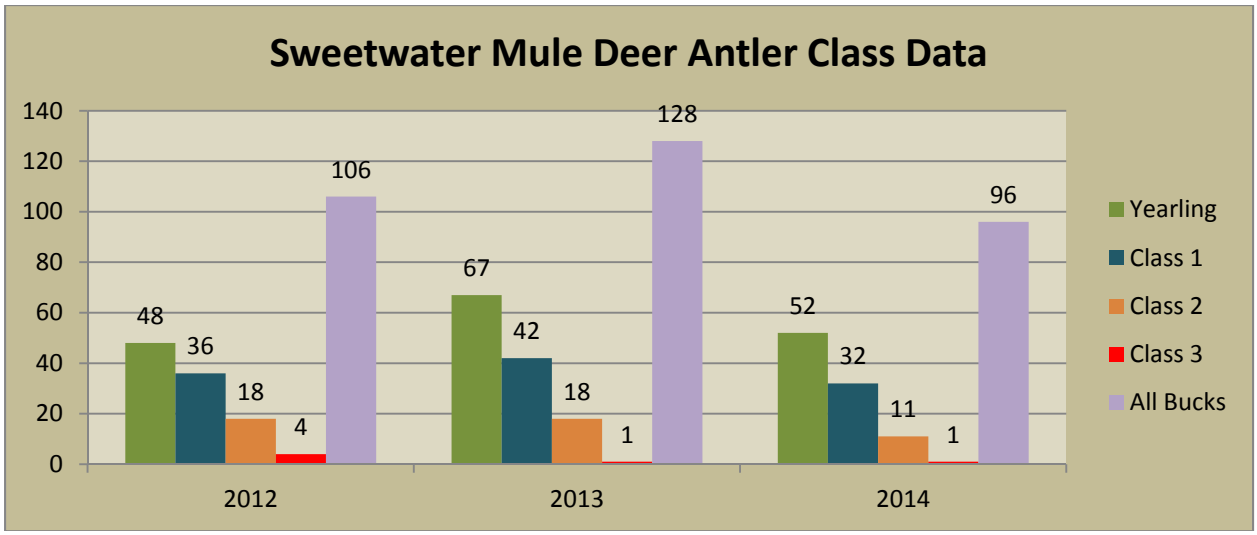


Figure 1. Antler class data from classification surveys in the Sweetwater Mule Deer Herd Unit, 2012-14.

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.

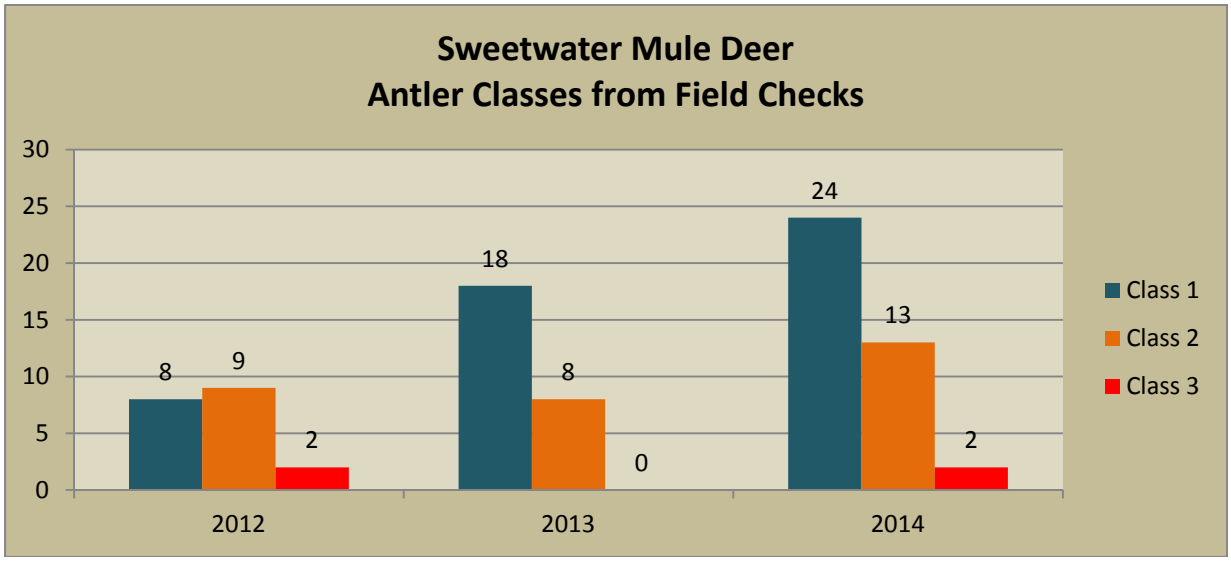


Figure 2. Antler class data as measured during field checks and at check stations, 2012-14.

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.

INPUT	
Species:	Mule Deer
Biologist:	Stan Harter
Herd Unit & No.:	Sweetwater (MD646)
Model date:	02/20/15

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	239	248	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	239	248	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	38	130	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1994				1127	555	2084	3766	1127	424	2084	3635	6000
1995				1327	562	1880	3770	1327	426	1880	3633	6000
1996				962	604	1758	3323	962	442	1758	3162	6000
1997				1220	543	1588	3352	1220	357	1588	3166	6000
1998				1379	596	1574	3549	1379	380	1574	3333	6000
1999				1307	792	1740	3840	1307	379	1740	3426	6000
2000				1130	823	1905	3858	1130	349	1905	3384	6000
2001				1024	639	1874	3538	1024	276	1874	3175	6000
2002				941	613	1882	3436	941	256	1882	3078	6000
2003				998	579	1870	3447	998	277	1870	3145	6000
2004				1405	599	1864	3868	1405	480	1864	3749	6000
2005				1643	931	2030	4603	1641	652	1998	4291	6000
2006				1473	1174	2242	4890	1472	536	2208	4217	6000
2007				1638	1015	2342	4995	1622	469	2231	4322	6000
2008				1804	1021	2420	5246	1798	487	2293	4577	6000
2009				1803	1105	2539	5448	1780	594	2323	4697	6000
2010				1793	1121	2493	5407	1756	548	2126	4429	6000
2011				1676	907	2160	4743	1644	340	1851	3836	6000
2012				1144	599	1798	3542	1142	360	1747	3249	6000
2013				1021	515	1615	3151	1016	317	1608	2940	6000
2014				1498	570	1595	3662	1498	335	1575	3408	6000
2015				1425	730	1714	3868	1419	400	1703	3522	6000
0												6000
0												6000
0												6000
0												6000
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0												6000
0												6000
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0												6000
0												6000
0												6000

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	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
0	0.65					
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%

	Classification Counts										Harvest	
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1994		54.07	5.21	20.35	25.41	3.22	0	119	0	119	23.6	0.0
1995		70.61	6.38	22.65	20.95	2.93	0	124	0	124	24.3	0.0
1996		54.69	5.88	25.13	24.08	3.49	0	147	0	147	26.8	0.0
1997		76.83	7.43	22.49	20.33	3.15	0	169	0	169	34.2	0.0
1998		87.65	9.84	24.12	24.12	4.20	0	197	0	197	36.3	0.0
1999		75.09	6.79	21.76	16.84	2.63	0	376	0	376	52.2	0.0
2000		59.32	4.02	18.34	21.37	2.11	0	431	0	431	57.6	0.0
2001		54.66	3.97	14.74	14.74	1.78	0	330	0	330	56.8	0.0
2002		50.00	5.19	13.59	12.59	2.26	0	325	0	325	58.3	0.0
2003		53.33	3.56	14.80	15.35	1.66	0	275	0	275	52.2	0.0
2004		75.36	4.58	25.76	25.76	2.27	0	108	0	108	19.8	0.0
2005		82.14	5.30	32.66	31.20	2.77	2	253	29	284	29.9	1.6
2006		66.67	4.37	24.29	23.88	2.25	1	580	31	612	54.3	1.5
2007		72.69	4.26	21.03	17.92	1.75	15	496	101	612	53.8	4.7
2008		78.41	3.96	21.22	25.17	1.88	6	486	116	608	52.4	5.3
2009		76.64	3.38	25.57	25.72	1.65	21	465	197	683	46.3	8.5
2010		82.61	5.02	25.76	25.75	2.33	34	521	334	889	51.1	14.7
2011		88.85	5.54	18.39	27.42	2.53	29	515	281	825	62.5	14.3
2012		65.37	4.84	20.64	22.94	2.47	2	217	47	266	39.8	2.9
2013		63.22	3.56	19.69	15.74	1.50	4	180	7	191	38.5	0.5
2014		95.12	6.42	21.29	21.29	2.39	0	213	18	231	41.1	1.2
2015		83.33	5.05	23.48	23.33	2.19	5	300	10	315	45.2	0.6
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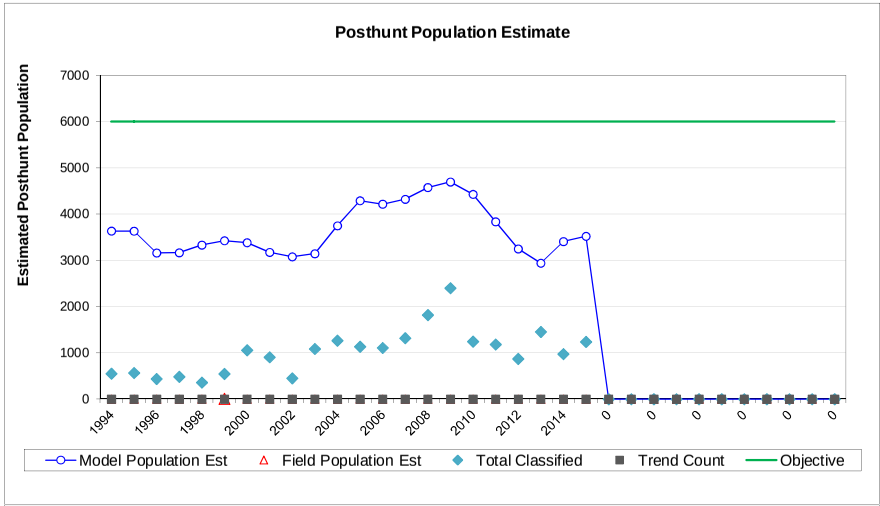
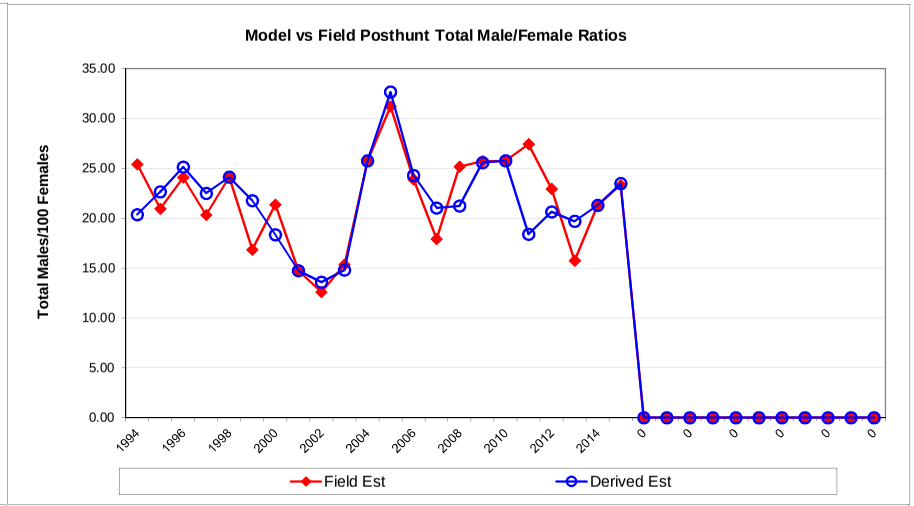
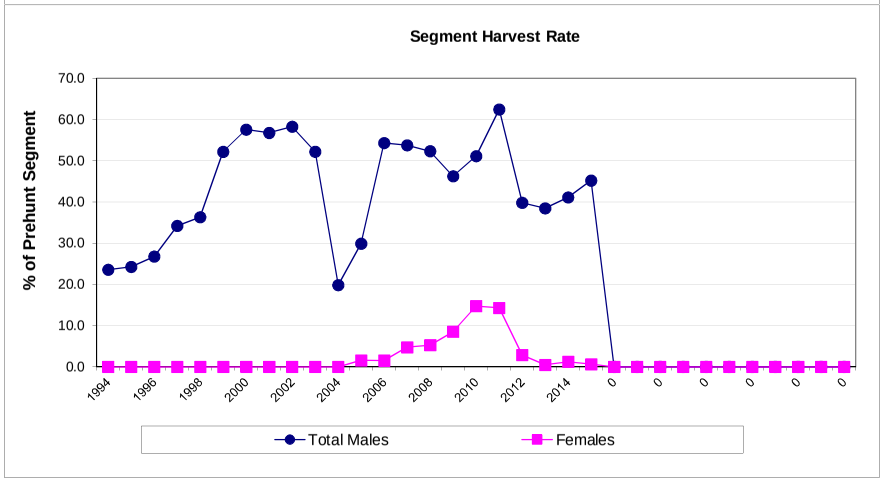
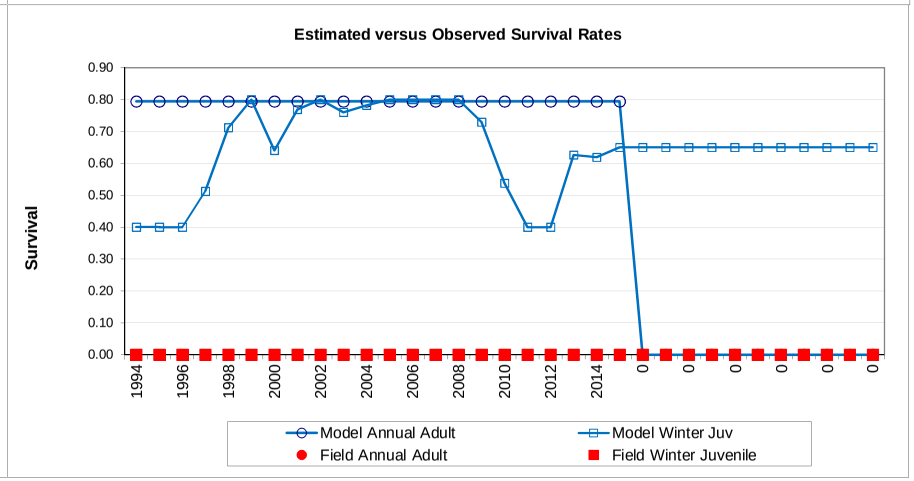
FIGURES









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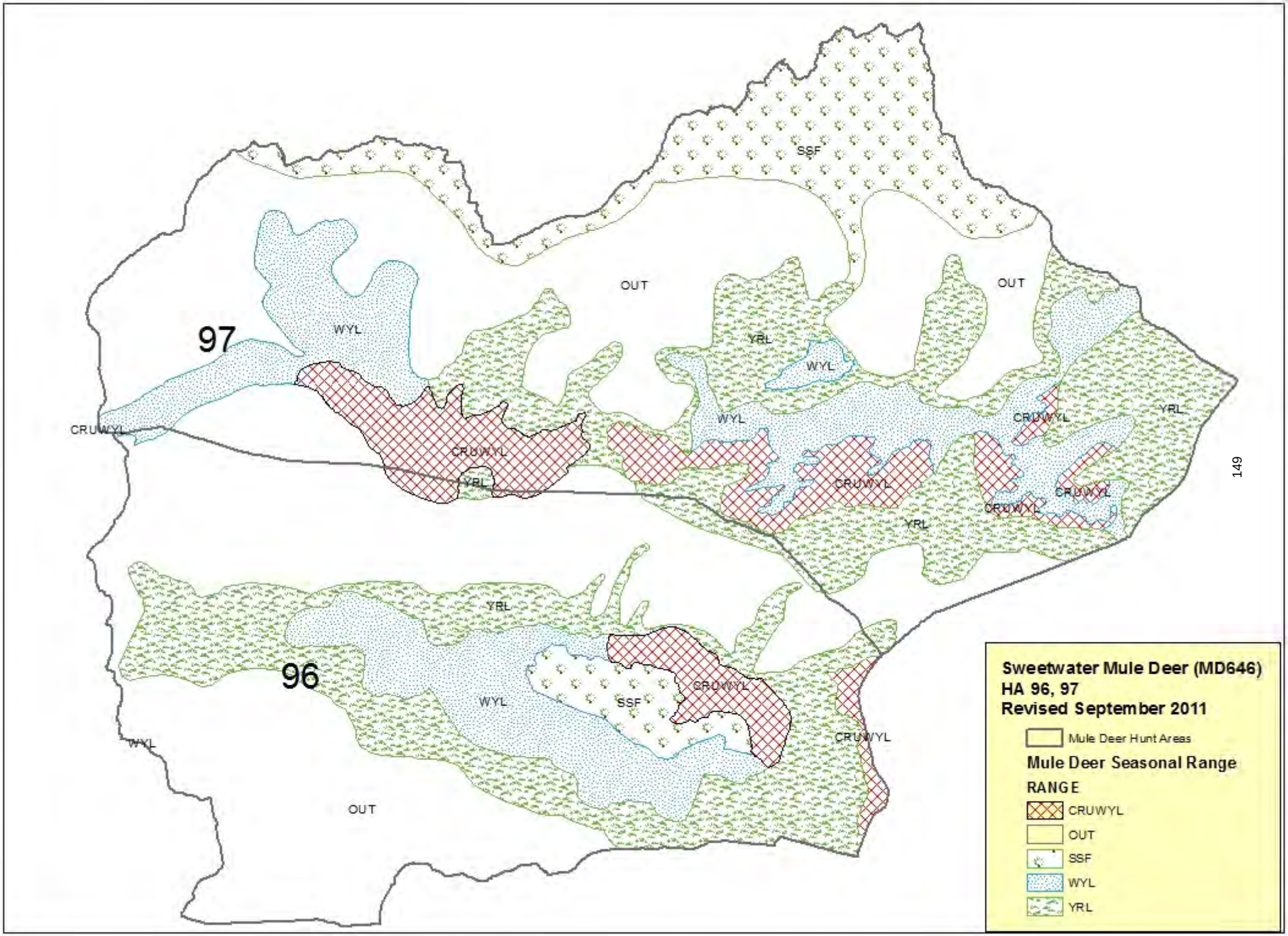

Sweetwater Mule Deer (MD646)
HA 96, 97
Revised September 2011
Mule Deer Hunt Areas
Mule Deer Seasonal Range
RANGE
CRUWYL
OUT
SSF
WYL
YRL
97
96
SSF
OUT
OUT
WYL
YRL
WYL
CRUWYL
YRL
CRUWYL
CRUWYL
YRL
CRUWYL
CRUWYL
CRUWYL
YRL
YRL
WYL
SSF
CRUWYL
CRUWYL
WYL
OUT

2014 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2014 - 5/31/2015

HERD: MD647 - FERRIS

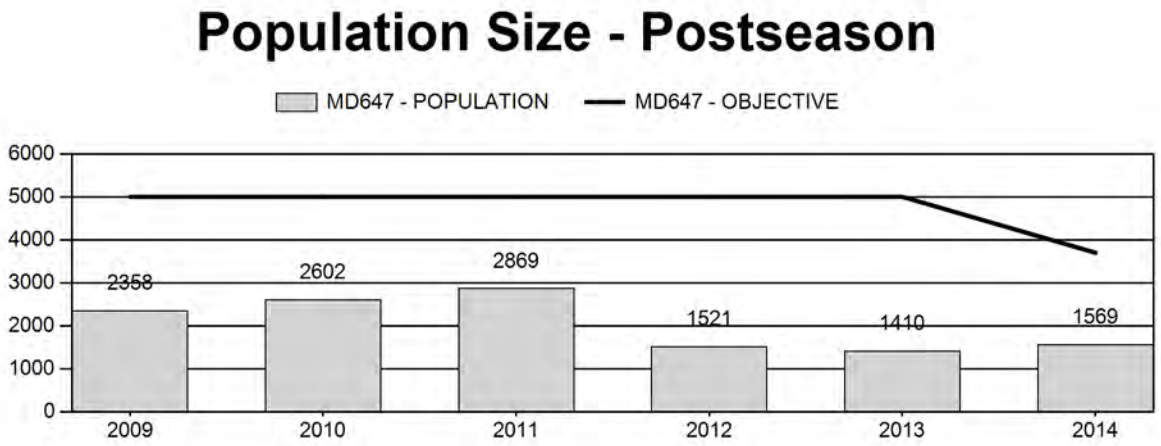
HUNT AREAS: 87 | PREPARED BY: GREG HIATT

	2009 - 2013 Average	2014	2015 Proposed
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	

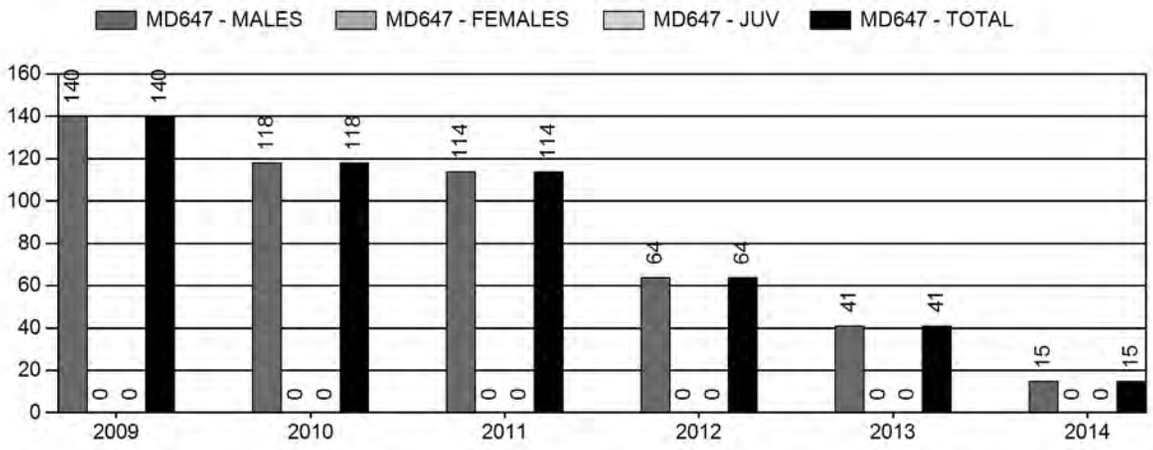
Population Objective (± 20%) :	3700 (2960 - 4440)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-57.6%
Number of years population has been + or - objective in recent trend:	21
Model Date:	3/3/2015

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

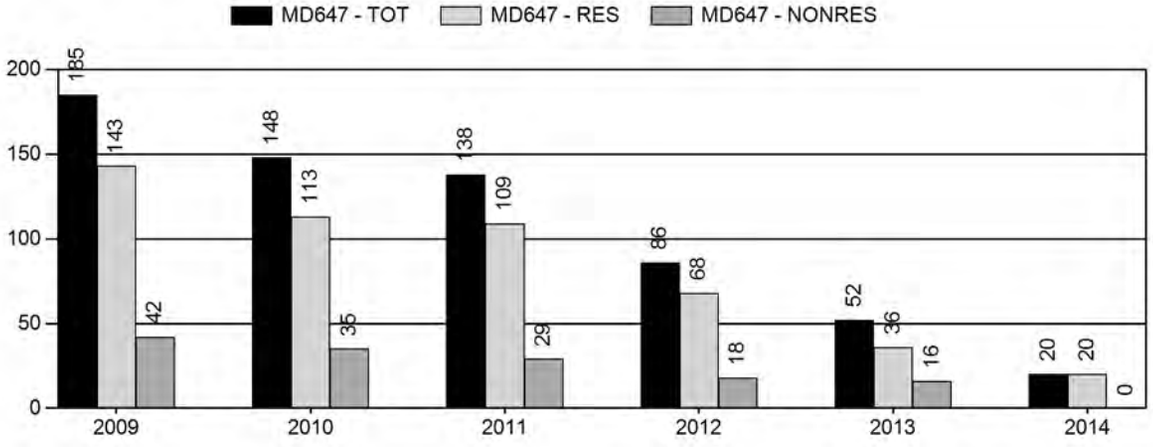
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	4.3%	8.8%
Juveniles (< 1 year old):	0%	0%
Total:	1.0%	2.1%
Proposed change in post-season population:	+2.4%	+1.1%



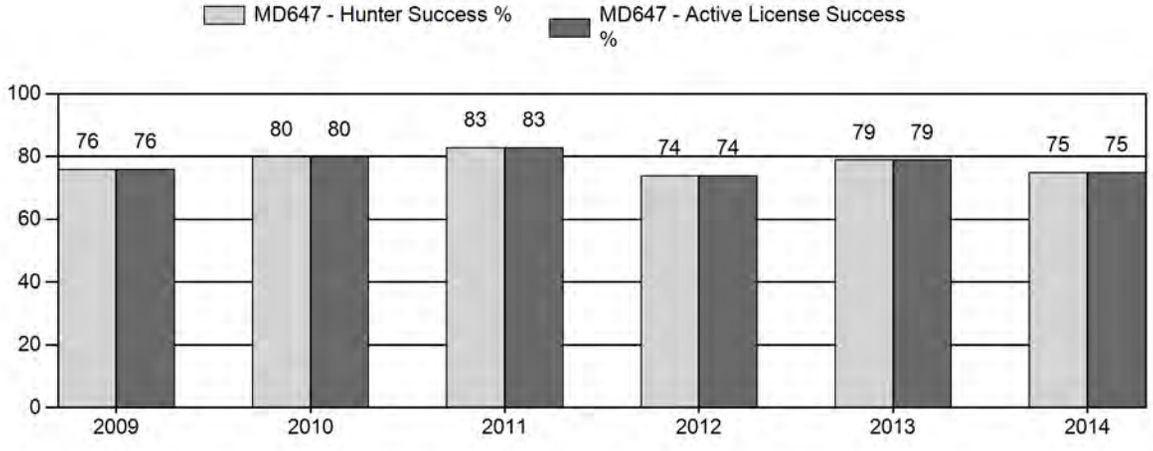
Harvest



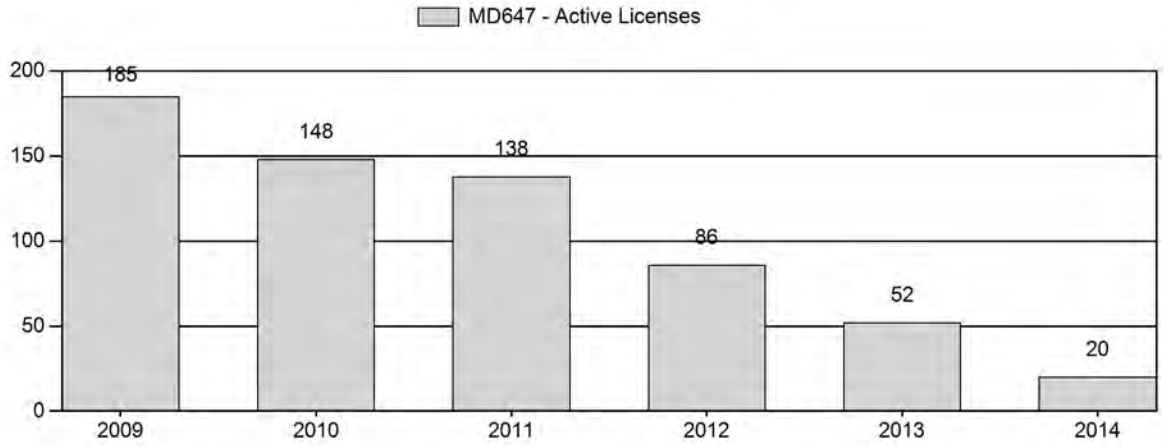
Number of Hunters



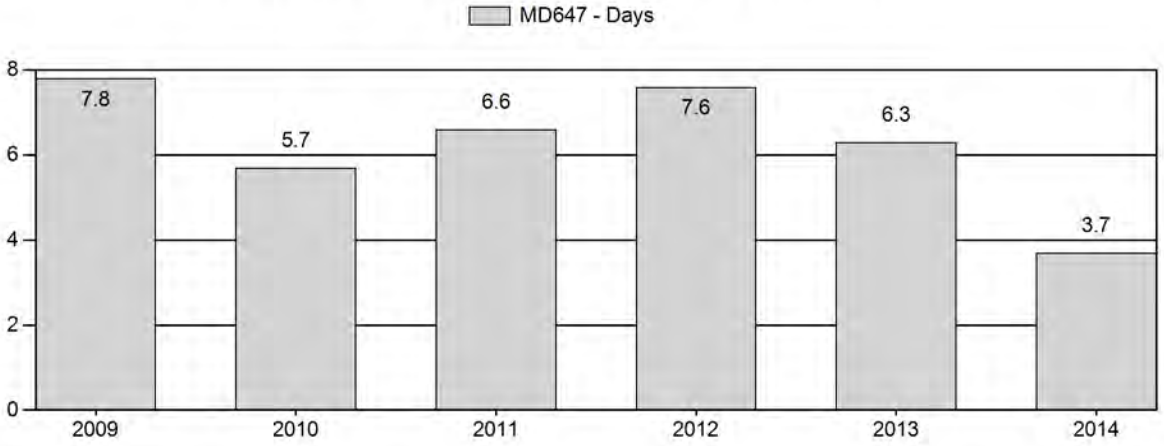
Harvest Success



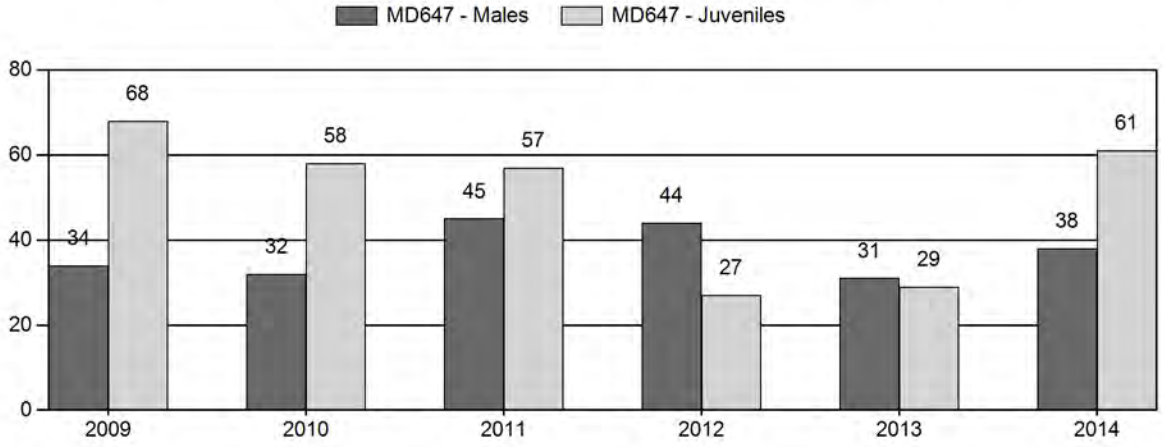
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD647 - FERRIS

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 Opens	Closes	Quota	Limitations
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:	Greg Hiatt
Herd Unit & No.:	MD647 Ferris
Model date:	03/03/15

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	605	614	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	204	227	☐ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	55	207	☑ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		Juveniles	Total Males	Females		
1993				713	365	1372	2450	709	268	1300	2277	5000
1994				615	376	1277	2268	615	268	1249	2132	5000
1995				743	357	1213	2314	743	269	1213	2226	5000
1996				784	417	1242	2443	784	297	1242	2323	5000
1997				760	519	1344	2624	760	381	1344	2485	5000
1998				1097	485	1326	2907	1097	364	1326	2786	5000
1999				996	537	1377	2911	996	336	1377	2710	5000
2000				886	614	1524	3025	886	392	1524	2802	5000
2001				1004	520	1508	3032	1004	372	1508	2885	5000
2002				881	526	1518	2926	881	382	1518	2781	5000
2003				1189	538	1530	3257	1189	382	1530	3101	5000
2004				918	572	1574	3064	918	379	1551	2848	5000
2005				799	767	1790	3357	799	533	1790	3123	5000
2006				887	845	1943	3676	887	633	1943	3463	5000
2007				1125	802	1947	3874	1125	554	1947	3626	5000
2008				732	681	1377	2789	732	522	1377	2631	5000
2009				921	602	1349	2872	921	448	1349	2718	5000
2010				794	576	1362	2732	794	446	1362	2602	5000
2011				845	674	1475	2994	845	549	1475	2869	5000
2012				242	443	906	1592	242	373	906	1521	5000
2013				241	374	840	1455	241	329	840	1410	5000
2014				474	336	782	1591	474	314	782	1569	3700
2015				454	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

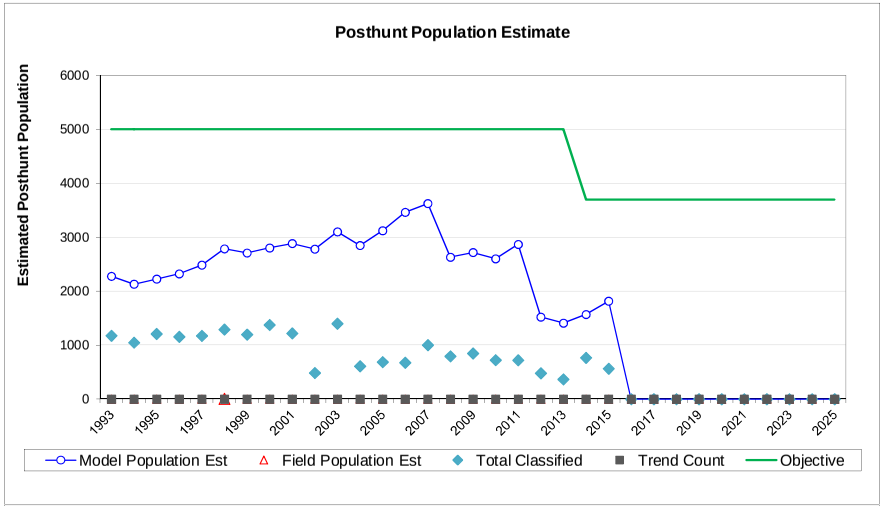
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.40			0.87		
1994	0.40			0.87		
1995	0.49			0.87		
1996	0.66			0.87		
1997	0.40			0.87		
1998	0.40			0.87		
1999	0.64			0.87		
2000	0.40			0.87		
2001	0.40			0.87		
2002	0.46			0.87		
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					

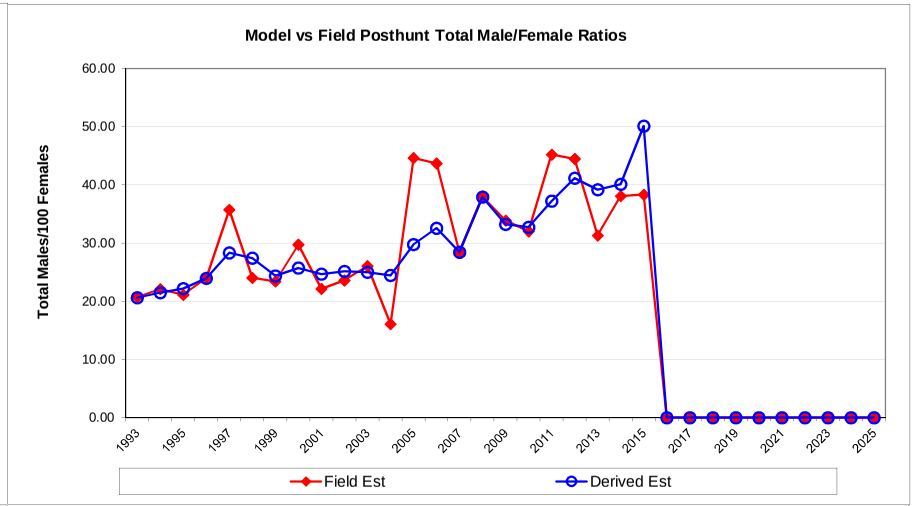
Parameters:	Optim cells
Adult Survival =	0.873
Initial Total Male Pop/10,000 =	0.027
Initial Female Pop/10,000 =	0.130

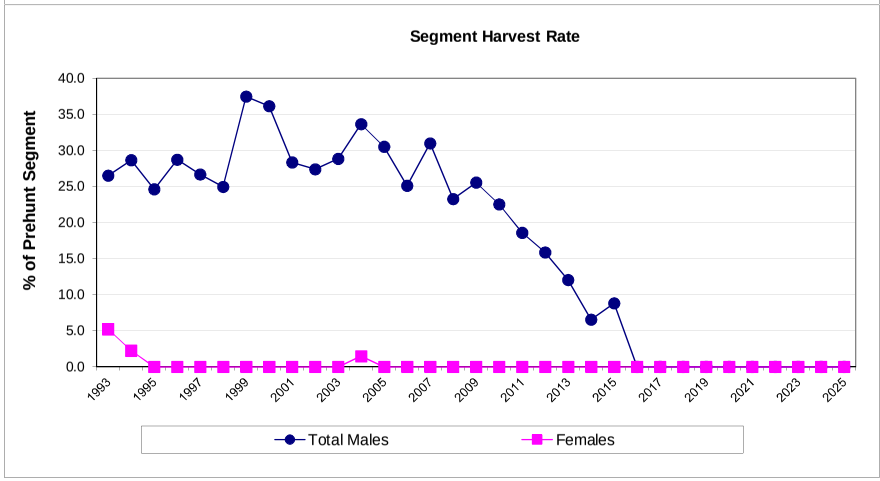
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

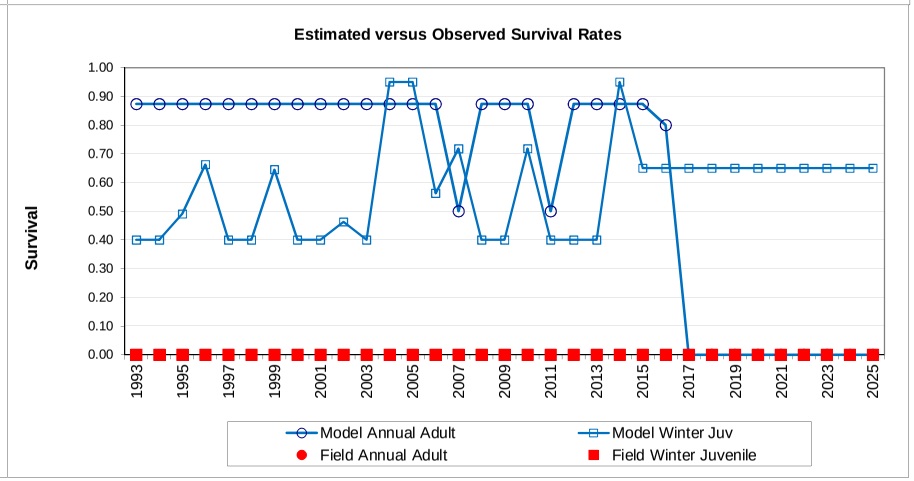
	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		54.55	3.54	20.62	20.72	1.93	4	88	65	157	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	5.86	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	3.47	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









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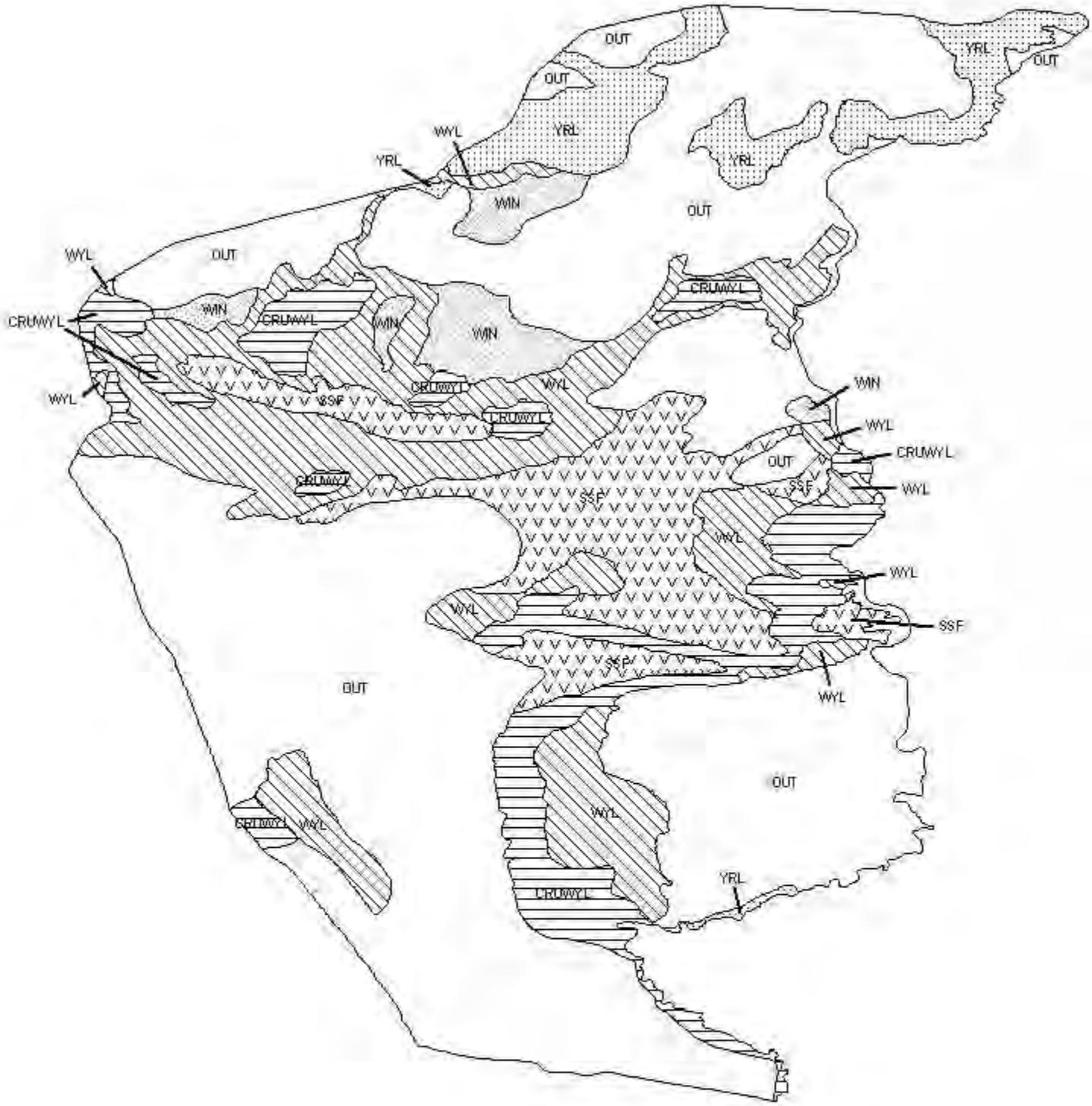


Mule Deer (MD647) - Ferris
HA 87
Revised - 3/91

2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD648 - BEAVER RIM

HUNT AREAS: 90

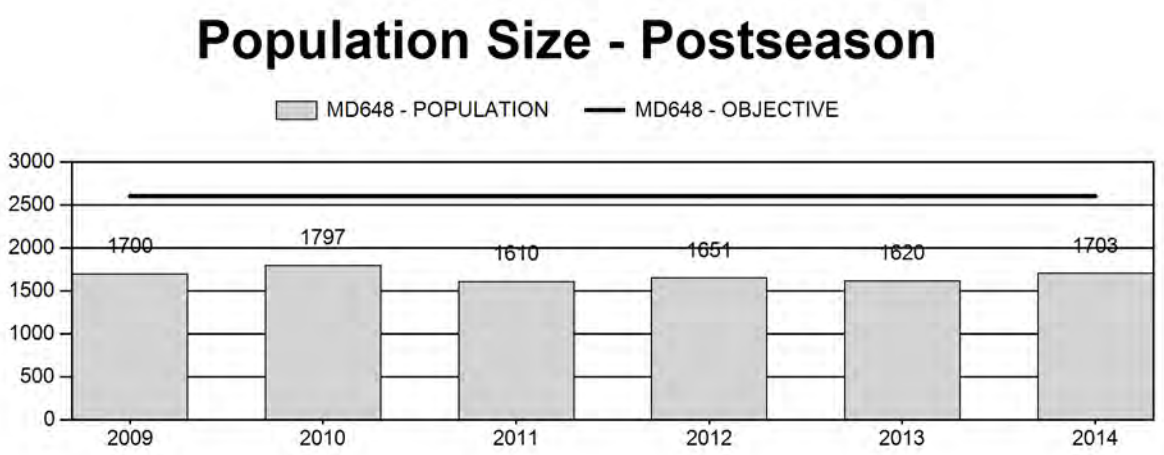
PREPARED BY: GREG ANDERSON

	2009 - 2013 Average	2014	2015 Proposed
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	

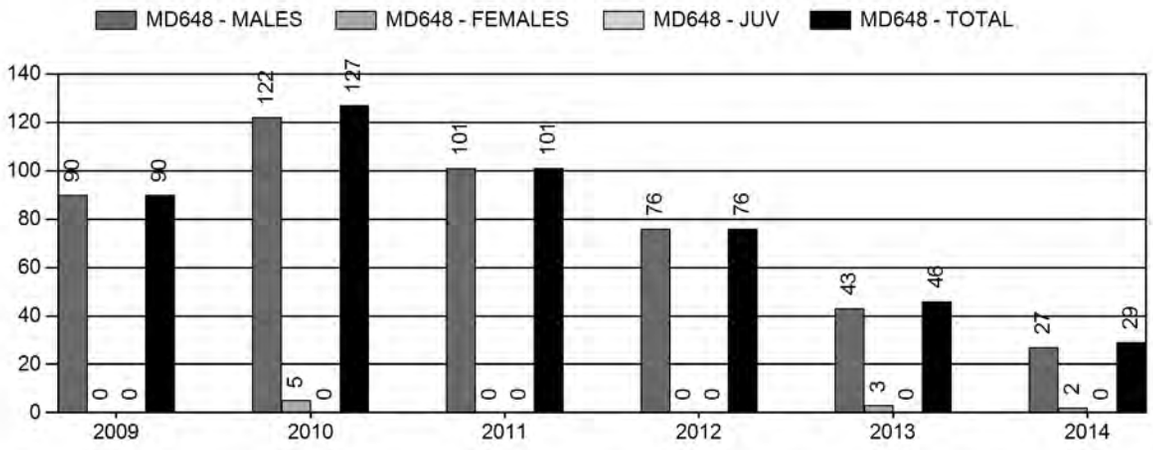
Population Objective (± 20%) :	2600 (2080 - 3120)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-34.5%
Number of years population has been + or - objective in recent trend:	10
Model Date:	2/20/2015

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

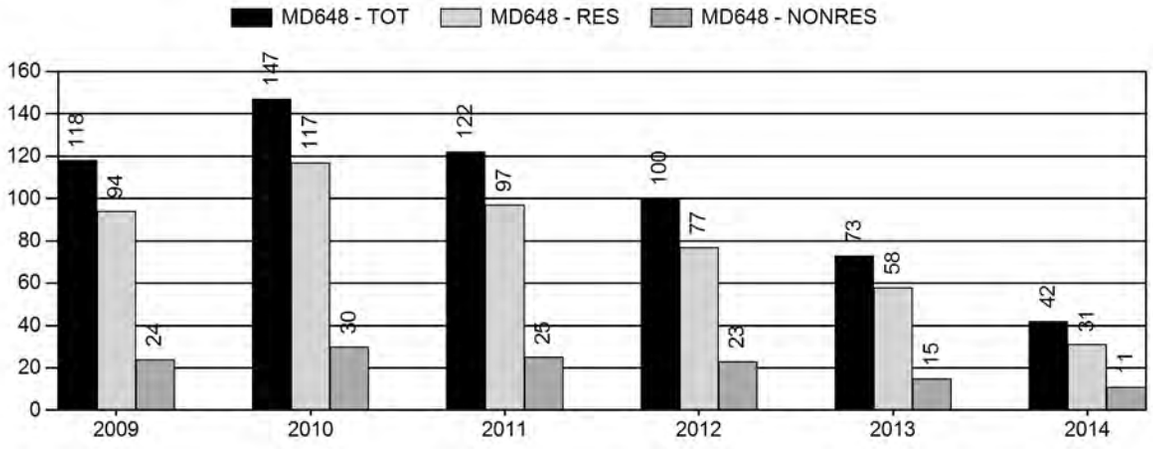
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	12%	8%
Juveniles (< 1 year old):	0%	0%
Total:	2%	2%
Proposed change in post-season population:	+11%	+11%



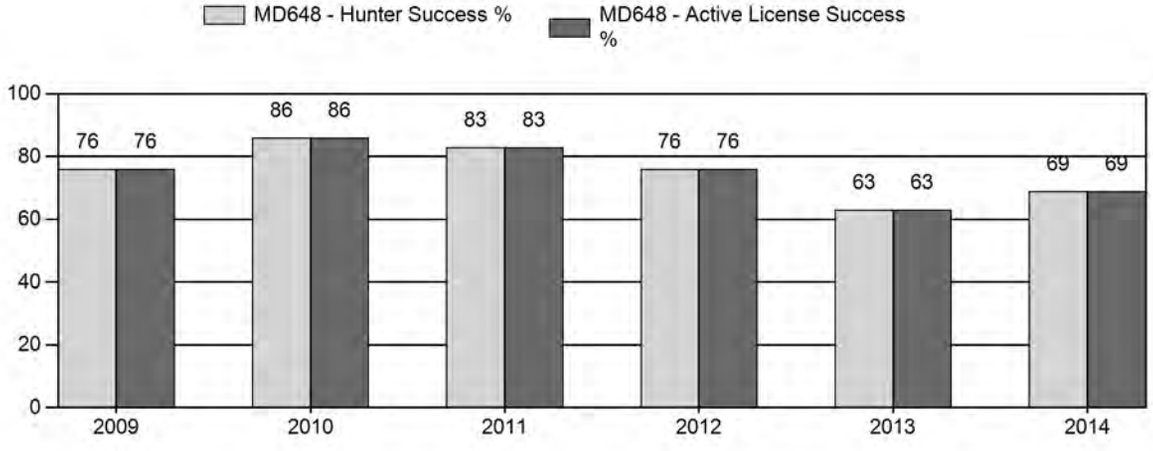
Harvest



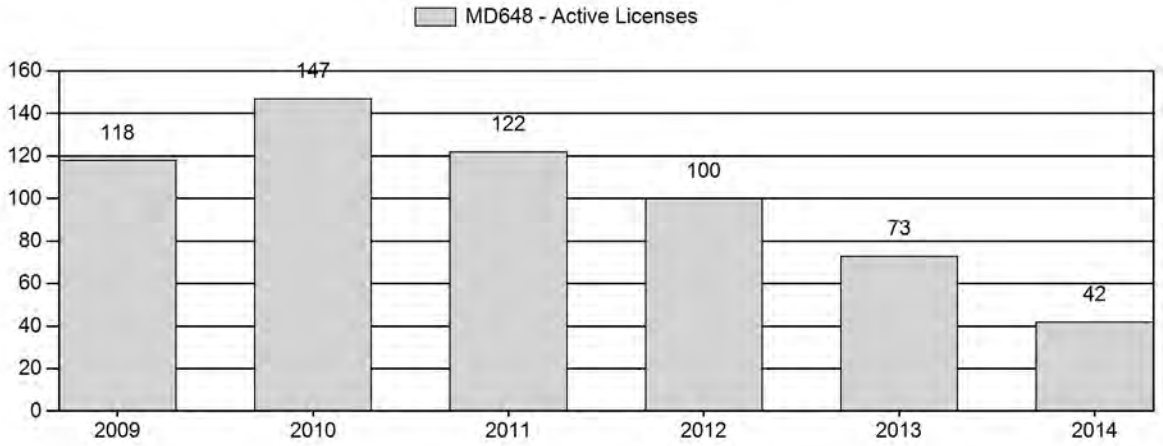
Number of Hunters



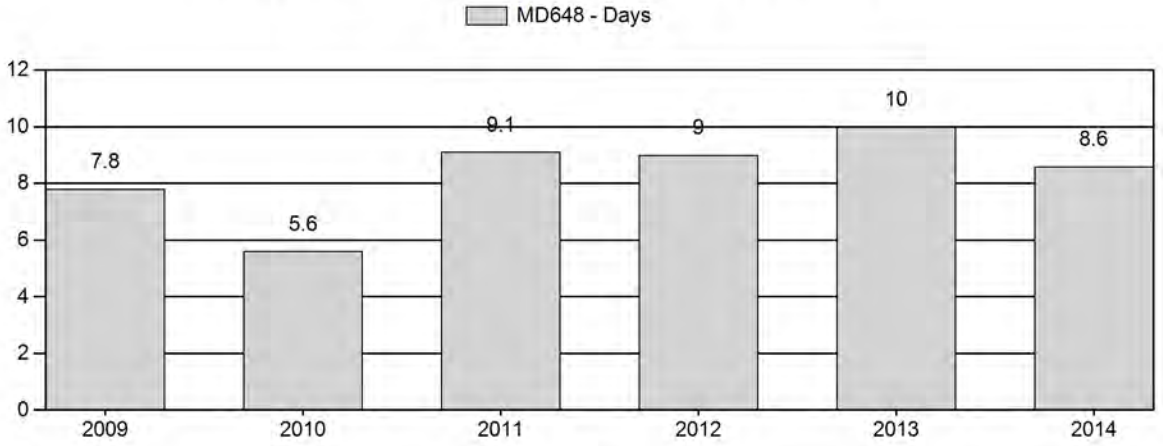
Harvest Success



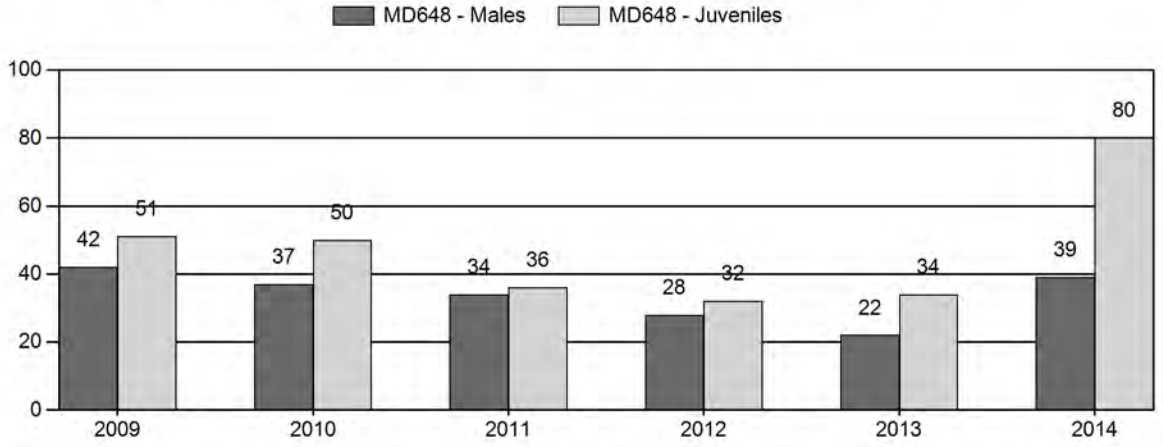
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD648 - BEAVER RIM

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 Opens	Closes	Quota	Limitations
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.

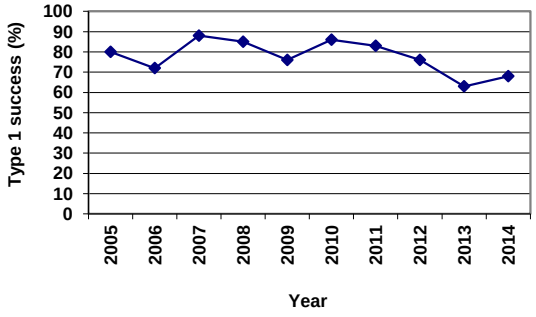
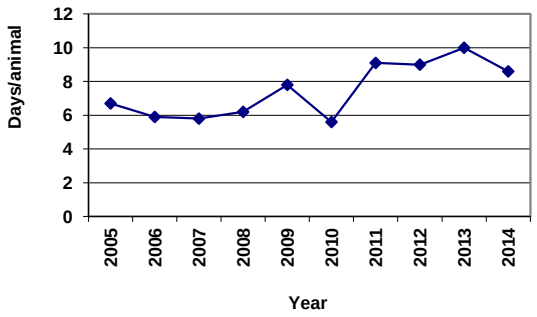


Figure 2. Type 1 license days/animal statistic



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		Fit	Relative AICc	Check best model to create report	Notes
CJ,CA	**Constant Juvenile & Adult Survival**	21	30	☐ CJ,CA Model	
SCJ,SCA	**Semi-Constant Juvenile & Semi-Constant Adult Survival**	18	32	☑ SCJ,SCA Mod	
TSJ,CA	**Time-Specific Juvenile & Constant Adult Survival**	11	133	☐ TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population			Total	Predicted Posthunt Population			Total	Objective
	Field Est	Field SE		Juveniles	Total Males	Females		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	SE	Model Est	Field Est	SE
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						
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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%

	Classification Counts						Harvest					
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total 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												
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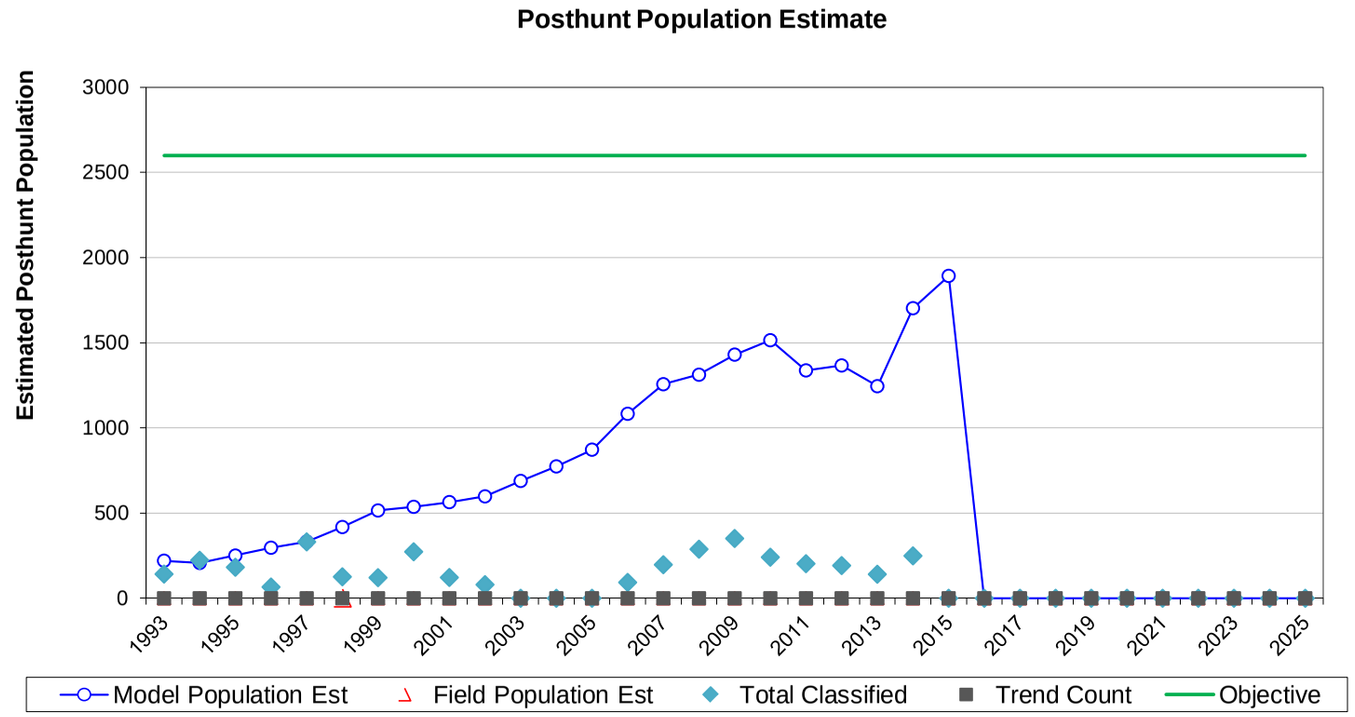
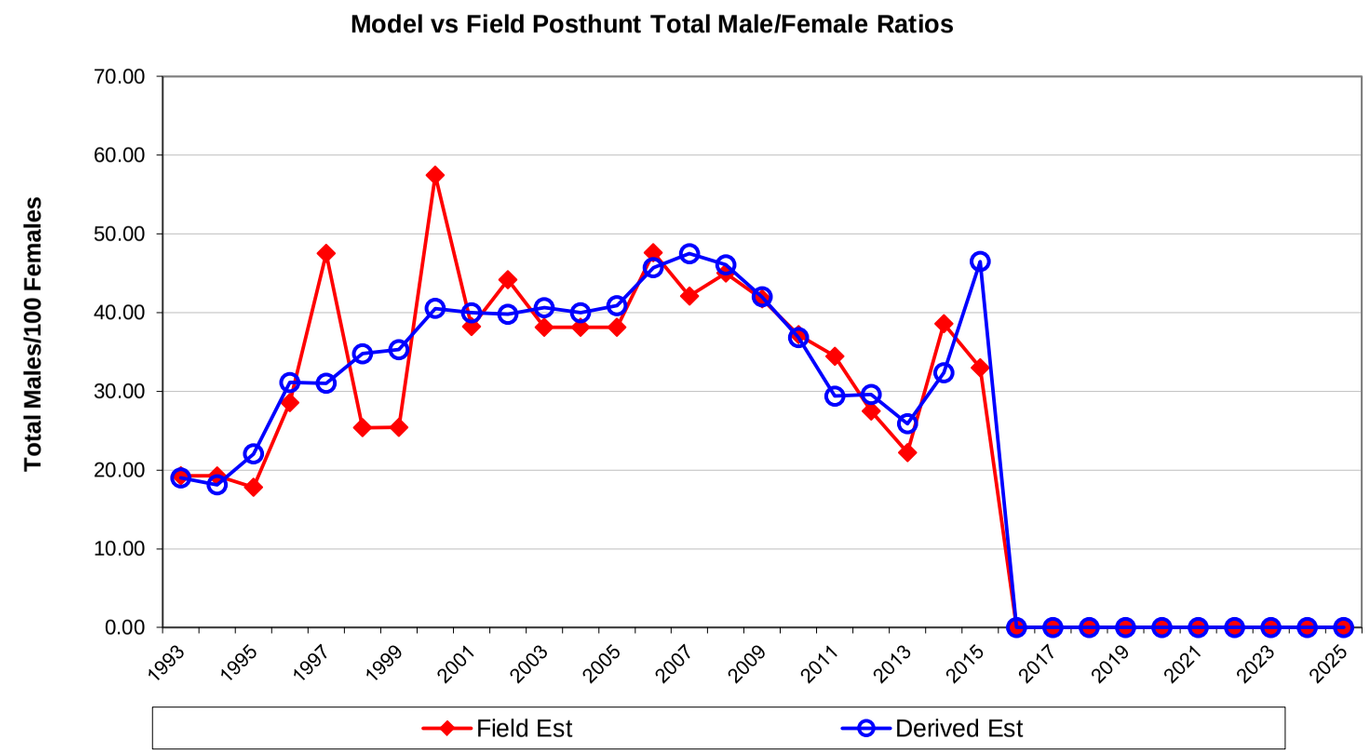
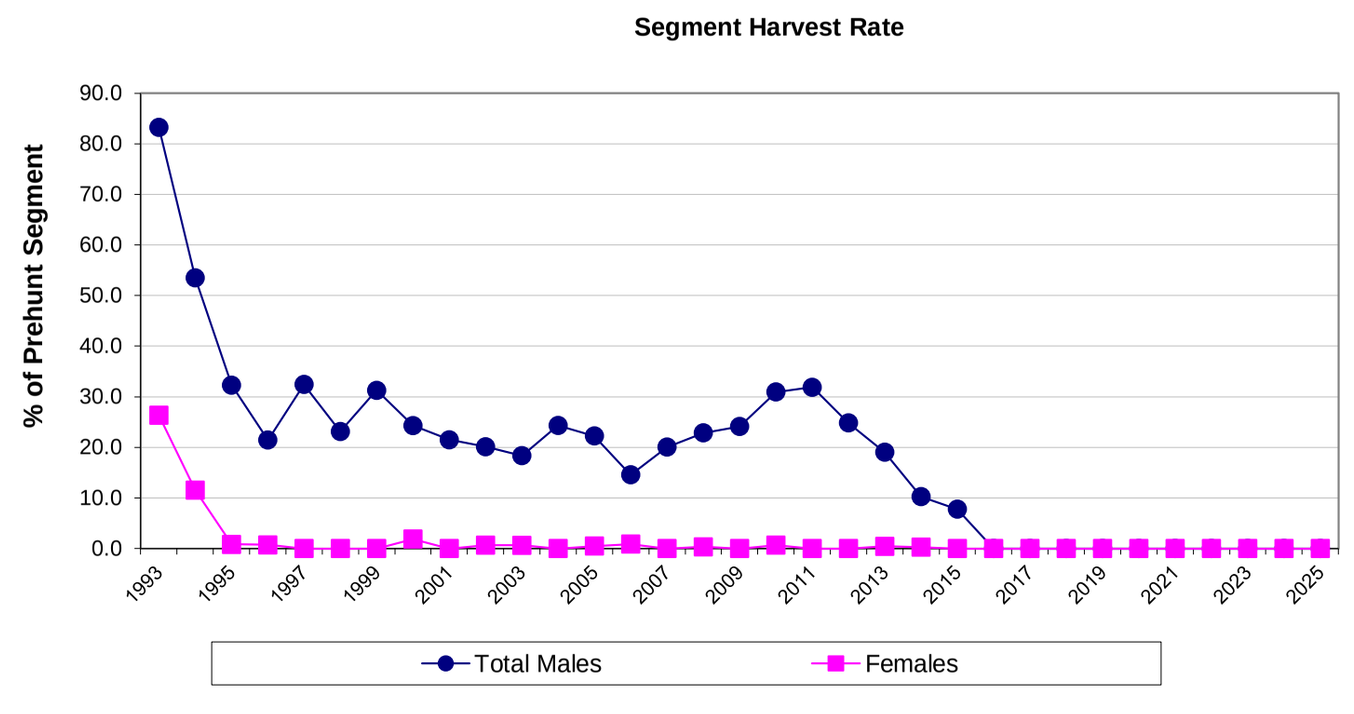
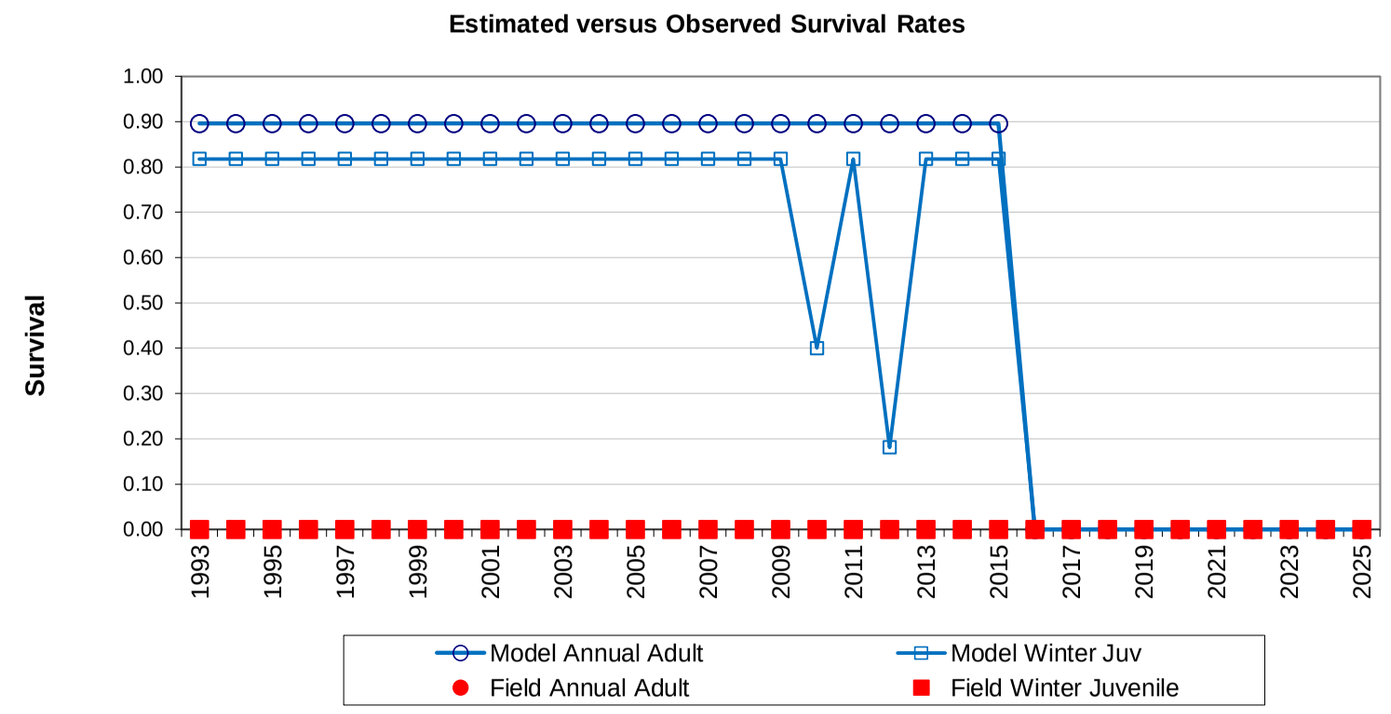
2023												
2024												
2025												

FIGURES









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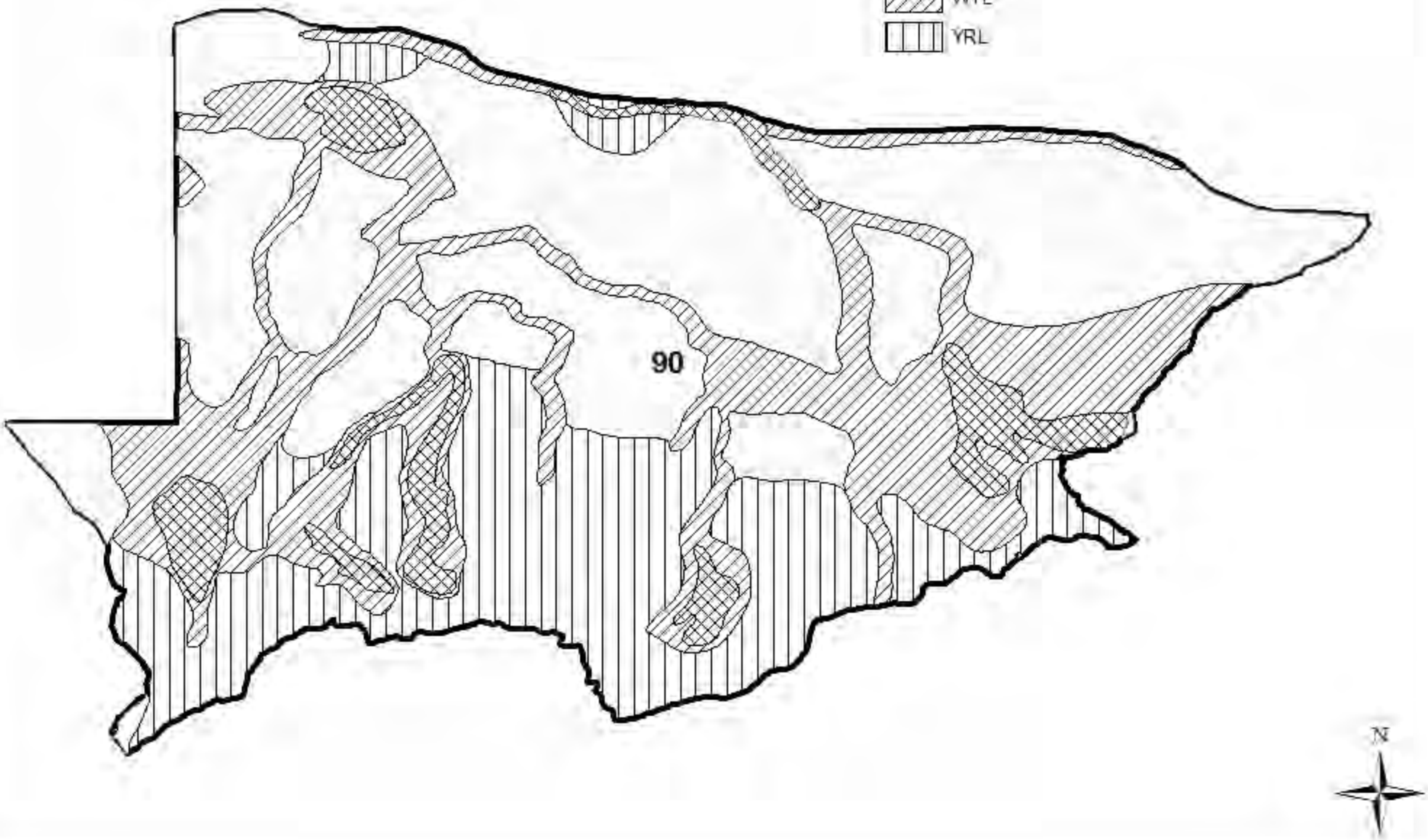

Beaver Rim Mule Deer Seasonal Range
Hunt Area 90
Revised 2012
CRUWYL
OUT
SSF
WYL
YRL
90
N

2014 - JCR Evaluation Form

SPECIES: Mule Deer | PERIOD: 6/1/2014 - 5/31/2015

HERD: MD650 - CHAIN LAKES

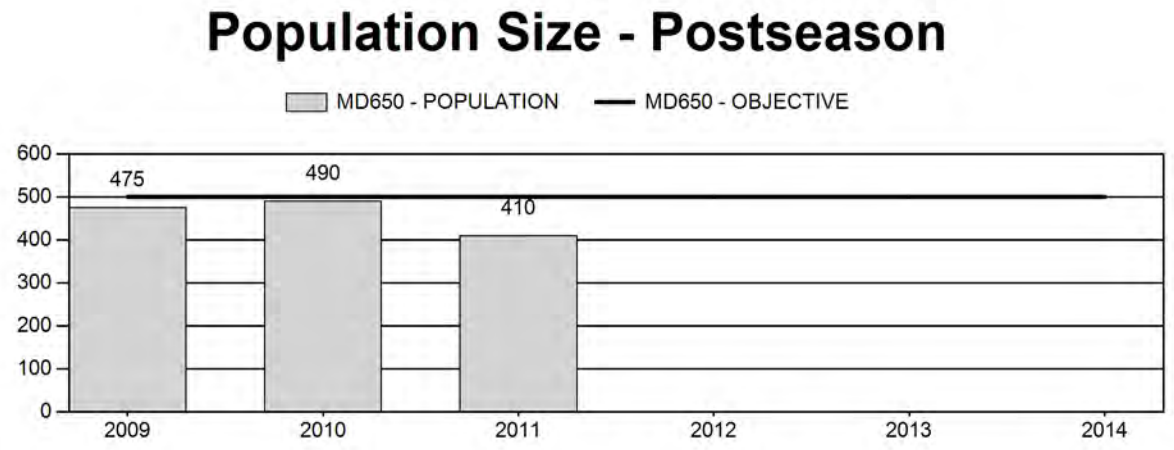
HUNT AREAS: 98 | PREPARED BY: GREG HIATT

	2009 - 2013 Average	2014	2015 Proposed
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	

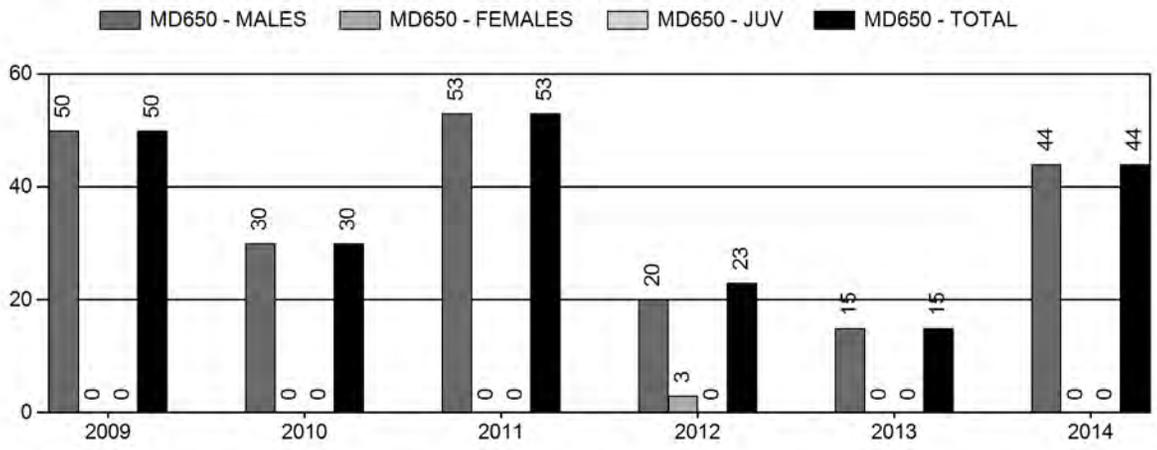
Population Objective (± 20%) :	500 (400 - 600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

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

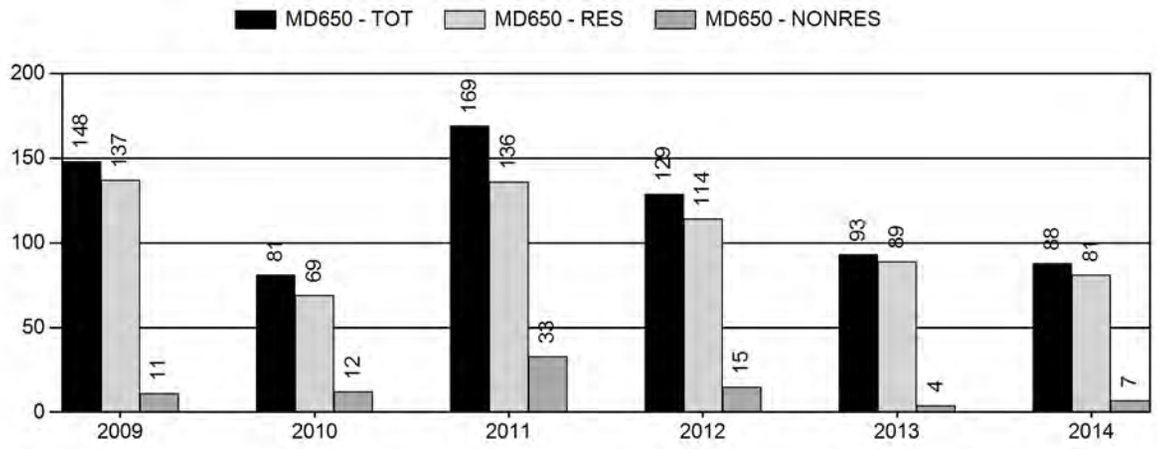
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%
Total:	0%	0%
Proposed change in post-season population:	0%	0%



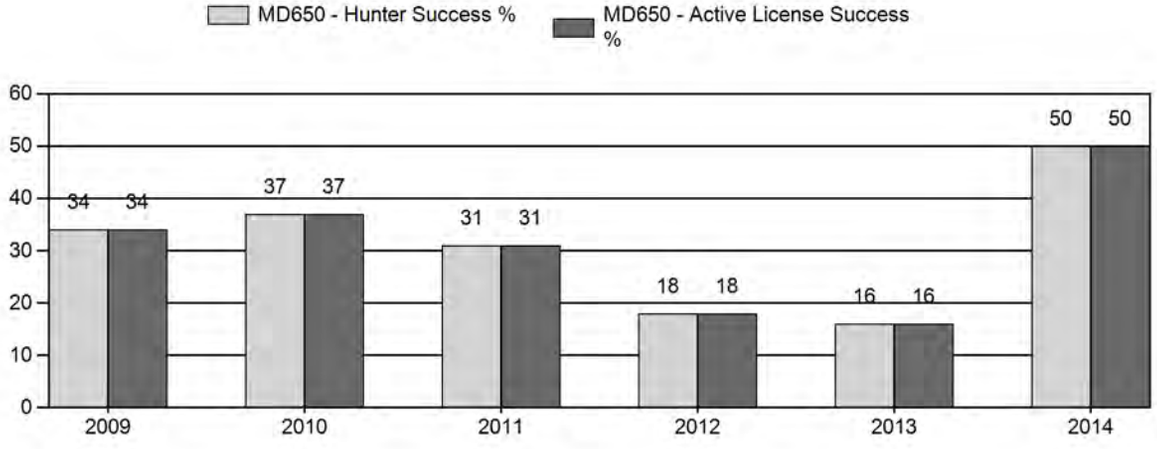
Harvest



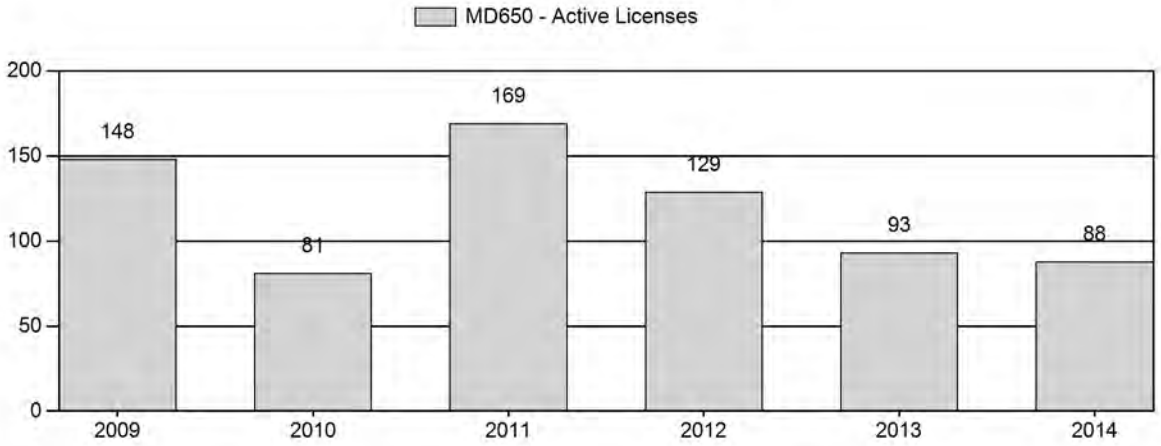
Number of Hunters



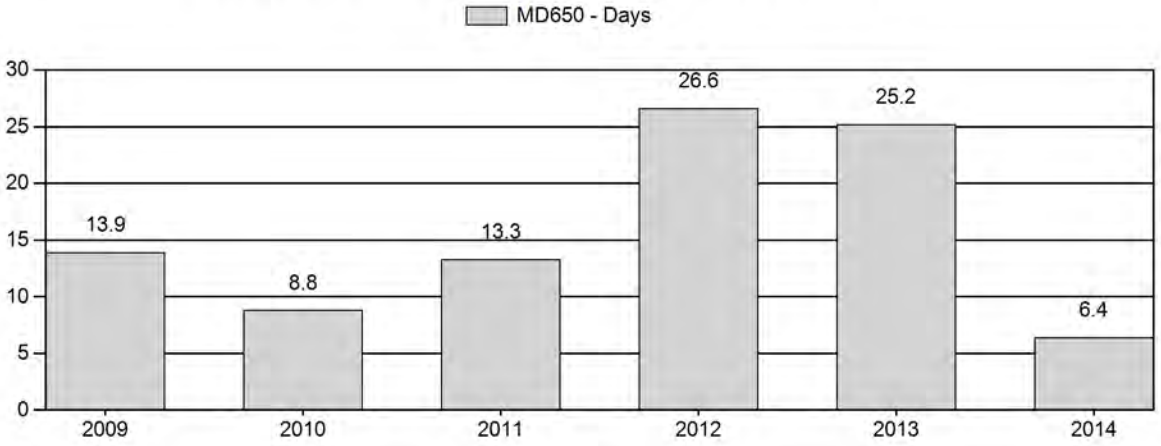
Harvest Success



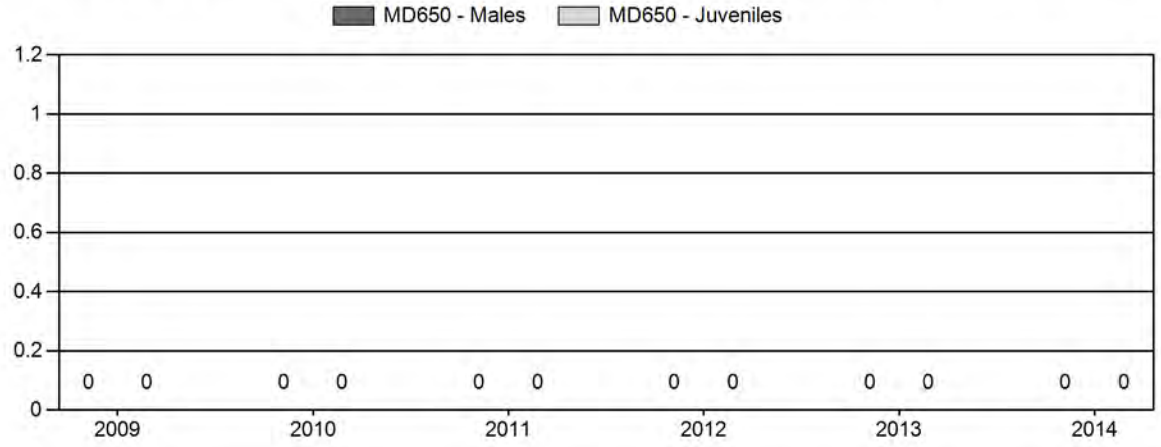
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD650 - CHAIN LAKES

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	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 Opens	Closes	Quota	Limitations
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.

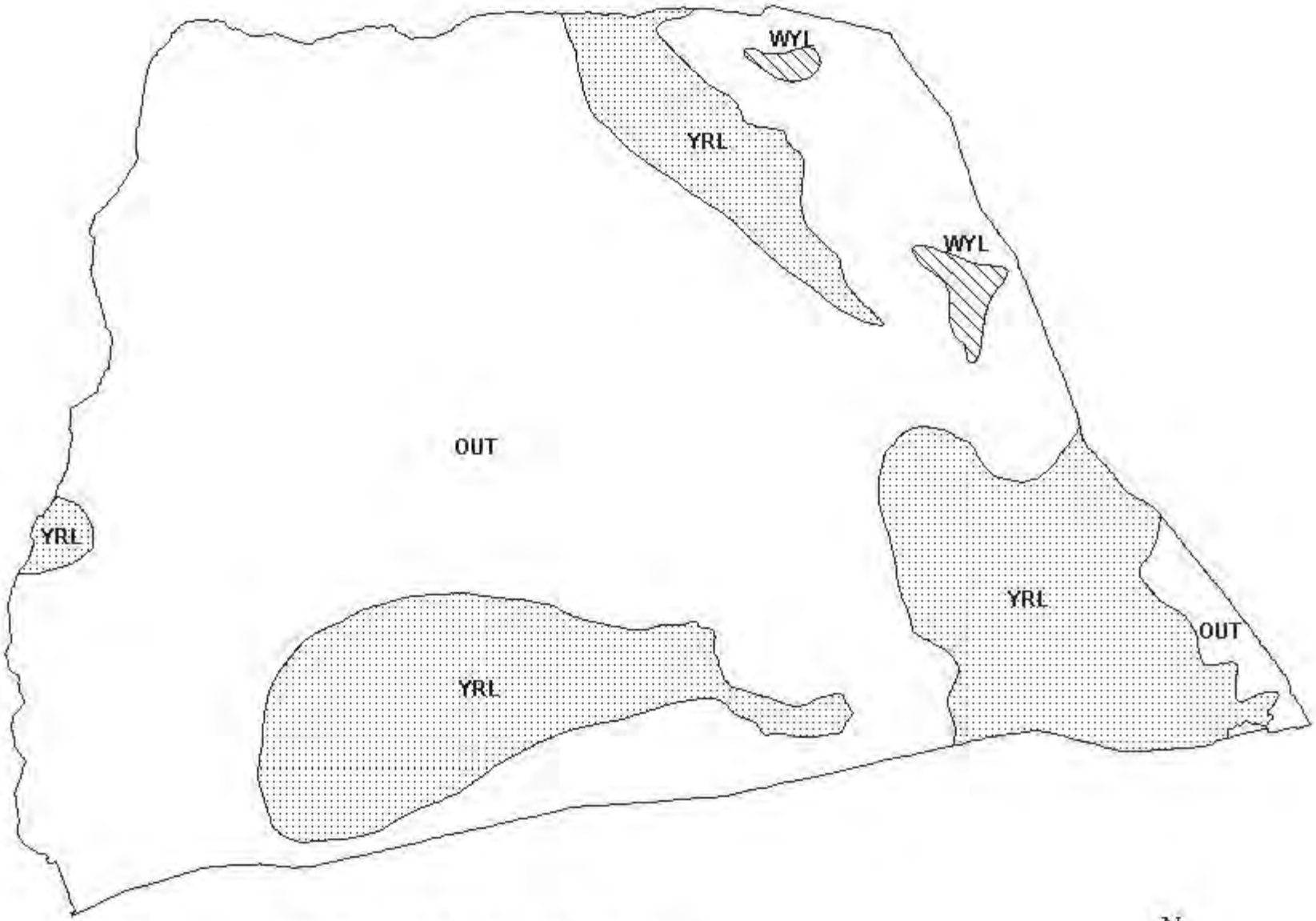
Population

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