2014 - JCR Evaluation Form

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

HERD: MD423 - UINTA

HUNT AREAS: 132-133, 168 | PREPARED BY: JEFF SHORT

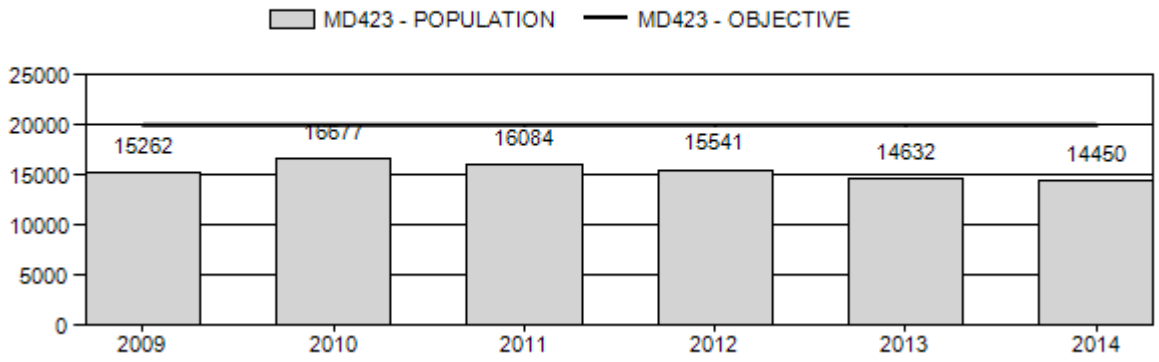
	2009 - 2013 Average	2014	2015 Proposed
Population:	15,639	14,450	15,692
Harvest:	1,139	1,100	1,010
Hunters:	2,489	2,429	2,400
Hunter Success:	46%	45%	42 %
Active Licenses:	2,518	2,447	2,400
Active License Success:	45%	45%	42 %
Recreation Days:	11,396	12,689	12,000
Days Per Animal:	10.0	11.5	11.9
Males per 100 Females	28	26	
Juveniles per 100 Females	61	56	

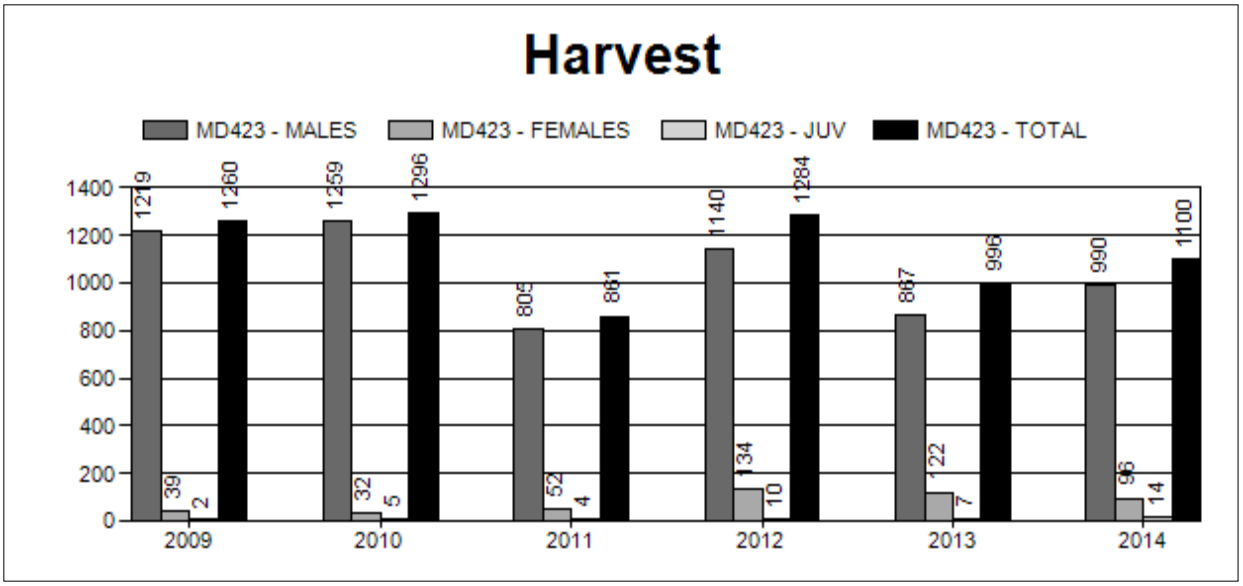
Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-27.8%
Number of years population has been + or - objective in recent trend:	20
Model Date:	02/28/2015

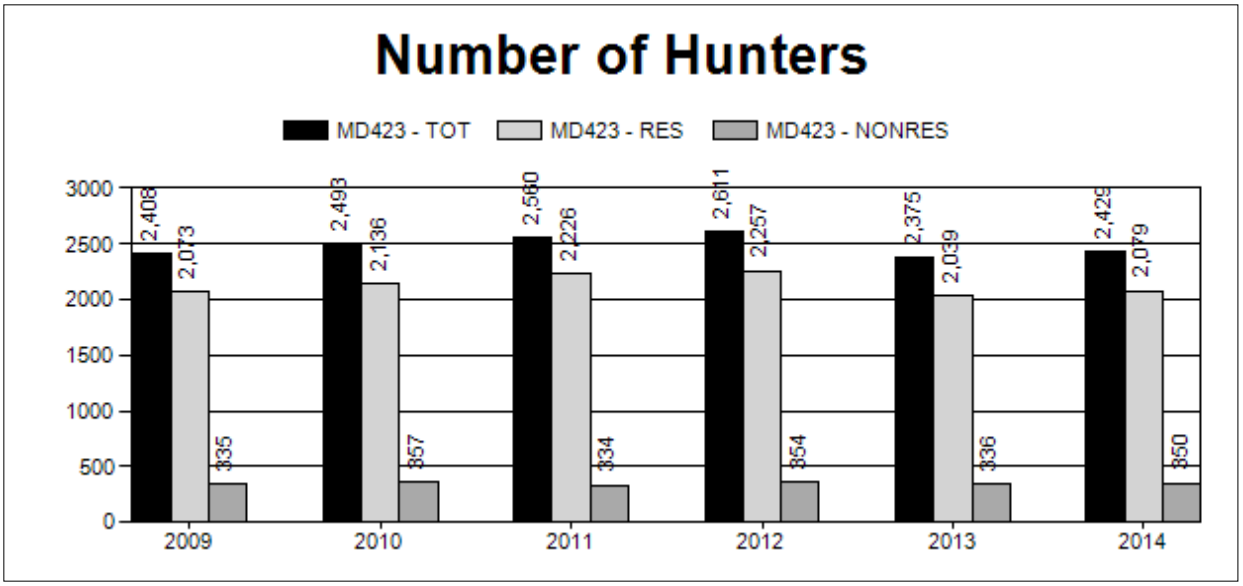
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

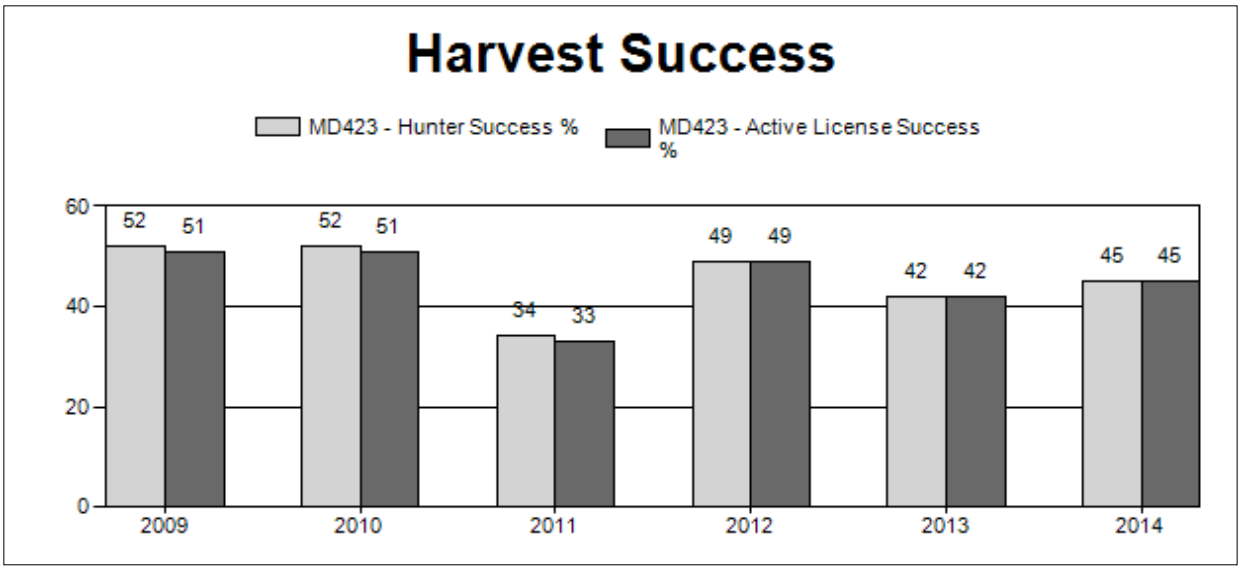
	JCR Year	Proposed
Females ≥ 1 year old:	1.3%	1.3%
Males ≥ 1 year old:	34.4%	28.3%
Juveniles (< 1 year old):	0.3%	0.2%
Total:	7.0%	6.0%
Proposed change in post-season population:	-1.4%	8.5%

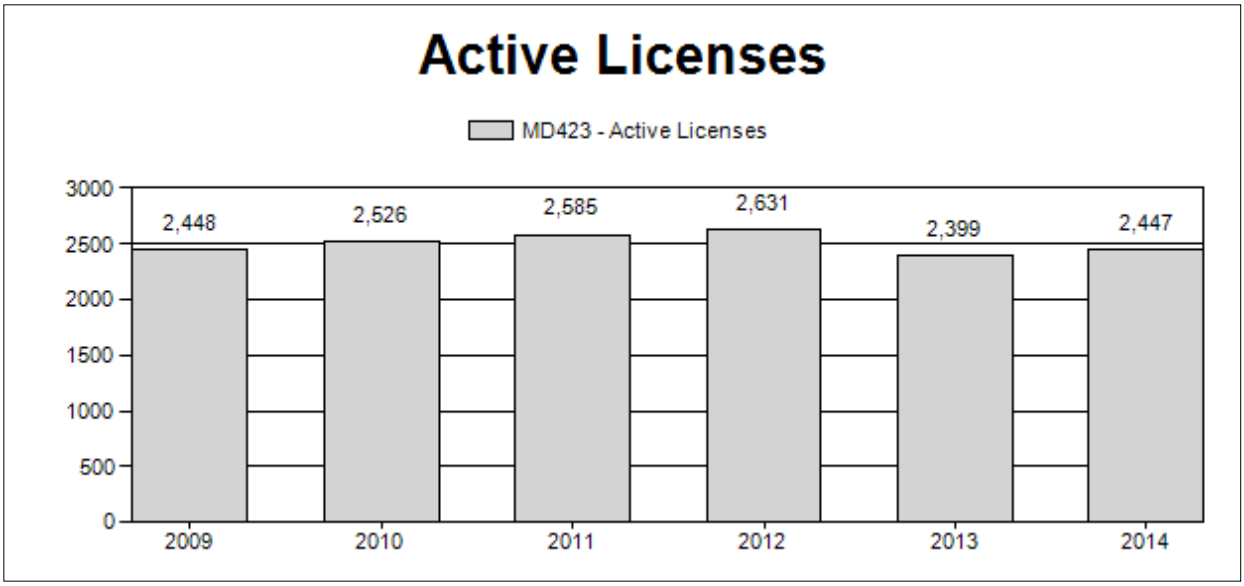
Population Size - Postseason

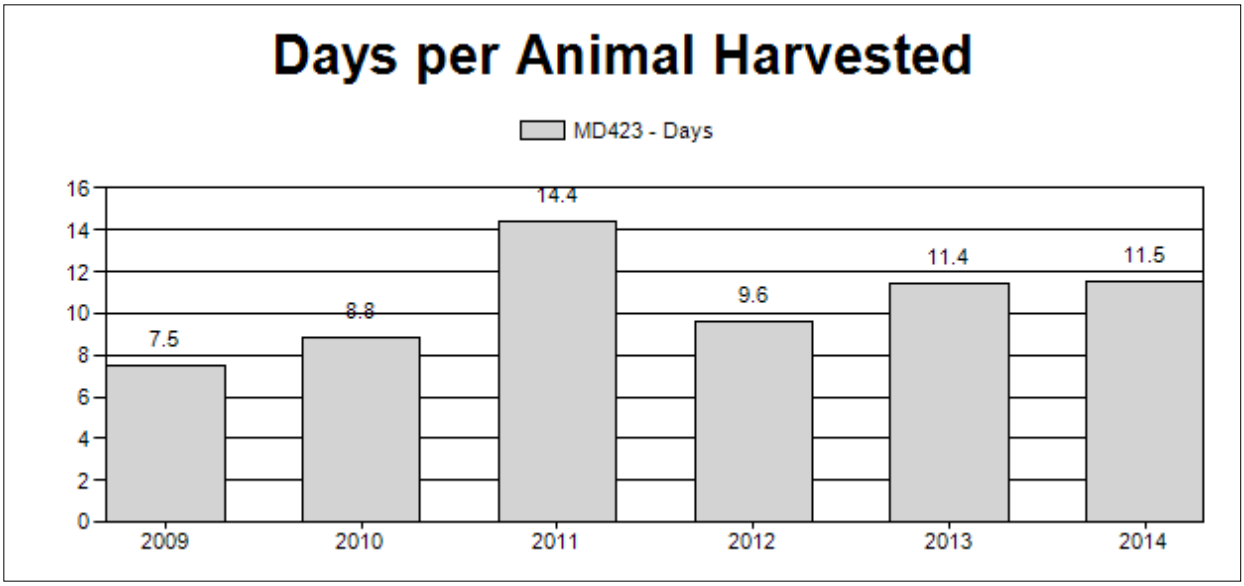


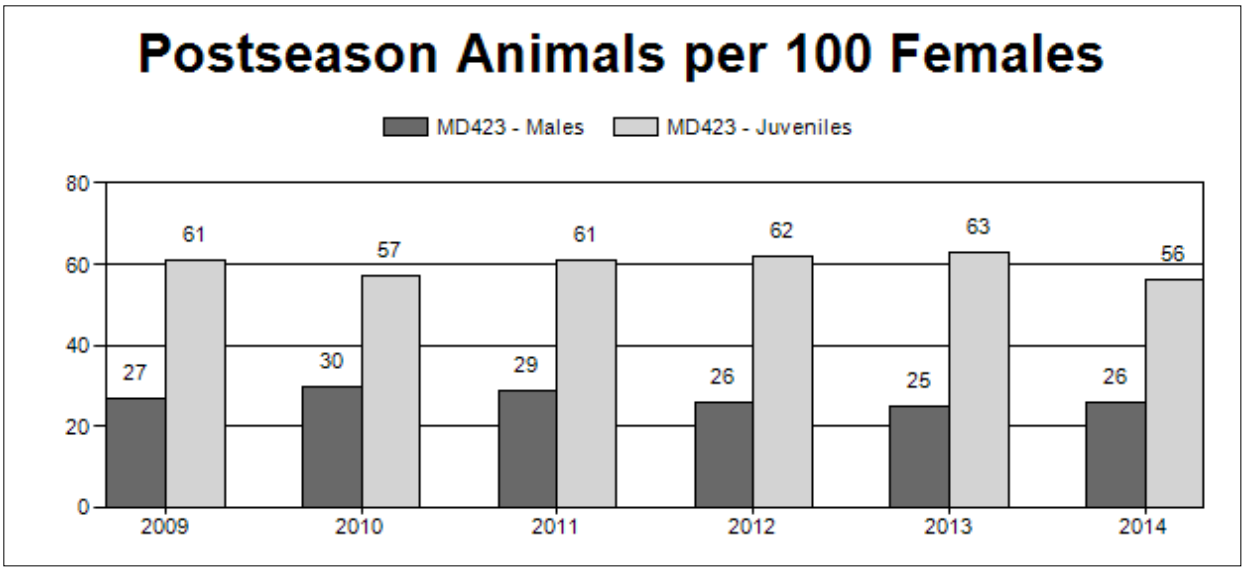

Harvest
MD423 - MALES
MD423 - FEMALES
MD423 - JUV
MD423 - TOTAL
1400
1200
1000
800
600
400
200
0
1219
39
2
1260
1259
32
5
1296
805
52
4
861
1140
134
10
1284
867
122
7
996
990
96
14
1100
2009
2010
2011
2012
2013
2014


Number of Hunters
MD423 - TOT
MD423 - RES
MD423 - NONRES
3000
2500
2000
1500
1000
500
0
2,408
2,073
335
2,493
2,136
357
2,560
2,226
334
2,611
2,257
354
2,375
2,039
336
2,429
2,079
350
2009
2010
2011
2012
2013
2014


Harvest Success
MD423 - Hunter Success %
MD423 - Active License Success %
60
40
20
0
52
51
52
51
34
33
49
49
42
42
45
45
2009
2010
2011
2012
2013
2014


Active Licenses
MD423 - Active Licenses
3000
2500
2000
1500
1000
500
0
2,448
2,526
2,585
2,631
2,399
2,447
2009
2010
2011
2012
2013
2014


Days per Animal Harvested
MD423 - Days
16
14
12
10
8
6
4
2
0
7.5
8.8
14.4
9.6
11.4
11.5
2009
2010
2011
2012
2013
2014


Postseason Animals per 100 Females
MD423 - Males
MD423 - Juveniles
80
60
40
20
0
27
61
30
57
29
61
26
62
25
63
26
56
2009
2010
2011
2012
2013
2014

2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD423 - UINTA

		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	15,262	115	0	0	0	206	321	14%	1,190	53%	725	32%	2,236	0	10	17	27	± 2	61	± 3	48
2010	16,677	261	0	0	0	271	532	16%	1,767	53%	1,011	31%	3,310	0	15	15	30	± 2	57	± 3	44
2011	16,084	93	0	0	0	313	406	15%	1,393	53%	846	32%	2,645	0	7	22	29	± 2	61	± 3	47
2012	15,541	119	0	0	0	311	430	14%	1,642	53%	1,025	33%	3,097	0	7	19	26	± 2	62	± 3	49
2013	14,632	151	0	0	0	235	386	13%	1,551	53%	974	33%	2,911	0	10	15	25	± 2	63	± 3	50
2014	14,450	224	298	222	50	0	520	14%	1,982	55%	1,112	31%	3,614	0	11	15	26	± 1	56	± 2	44

2015 HUNTING SEASONS

SPECIES : Mule Deer

HERD UNIT : Uinta (423)
HUNT AREAS: 132, 133, 168

Hunt Area	Type	Dates of Seasons Opens	Closes	Quota	Licenses	Limitations
132		Oct. 1	Oct. 14		General	Antlered deer three (3) points or more on either antler
133		Oct. 1	Oct. 14		General	Antlered deer three (3) points or more on either antler
168		Oct. 1	Oct. 14		General	Antlered deer three (3) points or more on either antler
132, 133, 168	7	Oct. 1	Oct. 14	50	Limited quota	Doe or fawn valid on irrigated land
132, 133, 168	Archery	Sept. 1	Sept. 30			Refer to Section 3 of this chapter

Region K Nonresident Quota: 500

Hunt Area	License Type	Quota change from 2014
Herd Unit Total		

<u>Management Evaluation</u>
Current Postseason Population Management Objective: 20,000
Management Strategy: Recreational
2014 Postseason Population Estimate: ~14,450
2015 Proposed Postseason Population Estimate: ~15,692

Herd Unit Issues

Energy development on crucial deer habitat is a looming issue for this herd. Extensive development has occurred over their range. Xeric environments and limited high quality fawning habitats greatly affect deer productivity in several areas in this herd. This limited fawning habitat will affect the ability of fawns to evade predation by coyotes. Winter severity every three to five years is a major limiting factor for this deer herd. This is especially true in the western part of the herd around Evanston, Fort Bridger and Leroy. The eastern portion of the herd around Cedar Mountain experiences a rain shadow effect and does not tend to get the sever winters in the last 10 years.

Highway mortality and impediment of migration is a significant issue in this herd unit. Mule deer have to cross highways to migrate to crucial winter ranges in several locations. In the Leroy area mule deer are crossing Interstate 80 to get to and from important winter ranges. Deer fencing is present in most of this area but deer crossing structures are limited and the fence is ageing and showing signs of wear. Deer must cross Highway 414 in several areas between Mountain View and McKinnon to migrate to summer and winter ranges. Mortalities are common in those areas. The most significant area of issue is Wyoming Highway 189 between I-80 and Kemmerer. A large segment of the herd must cross this highway to get to winter ranges. Mortalities are very common due to heavy traffic on the roadway. This issue is likely to become much larger due to increasing traffic on this section of the road.

Weather

Weather during 2014 and into 2015 was highly variable. In the early part of 2014 the winter was very mild and dry. A moist spring and summer followed. In late August and into September precipitation continued. The winter of 2014-2015 has been very mild to this point. The winters of 2011/12, 2012/13 and 2013/14 were also mild with low snowpack resulting in good over winter survival. However, the dry springs and summers of 2012 and 2013 negatively impacted summer and winter range forage production. Fawn production suffered from the extremely dry conditions. Conditions were better at the higher elevations.

Habitat

Habitat data collection has been inconsistently collected in this herd unit and has been absent in the recent past.

Field Data

The winter of 2010/11 was very severe in some areas and the population in the western part of the herd unit declined significantly due to it. Mortality surveys at the LeRoy winter range complex showed significant fawn and adult doe mortality. However, conditions were much milder in the eastern part of the herd unit. A radio collar study in that area showed a 92% survival rate from December of 2010 to December of 2011, a very high survival rate for mule deer does. Since then winter conditions have been very mild in this herd unit creating a situation where fawn and adult survival is relatively high and populations have been able to grow even with low fawn production.

Classification data is collected yearly by helicopter in Hunt Areas 168, 132 and 133. Sample sizes are very good with around 3,000 deer classified in the last 5 years. Post season buck ratios in 2014 were good with 26 bucks per 100 does. This is the middle of the range for the objective in the herd unit. Yearling buck ratios and adult buck:doe ratios were average at 11:100 and 15:100. This is very odd considering a point restriction was implemented in the entire Herd Unit for 2014. This should have greatly increased yearling buck ratios but did not.

For 2014 the fawn:doe ratios as a whole dropped from what we have been seeing in this herd unit at 56:100. This is very odd considering excellent conditions were in place for fawn recruitment during 2014 and surrounding mule deer herds had much better fawn:doe ratios. This is well below where we would like to see fawn:doe ratios. The low fawn recruitment in this population is of concern. It may be due to several factors including winter range habitat condition, summer range habitat condition, elk competition on summer habitats, neonate predation on summer ranges, aspen stand condition on summer habitats, limited areas of effective parturition habitats and doe age structure. We would like to continue to improve future fawn:doe ratios through habitat improvement and predator manipulation to promote growth of this herd.

Hunt Area 132 is very dry and low productivity habitat compared to the rest of the herd unit. It also has patchy fawning habitat and newborn fawns may be easier prey for coyotes due to the limited fawning sites. Since 2012 we have procured funding and implemented targeted predator control on mule deer fawning sites in HA132. Control is conducted during the fawning period. This was designed as a 3 year project and data will be analyzed in 2015.

Harvest Data

The hunter harvest from seasons recently offered for mule deer do not impact overall population size, recruitment or productivity. They only influence buck:doe ratios and we have been able to maintain buck:doe ratios within the objective. Doe harvest is only allowed by youth hunters and in a very limited type 7 hunt on irrigated lands. The overall doe harvest is negligible. Harvest has fluctuated greatly over the past five years due to changes in populations from winter severity and fluctuations in weather conditions during the hunting season.

Population

We feel somewhat confident in this model since it reflects field information and seems reasonable. However, caution should be used since this an interstate population with some interchange across state boundaries. Recent radio collar data documents over 12% interchange. This is far lower than we once expected though. More radio collar studies would help determine the extent of these movements. The TSJ,CA model was selected due to the low Relative AICc score and its good fit with the data. The TSJ,CA model fits very well with mule deer population dynamics in this type of system. Unfortunately model estimates do not seem to track well with known significant winter mortality events in the winters of 2007/2008 and 2010/2011 which concerns us. An independent population estimate would be helpful in validating the model but is not very feasible for this herd.

In 2012 the Department switched from POPII models to an Excel spreadsheet model. Since these are new models they are going to be under development and subject to extensive refining. They will likely change over time with new data.

The model predicts a post-season population of around 14,450 mule deer in 2014. This is a decrease in the population from 2010 levels. This reduction is substantiated by Hunter comments, winter mortality surveys and field observations. This supporting information gives us some confidence in model results. However, the reduction modeled from 2010 levels is not totally realistic considering the severity of winter mortality observed on the western winter ranges where the vast majority of the deer herd winters. The reduction should have been much greater than what is modeled.

Management Summary

The 2015 season in hunt areas 132, 133 and 168 will allow for 14 days of general antlered deer hunting opportunity. In this part of the state we strive to offer a 14 day season and include 2 weekends of hunting opportunity. With the current favorable weather and survival conditions for improving deer herds and with buck:doe ratios within objective we feel we can offer a 14 day season. This is still a very conservative deer hunting season. A three point or more antler restriction is also in place in the entire Herd Unit. This restriction was brought on by members of the public. The use of the restriction for limited time periods is warranted in parts of the herd unit where buck security cover and fawn productivity is lacking but many parts of the Herd Unit do not require this type of management.

In 2008 we started a new hunt with 50 type 7 doe/fawn tags good for all hunt areas in the herd unit on irrigated land. This is to address the number of deer that are living year round on irrigated fields and give landowners an opportunity to have some harvested. This hunt will be continued in 2014. The Objective and management strategy were last revised in 2014.

INPUT	
Species:	Deer
Biologist:	Jeff Short
Herd Unit & No.:	Uinta MD423
Model date:	02/28/14

☐ Clear form

MODELS SUMMARY		Fit	Relative AICc	Check best model to create report
CJ,CA	Constant Juvenile & Adult Survival	97	106	☐ CJ,CA Model
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	96	130	☐ SCJ,SCA Mo
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	0	105	☑ TSJ,CA Model

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population				Predicted Posthunt Population				Objective
	Field Est	Field SE		Juveniles	Total Males	Females	Total	Juveniles	Total Males	Females	Total	
1993				3385	2355	8491	14230	3345	1624	7880	12849	7000
1994				5602	2211	7396	15209	5602	1553	7396	14551	7000
1995				5124	2802	7645	15571	5124	2039	7645	14809	7000
1996				6313	3328	7975	17616	6313	2263	7975	16551	7000
1997				5125	2885	7619	15629	5115	2081	7467	14662	20000
1998				5798	2676	7141	15616	5798	1878	7141	14817	20000
1999				5417	2806	7169	15392	5417	1578	7169	14164	20000
2000				5134	3561	8195	16890	5093	2134	7936	15162	20000
2001				5177	2968	7777	15922	5156	1806	7597	14559	20000
2002				4691	2974	7774	15439	4637	1828	7388	13853	20000
2003				4760	3109	7718	15587	4726	1988	7521	14235	20000
2004				5572	3438	8024	17033	5529	2376	7787	15692	20000
2005				5637	3066	7551	16254	5637	2021	7551	15209	20000
2006				4814	3083	7668	15565	4814	2030	7668	14512	20000
2007				4440	2405	7078	13923	4440	1285	7078	12803	20000
2008				4410	2683	7484	14577	4408	1886	7452	13746	20000
2009				4948	3547	8161	16656	4946	2206	8118	15270	20000
2010				5109	4054	8955	18118	5103	2669	8919	16692	20000
2011				5155	3358	8539	17051	5151	2472	8481	16104	20000
2012				5159	3413	8395	16967	5148	2159	8247	15555	20000
2013				4912	2898	7944	15753	4904	1944	7810	14658	20000
2014				4462	3168	8030	15660	4446	2079	7925	14450	20000
2015				4953	3502	8347	16803	4942	2512	8237	15692	20000

Survival and Initial Population Estimates

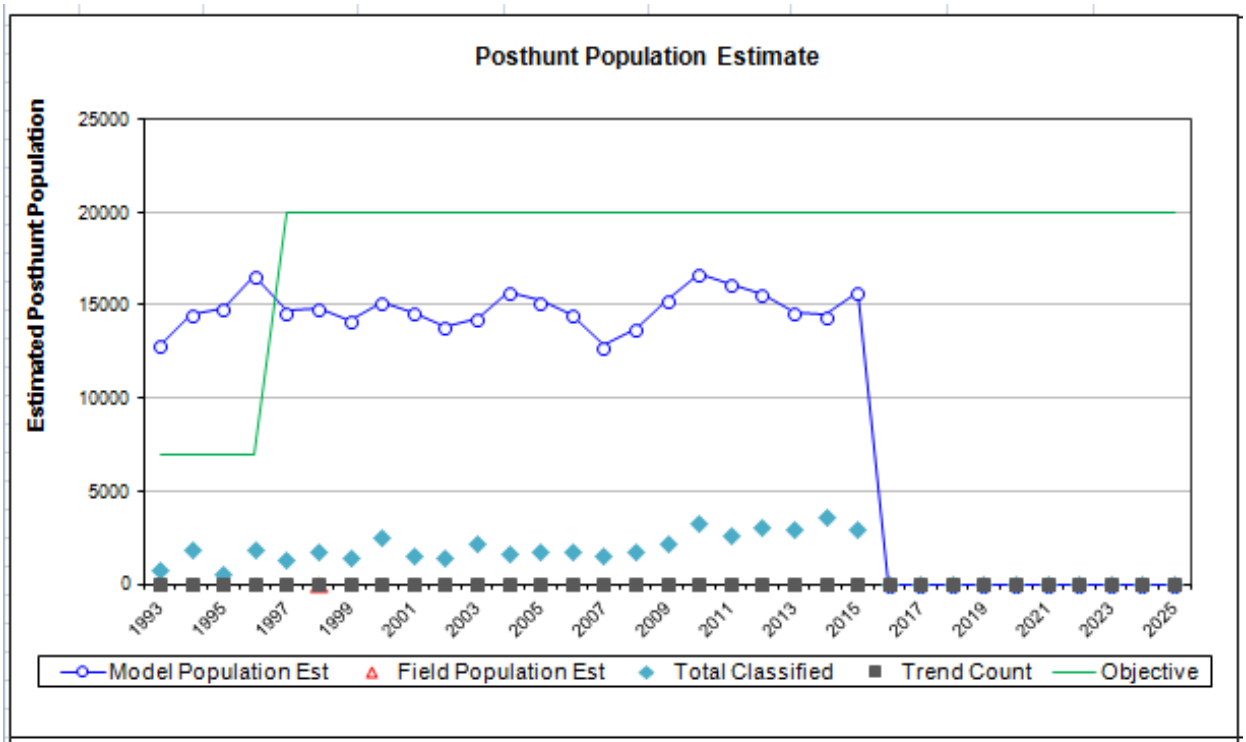
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.52			0.83		
1994	0.54			0.83		
1995	0.64			0.83		
1996	0.32			0.83		
1997	0.37			0.83		
1998	0.43			0.83		
1999	0.83			0.83		
2000	0.47			0.83		
2001	0.57			0.83		
2002	0.69			0.83		
2003	0.76			0.83		
2004	0.40			0.83		
2005	0.50			0.83		
2006	0.30			0.83		
2007	0.73			0.83		
2008	0.90			0.83		
2009	0.90			0.83		
2010	0.45			0.83		
2011	0.53			0.83		
2012	0.43			0.83		
2013	0.63			0.83		
2014	0.80			0.83		
2015	0.70			0.83		

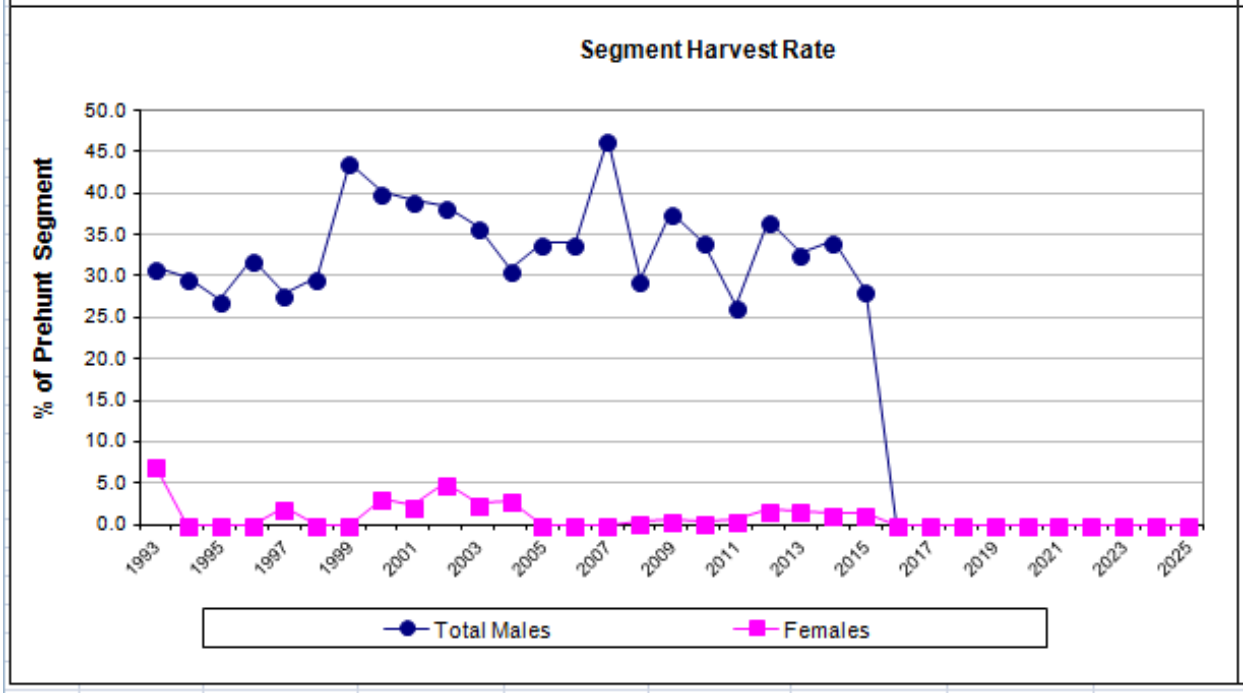
Parameters:	Optim cells
Adult Survival =	0.829
Initial Total Male Pop/10,000 =	0.162
Initial Female Pop/10,000 =	0.788

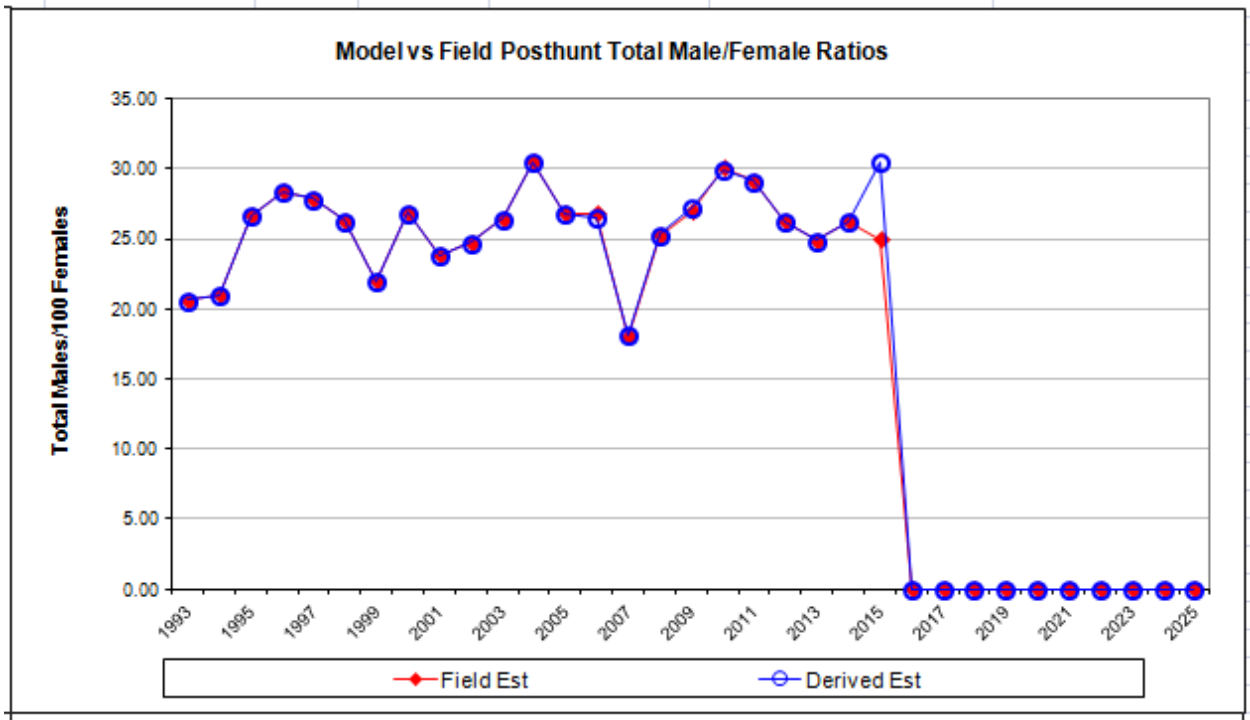
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

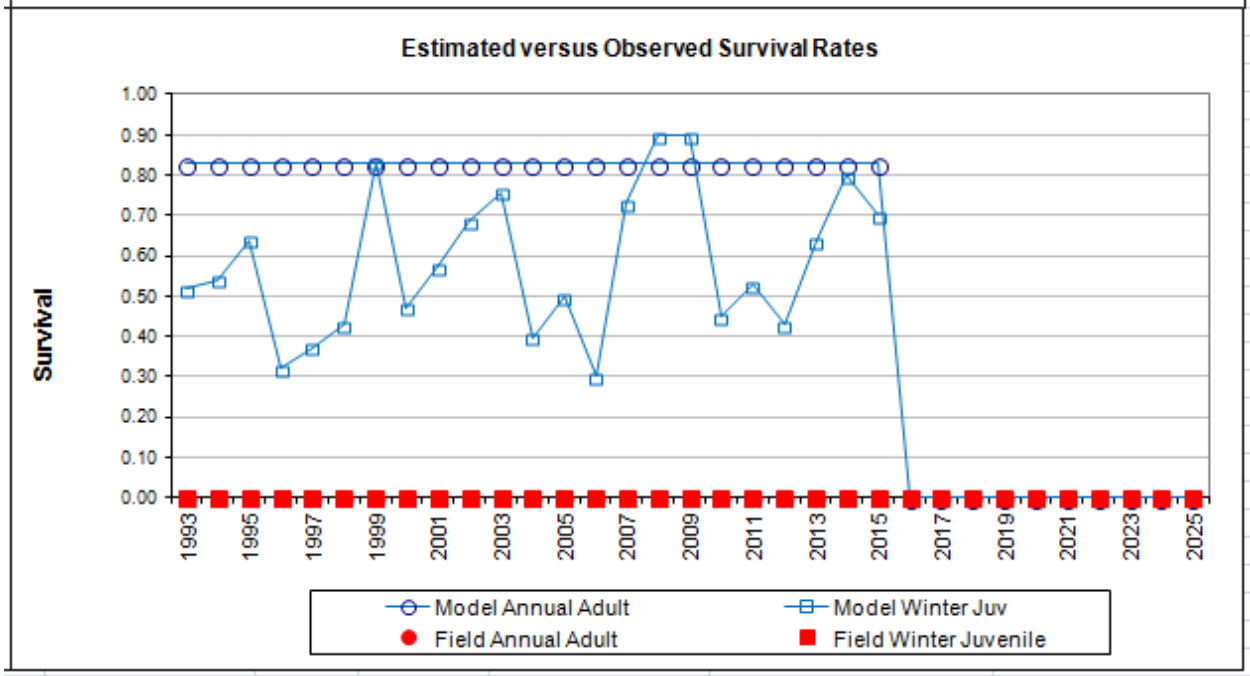
Classification Counts / **Harvest**

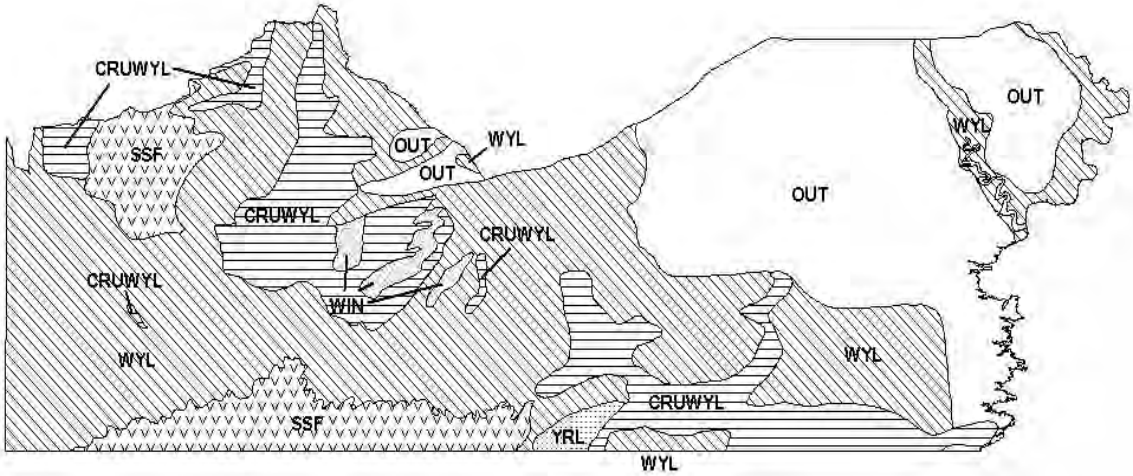
Year	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
1993		42.45	3.51	20.61	20.61	2.25	36	664	555	1255	31.0	7.2
1994		75.74	3.75	20.99	20.99	1.64	0	598	0	598	29.8	0.0
1995		67.02	6.27	26.67	26.67	3.44	0	693	0	693	27.2	0.0
1996		79.16	3.97	28.38	28.38	2.01	0	968	0	968	32.0	0.0
1997		68.51	4.09	27.87	27.87	2.27	9	731	139	879	27.9	2.0
1998		81.20	4.12	26.30	26.30	1.96	0	726	0	726	29.8	0.0
1999		75.57	4.34	22.02	22.02	1.95	0	1116	0	1116	43.7	0.0
2000		64.18	2.85	26.89	26.89	1.62	37	1298	236	1571	40.1	3.2
2001		67.87	3.83	23.78	23.78	1.95	19	1056	164	1239	39.1	2.3
2002		62.76	3.63	24.74	24.74	1.99	49	1042	351	1442	38.5	5.0
2003		62.83	2.96	26.44	26.44	1.69	31	1019	179	1229	36.1	2.6
2004		71.00	3.91	30.51	30.52	2.24	39	965	215	1219	30.9	2.9
2005		74.65	3.91	26.76	26.76	2.00	0	950	0	950	34.1	0.0
2006		62.79	3.35	26.48	26.78	1.93	0	957	0	957	34.1	0.0
2007		62.73	3.51	18.16	17.97	1.60	0	1018	0	1018	46.6	0.0
2008		59.14	3.14	25.31	25.29	1.82	2	724	29	755	29.7	0.4
2009		60.92	2.87	27.18	26.97	1.70	2	1219	39	1260	37.8	0.5
2010		57.22	2.26	29.93	30.11	1.49	5	1259	32	1296	34.2	0.4
2011		60.73	2.65	29.15	29.15	1.64	4	805	52	861	26.4	0.7
2012		62.42	2.48	26.18	26.19	1.42	10	1140	134	1284	36.7	1.8
2013		62.80	2.57	24.89	24.89	1.42	7	867	122	996	32.9	1.7
2014		56.10	2.10	26.24	26.24	1.29	14	990	96	1100	34.4	1.3
2015		60.00	2.45	30.49	25.00	1.40	10	900	100	1010	28.3	1.3


Posthunt Population Estimate
Estimated Posthunt Population
25000
20000
15000
10000
5000
0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Model Population Est
Field Population Est
Total Classified
Trend Count
Objective


Segment Harvest Rate
% of Prehunt Segment
50.0
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Total Males
Females


Model vs Field Posthunt Total Male/Female Ratios
Total Males/100 Females
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Field Est
Derived Est


Estimated versus Observed Survival Rates
Survival
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
2017
2019
2021
2023
2025
Model Annual Adult
Model Winter Juv
Field Annual Adult
Field Winter Juvenile



Mule Deer (MD423) - Uinta
HA 132, 133, 168
Revised - 3/94

2014 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD424 - SOUTH ROCK SPRINGS

HUNT AREAS: 101-102

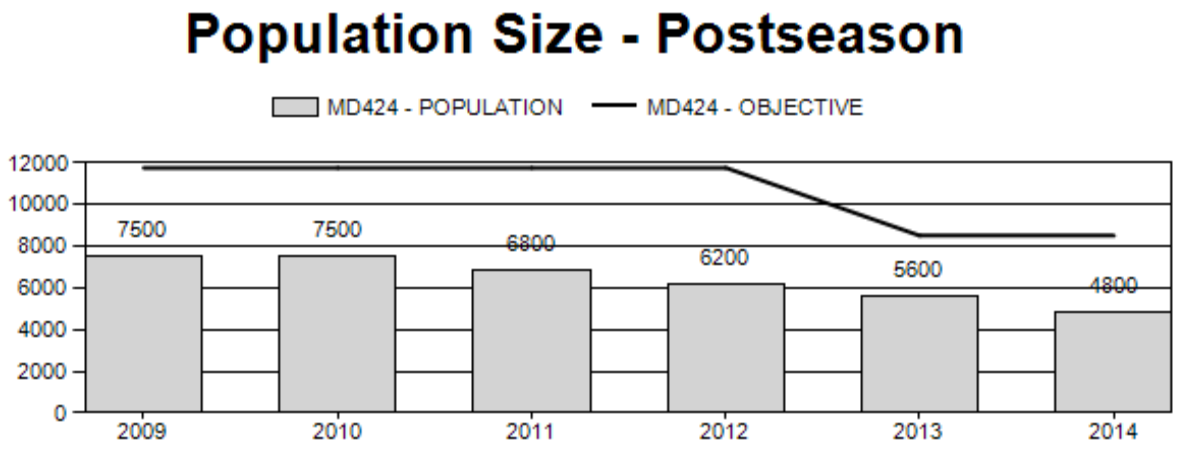
PREPARED BY: PATRICK BURKE

	2009 - 2013 Average	2014	2015 Proposed
Population:	6,720	4,800	4,300
Harvest:	358	257	180
Hunters:	447	319	225
Hunter Success:	80%	81%	80%
Active Licenses:	447	319	225
Active License Success:	80%	81%	80%
Recreation Days:	3,006	2,356	1,700
Days Per Animal:	8.4	9.2	9.4
Males per 100 Females	26	20	
Juveniles per 100 Females	54	92	

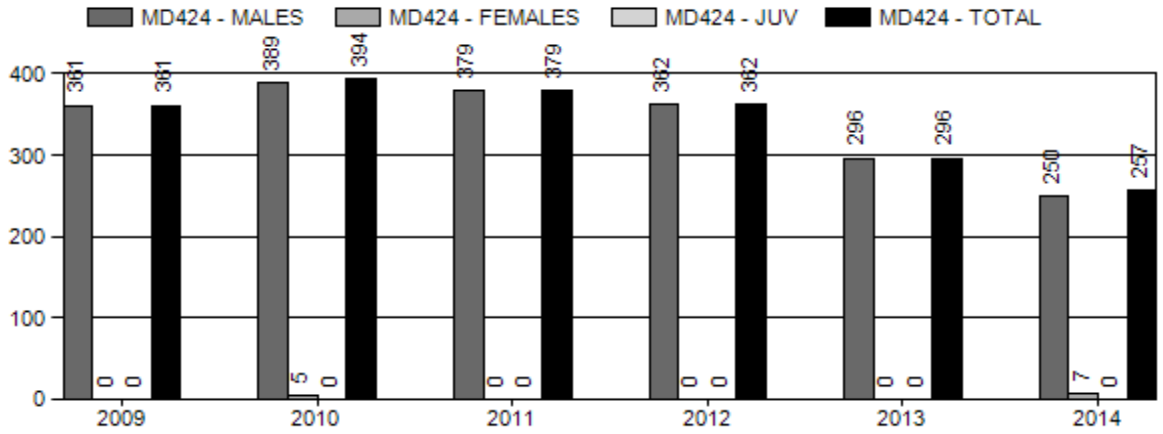
Population Objective (± 20%) :	8500 (6800 - 10200)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-43.5%
Number of years population has been + or - objective in recent trend:	10
Model Date:	02/23/2015

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

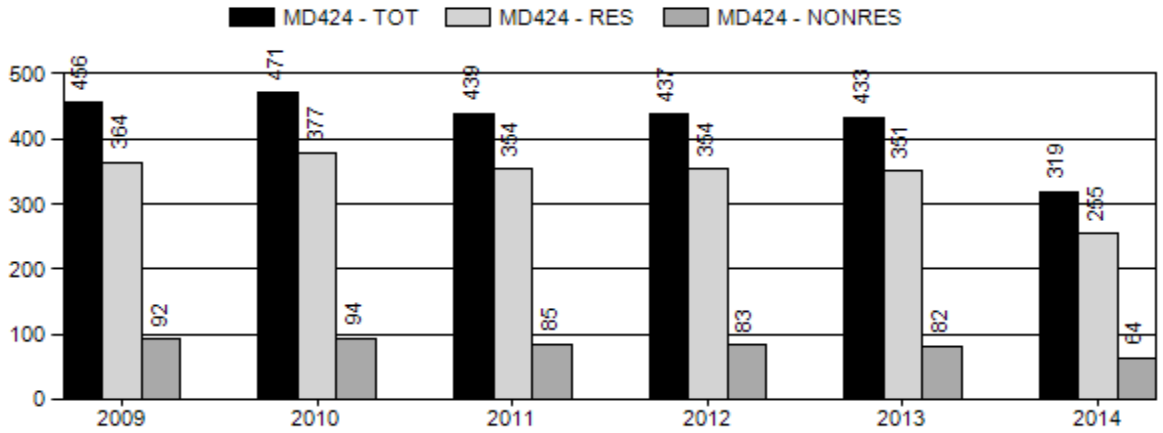
	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	19%	30%
Juveniles (< 1 year old):	0%	0%
Total:	4%	4%
Proposed change in post-season population:	11%	10%



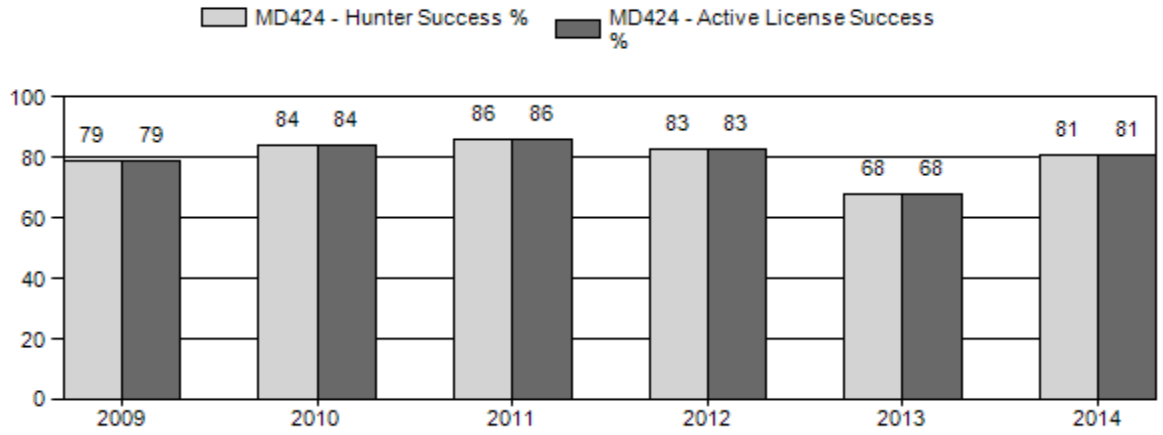
Harvest



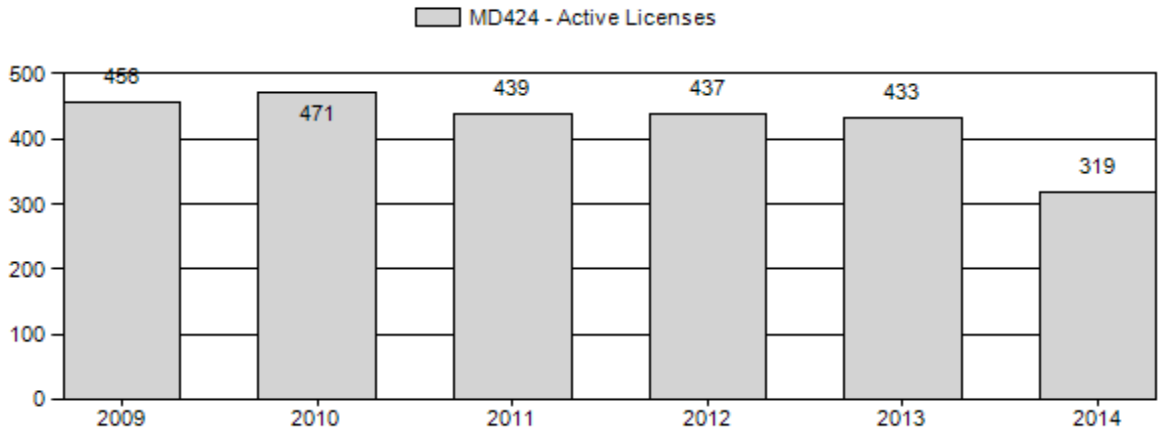
Number of Hunters



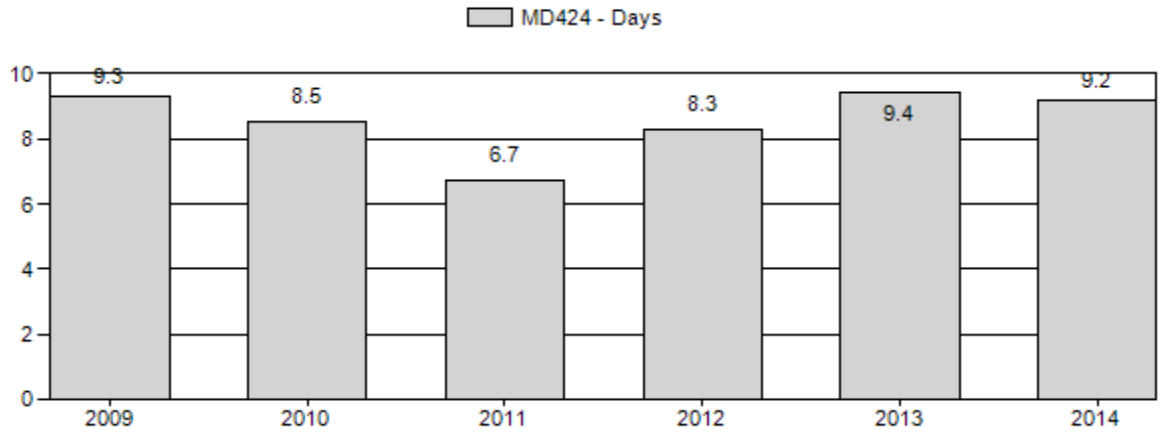
Harvest Success



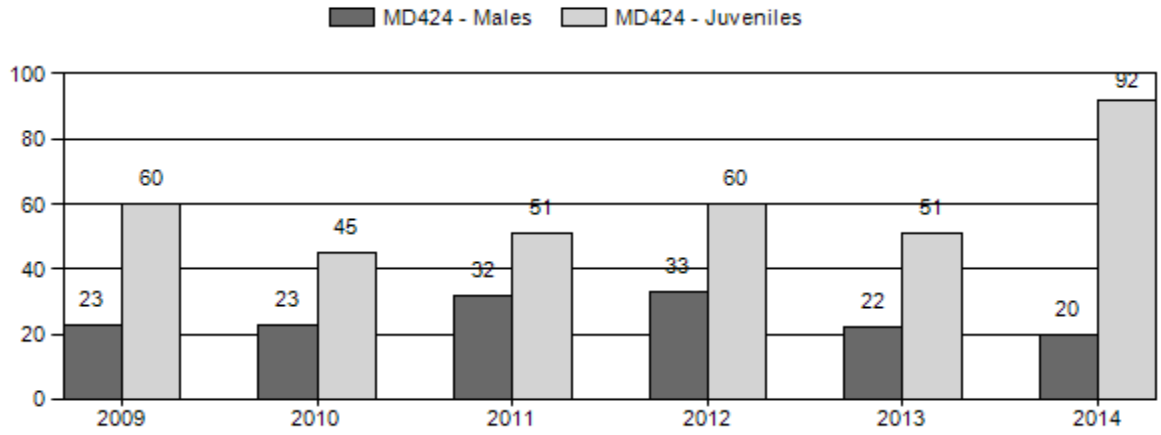
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2009 - 2014 Postseason Classification Summary

for Mule Deer Herd MD424 - SOUTH ROCK SPRINGS

		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	7,500	61	0	0	0	120	181	12%	798	55%	482	33%	1,461	1,048	8	15	23	± 0	60	± 0	49
2010	7,500	47	0	0	0	55	102	14%	446	60%	200	27%	748	1,048	11	12	23	± 0	45	± 0	36
2011	6,800	38	0	0	0	108	146	18%	453	55%	229	28%	828	1,030	8	24	32	± 4	51	± 5	38
2012	6,200	55	0	0	0	129	184	17%	558	52%	334	31%	1,076	680	10	23	33	± 3	60	± 5	45
2013	5,600	40	0	0	0	89	129	13%	593	58%	305	30%	1,027	767	7	15	22	± 2	51	± 4	42
2014	4,800	30	0	0	0	55	85	10%	417	47%	383	43%	885	1,242	7	13	20	± 3	92	± 8	76

2015 HUNTING SEASONS
SOUTH ROCK SPRINGS MULE DEER HERD (MD424)

Hunt Area	Type	SEASON DATES Opens	Closes	Quota	Limitations
101	1	Oct. 15	Oct. 31	25	Limited quota; antlered deer
102	1	Oct. 15	Oct. 31	200	Limited quota; any deer
Archery		Sept. 1	Sept. 30		Refer to license type and limitations in Section 3

Hunt Area	Type	Quota change from 2014
101	1	-25
102	1	-100
Herd Unit Total	**1**	**-125**

Management Evaluation
Current Management Objective: 8,500
Management Strategy: Special
2014 Postseason Population Estimate: ~4,800
2015 Proposed Postseason Population Estimate: ~4,300

The post-season population objective for the South Rock Springs mule deer herd is 8,500 deer under special management. The objective for this herd was changed to its current level in 2013, when it was lowered from 11,750.

Herd Unit Issues

This herd has been well below this objective since South Rock Springs and Black Butte herds were combined in the 1980's and most likely will continue to remain below objective for the foreseeable future. Because of this, the objective for this herd was taken out for public review in the summer of 2013, when the objective was lowered to 8,500 dear post-season. There was some public concern over lowering the objective from where it had been, so the new objective was set at a level that would still allow for the population to grow to a level higher than it has been at in over 20 years.

Current population estimates suggest this herd may be around 5,600 deer after the 2014 hunting season. This estimate represents the third straight year of fairly significant population declines. The lack of growth in this herd despite very conservative hunting seasons can be attributed to poor fawn recruitment year after year. Observed fawn to doe ratios for this herd have averaged only 60 fawns per 100 does for the last decade, with some years generating observed ratios of only 45 to 50 fawns:100 does. This level of juvenile recruitment allows for population maintenance at best, but does not allow for population growth.

Weather

The weather conditions that have had the greatest impact on the South Rock Springs deer herd are the dry summers that this population has experienced in the last three years. The summer of 2012 was the driest on record in Wyoming and the summer of 2013 was also very. While the summer of 2014 saw substantially better moisture in most of Wyoming, the portion of southwest Wyoming inhabited by this herd was still considered to be experiencing drought conditions by the National Weather Service. Since high quality summer range is the most limiting habit type in the region south of Rock Springs, the additional stress of below average summer precipitation has caused this herd to lose ground in relation to its population objective. The modeled population estimate for this herd has declined by 2,000 animals since 2011, this decline was most likely driven by the drought conditions in the herd unit. With the exception of the 2010-2011 winter, winters in the herd unit have been very mild, and should not have caused any significant mortality in the herd. Therefore, the dry summers and the resulting decreased forage production are the most likely culprits in the recent observed population decline.

The high observed fawn ratio seen in the 2014 post-season classifications gives cautious optimism that this population may have stopped its slide and will begin to grow in 2015, however the physical condition of some deer witnessed during the fall of 2014 suggest that the herd is still experiencing tough times. Numerous doe deer were encountered in HA101 this fall that were in extremely poor body condition going into winter. Entire groups of does were seen with visible ribs and scapula in the last fall. It is unlikely that these deer were able to even survive the mild winter conditions that have so far been encountered in the 2014-2015 winter. Antler production of buck deer in 2014 was also poor in the herd, which also suggests reduced habitat conditions.

Habitat

The Green River aquatic habitat biologist has established six aspen regeneration monitoring transects throughout Hunt Area 102. These transects are designed to evaluate browsing impacts from ungulates on young aspen suckers. Two transects were established on Little Mountain in 2007, as well as four additional transects that were established in 2009, one each on Aspen and Miller Mountains and two in the Pine Mountain area. These transects have been read each summer since their establishment, except that one of the Pine Mountain transects was not read in 2013 due to difficulty in accessing that site caused by the amount of rain and snow received that fall and the South Pine Mountain site was not read in 2014 due to the aspen stand that it was located in dying off resulting in an insufficient number of aspen suckers left alive to measure. Because of the loss of the South Pine Mountain site, a new transect was established near the tri-state marker in 2014.

A detailed accounting of the technique and results from these monitoring efforts can be found in the aquatic habitat annual report. In general, this method compares the height of the initial growth point for the current year's terminal leader to the height of the tallest previous terminal leader branch that was killed as a result of browsing. A positive Live-Dead (LD) value suggests growth of young trees, while a negative value or value near zero suggests that browsing may be suppressing tree growth. Results of monitoring efforts are presented in the following table (Table 1) taken from the aquatic habitat annual progress report, but in general, two of the five monitored sites showed positive LD values for 2014, while four of the sites had LD values below zero. The new tri-state monitoring site, not reported in the table below had a positive LD value of +3.4 inches.

Table 1. Trends in aspen regeneration LD Index values (vertical inches) for the SRS herd unit 2011-2014

Monitoring site	2011	2012	2013	2014
Pine Mt/Red Ck.	-0.5	-3.0	NA	-7.8
South Pine Mt.	+0.7	-3.2	-4.3	NA
Miller Mt.	+8.7	+5.3	+6.6	+4.6
Aspen Mt.	+1.5	-6.0	+4.6	-4.5
Little Mt./Dipping Spr.	-4.1	-2.6	0	-0.9
Little Mt./West Currant Ck.	+4.2	0	0	-1.6

Field Data

This herd was classified only from the ground in mid-November 2014. A total of 885 deer were classified, with resulting ratios of 92 fawns : 100 does and 21 total bucks per 100 does, with 7 yearling bucks per 100 does. This observed fawn ratio is extremely high for this herd and should probably be regarded with some caution since the classification objective of 1,200 deer was not achieved, there is the potential that this extremely high observed ratio for the herd may be higher than the true ratio for the population. The observed buck ratio is also probably lower than the true ratio for the herd.

It was noted by all observers conducting the classifications that the number of deer available in November was noticeably less than what was seen during October. This pattern of deer apparently moving out of the herd unit during late fall or early winter has been observed since the 2010-2011 winter. It appears that winter may have triggered migratory movements than were not observed in this herd, at least the recent history. During the 2013 classification flight, only 319 deer were observed in almost a day and a half of helicopter time in late December. These movements that appear to be occurring sometime in the late fall make determining accurate population statistics for this herd difficult or impossible with the current knowledge of the seasonal movements of this herd.

Harvest Data

The 2014 season saw the lowest harvest documented in this herd in quite some time. A reported total of 257 bucks and 7 doe mule deer were harvested in the herd unit. Success rates for the two hunt areas that make up this herd unit were 78% for HA101 and 81% for HA102, giving the herd unit as a whole a success rate of 81%. This herd unit usually exhibits success rates in the mid-80s, so the success rates reported in 2014 were in line with average success rates and an improvement over 2013's harvest success rate of 68% in the herd unit. The number of deer harvested in HA102 in 2014 was significantly lower than it has been in past years due to a decrease in the number of licenses issued in the hunt area by 100 licenses.

Because the South Rock Springs mule deer herd is a special management herd and because of its significant local status, successful hunters are asked to voluntarily submit tooth samples for cementum annuli ageing analysis. Successful hunters submitted 98 samples for analysis from the 2014 hunting season. Based on those samples, the average age of harvested bucks was 5.3 years old in 2014. The average age of harvested deer was 5.1 years old in 2013, 4.5 years old in 2012, and 5.0 years old in both 2010 and 2011. Based on hunter submitted tooth samples, the oldest deer harvested during the 2014 season was an 11.5-year-old buck from HA102 and a 10.5 year old buck from HA101. It should be noted that this increase in the average of harvest bucks goes contrary to what managers encountered during field checks during the 2014 season.

Population

The model for this herd tracks only moderately well to poorly with observed data, in particular with observed buck ratios, and sharing this herd with Colorado and Utah continues to decrease its overall reliability.

The model selected for this herd is the time-specific juvenile survival model based it producing the most realistic estimate for this population and based on the biology of mule deer. However, the model seems to be unable to track the trend for the population. While the model will change the current years population estimate to what is probably a believable number each year, it shows that the herd is steadily growing to the current estimate instead of showing that the population was at a higher level in the past. The most likely explanation for this is the discrepancy between

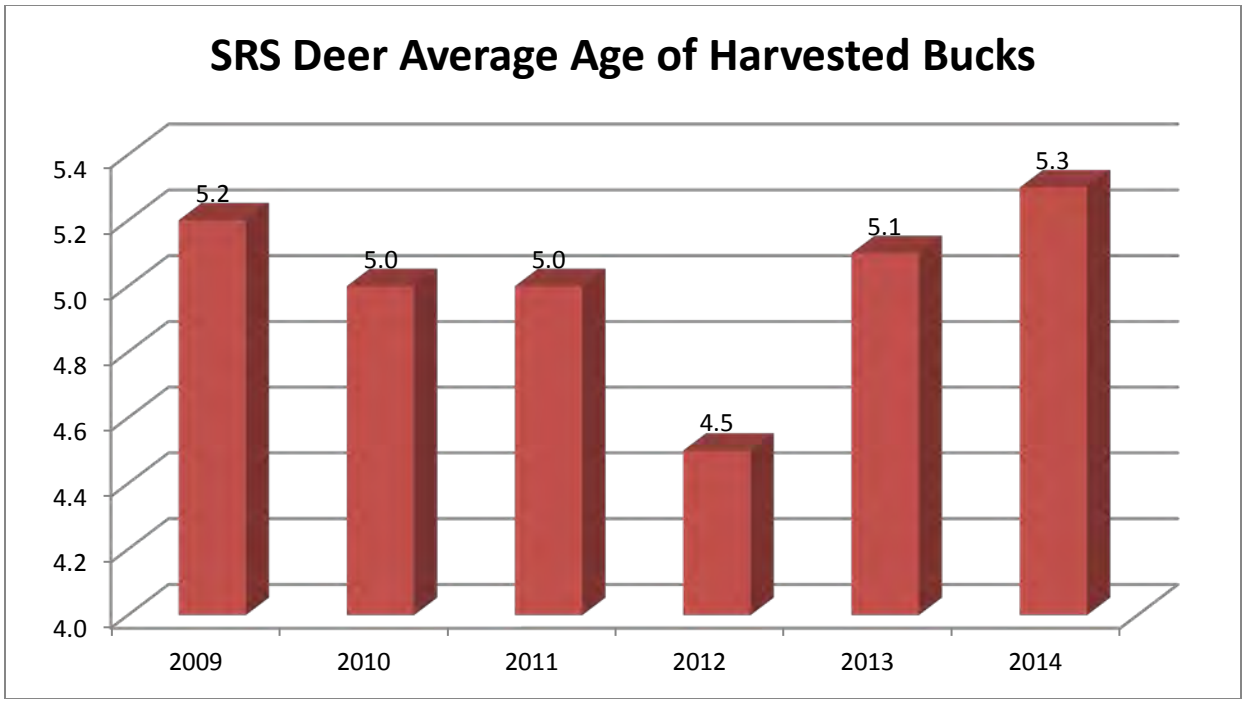
what the model expects for buck ratios and what is observed in the field each year. This, along with the lack of correlation between male harvest rates and fawn ratios with subsequent buck ratios has led to speculation that bucks may be leaving the herd unit, which would reduce the functionality of the model.

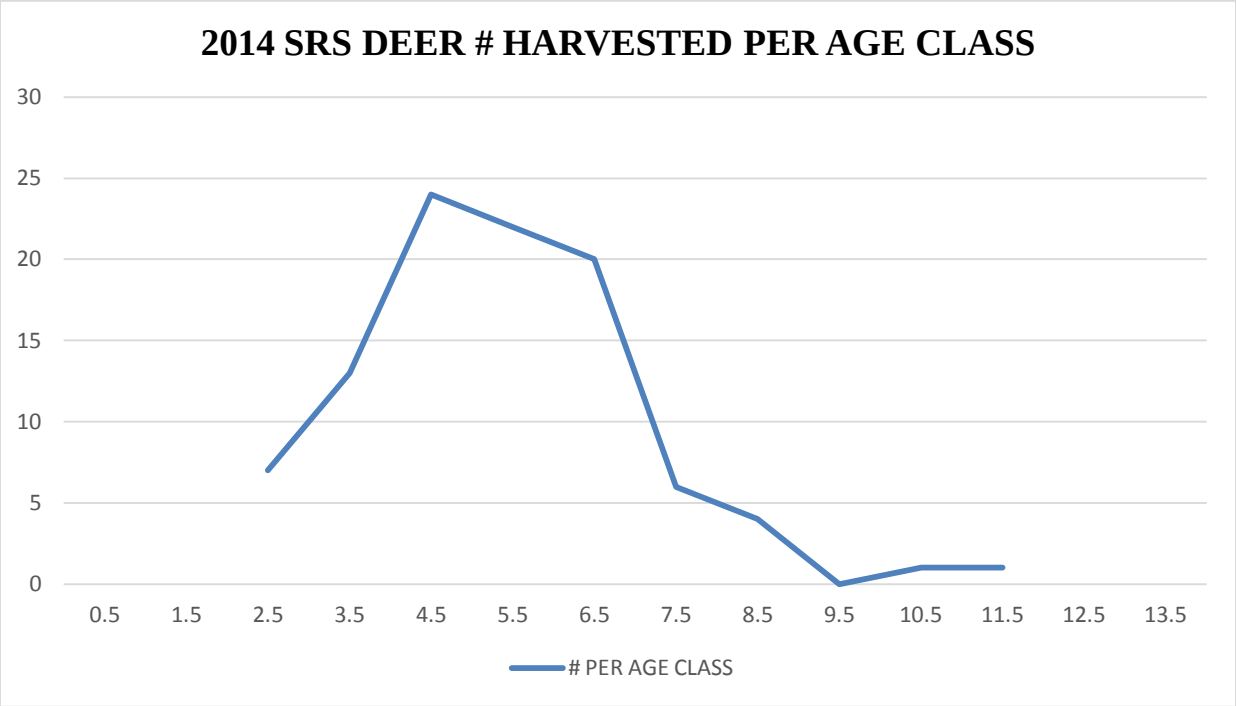
Additional information from the harvest survey, classifications, and age data from lab-aged teeth from hunter-harvested deer combined with the model help in management of this locally high profile herd.

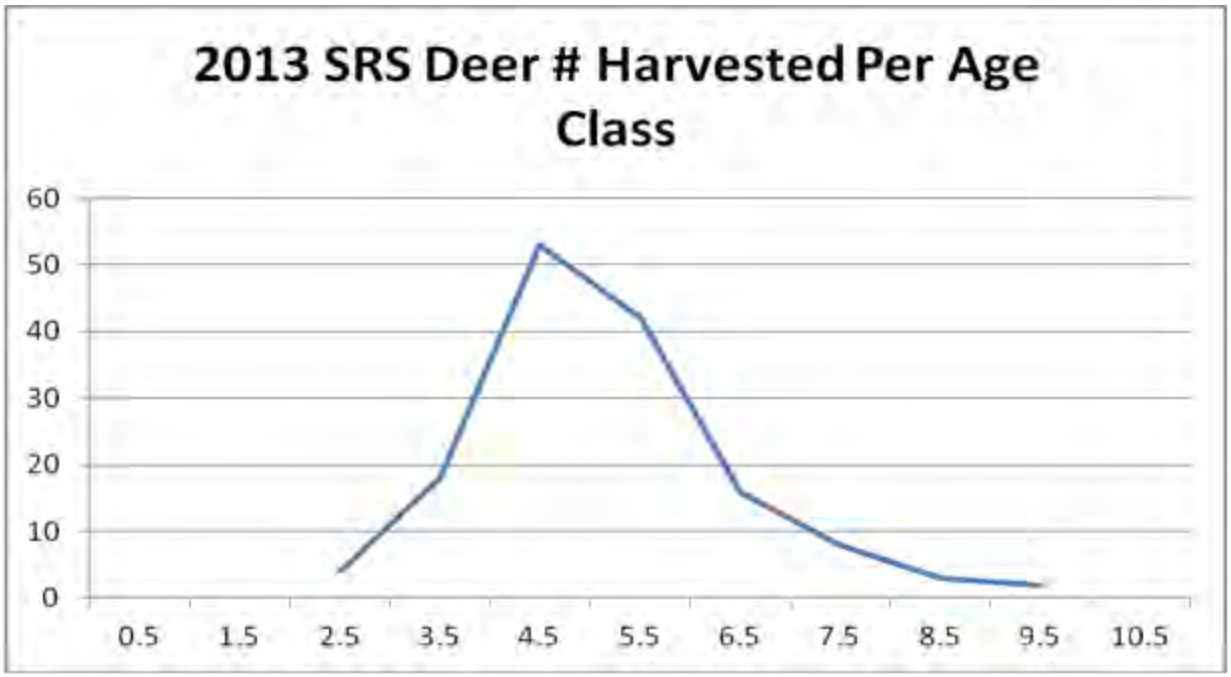
Management Summary

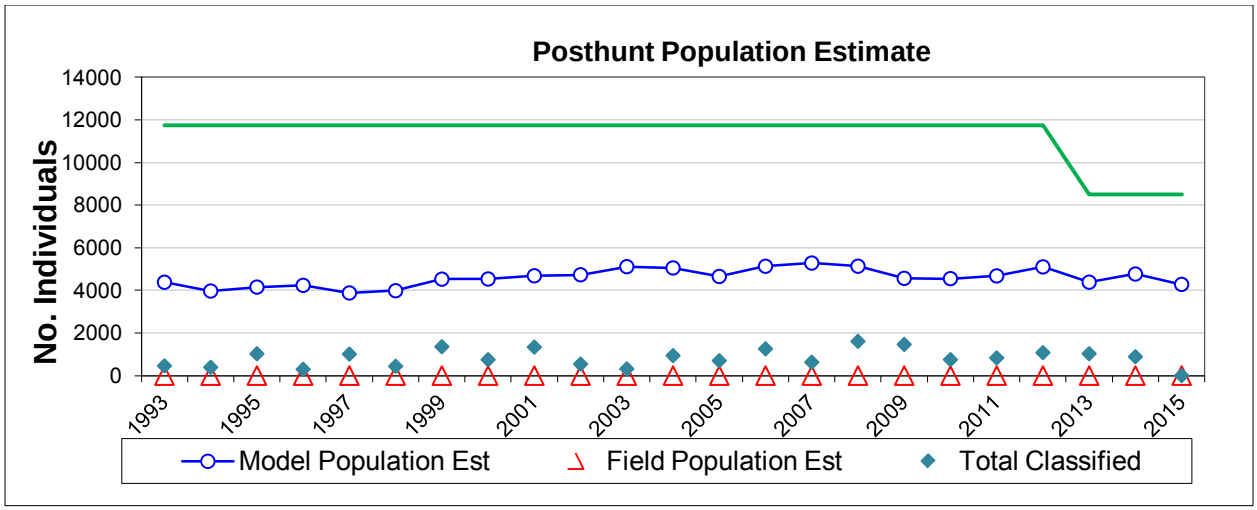
The 2015 hunting season proposal is similar in structure to how this herd has been managed for quite some time. However, changes are being proposed for 2015 in the number of licenses suggested in both HA101 & HA102. A reduction of 25 licenses is being proposed in HA101 from 50 to 25 licenses and a reduction of 100 licenses from 300 to 200 is proposed in HA102. Only two years ago 400 licenses were issued in HA102, so the current proposal is a significant reduction, and would be the fewest licenses issued in the last 20 years.

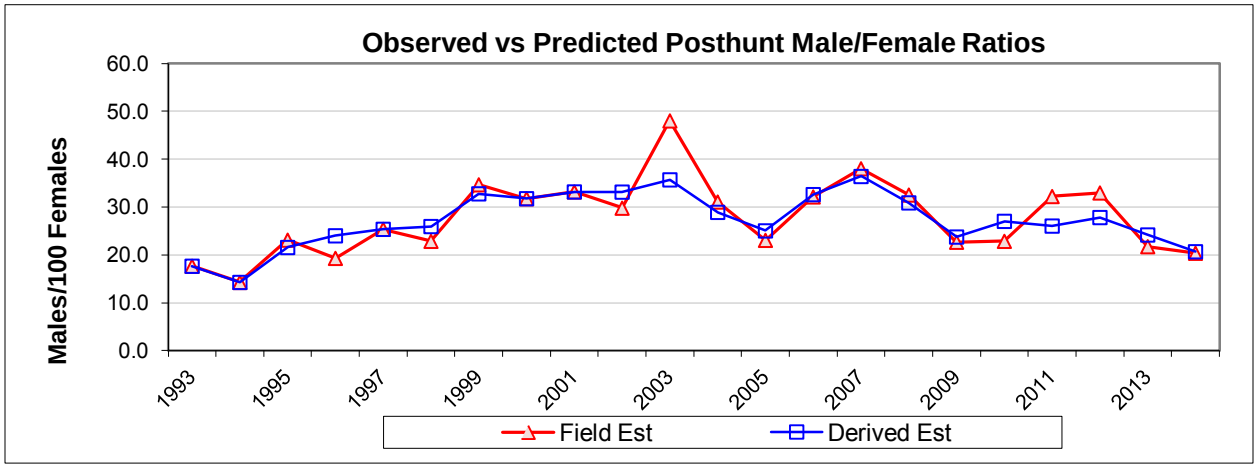
Despite the conservative seasons that have been set for this herd unit, observed buck to doe ratios are never higher than the lower end allowed for a special management herd. However, classifications compared to the number of licenses issued over the past 15 years, when there has been no issuance of doe licenses, shows little correlation between license issuance levels and post-season buck to doe ratios. The most likely explanation for this is emigration of young bucks out of the state, but that hypothesis is based on speculation and deserves study to attempt to quantify if emigration is occurring and if it is occurring, at what level. It is possible that young bucks could be moving into Utah where the average age of bucks is less than that in the Wyoming portion of the herd. This is suggested by the fact that the model does a poor job of aligning simulated and observed buck to doe ratios.

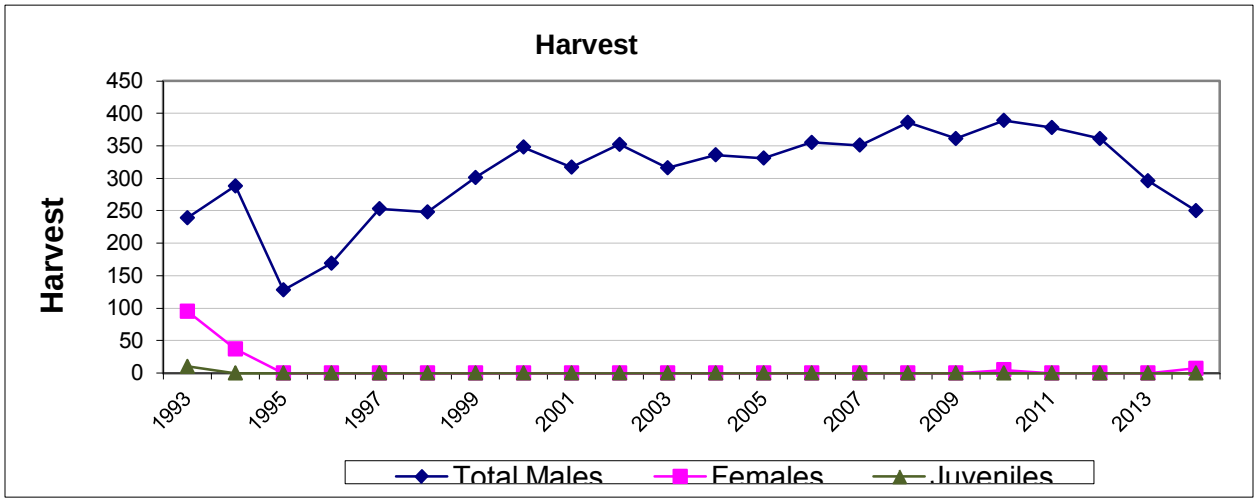

SRS Deer Average Age of Harvested Bucks
5.4
5.2
5.0
4.8
4.6
4.4
4.2
4.0
5.2
5.0
5.0
4.5
5.1
5.3
2009
2010
2011
2012
2013
2014

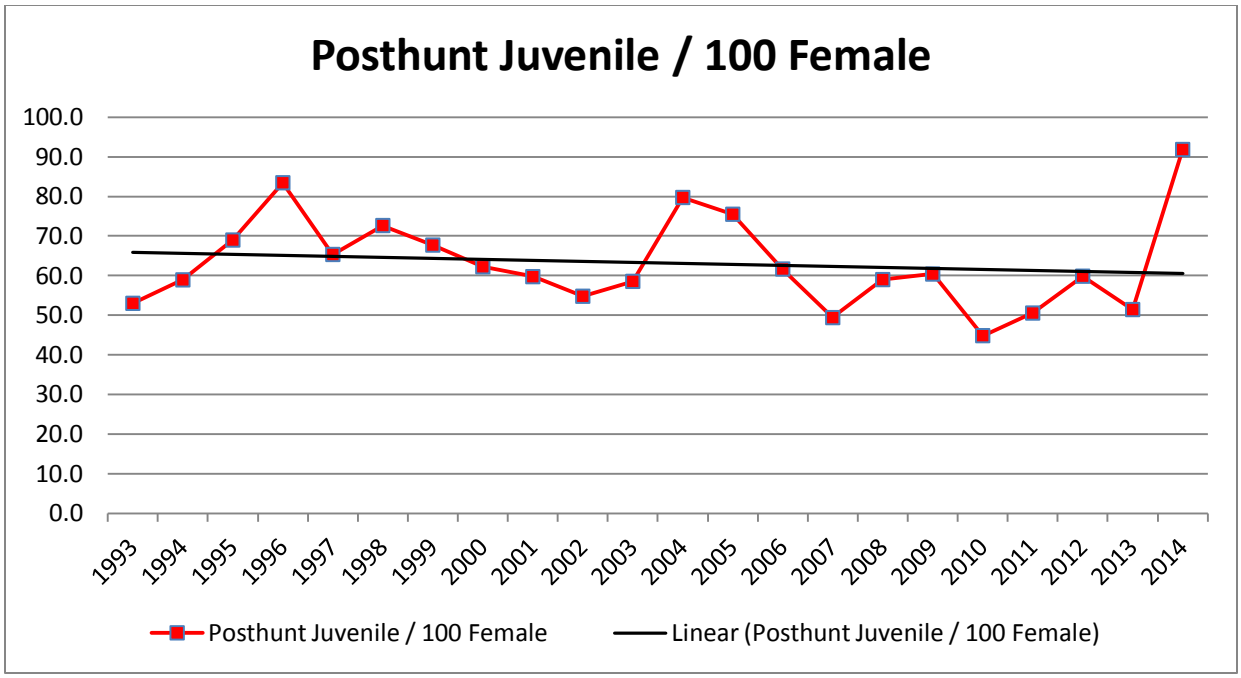

2014 SRS DEER # HARVESTED PER AGE CLASS
30
25
20
15
10
5
0
0.5
1.5
2.5
3.5
4.5
5.5
6.5
7.5
8.5
9.5
10.5
11.5
12.5
13.5
PER AGE CLASS

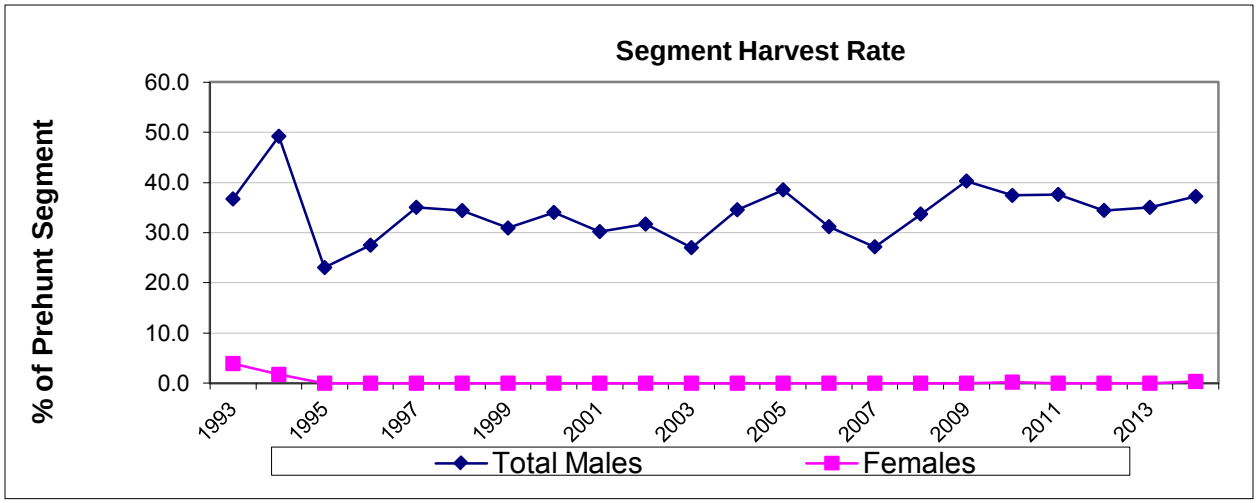

2013 SRS Deer # Harvested Per Age Class
60
50
40
30
20
10
0
0.5
1.5
2.5
3.5
4.5
5.5
6.5
7.5
8.5
9.5
10.5

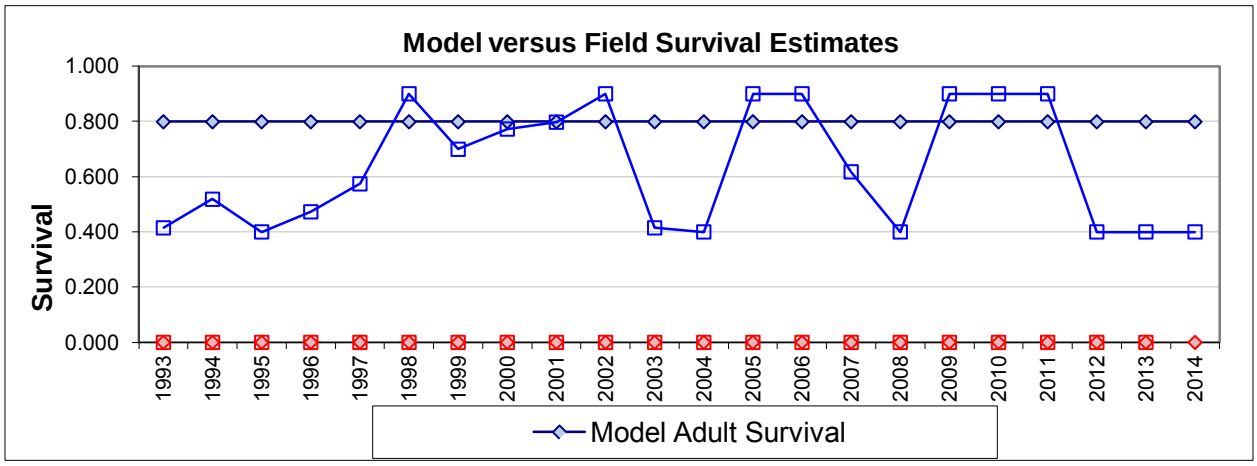

Posthunt Population Estimate
No. Individuals
14000
12000
10000
8000
6000
4000
2000
0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
2015
Model Population Est
Field Population Est
Total Classified

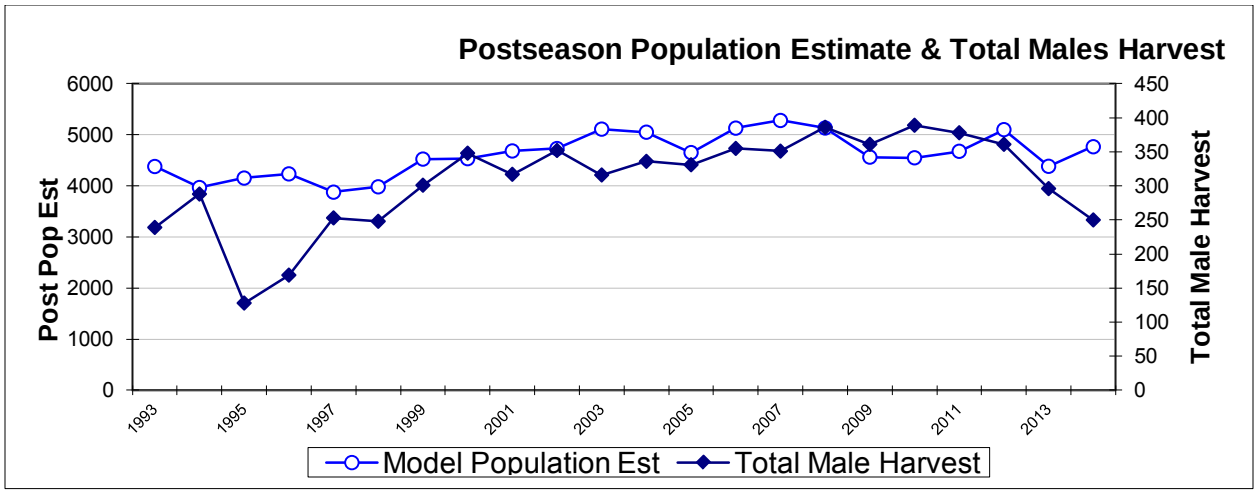

Observed vs Predicted Posthunt Male/Female Ratios
Males/100 Females
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Field Est
Derived Est


Harvest
Harvest
450
400
350
300
250
200
150
100
50
0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Total Males
Females
Juveniles


Posthunt Juvenile / 100 Female
100.0
90.0
80.0
70.0
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Posthunt Juvenile / 100 Female
Linear (Posthunt Juvenile / 100 Female)


Segment Harvest Rate
% of Prehunt Segment
60.0
50.0
40.0
30.0
20.0
10.0
0.0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Total Males
Females


Model versus Field Survival Estimates
Survival
1.000
0.800
0.600
0.400
0.200
0.000
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
Model Adult Survival


Postseason Population Estimate & Total Males Harvest
Post Pop Est
Total Male Harvest
6000
5000
4000
3000
2000
1000
0
450
400
350
300
250
200
150
100
50
0
1993
1995
1997
1999
2001
2003
2005
2007
2009
2011
2013
Model Population Est
Total Male Harvest

INPUT	
Species:	Mule Deer
Biologist:	Patrick Burke
Herd Unit & No.:	MD424 SRS
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	75	84	☐ CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	12	1300	☐ SCJ,SCA Model	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	21	147	☑ 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				925	568	1829	3322	914	305	1725	2944	11750
1994				998	559	1734	3291	998	242	1694	2933	11750
1995				1190	523	1725	3438	1190	382	1725	3297	11750
1996				1390	555	1666	3611	1390	369	1666	3425	11750
1997				1184	738	1812	3735	1184	460	1812	3456	11750
1998				1380	780	1900	4060	1380	508	1900	3788	11750
1999				1486	1041	2194	4721	1486	710	2194	4390	11750
2000				1470	1133	2361	4964	1470	750	2361	4581	11750
2001				1504	1184	2518	5207	1504	836	2518	4859	11750
2002				1421	1201	2594	5217	1421	814	2594	4830	11750
2003				1632	1314	2787	5733	1632	966	2787	5385	11750
2004				2100	1126	2634	5860	2100	757	2634	5490	11750
2005				1963	1046	2600	5610	1963	682	2600	5246	11750
2006				1801	1332	2920	6053	1801	942	2920	5663	11750
2007				1595	1590	3228	6412	1595	1204	3228	6026	11750
2008				1765	1316	2991	6071	1765	891	2991	5647	11750
2009				1709	1091	2829	5629	1709	693	2829	5232	11750
2010				1346	1240	3008	5594	1346	812	3002	5161	11750
2011				1563	1278	3091	5932	1563	862	3091	5516	11750
2012				1953	1417	3263	6632	1953	1020	3263	6235	11750
2013				1590	1235	3091	5916	1590	909	3091	5591	8500
2014				1767	1468	3275	6510	1767	1083	3275	6125	8500
2015												8500
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

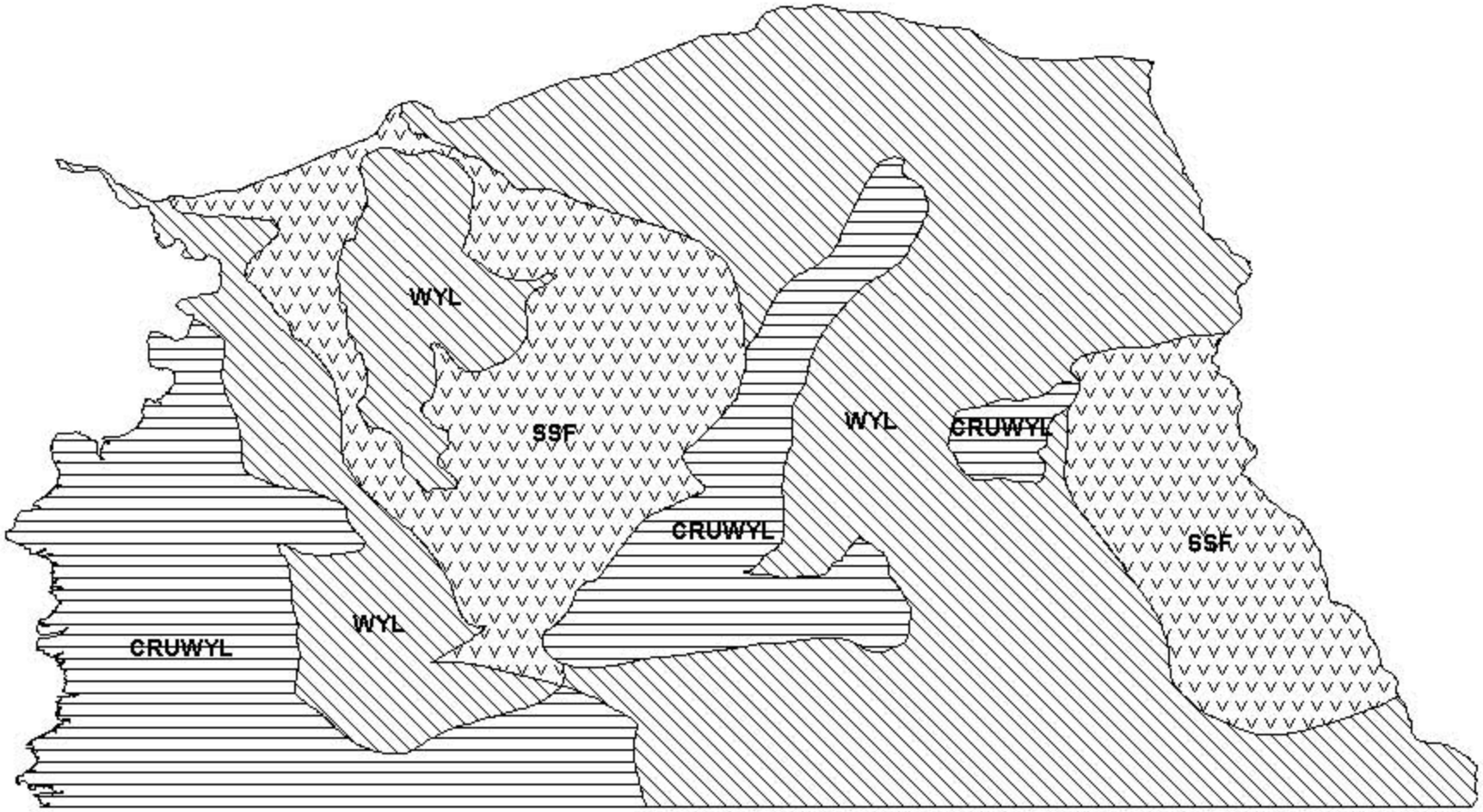
Survival and Initial Population Estimates

Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.67			0.83		
1994	0.65			0.83		
1995	0.40			0.83		
1996	0.62			0.83		
1997	0.67			0.83		
1998	0.90			0.83		
1999	0.73			0.83		
2000	0.77			0.83		
2001	0.68			0.83		
2002	0.90			0.83		
2003	0.40			0.83		
2004	0.40			0.83		
2005	0.78			0.83		
2006	0.90			0.83		
2007	0.40			0.83		
2008	0.40			0.83		
2009	0.78			0.83		
2010	0.90			0.83		
2011	0.90			0.83		
2012	0.40			0.83		
2013	0.90			0.83		
2014	0.40			0.83		
2015						
2016						
2017						
2018						
2019						
2020						
2021						
2022						
2023						
2024						
2025						

Parameters:	Optim cells
Adult Survival =	0.828
Initial Total Male Pop/10,000 =	0.030
Initial Female Pop/10,000 =	0.172

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

	Classification Counts										Harvest	
	Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
Year	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		53.01	5.52	17.67	17.67	2.80	10	239	95	344	46.3	5.7
1994		58.93	6.47	14.29	14.29	2.70	0	288	37	325	56.7	2.3
1995		68.98	4.68	22.17	23.12	2.31	0	128	0	128	26.9	0.0
1996		83.45	10.27	22.13	19.31	3.99	0	169	0	169	33.5	0.0
1997		65.34	4.52	25.38	25.38	2.45	0	253	0	253	37.7	0.0
1998		72.65	7.50	26.72	22.87	3.55	0	248	0	248	35.0	0.0
1999		67.71	4.12	32.37	34.68	2.64	0	301	0	301	31.8	0.0
2000		62.24	5.13	31.77	31.77	3.30	0	348	0	348	33.8	0.0
2001		59.74	3.71	33.19	33.19	2.53	0	317	0	317	29.4	0.0
2002		54.79	5.39	31.38	29.79	3.64	0	352	0	352	32.2	0.0
2003		58.55	7.82	34.66	48.03	6.84	0	316	0	316	26.5	0.0
2004		79.73	5.68	28.72	31.08	3.03	0	336	0	336	32.8	0.0
2005		75.50	6.14	26.23	23.08	2.84	0	331	0	331	34.8	0.0
2006		61.67	3.93	32.25	32.15	2.56	0	355	0	355	29.3	0.0
2007		49.40	4.70	37.29	38.02	3.96	0	351	0	351	24.3	0.0
2008		59.00	3.34	29.78	32.54	2.27	0	386	0	386	32.3	0.0
2009		60.40	3.48	24.51	22.68	1.87	0	361	0	361	36.4	0.0
2010		44.84	3.82	27.04	22.87	2.51	0	389	5	394	34.5	0.2
2011		50.55	4.10	27.89	32.23	3.07	0	378	0	378	32.5	0.0
2012		59.86	4.14	31.26	32.97	2.80	0	361	0	361	28.0	0.0
2013		51.43	3.62	29.41	21.75	2.11	0	296	0	296	26.4	0.0
2014		91.85	6.50	33.08	20.38	2.43	0	250	7	257	26.2	0.0
2015		67.71	4.76		25.04	2.45	0	180	0	180		
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												



Mule Deer (MD424) - South Rock Springs
HA 101, 102
Revised - 3/94

2014 - JCR Evaluation Form

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

HERD: MD427 - BAGGS

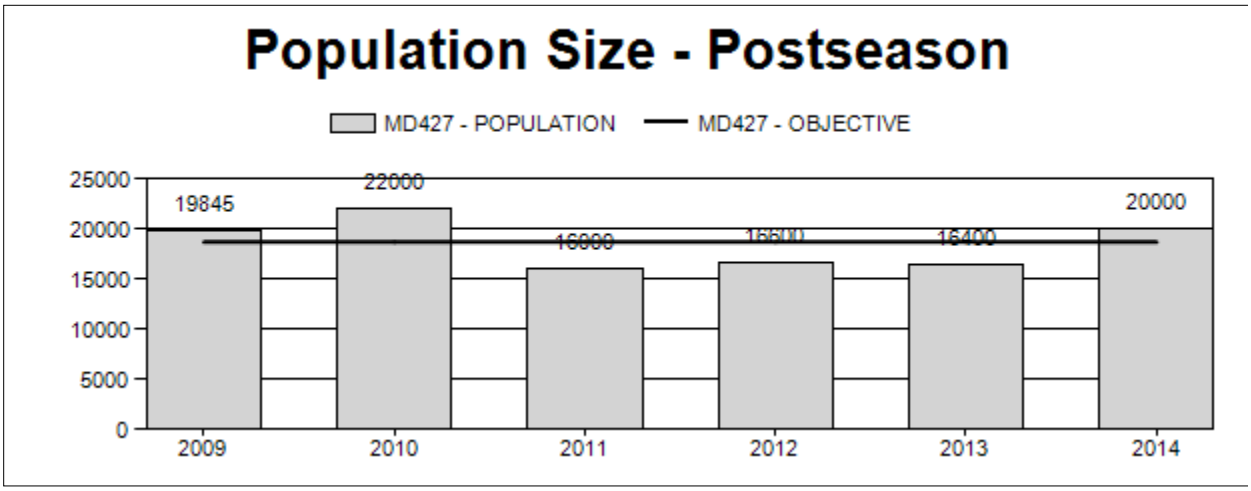
HUNT AREAS: 82, 84, 100 | PREPARED BY: TONY MONG

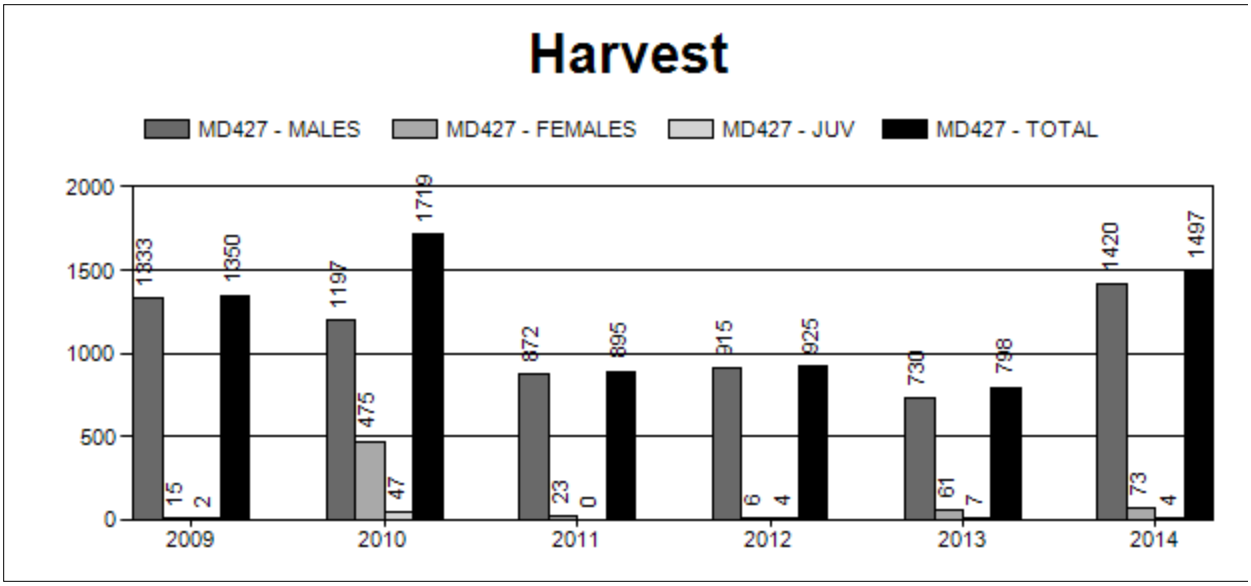
	2009 - 2013 Average	2014	2015 Proposed
Population:	18,169	20,000	20,000
Harvest:	1,137	1,497	1,600
Hunters:	2,457	2,441	2,600
Hunter Success:	46%	61%	62%
Active Licenses:	2,471	2,441	2,650
Active License Success:	46%	61%	60%
Recreation Days:	11,647	11,668	12,000
Days Per Animal:	10.2	7.8	7.5
Males per 100 Females	28	37	
Juveniles per 100 Females	62	54	

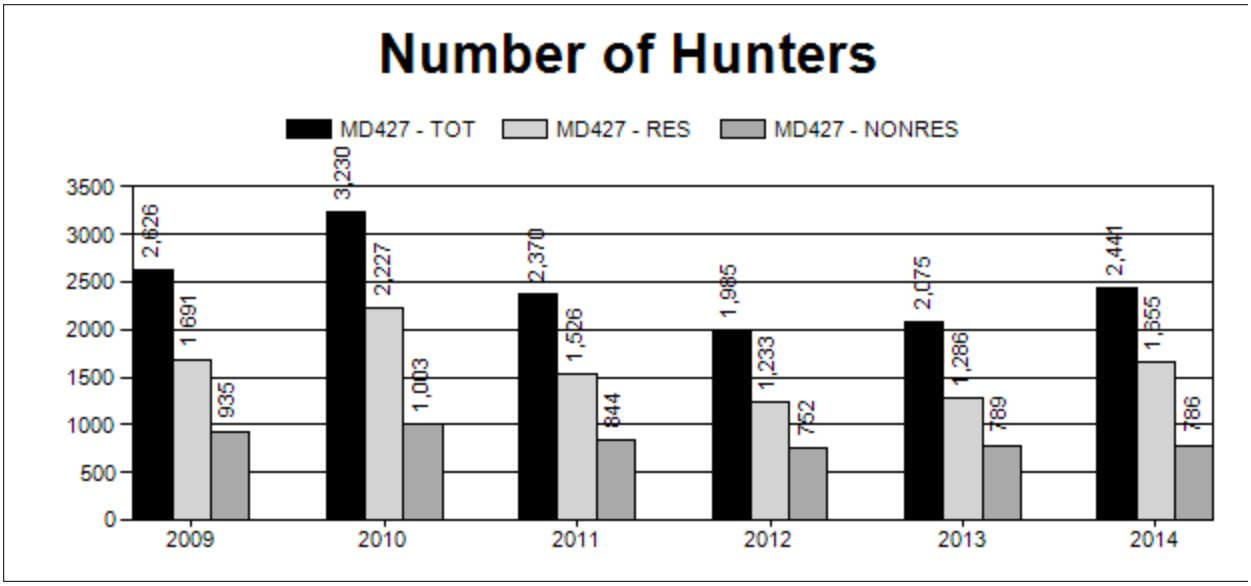
Population Objective (± 20%) :	18700 (14960 - 22440)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	7%
Number of years population has been + or - objective in recent trend:	1
Model Date:	03/03/2015

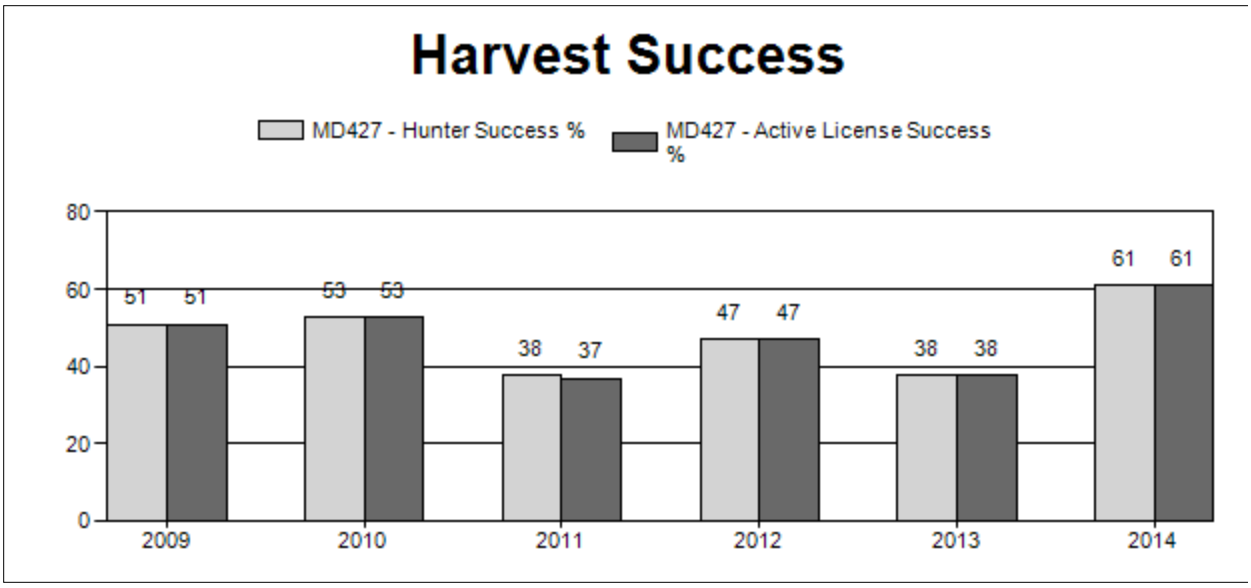
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

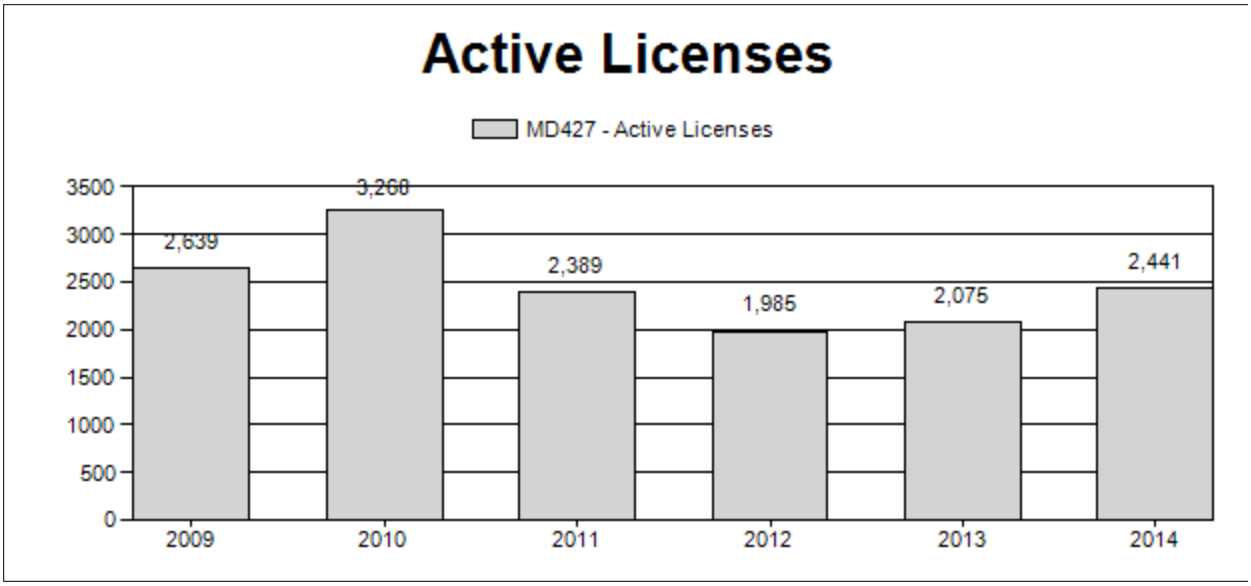
	JCR Year	Proposed
Females ≥ 1 year old:	0.2%	0.8%
Males ≥ 1 year old:	36%	27.3%
Juveniles (< 1 year old):	0%	0.1%
Total:	3%	7%
Proposed change in post-season population:	1%	0%

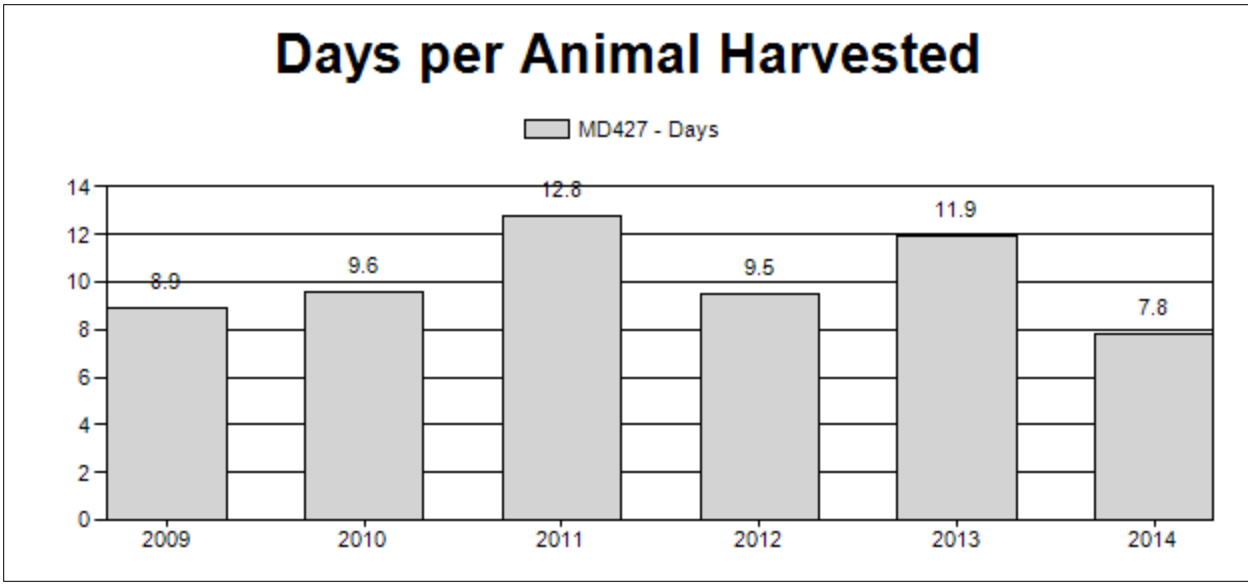


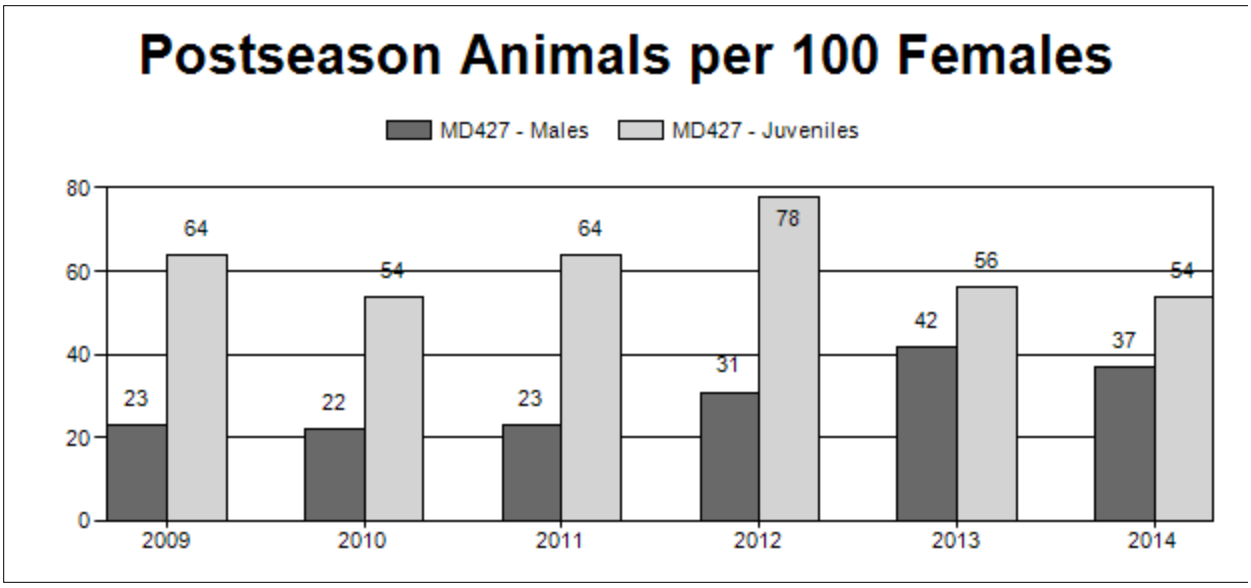

Harvest
MD427 - MALES
MD427 - FEMALES
MD427 - JUV
MD427 - TOTAL
2000
1500
1000
500
0
1833
15
2
1350
1197
475
47
1719
872
23
0
895
915
6
4
925
730
61
7
798
1420
73
4
1497
2009
2010
2011
2012
2013
2014


Number of Hunters
MD427 - TOT
MD427 - RES
MD427 - NONRES
3500
3000
2500
2000
1500
1000
500
0
2,626
1,691
935
3,230
2,227
1,003
2,370
1,526
844
1,985
1,233
752
2,075
1,286
789
2,441
1,555
786
2009
2010
2011
2012
2013
2014


Harvest Success
MD427 - Hunter Success %
MD427 - Active License Success %
80
60
40
20
0
51
51
53
53
38
37
47
47
38
38
61
61
2009
2010
2011
2012
2013
2014


Active Licenses
MD427 - Active Licenses
3500
3000
2500
2000
1500
1000
500
0
2,639
3,260
2,389
1,985
2,075
2,441
2009
2010
2011
2012
2013
2014


Days per Animal Harvested
MD427 - Days
14
12
10
8
6
4
2
0
8.9
9.6
12.8
9.5
11.9
7.8
2009
2010
2011
2012
2013
2014


Postseason Animals per 100 Females
MD427 - Males
MD427 - Juveniles
80
60
40
20
0
23
64
22
54
23
64
31
78
42
56
37
54
2009
2010
2011
2012
2013
2014

2015 HUNTING SEASONS

SPECIES : **Mule Deer** HERD UNIT : **Baggs (427)**
HUNT AREAS: **82, 84, 100**

Hunt Area	Type	Season Dates Opens	Closes	Quota	License	Limitations
82		Oct. 1	Oct. 10		General	Antlered mule deer or any white-tailed deer
		Oct. 1	Oct. 14		General youth	Any deer
	7	Oct. 1	Oct. 10	100	Limited quota	Doe or fawn valid south of the East Fork of Savery Creek; south and east of Savery Creek; and north and east of the Little Snake River
84	1	Oct. 1	Oct. 9	50	Limited quota	Antlered mule deer or any white-tailed deer
100		Oct. 1	Oct. 5		General	Antlered mule or any white-tailed deer
		Oct. 1	Oct. 7		General youth	Any deer
82, 84, 100	Archery	Sep. 1	Sep. 30			Refer to Section 3

Hunt Area	*Type*	*Quota change from 2014*
Region W	*Gen*	*0*
82	*7*	*+100*
84	*1*	*0*
Herd Unit Total	***1***	***0***
	7	***+100***
	Region W	***0***

Management Evaluation
Current Management Objective: 18,700
Management Strategy: Recreational
2014 End-of-bio-year Estimate: 22,000
2015 Proposed Postseason Population Estimate: 20,000
Region W Quota - 900

The Baggs Mule Deer herd is at the current established population objective of around 19,000 (18,700) (established in 1986) and our current management strategy is to maintain the current population size through similar management.

Herd Unit Issues

This herd unit consists of three disparate hunt areas; 82, 84, and 100. Area 82 is the most productive, and supports the bulk of hunters and mule deer in this herd. Access in this area is good throughout most of the area. Area 84 contains a mixture of good to marginal deer habitats, but is under checkerboard ownership and access is very limited for deer hunting; most areas are leased by outfitters. Area 100 has good access, but few deer during the hunting season due to limited suitable habitat (Area 100 supports the bulk of this herd unit during the winter).

Throughout the Baggs mule deer herd unit, oil and gas fields associated with the Atlantic Rim Project continue to expand, and we expect construction of the largest wind energy project in North America to begin within two years, the Chokecherry-Sierra Madre Wind Energy Project. In addition to the Atlantic Rim and Chokecherry-Sierra Madre Wind projects many parcels of public land on the west side of the Sierra Madre Mountain Range have been leased for oil and gas development, as well as the majority of winter ranges west of Baggs. Uranium leases also occur on this winter range complex in the Powder Rim area, but these are currently not being developed.

We have documented a dramatic decline in the number of deer using the Dad/Sandhills winter range area (2004-2007 average total count 762, 2010-2013 average total count 224) due to increased human activity associated with the Atlantic Rim Development.

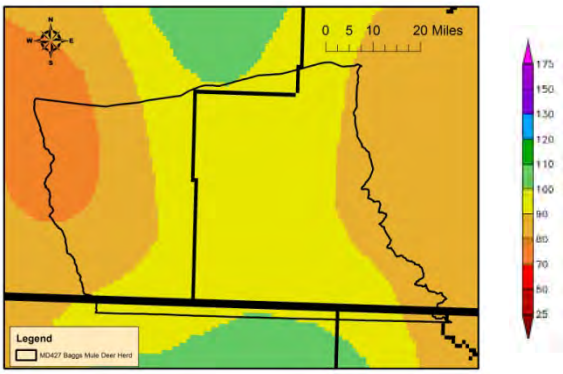
Mule deer numbers have been responding favorably to improved precipitation and mild winters in this herd unit, particularly in Area 82 and the southernmost portion of 84. In hunt area 100 we are not seeing the same population response as we see in hunt area 82 or in parts of 84 due to significant differences in habitats and ability to produce deer. Area 100 supports the bulk of this mule deer population during the winter, but has significantly fewer resident deer. Although hunt area 100 has never had the same success rates or hunting season density of deer as hunt area 82 or 84, it appears the divergence has become exceedingly evident over the last 4 years.

Weather

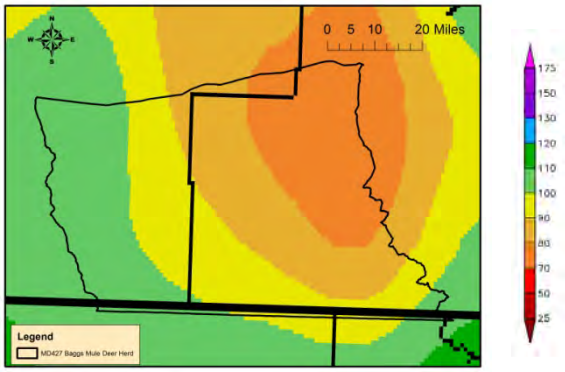
The weather conditions have been quite variable over the last several years. Overall the herd unit has seen higher than normal percent of precipitation when comparing 2013 to 2014 (Figure 1). Increased moisture throughout the entire herd unit, particularly in the higher, more productive habitats, should equate to better vegetation for 2015. The 2014-15 winter was extremely mild with low levels of snowfall, higher than average temperatures, and very limited winter mortality of all age classes. Although the lack of winter precipitation was initially concerning, spring moisture levels seem to have compensated for low winter moisture levels.

Figure 1. A) Percent of normal precipitation for the herd unit from January 2013 to December 2013, B) Percent of normal precipitation for the herd unit from January 2014 to December 2013.

A)



B)



Habitat

2014-15 precipitation levels have resulted in improved habitat conditions in this herd unit. I ncreased precipitation during the 2014 fall resulted in a late growth opportunity for most vegetation in the herd unit, and mule deer were able to capitalize on this for increased winter fat stores. An early warming trend following the 2014-15 winter, coupled with regular precipitation during the 2015 spring months resulted in an early green up that continues to this day. Some areas in the herd unit have received significantly more moisture than has been observed in many years, and will equate to continued improvement in habitats for mule deer.

There is some concern regarding the condition of winter habitats on the large winter complex west of Baggs. Significant hedging of mixed mountain shrubs and sagebrush, and highlining of junipers is apparent. This issue will need to be addressed in the future if deer numbers at current levels are to persist. Local Game and Fish personnel will need to work closely with land managers, Game and Fish habitat biologists, sportsmen, and livestock permittees to address competiton issues, habitat projects, and population management to address some of these concerns.

Field Data

Long-term drought, severe winters, and increasing human activity has been a challenge for the mule deer in this herd unit. Despite these challenges, we have seen deer numbers increase over the last 3 years, and the population is now at objective. Initiation of an antler point-restriction for two years (coupled with good fawn production and survival during those years, which is key), followed by subsequent removal of this-restriction resulted in increased buck ratios (from a low of 22:100 in 2010 to 37:100 in 2014). Despite lower fawn ratios over the past 2 years, data from Colorado Parks and Wildlife indicate that fawn survival has been very high over the same period (~88% survival in 2013, pers. comm.. Darby Finley, CPW).

We do not have separate data for those resident mule deer in hunt area 100 to provide a better indication of the issues facing this portion of the population. Hunter comments, field observations and local knowledge lead us to believe this portion of the herd is not responding the same way as the portion in hunt area 82. It is likely this exceptionally dry (5-7 inch precipitation zone), unproductive habitat, will see some improvement in 2015 due to improved precipitation and habitat conditions, but a response in deer in this area similar to a montane hunt area (e.g. 82) with significant amounts of productive habitat is not realistic and cannot be expected.

Harvest Data

The 2014 hunting season saw a return to pre-2007/08 levels (2003 to 2007 average buck harvest, 1600, 2014 buck harvest, 1,420). The 2014 hunting season resulted in a higher than average hunter success rate (61%), as compared to the previous 10 year average of 55%. These statistics led to an increase in hunter satisfaction from 53% in 2013 to 72% in 2014 (combined satisfied and very satisfied). Despite the opportunity provided during the youth-only portion of the season (any deer and antlerless elk combination hunt), we observe limited participation during this period. Youth hunter contacts suggest they and their parents are appreciative of the season. Since doe fawn licenses have not been issued in the past few years (including 2014), doe harvest reported in the harvest survey is from the youth season and/or archery hunters. A total of 73 doe deer were harvested in 2014, an insignificant amount in a herd of ~19,000 mule deer.

Population

The current post-season population model suggests we are now above the objective but within the objective range (14,960 – 22,440) at 20,000 animals. Despite the SCJ, SCA model having the lowest relative AICc value (152), we chose the TSJ, CA model (189) based on what we believe to be a better representation of the actual population trend, simulated versus observed buck ratios , plausibility, and field observations. The SCJ, SCA model shows a population that is nearly 300% above objective, and makes little sense and is not biologically feasible. Within the TSJ, CA model we constrained adult survival to lower levels during the 2007-08 and 2010-11 winters to match observed difficult winter conditions and increased deer mortality.

The spreadsheet model seems to be a useful tool for this herd. However, the model should be viewed as a tool to predict trend and relative abundance, only, barring an independent estimate of the population size to calibrate the model. Additionally, based on recent research in Colorado and Wyoming, there appears to be significant interchange between the two states, resulting in unknown effects on harvest management and population.

Management Summary

Since this herd is currently at objective, seasons are becoming less conservative in the primary hunt area (hunt area 82) in 2015. This will shift management from population growth strategy to one of population maintenance, accomplished by increasing season length and offering a limited number of doe/fawn licenses in the portion of highest deer density. Continued high buck ratios (especially in Area 82) and continued "any antlered deer" hunting will spread harvest across all age classes, resulting in opportunity for more bucks to make it into the older age classes. In order to maintain current population level without a corresponding increase in hunter numbers in this area of high hunter density, we are issuing a limited number of (100) additional, reduced price doe/fawn licenses, valid only in the southeastern portion of Area 82. Using the spreadsheet model as a predictor of next year's population based on increased doe harvest we should see a "flattening" of the population growth curve. Seasons will remain more conservative in both of our "desert" hunt areas (84 and 100) until deer numbers in these areas are at more acceptable levels.

A Baggs Mule Deer Working group was formed in the Summer/Fall of 2014 to bring multiple interest groups together for the management of mule deer in this herd unit. This group has met multiple times and made the initial recommendations to lengthen the season by one day and to add doe/fawn licenses if the spreadsheet model predicted a continued increase in the population to objective levels. The group came to the consensus on these recommendations on January 6, 2015.

INPUT	
Species:	Deer
Biologist:	Tony Mong
Herd Unit & No.:	Baggs Herd, 427
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	197	206	CJ,CA Model	
SCJ,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	132	152	SCJ,SCA Mo	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival	37	189	TSJ,CA Model	

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population				Predicted Posthunt Population				Objective
	Field Est	Field SE		Juveniles	Total Males	Females	Total	Juveniles	Total Males	Females	Total	
1993				2951	2291	6605	11847	2783	1053	5436	9272	18700
1994				3483	2087	5896	11466	3483	1343	5896	10722	18700
1995				4043	2703	6660	13406	4043	1624	6660	12327	18700
1996				5324	3231	7607	16162	5324	2084	7607	15016	18700
1997				6427	3409	8208	18044	6427	2068	8173	16668	18700
1998				5399	3725	9030	18154	5386	2315	8685	16386	18700
1999				5341	4435	9971	19747	5264	2380	9430	17074	18700
2000				6386	4437	10564	21387	6350	2201	10283	18834	18700
2001				5143	3818	10841	19802	5143	2339	10840	18322	18700
2002				5702	4143	11530	21374	5702	2231	11530	19463	18700
2003				5329	4254	12336	21919	5308	2563	12109	19979	18700
2004				6881	4257	12553	23691	6860	2684	12244	21788	18700
2005				6850	4505	12812	24167	6806	3119	12534	22459	18700
2006				6964	5512	13694	26169	6932	3536	13064	23533	18700
2007				7043	5469	13749	26261	7002	3307	13056	23366	18700
2008				4198	3185	9426	16809	4195	2083	9419	15698	18700
2009				6403	3698	10073	20174	6400	2232	10057	18689	18700
2010				5334	3540	10340	19213	5282	2223	9817	17322	18700
2011				4356	2580	6882	13818	4356	1614	6857	12827	18700
2012				6143	3363	7919	17425	6138	2343	7913	16394	18700
2013				5426	4799	9638	19863	5418	3996	9571	18985	18700
2014				5934	5710	10556	22200	5930	4148	10475	20553	18700
2015				6563	5087	10586	22236	6559	3525	10395	20479	18700

Survival and Initial Population Estimates

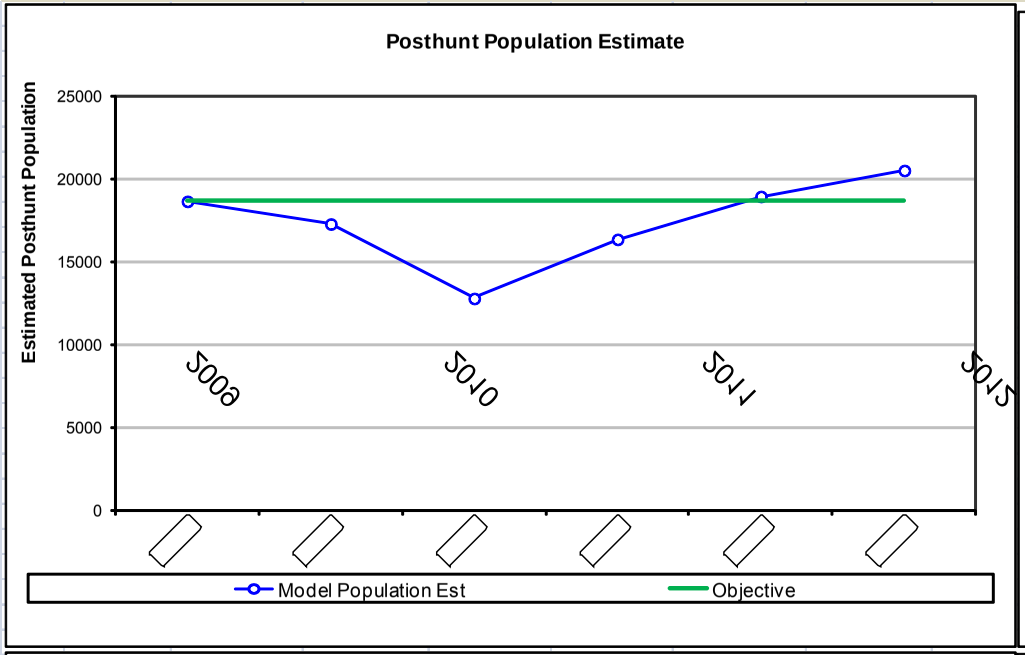
Year	Annual Juvenile Survival Rates			Annual Adult Survival Rates		
	Model Est	Field Est	SE	Model Est	Field Est	SE
1993	0.84			0.87		
1994	0.88			0.87		
1995	0.90			0.87		
1996	0.60			0.87		
1997	0.60			0.87		
1998	0.90			0.87		
1999	0.90			0.87		
2000	0.60			0.87		
2001	0.82			0.87		
2002	0.81			0.87		
2003	0.76			0.87		
2004	0.63			0.87		
2005	0.82			0.87		
2006	0.69			0.87		
2007	0.30			0.64		
2008	0.90			0.87		
2009	0.50			0.87		
2010	0.50			0.57		
2011	0.90			0.87		
2012	0.90			0.87		
2013	0.83			0.87		
2014	0.50			0.87		
2015	0.50			0.87		

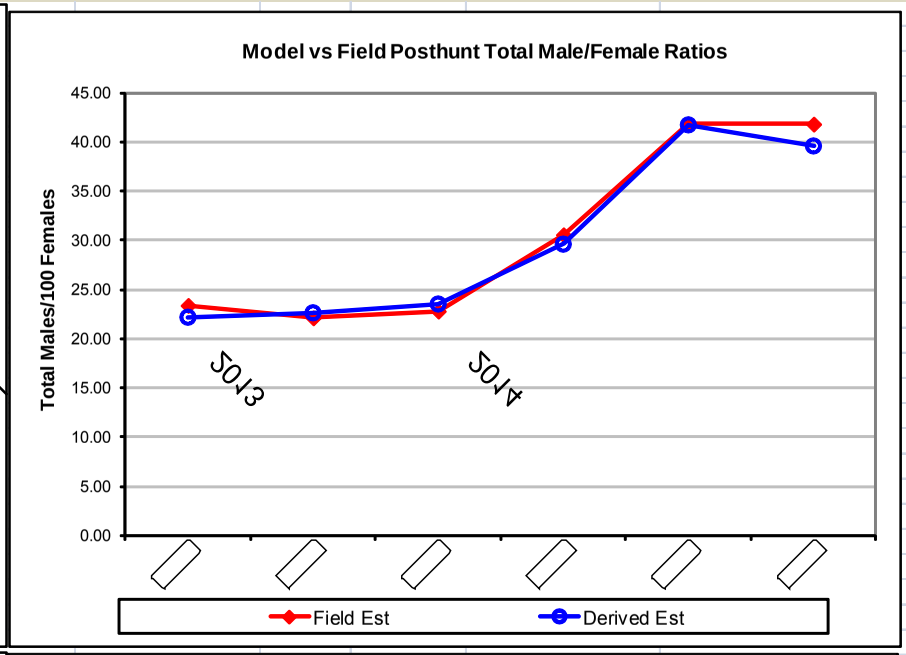
Parameters:	Optim cells
Adult Survival =	0.869
Initial Total Male Pop/10,000 =	0.105
Initial Female Pop/10,000 =	0.544

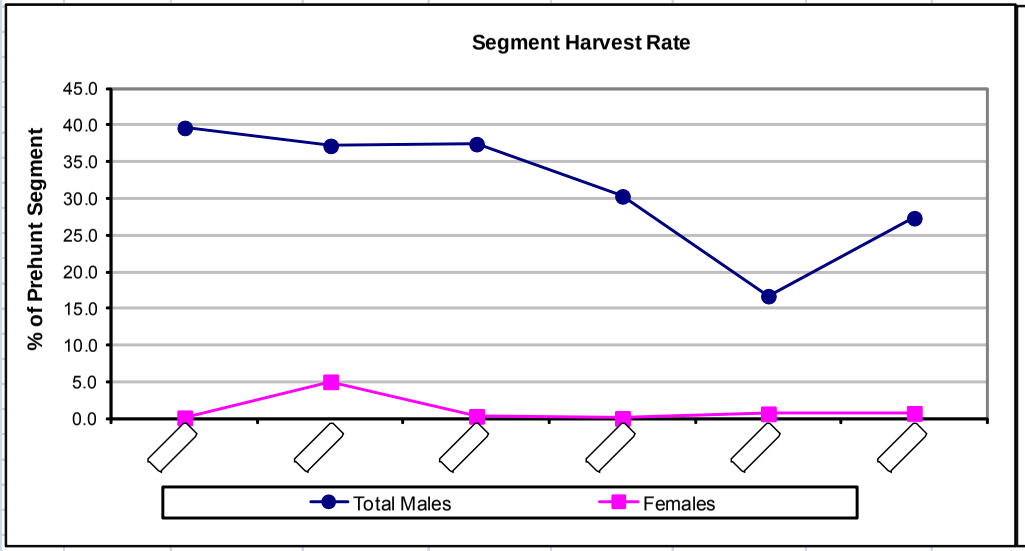
MODEL ASSUMPTIONS	
Sex Ratio (% Males) =	50%
Wounding Loss (total males) =	10%
Wounding Loss (females) =	10%
Wounding Loss (juveniles) =	10%

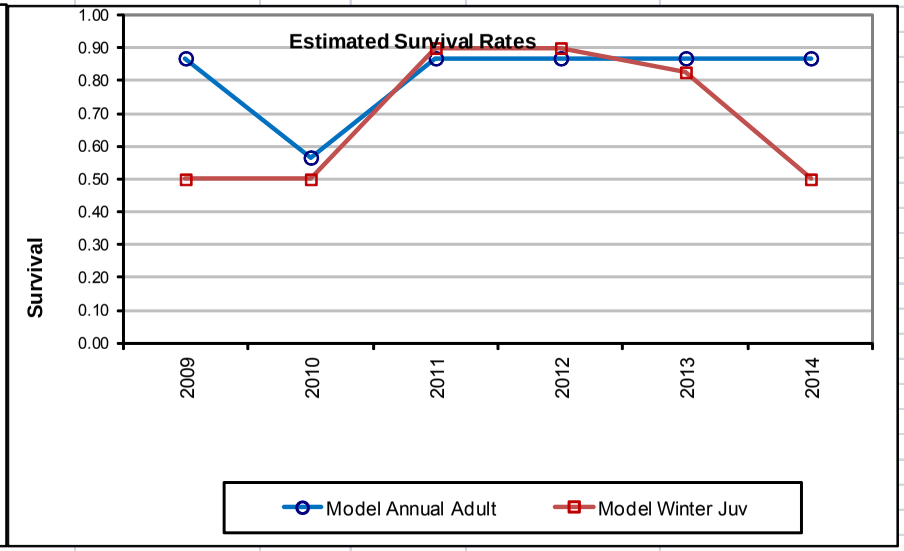
Classification Counts						Harvest					
Juvenile/Female Ratio			Total Male/Female Ratio							Segment Harvest Rate (% of	
Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Males	Females	Total Harvest	Total Males	Females
	51.20	1.65	19.37	19.37	0.90	153	1125	1063	2341	54.0	17.7
	59.08	2.01	22.77	22.77	1.09	0	677	0	677	35.7	0.0
	60.71	2.11	24.38	23.56	1.15	0	981	0	981	39.9	0.0
	69.99	2.32	27.40	30.28	1.34	0	1042	0	1042	35.5	0.0
	78.65	2.84	25.30	26.64	1.39	0	1219	32	1251	39.3	0.4
	62.01	2.39	26.65	23.11	1.27	12	1282	314	1608	37.9	3.8
	55.82	2.07	25.24	23.29	1.19	70	1868	492	2430	46.3	5.4
	61.75	2.29	21.41	26.50	1.33	33	2033	255	2321	50.4	2.7
	47.44	1.39	21.58	20.84	0.83	0	1344	1	1345	38.7	0.0
	49.45	1.77	19.35	19.35	0.99	0	1738	0	1738	46.1	0.0
	43.83	1.67	21.16	21.16	1.07	19	1538	206	1763	39.8	1.8
	56.03	1.67	21.92	21.92	0.92	19	1430	281	1730	37.0	2.5
	54.30	1.51	24.88	24.88	0.92	40	1260	253	1553	30.8	2.2
	53.06	1.70	27.07	27.07	1.11	29	1796	572	2397	35.8	4.6
	53.63	1.55	25.33	25.33	0.96	37	1965	630	2632	39.5	5.0
	44.54	1.51	22.12	21.70	0.97	3	1001	6	1010	34.6	0.1
	63.64	2.13	22.20	23.41	1.12	2	1333	15	1350	39.6	0.2
	53.81	2.09	22.65	22.15	1.20	47	1197	475	1719	37.2	5.1
	63.53	2.25	23.54	22.83	1.17	0	878	23	901	37.4	0.4
	77.58	2.94	29.62	30.59	1.58	4	927	6	937	30.3	0.1
	56.61	2.08	41.75	41.84	1.70	7	730	61	798	16.7	0.7
	56.61	2.08	39.60	41.84	1.70	4	1420	73	1497	27.4	0.8
	63.09	2.33	33.91	32.33	1.50	4	1420	173	1597	30.7	1.8

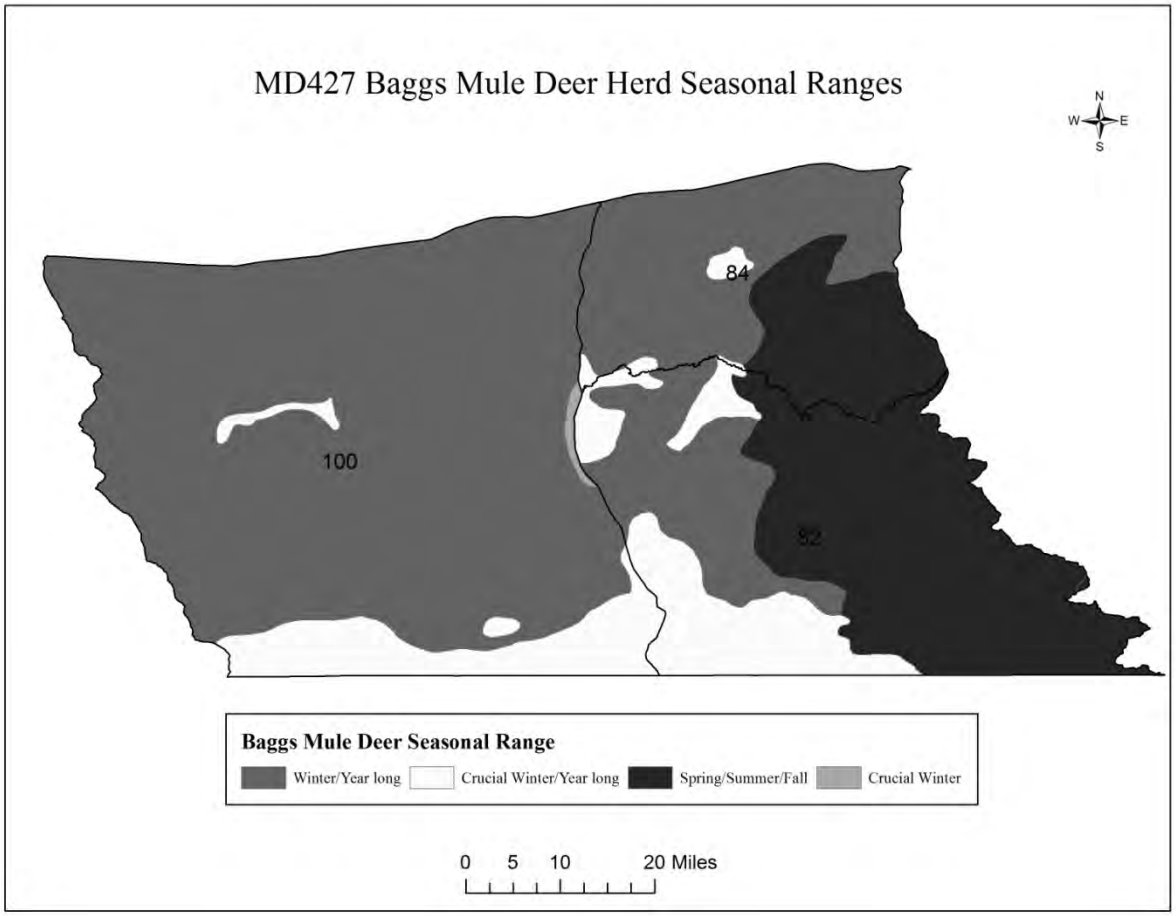
FIGURES


Posthunt Population Estimate
Estimated Posthunt Population
25000
20000
15000
10000
5000
0
2009
2010
2011
2012
Model Population Est
Objective


Model vs Field Posthunt Total Male/Female Ratios
Total Males/100 Females
45.00
40.00
35.00
30.00
25.00
20.00
15.00
10.00
5.00
0.00
2013
2014
Field Est
Derived Est


Segment Harvest Rate
% of Prehunt Segment
45.0
40.0
35.0
30.0
25.0
20.0
15.0
10.0
5.0
0.0
Total Males
Females


Estimated Survival Rates
Survival
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
2009
2010
2011
2012
2013
2014
Model Annual Adult
Model Winter Juv


MD427 Baggs Mule Deer Herd Seasonal Ranges
N
W
E
S
84
100
92
Baggs Mule Deer Seasonal Range
Winter/Year long
Crucial Winter/Year long
Spring/Summer/Fall
Crucial Winter
0 5 10 20 Miles