

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD534 - GOSHEN RIM

HUNT AREAS: 15-16, 55, 57

PREPARED BY: MARTIN HICKS

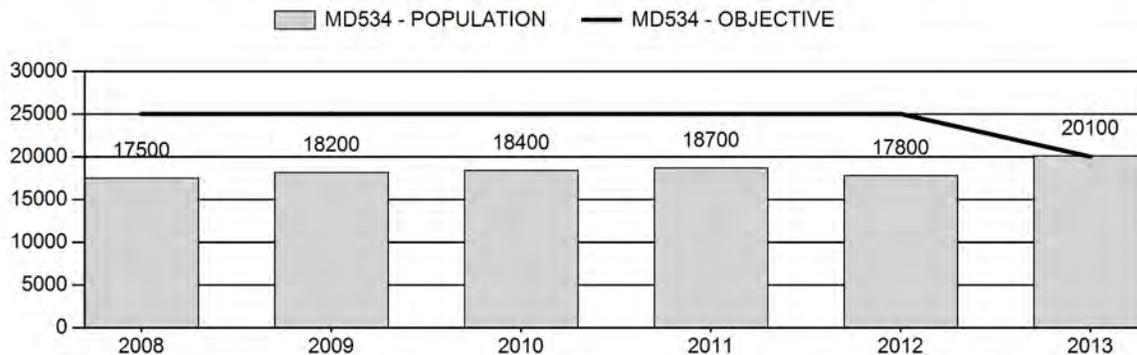
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	18,120	20,100	19,800
Harvest:	772	678	1,035
Hunters:	1,655	1,463	1,435
Hunter Success:	47%	46%	72 %
Active Licenses:	1,712	1,542	1,465
Active License Percent:	45%	44%	71 %
Recreation Days:	6,189	5,858	7,000
Days Per Animal:	8.0	8.6	6.8
Males per 100 Females	33	28	
Juveniles per 100 Females	62	58	

Population Objective:	20,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	0%
Number of years population has been + or - objective in recent trend:	7
Model Date:	03/04/2014

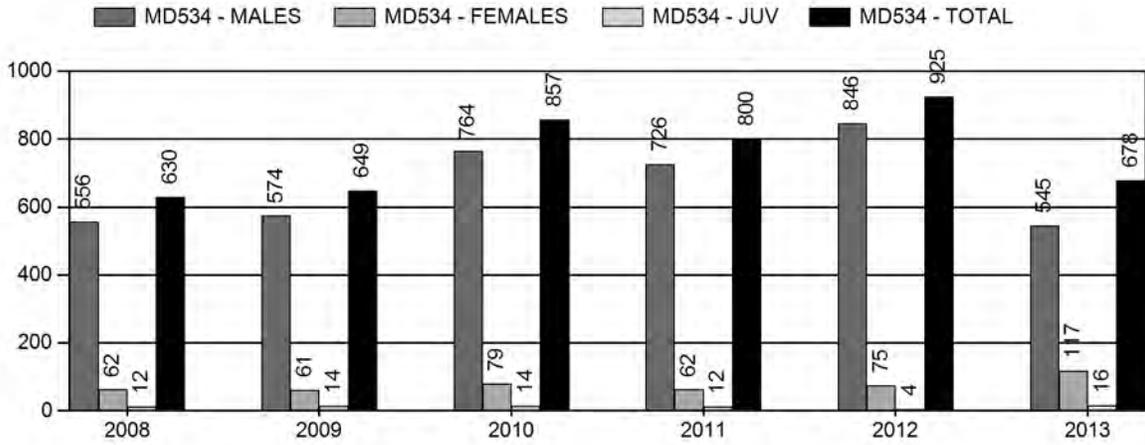
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	1%	1%
Males ≥ 1 year old:	10%	12%
Juveniles (< 1 year old):	.2%	0%
Total:	3%	3%
Proposed change in post-season population:	+12%	0%

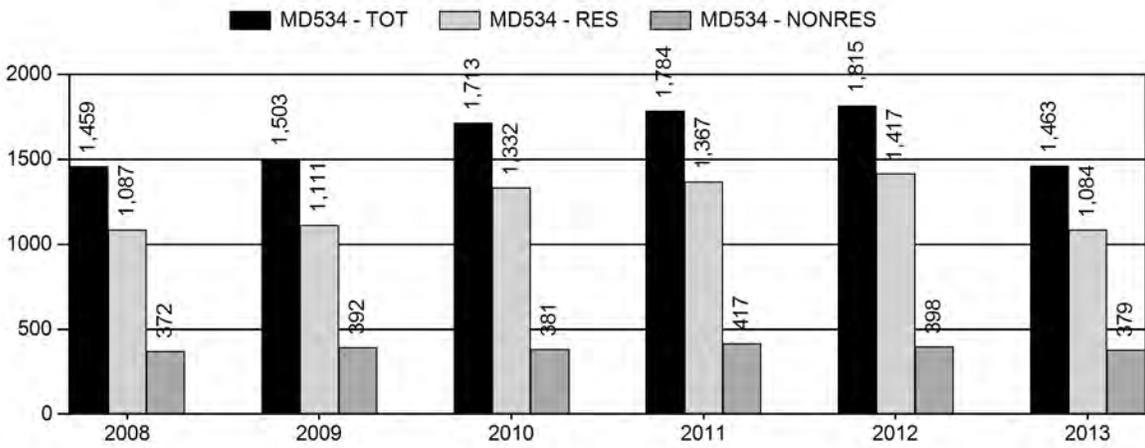
Population Size - Postseason



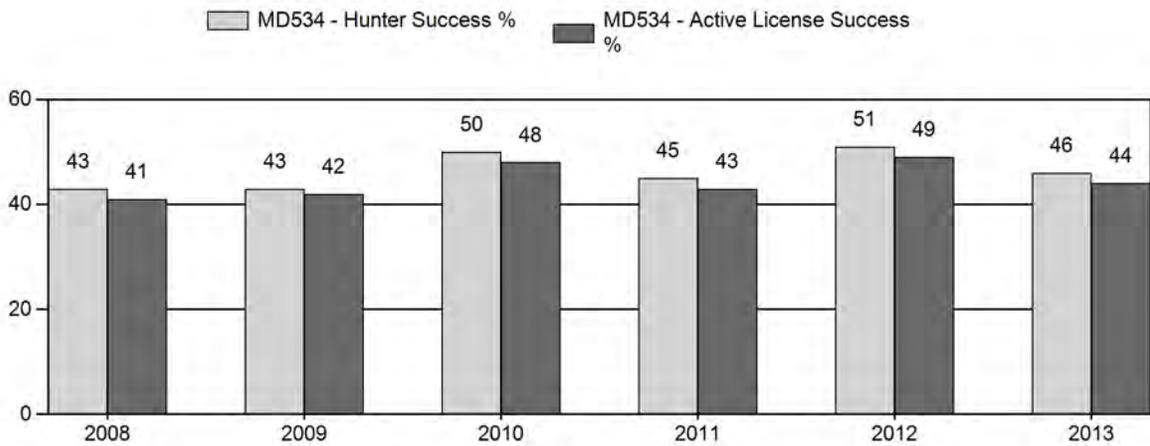
Harvest



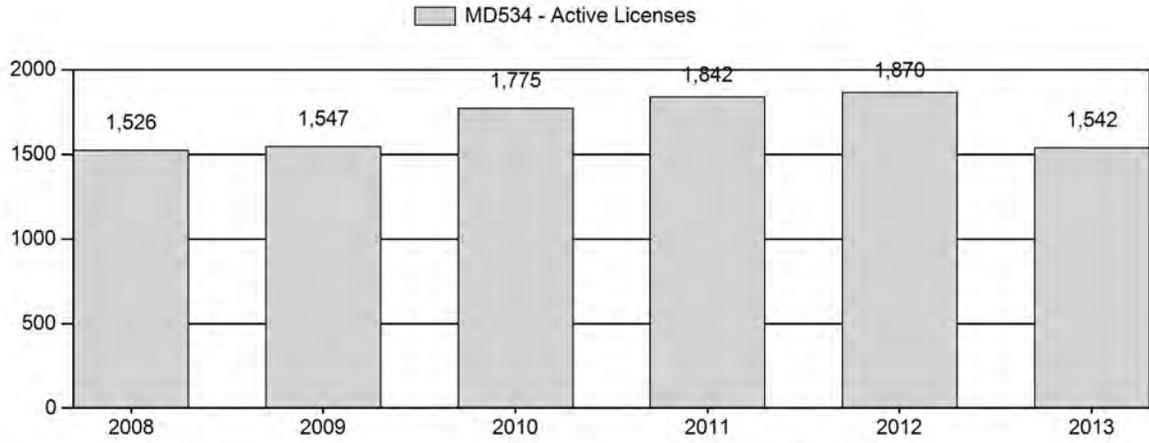
Number of Hunters



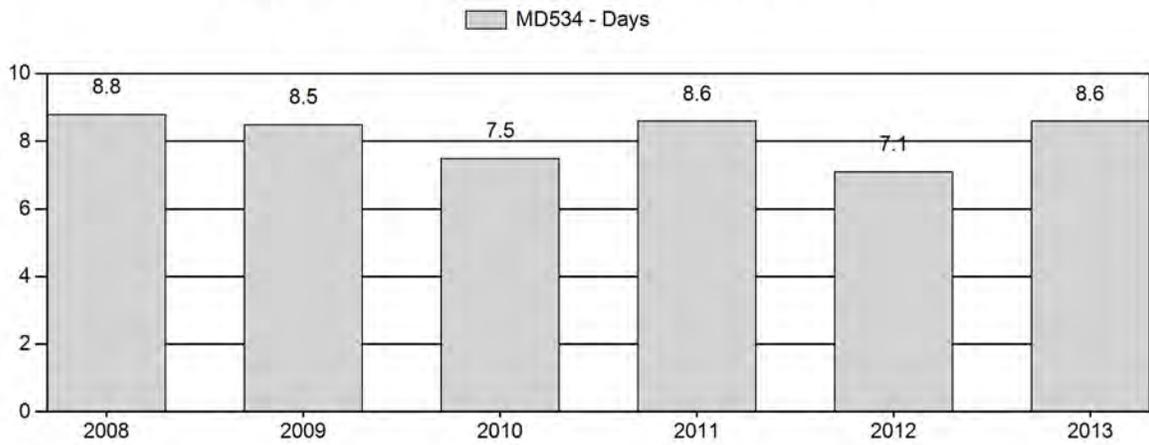
Harvest Success



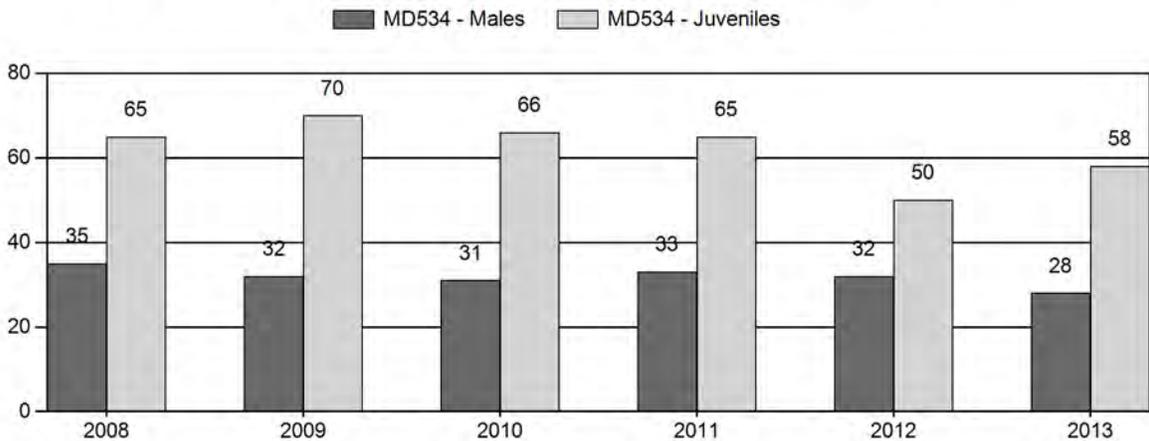
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD534 - GOSHEN RIM

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	17,500	57	106	163	18%	462	50%	299	32%	924	1,143	12	23	35	± 4	65	± 6	48
2009	18,200	44	98	142	16%	442	49%	311	35%	895	1,210	10	22	32	± 4	70	± 7	53
2010	18,400	80	125	205	16%	668	51%	440	34%	1,313	1,123	12	19	31	± 3	66	± 5	50
2011	18,700	116	226	342	17%	1,031	51%	665	33%	2,038	1,364	11	22	33	± 3	65	± 4	48
2012	17,800	121	192	313	18%	977	55%	487	27%	1,777	1,076	12	20	32	± 3	50	± 3	38
2013	20,100	39	176	215	15%	776	54%	451	31%	1,442	1,235	5	23	28	± 3	58	± 4	46

**2014 HUNTING SEASONS
GOSHEN RIM MULE DEER HERD UNIT (MD534)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
15	Gen	Oct. 1	Oct. 14		General license; antlered mule deer or any white-tailed deer.
	6	Oct. 1	Dec. 31	350	Limited quota; doe or fawn
Region T				400	
Archery		Sept. 1	Sept. 30		Refer to Section 3 of this Chapter

Hunt Area	Type	Quota change from 2013
15	6	+325
16	2	-50(deleted)
16	6	-100(deleted)
55	6	-100(deleted)
57	6	-75(deleted)
Total	2	-50
	6	+50

Management Evaluation

Current Management Objective: 20,000

Management Strategy: Recreational

2013 Post-season Population Estimate: ~20,100

2014 Post-season Population Estimate: ~19,800

Herd Unit Issues

The management objective for the Goshen Rim Mule Deer Herd Unit was changed from 25,000 to 20,000 and Hunt Areas 15,16,55,57 were combined into Hunt Area 15 as a result of internal recommendations and public input during the 2013 herd objective review process. The management strategy is recreational management with a post-season buck ratio range of 20-29 bucks:100 does.

The 2013 post-season population estimate was approximately 20,100 mule deer with the population stable to slowly trending up. Restricted access makes it difficult to manage this herd. Access is provided by; isolated private land experiencing damage, small parcels of state, BLM lands, and private lands enrolled into the Department's PLPW program. Without paying a trespass/trophy fee or hiring an outfitter hunters have a difficult time harvesting a mature mule deer buck. Landowners and hunters would like to see an increase in mule deer, but without major habitat revitalization (for part of the year mule deer are dependent on irrigated and dryland agriculture fields) this herd unit will most likely remain between 15,000 and 20,000 mule deer. Buck ratios are anticipated to remain on the higher end of the recreational management strategy due to private land (92% of the occupied habitat). However, public land hunters will continue to

have a difficult time finding a mature buck due to the majority of land being held in private ownership.

Major landscape changes have been occurring in the southern portion of the herd unit. Urban sprawl continues to increase north and east of Cheyenne as well as industrial (methane production) development in Laramie County. The USDA's Conservation Reserve Program (CRP) has experienced a decline in productivity and quality of perennial forage throughout the herd unit. The conversion of dryland (wheat fields) cropland to CRP in the past provided favorable fawning and winter cover for mule deer. These stands are now monotypic stands of unfavorable perennial grass (i.e. smooth brome and crested wheatgrass) and no legume component that provide little if any habitat benefits.

Weather

Weather during 2013 and into 2014 was wetter and colder than normal. Post-season fawn ratios of 58:100 were 14% higher than 2012 and were slightly higher than the ten-year average of 45:100. The increase is most likely a result of mild winter conditions and above average summer/fall moisture. Ungulates went into the winter in good body condition as a result of the fall moisture. Winter conditions were somewhat mild with low snowpack but with periods of extreme cold temperatures followed by periods above freezing. A high winter mortality rate is not expected. Refer to the following websites for weather data: <http://www.ncdc.noaa.gov/temp-and-precip/time-series/> and <http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html>.

Habitat

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality to heavily influence population management for any particular big game species. Shrub communities within the Laramie Region that are annually assessed by terrestrial habitat biologist, wildlife biologist and game wardens include: True mountain mahogany, Antelope bitterbrush, Skunkbrush sumac, Big sagebrush, and Fourwing saltbush. The majority of the transects were established approximately 12 – 13 years ago. Transects were established for several different primary reasons, but may have included: measuring habitat response prior to or following treatments (i.e. prescribed fire, wildfire, mowing), concern over historic or current domestic livestock or wild ungulate utilization levels, selection of “representative habitats” utilized by wildlife on identified winter ranges, or other. Turnover in personnel, changes in individual job responsibilities of employees, and evolving WGFD agency priorities have resulted in some issues with consistent habitat data collection and interpretation of data. Some transects, years after their initial establishment, have been identified as being in “non-representative” locations. Site selection was often influenced by terrain and/or land ownership status (i.e public access). Changing land uses (wind turbines, roads, fence construction, other developments, etc.) have influenced habitat use by wildlife in some locations, and in some instances have resulted in major shifts in animal usage of the area being monitored. Department personnel are currently evaluating shrub transects and the types of information being collected, and will be looking for ways to improve efficiency of data collection, types of data being collected, and refining criteria for site selection for future transects. Habitat monitoring protocols to improve the quality and quantity of data is being gathered. These planned changes will hopefully result in improved validity of habitat information being gathered, and may prove to be a useful tool in population management of wild ungulates.

Field Data

This herd has been stable to slightly increasing since 2006 and is now within the new objective of 20,000 mule deer. General licenses have focused harvest on the male segment of the population with little effort to remove females. Typically there have been around 200 Type 6

licenses available between the 4 hunt areas. To address damage issues they were increased to 300 for the 2013 season. On average less than 1 percent of the harvest is comprised of females. Chronic wasting disease (CWD) is not as prevalent in this herd when compared to the Laramie Mountains Mule Deer and the South Converse Mule Deer Herd Units, but the long-term prevalence rate average of 10% is likely affecting population performance but to what extent is unknown.

Four out of the past five years the sample size has been met, lending credibility to composition data. Fawn ratios in 2013 (58 Fawns:100 Does) continue to remain below levels to maintain a population. According to Unsworth et al. populations did not increase unless fawn ratios exceeding 66 fawns:100 does. 1999). Buck ratios remain well within the recreational management range (28 Bucks:100 Does in 2013). However, based on personnel and hunter observation the buck ratios on accessible lands are more likely on the lower end of the management strategy. With 92% of the occupied habitat under private land ownership male mule deer have an easier time surveying to 4-5 years old. The majority of bucks harvested on public land are 1-3 years old. There were few yearling mule deer in the composition survey (n=39). The five-year average is 84. The small sample size is most likely a result of poor fawn production in 2012 (50 fawns: 100does). Field harvest of 0 yearling bucks checked in the field also supports fewer yearling bucks in the population. The reduction in yearling male mule deer will correlate to fewer mature bucks 2-3 years from now. Hunters will be informed in future PIGMs so they can plan their hunt if they are looking to harvest a trophy buck. Antler class data was collected for the first time in 2012. There were 30 deer sampled with 50% Class I, 40% Class II and 10% Class III. In 2013 there were 20 male deer sampled and again it broke down as: 50% Class I, 40% Class II and 10% Class III with the average antler width of 19". Class I and II deer are typically 1-3 years old, which is consistent with observed public land male deer harvested.

The hunter satisfaction survey showed that 64% of the hunters were satisfied with their hunt, slightly down from 66% in 2012. This level of satisfaction is somewhat surprising given the negative comments received from hunters by field personnel. Hunters continue to comment on lack of mature bucks and overall lack of deer.

Harvest Data

Hunter success (46%) decreased compared to the ten-year average of 60% and hunter effort (8.6 days) was nearly one day more than the ten-year average of 7.7 days per harvest. Access continues to be an issue in this herd unit with 92% of the occupied habitat consisting of private land. The only major access is the PLPW's Hunter Management Program on the Guernsey Guard Camp, walk-in areas and the various Wildlife Habitat Management Areas. Access for the most part is driven by damage, which is the reason for the Type 6 license. Access for male harvest is extremely difficult unless a hunter is willing to pay a trespass fee or hire an outfitter. Private land ratios inflate overall buck ratios to the higher end of the recreational management strategy.

Population

The "Time-Specific Juvenile and Constant Adult Survival" (TSJ,CA) spreadsheet model was chosen to use for the post-season population estimate of this herd. The AIC value for this model was 163 which was higher than the AIC value (134) of the SCJ,SCA model. The TSJ,CA was chosen over the SCJ,SCA model for several reasons: 1) both models fit actual data with simulated data fairly well. However, based on fawn production it survival is more variable year to year, which is indicative of the TSJ, CA model, 2) Adult survival remains fairly consistent, again indicative of the TSJ, CA model, 3) There is not a field estimate of survival from a collaring or mark-recapture study, a requirement of the SCJ,SCA model, 4) The population trend

of both models indicates a increase in the populations. However, field observations of department personnel, landowners and hunters perceived perception of the population is likely closer to the estimate the TSJ, CA model (~20,000 mule deer). The SCJ,SCA simulates a population at 27,000 mule deer. Past estimations that directed herd management and were also presented to the public were around 17,000 mule deer. A 45% increase in the population is unrealistic given poor fawn production. For these reasons the model is rated as fair. Juvenile survival was adjusted to the range of .6-.9, which allowed for a better model fit based on long-term population observation trends. The larger range of juvenile survival of .4-.9 drove the population well below perceived estimations. Hunters and landowners would like to see a continued increase in the herd, but given poor fawn production, which is below the level of 66 fawns:100 does (Unsworth et al. 1999) needed for population growth combined with CWD, poor shrub conditions an increase is not likely in the near future.

Management Summary

Hunting seasons in this herd unit have traditionally started on October 1 and run for 11 to 14 days for the general season. Limited doe fawn hunting opportunities exist in some hunt areas during November and December. Starting in 2014 there will be one hunt area (Hunt Area 15) with a general season date of October 1-14. There will be 350 doe/fawn licenses available area wide with no limitation on the license. Department personnel will work with landowners and hunters to distribute hunter access as damage issues arise. The Region T licenses are proposed to decrease from 500 to 400. There is limited access on public lands and the reduction is warranted to decrease hunter congestion and improve success. In addition this decrease will bring license sales within the five-year average of 380 Region T licenses sold. If we attain the projected harvest of 1,035 deer and observe normal fawn production the mule deer population should remain within the objective of 19,800 mule deer.

Literature cited:

Unsworth, JW, Pac DF, White GC, and Bartmann BC: Mule deer survival in Colorado, Montana, and Idaho. *J. Wildl. Manage.* 63(1):315-326, 1999

INPUT	
Species:	Deer
Biologist:	Martin Hicks
Herd Unit & No.:	Goshen Rim MD534
Model date:	02/25/13

Clear form

MODELS SUMMARY		Relative AICc	Fit	Notes
C,J,CA	Constant Juvenile & Adult Survival	171	162	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	132	105	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	163	41	

Year	Posthunt Population Est.		Trend Count		Predicted Prehunt Population			Predicted Posthunt Population			Objective
	Field Est	Field SE	Juveniles	Total	Juveniles	Total Males	Females	Juveniles	Total Males	Females	
1993			4385	2988	7527	14901	4301	1510	6623	12434	14500
1994			3806	2553	6777	13137	3727	1247	5849	10822	14500
1995			4177	2187	5989	12352	4124	1127	5537	10788	14500
1996			4319	2307	5950	12576	4319	1401	5833	11553	14500
1997			4288	2453	6115	12836	4263	1667	5939	11870	14500
1998			4082	2657	6185	12924	4080	1678	6005	11762	14500
1999			5163	3222	6797	15181	5131	1697	6571	13399	25000
2000			4598	3024	7051	14673	4579	1737	6723	13039	25000
2001			3285	2809	6928	13021	3253	1694	6649	11997	25000
2002			3708	2861	6954	13523	3698	1839	6763	12300	25000
2003			5023	3183	7251	15458	4982	2081	7013	14076	25000
2004			4429	3961	8036	16426	4404	2850	7767	15022	25000
2005			6195	4149	8211	18556	6178	2930	8084	17192	25000
2006			4076	4363	8621	17060	4063	3006	8524	15593	25000
2007			4127	4311	8871	17309	4107	2769	8707	15583	25000
2008			5820	4136	9041	18998	5807	2690	8973	17470	25000
2009			6410	3964	9155	19529	6385	2669	9088	18152	25000
2010			6167	4124	9426	19717	6152	2866	9339	18358	25000
2011			6136	4214	9561	19911	6123	3064	9493	18680	25000
2012			4788	4368	9680	18836	4784	3438	9597	17818	25000
2013			5802	4993	10081	20876	5784	4393	9952	20130	25000
2014			5606	5365	9957	20928	5595	4468	9726	19790	20000
2015											
2016											
2017											
2018											
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2024											
2025											

Survival and Initial Population Estimates

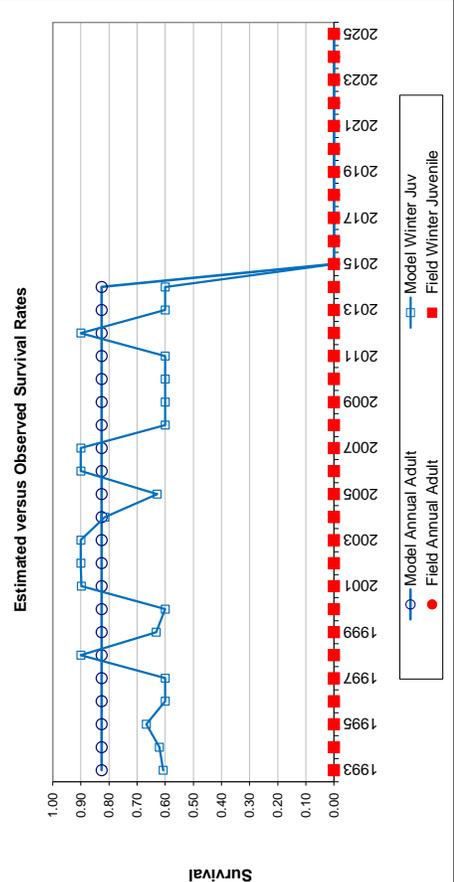
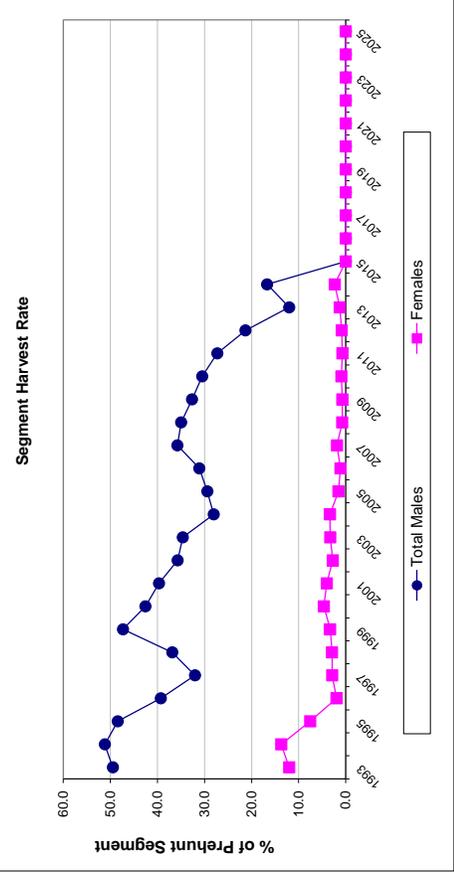
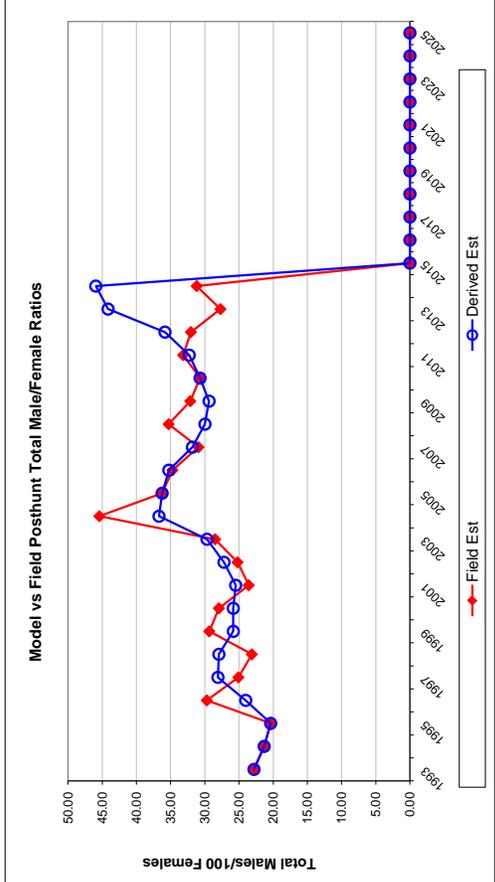
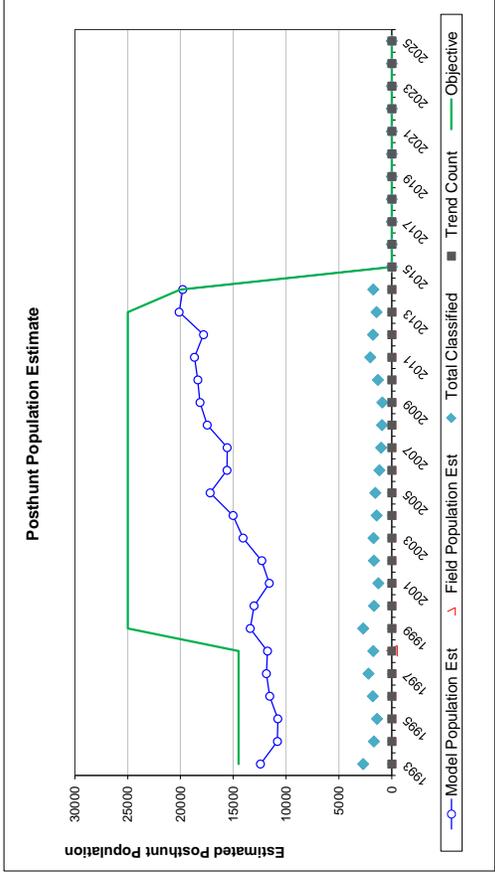
Year	Winter Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.61		0.83	
1994	0.62		0.83	
1995	0.67		0.83	
1996	0.60		0.83	
1997	0.60		0.83	
1998	0.90		0.83	
1999	0.63		0.83	
2000	0.60		0.83	
2001	0.90		0.83	
2002	0.90		0.83	
2003	0.90		0.83	
2004	0.81		0.83	
2005	0.63		0.83	
2006	0.90		0.83	
2007	0.90		0.83	
2008	0.60		0.83	
2009	0.60		0.83	
2010	0.60		0.83	
2011	0.60		0.83	
2012	0.90		0.83	
2013	0.60		0.83	
2014	0.60		0.83	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.826
Initial Total Male Pop/10,000 =	0.151
Initial Female Pop/10,000 =	0.662

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

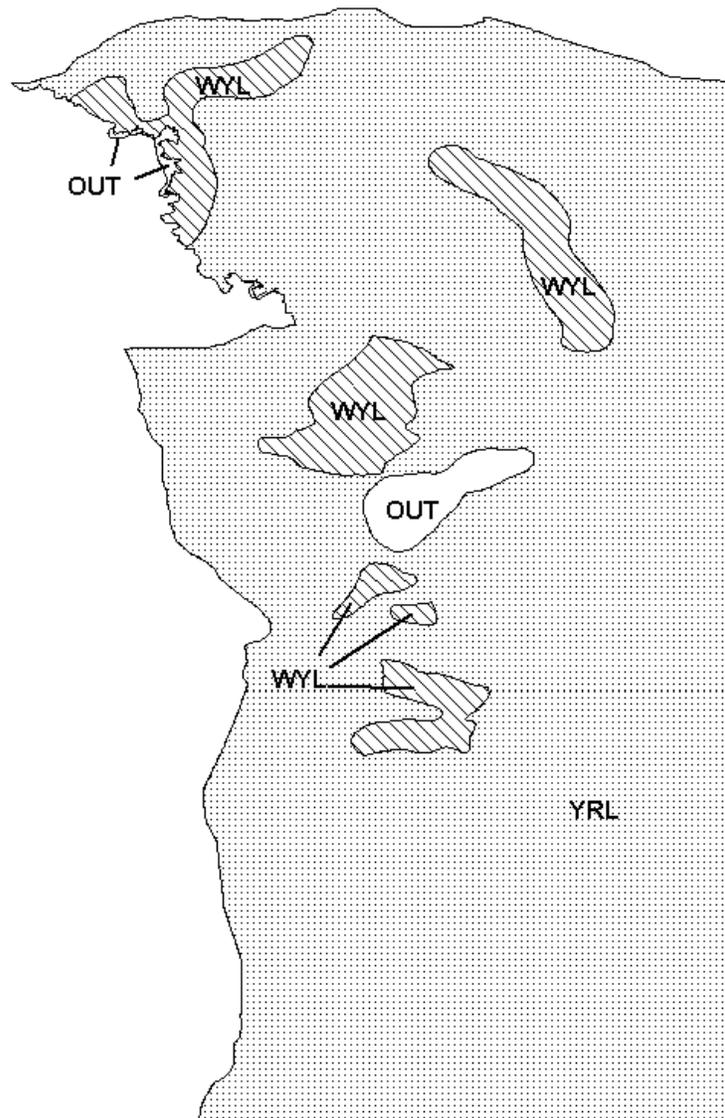
Year	Classification Counts						Harvest							
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Yrl males	2+ Males	Females	Total Harvest	Segment Harvest Rate (% of Prehunt Segment)		
	Derived Est	Field Est	Field SE	Derived Est	Field Est	Field SE						Total Males	Females	
1993		64.93	2.72	22.80	22.80	1.39	77	0	1344	822	2243	49.5	12.0	
1994		63.72	3.38	21.31	21.31	1.68	72	0	1188	844	2104	51.2	13.7	
1995		74.48	4.26	20.36	20.36	1.85	48	0	963	411	1422	48.4	7.5	
1996		74.04	3.82	24.01	29.71	2.09	0	0	824	106	930	39.3	2.0	
1997		71.79	3.32	28.08	25.09	1.67	4	0	714	160	878	32.0	2.9	
1998		67.94	3.53	27.94	23.12	1.76	2	0	890	164	1056	36.9	2.9	
1999		78.08	3.26	25.83	29.35	1.71	29	0	1386	205	1620	47.3	3.3	
2000		68.10	3.65	25.84	27.94	2.04	18	0	1170	298	1486	42.6	4.6	
2001		48.92	3.14	25.48	23.58	1.99	29	0	1013	253	1295	39.7	4.0	
2002		54.68	3.00	27.19	25.21	1.83	9	0	929	174	1112	35.7	2.8	
2003		71.05	3.74	29.68	28.49	2.05	37	0	1002	217	1256	34.6	3.3	
2004		56.70	3.54	36.70	45.42	3.05	23	0	1010	244	1277	28.0	3.3	
2005		76.43	4.29	36.24	36.24	2.59	15	0	1109	116	1240	29.4	1.6	
2006		47.66	3.31	35.26	34.74	2.70	12	0	1234	88	1334	31.1	1.1	
2007		47.17	3.50	31.81	30.92	2.67	18	0	1402	149	1569	35.8	1.8	
2008		64.72	4.80	29.97	35.28	3.21	12	0	1315	62	1389	35.0	0.8	
2009		70.36	5.21	29.37	32.13	3.10	14	0	1177	61	1252	32.7	0.7	
2010		65.87	4.04	30.69	30.69	2.45	14	0	1143	79	1236	30.5	0.9	
2011		64.50	3.21	32.28	33.17	2.07	12	0	1045	62	1119	27.3	0.7	
2012		49.85	2.76	35.82	32.04	2.08	4	0	846	75	925	21.3	0.9	
2013		58.12	3.44	44.14	27.71	2.14	16	0	545	117	678	12.0	1.3	
2014		57.53	3.12	45.94	31.18	2.10	10	0	815	210	1035	16.7	2.3	
2015														
2016														
2017														
2018														
2019														
2020														
2021														
2022														
2023														
2024														
2025														

FIGURES



Comments:

END



Mule Deer (MD534) - Goshen Rim
HA 15, 16, 55, 57
Revised - 97



2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD537 - LARAMIE MOUNTAINS

HUNT AREAS: 59-60, 62-64, 73

PREPARED BY: MARTIN HICKS

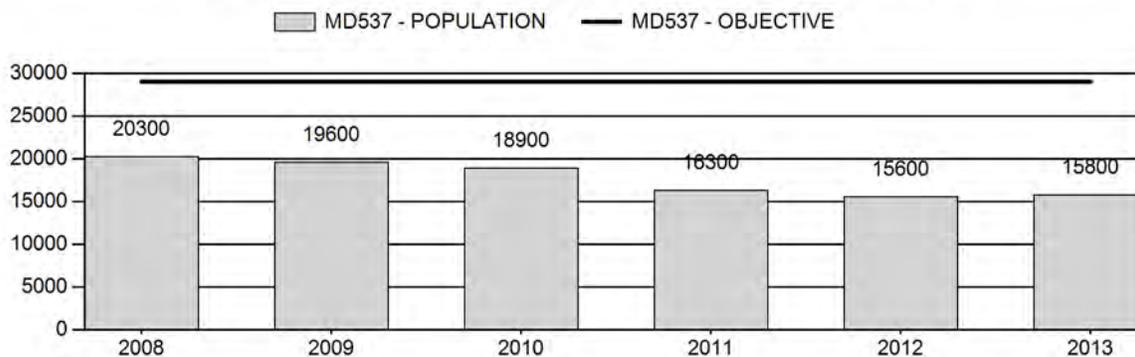
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	18,140	15,800	14,700
Harvest:	1,280	1,013	935
Hunters:	2,279	1,914	1,750
Hunter Success:	56%	53%	53 %
Active Licenses:	2,373	1,989	1,850
Active License Percent:	54%	51%	51 %
Recreation Days:	10,303	8,401	8,000
Days Per Animal:	8.0	8.3	8.6
Males per 100 Females	38	37	
Juveniles per 100 Females	60	61	

Population Objective:	29,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-45.5%
Number of years population has been + or - objective in recent trend:	22
Model Date:	03/03/2014

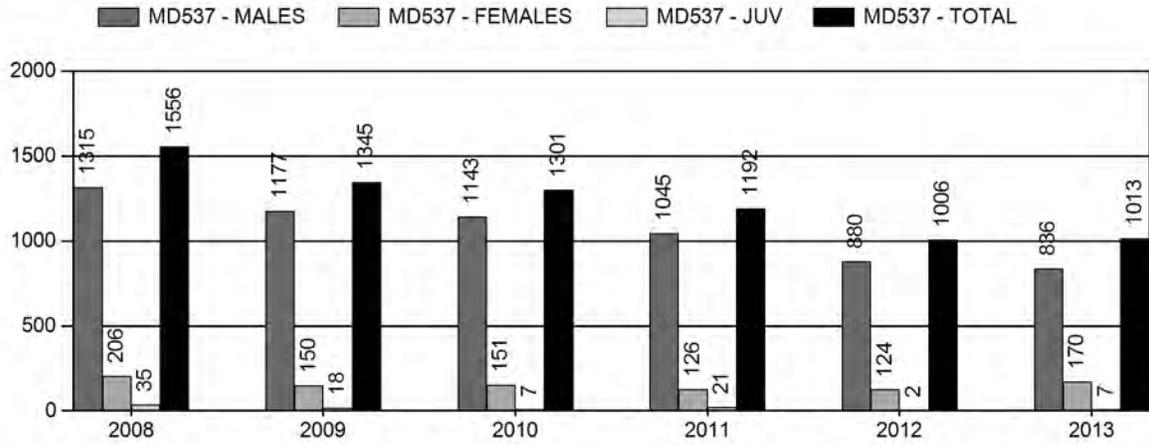
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	2%	1%
Males ≥ 1 year old:	21%	23%
Juveniles (< 1 year old):	0%	0%
Total:	5%	6%
Proposed change in post-season population:	0%	-8%

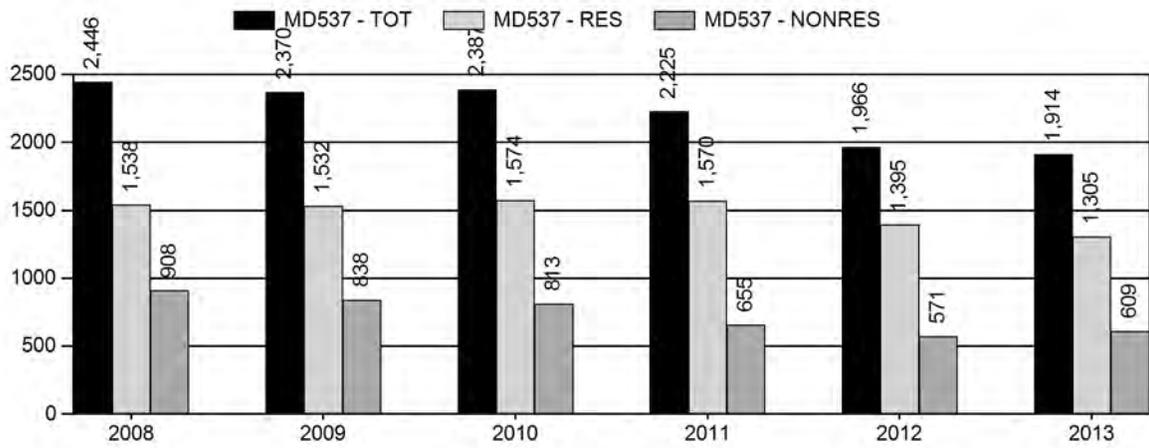
Population Size - Postseason



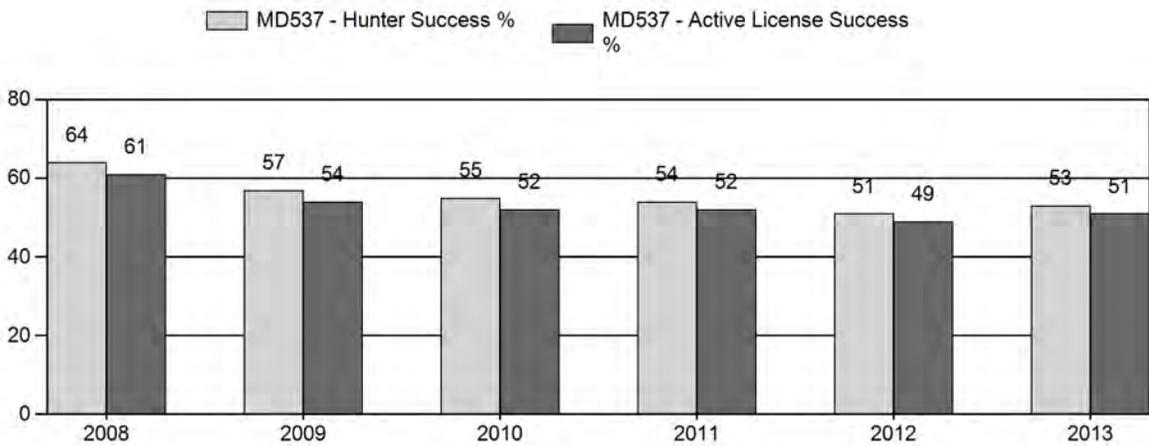
Harvest



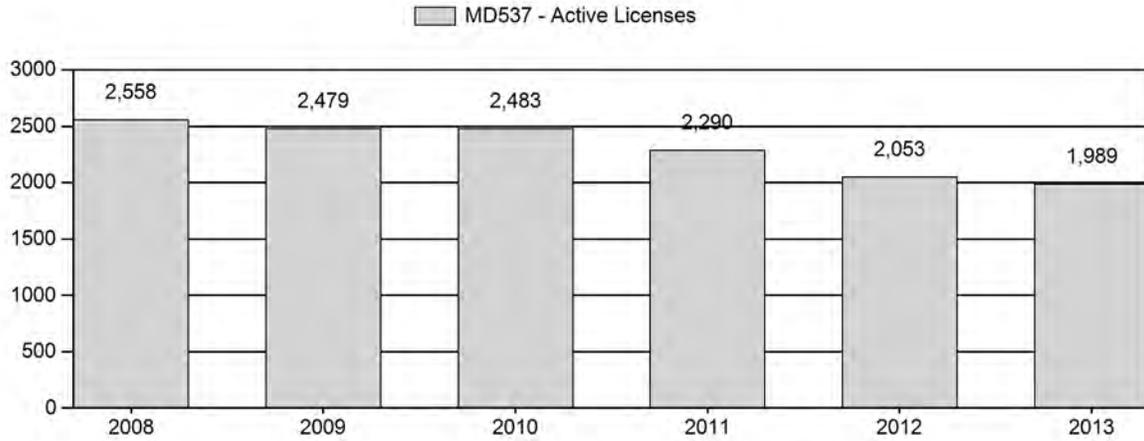
Number of Hunters



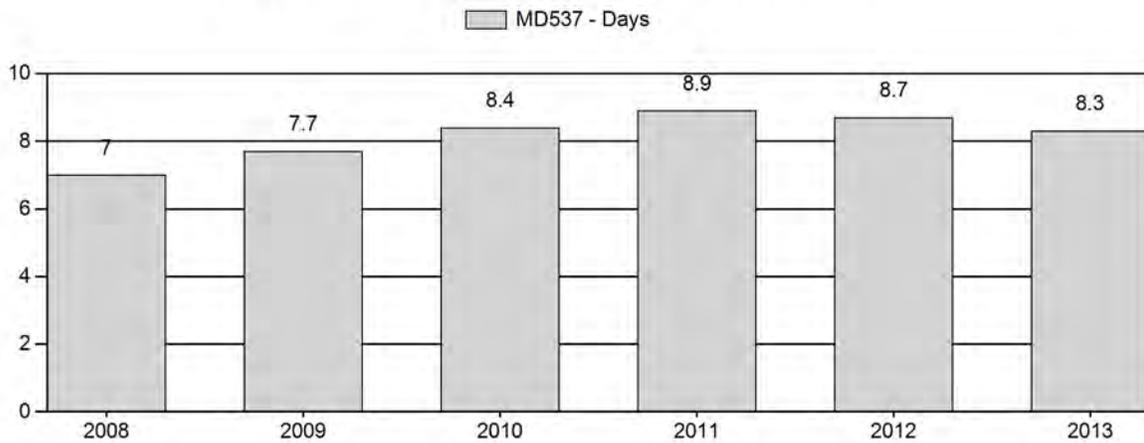
Harvest Success



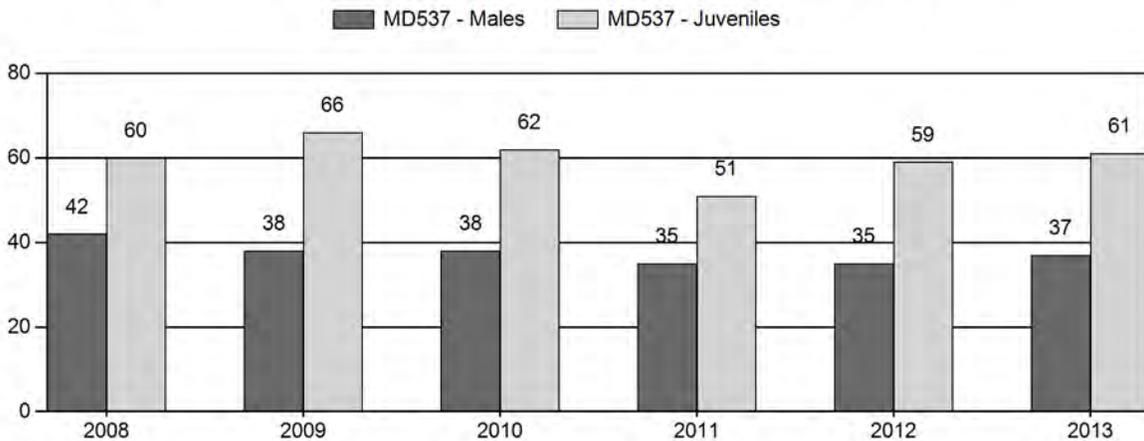
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD537 - LARAMIE MOUNTAINS

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	20,300	101	335	436	21%	1,034	49%	623	30%	2,093	1,180	10	32	42	± 3	60	± 4	42
2009	19,600	155	395	550	19%	1,433	49%	952	32%	2,935	1,245	11	28	38	± 2	66	± 3	48
2010	18,900	205	425	630	19%	1,639	50%	1,015	31%	3,284	1,202	13	26	38	± 2	62	± 3	45
2011	16,300	102	296	398	19%	1,122	54%	570	27%	2,090	1,263	9	26	35	± 2	51	± 3	38
2012	15,600	83	162	245	18%	699	51%	415	31%	1,359	1,218	12	23	35	± 3	59	± 5	44
2013	15,800	23	173	196	19%	528	50%	324	31%	1,048	1,161	4	33	37	± 4	61	± 5	45

**2014 HUNTING SEASONS
LARAMIE MOUNTAINS MULE DEER HERD (MD537)**

Hunt Area	Type	Dates of Seasons		Quota	Limitations
		Opens	Closes		
59,62,63	General	Oct. 15	Oct.25		General license; antlered mule deer or any white-tailed deer, except the Wyoming Game and Fish Commission's Tom Thorne/Beth Williams Wildlife Research Center at Sybille shall be closed
62,63, 64	6	Oct. 15	Oct. 31	100	Limited quota; doe or fawn, valid on private land
		Nov. 1	Dec. 31		Unused Area 62, 63, 64 Type 6 licenses valid for doe or fawn white-tailed deer
60	1	Oct. 20	Nov. 5	100	Limited quota; antlered deer on national forest, any deer valid off national forest; All lands within Curt Gowdy State Park, archery only
		Oct. 20	Nov. 5		150
		Nov. 6	Nov. 30		Unused Area 60 Type 1 and Type 2 licenses valid for doe or fawn white-tailed deer valid off national forest; all lands within Curt Gowdy State Park, archery only
64	6	Oct. 20	Nov. 30	50	Limited quota; doe or; all lands within Curt Gowdy State Park, archery only
		Oct. 15	Oct. 25		
	2	Oct. 15	Oct. 25	100	Limited quota; antlered mule deer or any white-tailed deer
73	General	Oct. 15	Oct. 25		General license; antlered mule deer or any white-tailed deer
Archery		Sept. 1	Sept. 30		Refer to license type and limitations in Section 3

Region J Nonresident Quota: 900

Hunt Area	Type	Quota change from 2013
62,63,64	6	-50
60	1	0
60	2	0
60	6	0
64	2	0
59,60,62-65,73	Region J	-200
Total	1	0
	2	0
	6	-50
	Region J	-200

Management Evaluation

Current Post-season Population Objective: 29,000

Management Strategy: Recreational

2013 Post-season Population Estimate: ~15,800

2014 Post-season Population Estimate: ~14,700

Herd Unit Issues

The management objective for the Laramie Mountains Mule Deer Herd Unit is a post-season population objective of 29,000 mule deer. The management strategy is a recreational management with a post-season buck ratio range of 20-29 Bucks:100 Does. The herd objective and management strategy was last revised in 2003. During the herd objective review process this winter/spring the department will recommend to the WGFD Commission a reduction of the numeric objective from 29,000 to 20,000, which will be more in line with the current population estimate and biologically achievable within 5 years.

The 2013 post-season population estimate was about 15,800 with the population trending downward. Chronic Wasting Disease has been detected in this herd for well over two decades. The average prevalence rate since 1997 is 22%, contributing towards the suppression of this herd. Management strategy has been very conservative with little doe harvest to try and increase the herd. Approximately 50% of the herd unit is private lands which affects our ability to provide opportunity.

The Arapahoe wild fire in 2012 will have habitat effects for years to come. In some areas perennial vegetation is responding. In other places the ground appears sterile with little to no vegetation growth. Mule deer have been harvested in the burned area in 2012 and 2013. Mule deer occupation in burned areas was also documented during the winter of 2013. In the long run this major fire will be a positive for ungulate habitat. It will take time to see the major re-vegetation events.

Landowners and sportsmen would like to see more mule deer. To try and address this situation the Type 6 license was reduced from 250 to 100

Weather

Weather during 2013 and into 2014 was wetter and colder than normal. Post-season fawn ratios of 61 Juveniles:100 Females were similar to 2012 (59J:100F) and the ten-year average (62J:100F). The mild winter conditions and above average summer/fall moisture most likely prevented a significant decrease given ungulates just came out of the worst drought observed since the 1930s. Winter conditions were somewhat mild with low snowpack but with periods of extreme cold temperatures, followed by above freezing periods. High winter mortality rates are not expected. Refer to the following websites for weather data: <http://www.ncdc.noaa.gov/temp-and-precip/time-series/> and <http://www.ncdc.noaa.gov/oa/climate/research/prelim/drought/pdiimage.html>.

Habitat

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality to heavily influence population management for any particular big game species.

Shrub communities within the Laramie Region that are annually assessed by game wardens, wildlife biologists, and terrestrial habitat biologists, include: True mountain mahogany, Antelope bitterbrush, Skunkbrush sumac, Big sagebrush, and Fourwing saltbush. The majority of the transects were established approximately 12 – 13 years ago. Transects were established for several different primary reasons, but may have included: measuring habitat response prior to or following treatments (i.e.

prescribed fire, wildfire, mowing), concern over historic or current domestic livestock or wild ungulate utilization levels, selection of “representative habitats” utilized by wildlife on identified winter ranges, or other.

Turnover in personnel, changes in individual job responsibilities of employees, and evolving WGFD agency priorities have resulted in some issues with consistent habitat data collection and interpretation of data. Some transects, years after their initial establishment, have been identified as being in “non-representative” locations. Site selection was often influenced by terrain and/or land ownership status (i.e public access). Changing land uses (wind turbines, roads, fence construction, other developments, etc.) have influenced habitat use by wildlife in some locations, and in some instances have resulted in major shifts in animal usage of the area being monitored. Department personnel are currently evaluating shrub transects and the types of information being collected, and will be looking for ways to improve efficiency of data collection, types of data being collected, and refining criteria for site selection for future transects. Habitat monitoring protocols to improve the quality and quantity of data are being gathered. These planned changes will hopefully result in improved validity of habitat information being gathered, and may prove to be a useful tool in population management of wild ungulates.

Field Data

Fawn ratios of 61 Fawns:100 Does in 2013 were not at level to sustain a population. According to Unsworth et al. (1999) populations do not increase if fawn ratios are below 66 fawn: 100 does. The 2013 fawn classification data was similar to the ten-year average; a major cause contributing to the decline in population. Buck ratios of 37 Bucks:100 Does were well within the recreational management strategy. However, finding a mature buck on public land is often difficult.

Based on the 2013 herd classification survey yearling bucks observed were significantly lower (4 yearling males: 100 females) compared to the five-year average (11 yearling males:100 females). Fawn production in 2012 was 59 juveniles:100 females so a decline in yearling males was expected in 2013. Classification sample size was met four out of the past five years. It was not met in 2013 (C.I.=1,161, n=1,048), but given the majority of samples met lends credibility to composition data. Examining other field data it is interesting to find that field harvest data contradicts composition survey data. In 2013, 28% of the male harvest was comprised yearling bucks. Compared to the five-year average (2007-2012, with 2010 thrown out because there was not a Wheatland Wildlife Biologist working at that time) of 13% this is significantly higher. It is hard to infer what the explanation is for the conflicting data. Perhaps the smaller sample size of 64 compared to the five-year average (again 2010 was thrown out) of 90 might have affected the ratio. The 2013 classification survey technique (air and ground) did not change compared to the past five years but the sample size was not met. The data will likely provide clarity next year through field harvest data, antler classification, and the herd classification survey.

Buck antler classification data was collected for the first time in 2012. There were 51 deer sampled with 75% Class I, 14% Class II and 12% Class III. In 2013 there were 68 deer sampled with 58% Class I, 38% Class II and 4% Class III and an average antler spread of 16”. This supports sportsmen’s comments that older age class deer were hard to find. The majority of the sampled deer were on public land where there are lower buck densities. Deer appeared to be going into the winter in good condition with a body condition score of 17 out of 20. Increased fall moisture likely increased vital fat reserves for mule deer prior to winter. The satisfaction survey showed that 61 % of the hunters were satisfied, which was somewhat surprising based on negative comments received from the field that hunters were having difficulty finding mature buck.

Harvest Data

Hunter success in 2013 (53%) was slightly lower than the ten-year average of 57% and hunter effort was 8.3 days per harvest which was higher than the ten-year average of 7.5 days per harvest. These data support a decreasing trend in population, which also supports personnel, landowner and sportsmen observations. As a result the Type 6 licenses were decreased to try and address the decreasing population. However, given poor fawn production, CWD, and poor habitat conditions a reduction in doe/fawn licenses will not improve herd performance.

Population

The “Time-Specific Juvenile and Constant Adult Survival” (TSJ,CA) spreadsheet model was chosen to use for the post-season population estimate of this herd. The AIC value for the TSJ, CA model is 113, which is slightly higher than the AIC value (134) for the SCJ, SCA. This model was chosen for the following reasons: 1) The model tracks juvenile variability in survival, which is more consistent with this herd unit based on the fluctuations in juvenile composition data, 2) There is a large number of years of classification and harvest data, indicative of the TSJ, CA model, 3) Simulated population trends mimic perceived trends observed by local personnel, landowners and hunters. This model is rated as fair. There is not a annual population estimate, with a standard error available to anchor the model to, but enough data to give the model a fair fit and results are biologically defensible. Adult survival was adjusted to .7-.8 instead of the recommended range of .7-.95 to account for chronic wasting disease prevalence rates. This herd has the second highest prevalence rate (24%) in the state and adult survival rates were adjusted based on initial study results from the South Converse Mule Deer Herd Unit, which has the highest prevalence rate of 46% in 2013. Hunters and landowners would like to see an increase in mule deer, but given poor recruitment, CWD and poor habitat conditions an increase in the population does not seem likely in the near future.

Management Summary

Hunting seasons in this herd unit have started on the 15th of October and run between 10-15 days. Late doe/fawn seasons have been used to address damage situations in lower elevations on private land, but the public has overwhelmingly indicated they would like to see more mule deer. To address this concern there will be a decrease of Type 6 licenses from 250 to 100. Area 60 remains a sought after license for hunters since it gives them a chance to hunt into November when male deer are more susceptible to harvest. Region J licenses are proposed to decrease from 1,100 to 900 to address low deer densities, especially on public lands. This is a major change and was not made without careful consideration for the herd and the nonresident hunter. The reduction will be consistent with recent license sales (2012=949 and 2013=779) and should improve harvest statistics and reduce hunting pressure. In addition increased hunter density is an issue on public land for both residents and nonresident hunters. Field personnel are receiving more and more negative comments regarding the lack of access. There has also been a decreasing trend in harvest success and satisfaction for nonresidents. It is our hope that the reduction in Region J licenses will improve harvest success and overall satisfaction of the hunt for nonresidents.

If we attain the projected harvest of 935 mule deer (860 bucks, 75 does) and average fawn recruitment, the mule deer population will slightly decline and still remain well below the management objective. We predict a 2014 post-season population of about 14,700.

Literature Cited:

Unsworth, JW, Pac DF, White GC, and Bartmann BC: Mule deer survival in Colorado, Montana, and Idaho. *J. Wildl. Manage.* 63(1):315-326, 1999

INPUT	
Species:	Mule Deer
Biologist:	Martin Hicks
Herd Unit & No.:	Laramie Mts Herd
Model date:	02/08/13

Clear form

MODELS SUMMARY		Relative AICc	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival	120	111	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	113	103	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	134	12	

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			4684	4678	10479	19841	4637	3200	9645	17481	29000	
1994			4087	3759	8916	16762	4087	2452	8702	15242	29000	
1995			4979	3250	8250	16479	4973	2191	8209	15373	29000	
1996			4525	3318	8132	15975	4518	2412	8110	15039	29000	
1997			5429	2976	7535	15939	5425	2190	7515	15131	29000	
1998			5373	3336	7596	16305	5373	2357	7576	15306	29000	
1999			5678	4304	8479	18460	5678	2779	8465	16922	29000	
2000			4772	3359	7908	16039	4770	2072	7888	14730	29000	
2001			4517	3646	8299	16462	4517	2531	8258	15307	29000	
2002			4802	4058	8639	17499	4802	3036	8609	16447	29000	
2003			5922	3389	7848	17159	5922	2287	7816	16025	29000	
2004			5072	3550	7974	16595	5057	2439	7860	15357	29000	
2005			5834	4227	8564	18625	5831	3007	8510	17348	29000	
2006			5749	5030	9432	20211	5734	3672	9382	18788	29000	
2007			5560	5436	10004	21000	5539	3894	9830	19262	29000	
2008			6142	5608	10356	22105	6103	4161	10129	20394	29000	
2009			6385	4972	9746	21103	6365	3677	9581	19623	29000	
2010			5858	4889	9612	20359	5850	3632	9446	18928	29000	
2011			4481	4263	8914	17659	4458	3113	8776	16347	29000	
2012			4642	3859	8389	16889	4640	2891	8252	15783	29000	
2013			4910	3887	8176	16973	4903	2967	7989	15859	29000	
2014			4454	3664	7681	15799	4448	2718	7599	14765	20000	
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

Survival and Initial Population Estimates

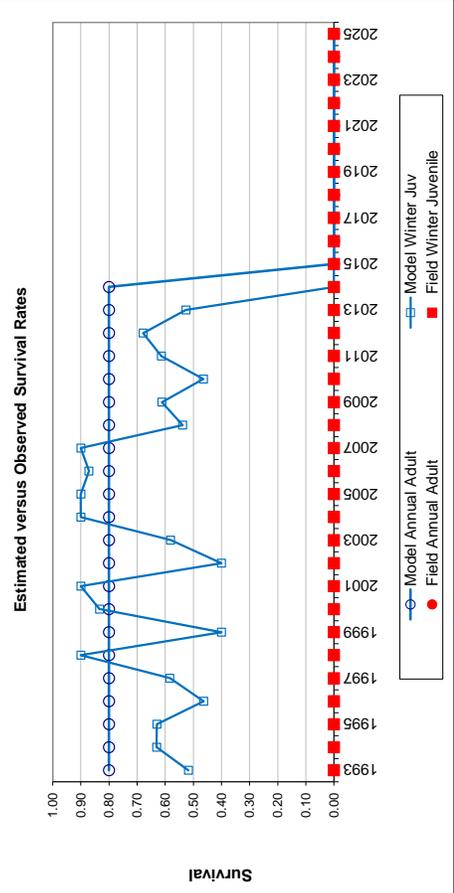
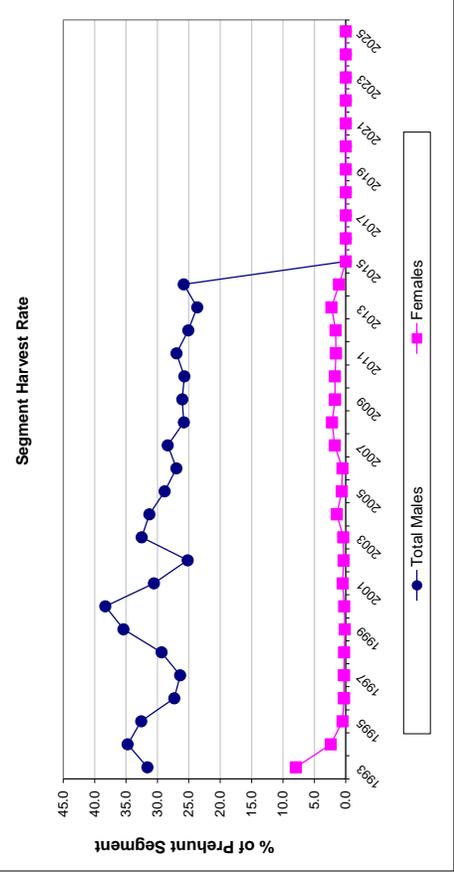
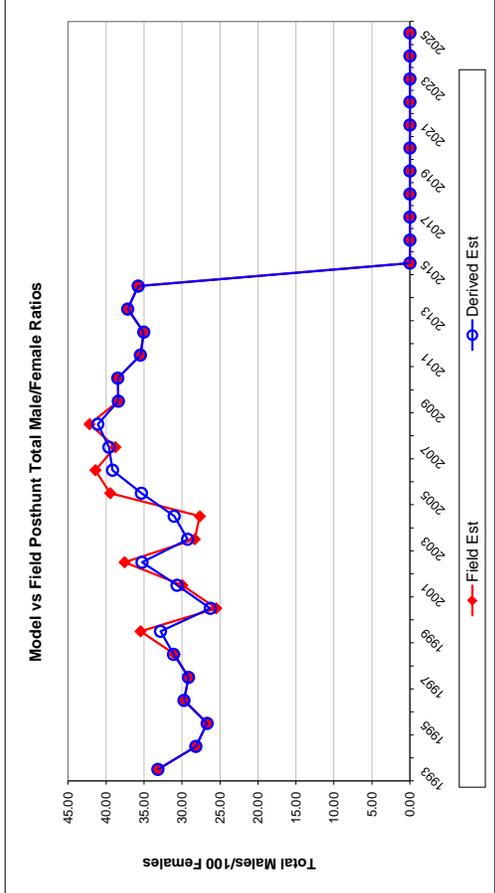
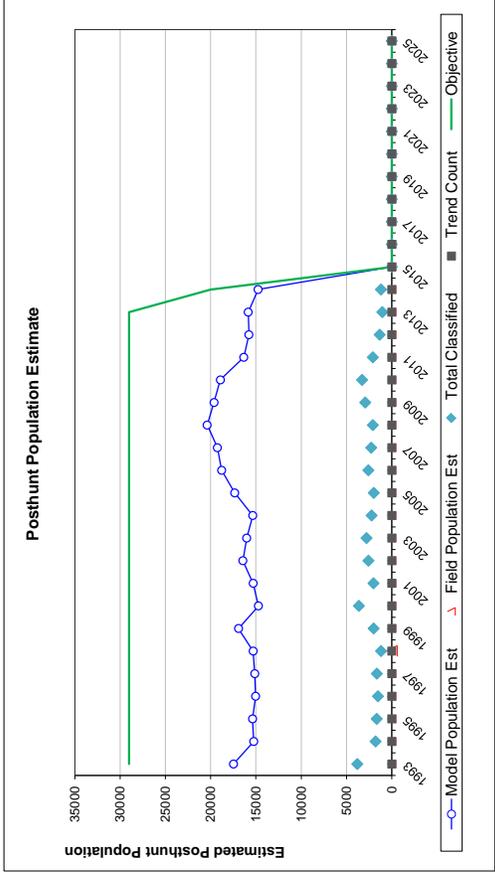
Year	Winter Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est	Model Est	Field Est
1993	0.52		0.80	
1994	0.63		0.80	
1995	0.63		0.80	
1996	0.46		0.80	
1997	0.58		0.80	
1998	0.90		0.80	
1999	0.40		0.80	
2000	0.83		0.80	
2001	0.90		0.80	
2002	0.40		0.80	
2003	0.58		0.80	
2004	0.90		0.80	
2005	0.90		0.80	
2006	0.87		0.80	
2007	0.90		0.80	
2008	0.54		0.80	
2009	0.61		0.80	
2010	0.46		0.80	
2011	0.61		0.80	
2012	0.68		0.80	
2013	0.53		0.80	
2014	0.00		0.80	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:	Optim cells
Adult Survival =	0.800
Initial Total Male Pop/10,000 =	0.320
Initial Female Pop/10,000 =	0.965

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

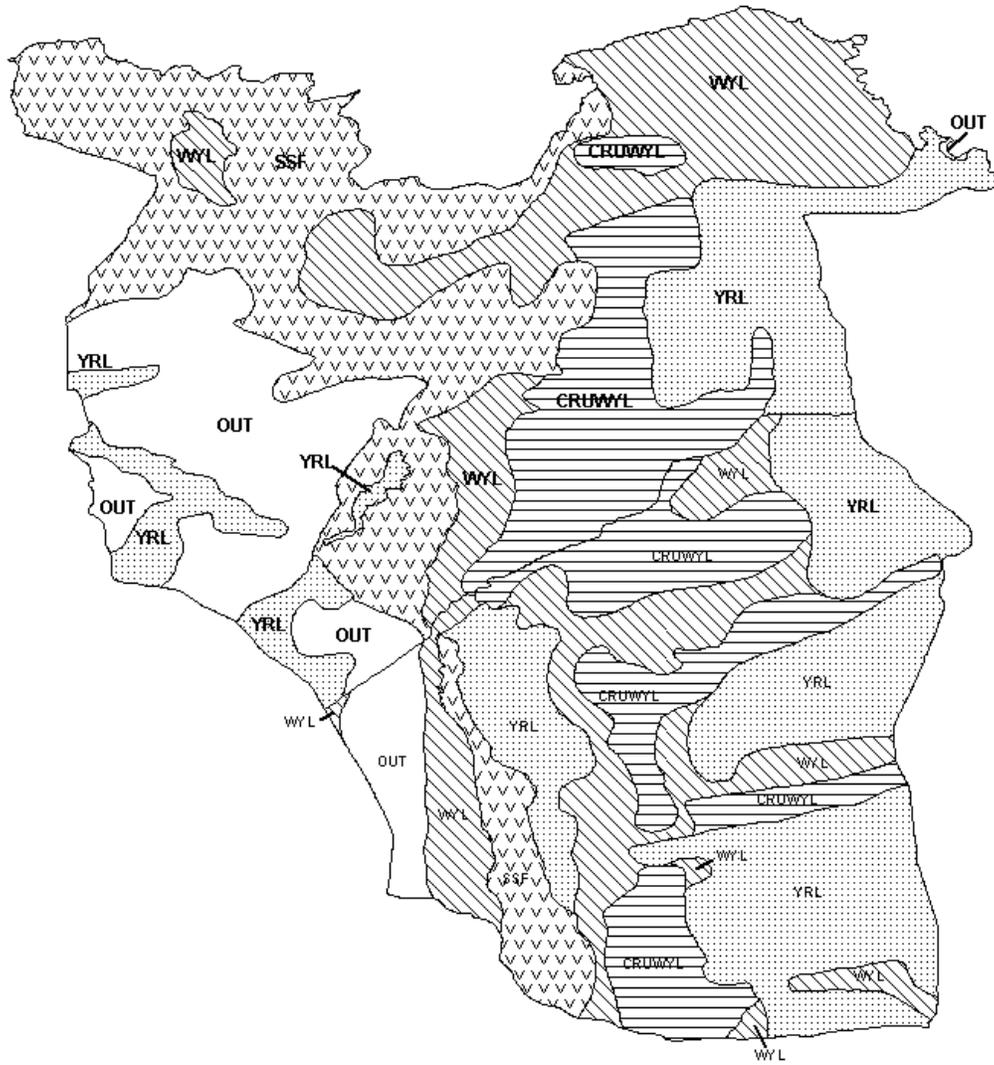
Year	Classification Counts						Harvest						
	Juvenile/Female Ratio			Total Male/Female Ratio			2+ Males			Segment Harvest Rate (% of Prehunt Segment)			
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE	Juv	Yrl males	2+ Males	Females	Total Harvest	Total Males	Females
1993		48.07	1.84	33.17	33.17	1.45	43	0	1344	756	2146	31.6	8.0
1994		46.97	2.60	28.18	28.18	1.88	0	0	1188	194	1382	34.8	2.4
1995		60.59	3.31	26.69	26.69	1.95	5	0	963	38	1006	32.6	0.5
1996		55.70	3.24	29.74	29.73	2.16	7	0	824	20	851	27.3	0.3
1997		72.20	3.89	29.15	29.15	2.14	3	0	714	18	735	26.4	0.3
1998		70.92	4.54	31.12	30.95	2.63	0	0	890	18	908	29.3	0.3
1999		67.07	3.36	32.83	35.45	2.20	0	0	1386	12	1398	35.4	0.2
2000		60.47	2.23	26.27	25.50	1.28	2	0	1170	18	1190	38.3	0.3
2001		54.70	2.78	30.65	29.95	1.89	0	0	1013	37	1050	30.6	0.5
2002		55.77	2.55	35.26	37.56	1.97	0	0	929	27	956	25.2	0.3
2003		75.77	3.12	29.26	28.33	1.63	0	0	1002	29	1031	32.5	0.4
2004		64.54	3.02	31.03	27.65	1.74	13	0	1010	103	1126	31.3	1.4
2005		68.51	3.48	35.34	39.44	2.40	3	0	1109	49	1161	28.9	0.6
2006		61.11	2.78	39.14	41.39	2.14	14	0	1234	45	1283	27.0	0.5
2007		56.35	2.75	39.62	38.77	2.15	19	0	1402	159	1560	28.4	1.7
2008		60.25	3.06	41.08	42.17	2.41	35	0	1315	206	1521	25.8	2.2
2009		66.43	2.78	38.38	38.38	1.93	18	0	1177	150	1327	26.0	1.7
2010		61.93	2.47	38.45	38.44	1.80	7	0	1143	151	1294	25.7	1.7
2011		50.80	2.61	35.48	35.47	2.07	21	0	1045	126	1171	27.0	1.6
2012		56.22	3.54	35.03	35.05	2.60	2	0	880	124	1004	25.1	1.6
2013		61.36	4.33	37.14	37.12	3.10	7	0	836	170	1006	23.7	2.3
2014		58.54	3.88	35.77	35.77	2.81	5	0	860	75	935	25.8	1.1
2015													
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

FIGURES



Comments:

END



Mule Deer (MD537) - Laramie Mountains
 HA 59, 60, 62-64, 73
 Revised - 3/04



2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD539 - SHEEP MOUNTAIN

HUNT AREAS: 61, 74-77

PREPARED BY: LEE KNOX

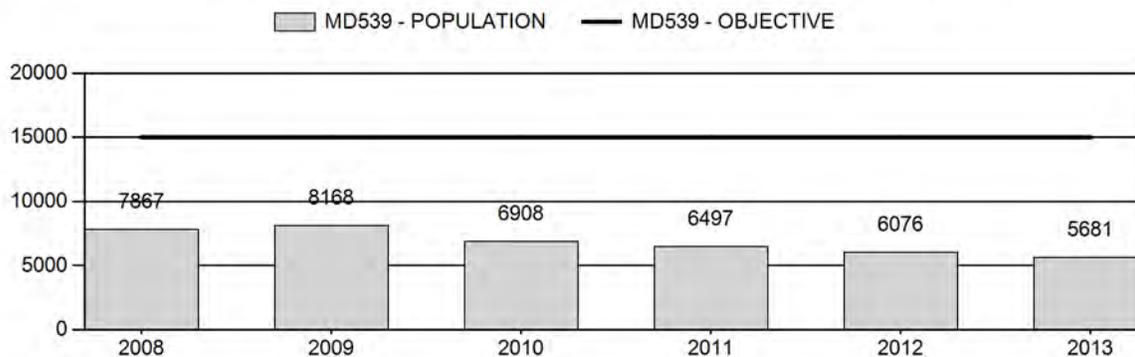
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	7,103	5,681	5,611
Harvest:	485	197	250
Hunters:	1,844	1,345	1,300
Hunter Success:	26%	15%	19%
Active Licenses:	1,844	1,345	1,300
Active License Percent:	26%	15%	19%
Recreation Days:	9,043	6,816	5,500
Days Per Animal:	18.6	34.6	22
Males per 100 Females	27	26	
Juveniles per 100 Females	60	55	

Population Objective:	15,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-62.1%
Number of years population has been + or - objective in recent trend:	15
Model Date:	5/12/2014

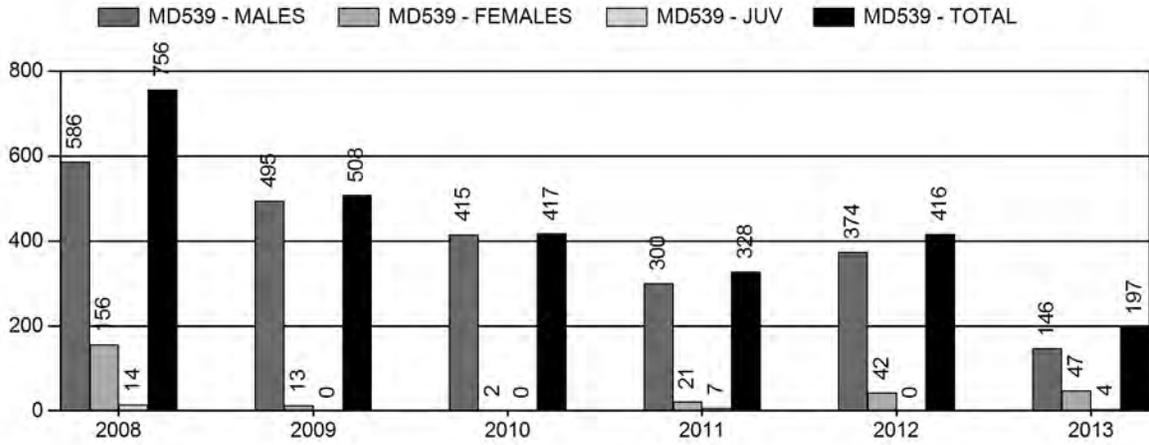
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0.1%	.1%
Males ≥ 1 year old:	6%	6%
Juveniles (< 1 year old):	0.0%	0.0%
Total:	1.32%	1.32%
Proposed change in post-season population:	5.3%	0%

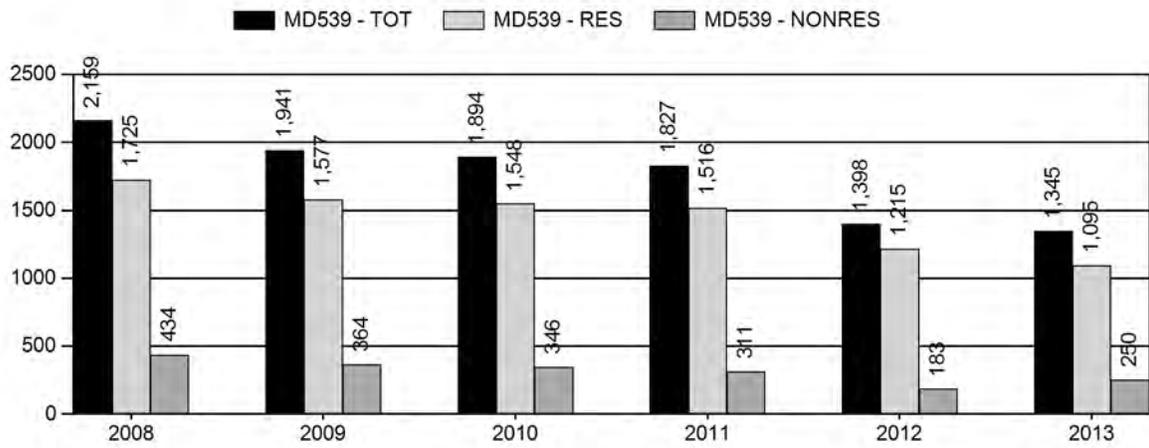
Population Size - Postseason



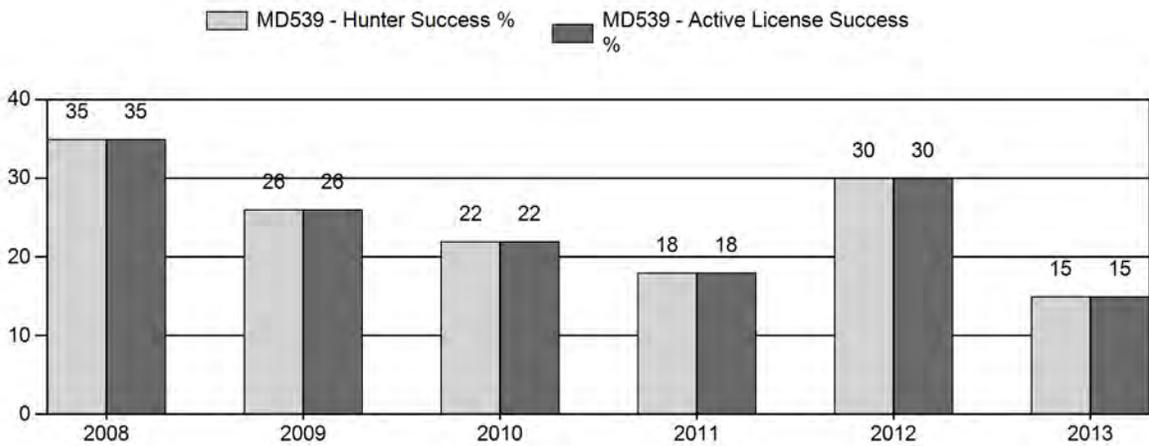
Harvest



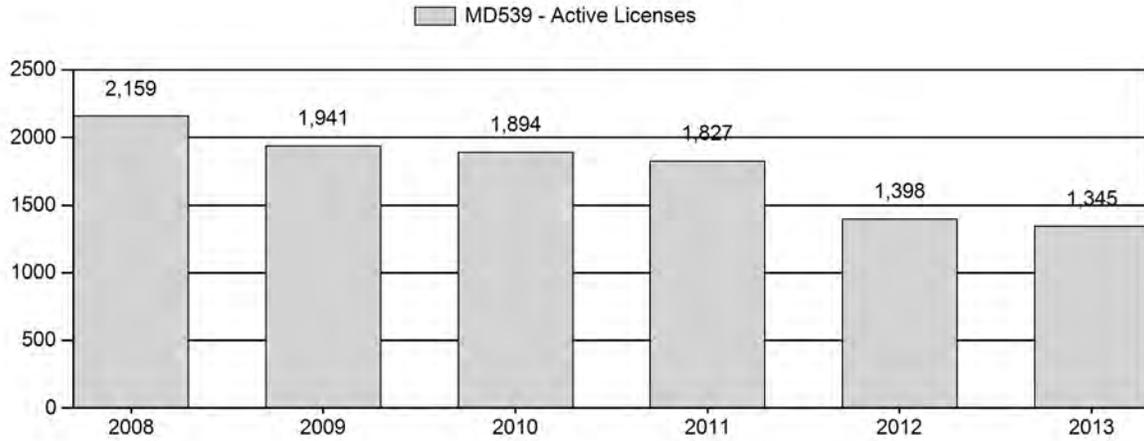
Number of Hunters



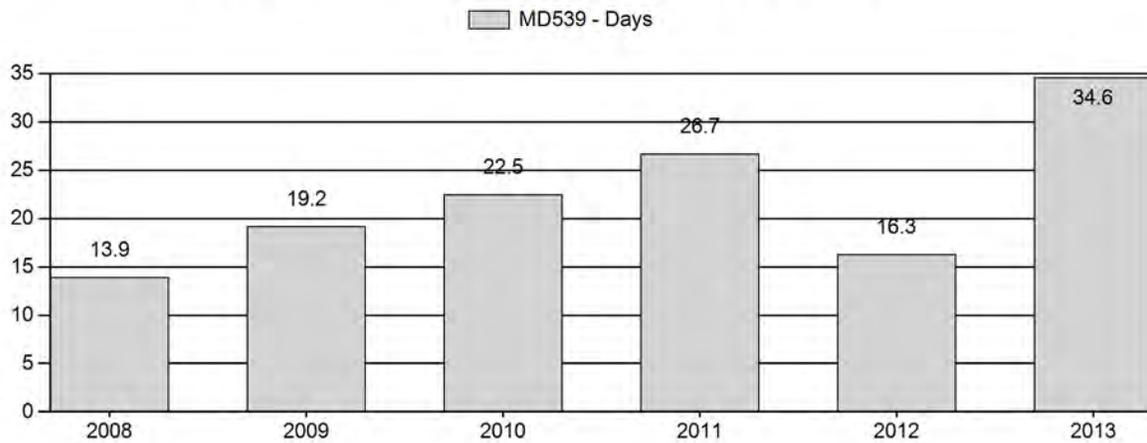
Harvest Success



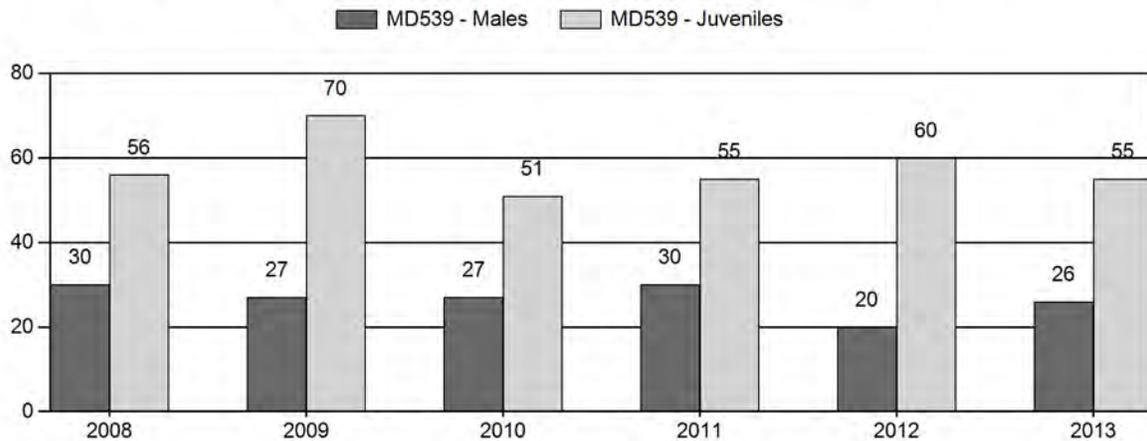
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary
for Mule Deer Herd MD539 - SHEEP MOUNTAIN

Year	MALES		FEMALES		JUVENILES		Tot		Males to 100 Females			Young to					
	Ylg	Adult	Total	%	Total	%	Cls	Obj	Ying	Adult	Total	Conf Int	100 Adult				
2008	38	93	131	16%	441	54%	247	30%	819	993	9	21	30	± 4	56	± 5	43
2009	91	134	225	14%	843	51%	593	36%	1,661	1,391	11	16	27	± 2	70	± 4	56
2010	63	63	126	15%	474	56%	243	29%	843	840	13	13	27	± 3	51	± 5	40
2011	48	98	146	16%	480	54%	263	30%	889	1,087	10	20	30	± 3	55	± 5	42
2012	33	52	85	11%	416	55%	249	33%	750	1,047	8	12	20	± 3	60	± 6	50
2013	82	106	188	14%	721	55%	395	30%	1,304	984	11	15	26	± 2	55	± 4	43

2014 HUNTING SEASONS
Sheep Mountain Mule Deer (MD539)

Hunt Area	Type	Date of Seasons		Quota	Limitations
		Opens	Closes		
61		Oct. 1	Oct. 7		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
74		Oct.1	Oct. 7		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
75		Oct.1	Oct. 7		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
76		Oct.1	Oct. 7		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
77		Oct.1	Oct. 7		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
Archery		Sep. 1	Sep. 30		Refer to Section 4 of this Chapter

Region D Nonresident Quota: 400

Management Evaluation

Current Postseason Population Management Objective: 15,000

Management Strategy: Recreational

2013 Postseason population Estimate: ~ 5,700

2014 Proposed Postseason Population Estimate: ~ 5,600

The management objective for the Sheep Mountain Mule Deer Herd Unit is a post-season population objective of 15,000 mule deer. The management strategy is recreational management with guidelines to maintain a post hunt buck ratio of 20 to 29:100 does. The objective and management strategy were last revised in 1987 and will be reviewed again in 2015.

Herd Unit Issues

The Sheep Mountain Herd Unit encompasses Hunt Areas 61, 74, 75, 76 and 77. Landownership varies from mostly private lands with limited public access, to large portions of public lands. The 2013 post-season population estimate is approximately 5,700 with the population trending

slowly downward from a high of 8,000 in 2009. The Sheep Mountain Herd Unit historically has one of the lowest hunter success rates in the state. There are many contributing factors including: low population, inaccessible private lands, and a restrictive season structure. Poor habitat conditions continue to be a limiting factor for this herd as well as an increase in rural subdivisions, and wind energy development in transition and winter ranges.

Weather

Weather during the spring and summer of 2013 remained extremely dry. The Palmer Drought Severity Index (PDSI) ranked drought conditions in SE Wyoming as extreme through the month of August. The lack of spring moisture may have caused fawn ratios to decline from 60:100 does in 2012 to 55:100 does in 2013. We received a lot of precipitation during the fall, with September 2013 being the wettest September ever recorded in Laramie. With the second green up in September, deer were in good condition going in to the winter. For specific weather information please refer to the following link: <http://www.ncdc.noaa.gov/>.

Habitat

Turnover in personnel, changes in individual job responsibilities of employees, and evolving WGFD agency priorities have resulted in some issues with consistent habitat data collection and interpretation of data. Some transects, years after their initial establishment, have been identified as being in “non-representative” locations. Site selection was often influenced by terrain and/or land ownership status (i.e public access). Changing land uses (wind turbines, roads, fence construction, other developments, etc.) have influenced habitat use by wildlife in some locations, and in some instances have resulted in major shifts in animal usage of the area being monitored. Department personnel are currently evaluating shrub transects and the types of information being collected, and will be looking for ways to improve efficiency of data collection, types of data being collected, and refining criteria for site selection for future transects. The reader is referred to the Strategic Habitat Plan Annual Report for further background information on shrub transects.

The Squirrel Creek Fire (Figure 1.) started on June 30th 2012 and burned about 11,000 acres of transitional and crucial mule deer winter range within this Herd Unit. Habitat conditions were old and decadent and we expect this fire to greatly benefit range conditions in future years. During the summer of 2013 field personal observed a high success of re-sprouting from true mountain mahogany and antelope bitterbrush. However, on steep slopes and areas that burned at higher temperatures there is substantial cheatgrass encroachment. The USFS has not finished the EIS to allow aerial application of herbicide, and until they do there is little that can be done.

Field Data

We classified 1,304 deer within the herd unit, exciding the estimated sample size of 984. Fawn ratios decreased from 60:100 does in 2012 to 55:100 does in 2013 which was expected with the drought conditions during the summer of 2012 through the spring of 2013. Past research shows that higher fawn ratios are needed to maintain the population. At the current 55:100 we expect the population will continue to be stable to decreasing. Antlerless harvest has been eliminated except for youth and archery hunters, who harvested 51 does and fawns in 2013, less than 1% of the total female population. Under the antler point restriction the buck ratio increased from 20:100 does in 2012 to 26:100 does in 2013, reaching the high side of recreational management.

We implemented a new ranking system in our classification that places bucks into 3 classes based on antler spread: class I is less than 19 inches, class II is 20-25 inches, and class III is greater than 25 inches. Of the total number of bucks classified, class I was made up 70%, class II was 22%, and class III was 9%. Total active licenses decreased by 100 residents, which has been the trend with a 1,000 less resident hunters in the last decade. Nonresident hunters increased by 100 from 2012, but we hypothesize that some hunters did not realize the Platte Valley was limited quota, and the only nearby general season in early October was in the Sheep Mountain Herd Unit. With the short season and implementation of an antler point limitation, hunter effort increased by 16 days, and hunter success decreased to 15%, the lowest in 10 years. This is far below the state wide average of 64% and is the lowest herd unit success rate in the state. The hunter satisfaction survey indicated that 40% of hunters were satisfied or very satisfied with their hunt with 26% remaining neutral in the survey.

Harvest Data

2013 was the second year of a shortened season and the first year we implemented a 3 point or better antler point restriction in this herd unit. Harvest has been on a steady decline over the last decade. The 2013 harvest estimate of 200 deer is half of the harvest from 2012. The percentage of yearlings from the total number of bucks harvested decreased from 33% in 2012 to 11% in 2013, indicating that the antler point restriction saved a portion of the younger age classes. We also saw the percentage of yearling bucks compared to the total number of bucks classified increase from 38% to 45% during our post season aerial classifications. Of the estimated 197 mule deer harvested, 51 were does and fawns. Of the 51 does and fawns 43 were harvested with archery and the remaining 8 were harvested by youth. Even though the female harvest makes up 25% of the total harvest, it is less than 1% of the total female population and is not substantial enough to affect the population, but it is perceived poorly by some of the public. The 2013 season structure was mostly well received; hunters and landowners perceived it as the Department was addressing their concerns with this herd unit.

Population

Time-Specific Juvenile & Constant Adult Survival (TSJ, CA) spreadsheet model was chosen for this Herd Unit. This model has the lowest AIC score of 146 and a Fit of 42 and shows the population declining from a high of 8,000 in 2009 to the current estimate of 5,700. This model is ranked as fair; there is 15-20 years of data; ratio data available for all years in model; juvenile and adult survival estimate with standard errors obtained from adjacent or other similar herds; model aligns fairly well. From our coordination meeting with Colorado we were able to get several years of fawn and adult survival rates from radio collared studies that took place near the Wyoming border. With this information the model provides a more believable estimate considering the classification samples and fawn ratios. Field staff, landowners, and hunters all agree we are well below the objective of 15,000 deer and the herd should be managed conservatively.

Management summary

If we attain the projected harvest of 250 deer and maintain a fawn ratio of 65:100 does or higher, the herd should remain stable. Using the five year average for the fawn ratio, we predict a 2014 post-season population of about 5,600. The 2014 season will be 7 days with a 3 point or better antler restriction to maintain higher buck ratios and address public concerns. We feel the 3 point

or better limitation is restrictive enough without a short season, but the majority of the public did not want more than a week long season. The nonresident quota for region D was decreased to 400 licenses to address the declining populations in the region D herd units and the platte valley limited quota hunt areas.

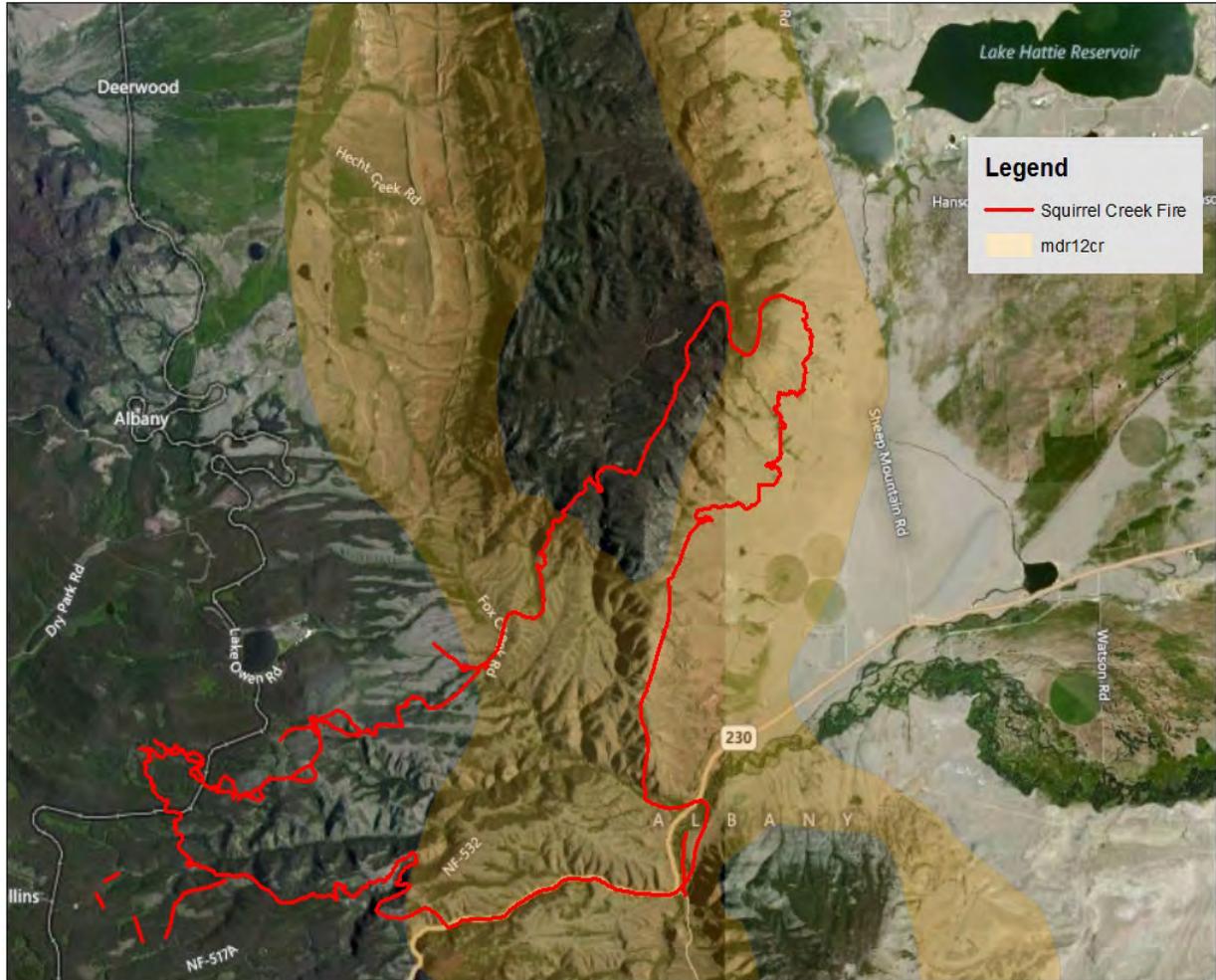


Figure. 1 Squirrel Creek Fire Perimeter with Sheep Mountain Mule Deer crucial winter range.

INPUT	
Species:	Deer
Biologist:	Lee Knox
Herd Unit & No.:	MD539 Sheep Mountain
Model date:	02/21/14

MODELS SUMMARY			Relative AICc	Fit	Notes
CJ,CA	Constant Juvenile & Adult Survival		385	376	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival		411	402	
TSJ,CA	Time-Specific Juvenile & Constant Adult Survival		146	42	

Year	Posthunt Population Est.		Trend Count	Predicted Prehunt Population		Predicted Posthunt Population		Objective			
	Field Est	Field SE		Juveniles	Total	Total Males	Females		Total		
1993			1181	1083	2730	4994	1137	457	2275	3869	15000
1994			1254	891	2398	4543	1254	396	2390	4040	15000
1995			1611	874	2528	5013	1611	463	2528	4602	15000
1996			1463	773	2485	4721	1463	390	2477	4329	15000
1997			1546	899	2630	5076	1546	578	2630	4754	15000
1998			1933	1039	2741	5713	1933	680	2741	5353	15000
1999			1972	1324	3033	6329	1972	799	3033	5804	15000
2000			2354	1514	3366	7233	2341	860	3354	6556	15000
2001			2047	1683	3751	7480	2047	1062	3739	6847	15000
2002			2382	1582	3802	7766	2382	873	3793	7048	15000
2003			2295	1505	3927	7727	2259	846	3631	6736	15000
2004			1947	1718	4027	7693	1879	1015	3716	6610	15000
2005			1563	1687	3927	7178	1545	955	3673	6172	15000
2006			2391	1487	3741	7619	2391	844	3737	6973	15000
2007			2612	1776	4175	8563	2607	1208	4165	7980	15000
2008			2346	1881	4333	8560	2331	1236	4162	7729	15000
2009			2834	1617	4043	8494	2834	1073	4029	7935	15000
2010			2002	1456	3908	7366	2002	1000	3906	6908	15000
2011			1989	1230	3639	6858	1981	900	3616	6497	15000
2012			1996	1142	3395	6534	1996	731	3349	6076	15000
2013			1716	1005	3176	5898	1712	845	3125	5681	15000
2014			1884	1043	2934	5861	1882	823	2906	5611	15000
2015											
2016											
2017											
2018											
2019											
2020											
2021											
2022											
2023											
2024											
2025											

Survival and Initial Population Estimates

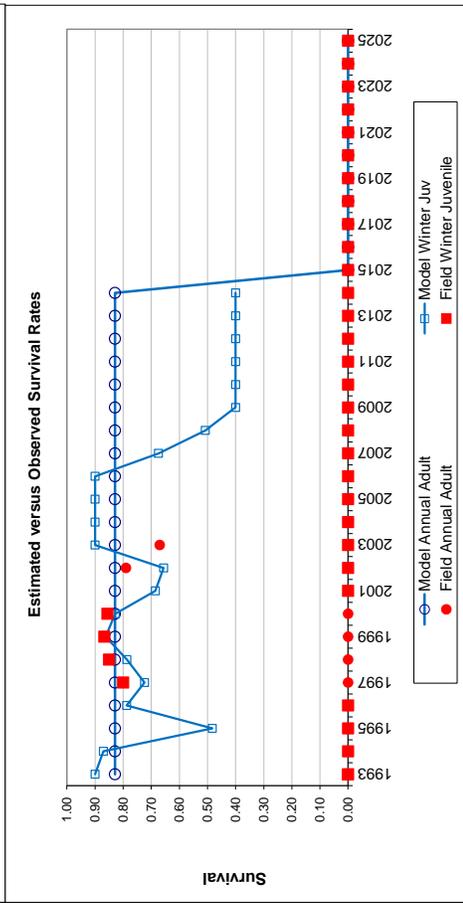
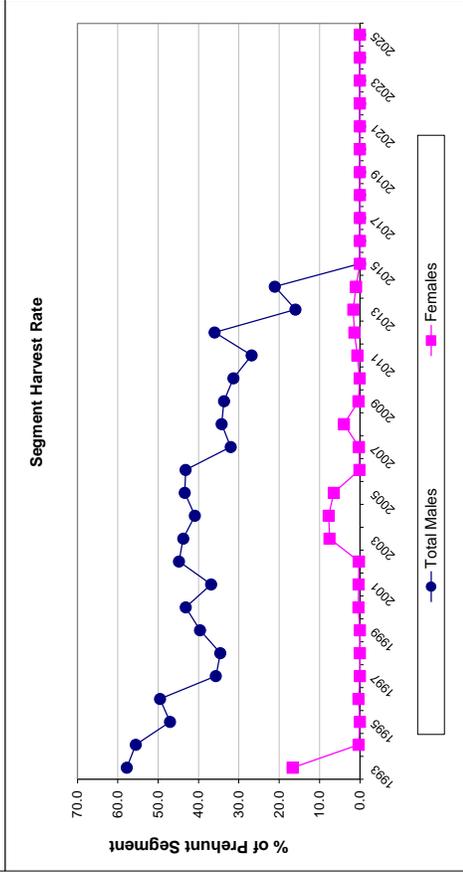
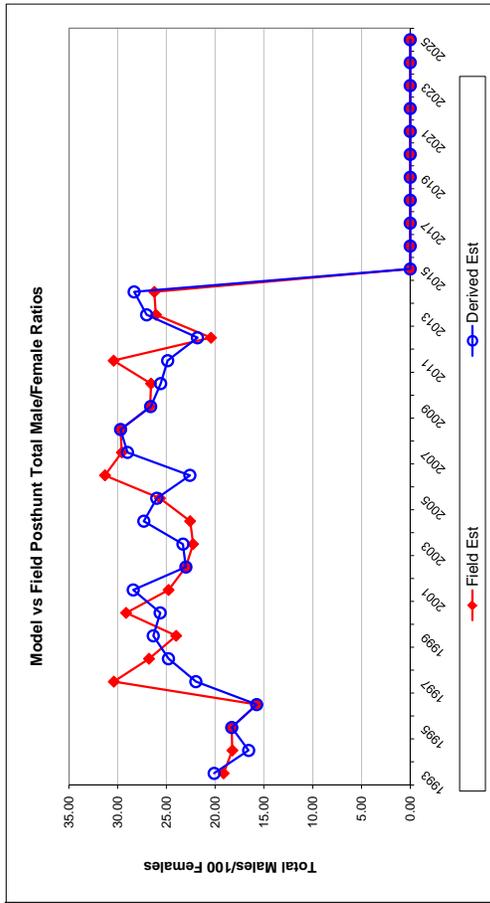
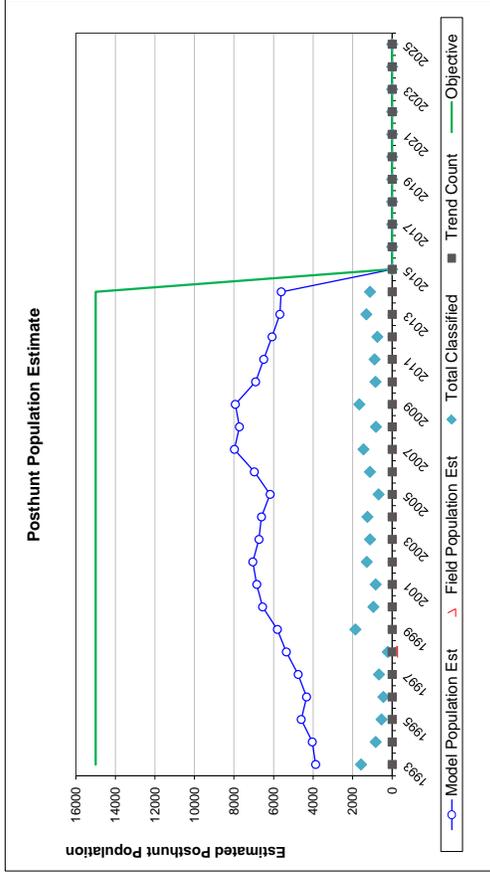
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est	Field Est SE	Model Est	Field Est SE
1993	0.90		0.83	
1994	0.87		0.83	
1995	0.48		0.83	
1996	0.79		0.83	
1997	0.72	0.07	0.83	
1998	0.79	0.06	0.83	
1999	0.86	0.05	0.83	
2000	0.83	0.05	0.83	
2001	0.69		0.83	
2002	0.66		0.83	0.79 0.04
2003	0.90		0.83	0.67 0.09
2004	0.90		0.83	
2005	0.90		0.83	
2006	0.90		0.83	
2007	0.67		0.83	
2008	0.51		0.83	
2009	0.40		0.83	
2010	0.40		0.83	
2011	0.40		0.83	
2012	0.40		0.83	
2013	0.40		0.83	
2014	0.40		0.83	
2015			0.83	
2016				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Adult Survival =		0.829
Initial Total Male Pop/10,000 =		0.046
Initial Female Pop/10,000 =		0.227

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

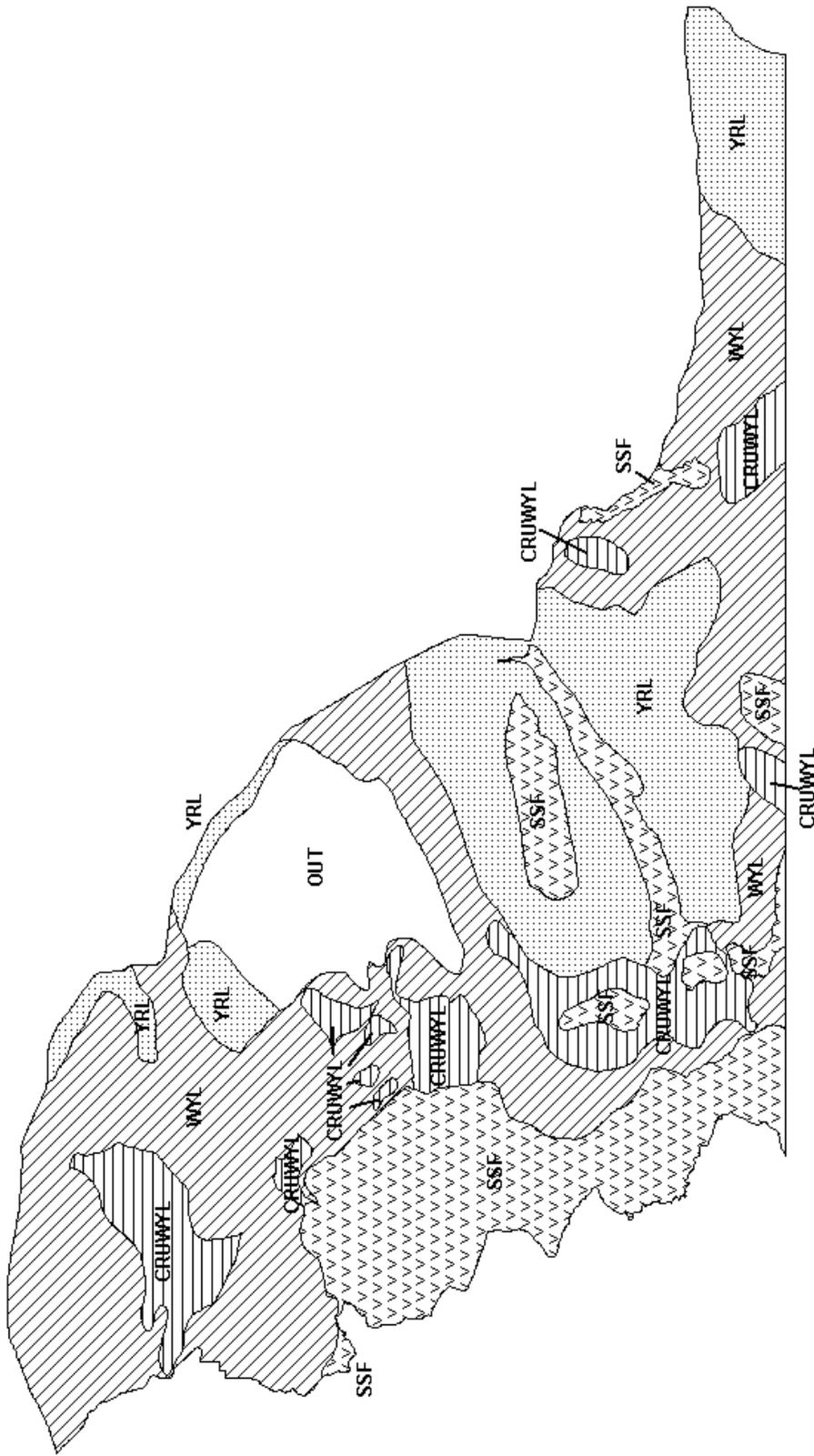
Year	Classification Counts					Harvest						
	Juvenile/Female Ratio		Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of		
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj					Field SE	Total Males	Females
1993		50.00	2.84	20.11	19.14	1.57	569	414	1023	57.8	16.7	
1994		52.46	4.05	16.57	18.24	2.10	450	7	457	55.6	0.3	
1995		63.73	5.95	18.30	18.31	2.71	374	0	374	47.1	0.0	
1996		59.06	6.08	15.75	15.75	2.68	348	8	356	49.5	0.4	
1997		58.81	5.15	21.99	30.40	3.36	292	0	292	35.7	0.0	
1998		70.54	10.36	24.80	26.79	5.51	327	0	327	34.6	0.0	
1999		65.01	3.30	26.35	24.01	1.74	477	0	477	39.6	0.0	
2000		69.81	4.99	25.65	29.14	2.81	594	11	616	43.2	0.4	
2001		54.74	4.27	28.41	24.78	2.58	564	11	575	36.9	0.3	
2002		62.81	3.85	23.01	23.01	2.02	645	8	653	44.8	0.2	
2003		62.21	4.08	23.31	22.28	2.12	599	269	901	43.8	7.5	
2004		50.55	3.25	27.32	22.58	1.96	639	283	984	40.9	7.7	
2005		42.05	3.82	25.99	25.67	2.81	666	231	914	43.4	6.5	
2006		64.00	4.27	22.60	31.30	2.67	584	4	588	43.2	0.1	
2007		62.60	3.67	29.00	29.58	2.25	517	9	530	32.0	0.2	
2008		56.01	4.45	29.71	29.71	2.96	586	156	756	34.3	4.0	
2009		70.34	3.77	26.62	26.69	2.00	495	13	508	33.7	0.4	
2010		51.27	4.04	25.60	26.58	2.66	415	2	417	31.3	0.1	
2011		54.79	4.20	24.88	30.42	2.87	300	21	328	26.8	0.6	
2012		59.62	4.78	21.82	20.43	2.43	374	42	416	36.0	1.4	
2013		54.79	3.43	27.03	26.07	2.14	146	47	197	16.0	1.6	
2014		64.76	4.26	28.32	26.24	2.38	200	25	227	21.1	0.9	
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



Comments:

END



Mule Deer (MD539) - Sheep Mountain
 HA 61, 74-77
 Revised - 8/88

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD540 - SHIRLEY MOUNTAIN

HUNT AREAS: 70

PREPARED BY: WILL SCHULTZ

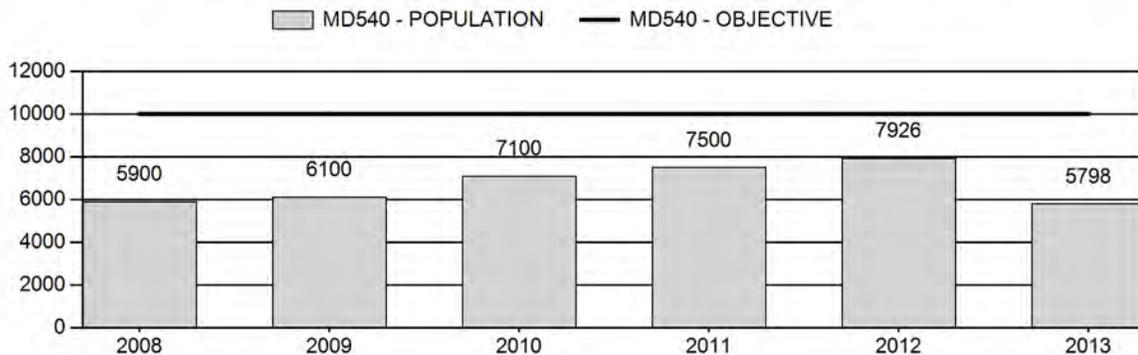
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	6,905	5,798	6,049
Harvest:	395	159	280
Hunters:	809	508	650
Hunter Success:	49%	31%	43 %
Active Licenses:	827	516	660
Active License Percent:	48%	31%	42 %
Recreation Days:	3,289	1,851	2,800
Days Per Animal:	8.3	11.6	10
Males per 100 Females	30	24	
Juveniles per 100 Females	61	42	

Population Objective:	10,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-42.0%
Number of years population has been + or - objective in recent trend:	20
Model Date:	03/04/2014

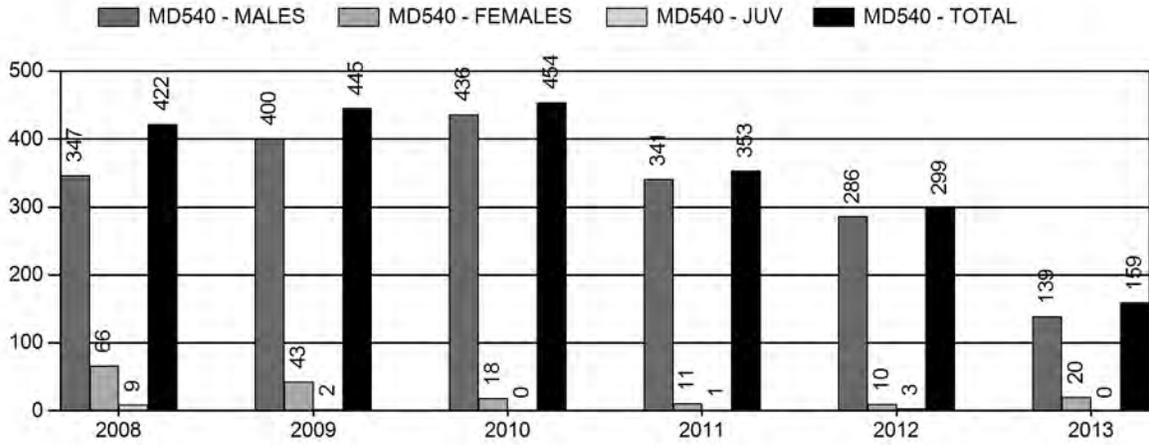
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0.7%	0.8%
Males ≥ 1 year old:	15.0%	22.7%
Juveniles (< 1 year old):	0.02%	0.2%
Total:	3.4%	4.4%
Proposed change in post-season population:	-3.7%	-4.9%

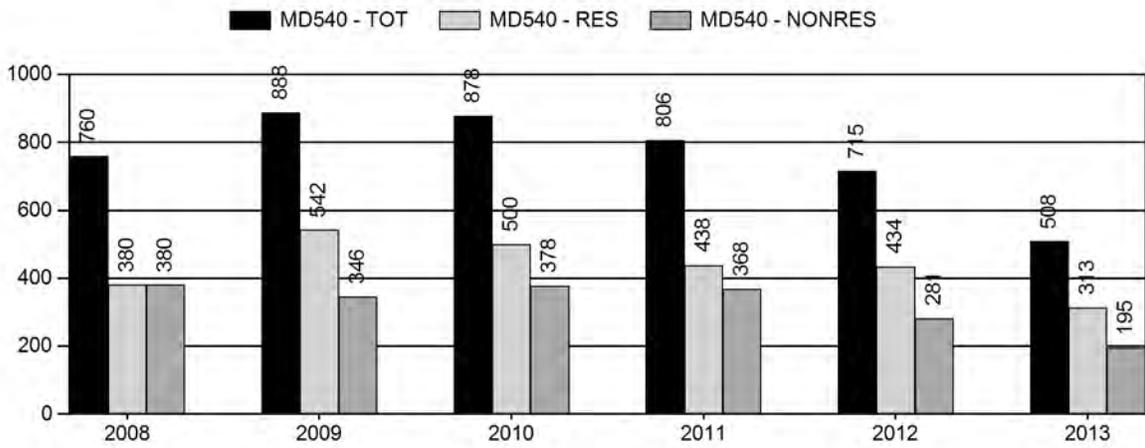
Population Size - Postseason



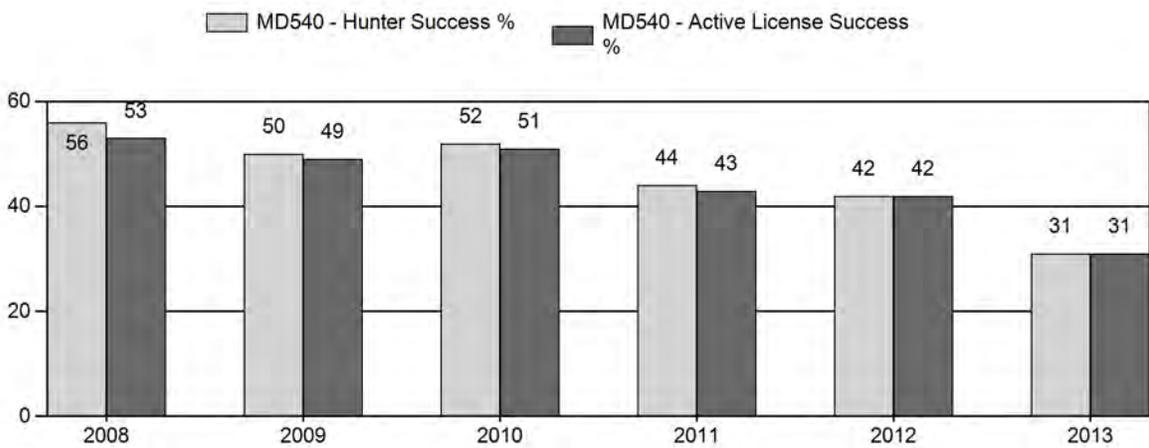
Harvest



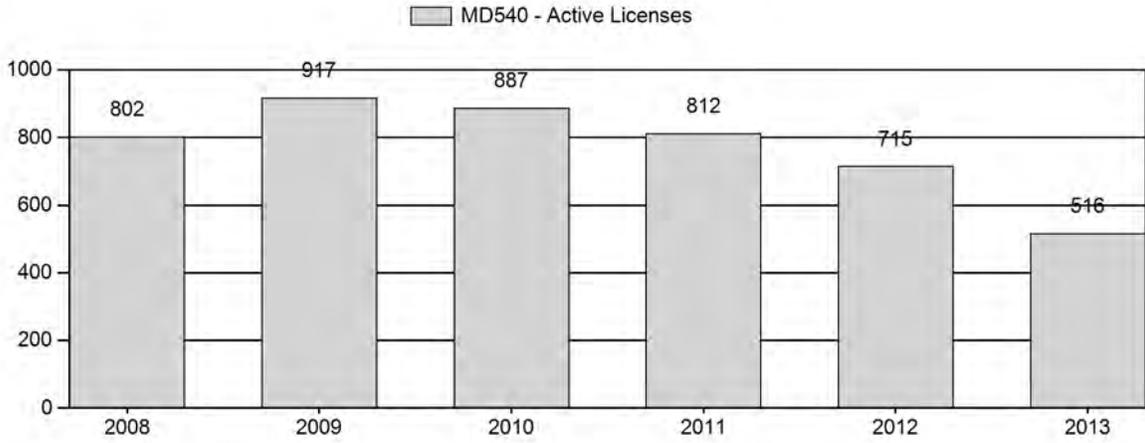
Number of Hunters



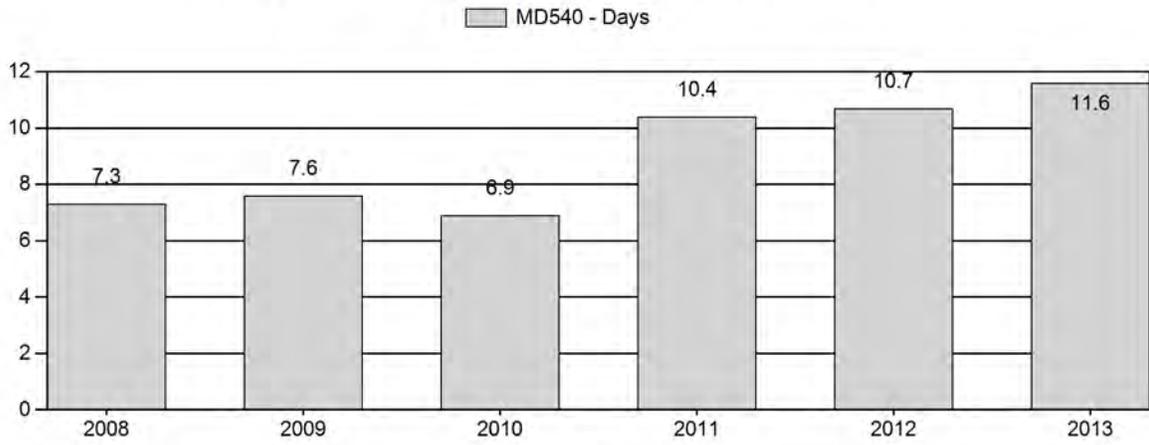
Harvest Success



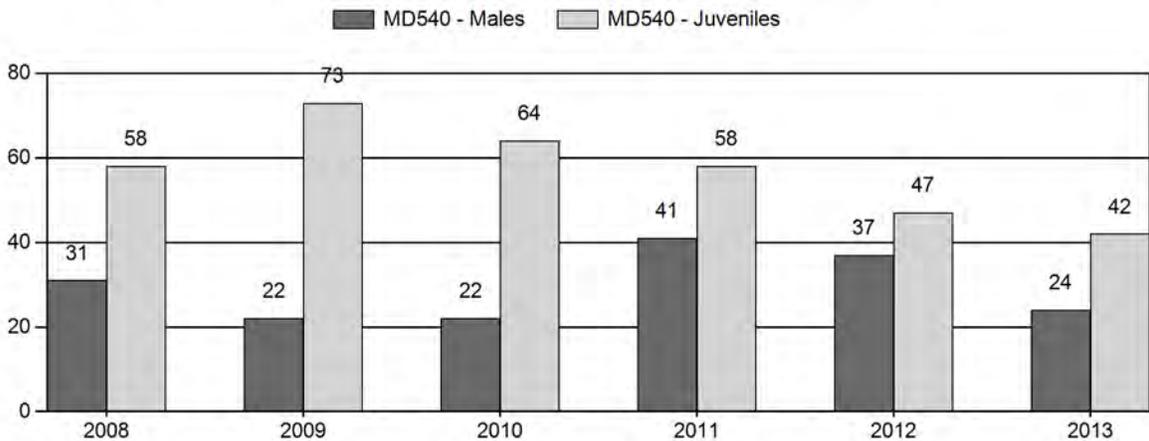
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD540 - SHIRLEY MOUNTAIN

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			YIng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	5,900	26	60	86	17%	276	53%	159	31%	521	963	9	22	31	± 5	58	± 7	44
2009	6,100	10	38	48	11%	216	51%	157	37%	421	913	5	18	22	± 4	73	± 9	59
2010	7,100	24	18	42	12%	190	54%	122	34%	354	958	13	9	22	± 5	64	± 9	53
2011	7,500	29	37	66	20%	162	50%	94	29%	322	1,079	18	23	41	± 7	58	± 9	41
2012	7,926	16	39	55	20%	149	54%	70	26%	274	1,033	11	26	37	± 7	47	± 9	34
2013	5,798	26	32	58	14%	246	60%	103	25%	407	997	11	13	24	± 4	42	± 6	34

Shirley Mountain Mule Deer (MD540)
Hunt Area 70
2014 Hunting Seasons

Hunt Area	Type	Dates of Seasons		Limited Quota	Limitations
		Opens	Closes		
70		Oct. 15	Oct. 21		General license; antlered mule deer three (3) points or more on either antler or any white-tailed deer
	6	Oct. 15	Nov. 30	25	Limited quota licenses; doe or fawn valid on private land

Hunt Area	Type	Quota change from 2013
Herd Unit Total		none

Management Evaluation

Current Management Objective: 10,000

Management Strategy: Recreational

2013 Postseason Population Estimate: 5,800

2014 Proposed Postseason Population Estimate: 6,000

Mule deer in the Shirley Mountain herd unit are managed toward a numeric objective of 10,000. The population was estimated using a spreadsheet model developed in 2012 and update in 2014. The herd is managed for recreation opportunity. The objective was last reviewed in 1987.

Herd Unit Issues

The Shirley Mountain herd unit is comprised of a mixture of habitat and landownership types. Hunter access to public lands containing mule deer habitat is considered good. Small groups of mule deer are considered nuisances and create damage in a localized area on the west side of Shirley Mountain, along Lost and Sage Creeks. Trends in mule deer numbers are in decline while interest from both residents and nonresidents in hunting in this herd unit have increased over the past 5 years. Expansion of wind farms in the eastern half of this herd unit is imminent.

Weather

Weather in this herd unit was relatively normal during the past bio-year. This weather pattern most likely had a neutral to positive influence on mule deer. For specific meteorological information for the Shirley Mountain herd unit the reviewer is referred to the following link: <http://www.ncdc.noaa.gov/cag/>

Habitat

Habitat conditions improved in 2013 with an increase in timely spring and fall precipitation. However, much of the transition and winter ranges were severely impacted by the drought conditions experienced in bio-year 2012. No mule deer habitat production/utilization data was available for this herd unit. However, annual production rates should have improved from the previous year, while utilization rates on winter ranges likely continued to be high.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game specie.

Shrub communities within the Laramie Region that are annually assessed by game wardens, wildlife biologists, and terrestrial habitat biologists, include: true mountain mahogany, antelope bitterbrush, skunkbrush sumac, big sagebrush, and four-wing saltbush. A majority of these transects were established approximately 12–13 years ago. Transects were established for several different reasons, including: measuring habitat response prior to or following treatments (i.e. prescribed fire, wildfire, mowing), concern over historic or current domestic livestock or wild ungulate utilization levels, selection of “representative habitats” utilized by wildlife on identified winter ranges, and to compare present results with historic data sets.

Field Data

The 2013 postseason classification ground survey was completed in late November. An adequate classification sample size of 407 mule deer was required to achieve an 80% confidence interval for the ratio estimates. The sample size (n=407) was the greatest recorded since 2009, yet fell below the adequate sample size goal. Yearling ratios were the same as in 2012 at 11 yearling bucks:100 does. This was lower than was anticipated given the implementation of the 3-point or more on either antler limitation in 2013. However, 2012 fawn ratios were poor and thus may have contributed to no increase in the observed yearling ratio. Adult bucks ratios declined from 26 in 2012 to 13 in 2013, indicating harvest pressure was greatly shifted to this segment of the deer population. Fawn ratios once again declined as they had done in 2012, reaching 42 fawns:100 does, which was lower than any ratio observed during the past 25 years.

Harvest Data

A significant change for the 2013 season was the addition of a 3-points or better limitation for the herd unit. Season lengths had been incrementally reduced over the past several years to protect overall buck numbers. The antler point restriction was implemented as an additional protection specifically for yearling bucks. The final 2013 WGFD deer harvest survey report indicated 500 general licensed hunters’ harvested 150 mule deer for an overall success rate of 30%. General license buck harvest decreased 51% and general license hunter numbers decreased 29%, compared to the 2012 season.

In addition to decreasing total buck harvest rates, the antler point restriction likely contributed to the decrease in hunter numbers. An increase in the number of unsuccessful hunter corresponded with an increase in the portion of hunters who were dissatisfied with their overall hunting experience. The harvest survey reported satisfaction ratings of satisfied or very satisfied dropping from 58% in 2012, to 41% in 2013.

Population

In 2013 we selected to use the SCJ,SCA model. Although the SCJ,SCA model can be made into a more complicated model than the other 2 models in the Wyoming Spreadsheet Model suite, we limited the optimizing cells to 9 cells. Cell optimization for fawn and adult survival rates was allowed in order to assist in simulating the likely lower than normal survival rates due to severe winter weather during those particular years selected in the model. It produced the lowest AICc score but the population estimate was still considered suspect by managers.

Given the openness of the landscape, and well defined herd unit boundaries, we believed observed harvest rates and classification sample sizes were not representative for an estimated population of this size. We believe the true population size to be lower than the estimate produced by the spreadsheet model. The observed trend in mule deer abundance and harvest does not support population dynamics depicted in the models. Without other information (e.g. an independent population estimate or survival data) to incorporate into the model, accuracy of estimates will continue to be unknown.

We rated this model as poor, and not biologically defensible. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model, and primarily due to less than adequate sample sizes for postseason classification counts (Morrison 2012).

Management Summary

The 2014 hunting season will include 7-days of General licensed antlered mule deer, 3 points or more on either antler, or any white-tailed deer hunting. The point restriction will provide protection for yearling mule deer bucks. Type 6, private land doe or fawn licenses were prescribed to reduce damage and nuisance deer issues in the Lost and Sage Creek area.

The Region D quota was reduced to bring hunter opportunity in line with the current mule deer resource. This will also improve hunter satisfaction for both nonresidents and resident hunters alike.

Literature Cited

Morrison, T. 2012. User Guide: Spreadsheet Model for Ungulate Population data. Wyoming Cooperative Fish and Wildlife Research Unit, University of Wyoming, Laramie. USA. 41 pp.

Bibliography of Herd Specific Studies

McDaniel G. W., F. G. Lindzey. 1991. Seasonal Movements, Population Characteristics and Habitat Use of Mule Deer in the Shirley Mountain Area, Central Wyoming. Wyoming Cooperative Fishery and Wildlife Research Unit. University of Wyoming, Laramie. 64 pp.

Strickland, D., L.L. McDonald, G. Johnson, and J. Kern. 1992. An Evaluation of Mule Deer Classifications From Helicopter and Ground Surveys. Western Ecosystems Technology, Inc. Cheyenne. 37pp.

INPUT
 Species: MULE DEER
 Biologist: SCHULTZ
 Herd Unit & No.: SHIRLEY MTN 540
 Model date: 03/04/14

MODEL EVALUATION: POOR

Clear form

MODELS SUMMARY		Fit	Relative AICc	Notes
CJ,CA	Constant Juvenile & Adult Survival	89	98	
SC,J,SCA	Semi-Constant Juvenile & Semi-Constant Adult Survival	68	91	
TS,J,CA	Time-Specific Juvenile & Constant Adult Survival	37	148	

Year	Posthunt Population Est. Field SE	Trend Count	Predicted Prehunt Population		Predicted Posthunt Population		Total	Objective		
			Juveniles	Total Males	Juveniles	Total Males			Females	Females
1993			603	1078	2437	4118	552	1838	2908	10000
1994			950	613	1788	3351	950	1788	3027	10000
1995			1401	518	1854	3773	1401	1854	3547	10000
1996			1421	645	2036	4102	1421	2036	3853	10000
1997			1287	743	2204	4234	1287	2204	4060	10000
1998			1515	861	2317	4692	1515	2317	4487	10000
1999			1480	1000	2480	4959	1480	2480	4578	10000
2000			1603	958	2615	5177	1603	2615	4847	10000
2001			1411	1000	2770	5181	1411	2770	4813	10000
2002			1942	951	2855	5748	1942	2855	5433	10000
2003			2015	1101	3076	6192	2015	3076	5845	10000
2004			2206	1225	3294	6725	2206	3294	6425	10000
2005			1644	1431	3540	6615	1642	3511	6211	10000
2006			1931	1394	3578	6904	1928	3530	6447	10000
2007			2116	1413	3682	7211	2111	3622	6585	10000
2008			1860	1207	3285	6352	1851	3212	5888	10000
2009			2417	1244	3370	7030	2415	3322	6541	10000
2010			2313	1380	3623	7316	2313	3603	6816	10000
2011			1834	1143	3171	6148	1833	3158	5759	10000
2012			1556	1188	3317	6061	1553	3306	5727	10000
2013			1402	1200	3371	5973	1402	3349	5798	10000
2014			1882	1213	3263	6357	1876	3235	6049	10000
2015										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

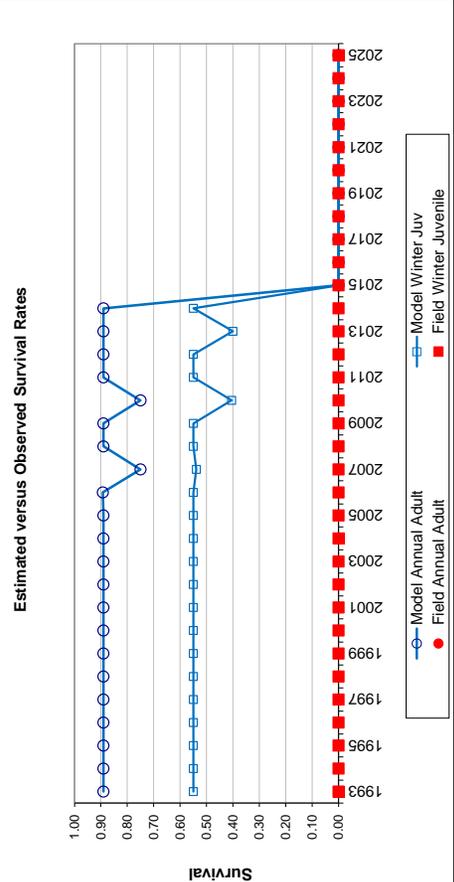
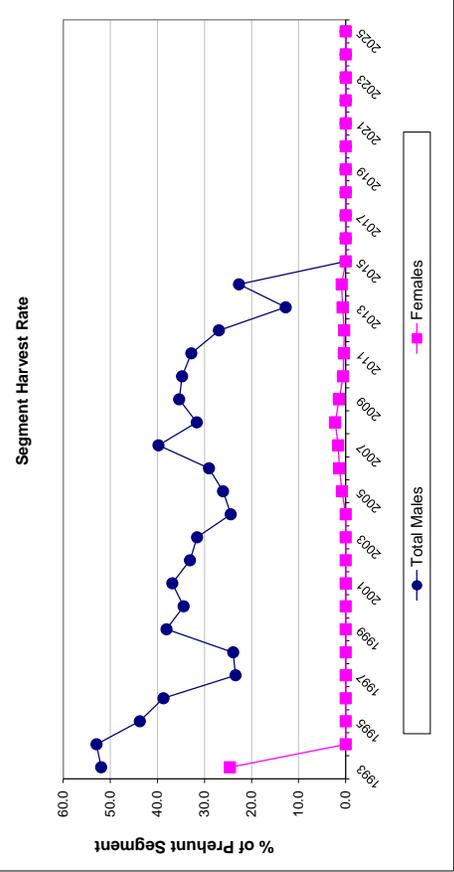
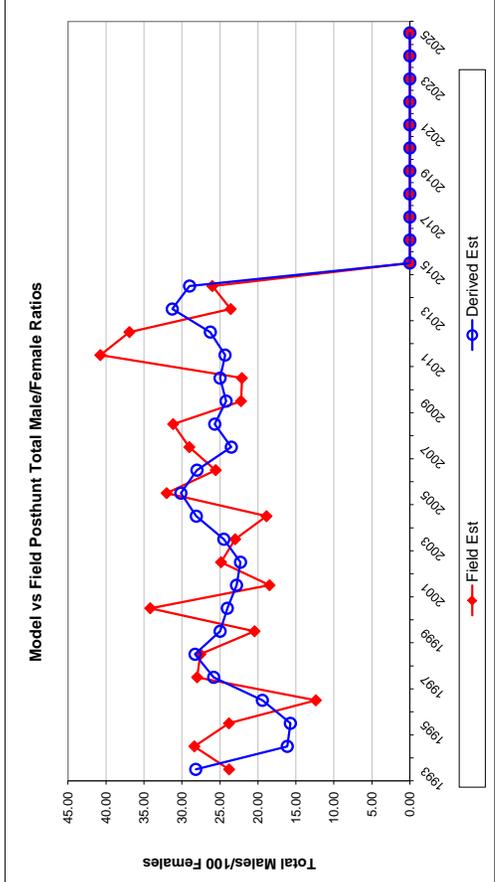
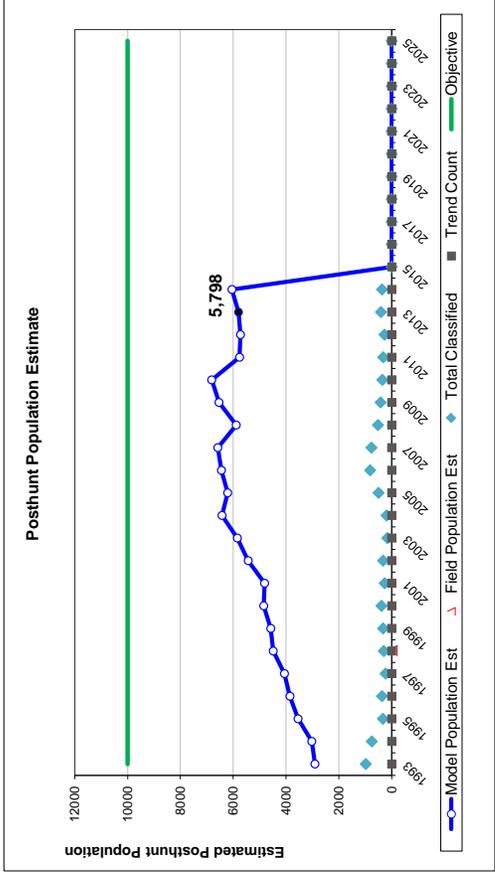
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est.	Field Est. SE	Model Est.	Field Est. SE
1993	0.55		0.89	
1994	0.55		0.89	
1995	0.55		0.89	
1996	0.55		0.89	
1997	0.55		0.89	
1998	0.55		0.89	
1999	0.55		0.89	
2000	0.55		0.89	
2001	0.55		0.89	
2002	0.55		0.89	
2003	0.55		0.89	
2004	0.55		0.89	
2005	0.55		0.89	
2006	0.55		0.89	
2007	0.54		0.75	
2008	0.55		0.89	
2009	0.55		0.89	
2010	0.40		0.75	
2011	0.55		0.89	
2012	0.55		0.89	
2013	0.40		0.89	
2014	0.55		0.89	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Juvenile Survival =		10.550
Adult Survival =		0.891
Initial Total Male Pop/10,000 =		0.104
Initial Female Pop/10,000 =		0.368

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

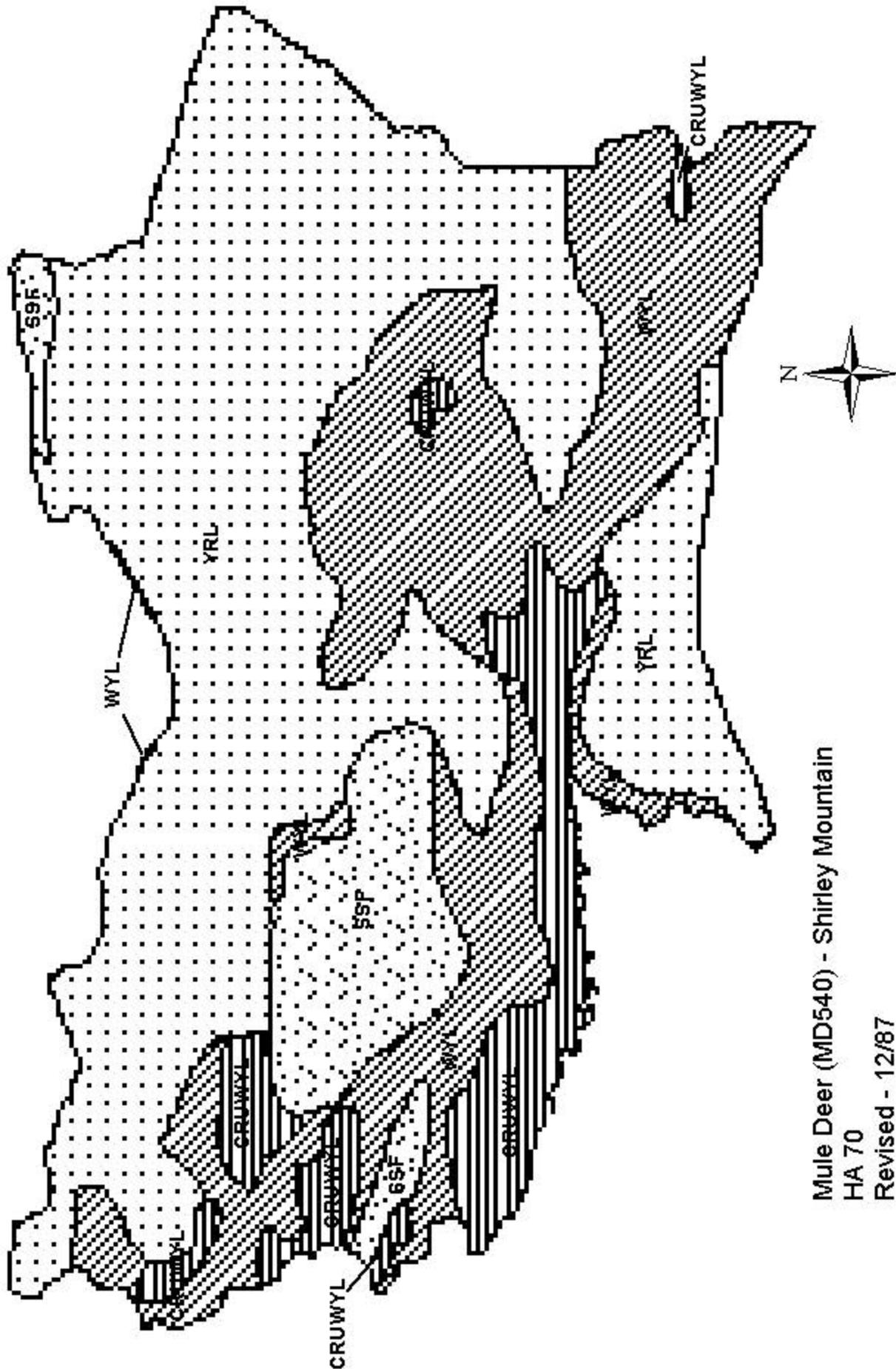
Year	Classification Counts						Harvest					
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of	
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE					Total Males	Females
1993							46	509	545	1100	52.0	24.6
1994	30.05	53.13	2.47	28.18	23.79	2.15	0	295	0	295	52.9	0.0
1995	75.60	23.81	4.42	16.13	28.37	2.96	0	206	0	206	43.7	0.0
1996	69.80	12.38	7.66	15.73	23.81	4.19	0	227	0	227	38.7	0.0
1997	58.40	28.00	8.60	25.82	12.38	2.62	0	158	0	158	23.4	0.0
1998	65.38	27.56	8.33	28.27	28.00	5.35	0	187	0	187	23.9	0.0
1999	59.67	20.44	7.26	24.97	27.56	4.75	0	346	0	346	38.1	0.0
2000	61.31	34.17	7.05	24.03	20.44	3.69	0	300	0	300	34.4	0.0
2001	50.96	18.47	7.00	22.82	34.17	4.80	0	335	0	335	36.8	0.0
2002	68.05	22.29	8.23	22.29	18.47	3.73	0	286	0	286	33.1	0.0
2003	65.52	24.48	11.16	24.48	24.85	4.28	0	316	0	316	31.6	0.0
2004	66.98	18.87	10.27	28.11	22.99	5.70	0	272	0	272	24.4	0.0
2005	46.76	32.01	4.97	30.14	18.87	4.60	2	339	26	367	26.1	0.8
2006	54.63	25.55	4.31	28.02	32.01	3.90	3	368	44	415	29.0	1.4
2007	58.29	23.50	4.74	23.50	25.55	2.66	4	511	54	569	39.8	1.6
2008	57.61	31.16	5.74	25.68	23.50	3.02	9	347	66	422	31.6	2.2
2009	72.69	22.22	7.62	24.19	31.16	3.85	2	400	43	445	35.4	1.4
2010	64.21	22.11	7.45	24.98	22.22	3.55	0	436	18	454	34.8	0.5
2011	58.02	40.74	7.52	24.33	22.11	3.77	1	341	11	353	32.8	0.4
2012	46.98	36.91	6.81	26.26	40.74	5.95	3	291	10	304	26.9	0.3
2013	41.87	23.58	4.91	31.27	36.91	5.82	0	139	20	159	12.7	0.7
2014	58.00	26.00	6.77	29.00	23.58	3.44	5	250	25	280	22.7	0.8
2015												
2016												
2017												
2018												
2019												
2020												
2021												
2022												
2023												
2024												
2025												

FIGURES



Comments: The SCJ,SCA model produced the lowest AICc score. We assume the true population size to be lower than those produced by these models.

END



Mule Deer (MD540) - Shirley Mountain
 HA 70
 Revised - 12/87

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD541 - PLATTE VALLEY

HUNT AREAS: 78-81, 83, 161

PREPARED BY: WILL SCHULTZ

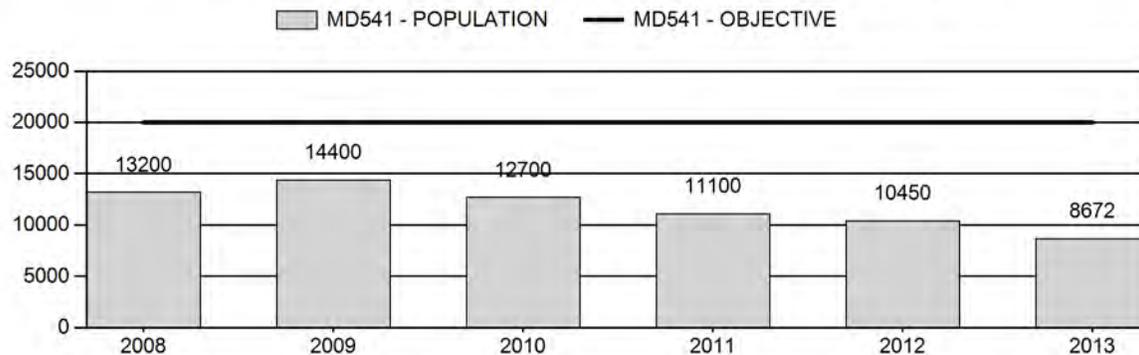
	<u>2008 - 2012 Average</u>	<u>2013</u>	<u>2014 Proposed</u>
Population:	12,370	8,672	7,989
Harvest:	861	391	391
Hunters:	2,936	879	850
Hunter Success:	29%	44%	46%
Active Licenses:	2,998	879	850
Active License Percent:	29%	44%	46%
Recreation Days:	15,921	4,931	4,900
Days Per Animal:	18.5	12.6	12.5
Males per 100 Females	27	32	
Juveniles per 100 Females	55	52	

Population Objective:	20,000
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-56.6%
Number of years population has been + or - objective in recent trend:	19
Model Date:	05/22/2014

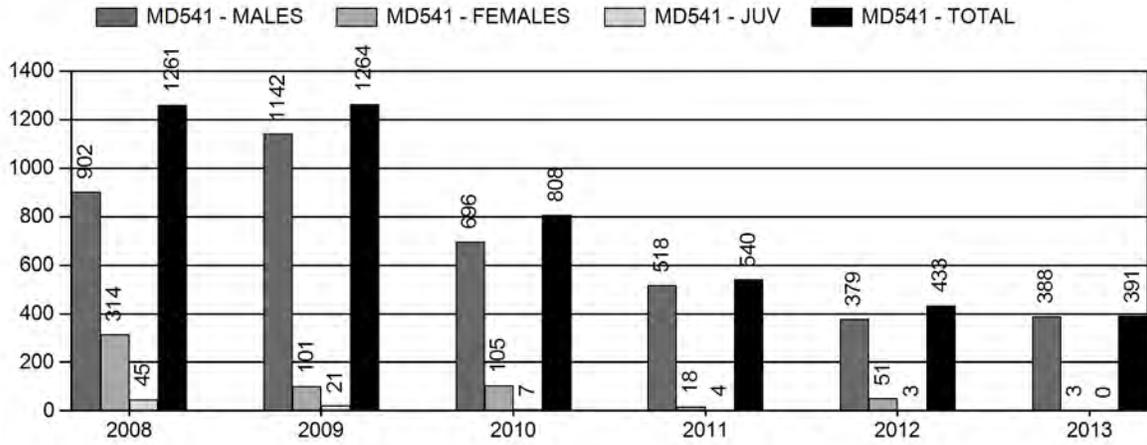
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

	<u>JCR Year</u>	<u>Proposed</u>
Females ≥ 1 year old:	0.7%	0.1%
Males ≥ 1 year old:	23.1%	26.4%
Juveniles (< 1 year old):	0.2%	0%
Total:	4.3%	4.6%
Proposed change in post-season population:	-4.8%	-5.1%

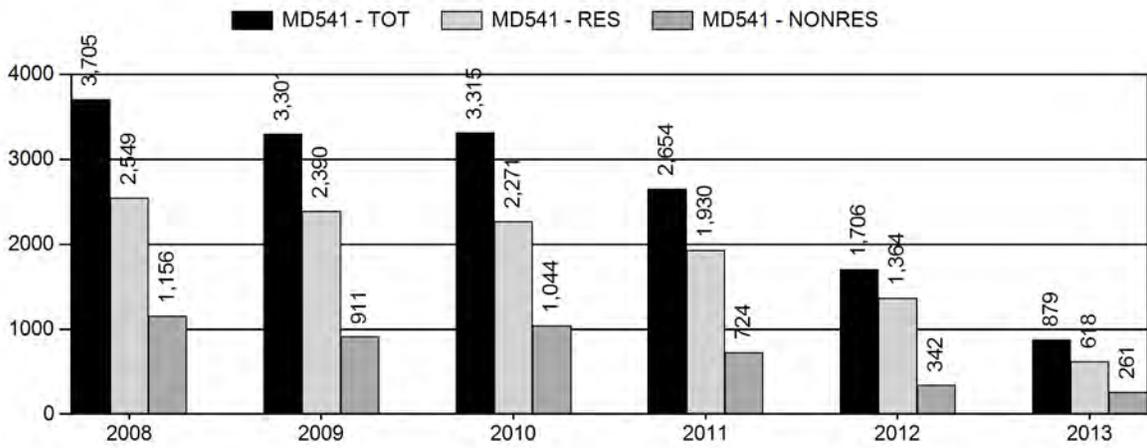
Population Size - Postseason



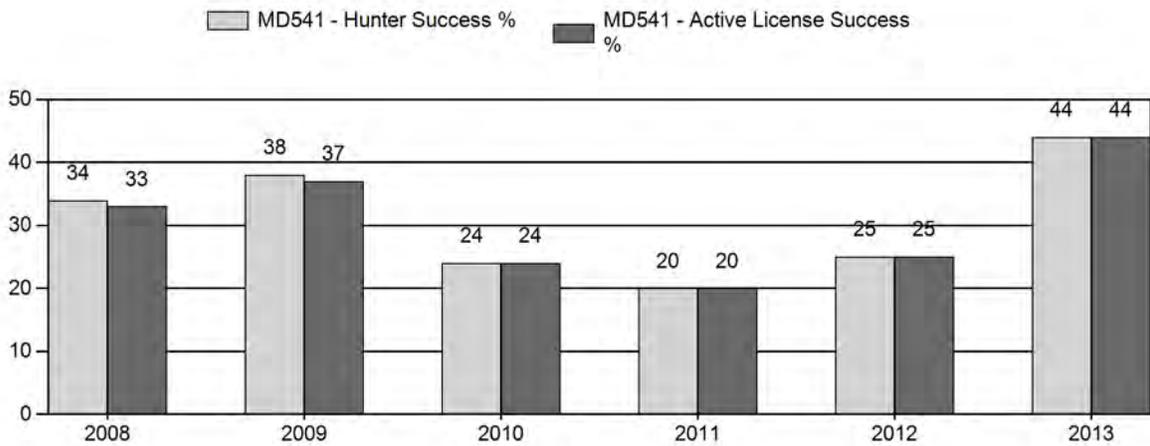
Harvest



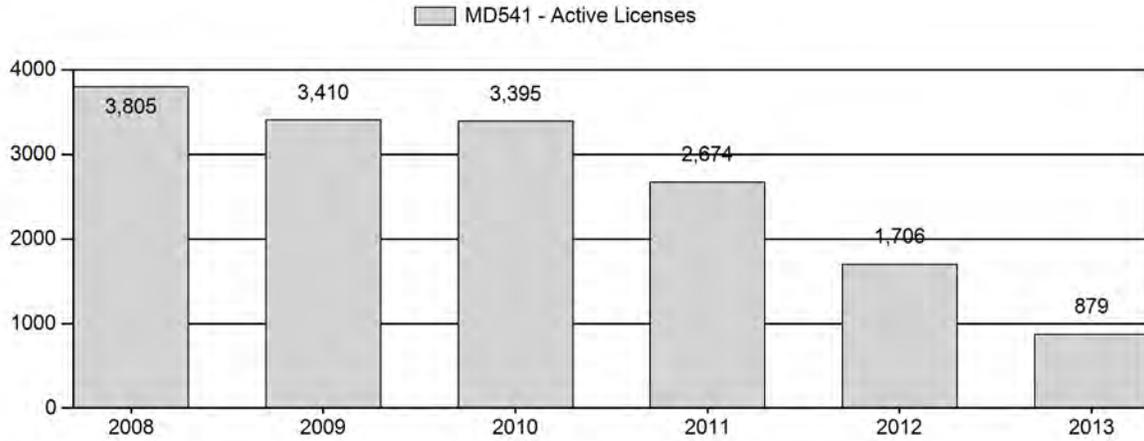
Number of Hunters



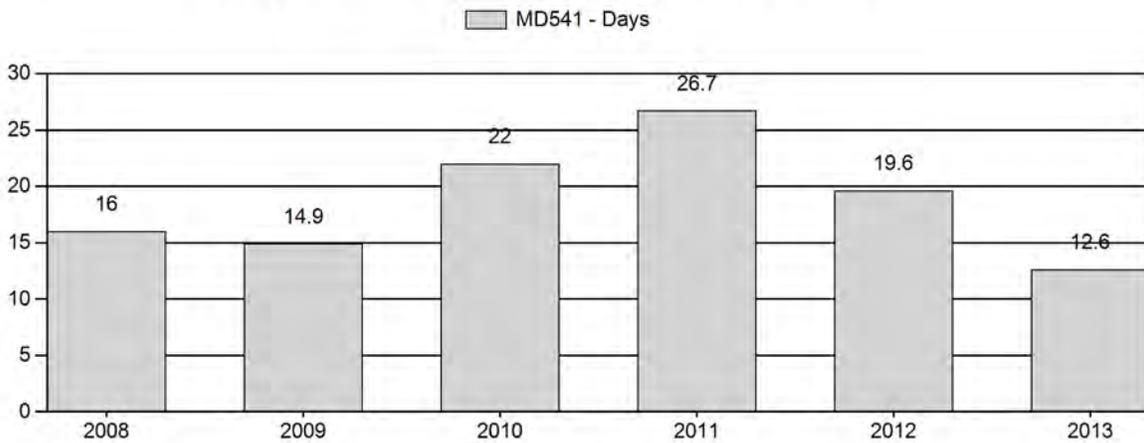
Harvest Success



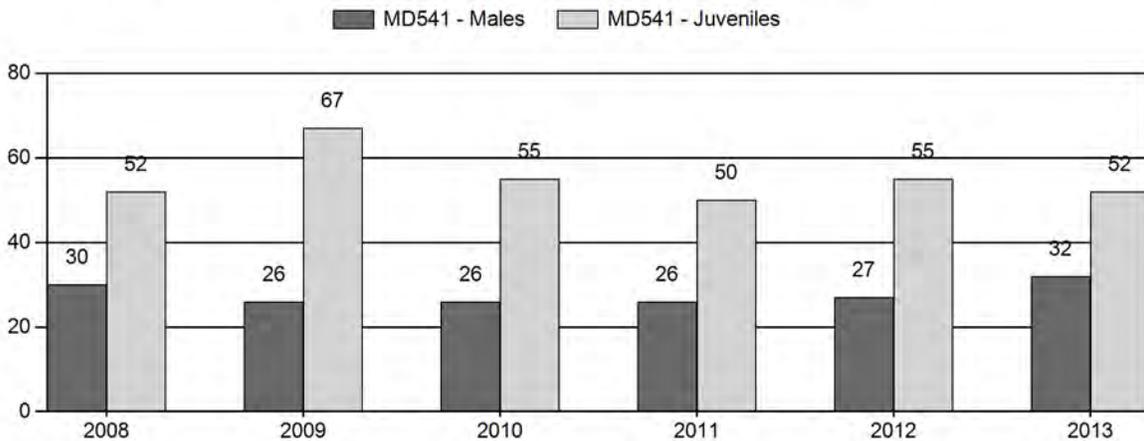
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD541 - PLATTE VALLEY

Year	Post Pop	MALES				FEMALES		JUVENILES		Tot Cls	Cls Obj	Males to 100 Females				Young to		
		Ylg	Adult	Total	%	Total	%	Total	%			Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2008	13,200	199	386	585	17%	1,928	55%	1,003	29%	3,516	1,020	10	20	30	± 2	52	± 2	40
2009	14,400	65	207	272	13%	1,047	52%	700	35%	2,019	1,053	6	20	26	± 2	67	± 4	53
2010	12,700	111	222	333	14%	1,265	55%	701	30%	2,299	1,094	9	18	26	± 2	55	± 3	44
2011	11,100	114	340	454	15%	1,738	57%	865	28%	3,057	999	7	20	26	± 2	50	± 2	39
2012	10,450	70	143	213	15%	794	55%	438	30%	1,445	980	9	18	27	± 2	55	± 4	43
2013	8,672	136	209	345	17%	1,092	55%	565	28%	2,002	937	12	19	32	± 2	52	± 3	39

**Platte Valley Mule Deer (MD541)
 Hunt Areas 78-81, 83 & 161
 2014 Hunting Seasons**

Hunt Area	Type	Dates of Seasons		Limited Quota	Limitations
		Opens	Closes		
78	1	Oct. 1	Oct. 14	300	Limited quota licenses; antlered mule deer or any white-tailed deer
79	1	Oct. 1	Oct. 14	300	Limited quota licenses; antlered mule deer or any white-tailed deer
80, 83	1	Oct. 1	Oct. 14	200	Limited quota licenses; antlered mule deer or any white-tailed deer
81	1	Oct. 1	Oct. 14	200	Limited quota licenses; antlered mule deer or any white-tailed deer
161	1	Oct. 1	Oct. 14	25	Limited quota licenses; antlered mule deer or any white-tailed deer

Hunt Area	Type	Quota change from 2013
161	1	-25
Herd Unit Total	1	-25

Management Evaluation

Current Management Objective: 20,000

Management Strategy: Recreational

2013 Postseason Population Estimate: 8,700

2014 Proposed Postseason Population Estimate: 8,000

Mule deer in the Platte Valley herd unit are managed toward a numeric objective of 20,000. The population was estimated using a spreadsheet model developed in 2013 and updated in 2014. The herd is managed for recreational opportunity. The objective was last reviewed in 1987 and will be reviewed in 2014.

Herd Unit Issues

Fieldwork for several projects initiated under the Platte Valley Mule Deer Initiative (PVMDI) was completed during this past year. The monitoring of 70 radio-collared mule deer ended with the last radio-collars being retrieved for downloading in February of 2014. The University of Wyoming Cooperative Unit began analyzing data from the

Platte Valley sightability survey evaluation trials. A March meeting was held in Saratoga to update the public regarding PVMDI Mule Deer Plan progress and accomplishments.

In the June of 2013, Wyoming Game and Fish Department and the Platte Valley Habitat Partnership finalized their Mule Deer Habitat Management Plan. This multi-stakeholder partnership was tasked with identifying mule deer habitat improvement needs in the herd unit and collectively developing projects to address those needs. In November, the Wyoming Game and Fish Commission (WGFC) allocated \$95K from the \$500K Platte Valley Habitat Partnership budget to be used as matching funds toward these mule deer habitat improvement projects.

Efforts to reduce predators of mule deer in the Platte Valley were implemented during this period. Carbon County Predator Management District began a 3-year coyote removal project (Appendix A). The WGFC approved increases to both mountain lion and black bear seasons mortality limits and season lengths.

Weather

Weather in this herd unit was relatively normal during the past bio-year. This weather pattern most likely had a neutral to positive influence on mule deer. For specific meteorological information for the Platte Valley herd unit the reviewer is referred to the following link:

<http://www.ncdc.noaa.gov/cag/>

Habitat

Habitat conditions improved in 2013 with an increase in timely spring and fall precipitation. However, much of the transition and winter ranges were severely impacted by the drought conditions experienced in bio-year 2012. No mule deer habitat production/utilization data was available for this herd unit. However, annual production rates should have improved from the previous year, while utilization rates on winter ranges likely continued to be high.

The limited number of habitat transects that have been established throughout the Laramie Region have not provided sufficient data to make reliable assumptions of habitat quantity or quality and consequently heavily influence population management for any particular big game specie.

Shrub communities within the Laramie Region that are annually assessed by game wardens, wildlife biologists, and terrestrial habitat biologists, include: true mountain mahogany, antelope bitterbrush, skunkbrush sumac, big sagebrush, and four-wing saltbush. A majority of these transects were established approximately 12–13 years ago. Transects were established for several different reasons, including: measuring habitat response prior to or following treatments (i.e. prescribed fire, wildfire, mowing), concern over historic or current domestic livestock or wild ungulate utilization levels, selection of “representative habitats” utilized by wildlife on identified winter ranges, and to compare present results with historic data sets.

Field Data

The 2013 Platte Valley Herd Unit postseason classification ratios were 32 bucks and 52 fawns/100 does; based on an adequate sample of 2,002 mule deer. The buck ratio increased 16% in 2013. The observed fawn ratio at 52 fawns/100 does was 7% lower than the previous year. It was hypothesized that does went into the 2012-2013 winter in very poor body condition following the 2012 drought, resulting in decreased birth rates and decreased fawn survival in 2013.

Harvest Data

Mule deer hunting seasons in the Platte Valley were administered entirely by limited quota licenses in 2013. Each hunt area was prescribed an area specific license quota. These quotas were formulated based on past harvest success and a PVMDI Mule Deer Plan goal of attaining a 40% harvest success rate for the herd unit in 2013. A total of 1,050 licenses were issued (Table 1). Total harvest success increased to 44% in 2013 with 388 bucks being harvested. This harvest rate was attributed to an increased season length, removal of the 2012 3-point or more antler point limitation, and perhaps most important, alignment of hunter numbers with the current mule deer resource. An increase in the harvest success rate resulted in an increase in the number hunters who were either satisfied, or very satisfied. Hunter satisfaction increased from 46% in 2012, to 57% in 2013.

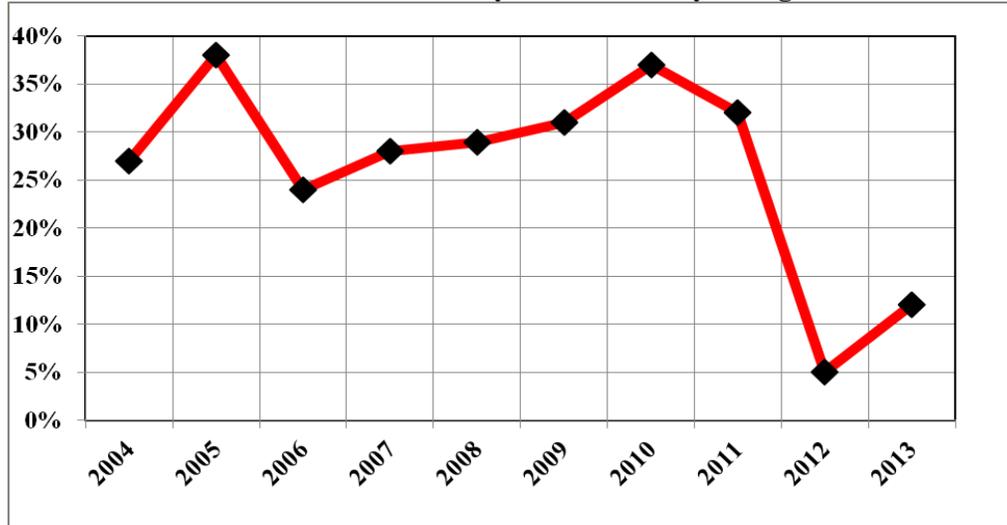
2013 Harvest of yearling bucks did not increase significantly with the removal of the 2012 antler point restriction (Figure 1). Field checked harvest data from past years indicated on average greater than 25% of the buck harvest consisted of yearling bucks. The 2012 antler point restrictions resulted in lowering the yearling percentage to 5% of the total buck harvest. The 2013 limited quoted seasons, with no antler point restrictions, resulted in an additional 7% increase to 12% of yearling bucks in the buck harvest. Only 3 antlerless mule deer were reported harvested in the Platte Valley.

Table 1. 2013 Platte Valley mule deer herd unit harvest information from the WGFD harvest survey, Wyoming.

MULE DEER 2013 HARVEST, HUNTING PRESSURE, HUNTER SUCCESS BY HUNT AREA										
AREA	TYPE	ACTIVE	HARVEST				HUNTER SUCCESS	DAYS/ HARVEST	HUNTER LICENSES	
			LICS/HTRS	BUCK	DOE	FAWN			TOTAL	HUNTER DAYS
78 French Creek	Type 1	244	108	0	0	108	44.3%	10.1	1096	298
Pooled Total		244	108	0	0	108	44.3%	10.1	1096	
Pooled Resident		201	81	0	0	81	40.3%	11.1	901	
Pooled Nonresident		43	27	0	0	27	62.8%	7.2	195	
79 Kennaday Peak	Type 1	247	107	0	0	107	43.3%	13.7	1466	299
Pooled Total		247	107	0	0	107	43.3%	13.7	1466	
Pooled Resident		146	49	0	0	49	33.6%	19.6	960	
Pooled Nonresident		101	58	0	0	58	57.4%	8.7	506	
80 Spring Creek	Type 1	172	69	0	0	69	40.1%	15.7	1083	197
Pooled Total		172	69	0	0	69	40.1%	15.7	1083	
Pooled Resident		101	33	0	0	33	32.7%	23.0	759	
Pooled Nonresident		71	36	0	0	36	50.7%	9.0	324	
81 Blackhall	Type 1	176	73	3	0	76	43.2%	14.8	1128	199
Pooled Total		176	73	3	0	76	43.2%	14.8	1128	
Pooled Resident		138	52	3	0	55	39.9%	17.6	967	
Pooled Nonresident		38	21	0	0	21	55.3%	7.7	161	
83 Bolten Rim	Type 1	16	2	0	0	2	12.5%	21.5	43	197
Pooled Total		16	2	0	0	2	12.5%	21.5	43	
Pooled Resident		3	0	0	0	0	0.0%	0.0	16	
Pooled Nonresident		13	2	0	0	2	15.4%	13.5	27	
161 St. Mary's Creek	Type 1	39	29	0	0	29	74.4%	4.0	115	50
Pooled Total		39	29	0	0	29	74.4%	4.0	115	
Pooled Resident		33	23	0	0	23	69.7%	4.3	100	
Pooled Nonresident		6	6	0	0	6	100.0%	2.5	15	

MULE DEER 2013 HARVEST BY HERD UNIT										
HERD	TYPE	ACTIVE	HARVEST				HUNTER SUCCESS	DAYS/ HARVEST	HUNTER LICENSES	
			LICS/HTRS	BUCK	DOE	FAWN			TOTAL	HUNTER DAYS
541 Platte Valley	Type 1	879	388	3	0	391	44.5%	12.6	4931	1,043
Total Hunters		879	388	3	0	391	44.5%	12.6	4931	
Resident		618	238	3	0	241	39.0%	15.4	3703	
Nonresident		261	150	0	0	150	57.5%	8.2	1228	

Figure 1. 2004-2013 Percentage of yearling bucks in the total mule deer buck harvest checked in the field. Platte Valley herd unit, Wyoming.



Population

We continued to use the TSJ,CA spreadsheet model in 2013. This model provided the balance of allowing juvenile survival rates to be optimized for alignment with observed population dynamics, while maintaining a constant survival rate for adult mule deer in model simulations. The TSJ,CA model also offered the best AICc score of the suite of spreadsheet models. TSJ,CA model aligned very well with 3 abundance estimates for this herd unit and will provide for an excellent "anchor" for future model development. Adult survival rates for 2011 and 2012 were developed from a sample of 70 radio-collared mule deer in this herd unit and included in the model.

We rated this model as fair, and biologically defensible in our evaluation. This rating was based on criteria identified in the user's guide for the WGFD spreadsheet model (Morrison 2012).

Management Summary

In 2014, the limited quota licenses numbers will remain similar to the 2013 quotas. A small reduction in licenses was prescribed for Hunt Area 161 due to decreasing public access. We believe limited quota hunting seasons will continue to gain support from the public in 2014. Predator management and habitat improvement projects will continue as means to improve and sustain mule deer and their habitat in the Platte Valley herd unit.

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Yost, J. 2009. North Park Deer Movement and Distribution Study Update - March, 2009. Colorado Division of Wildlife, Steamboat Springs. 4 pp.

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Wyoming Game and Fish Dept. 2013. Platte Valley Habitat Partnership's (PVHP) Mule Deer Habitat Plan, May 22, 2013. Wyoming Game and Fish Department, Cheyenne. 99 pp.

INPUT	
Species:	MULE DEER
Biologist:	WILL SCHULTZ
Herd Unit & No.:	PLATTE MDS41
Model date:	05/22/14

MODEL EVALUATION: FAIR

Clear form

MODELS SUMMARY			Notes
	Fit	Relative AICc	
CJ,CA	567	576	
SC,J,SCA	261	287	
TS,J,CA	179	277	Best fit & AICc score, juvenile survival constrained to ≥0.40 - <0.70

Population Estimates from Top Model

Year	Posthunt Population Est.		Trend Count		Predicted Prehunt Population			Predicted Posthunt Population			Objective
	Field Est	Field SE	Juveniles	Total	Total Males	Females	Total	Total Males	Females	Total	
1993			5951	23460	3415	14094	5923	2276	13375	21573	20000
1994			7248	22225	3018	11959	7248	2118	11959	21326	20000
1995			6674	20914	3156	11084	6674	2523	11084	20282	20000
1996			6378	20011	3368	10265	6378	2489	10265	19132	20000
1997			5152	17977	3281	9545	5152	2722	9545	17419	20000
1998			5588	19077	3996	9493	5588	3226	9493	18307	20000
1999			6931	21089	4555	9604	6931	3257	9604	19791	20000
2000			7027	22240	5050	10163	7027	2997	10163	20187	20000
2001			5935	21291	4792	10565	5935	3072	10565	19571	20000
2002			6742	21882	4552	10588	6703	2564	10164	19431	20000
2003			6583	21529	4412	10534	6515	2889	10100	19504	20000
2004			5960	20984	4608	10417	5941	2664	9955	18560	20000
2005			6123	20448	4226	10099	6098	2471	9794	18363	20000
2006			5416	19566	4125	10025	5354	2511	9343	17209	20000
2007			4763	17810	3772	9275	4704	2441	8666	15811	20000
2008	12955	163	3991	14821	2907	7922	3942	1915	7577	13434	20000
2009			4952	15358	2922	7484	4929	1666	7373	13968	20000
2010	16892	790	3958	13851	2648	7245	3951	1882	7129	12962	20000
2011	11120	905	3246	12087	2306	6534	3242	1737	6514	11493	20000
2012			2993	10313	1916	5404	2990	1496	5353	9839	20000
2013			2496	9102	1780	4827	2496	1353	4824	8672	20000
2014			2445	8419	1589	4385	2445	1162	4382	7989	20000
2015											20000
2016											20000
2017											20000
2018											20000
2019											20000
2020											20000
2021											20000
2022											20000
2023											20000
2024											20000
2025											20000

Survival and Initial Population Estimates

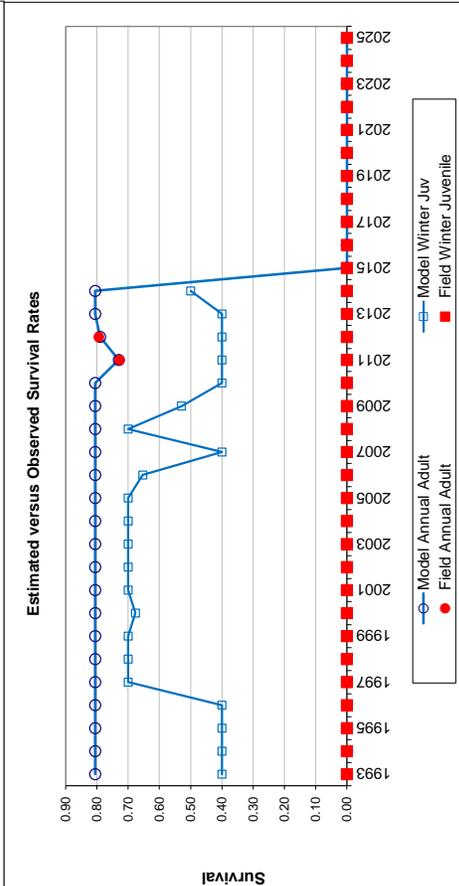
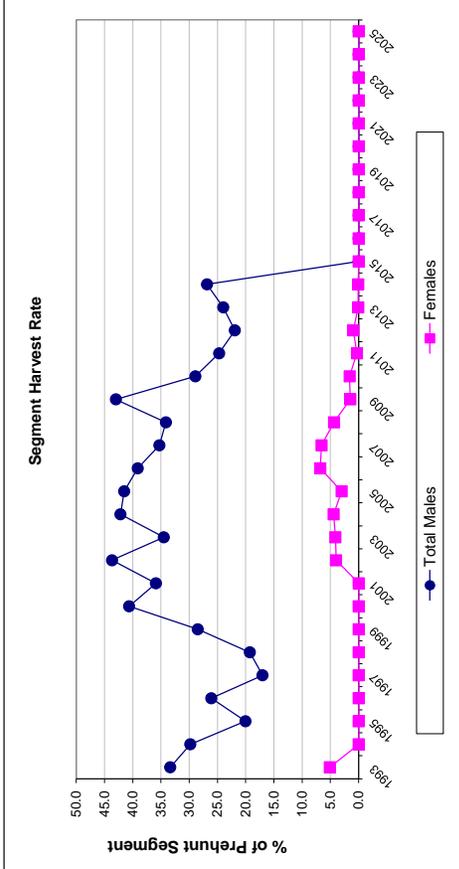
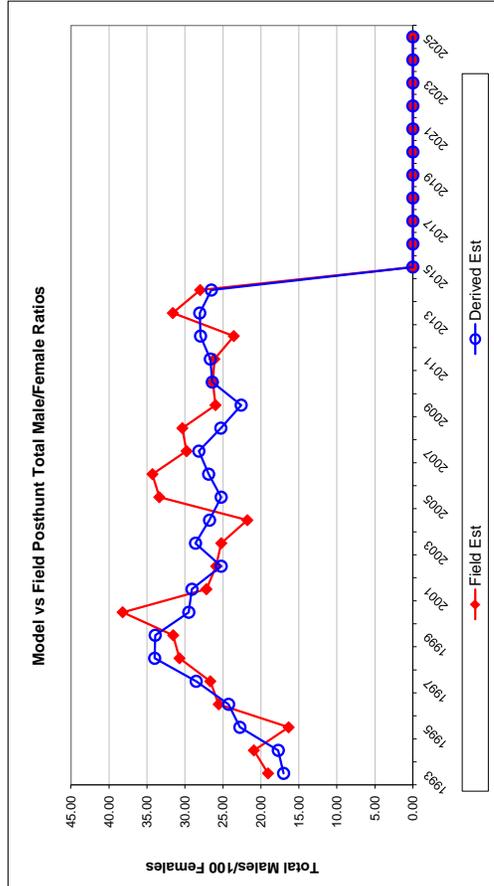
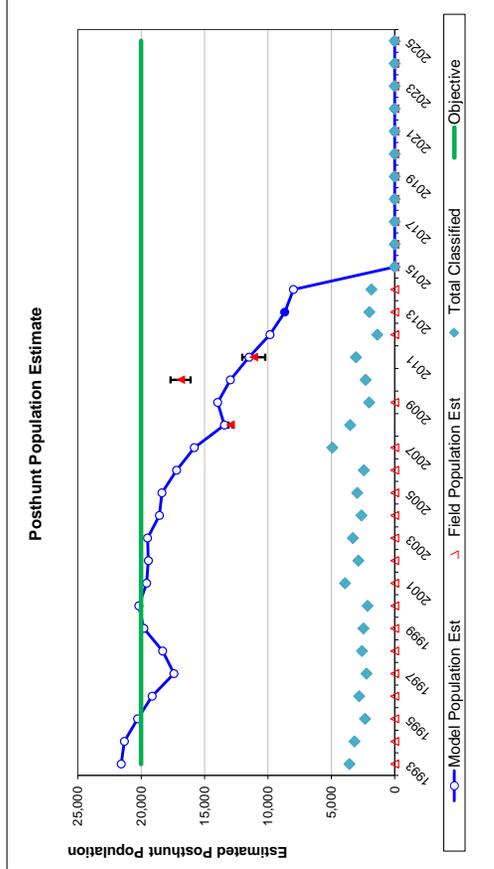
Year	Annual Juvenile Survival Rates		Annual Adult Survival Rates	
	Model Est.	Field Est.	Model Est.	Field Est.
1993	0.40		0.81	
1994	0.40		0.81	
1995	0.40		0.81	
1996	0.40		0.81	
1997	0.70		0.81	
1998	0.70		0.81	
1999	0.70		0.81	
2000	0.68		0.81	
2001	0.70		0.81	
2002	0.70		0.81	
2003	0.70		0.81	
2004	0.70		0.81	
2005	0.70		0.81	
2006	0.65		0.81	
2007	0.40		0.81	
2008	0.70		0.81	
2009	0.53		0.81	
2010	0.40		0.81	
2011	0.40		0.73	0.06
2012	0.40		0.79	0.05
2013	0.40		0.81	
2014	0.50		0.81	
2015				
2016				
2017				
2018				
2019				
2020				
2021				
2022				
2023				
2024				
2025				

Parameters:		Optim cells
Adult Survival =		0.806
Initial Total Male Pop/10,000 =		0.228
Initial Female Pop/10,000 =		1.337

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

Year	Classification Counts						Harvest						
	Juvenile/Female Ratio			Total Male/Female Ratio			Juv	Males	Females	Total Harvest	Segment Harvest Rate (% of		
	Derived Est	Field Est	Field SE	Derived Est	Field Est w/o bull adj	Field SE					Total Males	Females	
1993		44.29	1.71	17.01	19.06	1.02	25	1036	654	1715	33.4	5.1	
1994		60.61	2.36	17.71	20.93	1.20	0	818	0	818	29.8	0.0	
1995		60.21	2.70	22.77	16.35	1.20	0	575	0	575	20.0	0.0	
1996		62.14	2.60	24.25	25.55	1.46	0	799	0	799	26.1	0.0	
1997		53.97	2.60	28.52	26.66	1.65	0	508	0	508	17.0	0.0	
1998		58.87	2.62	33.98	30.72	1.72	0	700	0	700	19.3	0.0	
1999		72.17	3.20	33.91	31.54	1.85	0	1180	0	1180	28.5	0.0	
2000		69.15	3.36	29.49	38.20	2.26	0	1866	0	1866	40.6	0.0	
2001		56.17	2.03	29.07	27.17	1.27	0	1564	0	1564	35.9	0.0	
2002		65.95	2.71	25.23	25.89	1.48	35	1807	386	2228	43.7	4.0	
2003		64.50	2.47	28.61	25.22	1.35	62	1384	395	1841	34.5	4.1	
2004		59.68	2.57	26.76	21.78	1.35	17	1767	420	2204	42.2	4.4	
2005		62.26	2.58	25.23	33.38	1.72	23	1595	277	1895	41.5	3.0	
2006		57.31	2.66	26.88	34.28	1.90	56	1467	620	2143	39.1	6.8	
2007		54.28	1.77	28.17	29.78	1.20	53	1210	554	1817	35.3	6.6	
2008		52.02	2.03	25.27	30.34	1.43	45	902	314	1261	34.1	4.4	
2009		66.86	3.26	22.60	25.98	1.77	21	1142	101	1264	43.0	1.5	
2010		55.42	2.61	26.40	26.32	1.62	7	696	105	808	28.9	1.6	
2011		49.77	2.07	26.66	26.12	1.38	4	518	18	540	24.7	0.3	
2012		55.86	3.37	27.95	23.57	1.95	3	382	46	431	21.9	0.9	
2013		51.74	2.68	28.05	31.59	1.95	0	388	3	391	24.0	0.1	
2014		55.80	2.95	26.53	28.00	1.89	0	388	3	391	26.9	0.1	
2015													
2016													
2017													
2018													
2019													
2020													
2021													
2022													
2023													
2024													
2025													

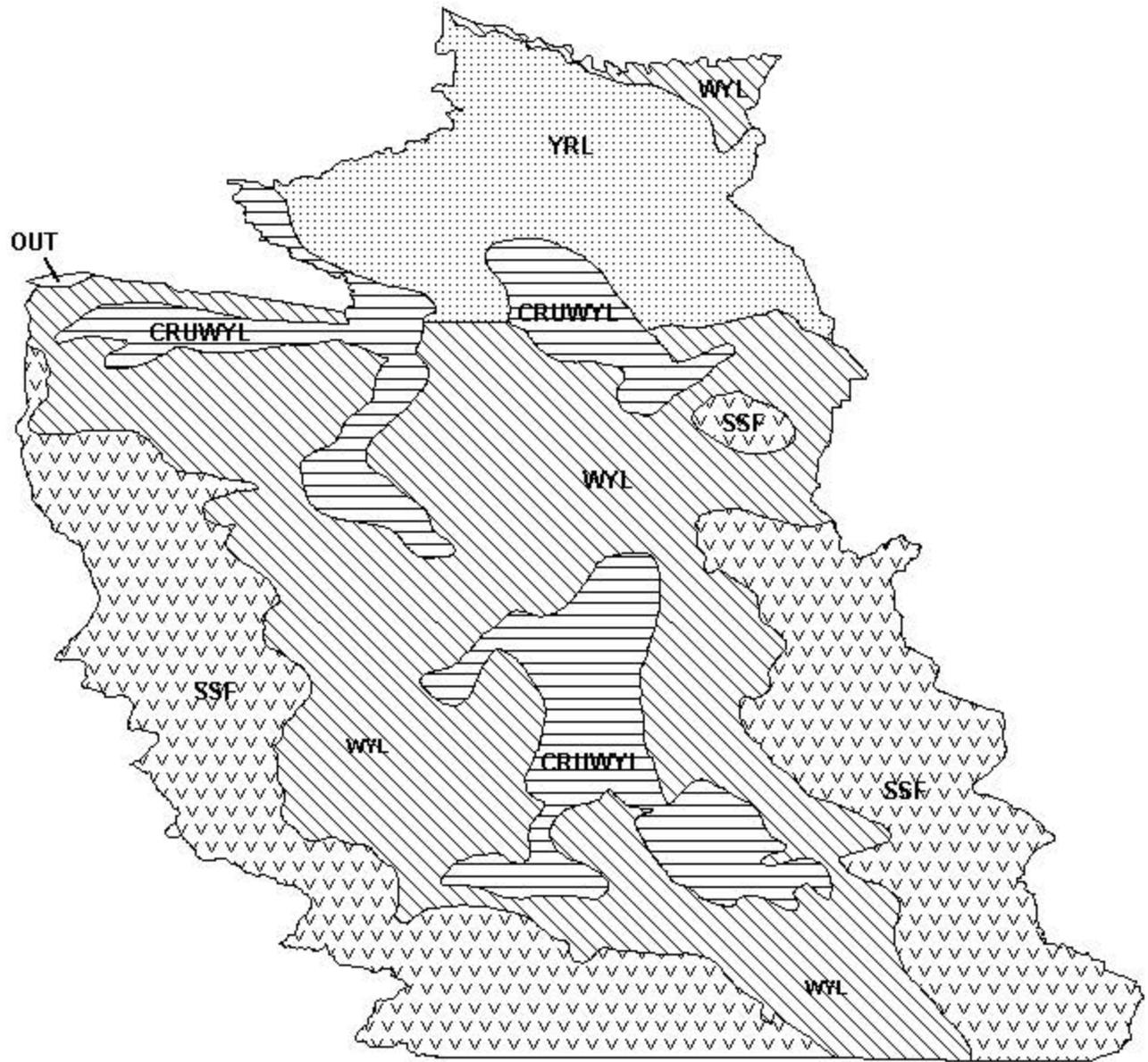
FIGURES



Comments:

The TSJ,CA model was selected to produce the 2013 postseason population estimate. TSJ,SC model aligns very well with 3 abundance estimates for this herd unit and provides for an excellent "anchor" for future model development.

END



Mule Deer (MD541) - Platte Valley
 HA 78-81, 83, 161
 Revised - 12/87



