2016 - JCR Evaluation Form

| SPECIES: Mule Deer HERD: MD207 - PAINTROCK |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
|  |  |  |
| HUNT AREAS: 41, 46-47 |  | PREPARED BY: LESLIE SCHREIBER |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 9,220 | 8,000 | 8,000 |
| Harvest: 803 | 854 | 850 |
| Hunters: 1,550 | 1,444 | 1,400 |
| Hunter Success: 52\% | 59\% | 61 \% |
| Active Licenses: 1,615 | 1,549 | 1,500 |
| Active License Success: 50\% | 55\% | 57 \% |
| Recreation Days: 7,027 | 6,201 | 6,000 |
| Days Per Animal: 8.8 | 7.3 | 7.1 |
| Males per 100 Females 28 | 24 |  |
| Juveniles per 100 Females 68 | 65 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 11000 (8800-13200) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -27.3\% |
| Number of years population has been + or - objective in rece | rend: | 10 |
| Model Date: |  | 02/25/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 15\% | 15\% |
| Males $\geq 1$ year old: | 27\% | 27\% |
| Total: | 14\% | 14\% |
| Proposed change in post-season population: | -3\% | -3\% |

Population Size - Postseason


## Harvest



Number of Active Licenses


Harvest Success
$\square$ MD207-EVHTRSUCCESS $\square$ MD207-EVACTIVESUCCESS


## Active Licenses

$\square$ MD207 - Active Licenses


Days per Animal Harvested


Postseason Animals per 100 Females


## Age Structure of Field Checked Males

MD207 - JUV

MD207- YRLG
MD207-2+


Age Structure Data (Field and Laboratory) - Male

| MD207 - JUV MD207 - YLG $\square$ MD207 - ADLT |
| :--- | :--- |



Age Structure Data (Field and Laboratory ) - Female



2011-2016 Postseason Classification Summary
for Mule Deer Herd MD207 - PAINTROCK


| 2011 | 9,400 | 84 | 0 | 0 | 0 | 193 | 277 | 14\% | 1,078 | 55\% | 612 | 31\% | 1,967 | 1,209 | 8 | 18 | 26 | $\pm 2$ | 57 | $\pm 3$ | 45 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012 | 9,200 | 87 | 0 | 0 | 0 | 147 | 234 | 14\% | 877 | 53\% | 542 | 33\% | 1,653 | 1,060 | 10 | 17 | 27 | $\pm 2$ | 62 | $\pm 4$ | 49 |
| 2013 | 9,500 | 98 | 0 | 0 | 0 | 141 | 239 | 15\% | 789 | 49\% | 570 | 36\% | 1,598 | 904 | 12 | 18 | 30 | $\pm 3$ | 72 | $\pm 5$ | 55 |
| 2014 | 9,000 | 94 | 0 | 0 | 0 | 85 | 179 | 13\% | 704 | 51\% | 499 | 36\% | 1,382 | 1,167 | 13 | 12 | 25 | $\pm 3$ | 71 | $\pm 5$ | 57 |
| 2015 | 9,000 | 115 | 96 | 56 | 5 | 0 | 272 | 15\% | 864 | 47\% | 703 | 38\% | 1,839 | 1,724 | 13 | 18 | 31 | $\pm 3$ | 81 | $\pm 5$ | 62 |
| 2016 | 8,000 | 71 | 87 | 63 | 4 | 0 | 225 | 13\% | 919 | 53\% | 593 | 34\% | 1,737 | 1,214 | 8 | 17 | 24 | $\pm 2$ | 65 | $\pm 4$ | 52 |

2017 HUNTING SEASONS
PAINTROCK MULE DEER HERD (MD207)

| Hunt <br> Area | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 41 |  | Oct. 15 | Oct. 24 |  | General | Antlered deer |
| 41 |  | Oct. 25 | Oct. 31 |  | General | Antlerless deer valid on or within one-half ( $1 / 2$ ) mile of irrigated land |
| 41 | 3 | Nov. 1 | Nov. 30 | 75 | Limited quota | Any white-tailed deer |
| 41 | 6 | Oct. 15 | Nov. 15 | 150 | Limited quota | Doe or fawn valid on or within one- half ( $1 / 2$ ) mile of irrigated land |
| 41 | 8 | Nov. 1 | Nov. 30 | 75 | Limited quota | Doe or fawn white-tailed deer |
| 46 |  | Oct. 15 | Oct. 24 |  | General | Antlered deer |
| 47 |  | Oct. 15 | Oct. 24 |  | General | Antlered deer |
| 47 |  | Oct. 25 | Oct. 31 |  | General | Antlerless deer valid on or within one-half ( $1 / 2$ ) mile of irrigated land |
| $\begin{gathered} 47, \\ 51 \\ \hline \end{gathered}$ | 3 | Nov. 1 | Nov. 30 | 75 | Limited quota | Any white-tailed deer |
| 47 | 6 | Oct. 15 | Nov. 15 | 100 | Limited quota | Doe or fawn valid on or within one-half ( $1 / 2$ ) mile of irrigated land |
| 47 | 8 | Nov. 1 | Nov. 30 | 50 | Limited quota | Doe or fawn white-tailed deer |

## Region $\mathbf{R}$ nonresident quota $=\mathbf{7 5 0}$ licenses

| Special Archery Season Hunt Areas |  | Season Dates |  |
| :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |
| 41, 46, 47 |  | Sep. 1 | Sep. 30 |
| Hunt Area | License Type | Quota change from 2016 |  |
| 47, 51 | 3 | +25 |  |
| Herd Unit Total | 3 | +25 |  |

## Management Evaluation

Current Postseason Population Management Objective: 11,000
Management Strategy: Recreational
2016 Postseason Population Estimate: ~8,000
2017 Proposed Postseason Population Estimate: ~7,700
2016 Hunter Satisfaction: 71\% Satisfied, 19\% Neutral, 10\% Dissatisfied

## Herd Unit Issues

The population objective for the Paintrock mule deer herd was originally set at 13,000 deer in 1995 when the herd unit was created from two pre-existing herd units. After a public review process, the population objective was lowered to 11,000 deer in 2013, because the population was on a downward trajectory and an objective of 13,000 deer was thought to be unattainable after years of drought.

Human activities are rarely severe enough in this herd unit to affect deer survival and productivity. Bentonite mining and oil/gas development occur on the west side of the herd unit where habitat is marginal. Farming has altered riparian habitat on private land and increased available forage, but landowner tolerance of deer on cropland is low. Antlerless deer hunting seasons are driven by landowner complaints. The majority of this herd unit is public land.

## Weather

Climatic factors affect this deer herd more than human-caused factors. Drought and severe winters are the most important factors influencing survival and productivity of this deer herd. Drought conditions occurred in 2000-04 and 2012. Good to excellent growing season conditions occurred in 2013-15. Below average temperatures and above average snowfall occurred in December and January, but moderated in February. December precipitation levels ranked $8^{\text {th }}$ highest out of the last 122 years.

## MD207 Annual and Growing Season Precipitation with 30 Year Averages



## Habitat

Two sagebrush browse transects were established in this herd unit in 2004. One transect in the Brokenback/Renner area has been of limited utility in gauging browsing levels since production has been limited, even in non-drought years. Utilization of sagebrush along that transect has ranged from $<1 \%$ to $3 \%$. The other transect, Alkali, is in the northern portion of the herd unit. That site is only slightly more productive than Brokenback. In 2016, utilization increased to an average of $17 \%$, likely as a result of deep snow.

# Alkali Utilization and Pellet Counts 



## Field Data

Low fawn:doe ratios were observed during the drought of 2000-04 averaging 54 fawns: 100 does. In years with "normal" precipitation (2005-12), the average was 61 fawns: 100 does. Fawn ratios in 2013-15 were >70:100. Unsworth et al. (1999) suggested that a winter fawn:doe ratio above 66:100 would result in an increasing population. For 2015, the model suggests an increasing population agreeing with Unsworth et al. (1999). For 2016 specifically, we observed 65 fawns: 100 does.

The total number of deer observed during classification surveys has been declining over the past 20 years. In 1993 and 1994, 3,000 and 3,500 deer were surveyed, respectively. Numbers dropped to 2,500 or below for the remainder of the 1990s. During the drought of 2000-04, around 2,000 deer were observed. Number of deer classified has rarely been over 2,000 deer since 2005 with the exception of 2007 when 2,865 deer were classified. In 2016, about 1,700 deer were classified. Farmland is surveyed from the ground and higher elevation winter ranges are surveyed from a helicopter.

Maintaining buck:doe ratios between 25-29:100 is a goal for recreational management of this herd unit. During the mid 1980s, ratios increased from 15:100 to around 30:100 in the early 1990s. A gradual decline in buck:doe ratios occurred through the late 1990s to 16:100 in 2000, followed by an increase to $30: 100$ in the mid-2000s. Between 2009-14, the buck ratio has been stable at approximately 27:100. In 2015, the buck ratio increased to 31:100 due to excellent productivity. At the same time, the general license was changed from "any deer" to "antlered deer" in an effort to arrest the previous downward trend. The buck ratio stabilized at 24:100 in 2016.

## Harvest Data

Buck harvest can be dependent on hunting season regulations, number of bucks available in the population, hunter numbers, snow depth and weather at higher elevations affecting migration, and access to public land from roads affected by snow depth. Structure of the hunting seasons in this herd unit has remained fairly constant over the past 20 years. General licenses have been open Oct. 15 to Nov. 4. In some years, some Hunt Areas have changed between "any deer" and "antlered deer" depending on trends in previous year's sex and age ratios. When the buck:doe ratio dropped to $16: 100$ in 2001, a 4-point antler restriction was enacted during the 2002 and

2003 hunting seasons. Buck harvest decreased significantly and hunter effort increased those two years. Nonresident hunters typically take $60 \%$ of all harvested bucks but only make up $40 \%$ of all hunters. Many nonresidents harvest the first buck they see; thus, many small ( $>20$ " antler spread) deer are harvested. When Region R was created in 1996, the nonresident quota was 1,500 hunters. That level was adjusted to 1,000 in 2004 due to declining buck ratios and again in 2014 to 750. Although this herd unit's buck ratios have historically been within the range of recreational management, many of these bucks are young and/or small ( $>20$ " antler spread). A vocal contingent of hunters are dissatisfied with the lack of mature bucks and consistently advocate for an antler point restriction.

Doe/fawn licenses were issued in response to landowner concerns of too many deer in crops and may reflect fluctuations in population level. In the 1980s through early 1990s, 600-1,000 doe/fawn licenses were issued. Between 1995-99, 0-50 doe/fawn licenses were issued. Number of doe/fawn licenses increased to between 350-500 during 1997-2011, and 100-250 during 201216.

## Population

Spreadsheet models replaced POP-II for estimating populations of big game species. The timespecific juvenile, constant adult (TSJ,CA) survival model estimated this population was at objective ( 13,000 deer) through the late 1990s. Beginning with the extended drought in 2000-04, this population began decreasing, except for a spike in 2007. By 2012, the population had reached a low of 7,500 deer, then increased slightly to 8,000 by post-season 2016. While the constant juvenile, constant adult survival model had the lowest AIC score (116), the TSJ, CA model was chosen, because the AIC score (160) is within the same order of magnitude and it biologically makes sense that fawn survival varies temporally. Survival constraints matched normal criteria. This model performs fair and the results are biologically defensible, but the model could benefit from a sample-based population estimate with standard errors.

## Management Summary

Several indices suggest the Paintrock mule deer population was in decline since the early 1990s, but that trend may have temporarily stabilized with recent high fawn production. Buck:doe ratios have recently remained stable; however, that may be more of a factor of less does in the population. Many hunters have urged more conservative buck seasons (4-points or better) to increase buck numbers to previous levels and to increase number of trophy ( $>25^{\prime \prime}$ antler width) bucks available. Placing a point restriction on the general license season and/or reducing the nonresident quota are usually only proposed if buck:doe ratios fall below 20:100. In this case, buck: doe ratios have been stable for the past five years, averaging 27:100.

## Literature Cited

Unsworth, J.W., D.F. Pac, G. C. White, and R.M. Bartman. 1999. Mule deer survival in Colorado, Idaho, and Montana. Journal of Wildlife Management 36:315-326.


Mule Deer (MD207) - Paintrock
HA 41, 44-47, 49
Revised - $3 / 96$


2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD208-SOUTHWEST BIGHORNS |  |  |
| HUNT AREAS: 35-37, 39-40, 164 |  | PREPARED BY: BART KROGER |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 10,320 | 11,798 | 10,707 |
| Harvest: 1,156 | 1,258 | 1,350 |
| Hunters: 2,072 | 2,039 | 2,100 |
| Hunter Success: 56\% | 62\% | 64\% |
| Active Licenses: 2,178 | 2,143 | 2,200 |
| Active License Success: 53\% | 59\% | 61\% |
| Recreation Days: 9,176 | 8,877 | 9,000 |
| Days Per Animal: 7.9 | 7.1 | 6.7 |
| Males per 100 Females 31 | 41 |  |
| Juveniles per 100 Females 66 | 67 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 16000 (12800-19200) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -26.3\% |
| Number of years population has been + or - objective in rece | rend: | 1 |
| Model Date: |  | 05/05/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 4\% | 5\% |
| Males $\geq 1$ year old: | 30\% | 35\% |
| Total: | 10\% | 11\% |
| Proposed change in post-season population: | +3\% | -10\% |

## Population Size - Postseason



## Harvest



Number of Active Licenses


Harvest Success
$\square$ MD208-EVHTRSUCCESS $\square$ MD208-EVACTIVESUCCESS


## Active Licenses

$\square$ MD208 - Active Licenses


Days per Animal Harvested
$\square$ MD208- Days


Postseason Animals per 100 Females


2011-2016 Postseason Classification Summary
for Mule Deer Herd MD208 - SOUTHWEST BIGHORNS

|  |  | MALES |  |  |  |  |  |  | FEMALES |  |  | JUVENILES |  | Tot Cls | Cls <br> Obj | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Post Pop | Ylg | $\begin{gathered} 2+ \\ \text { Cls } 1 \end{gathered}$ | $\begin{gathered} 2+ \\ \mathrm{Cls} 2 \end{gathered}$ | $\begin{gathered} 2+ \\ \mathrm{Cls} 3 \end{gathered}$ | $\begin{gathered} 2+ \\ \text { UnCls } \end{gathered}$ | Total | \% |  | Total | \% | Total | \% |  |  | Ylng | Adult | Total | $\begin{aligned} & \text { Conf } \\ & \text { Int } \end{aligned}$ | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | $\begin{aligned} & \text { Conf } \\ & \text { Int } \end{aligned}$ | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |


| 2011 | 14,750 | 56 | 0 | 0 | 0 | 181 | 237 | $17 \%$ | 721 | $52 \%$ | 419 | $30 \%$ | 1,377 | 1,094 | 8 | 25 | 33 | $\pm 3$ | 58 | $\pm 4$ | 44 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012 | 13,613 | 56 | 0 | 0 | 0 | 141 | 197 | $16 \%$ | 633 | $52 \%$ | 383 | $32 \%$ | 1,213 | 1,152 | 9 | 22 | 31 | $\pm 3$ | 61 | $\pm 5$ | 46 |
| 2013 | 12,098 | 76 | 0 | 0 | 0 | 153 | 229 | $15 \%$ | 858 | $55 \%$ | 464 | $30 \%$ | 1,551 | 918 | 9 | 18 | 27 | $\pm 2$ | 54 | $\pm 4$ | 43 |
| 2014 | 14,219 | 93 | 40 | 40 | 6 | 83 | 262 | $14 \%$ | 882 | $49 \%$ | 674 | $37 \%$ | 1,818 | 1,584 | 11 | 19 | 30 | $\pm 3$ | 76 | $\pm 5$ | 59 |
| 2015 | 15,885 | 107 | 102 | 67 | 16 | 40 | 332 | $16 \%$ | 961 | $47 \%$ | 747 | $37 \%$ | 2,040 | 814 | 11 | 23 | 35 | $\pm 3$ | 78 | $\pm 5$ | 58 |
| 2016 | 17,496 | 112 | 175 | 101 | 17 | 0 | 405 | $20 \%$ | 979 | $48 \%$ | 659 | $32 \%$ | 2,043 | 1,406 | 11 | 30 | 41 | $\pm 3$ | 67 | $\pm 4$ | 48 |

2017 HUNTING SEASONS
SOUTHWEST BIGHORNS MULE DEER HERD (MD208)

| Hunt <br> Area | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 35 |  | Oct. 15 | Oct. 31 |  | General | Any deer |
| 36 | 1 | Oct. 15 | Oct. 31 | 325 | Limited quota | Antlered mule deer or any white-tailed deer |
| 36 | 8 | Oct. 15 | Oct. 31 | 25 | Limited quota | Doe or fawn white-tailed deer |
| 37 | 1 | Oct. 1 | Oct. 25 | 200 | Limited quota | Antlered deer |
| 37 | 3 | Nov. 1 | Nov. 30 | 25 | Limited quota | Any white-tailed deer |
| 37 | 6 | Sep. 1 | Nov. 15 | 150 | Limited quota | Doe or fawn valid on or within one-half $(1 / 2)$ mile of irrigated land |
| 39 |  | Oct. 15 | Oct. 25 |  | General | Antlered deer |
| 40 |  | Oct. 15 | Oct. 31 |  | General | Antlered deer valid on national forest; any deer off national forest |
| 40 | 6 | Oct. 15 | Oct. 31 | 200 | Limited quota | Doe or fawn |
| 40 | 8 | Oct. 15 | Nov. 30 | 100 | Limited quota | Doe or fawn white-tailed deer |
| 164 |  | Oct. 1 | Oct. 10 |  | General | Any deer |
| 164 | 3 | Nov. 1 | Nov. 30 | 25 | Limited quota | Any white-tailed deer |
| 164 | 6 | Oct. 25 | Nov. 15 | 100 | Limited quota | Doe or fawn valid on or within one-half $(1 / 2)$ mile of irrigated land |

Region M Nonresident general license quota - 800 licenses

| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| $35,36,37,39,40,164$ | Sep. 1 | Sep. 30 |


| Hunt Area | Type | Quota change from 2016 |
| :---: | :---: | :---: |
| 36 | 1 | -50 |
| 37 | 6 | +50 |
| 40 | 6 | +100 |
| 40 | 8 | +50 |
| 164 | 6 | +25 |
| Total | $\mathbf{1}$ | $\mathbf{- 5 0}$ |
|  | $\mathbf{6}$ | $\mathbf{+ 1 7 5}$ |
|  | $\mathbf{8}$ | $\mathbf{+ 5 0}$ |

## Management Evaluation

Current Postseason Population Management Objective: 16,000
Management Strategy: Recreational
2016 Postseason Population Estimate: 11,800
2017 Proposed Postseason Population Estimate: 10,700
2016 Hunter Satisfaction: 66\% satisfied, $19 \%$ neutral, $15 \%$ dissatisfied

## Herd Unit Issues

The herd unit is about $70 \%$ public land and $30 \%$ private land. Deer densities are typically higher in the mid to upper elevations, while the lower elevation desert areas support fewer deer. Poor habitat conditions, long-term drought, and crop damage continue to be major management concerns for this herd. Chronic wasting disease and hemorrhagic disease are both common in this deer herd. Hunter access in the southern and eastern portion of this herd is very difficult because of restrictive private lands. The herd objective and management strategy was evaluated and approved in 2014. A sightability survey was flown in February 2017, which resulted in a population estimate of about 11,800 deer, nearly 5,000 fewer deer than previous year model estimates.

## Weather

The winters of 2010/11, 2012/13 and 2013/14 were severe enough in the southern Bighorn Basin to have caused significant mortality in this herd, thus keeping this population well below objective. It wasn't until above normal spring and early summer moisture in 2014 and 2015 that this herd started showing improving numbers, mainly because of record high fawn production. The 2016 spring moisture was favorable, but conditions dried considerable through the summer. The 2016/17 winter started out severe, with deep snow cover and below normal temperatures persisting through early February. By mid February, most winter ranges were free of snow with moderate winter temperatures. These conditions persisted through the rest of the winter, with occasional snowfall events occurring into April.

## Habitat

Habitat conditions have declined in this herd unit since the onset of drought in the 1990's. Much of the herd unit is supported by vast areas of cheatgrass, due to large wildfires in 1996. Little to no regeneration of sagebrush and native herbaceous species has occurred since those fires. Two sagebrush transects were established in this herd unit in September 2004 (Appendix A). Overall, annual production (leader growth) for these transects has average around 2.0 cm . Winter utilization remains low at about $10 \%$ for these transects. Good spring moisture since 2014 has helped improve range conditions, particularly desert forb production.

## Field Data

Both aerial and ground surveys are used in obtaining post-season classification data for this deer herd. Adequate sample sizes are typically exceeded, mainly because routine classification routes for each hunt area are maintained. Past post-season fawn ratios have remained fairly consistent in this herd unit, averaging 60 fawns: 100 does. However, since 2014 fawn ratios have increased to an annual average of 74:100. This has resulted in an overall increase in the deer population. This is also reflected in the post-season classification sample sizes, which have increased by $68 \%$ since 2012. Buck ratios typically average around 32:100, but in 2016 the ratio jumped to 41:100.

## Harvest Data

Recent harvest statistics further support increasing deer numbers in this herd. Since 2013, overall buck harvest has increased by $27 \%$, while hunter success has increased from $50 \%$ in 2013 to $62 \%$ in 2016 . These harvest trends are reflective of field personnel perceptions that deer numbers have increased and hunting conditions have improved. Doe/fawn harvest has remained low the past few years with an annual harvest of about 225 since 2013 . Prior to that, the annual average harvest was about 400 does and fawns.

## Population

The Time-Specific Juvenile and Constant Adult Survival (TSJ, CA) spreadsheet model best represents the long-term population trend for this herd. Although the model has the highest AIC ( $\mathrm{n}=132$ ), it also has the best fit $(\mathrm{n}=3$ ) of all three models. The model supports an adequate representation of recent trends in the population and best reflects the current perceptions of field personnel, harvest statistics and classification sample sizes. Overall, the model is considered a good representation of herd trend and population.

A mule deer sightability survey was flown in this herd unit in February 2017. Survey flight summary and results are listed below. Nine days ( 70.9 hrs ) were needed to complete the survey, at a cost of $\$ 60,555$ ). Sixty-two (62) of the 79 units were flown in the herd unit, including 14 low density units, 11 medium density units and 37 high density units. A total of 8,088 mule deer were observed, which resulted in an abundance estimate of $11,442( \pm 332)$ mule deer for the herd. Results of the sightability survey indicated the current spreadsheet model over estimated mule deer numbers by about $44 \%$. Based on these results, and the fact mule deer numbers have improved in recent years, it is unlikely current management strategies would allow this herd to reach objective levels of 16,000 deer. Therefore, a revision to lower the herd unit objective will likely be needed in the future.

# 2016 MD208 - Southwest Bighorns Mule Deer Sightability Summary 

Survey Dates:
Survey Time (Hrs)
Survey Cost:
Flight Service:
Aircraft:
Observers:
Weather Conditions:
Temperature ( ${ }^{\circ} \mathbf{F}$ ):
Cloud Cover (\%):
Wind Speed (MPH):

5/7/2017-5/26/2017
70.9
\$ 60,555
SKY AVIATION CORP.
Jet Ranger
Kroger, Lentsch, Desomber, Brown, Anderson, Beecham, Frude
$10^{\circ}-60^{\circ}$
0-100\%
0-20

## Management Summary

With improving deer numbers, and the likelihood of damage issues to arise, areas 37, 40 and 164 will have increased license quotas for doe/fawn hunting. Because hunt area 36 changed to limited quota in 2016, the Region M nonresident quota will again remain at 800 licenses to compensate for the displacement of 170 nonresident general hunters. No changes to the general license hunt area seasons will occur. Area 36 will have a slight reduction of 50 type 1 licenses due to a higher than expected harvest in 2016. The projected 2017 harvest is about 1,350 deer, and a post-season 2017 estimate of around 10,700 deer.

```
Aerial Survey for Windows, Version 1.00 Beta 6.1.1 (17-Sep-1999)
Wednesday, March 29, 2017 10:25 AM
Model: Mule Deer, Hiller 12-E, Idaho (Spring)
[Files]
Title = C:\Program Files\IDFG\Aerial Survey\MD208_K.ttl
Summary = C:\Program Files\IDFG\Aerial Survey\MD208_K.sum
```


## MD208_Kroger_Strata

## Section 1: Summary of Raw Counts



## Section 2: Summary of Raw Counts for Perfect Visibility Model

This table projects the number of animals that would have been counted if every unit had been flown and visibility had been perfect (no animals obscured by vegetation, etc.)

No of Units
Strat Popn Sample Total

| 1 | 27 | 14 | 257 |
| :---: | :---: | :---: | :---: |
| 2 | 15 | 11 | 813 |
| 3 | 37 | 37 | 7359 |
| Total | 79 | 62 | 8428 |

Section 3: Estimates for Total Number

Total

|  | Number of UnitsPopn. Sample |  |  | -------- Variance |  |  | Bound |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Stratum |  |  | Estimate | Sampling | Sightability | Model | 95\% |
| 1 | 27 | 14 | 335 | 10430 | 1218 | 134 | 213 |
| 2 | 15 | 11 | 1099 | 21441 | 6530 | 775 | 332 |
| 3 | 37 | 37 | 10008 | 0 | 61578 | 7741 | 516 |
| Total | 79 | 62 | 11,442 | 31871 | 69326 | 8650 | 650 |



| SUBUNIT | KROGER STRATA | RAW SUBUNIT TOTAL |
| :---: | :---: | :---: |
| 35.01 | High | 80 |
| 35.02 | High | 553 |
| 35.03 | OUT |  |
| 35.04 | OUT |  |
| 36.01 | Low | 2 |
| 36.02 | High | 178 |
| 36.03 | OUT |  |
| 36.04 | OUT |  |
| 36.05 | Low | 0 |
| 36.06 | Low | 7 |
| 36.07 | Medium | 39 |
| 36.08 | Low | 0 |
| 36.09 | OUT |  |
| 36.10 | Low | 0 |
| 36.11 | Low | 0 |
| 36.12 | Low | 0 |
| 36.13 | Low | 0 |
| 36.14 | Low | 0 |
| 36.15 | OUT |  |
| 36.16 | OUT |  |
| 36.17 | OUT |  |
| 36.18 | OUT |  |
| 36.19 | Medium | 69 |
| 36.20 | Medium | 12 |
| 37.01 | High | 166 |
| 37.02 | High | 435 |
| 37.03 | Medium | 126 |
| 37.04 | Low | 0 |
| 37.05 | Low | 0 |
| 37.06 | Medium | 152 |
| 37.07 | High | 256 |
| 37.08 | High | 0 |
| 37.09 | Medium | 85 |
| 37.10 | Medium | 26 |
| 37.11 | Medium | 0 |
| 37.12 | High | 331 |
| 37.13 | High | 209 |
| 37.14 | High | 68 |
| 37.15 | OUT |  |
| 37.16 | Low | 0 |
| 37.17 | High | 94 |
| 39.01 | High | 414 |
| 39.02 | High | 61 |
| 39.03 | Medium | 0 |
| 39.06 | Low | 0 |


| SUBUNIT | KROGER <br> STRATA | RAW <br> SUBUNIT <br> TOTAL |
| :---: | :---: | ---: |
| 39.07 | Medium | 0 |
| 39.08 | Medium | 6 |
| 40.01 | High | 322 |
| 40.02 | Medium | 0 |
| 40.03 | High | 70 |
| 40.04 | Low | 11 |
| 40.05 | Low | 13 |
| 40.06 | Low | 0 |
| 40.07 | High | 29 |
| 40.08 | Medium | 0 |
| 40.09 | High | 97 |
| 40.11 | Low | 0 |
| 40.12 | Medium | 39 |
| 40.13 | High | 76 |
| 40.14 | Low | 4 |
| 40.15 | Medium | 42 |
| 40.16 | High | 166 |
| 40.17 | Low | 13 |
| 40.18 | Low | 15 |
| 40.19 | Low | 68 |
| 40.20 | High | 340 |
| 40.21 | High | 174 |
| 40.22 | High | 382 |
| 40.23 | High | 267 |
| 40.24 | High | 504 |
| 40.25 | High | 397 |
| 164.01 | High | 269 |
| 164.02 | High | 98 |
| 164.03 | High | 83 |
| 164.04 | High | 63 |
| 164.05 | High | 36 |
| 164.06 | High | 353 |
| 164.07 | Low | 0 |
| 164.08 | Low | 0 |
| 164.09 | High | 60 |
| 164.10 | High | 189 |
| 164.11 | Low | 0 |
| 164.12 | High | 90 |
| 164.13 | High | 35 |
| 164.14 | Low | 0 |
| 164.15 | Low | 0 |
| 164.16 | High | 411 |
| 164.17 | High | 3 |
| 164.18 | Low | 0 |
|  |  |  |


| KROGER STRATA |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: |
| STRATA | ALL | SAMPLED | RANGE | AVE |
| LOW | 27 | 14 | 0-68 | 10 |
| MEDIUM | 15 | 11 | 0-152 | 54 |
| HIGH | 37 | 37 | 0-553 | 199 |
|  | 79 | 62 |  |  |







Revised 4/2006

2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD209-BASIN |  |  |
| HUNT AREAS: 125, 127 |  | PREPARED BY: BART KROGER |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 2,386 | 2,822 | 2,943 |
| Harvest: 177 | 140 | 175 |
| Hunters: 321 | 318 | 350 |
| Hunter Success: 55\% | 44\% | 50 \% |
| Active Licenses: 346 | 318 | 350 |
| Active License Success: 51\% | 44\% | 50 \% |
| Recreation Days: 1,376 | 1,332 | 1,400 |
| Days Per Animal: 7.8 | 9.5 | 8 |
| Males per 100 Females 33 | 40 |  |
| Juveniles per 100 Females 63 | 68 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 3600 (2880-4320) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -21.6\% |
| Number of years population has been + or - objective in rece | rend: | 15 |
| Model Date: |  | 02/17/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 0\% | 2\% |
| Males $\geq 1$ year old: | 22\% | 20\% |
| Total: | 5\% | 6\% |
| Proposed change in post-season population: | +6\% | +3\% |

## Population Size - Postseason



## Harvest



Number of Active Licenses

Harvest Success
$\square$ MD209-EVHTRSUCCESS $\square$ MD209-EVACTIVESUCCESS


## Active Licenses

$\square$ MD209 - Active Licenses


Days per Animal Harvested
$\square$ MD209-Days


Postseason Animals per 100 Females


## 2011-2016 Postseason Classification Summary

for Mule Deer Herd MD209-BASIN


## 2017 HUNTING SEASONS BASIN MULE DEER HERD (MD209)

| Hunt <br> Area | Type | Season Dates <br> Opens |  | Closes | Quota | License |
| :---: | :---: | :---: | :---: | :---: | :--- | :--- |

Region X Nonresident General license quota - 300 licenses

| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| 125,127 | Sep. 1 | Sep. 30 |


| Hunt Area | Type | Quota change from 2016 |
| :---: | :---: | :---: |
| 125 | 6 | +50, new license type |
| HU Total | $\mathbf{6}$ | +50, new license type |

## Management Evaluation

Current Postseason Population Management Objective: 3,600
Management Strategy: Recreational
2016 Postseason Population Estimate: 2800
2017 Proposed Postseason Population Estimate: 2900
2016 Hunter Satisfaction: 64\% satisfied, 14\% neutral, 22\% dissatisfied

## Herd Unit Issues

Deer densities in this herd unit are higher on and around private irrigated lands, whereas the dry desert areas support fewer deer. Poor habitat conditions, long-term drought, CWD, and recent EHD outbreaks continue to be major management concerns for this herd. Much of the herd unit is arid desert shrubland, thus limiting the options for vegetation treatment because of the potential for cheatgrass invasion. Since 2006, seven guzzlers have been installed to provide additional water sources for deer in this herd unit.

## Weather

The winters of 2010/11, 2012/13 and 2013/14 were severe enough in the southern Bighorn Basin to have caused significant mortality in this herd, thus keeping this population below objective. It wasn't until above normal spring and early summer moisture in 2014 and 2015 that this herd started showing improving numbers. The 2016 spring moisture was also favorable in this herd, but dry conditions persisted through the summer. The 2016/17 winter has been semi-severe, with deep snow cover and below normal temperatures persisting through early February, however since then significant snow melt has occurred and temperatures have moderated.

## Habitat

Most of the herd unit is within a 5-9" precipitation zone. Limited opportunities exist to increase forage quality of native plant communities due to the prevalence of cheatgrass. Drought conditions have also affected available water in many stock reservoirs and perennial streams. One sagebrush transect (5-Mile Creek) was established in this herd unit in 2004 (Appendix A). Average sagebrush leader growth since 2008 has average 3 cm , with utilization levels at about $17 \%$. Overall, habitat conditions in this herd unit are considered poor to fair at best because of past long-term drought. Until normal moisture regimes return, herd growth and survival will be limited by current habitat conditions.

## Field Data

Aerial classifications surveys are used in obtaining post-season buck and fawn ratio for this deer herd. Routine classification routes for each hunt area have been maintained in order to reflect general trends in deer numbers over time. Record high fawn ratios have been observed in the herd the past three years, with a 3-year average of $72: 100$. Prior to that, the average fawn ratio was 54:100. The number of deer classified in recent years has also increased, over $100 \%$ since 2013. This recent increase in deer is the result of record high fawn ratios in 2014, 2015 and 2016. The buck ratio has averaged around 33:100 the past 6-years.

Spotlight surveys along Gooseberry Creek in area 125 have also been used to monitor relative trends in deer densities along Gooseberry Creek. Based on these surveys, the number of deer counted has stayed fairly stable through the 2000 's, with roughly about 100 deer being observed annually in recent years. However, the 2015 and 2016 survey resulted in 150 and 244 deer being observed, respectively. These past trends along with the recent increase in deer observed are reflective of field personnel perceptions of this deer herd.

## Harvest Data

Recent male harvest statistics do support an improving deer population. Since 2014, overall \% hunter success in areas 125 and 127 have improved by $13 \%$ and $27 \%$, respectively, while overall buck harvest in the herd unit improved by $33 \%$. Most hunters and landowners agree deer numbers are improving. Based on the 2014 hunter satisfaction survey, only $50 \%$ of the hunters surveyed in this herd unit indicted they were either satisfied or very satisfied with their overall hunting experience, whereas in 2016, $64 \%$ were satisfied or very satisfied. Again, this is likely the result of recent improving deer numbers due to record high fawn ratios and survival.

## Population

The Constant Juvenile \& Adult Survival (CJ, CA) spreadsheet model was chosen to represent this herd based on its population trend. This model has the second lowest AIC value ( $\mathrm{n}=86$ ) of all the models, yet its trends reflect that of field personnel perceptions, along with most hunters and landowners. The model is considered to be a fair to good representative of herd trend and population estimate, mainly because it tracks well with classification sample sizes and reflects an increasing population.

## Management Summary

Because of improving deer numbers, but the fact we are still below objective, 50 Type 6 licenses will be added to hunt area 125 to address potential damage issues and landowner concerns. The projected 2017 harvest is 175 deer, with a 2017 post-season population of 2900 deer, or $20 \%$ below objective.



```
主
```



2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :--- | :---: | :---: |
| HERD: MD210 - GREYBULL RIVER |  |  |
| HUNT AREAS: 124, 165 |  | PREPARED BY: LESLIE |
|  |  |  |
|  |  |  |

Population Size - Postseason


## Harvest



Number of Active Licenses


Harvest Success
$\square$ MD210-EVHTRSUCCESS $\square$ MD210-EVACTIVESUCCESS


## Active Licenses

$\square$ MD210 - Active Licenses


Days per Animal Harvested
$\square$ MD210 - Days


Postseason Animals per 100 Females

Age Structure of Field Checked Males
$\square$ MD210-JUV $\square$ MD210-YRLG MD210-2+

Age Structure Data (Field and Laboratory) - Male

|  |
| :---: |



Age Structure Data (Field and Laboratory ) - Female



## 2011-2016 Postseason Classification Summary

for Mule Deer Herd MD210 - GREYBULL RIVER


| 2011 | 4,500 | 47 | 0 | 0 | 0 | 113 | 160 | 16\% | 530 | 53\% | 315 | 31\% | 1,005 | 1,054 | 9 | 21 | 30 | $\pm 3$ | 59 | $\pm 5$ | 46 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012 | 4,200 | 65 | 0 | 0 | 0 | 94 | 159 | 15\% | 571 | 54\% | 320 | 30\% | 1,050 | 959 | 11 | 16 | 28 | $\pm 3$ | 56 | $\pm 4$ | 44 |
| 2013 | 4,300 | 47 | 0 | 0 | 0 | 95 | 142 | 17\% | 416 | 48\% | 301 | 35\% | 859 | 915 | 11 | 23 | 34 | $\pm 4$ | 72 | $\pm 6$ | 54 |
| 2014 | 4,000 | 69 | 0 | 0 | 0 | 114 | 183 | 14\% | 525 | 40\% | 590 | 45\% | 1,298 | 1,331 | 13 | 22 | 35 | $\pm 3$ | 112 | $\pm 7$ | 83 |
| 2015 | 4,600 | 68 | 71 | 50 | 4 | 6 | 199 | 19\% | 454 | 43\% | 410 | 39\% | 1,063 | 1,529 | 15 | 29 | 44 | $\pm 4$ | 90 | $\pm 7$ | 63 |
| 2016 | 4,600 | 38 | 51 | 26 | 3 | 3 | 121 | 14\% | 347 | 41\% | 383 | 45\% | 851 | 1,371 | 11 | 24 | 35 | $\pm 4$ | 110 | $\pm 9$ | 82 |

## 2017 HUNTING SEASONS

 GREYBULL RIVER MULE DEER HERD (MD210)| Hunt <br> Area | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 124 |  | Nov. 1 | Nov. 10 |  | General | Any deer |
| 124 | 3 | Nov. 1 | Nov. 30 | 75 | Limited quota | Any white-tailed deer |
| 124 | 6 | Oct. 15 | Nov. 30 | 150 | Limited quota | Doe or fawn on or within one-half ( $1 / 2$ ) mile of irrigated land |
| 124 | 7 | Nov. 1 | Nov. 30 | 100 | Limited quota | Doe or fawn valid west of Wyoming Highway 30 and Big Horn County Road 8, on or within one-half (1/2) mile of irrigated land |
| 124 | 8 | Nov. 1 | Nov. 30 | 75 | Limited quota | Doe or fawn white-tailed deer |
| 165 | 1 | Oct. 15 | Oct. 31 | 125 | Limited quota | Any deer |
| 165 | 3 | Nov. 1 | Nov. 30 | 50 | Limited quota | Any white-tailed deer |
| 165 | 6 | Sep. 1 | Oct. 31 | 100 | Limited quota | Doe or fawn valid on private land |
| 165 | 8 | Nov. 1 | Nov. 30 | 150 | Limited quota | Doe or fawn white-tailed deer |

## Region $X$ nonresident quota: 300

| Special Archery Season | Season Dates <br> Hunt Areas |  |
| :---: | :---: | :---: |
| Opens | Closes |  |
| 124,165 | Sep. 1 | Sep. 30 |


| Hunt Area | License <br> Type | Quota Change from 2016 |
| :---: | :---: | :---: |
| 124 | 3 | +25 |
| 124 | 8 | +25 |
| 165 | 8 | +50 |
| Herd Unit | $\mathbf{3}$ | +25 |
| Total | $\mathbf{8}$ | +75 |

## Management Evaluation

Current Postseason Population Management Objective: 4,000
Management Strategy: Recreational
2016 Postseason Population Estimate: ~4,600
2017 Proposed Postseason Population Estimate: ~4,600
2016 Hunter Satisfaction: 73\% Satisfied, 14\% Neutral, 13\% Dissatisfied

## Herd Unit Issues

The population objective for the Greybull River mule deer herd was increased from 3,000 to 4,000 deer in 1994 after revisions to the POP-II model. The population objective remained unchanged following reviews in 2002, 2007, and 2015. Greybull River deer are managed for recreational hunting.

Anthropomorphic factors are probably having only a slight influence on survival and productivity of this herd. There are several oil/gas wells scattered across the herd unit and 1 major field, Oregon Basin. Urban expansion has not been a major concern in the area. Although agriculture has altered riparian areas, farming has increased the amount of forage for deer. Landowner tolerance of deer on cropland is low. The majority of the herd unit is composed of public land, but the majority of the deer congregate on private agriculture fields.

## Weather

Habitat quality is probably most affected by desert-like conditions ( $<12$ " annual precipitation) and poor soils. Both factors have allowed cheatgrass to invade and dominate some sites. Drought conditions occurred in 2000-04 and 2012. Well-timed growing season precipitation in 2013-15 resulted in increased forage, while 2016 precipitation was below average. Below average temperatures and above average snowfall occurred in December and January, but moderated in February. December precipitation levels ranked $8^{\text {th }}$ highest out of the last 122 years.

## MD210 Annual and Growing Season Precipitation with 30 Year Averages



## Habitat

There is 1 sagebrush browse transect in this herd unit in Oregon Basin, but it was established in an area of low deer density to evaluate pronghorn antelope winter range. Mortality of individual sagebrush plants and increased precipitation in 2005, 2007, 2009-11, and 2014 allowed for increased growth of herbaceous vegetation and new growth of sagebrush and other shrub species. The resulting decrease in density of older sagebrush and increase in overall plant diversity may have long-term benefits for deer habitat.

## Field Data

Classification data has been used to monitor the population. Classification surveys were only conducted from the ground, so there is no measure of effort between years. Hunting seasons last the entire month of November and classification surveys occur in December during the late rut or after. By then, deer along the Greybull River do not come out of heavy cover until a few minutes before dark, so classification surveys can be strung out over the entire month. The likelihood of missing dominant bucks increases later in December. Little effort has been put forth to survey areas away from agriculture fields due to low deer densities.

We assumed number of deer classified can be used as an index to population level. The number of deer classified steadily increased from 1993 to 2009, but has since decreased to about 1,000 deer annually. In 2014, this herd unit had the highest fawn ratio in 30 years with 112 fawns: 100 does. This trend continued in 2015 with 90 fawns: 100 does and 110 fawns: 100 does in 2016. The increase in productivity was likely due to increased vegetation growth, subsidized by agricultural fields.

Buck numbers appear to have increased in this herd over the past 20 years; however, that may be more of a factor of less does in the population. Between 1993 and 2005, buck:doe ratios rarely exceeded 25:100 (range=18-26). After drought conditions subsided, buck ratios increased and have not dropped below 25 bucks: 100 does since. On average, there were 34 bucks: 100 does observed (range=26-49) between 2006-2016.

## Harvest Data

Conservative hunting of bucks and high numbers of doe/fawn licenses could be maintaining high buck ratios. As the number of complaints from landowners increased, the number of doe/fawn licenses increased. As the number of licenses issued increased, so does harvest of does. Doe/fawn licenses used to decrease the number of deer depredating crops also had major impacts at the population level, since most of the deer are concentrated on private land. Number of doe/fawn licenses issued may also have affected number of deer classified. Thus, the increase in buck:doe ratios observed after 2005 was probably a reflection of less does in the population rather than an increase in number of bucks.

Buck harvest is influenced more by hunter effort, weather, season dates, harvest of crops especially corn, and private land access than a reflection of population level. Harvest in Hunt Area 124 using a general license is large enough to mask trends in Hunt Area 165 which is limited quota. Historically, general license seasons for bucks only in Hunt Area 124, have remained fairly constant ranging from 7 to 10 days (1990-present), opening Nov. 1. Hunt Area 165 has been limited quota hunting since 1987 with 100-250 licenses typically issued. Type 1 buck seasons in Hunt Area 165 have opened Nov. 1 (1987-89), Oct. 1 (1990-2000), or Oct. 15 (2001-present).

Buck harvest declined dramatically from 485 to 214 between 1993-98; however, different contractors were used during that time to calculate harvest survey data. Following a large, unexpected increase in 1999, harvest of bucks has been somewhat stable ranging between 300400 bucks. There was a slight decrease in buck harvest during drought, then a steady increase between 2007 to 2010. Buck harvest has decreased since 2010 to a low of 288 in 2014. During 1993-2004, harvest of bucks was 1.5 times greater than number of does harvested. With
increased doe/fawn licenses, the number of bucks and does harvested converged and doe harvest surpassed buck harvest in 4 of the past 10 years (2007-2016).

Hunters have complained about too few mature bucks in this herd, but high harvest to address crop depredation limits the "trophy" potential of this herd. Most (90-100\%) of the bucks being harvested are fairly small in antler width. Likewise, $60-80 \%$ of the bucks classified are also in the smaller size classes. Antler size class is used as an index to age class.

## Population

While the constant juvenile, constant adult survival model had the lowest AIC score (88), this model is too simple to adequately describe fluctuating juvenile survival rates. The time-specific juvenile, constant adult (TSJ, CA) model was chosen (AIC=175), because it biologically makes sense that fawn survival varies year to year. Furthermore, the AIC score is high for the TSJ, CA model, because it is being penalized for being complex, in this case having each juvenile survival rate as a parameter. Survival constraints matched normal criteria. This model shows a decline in the population after 2010 possibly due to high doe harvest, or a harsh 2010-11 winter with deep, crusted snow. The population estimate bottoms out at 2,800 deer in 2012. In 2013 the model estimates a slight increase to 3,000 then jumps to 4,000 deer in 2014 then 4,600 deer in 2016. The drastic increase estimated for 2014-15 is a result of the record fawn ratios observed. This model performs fair and the results are biologically defensible, but the model could benefit from a sample-based population estimate with standard errors.

## Management Summary

The spreadsheet model predicts that the 2016 post-season population estimate will be $15 \%$ above objective. Seasons will result in a medium increase in whitetail deer harvest this coming fall with an increase in Type 3 and 8 licenses ( +100 ). In Hunt Area 165, an opening day one month earlier (Sep. 1) for the doe/fawn license valid on private land will address landowner concerns. Some hunters have requested more time to harvest bucks, while other hunters want shorter seasons to allow bucks to mature into older age classes. If buck ratios remain high, a longer buck season may be possible. Many hunters want fewer does harvested to increase the population, but with crop-damage prone areas, this may not be feasible on a large scale. The nonresident quota was set at 300 licenses when nonresident Region X was split from Region F in 2015.


2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD211-SHOSHONE RIVER |  |  |
| HUNT AREAS: 121-123 |  | PREPARED BY: LESLIE SCHREIBER |
| 2011-2015 Average | 2016 | 2017 Proposed |
| Population: 0 | 4,700 | 4,500 |
| Harvest: 811 | 663 | 650 |
| Hunters: 1,449 | 1,368 | 1,200 |
| Hunter Success: 56\% | 48\% | 54 \% |
| Active Licenses: 1,583 | 1,432 | 1,400 |
| Active License Success: 51\% | 46\% | 46 \% |
| Recreation Days: 6,368 | 5,423 | 5,400 |
| Days Per Animal: 7.9 | 8.2 | 8.3 |
| Males per 100 Females 32 | 36 |  |
| Juveniles per 100 Females 90 | 85 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 5000 (4000-6000) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -6\% |
| Number of years population has been + or - objective in recent | rend: | 3 |
| Model Date: |  | 2/25/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 15\% | 15\% |
| Males $\geq 1$ year old: | 27\% | 27\% |
| Total: | 14\% | 14\% |
| Proposed change in post-season population: | -3\% | -3\% |

## Population Size - Postseason



## Harvest



Number of Active Licenses


Harvest Success
$\square$ MD211-EVHTRSUCCESS $\square$ MD211-EVACTIVESUCCESS


## Active Licenses



Days per Animal Harvested
$\square$ MD211 - Days


Postseason Animals per 100 Females

Age Structure of Field Checked Males
$\square$ MD211 - JUV

MD211 - YRLG
MD211-2+

Age Structure Data (Field and Laboratory) - Male

| MD211 - JUV MD211 - YLG $\square$ MD211 - ADLT |
| :--- | :--- |



## Age Structure Data (Field and Laboratory ) - Female

```
                \squareMD211-JUV }\square\mathrm{ MD211-YLG }\square\mathrm{ MD211-ADLT
```



## 2011-2016 Postseason Classification Summary

for Mule Deer Herd MD211-SHOSHONE RIVER


| 2011 | 0 | 37 | 0 | 0 | 0 | 31 | 68 | 18\% | 172 | 44\% | 148 | 38\% | 388 | 0 | 22 | 18 | 40 | $\pm 0$ | 86 | $\pm 0$ | 62 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012 | 0 | 34 | 0 | 0 | 0 | 37 | 71 | 12\% | 293 | 48\% | 251 | 41\% | 615 | 825 | 12 | 13 | 24 | $\pm 0$ | 86 | $\pm 0$ | 69 |
| 2013 | 0 | 18 | 0 | 0 | 0 | 14 | 32 | 12\% | 131 | 47\% | 113 | 41\% | 276 | 810 | 14 | 11 | 24 | $\pm 0$ | 86 | $\pm 0$ | 69 |
| 2014 | 0 | 46 | 0 | 0 | 0 | 42 | 88 | 14\% | 266 | 44\% | 255 | 42\% | 609 | 0 | 17 | 16 | 33 | $\pm 0$ | 96 | $\pm 0$ | 72 |
| 2015 | 0 | 44 | 51 | 14 | 0 | 7 | 116 | 17\% | 301 | 43\% | 280 | 40\% | 697 | 0 | 15 | 24 | 39 | $\pm 0$ | 93 | $\pm 0$ | 67 |
| 2016 | 4,700 | 43 | 39 | 6 | 0 | 8 | 96 | 16\% | 265 | 45\% | 225 | 38\% | 586 | 1,371 | 16 | 20 | 36 | $\pm 5$ | 85 | $\pm 9$ | 62 |

2017 HUNTING SEASONS
SHOSHONE RIVER MULE DEER HERD (MD211)

| Hunt <br> Area | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 121 |  | Nov. 1 | Nov. 10 |  | General | Any deer |
| 121 |  | Nov. 11 | Nov. 30 |  | General | Antlerless deer |
| 121 | 3 | Nov. 1 | Nov. 30 | 50 | Limited quota | Any white-tailed deer |
| 121 | 6 | Oct. 15 | Nov. 30 | 150 | Limited quota | Doe or fawn |
| 122 |  | Nov. 1 | Nov. 10 |  | General | Any deer |
| 122 |  | Nov. 11 | Nov. 30 |  | General | Antlerless deer |
| 122 | 3 | Nov. 1 | Nov. 30 | 25 | Limited quota | Any white-tailed deer |
| 122 | 6 | Oct. 15 | Nov. 30 | 150 | Limited quota | Doe or fawn valid on or within one-half ( $1 / 2$ ) mile of irrigated land within the Shoshone River drainage |
| 123 |  | Oct. 15 | Oct. 31 |  | General | Any deer |
| 123 | 6 | Oct. 15 | Dec. 31 | 50 | Limited quota | Doe or fawn valid on private land south of the Shoshone River |

## Region X Nonresident deer quota: 300

| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| $121,122,123$ | Sep. 1 | Sep. 30 |


| Hunt Area | License Type | Quota change from 2016 |
| :---: | :---: | :---: |
| 122 |  |  |
| Herd |  |  |
| Unit |  |  |
| Total |  |  |

## Management Evaluation

Current Postseason Population Management Objective: 5,000
Management Strategy: Recreational
2016 Postseason Population Estimate: ~4,700
2017 Proposed Postseason Population Estimate: ~4,100
2016 Hunter Satisfaction: 61\% Satisfied, 22\% Neutral, 17\% Dissatisfied

## Herd Unit Issues

Management of the Shoshone River mule deer herd unit using a population objective was eliminated between 2001-15 due to insufficient classification sample sizes. Adequate sample
size is a key assumption to all population models. During the public herd unit review process in 2016, a population objective of 5,000 deer was set and Hunt Area 121 was transferred from the Clark's Fork mule deer herd unit (MD 216) to the Shoshone River herd. Management issues include crop depredation, lack of "quality" bucks, and insufficient sample sizes.

Anthropomorphic factors that may affect this deer population include housing development, agriculture, oil/gas development, and mining. There are few oil/gas wells scattered throughout the herd unit which probably have minimal impacts to deer or habitat. Mining for bentonite has typically been in poor quality habitat with few to no deer. Farming has altered riparian areas on private land and actually increases amount of available forage; however, landowner tolerance is low. Thus, managing deer to decrease crop depredation is a focus.

## Weather

Climate, specifically drought, has historically affected upland vegetation and water availability on public lands. Thus, deer congregate on agricultural areas in search of better forage. Drought during 2000-04 resulted in mortality of some sagebrush and probably affected herbaceous vegetation. Well-timed growing season precipitation in 2014-15 resulted in increased forage. Below average temperatures and above average snowfall occurred in December and January, but moderated in February. December precipitation levels ranked $8^{\text {th }}$ highest out of the last 122 years.

## MD211 Annual and Growing Season Precipitation with 30 Year Averages



## Habitat

Cheatgrass has established itself on some upland sites. Habitat quality is low due to low precipitation and poor soils in most non-agricultural portions of the herd unit. There are no transects established within the herd unit to measure production and utilization of sagebrush. The majority of deer are found along river bottoms in agricultural areas.

## Field Data

During periods of low deer numbers, classification surveys did not result in an adequate sample size to model this herd. Past attempts to survey the herd unit using a helicopter did not result in improved classification data, so the technique was discontinued. Since few ( $<400$ ) deer were observed, this herd unit was a low priority among big game herds in the district. During years when hunting seasons for deer and pheasant extend into December, deer remain nocturnal during
the regular post-season survey period resulting in low sample sizes. However, more deer (>400) were classified in recent years. More than 600 deer were classified between 2014-16 suggesting an increasing population. Classification effort has varied over the years. Unsworth et al. (1999) suggested that a winter fawn:doe ratio above 66:100 would result in an increasing population. Over the past 5 years, fawn:doe ratios have ranged between 85-96 fawns:100 does (average=89:100), suggesting an increasing population.

## Harvest Data

Harvest statistics are closely linked to the number of doe/fawn licenses issued in response to crop damage. In 2016, hunters harvested less deer ( $n=663$ ) compared to the 5 -year average ( $n=811$; 2011-15). Harvest success ranged from a low of $44 \%$ in 2015 to $62 \%$ in 2011, and mirrors license numbers over the last 6 years. In 2016 days per animal harvested (8.2) was about average (7.9; 2011-15). Doe harvest will continue to address agricultural damage.

## Population

With recent sample sizes, plus the inclusion of HA 121 harvest data, the time-specific juvenile, constant adult (TSJ, CA) spreadsheet model appears functional, estimating the Shoshone River mule deer herd at about 4,700 deer, near the objective of 5,000 . The population decreased from about 8,000 deer in 2009 to about 5,000 deer in 2015 after several years of high doe/fawn harvest targeting deer causing agriculture damage. While the constant juvenile, constant adult survival model had the lowest AIC score (86), the TSJ, CA model was chosen, because it biologically makes sense that fawn survival varies temporally, even though the AIC score was 163. Survival constraints matched normal criteria. This model performs fair and the results are biologically defensible, but the model could benefit from a sample-based population estimate with standard errors. Consistent effort by personnel during classifications will be critical in keeping this population model functioning.

## Management Summary

The objective of 5,000 deer provides opportunity, yet maintains acceptable levels of deer to satisfy most landowners. The General season in Hunt Areas 121-123 allows for ample harvest. Hunters have noticed decreased deer populations and have been vocal with their desires for more deer overall and some "quality" bucks. More negative hunter comments have been submitted with harvest surveys in recent years ( $17 \%$ dissatisfied), and more concerned hunters have been voicing opinions on low deer numbers during season-setting public meetings. However, the potential for agriculture damage limits the socially acceptable population size of this herd. When nonresident Region X was split from Region F in 2015, the nonresident quota was set at 300 hunters and seems to be working well.

## Literature Cited

Unsworth, J.W., D.F. Pac, G. C. White, and R.M. Bartman. 1999. Mule deer survival in Colorado, Idaho, and Montana. Journal of Wildlife Management 36:315-326.





2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD212-OWL CREEK/MEETEETSE |  |  |
| HUNT AREAS: 116-120 |  | PREPARED BY: BART KROGER |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 3,253 | 3,634 | 3,811 |
| Harvest: 248 | 205 | 300 |
| Hunters: 333 | 273 | 400 |
| Hunter Success: 74\% | 75\% | 75 \% |
| Active Licenses: 360 | 285 | 410 |
| Active License Success: 69\% | 72\% | 73 \% |
| Recreation Days: 1,491 | 1,277 | 1,500 |
| Days Per Animal: 6.0 | 6.2 | 5 |
| Males per 100 Females 39 | 43 |  |
| Juveniles per 100 Females 68 | 70 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 5000 (4000-6000) |
| Management Strategy: |  | Special |
| Percent population is above (+) or below (-) objective: |  | -27.3\% |
| Number of years population has been + or - objective in recent | rend: | 10 |
| Model Date: |  | 02/17/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 2\% | 4\% |
| Males $\geq 1$ year old: | 21\% | 26\% |
| Total: | 5\% | 7\% |
| Proposed change in post-season population: | +7\% | +5\% |

Population Size - Postseason


## Harvest



Number of Active Licenses


Harvest Success
$\square$ MD212 - EVHTRSUCCESS $\square$ MD212 - EVACTIVESUCCESS


## Active Licenses

$\square$ MD212 - Active Licenses


Days per Animal Harvested
$\square$ MD212 - Days


Postseason Animals per 100 Females

for Mule Deer Herd MD212 - OWL CREEK/MEETEETSE

|  |  | MALES |  |  |  |  |  |  |  | FEMALES |  | JUVENILES |  |  |  | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Post Pop | Ylg | $\begin{gathered} 2+ \\ \text { Cls } 1 \end{gathered}$ | $\begin{gathered} 2+ \\ \mathrm{Cls} 2 \end{gathered}$ | $\begin{gathered} 2+ \\ \mathrm{Cls} 3 \end{gathered}$ | $\begin{gathered} 2+ \\ \mathrm{UnCl} \end{gathered}$ | Total |  | \% | Total | \% | Total | \% | Tot Cls | Cls <br> Obj | Ylng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | $\begin{aligned} & \text { Conf } \\ & \text { Int } \end{aligned}$ | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |


| 2011 | 3,357 | 56 | 0 | 0 | 0 | 175 | 231 | $22 \%$ | 541 | $50 \%$ | 300 | $28 \%$ | 1,072 | 901 | 10 | 32 | 43 | $\pm 4$ | 55 | $\pm 4$ | 39 |
| :--- | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 2012 | 3,206 | 34 | 0 | 0 | 0 | 130 | 164 | $20 \%$ | 406 | $50 \%$ | 241 | $30 \%$ | 811 | 910 | 8 | 32 | 40 | $\pm 4$ | 59 | $\pm 5$ | 42 |
| 2013 | 3,026 | 37 | 0 | 0 | 0 | 113 | 150 | $18 \%$ | 413 | $51 \%$ | 250 | $31 \%$ | 813 | 916 | 9 | 27 | 36 | $\pm 4$ | 61 | $\pm 5$ | 44 |
| 2014 | 3,275 | 27 | 0 | 0 | 0 | 81 | 108 | $18 \%$ | 265 | $44 \%$ | 228 | $38 \%$ | 601 | 1,428 | 10 | 31 | 41 | $\pm 5$ | 86 | $\pm 9$ | 61 |
| 2015 | 3,400 | 89 | 70 | 51 | 15 | 0 | 225 | $16 \%$ | 635 | $46 \%$ | 518 | $38 \%$ | 1,378 | 1,389 | 14 | 21 | 35 | $\pm 3$ | 82 | $\pm 5$ | 60 |
| 2016 | 3,634 | 100 | 126 | 90 | 27 | 0 | 343 | $20 \%$ | 789 | $47 \%$ | 554 | $33 \%$ | 1,686 | 1,141 | 13 | 31 | 43 | $\pm 3$ | 70 | $\pm 4$ | 49 |

2017 HUNTING SEASONS
OWL CREEK/MEETEETSE MULE DEER HERD (MD212)

| Hunt <br> Area | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 116 | 1 | Oct. 15 | Oct. 31 | 75 | Limited quota | Antlered mule deer or any white-tailed deer |
| $\begin{aligned} & 116, \\ & 117, \\ & 118 \end{aligned}$ | 3 | Nov. 1 | Nov. 30 | 100 | Limited quota | Any white-tailed deer |
| 116 | 7 | Sep. 1 | Oct. 14 | 100 | Limited quota | Doe or fawn white-tailed deer valid on private land in the Wood River drainage |
| $\begin{aligned} & \hline 116, \\ & 117, \\ & 118 \\ & \hline \end{aligned}$ | 8 | Oct. 15 | Nov. 30 | 100 | Limited quota | Doe or fawn white-tailed deer |
| 117 | 1 | Sep. 15 | Oct. 15 | 50 | Limited quota | Antlered mule deer or any white-tailed deer |
| 118 | 1 | Oct. 15 | Oct. 31 | 25 | Limited quota | Antlered deer |
| 118 | 1 | Nov. 1 | Nov. 30 |  | Limited quota | Any white-tailed deer |
| 119 | 1 | Nov. 1 | Nov. 15 | 50 | Limited quota | Antlered deer |
| 119 | 2 | Oct. 1 | Oct. 15 | 75 | Limited quota | Antlered deer |
| $\begin{aligned} & 119, \\ & 120 \end{aligned}$ | 3 | Oct. 1 | Nov. 30 | 50 | Limited quota | Any white-tailed deer |
| 119 | 6 | Sep. 1 | Oct. 15 | 75 | Limited quota | Doe or fawn valid on or within one-half ( $1 / 2$ ) mile of irrigated land |
| 120 | 1 | Nov. 1 | Nov. 15 | 75 | Limited quota | Antlered deer |
| 120 | 8 | Sep. 1 | Dec. 15 | 150 | Limited quota | Doe or fawn white-tailed deer |


| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| $116,117,118,119,120$ | Sep. 1 | Sep. 30 |


| Hunt Area | Type | Quota change from 2016 |
| :---: | :---: | :---: |
| 119 | 2 | +25 |
| 119 | 6 | +25 |
| 120 | 1 | +25 |
| HU Total | $\mathbf{1 , 2}$ | $\mathbf{+ 5 0}$ |
|  | $\mathbf{6}$ | $\mathbf{+ 2 5}$ |

## Management Evaluation

Current Postseason Population Management Objective: 5,000
Management Strategy: Special
2016 Postseason Population Estimate: 3600
2017 Proposed Postseason Population Estimate: 3800
2016 Hunter Satisfaction: 75\% satisfied, $14 \%$ neutral, $11 \%$ dissatisfied

## Herd Unit Issues

Currently, the management goals of this deer herd is to provide quality buck hunting, allow mule deer populations to increase on public lands, and to address potential damage issues on private lands. The post-season population objective was changed in 2014 from 8,000 to 5,000. This herd unit went through the Mule Deer Initiative public process in early 2014. Field personnel, landowners and most hunters agree this herd is below desired numbers. Poor habitat conditions, long-term drought, and increased harvest of deer on private lands due to potential damage have kept this population below objective.

Weather


Precipitation: Annual precipitation from October 2015 thru September 2016 was higher than the 30 year average. Precipitation during the growing season (April thru June) was lower, and the growing season precipitation for high elevation SSF seasonal ranges (May - July) was markedly lower than the 30 year average.

Winter Severity: The 2016-2017 winter was semi-severe with below normal temperatures and above normal snowfall and snow depths. Data from the Sunshine 3 NE climate station ( 10 miles southwest of Meeteetse) showed the average temperature in December and January was 10.3 and 7.24 degrees respectively lower than normal. Snowfall at this station for the period November-February was $189 \%$ of normal, however since then significant snow melt has occurred and temperatures have moderated.

## Habitat

Between 2011 and 2013, winter snow conditions and summer drought conditions caused above normal mortality in this herd, keeping this population below objective. Annual precipitation has been higher than average for the last four years, which has contributed to record fawn production and an increasing population. The Department initiated a 5-year rapid habitat assessment of the herd unit that will primarily focus on the condition of aspen, sagebrush and riparian communities
being encroached upon by conifers. Several aspen stands were assessed during summer 2015 and 2016, and a 120 -acre treatment to remove conifers from aspen stands was initiated in fall 2016. Two permanent shrub transects occur in this herd unit. Data was collected on leader growth, hedging class, age class, and percent utilization. Utilization continues to be very low on sagebrush in this herd unit, indicating that forage quantity on winter range is not a limiting factor. These data can be found in Appendix B in the Cody Region JCRs.

## Field Data

Both aerial and ground classifications surveys are used in obtaining post-season buck and fawn ratios for this deer herd. Routine classification routes for each hunt area have been maintained in order to reflect general trends in deer numbers over time. The number of deer classified declined from 1407 deer in 2007 to 601 deer in and 2014. However, in 2015 the number of deer classified increased to nearly 1400, and in 2016 to nearly 1700 deer. Three years of record high fawn production since 2014 has helped increase deer numbers. The past 3-year average fawn ratio is 80:100, whereas prior to 2014 the annual average was around 60:100. Buck ratios have remained favorable in recent years, with a 6 -year average of 40 bucks per 100 does.

## Harvest Data

All Hunt Areas (116-120) in the herd unit support limited quota hunting seasons. Type 1 license quotas are typically kept low to allow for higher buck ratios and quality. Overwhelming public support for this type of management is heard annually at public season meetings, and during the recent Mule Deer Initiative process. Doe/fawn licenses have and will continue to be used for damage issues when warranted. Season structures have been designed to help increase this deer population, particularly those deer utilizing native ranges. License quotas, hunter numbers and total harvest have declined by over $100 \%$ over the past 10 years due to declines in deer numbers. The biggest declines have been mostly due to Type 6 and 7 license quota reductions. Type 1 hunter success and hunter effort continues to remain favorable at around $70 \%$ and 6.2 days/animal.

## Population

The semi-constant juvenile \& semi-constant adult survival (SCJ, SCA) spreadsheet model was chosen to represent this herd. This model supported an AIC value of 61, along with a very good fit ( $\mathrm{n}=21$ ) of the model vs. field male ratios. The 2016 population estimate seems reasonable, and reflects field personnel perceptions, harvest and classification sample size trends, which indicate a slight increasing population. Because of this, the model is considered a good representation of the herd.

## Management Summary

Overwhelming public support during the 2014 Mule Deer Initiative public meetings, were to reduce doe/fawn harvest and provide better quality buck hunting. Type 1 license quotas in Hunt Areas 116, 117 and 118 appear adequate, with most of these Hunt Areas having license quota reductions in recent years. However, areas 119 and 120 are showing improving deer numbers, and therefore will see slight increases in Type 1 and 2 license quotas. The Type 6 quota in area 119 will increase by 25 licenses to further address potential damage issues and increasing deer numbers. The projected 2017 harvest is roughly 300 deer, nearly 100 more than in 2016. Hopefully this deer herd will continue showing improving trends.





# 2016 - JCR Evaluation Form 

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD215-UPPER SHOSHONE |  |  |
| HUNT AREAS: 110-115 |  | PREPARED BY: Doug McWhirter/Tony Mong |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 9,360 | 10,800 | 10,000 |
| Harvest: 899 | 1,008 | 800 |
| Hunters: 1,681 | 1,821 | 1,500 |
| Hunter Success: 53\% | 55\% | 53\% |
| Active Licenses: 1,756 | 1,847 | 1,500 |
| Active License Success: $51 \%$ | 55\% | 53\% |
| Recreation Days: 8,624 | 9,525 | 8,500 |
| Days Per Animal: 9.6 | 9.4 | 10.6 |
| Males per 100 Females 24 | 29 |  |
| Juveniles per 100 Females 62 | 57 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 12000 (9600-14400) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -10\% |
| Number of years population has been + or - objective in rece | rend: | 10 |
| Model Date: |  | 3/7/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 1.7\% | 1.5\% |
| Males $\geq 1$ year old: | 45.4\% | 41\% |
| Total: | 8.7\% | 10\% |
| Proposed change in post-season population: | +1.5\% | -5\% |

## Population Size - Postseason



## Harvest

$\square$ MD2 215 - MALES $\square$ MD215 - FEMALES $\quad \square$ MD215 - JUV MD215 - TOTAL


Number of Active Licenses


## Harvest Success




## Active Licenses



## Days per Animal Harvested



## Postseason Animals per 100 Females



| 2011-2016 Postseas on Classification Summary |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| for Mule Deer Herd MD215 - UPPER SHOSHONE |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | MALES |  |  |  |  |  |  | FEMALES |  | JUVENILES |  |  |  | Males to 100 Females |  |  |  | Young to |  |  |
|  |  |  | 2+ | 2+ | 2+ | 2+ |  |  |  |  |  |  | Tot | Cls |  |  |  | Conf |  |  |  |
| Year | Post Pop | Ylg | Cls 1 | Cls 2 | Cls 3 | UnCls | Total | \% | Total | \% | Total | \% | Cls | Obj | Ylng | Adult | Total | Int | 100 Fem | Conf Int | 100 Adult |
| 2011 | 9,300 | 118 | 0 | 0 | 0 | 205 | 323 | 16\% | 1,071 | 53\% | 613 | $31 \%$ | 2,007 | 1,071 | 11 | 19 | 30 | $\pm 2$ | 57 | $\pm 3$ | 44 |
| 2012 | 8,900 | 79 | 0 | 0 | 0 | 139 | 218 | 10\% | 1,165 | 52\% | 863 | 38\% | 2,246 | 1,148 | 7 | 12 | 19 | $\pm 2$ | 74 | $\pm 4$ | 62 |
| 2013 | 9,400 | 127 | 0 | 0 | 0 | 117 | 244 | $14 \%$ | 946 | 53\% | 607 | $34 \%$ | 1,797 | 1,148 | 13 | 12 | 26 | $\pm 2$ | 64 | $\pm 4$ | 51 |
| 2014 | 9,200 | 98 | 101 | 20 | 4 | 0 | 223 | 13\% | 945 | 56\% | 512 | 30\% | 1,680 | 1,010 | 10 | 13 | 24 | $\pm 2$ | 54 | $\pm 3$ | 44 |
| 2015 | 10,000 | 76 | 143 | 43 | 1 | 0 | 263 | 12\% | 1,200 | 55\% | 722 | 33\% | 2,185 | 1,020 | 6 | 16 | 22 | $\pm 2$ | 60 | $\pm 3$ | 49 |
| 2016 | 10,800 | 189 | 163 | 40 | 6 | 0 | 398 | 16\% | 1,365 | 54\% | 782 | $31 \%$ | 2,545 | 0 | 14 | 15 | 29 | $\pm 2$ | 57 | $\pm 3$ | 44 |

## 2017 HUNTING SEASONS UPPER SHOSHONE MULE DEER HERD (MD215)

| HuntArea | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 110 |  | Oct. 15 | Nov. 10 |  | General | Antlered mule deer or any white-tailed deer |
| $\begin{aligned} & 110, \\ & 111 \end{aligned}$ | 8 | Oct. 15 | Dec. 31 | 100 | Limited quota | Doe or fawn white-tailed deer |
| 111 |  | Oct. 15 | Nov. 10 |  | General | Antlered mule deer or any white-tailed deer |
| 111 | 6 | Oct. 15 | Nov. 10 | 25 | Limited quota | Doe or fawn valid off national forest |
| 112 |  | Oct. 15 | Nov. 10 |  | General | Antlered mule deer or any white-tailed deer valid on national forest |
| 112 |  | Nov. 1 | Nov. 10 |  | General | Any deer valid off national forest |
| 112 | 3 | Nov. 1 | Nov. 30 | 25 | Limited quota | Any white-tailed deer |
| $\begin{aligned} & 112, \\ & 113 \end{aligned}$ | 6 | Oct. 15 | Nov. 10 | 25 | Limited quota | Doe or fawn valid off national forest |
| $\begin{aligned} & 112, \\ & 113 \end{aligned}$ | 8 | Oct. 15 | Dec. 31 | 150 | Limited quota | Doe or fawn white-tailed deer |
| 113 |  | Oct. 15 | Nov. 10 |  | General | Antlered mule deer or any white-tailed deer valid on national forest |
| 113 |  | Nov. 1 | Nov. 10 |  | General | Any deer valid off national forest |
| 114 |  | Oct. 15 | Nov. 10 |  | General | Antlered deer |
| 115 |  | Sep. 10 | Oct. 22 |  | General | Antlered deer |

## Region F Nonresident Quota: 750

| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| $110,111,112,114$ | Sep. 1 | Sep. 30 |
| 115 | Sep. 1 | Sep. 9 |


| Hunt Area | Type | Quota change <br> from 2016 |
| :---: | :---: | :---: |
| Region F | Gen | -200 |
| 112,113 | 8 | +50 |
| Herd Unit <br> Total | 8 | +50 |
|  | Region F | -200 |

## Management Evaluation

Postseason Population Management Objective: 12,000
Management Strategy: Recreational
2016 Postseason Population Estimate: 10,800
2017 Proposed Postseason Population Estimate: 10,000
2016 Hunter Satisfaction: 69\% Satisfied, 17\% Neutral, 14\% Dissatisfied

## Herd Unit Issues

The Upper Shoshone Herd Unit is dominated by migratory deer, although some non-migratory deer do exist in the North and South Fork Shoshone River valleys. Historically, these deer exhibit mediocre productivity, as evidenced by the 20-year (1995-2014) average fawn:doe ratio of 61:100 does (range 42:100-74:100). Buck harvest is influenced by fall weather and the timing of migration that can move deer to low elevation winter ranges prior to the standard closing date of November 10. This has created a situation where buck harvest and consequently buck:doe ratios vary widely. In response to this variation, periodic 4-point regulations are implemented for 2 years to protect primarily yearling bucks and assist in recovery of buck:doe ratios. This fluctuation is represented in postseason buck:doe ratios that have averaged 26:100 does over the past 20 years (1995-2014), but have ranged from 14:100 to 35:100. Since this herd is mostly migratory deer, we find it difficult to manage for stable buck:doe ratios. Low deer harvest early in the hunting season is typical. For example, over the last 25 years buck harvest in Area 115 (September 10 opening date) has averaged 31 bucks harvested per year. Our check station records indicate that $75 \%$ of deer harvest occurs during the November. Intense hunting pressure along restricted migration corridors during this time, particularly on the North Fork of the Shoshone River, has become an increasingly difficult situation to manage.

## Weather

Weather conditions during the 2016 biological year were characterized by near normal precipitation during the growing season (April-June). Winter conditions; however, were relatively severe in most of the unit, with above average snowfall and colder than normal temperatures.

## Habitat

See Cody region appendix.

## Field Data

Observed post-season buck ratios were 29:100 in 2016, an increase compared to the 2015 ratio of 22:100. The observed fawn ratio in 2016 (57:100 does) has not improved in the last few years, which affects overall growth of the herd. If the fawn production improves in future years, the abundance of bucks will gradually increase with time, especially with future mild winters that would delay the migration during the November portion of the hunting season. Since 2002, all adult bucks observed during postseason classification surveys are broken into antler width classes. In 2016, Class I bucks (those less than 20 inches) made up 78\% of adult bucks, class II bucks (those 20-25 inches) made up 19\%, and class III (those greater than 25 inches) made up $3 \%$.

## Harvest Data

A total of 1821 hunters harvested 922 bucks in 2016, 86 anterless deer for a total of 1008 deer and $55 \%$ success. This is an increase compared to 2015 where 1,666 hunters harvested 841 bucks, 69 antlerless, and 910 total deer. The 2016 buck harvest was above the 10 -year average of 818 bucks. Antlerless deer harvest was reduced beginning in 2012, and since then antlerless deer harvested has been minimal. Hunter numbers have remained relatively consistent over the last 10 years (2006-2014 avg. 1,876 hunters), and traditionally harbors a large proportion of nonresident hunters, averaging $42.6 \%$ over the 2006-2014 period (range $38.9 \%-49.9 \%$ ). In 2016, the percentage of non-resident hunters was $32 \%$.

## Population

The "Time Specific Juvenile - Constant Adult Mortality Rate" (TSJ,CA) spreadsheet model was chosen to use for the post season population estimate of this herd, and was updated this year. The postseason population estimate for 2016 is about 10,000 deer and is higher mainly due to the changing of the model, compared to the old model which estimates about 1500 deer less. The herd is still below the objective, and with the extremely difficult winter we expect high overwinter mortality.

## Management Summary

Conservative antlerless seasons were implemented in 2012 to allow deer numbers to grow and move the population towards objective; however, we have not seen the population respond to this conservative approach. Because we have not seen the population response to conservative seasons over the last 4 seasons coupled with the severe winter we experienced in 2016/17 doe/fawn harvest will be restricted as much as possible in 2017.


2016 - JCR Evaluation Form

| SPECIES: Mule Deer |  | PERIOD: 6/1/2016-5/31/2017 |
| :---: | :---: | :---: |
| HERD: MD216-CLARKS FORK |  |  |
| HUNT AREAS: 105-106, 109 |  | PREPARED BY: Doug McWhirter/Tony Mong |
| 2011-2015 Average | $\underline{2016}$ | 2017 Proposed |
| Population: 3,980 | 3,900 | 3,700 |
| Harvest: 842 | 680 | 340 |
| Hunters: 1,577 | 1,365 | 800 |
| Hunter Success: 53\% | 50\% | 42\% |
| Active Licenses: 1,699 | 1,425 | 800 |
| Active License Success: 50\% | 48\% | 42\% |
| Recreation Days: 7,974 | 5,902 | 3,500 |
| Days Per Animal: 9.5 | 8.7 | 10.3 |
| Males per 100 Females 28 | 32 |  |
| Juveniles per 100 Females 58 | 60 |  |
| Population Objective ( $\pm 20 \%$ ) : |  | 5000 (4000-6000) |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -22\% |
| Number of years population has been + or - objective in rece | rend: | 10 |
| Model Date: |  | 3/7/2017 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 3.0\% | 2.5\% |
| Males $\geq 1$ year old: | 34.9\% | 37\% |
| Total: | 8.2\% | 8\% |
| Proposed change in post-season population: | 0.0\% | -4.5\% |



## Harvest Success

$\square$ MD216 - Hunter Success \% $\square{ }_{\%}^{\text {MD2 }}$ - Active License Success


Harvest
$\square$ MD216 - MALES $\square$ MD216 - FEMALES $\square$ MD216 - JUV $\square$ MD216 - TOTAL


Active Licenses
$\square$ MD216 - Active Licenses


## Days per Animal Harvested



## Postseason Animals per 100 Females



| 2011-2016 Postseason Classification Summary |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| for Mule Deer Herd MD216-CLARKS FORK |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
|  |  | MALES |  |  |  |  |  |  | FEMALES |  | ES |  |  |  | Males to 100 Females |  |  |  | Young to |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  | Tot | Cls |  |  |  | Conf |  |  |  |
| Year | Post Pop | Ylg | Cls 1 | Cls 2 | Cls 3 | UnCls | Total | \% | Total | \% | Total | \% | Cls | Obj | Ylng | Adult | Total | Int | 100 Fem | Conf Int | 100 Adult |
| 2011 | 4,200 | 52 | 0 | 0 | 0 | 133 | 185 | 16\% | 656 | 57\% | 315 | 27\% | 1,156 | 1,051 | 8 | 20 | 28 | $\pm 3$ | 48 | $\pm 4$ | 37 |
| 2012 | 4,200 | 23 | 0 | 0 | 0 | 62 | 85 | 11\% | 386 | 52\% | 270 | 36\% | 741 | 947 | 6 | 16 | 22 | $\pm 3$ | 70 | $\pm 6$ | 57 |
| 2013 | 4,200 | 71 | 0 | 0 | 0 | 95 | 166 | 15\% | 576 | 51\% | 390 | 34\% | 1,132 | 1,083 | 12 | 16 | 29 | $\pm 3$ | 68 | $\pm 5$ | 53 |
| 2014 | 3,600 | 48 | 63 | 39 | 11 | 0 | 161 | 16\% | 550 | 55\% | 288 | 29\% | 999 | 893 | 9 | 21 | 29 | $\pm 3$ | 52 | $\pm 4$ | 41 |
| 2015 | 3,700 | 40 | 68 | 42 | 18 | 0 | 168 | 15\% | 580 | 53\% | 344 | 32\% | 1,092 | 800 | 7 | 22 | 29 | $\pm 3$ | 59 | $\pm 4$ | 46 |
| 2016 | 3,900 | 59 | 71 | 33 | 16 | 0 | 179 | 17\% | 564 | 52\% | 336 | 31\% | 1,079 | 0 | 10 | 21 | 32 | $\pm 3$ | 60 | $\pm 4$ | 45 |

## 2017 HUNTING SEASONS

CLARKS FORK MULE DEER HERD (MD216)

| $\begin{aligned} & \text { Hunt } \\ & \text { Area } \end{aligned}$ | Type | Season Dates |  | Quota | License | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Opens | Closes |  |  |  |
| 105 |  | Oct. 1 | Oct. 31 |  | General | Antlered mule deer or any white-tailed deer valid on national forest |
| 105 |  | Nov. 1 | Nov. 5 |  | General | Any deer valid off national forest |
| 105 |  | Nov. 6 | Nov. 30 |  | General | Antlerless deer valid off national forest |
| 105 | 6 | Nov. 1 | Nov. 30 | 25 | Limited quota | Doe or fawn valid off national forest |
| $\begin{aligned} & 105 \\ & 106 \\ & 109 \end{aligned}$ | 1 | Nov. 1 | Nov. 15 | 50 | Limited quota | Any deer |
| 106 |  | Oct. 1 | Oct. 31 |  | General | Antlered mule deer or any white-tailed deer |

## Region F Nonresident Quota: 750

| Special Archery Season | Season Dates |  |
| :---: | :---: | :---: |
| Hunt Areas | Opens | Closes |
| $105,106,109$, | Sep. 1 | Sep. 30 |


| Hunt <br> Area | License <br> Type | Quota change <br> from 2016 |
| :---: | :---: | :---: |
| Region F | Gen | -200 |
| Herd Unit <br> Total | Region F | $\mathbf{- 2 0 0}$ |

## Management Evaluation

Postseason Population Management Objective: 5,000
Management Strategy: Recreational
2016 Postseason Population Estimate: 3,900
2017 Proposed Postseason Population Estimate: 3,700
2016 Hunter Satisfaction: 65\% Satisfied, $21 \%$ Neutral, 13\% Dissatisfied

## Herd Unit Issues

Much of the Clarks Fork Herd Unit is characterized by migratory deer (Hunt Areas 105, 106, 109), but substantial numbers of non-migratory deer associated with agricultural areas are found in Area 105 and 121. Migratory deer exhibit relatively poor productivity, while deer associated with agricultural fields have much higher productivity. Consequently, damage situations arise with non-migratory deer in Area 105 and 121, while poor productivity requires conservative management of migratory deer. This situation is further complicated by the skewed classification effort directed at migratory deer and the lack of classification data from Area 121. Deer management in Area 121 is driven almost exclusively by landowner tolerance, and therefore little effort is placed on gathering population data from this segment of the Clarks Fork Herd Unit. This situation was corrected in 2014 when Hunt Area 121 was removed from the Clarks Fork Herd unit when the Clarks Fork Herd Unit objective review was completed in 2014.

## Weather

Weather conditions during the 2016 biological year were characterized by near normal precipitation during the growing season (April-June). Winter conditions; however, were relatively severe in most of the unit, with above average snowfall and colder than normal temperatures. We anticipate higher than normal overwinter mortality.

## Habitat

No habitat monitoring data is collected in this herd unit.

## Field Data

Fawn production in 2016 was average at 60:100 does, and compares to the most recent 10-year (2005-2014) average fawn:doe ratio of 59:100 does (range 48:100-70:100). The buck ratio was 32:100 in 2016, up compared to the 29:100 in 2015. Buck ratios averaged 26 bucks: 100 does over the 2005-2014 period (range 19:100-30:100), but recently have trended higher ( 28 bucks: 100 does) since removing the General License November season (moved opening date into October) in HAs 106 and portions of HA105.

## Harvest Data

Since removing the General License November season in Area 106 and portions of Area 105, buck harvest has declined, resulting in higher postseason buck:doe ratios and more older age class bucks in the population. This was accomplished primarily by reducing hunter numbers,
especially when bucks are most vulnerable in November. For example, in Area 106, 2008-2014 hunter numbers declined from the previous 5-year (2003-2007) average of 587 hunters/year to 490 hunters/year. Creation of Region X and the more intentional distribution of nonresident hunters resulted in a further decrease to 316 hunters in 2016. Current management in HAs 105, 106, and 109 maintaining buck:doe ratios at acceptable levels.

## Population

We constructed a new "Time Specific Juvenile - Constant Adult Mortality Rate" (TSJCA) spreadsheet model for the post season population estimate of this herd. We think the population trend appears to be reasonable. The postseason population estimate for 2016 is about 3,900 deer, or $30 \%$ below the population objective of 5,000 deer.

## Management Summary

We will continue managing for a under objective migratory deer, which consists of conservative buck seasons, with no antlerless harvest, while continuing to address specific damage situations in Hunt Area 105. The 2017 seasons should result in post-season 2017 population near 3,700 deer, while maintaining improved buck ratios in Hunt Areas 105, 106, and 109. Past problems of the very different management strategies of migratory deer in Hunt Area 105, 106, and 109 and farm ground deer of Hunt Area 121 were corrected when Hunt Area 121 was moved into the Shoshone River Herd, which contains similar agricultural habitats. We moved the HA during the 2014 objective review.


