## 2017 - JCR Evaluation Form

**SPECIES:** Mule Deer  
**PERIOD:** 6/1/2017 - 5/31/2018  
**HERD:** MD207 - PAINTROCK  
**HUNT AREAS:** 41, 46-47  
**PREPARED BY:** LESLIE SCHREIBER

### 2012 - 2016 Average | 2017 | 2018 Proposed
---|---|---
Population: | 8,940 | 8,301 | 7,904
Harvest: | 762 | 798 | 665
Hunters: | 1,457 | 1,453 | 1,300
Hunter Success: | 52% | 55% | 51%
Active Licenses: | 1,513 | 1,524 | 1,400
Active License Success: | 50% | 52% | 48%
Recreation Days: | 6,553 | 6,278 | 5,800
Days Per Animal: | 8.6 | 7.9 | 8.7
Males per 100 Females | 28 | 27 | 27
Juveniles per 100 Females | 70 | 65 | 65

Population Objective (± 20%): 11000 (8800 - 13200)

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -24.5%

Number of years population has been + or - objective in recent trend: 18

Model Date: 2/18/2018

<table>
<thead>
<tr>
<th>Proposed harvest rates (percent of pre-season estimate for each sex/age group):</th>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old:</td>
<td>15%</td>
<td>5%</td>
</tr>
<tr>
<td>Males ≥ 1 year old:</td>
<td>27%</td>
<td>33%</td>
</tr>
<tr>
<td>Total:</td>
<td>14%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Proposed change in post-season population: -3% -5%

### Population Size - Postseason

[Graph showing population size and objective range from 2012 to 2017]
Active Licenses

Days per Animal Harvested

Postseason Animals per 100 Females
## 2012 - 2017 Postseason Classification Summary

for Mule Deer Herd MD207 - PAINTROCK

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>Males</th>
<th>Females</th>
<th>Juveniles</th>
<th>Males to 100 Females</th>
<th>Young to Adult</th>
<th>Conf Int</th>
<th>100 Fem Conf Int</th>
<th>100 Fem Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>9,200</td>
<td>87 0 0 0 147 234 14% 877 53% 542 33% 1,653 1,080</td>
<td>10 17 27 ± 2</td>
<td>62 ± 4 49</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>9,500</td>
<td>98 0 0 0 141 239 15% 789 49% 570 36% 1,598 904</td>
<td>12 18 30 ± 3</td>
<td>72 ± 5 55</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td>9,000</td>
<td>94 0 0 0 85 179 13% 704 51% 499 36% 1,382 1,167</td>
<td>13 12 25 ± 3</td>
<td>71 ± 5 57</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>9,000</td>
<td>115 96 56 5 0 272 15% 864 47% 703 38% 1,839 1,724</td>
<td>13 18 31 ± 3</td>
<td>81 ± 5 62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2016</td>
<td>8,000</td>
<td>71 87 63 4 0 225 13% 919 53% 593 34% 1,737 1,214</td>
<td>8 17 24 ± 2</td>
<td>65 ± 4 52</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2017</td>
<td>8,301</td>
<td>92 137 81 10 0 320 14% 1,175 52% 768 34% 2,261 1,164</td>
<td>8 19 27 ± 2</td>
<td>65 ± 3 51</td>
<td></td>
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</table>
## 2018 HUNTING SEASONS
**PAINTROCK MULE DEER HERD (MD207)**

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>41</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 24</td>
<td>General</td>
<td>Antlered deer</td>
</tr>
<tr>
<td>41</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 31</td>
<td>General</td>
<td>Antlerless deer valid on or within one-half (1/2) mile of irrigated land</td>
</tr>
<tr>
<td>41</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>75</td>
<td>Limited quota</td>
</tr>
<tr>
<td>41</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 15</td>
<td>150</td>
<td>Limited quota</td>
</tr>
<tr>
<td>41</td>
<td>8</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>75</td>
<td>Limited quota</td>
</tr>
<tr>
<td>46</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 24</td>
<td>General</td>
<td>Antlered deer</td>
</tr>
<tr>
<td>47</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 24</td>
<td>General</td>
<td>Antlered deer</td>
</tr>
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<td>47</td>
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<tr>
<td>47, 51</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>75</td>
<td>Limited quota</td>
</tr>
<tr>
<td>47</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 15</td>
<td>100</td>
<td>Limited quota</td>
</tr>
<tr>
<td>47</td>
<td>8</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>50</td>
<td>Limited quota</td>
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</table>

Region R nonresident quota = 600 licenses

<table>
<thead>
<tr>
<th>Special Archery Season</th>
<th>Season Dates</th>
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</thead>
<tbody>
<tr>
<td>Hunt Areas</td>
<td></td>
</tr>
<tr>
<td>41, 46, 47</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>License Type</th>
<th>Quota change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region R</td>
<td>NR</td>
<td>-150</td>
</tr>
<tr>
<td>Herd Unit Total</td>
<td>Region R</td>
<td>-150</td>
</tr>
</tbody>
</table>

**Management Evaluation**
Current Postseason Population Management Objective: 11,000
Management Strategy: Recreational
2017 Postseason Population Estimate: ~8,300
2018 Proposed Postseason Population Estimate: ~7,900
2017 Hunter Satisfaction: 75% Satisfied, 13% Neutral, 13% Dissatisfied
Herd Unit Issues
The Paintrock mule deer herd unit is about 25% below its post-season population objective of 11,000 deer under recreational management. The objective was lowered in 2013 from 13,000 (set in 1995) to 11,000 deer, because the population was on a downward trajectory, and 13,000 deer was thought to be unattainable after years of drought. Deer survival and productivity are rarely affected by anthropogenic land uses. Bentonite mining and oil/gas development occur in marginal mule deer habitat on the west side of the herd unit. Riparian habitat on private land is farmed which increases available forage, but landowner tolerance of deer-caused crop damage is low. In an effort to slow the population’s decline, fairly conservative (10-day; antlered only) General hunting seasons are designed to allow some harvest of mule deer on public land, while licenses valid within ½ mile of irrigated land are designed to specifically harvest deer causing crop damage.

Weather
Temperature and precipitation data referenced in this section were summarized for the Bighorn Basin (Climate Division #4) by the National Oceanic and Atmospheric Administration at https://www.ncdc.noaa.gov/cag/divisional/time-series. Thirty-year averages constitute “normal” conditions. Spring 2017 experienced near normal temperatures and below normal precipitation with May receiving 1/3 less precipitation than normal. Summer was slightly drier than normal. During the fall of 2017, precipitation was significantly above normal (September), below normal (October), or above normal (November), with temperatures in November significantly above normal. Temperatures were above average in December and January, turning cold in February resulting in the coldest February since 1989. Precipitation was near normal for December and January with a wet February receiving almost twice the average precipitation. Winter conditions moderated in March and April 2018. The Paintrock mule deer herd experienced a more severe winter than normal in 2017-18, likely resulting in some mortality, especially of the sick and old.

Habitat
The herd unit covers approximately 1,500 mi². The Bighorn Mountains to the east are vegetated by sagebrush-grassland and alpine meadows interspersed with aspen, lodgepole pine, and spruce/fir timber stands. Steep foothills and drainages covered with juniper, sagebrush, and grasslands hold the highest densities of mule deer in the herd unit. Desert-like land to the west is managed by the Bureau of Land Management. Two WGFD Wildlife Habitat Management Areas (Medicine Lodge and Renner) are in this herd unit. To provide a general trend of shrub productivity and mule deer browsing pressure, two sagebrush transects were set up in 2004. Utilization of sagebrush in the Brokenback drainage ranges from <1% to 3% (2004-2017) and in the Alkali drainage ranges from 3% to 24% (2004-2017). Plant health is not affected by such low utilization levels. Snow depth also influences mule deer concentration, and subsequent utilization levels, at these sites.

Field Data
We collect classification data each December from aerial helicopter surveys at higher elevations and standardized ground survey routes at lower elevations. The 2017 buck ratio is 27 bucks: 100 does which is near the 5-year-average (28:100) and within the recreational management guidelines. The 2017 fawn ratio (65:100) is below the 5-year-average (70:100), but indicates a stable population (Unsworth et al. 1999). In this herd unit, fawn ratios drop during drought.
(2000-04=54:100), rally during good moisture years (2013-15=75:100), and level out during average moisture years (2016-17=65:100). Meeting our required minimum sample size, we classified 2,261 mule deer in 2017, which is above the 5-year average (2012-16=1,642).

**Harvest Data**

About 55% of hunters were successful (2012-16=50%) at harvesting a mule deer (n=798) in 2017. The total number of deer harvested mirrors doe/fawn licenses issued. Hunters in 2017 averaged 7.9 days per harvest, less than average (2012-16=8.7 days). About 75% of hunters were satisfied with their hunting experience during the 2017 season, with 13% neutral, and 13% dissatisfied. The hunting season structure has remained fairly constant over the past 20 years. Doe/fawn licenses are issued in response to deer-caused crop damage. General licenses are open Oct. 15 to Nov. 4. Hunt Areas vary between “any deer” and “antlered deer” depending on trends in the previous year’s sex and age ratios. A 4-point antler restriction was enacted during the 2002 and 2003 hunting seasons when the buck ratio dropped to 16:100 in 2001. Although buck ratios have historically been within the range of recreational management, many of these bucks are young and/or small (<20” antler spread), creating dissatisfaction among a vocal group of hunters.

**Population**

The spreadsheet model estimates 8,300 mule deer for post-season 2017; 25% below the objective of 11,000 deer. We selected the Time-Specific Juvenile/Constant Adult (TSJ, CA) survival model. We chose the TSJ, CA model, because the AIC score (159) is within the same order of magnitude as the lowest AIC score (117; CJ, CA), and it makes biological sense that fawn survival varies temporally. Survival constraints matched normal criteria. This model performs fair and the results are biologically defensible, but the model would benefit from a sample-based population estimate with standard errors.

**Management Summary**

Since the early 1990s, several metrics show the Paintrock mule deer population is declining, with only slight increases during good moisture years with higher fawn ratios. Buck ratios stabilized over the past 5 years, but this could be an unintended product of less does in the population. Vocal hunters urge more conservative buck seasons, focusing on antler point restrictions to increase buck numbers to previous levels and to increase number of trophy (>25” antler width) bucks available. Nonresident hunters make up 40% of all hunters, but take 60% of all harvested bucks. The nonresident Region R quota started at 1,500 hunters in 1996 coinciding with high deer abundance in the Paintrock and western North Bighorn (Hunt Areas 50-53) herd units. That quota declined to 1,000 hunters in 2004 then to 750 hunters in 2014 in response to declining mule deer numbers. Due to continued mule deer declines in both the Paintrock and North Bighorn herds, we are dropping the Region R quota to 600 in 2018. However, this does not address the large-scale habitat shifts and other contributing factors, such as nutrition, on decreased deer fawn production which ultimately determines buck quality and quantity.

**Literature Cited**

### 2017 - JCR Evaluation Form

**SPECIES:** Mule Deer  
**PERIOD:** 6/1/2017 - 5/31/2018  
**HERD:** MD208 - SOUTHWEST BIGHORNS  
**HUNT AREAS:** 35-37, 39-40, 164  
**PREPARED BY:** BART KROGER

<table>
<thead>
<tr>
<th></th>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Population:</strong></td>
<td>10,325</td>
<td>11,706</td>
<td>11,967</td>
</tr>
<tr>
<td><strong>Harvest:</strong></td>
<td>1,117</td>
<td>1,534</td>
<td>1,500</td>
</tr>
<tr>
<td><strong>Hunters:</strong></td>
<td>2,002</td>
<td>2,146</td>
<td>2,150</td>
</tr>
<tr>
<td><strong>Hunter Success:</strong></td>
<td>56%</td>
<td>71%</td>
<td>70%</td>
</tr>
<tr>
<td><strong>Active Licenses:</strong></td>
<td>2,074</td>
<td>2,302</td>
<td>2,300</td>
</tr>
<tr>
<td><strong>Active License Success:</strong></td>
<td>54%</td>
<td>67%</td>
<td>65%</td>
</tr>
<tr>
<td><strong>Recreation Days:</strong></td>
<td>8,811</td>
<td>9,045</td>
<td>9,000</td>
</tr>
<tr>
<td><strong>Days Per Animal:</strong></td>
<td>7.9</td>
<td>5.9</td>
<td>6</td>
</tr>
<tr>
<td><strong>Males per 100 Females:</strong></td>
<td>33</td>
<td>39</td>
<td></td>
</tr>
<tr>
<td><strong>Juveniles per 100 Females:</strong></td>
<td>68</td>
<td>65</td>
<td></td>
</tr>
</tbody>
</table>

**Population Objective (± 20%):** 16000 (12800 - 19200)  
**Management Strategy:** Recreational  
**Percent population is above (+) or below (-) objective:** -26.8%  
**Number of years population has been + or - objective in recent trend:** 15  
**Model Date:** 2/17/2018

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

<table>
<thead>
<tr>
<th></th>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old:</td>
<td>6%</td>
<td>6%</td>
</tr>
<tr>
<td>Males ≥ 1 year old:</td>
<td>37%</td>
<td>37%</td>
</tr>
<tr>
<td>Total:</td>
<td>11%</td>
<td>11%</td>
</tr>
</tbody>
</table>

**Proposed change in post-season population:** -0% +2%

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**Population Size - Postseason**

![Population Size Chart](chart.png)

**MD208 - POPULATION**  
**Objective Range**

- 2012: 9347  
- 2013: 9260  
- 2014: 10078  
- 2015: 11221  
- 2016: 11719  
- 2017: 11706
Active Licenses

Days per Animal Harvested

Postseason Animals per 100 Females
<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>MALES</th>
<th>FEMALES</th>
<th>JUVENILES</th>
<th>Males to 100 Females</th>
<th>Young to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2+ Ylg</td>
<td>Cls 1</td>
<td>Cls 2</td>
<td>Cls 3</td>
<td>UnCls Total</td>
</tr>
<tr>
<td>2012</td>
<td>9,347</td>
<td>56</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>141</td>
</tr>
<tr>
<td>2013</td>
<td>9,260</td>
<td>76</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>153</td>
</tr>
<tr>
<td>2014</td>
<td>10,078</td>
<td>93</td>
<td>40</td>
<td>40</td>
<td>6</td>
<td>83</td>
</tr>
<tr>
<td>2015</td>
<td>11,221</td>
<td>107</td>
<td>102</td>
<td>67</td>
<td>16</td>
<td>40</td>
</tr>
<tr>
<td>2016</td>
<td>11,719</td>
<td>112</td>
<td>175</td>
<td>101</td>
<td>17</td>
<td>0</td>
</tr>
<tr>
<td>2017</td>
<td>11,706</td>
<td>138</td>
<td>144</td>
<td>116</td>
<td>20</td>
<td>0</td>
</tr>
</tbody>
</table>
### 2018 HUNTING SEASONS
**SOUTHWEST BIGHORNS MULE DEER HERD (MD208)**

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td></td>
<td>Oct. 15-Oct. 31</td>
<td>375</td>
<td>General</td>
<td>Any deer</td>
</tr>
<tr>
<td>36</td>
<td>1</td>
<td>Oct. 15-Oct. 31</td>
<td>25</td>
<td>Limited quota</td>
<td>Antlered mule deer or any white-tailed deer</td>
</tr>
<tr>
<td>36</td>
<td>8</td>
<td>Oct. 15-Oct. 31</td>
<td>25</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
</tr>
<tr>
<td>37</td>
<td>1</td>
<td>Oct. 15-Oct. 31</td>
<td>200</td>
<td>Limited quota</td>
<td>Antlered deer</td>
</tr>
<tr>
<td>37,39</td>
<td>3</td>
<td>Nov. 1-Nov. 30</td>
<td>25</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
</tr>
<tr>
<td>37</td>
<td>6</td>
<td>Sep. 1-Nov. 15</td>
<td>150</td>
<td>Limited quota</td>
<td>Doe or fawn valid on or within one-half (1/2) mile of irrigated land</td>
</tr>
<tr>
<td>39</td>
<td></td>
<td>Oct. 15-Oct. 25</td>
<td></td>
<td>General</td>
<td>Antlered deer</td>
</tr>
<tr>
<td>40</td>
<td></td>
<td>Oct. 15-Oct. 31</td>
<td>200</td>
<td>Limited quota</td>
<td>Doe or fawn valid off national forest</td>
</tr>
<tr>
<td>40</td>
<td>6</td>
<td>Oct. 15-Oct. 31</td>
<td>200</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
</tr>
<tr>
<td>40</td>
<td>8</td>
<td>Oct. 15-Nov. 30</td>
<td>200</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
</tr>
<tr>
<td>164</td>
<td></td>
<td>Oct. 1-Oct. 30</td>
<td>200</td>
<td>General</td>
<td>Any deer</td>
</tr>
<tr>
<td>164</td>
<td>3</td>
<td>Nov. 1-Nov. 30</td>
<td>25</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
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<tr>
<td>164</td>
<td>6</td>
<td>Oct. 25-Nov. 15</td>
<td>100</td>
<td>Limited quota</td>
<td>Doe or fawn valid on or within one-half (1/2) mile of irrigated land</td>
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</tbody>
</table>

Region M Nonresident general license quota –800 licenses

<table>
<thead>
<tr>
<th>Special Archery Season Hunt Areas</th>
<th>Season Dates</th>
</tr>
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<tbody>
<tr>
<td>35, 36, 37, 39, 40, 164</td>
<td>Sep. 1-Sep. 30</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Quota change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>36</td>
<td>1</td>
<td>+50</td>
</tr>
<tr>
<td>40</td>
<td>8</td>
<td>+100</td>
</tr>
<tr>
<td>Region M</td>
<td>Gen.</td>
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<tr>
<td>Total</td>
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<td>+50</td>
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<tr>
<td></td>
<td>8</td>
<td>+100</td>
</tr>
</tbody>
</table>

**Management Evaluation**

**Current Postseason Population Management Objective**: 16,000

**Management Strategy**: Recreational

**2017 Postseason Population Estimate**: 11,700

**2018 Proposed Postseason Population Estimate**: 12,000

**2017 Hunter Satisfaction**: 77% satisfied, 13% neutral, 10% 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 unit is very difficult because of 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 the model estimate.

**Weather**
No winter conditions have been severe enough in this herd unit to have caused significant mortality in recent years. The winter of 2017/18 started out with mild conditions, but by early February deeper snows and colder temperatures persisted. Mostly normal precipitation levels, but slightly cooler temperatures occurred in the herd unit between May 2017-2018. Generally, the eastern and southern portions of this herd unit receive higher precipitation levels and cooler temperatures than the western and northern portions mainly because of higher elevations.

**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 C). Overall, annual production (leader growth) for these transects has average around 2.0cm. 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 72:100. 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 81% since 2012. Buck ratios typically average around 32:100, but in 2016 and 2017 the ratio jumped to around 40:100.

**Harvest Data**
Recent harvest statistics further support increasing deer numbers in this herd. Since 2013, overall buck harvest has increased by more than 50%, while hunter success has increased from 50% in 2013 to 71% in 2017. These harvest trends are also reflective of field personnel perceptions that deer numbers have increased and hunting conditions have improved. Doe/fawn harvest has remained fairly low the past few years with an annual harvest of about 275 since 2013.

**Population**
The Constant Juvenile and Constant Adult Survival (CJ, CA) spreadsheet model best represents the long-term population trend for this herd. The model has the lowest AIC (n=90), and 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 (Bio Year 2016). A total of 8,088 mule deer were observed, which resulted in an abundance estimate of 11,442 (±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.

**Management Summary**
With improving deer numbers, and an overall hunter satisfaction rating of 77%, only a couple minor season changes are needed for 2018. The first change will be an increase in the type 1 license quota in area 36, from 325 to 375 licenses. The second change will be a change to the area 37 type 1 season dates which is the result of a 2018 packet change. The next is to the area 40 type 6 limitation to only allow doe/fawn harvest off the national forest, which is also reflected in the general season limitation that only antlered deer can be harvested on national forest. The area 37 type 3 licenses will also be valid in area 39 due to white-tailed deer expansions up Kirby Creek. The last change is an increase of type 8 licenses in area 40. The projected 2018 harvest is about 1,500 deer, with a post-season 2018 estimate of around 12,000 deer.
2017 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2017 - 5/31/2018
HERD: MD209 - BASIN
HUNT AREAS: 125, 127
PREPARED BY: BART KROGER

<table>
<thead>
<tr>
<th></th>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population:</td>
<td>2,738</td>
<td>3,143</td>
<td>3,109</td>
</tr>
<tr>
<td>Harvest:</td>
<td>159</td>
<td>163</td>
<td>200</td>
</tr>
<tr>
<td>Hunters:</td>
<td>304</td>
<td>299</td>
<td>325</td>
</tr>
<tr>
<td>Hunter Success:</td>
<td>52%</td>
<td>55%</td>
<td>62%</td>
</tr>
<tr>
<td>Active Licenses:</td>
<td>322</td>
<td>317</td>
<td>300</td>
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<tr>
<td>Active License Success:</td>
<td>49%</td>
<td>51%</td>
<td>67%</td>
</tr>
<tr>
<td>Recreation Days:</td>
<td>1,233</td>
<td>1,082</td>
<td>1,200</td>
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<tr>
<td>Days Per Animal:</td>
<td>7.8</td>
<td>6.6</td>
<td>6</td>
</tr>
<tr>
<td>Males per 100 Females</td>
<td>35</td>
<td>34</td>
<td></td>
</tr>
<tr>
<td>Juveniles per 100 Females</td>
<td>66</td>
<td>64</td>
<td></td>
</tr>
</tbody>
</table>

Population Objective (± 20%): 3600 (2880 - 4320)
Management Strategy: Recreational
Percent population is above (+) or below (-) objective: -12.7%
Number of years population has been + or - objective in recent trend: 18
Model Date: 2/17/2018

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

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<thead>
<tr>
<th></th>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old</td>
<td>2%</td>
<td>4%</td>
</tr>
<tr>
<td>Males ≥ 1 year old</td>
<td>18%</td>
<td>17%</td>
</tr>
<tr>
<td>Total</td>
<td>5%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Proposed change in post-season population: +3% -1%

Population Size - Postseason

![Graph showing population size postseason from 2012 to 2017 with objective range shaded.](image-url)
## 2012 - 2017 Postseason Classification Summary

for Mule Deer Herd MD209 - BASIN

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>MALES</th>
<th>FEMALES</th>
<th>JUVENILES</th>
<th>Males to 100 Females</th>
<th>Young to Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ylg</td>
<td>Cls 1</td>
<td>Cls 2</td>
<td>Cls 3 UnCls Total %</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>%</td>
<td>Total %</td>
<td>Total %</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Total</td>
<td>Cls Obj</td>
<td>Ylng Adult Total</td>
<td>Conf Adult</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Conf</td>
<td>Int</td>
<td>100 Fem</td>
<td>100 Int</td>
<td>100 Adult</td>
</tr>
<tr>
<td>Year</td>
<td>Post Pop</td>
<td>2012</td>
<td>2,627</td>
<td>27 0 0 0 49 76</td>
<td>16%</td>
<td>236 51%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2013</td>
<td>2,483</td>
<td>30 0 0 0 58 88</td>
<td>20%</td>
<td>236 54%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2014</td>
<td>2,643</td>
<td>17 0 0 0 35 52</td>
<td>13%</td>
<td>210 51%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2015</td>
<td>2,883</td>
<td>33 44 23 5 0 105</td>
<td>17%</td>
<td>295 48%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2016</td>
<td>3,052</td>
<td>42 103 34 4 0 183</td>
<td>19%</td>
<td>460 48%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2017</td>
<td>3,143</td>
<td>25 29 37 5 0 96</td>
<td>17%</td>
<td>283 51%</td>
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</table>
2018 HUNTING SEASONS
BASIN MULE DEER HERD (MD209)

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>1</td>
<td>Nov. 1</td>
<td>Nov. 15</td>
<td>100</td>
<td>Limited quota</td>
</tr>
<tr>
<td>125</td>
<td>6</td>
<td>Sep. 15</td>
<td>Oct. 15</td>
<td>25</td>
<td>Limited quota</td>
</tr>
<tr>
<td>127</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 24</td>
<td></td>
<td>General</td>
</tr>
<tr>
<td>127</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>25</td>
<td>Limited quota</td>
</tr>
<tr>
<td>127</td>
<td>8</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>50</td>
<td>Limited quota</td>
</tr>
</tbody>
</table>

Region X Nonresident General license quota – 300 licenses

<table>
<thead>
<tr>
<th>Special Archery Season Hunt Areas</th>
<th>Season Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>125, 127</td>
<td>Sep. 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Quota change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>125</td>
<td>6</td>
<td>-25</td>
</tr>
<tr>
<td>127</td>
<td>8</td>
<td>+50, new license type</td>
</tr>
<tr>
<td>Region X</td>
<td>Gen.</td>
<td>0</td>
</tr>
<tr>
<td>HU Total</td>
<td>8</td>
<td>+25</td>
</tr>
</tbody>
</table>

Management Evaluation
Current Postseason Population Management Objective: 3,600
Management Strategy: Recreational
2017 Postseason Population Estimate: 3100
2018 Proposed Postseason Population Estimate: 3100
2017 Hunter Satisfaction: 66% satisfied, 15% neutral, 19% 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
No winter conditions have been severe enough in the Basin herd to have caused significant deer mortality in recent years. 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. The winter of 2017/18 started out with mild conditions, but by early February deeper snows and colder temperatures persisted. Mostly below normal precipitation levels, and slightly cooler temperatures occurred in the herd unit between May 2017-2018. Generally, this herd unit lies in a 5-7 inch precipitation zone within the interior portions of the Bighorn Basin. Thus, these drier conditions make for poorer habitats and available water for this deer herd as compared to other surrounding herds.

<table>
<thead>
<tr>
<th>Departure from normal precipitation (in) for the Bighorn Basin, WY. May 2017-May 2018</th>
<th>Departure from normal temperature (˚F) for the Bighorn Basin, WY. May 2017-May 2018</th>
</tr>
</thead>
</table>

**Habitat**

Most of the herd unit lies within a 5-7"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 3cm, with utilization levels at about 15%. 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 were observed in the herd from 2014-2016, with a 3-year average of 72:100. Prior to that, the average fawn ratio was 54:100. The 2017 fawn ratio was 64:100. The number of deer classified in recent years has also increased, with 440 deer in 2013 to 960 in 2016. However, the number classified in 2017 was down to 560. The buck ratio has continued to average around 34:100 the past 5 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, 244 and 136 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, percent hunter success in area 125 has improved from 56% in 2012 to 69% in 2017. Most hunters and landowners agree deer numbers are improving. Based on the 2014 hunter satisfaction survey, only 50% of the hunters surveyed indicated they were satisfied with their overall hunting experience, whereas in 2017, 65% were satisfied. Again, this is likely the result of recent improving deer numbers due to record high fawn ratios and survival.

**Population**
The Semi-Constant Juvenile & Semi-Constant Adult Survival (SCJ, SCA) spreadsheet model was chosen to represent this herd based on its population trend. This model has the lowest AIC value (n=79) of all the models, and 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**
The only change to the 2018 season is a decrease of 25 type 6 licenses for hunt area 125. This was due to an isolated EHD outbreak along Gooseberry Creek in late summer 2017. Although deer numbers have improved in recent years, the growth of this herd has always struggled. The only other changes will be the addition of a type 8 license for doe/fawn white-tailed deer in area 127 to address potential damage issues, and to allow area 127 type 3 hunters to also hunt in area 125. The projected 2018 harvest is 175 mule deer, with a 2018 post-season population of 3,100 deer, or 14% below objective.
2017 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2017 - 5/31/2018
HERD: MD210 - GREYBULL RIVER
HUNT AREAS: 124, 165
PREPARED BY: LESLIE SCHREIBER

<table>
<thead>
<tr>
<th></th>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>4,340</td>
<td>3,060</td>
<td>3,073</td>
</tr>
<tr>
<td>Harvest</td>
<td>594</td>
<td>523</td>
<td>505</td>
</tr>
<tr>
<td>Hunters</td>
<td>923</td>
<td>938</td>
<td>900</td>
</tr>
<tr>
<td>Hunter Success</td>
<td>64%</td>
<td>56%</td>
<td>56 %</td>
</tr>
<tr>
<td>Active Licenses</td>
<td>1,076</td>
<td>1,074</td>
<td>1,050</td>
</tr>
<tr>
<td>Active License Success</td>
<td>55%</td>
<td>49%</td>
<td>48 %</td>
</tr>
<tr>
<td>Recreation Days</td>
<td>3,735</td>
<td>3,173</td>
<td>3,175</td>
</tr>
<tr>
<td>Days Per Animal</td>
<td>6.3</td>
<td>6.1</td>
<td>6.3</td>
</tr>
<tr>
<td>Males per 100 Females</td>
<td>35</td>
<td>26</td>
<td></td>
</tr>
<tr>
<td>Juveniles per 100 Females</td>
<td>87</td>
<td>63</td>
<td></td>
</tr>
</tbody>
</table>

Population Objective (± 20%) : 4000 (3200 - 4800)

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -23.5%

Number of years population has been + or - objective in recent trend: 1

Model Date: 2/26/2018

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

<table>
<thead>
<tr>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old:</td>
<td>15%</td>
</tr>
<tr>
<td>Males ≥ 1 year old:</td>
<td>27%</td>
</tr>
<tr>
<td>Total:</td>
<td>14%</td>
</tr>
</tbody>
</table>

Proposed change in post-season population: 3% 0%

Population Size - Postseason

![Population Size - Postseason Chart](image)
## 2012 - 2017 Postseason Classification Summary

for Mule Deer Herd MD210 - GREYBULL RIVER

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>MALES</th>
<th>FEMALES</th>
<th>JUVENILES</th>
<th>Males to 100 Females</th>
<th>Young to</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td>2+</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ylg</td>
<td>Cls 1</td>
<td>Cls 2</td>
<td>Cls 3 UnCls</td>
<td>Total</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Total</td>
<td>Total</td>
<td>Tot Cls</td>
<td>Cls Obj</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>%</td>
<td>%</td>
<td>Ylng Adult Total</td>
<td>Conf Int</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Conf</td>
<td>Int</td>
<td>100 Fem</td>
<td>100 Int</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>100</td>
<td>Adult</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2012</td>
<td>4,200</td>
<td>65</td>
<td>0</td>
<td>0</td>
<td>94</td>
<td>159</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>15%</td>
<td>571</td>
<td>416</td>
<td>54%</td>
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<td></td>
<td></td>
<td></td>
<td>320</td>
<td>30%</td>
<td>1,050</td>
<td>969</td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>11</td>
<td>16</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>28 ± 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>56 ± 4</td>
<td>44</td>
</tr>
<tr>
<td>2013</td>
<td>4,300</td>
<td>47</td>
<td>0</td>
<td>0</td>
<td>95</td>
<td>142</td>
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<td></td>
<td></td>
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<td>17%</td>
<td>416</td>
<td>301</td>
<td>48%</td>
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<td>35%</td>
<td>859</td>
<td>915</td>
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<td>23</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>34 ± 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>72 ± 6</td>
<td>54</td>
</tr>
<tr>
<td>2014</td>
<td>4,000</td>
<td>69</td>
<td>0</td>
<td>0</td>
<td>114</td>
<td>183</td>
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<td></td>
<td></td>
<td></td>
<td>14%</td>
<td>525</td>
<td>590</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>590</td>
<td>45%</td>
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<td>1,331</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td>13</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>35 ± 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>112</td>
<td>± 3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>112 ± ± 7</td>
<td>83</td>
</tr>
<tr>
<td>2015</td>
<td>4,600</td>
<td>68</td>
<td>71</td>
<td>50</td>
<td>4</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>19%</td>
<td>454</td>
<td>410</td>
<td>43%</td>
</tr>
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<td></td>
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<td></td>
<td>410</td>
<td>39%</td>
<td>1,063</td>
<td>1,529</td>
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<td></td>
<td>44 ± 4</td>
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<td></td>
<td></td>
<td>90 ± ± 7</td>
<td>63</td>
</tr>
<tr>
<td>2016</td>
<td>4,600</td>
<td>38</td>
<td>51</td>
<td>26</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14%</td>
<td>347</td>
<td>363</td>
<td>41%</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>363</td>
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<td>851</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td>35 ± 4</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>110 ± ± 9</td>
<td>82</td>
</tr>
<tr>
<td>2017</td>
<td>3,060</td>
<td>30</td>
<td>31</td>
<td>17</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>14%</td>
<td>295</td>
<td>185</td>
<td>53%</td>
</tr>
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<td></td>
<td>185</td>
<td>33%</td>
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<td>26 ± 4</td>
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<tr>
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<td></td>
<td></td>
<td></td>
<td>63 ± ± 7</td>
<td>50</td>
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### 2018 HUNTING SEASONS
GREYBULL RIVER MULE DEER HERD (MD210)

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>124</td>
<td>1</td>
<td>Nov. 1</td>
<td>Nov. 10</td>
<td>General</td>
<td>Any deer</td>
</tr>
<tr>
<td>124</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
</tr>
<tr>
<td>124</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn on or within one-half (1/2) mile of irrigated land</td>
</tr>
<tr>
<td>124</td>
<td>7</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn valid on or within one-half (1/2) mile of irrigated land west of Wyoming Highway 30 and Big Horn County Road 8</td>
</tr>
<tr>
<td>124</td>
<td>8</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
</tr>
<tr>
<td>165</td>
<td>1</td>
<td>Oct. 15</td>
<td>Oct. 31</td>
<td>Limited quota</td>
<td>Any deer</td>
</tr>
<tr>
<td>165</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
</tr>
<tr>
<td>165</td>
<td>6</td>
<td>Sep. 1</td>
<td>Oct. 31</td>
<td>Limited quota</td>
<td>Doe or fawn valid on private land</td>
</tr>
<tr>
<td>165</td>
<td>8</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
</tr>
</tbody>
</table>

Region X nonresident quota: 300

<table>
<thead>
<tr>
<th>Special Archery Season</th>
<th>Season Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunt Areas</td>
<td>Opens</td>
</tr>
<tr>
<td>124, 165</td>
<td>Sep. 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>License Type</th>
<th>Quota Change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>124</td>
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<td>-50</td>
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<tr>
<td>124</td>
<td>8</td>
<td>+25</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Herd Unit</th>
<th>Quota Change from 2017</th>
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</thead>
<tbody>
<tr>
<td>Total</td>
<td>+25</td>
</tr>
</tbody>
</table>

**Management Evaluation**

Current Postseason Population Management Objective: 4,000
Management Strategy: Recreational
2017 Postseason Population Estimate: ~3,000
2018 Proposed Postseason Population Estimate: ~3,000
2017 Hunter Satisfaction: 71% Satisfied, 19% Neutral, 10% Dissatisfied
Herd Unit Issues
The model-based post-season population objective is 4,000 deer under recreational management. While the majority of the Greybull River mule deer herd unit is public land, deer congregate along riparian corridors on private cropland which has increased forage. Landowner tolerance of deer and the crop damage they cause is low in Hunt Area 124 to the east. A November General hunting season in Hunt Area 124 is designed to address crop damage and prevent this herd from increasing rapidly during high production years. About 20 walk-in hunting areas in Hunt Area 124 provide access to private land. On the other hand, landowners to the west in Hunt Area 165 are typically unconcerned with crop damage, hire outfitters, and helped institute a Limited Quota hunting season to manage for higher buck ratios. Anthropomorphic land uses, such as the Oregon Basin oil field to the west, have only a slight influence on deer survival and productivity.

Weather
Temperature and precipitation data referenced in this section were summarized for the Bighorn Basin (Climate Division #4) by the National Oceanic and Atmospheric Administration at https://www.ncdc.noaa.gov/cag/divisional/time-series. Thirty-year averages constitute “normal” conditions. Spring 2017 experienced near normal temperatures and below normal precipitation with May receiving $1/3$ less precipitation than normal. Summer was slightly drier than normal. During the fall of 2017, precipitation was significantly above normal (September), below normal (October), or above normal (November), with temperatures in November significantly above normal. Temperatures were above average in December and January, turning cold in February resulting in the coldest February since 1989. Precipitation was near normal for December and January with a wet February receiving almost twice the average precipitation. Winter conditions moderated in March and April 2018. Cold and wet weather in February may have energetically taxed some deer, but proximity to agriculture areas likely mitigated those effects.

Habitat
This herd unit stretches east to west across the Bighorn Basin. Uplands are comprised of sagebrush-saltbush-grasslands, and private agriculture is found along major rivers and streams. Habitat quality is limited by a scarcity of moisture ($\leq 12\text{" average annual precipitation}) and poor soils producing desert-like conditions. Compared to the rest of Wyoming, the Bighorn Basin is more susceptible to cheatgrass, which does not bode well for already marginal mule deer habitat on public lands. To provide a general trend of upland shrub productivity, a sagebrush transect was established in 2004 near Dry Creek; however, this transect’s main purpose is to evaluate pronghorn winter range, and deer do not utilize this site.

Field Data
The 2017 buck ratio is 26 bucks:100 does which is below the 5-year-average (35:100). The average buck ratio represents a mixture of high buck ratios in Limited Quota Hunt Area 165 and lower recreational buck ratios in General Hunt Area 124. The 2017 fawn ratio (63:100) is below the 5-year-average (88:100) when record high fawn ratios were recorded. We collect classification data each December from ground surveys; unfortunately, no measure of effort between years exists, and some years we fail to meet our minimum sample size (~1,000). Due to personnel workload, Hunt Area 165 was not classified in 2017. We classified 558 mule deer in 2017 (all Hunt Area 124) which is understandably below the 5-year-average for the herd unit (n=1,018). By December, deer along the Greybull River stay in heavy cover until a few minutes
before dark, making classification surveys challenging and strung out over the month of December.

**Harvest Data**

About 55% of hunters were successful (2012-16=50%) at harvesting a mule deer (n=798) in 2017. The total number of deer harvested mirrors doe/fawn licenses issued. Hunters in 2017 averaged 7.9 days per harvest, less than average (2012-16=8.7 days). Hunters in 2017 had low success (56%) compared to the 5-year-average (64%). Hunters in 2017 harvested 523 mule deer which is less than average (n=594); however, total deer harvest mirrors the quota of doe/fawn licenses issued. Hunters in 2017 averaged 6.1 days per harvest which is near average (2012-16=6.2 days). About 71% of hunters were satisfied with their hunting experience during the 2017 season, with 19% neutral, and 10% dissatisfied. The nonresident Region X quota (n=300) was established in 2015 when it was split from Region F. The General season harvest in Hunt Area 124 is large enough to mask trends in Limited Quota Hunt Area 165. Historically, General seasons in Hunt Area 124 for bucks only ranged from 7 to 10 days (1990-present), opening November 1. Hunt Area 165 switched to Limited Quota in 1987 with 100-250 licenses issued annually. 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. Some Hunt Area 124 hunters complain about the lack of large-antlered bucks, but high harvest to address crop damage limits the “trophy” potential of this herd.

**Population**

The spreadsheet model estimates 3,000 mule deer for post-season 2017; 24% below the objective of 4,000 deer. We selected the Time-Specific Juvenile/Constant Adult (TSJ, CA) survival model, because the AIC score (179) is within the same order of magnitude as the lowest AIC score (122; CJ, CA), and it makes biological sense that fawn survival varies temporally. Survival constraints matched normal criteria. This model performs **poor**, because rigorous classification data is lacking due to the nocturnal habits of deer. Plus, fawn ratios vary drastically year-to-year, creating a challenging modeling environment. The model would benefit from a sample-based population estimate with standard errors. The model estimates the population declined 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, then jumps to 4,600 deer in 2016. The drastic increase estimated for 2014-15 is a result of the record fawn ratios observed, but caution is warranted when interpreting ratio data with small sample sizes.

**Management Summary**

The spreadsheet model estimates fluctuate widely year-to-year, reducing our confidence in its utility for this herd. We continue to manage this herd by providing hunter opportunity while concurrently addressing crop damage. Some hunters request more time to harvest bucks, while other hunters want shorter seasons to allow bucks to mature into older age classes. If buck ratios increase in Hunt Area 124, a longer buck season may be possible. Many hunters want fewer does harvested, but with the majority of the deer residing on private croplands, this is impractical and irresponsible on a large scale.
# 2017 - JCR Evaluation Form

**SPECIES:** Mule Deer  
**PERIOD:** 6/1/2017 - 5/31/2018  
**HERD:** MD211 - SHOSHONE RIVER  
**HUNT AREAS:** 121-123  
**PREPARED BY:** LESLIE SCHREIBER

### 2012 - 2016 Average vs. 2017 vs. 2018 Proposed

<table>
<thead>
<tr>
<th></th>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population</td>
<td>940</td>
<td>4,216</td>
<td>3,685</td>
</tr>
<tr>
<td>Harvest</td>
<td>754</td>
<td>859</td>
<td>890</td>
</tr>
<tr>
<td>Hunters</td>
<td>1,416</td>
<td>1,726</td>
<td>1,750</td>
</tr>
<tr>
<td>Hunter Success</td>
<td>53%</td>
<td>50%</td>
<td>51%</td>
</tr>
<tr>
<td>Active Licenses</td>
<td>1,536</td>
<td>1,859</td>
<td>1,800</td>
</tr>
<tr>
<td>Active License Success</td>
<td>49%</td>
<td>46%</td>
<td>49%</td>
</tr>
<tr>
<td>Recreation Days</td>
<td>5,996</td>
<td>7,070</td>
<td>7,100</td>
</tr>
<tr>
<td>Days Per Animal</td>
<td>8.0</td>
<td>8.2</td>
<td>8.0</td>
</tr>
<tr>
<td>Males per 100 Females</td>
<td>32</td>
<td>36</td>
<td></td>
</tr>
<tr>
<td>Juveniles per 100 Females</td>
<td>89</td>
<td>78</td>
<td></td>
</tr>
</tbody>
</table>

### Population Objective (± 20%)

- **5000** (4000 - 6000)

### Management Strategy

- Recreational

### Percent population is above (+) or below (-) objective

- -15.7%

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

- 1

### Model Date

- 2/18/2018

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

<table>
<thead>
<tr>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old</td>
<td>15%</td>
</tr>
<tr>
<td>Males ≥ 1 year old</td>
<td>27%</td>
</tr>
<tr>
<td>Total</td>
<td>14%</td>
</tr>
</tbody>
</table>

### Proposed change in post-season population

- -3%  
- -12%

---

**Population Size - Postseason**

[Graph showing population size from 2012 to 2017, indicating a proposed harvest range of 4,000 to 4,216.]
# 2012 - 2017 Postseason Classification Summary
for Mule Deer Herd MD211 - SHOSHONE RIVER

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>MALES</th>
<th>FEMALES</th>
<th>JUVENILES</th>
<th>Males to 100 Females</th>
<th>Young to 100 Females</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Ylg</td>
<td>2+ Cls 1</td>
<td>2+ Cls 2</td>
<td>2+ Cls 3</td>
<td>UnCls</td>
</tr>
<tr>
<td>2012</td>
<td>0</td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>37</td>
</tr>
<tr>
<td>2013</td>
<td>0</td>
<td>18</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>14</td>
</tr>
<tr>
<td>2014</td>
<td>0</td>
<td>46</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>42</td>
</tr>
<tr>
<td>2015</td>
<td>0</td>
<td>44</td>
<td>51</td>
<td>14</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td>2016</td>
<td>4,700</td>
<td>43</td>
<td>39</td>
<td>6</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td>2017</td>
<td>4,216</td>
<td>21</td>
<td>29</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

2012: 34 males, 0 females, 0 juveniles. Total 71, 12% Ylg, 48% 2+ Cls
2013: 18 males, 0 females, 0 juveniles. Total 32, 12% Ylg, 47% 2+ Cls
2014: 46 males, 0 females, 0 juveniles. Total 88, 14% Ylg, 44% 2+ Cls
2015: 44 males, 51 females, 14 juveniles. Total 116, 17% Ylg, 43% 2+ Cls
2016: 43 males, 39 females, 6 juveniles. Total 96, 16% Ylg, 45% 2+ Cls
2017: 21 males, 29 females, 6 juveniles. Total 56, 17% Ylg, 47% 2+ Cls
### 2018 HUNTING SEASONS
**SHOSHONE RIVER MULE DEER HERD (MD211)**

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td></td>
<td>Nov. 1</td>
<td>Nov. 10</td>
<td>General</td>
<td>Any deer</td>
</tr>
<tr>
<td>121</td>
<td></td>
<td>Nov. 11</td>
<td>Nov. 30</td>
<td>General</td>
<td>Antlerless deer</td>
</tr>
<tr>
<td>121</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
</tr>
<tr>
<td>121</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn valid on or within one-half (1/2) mile of irrigated land</td>
</tr>
<tr>
<td>122</td>
<td></td>
<td>Nov. 1</td>
<td>Nov. 10</td>
<td>General</td>
<td>Any deer</td>
</tr>
<tr>
<td>122</td>
<td></td>
<td>Nov. 11</td>
<td>Nov. 30</td>
<td>General</td>
<td>Antlerless deer</td>
</tr>
<tr>
<td>122</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
</tr>
<tr>
<td>122</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn valid on or within one-half (1/2) mile of irrigated land within the Shoshone River drainage</td>
</tr>
<tr>
<td>123</td>
<td></td>
<td>Oct. 15</td>
<td>Oct. 31</td>
<td>General</td>
<td>Antlered mule deer or any white-tailed deer</td>
</tr>
<tr>
<td>123</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>Limited quota</td>
<td>Doe or fawn valid on private land south of the Shoshone River</td>
</tr>
</tbody>
</table>

**Region X Nonresident deer quota: 300**

<table>
<thead>
<tr>
<th>Special Archery Season</th>
<th>Season Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hunt Areas</td>
<td>Opens</td>
</tr>
<tr>
<td>121, 122, 123</td>
<td>Sep. 1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>License Type</th>
<th>Quota change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>6</td>
<td>+50</td>
</tr>
<tr>
<td>122</td>
<td>3</td>
<td>+25</td>
</tr>
<tr>
<td>123</td>
<td>6</td>
<td>+50</td>
</tr>
</tbody>
</table>

| Herd Unit Total | 3 | +25 |

**Management Evaluation**

- **Current Postseason Population Management Objective:** 5,000
- **Management Strategy:** Recreational
- **2017 Postseason Population Estimate:** ~4,200
- **2018 Proposed Postseason Population Estimate:** ~3,700
- **2017 Hunter Satisfaction:** 59% Satisfied, 23% Neutral, 18% Dissatisfied
Herd Unit Issues
The model-based post-season population objective is 5,000 deer under recreational management. This objective was established during the public herd unit review in 2016, after 15 years of no objective due to insufficient classification sample sizes. In addition, Hunt Area 121 was transferred from the Clarks Fork mule deer herd (MD 216) to the Shoshone River herd in 2016. While the majority of the Shoshone River mule deer herd unit is public land, deer congregate along riparian corridors on private cropland which has increased forage. Landowner tolerance of deer and the crop damage they cause is low in all three hunt areas. A November General hunting season is designed to address crop damage and prevent this herd from increasing rapidly during high production years. About a dozen walk-in hunting areas provide access to private land. Anthropomorphic land uses, other than farming, that have little effect on deer survival and productivity include housing development, oil/gas development, and mining. Bentonite mining is typically in poor quality habitat with few to no deer.

Weather
Temperature and precipitation data referenced in this section were summarized for the Bighorn Basin (Climate Division #4) by the National Oceanic and Atmospheric Administration at https://www.ncdc.noaa.gov/cag/divisional/time-series. Thirty-year averages constitute “normal” conditions. Spring 2017 experienced near normal temperatures and below normal precipitation with May receiving 1/3 less precipitation than normal. Summer was slightly drier than normal. During the fall of 2017, precipitation was significantly above normal (September), below normal (October), or above normal (November), with temperatures in November significantly above normal. Temperatures were above average in December and January, turning cold in February resulting in the coldest February since 1989. Precipitation was near normal for December and January with a wet February receiving almost twice the average precipitation. Winter conditions moderated in March and April 2018. Cold and wet weather in February may have energetically taxed some deer, but proximity to agriculture areas likely mitigated those effects.

Habitat
This herd unit stretches east to west across the Bighorn Basin, adjacent to Montana. Uplands are comprised of sagebrush-saltbush-grasslands, and private agriculture is found along major rivers and streams. Habitat quality is limited by a scarcity of moisture (≤12” average annual precipitation) and poor soils producing desert-like conditions. Compared to the rest of Wyoming, the Bighorn Basin is more susceptible to cheatgrass, which does not bode well for already marginal mule deer habitat on public lands. No shrub transects are established within the herd unit to measure production and utilization of upland shrubs.

Field Data
We collect classification data each December from ground surveys; unfortunately, no measure of effort between years exists. The 2017 buck ratio is 36 bucks:100 does which is above the 5-year-average (31:100). The 2017 fawn ratio (78:100) is also below the 5-year-average (89:100). However, we consistently fall short of our classification objective (1,333 deer). We only classified 334 mule deer in 2017 which is also below the 5-year-average (n=557) and below the required minimum sample size (n=1,333). By December, deer along the Shoshone River stay in heavy cover until a few minutes before dark, making classification surveys challenging and strung out over the month of December. Past attempts to survey the herd unit using a helicopter
did not result in improved classification data, so we discontinued the technique. Unsworth et al. (1999) suggests that a winter fawn ratio above 66:100 results in an increasing population. While caution is warranted over small sample sizes, fawn ratios ranged between 78-96:100 over the past 5 years; evidence that the Shoshone River deer herd can grow quickly, given that nutrition is supplemented by irrigated crops.

**Harvest Data**

About 50% of hunters were successful (2012-16=53%) at harvesting a mule deer (n=859) in 2017. The total number of deer harvested mirrors doe/fawn licenses issued. Hunters in 2017 averaged 8.2 days per harvest, slightly more than average (2012-16=8.0). Number of hunters and their success mirrors doe/fawn license quotas. About 59% of hunters were satisfied with their hunting experience during the 2017 season, with 23% neutral, and 18% dissatisfied. The nonresident Region X quota (n=300) was established in 2015 when it was split from Region F. 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. Some hunters complain about the lack of large-antlered bucks, but high harvest to address crop damage limits the “trophy” potential of this herd.

**Population**

The spreadsheet model estimates 4,200 mule deer for post-season 2017; 16% below the objective of 5,000 deer. We selected the Time-Specific Juvenile/Constant Adult (TSJ, CA) survival model, because the AIC score (162) is within the same order of magnitude as the lowest AIC score (102; CJ, CA), and it makes biological sense that fawn survival varies temporally. Survival constraints matched normal criteria. This model performs *poor*, because rigorous classification data is lacking due to the nocturnal habits of deer. Plus, fawn ratios vary drastically year-to-year which challenges the model. The model would benefit from a sample-based population estimate with standard errors. The model estimates 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 crop damage.

**Management Summary**

The objective of 5,000 deer provides opportunity, yet maintains acceptable levels of deer to satisfy most landowners. The General hunting season allows for ample harvest. Many hunters want fewer does harvested and more “quality” bucks available, but with the majority of the deer residing on private croplands, this is impractical and irresponsible on a large scale. Very few (range=5-18) mule deer does are observed during annual nighttime classifications on Yellowtail Wildlife Habitat Management Area. The 2018 General hunting season for Hunt Area 123 (Yellowtail) prohibits the harvest of mule deer does while allowing the harvest of mule deer bucks and any white-tailed deer.

**Literature Cited**

2017 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2017 - 5/31/2018
HERD: MD212 - OWL CREEK/MEETEETSE
HUNT AREAS: 116-120
PREPARED BY: BART KROGER

<table>
<thead>
<tr>
<th></th>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population:</td>
<td>3,308</td>
<td>3,941</td>
<td>4,344</td>
</tr>
<tr>
<td>Harvest:</td>
<td>223</td>
<td>261</td>
<td>275</td>
</tr>
<tr>
<td>Hunters:</td>
<td>299</td>
<td>337</td>
<td>350</td>
</tr>
<tr>
<td>Hunter Success:</td>
<td>75%</td>
<td>77%</td>
<td>79 %</td>
</tr>
<tr>
<td>Active Licenses:</td>
<td>313</td>
<td>351</td>
<td>375</td>
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<tr>
<td>Active License Success:</td>
<td>71%</td>
<td>74%</td>
<td>73 %</td>
</tr>
<tr>
<td>Recreation Days:</td>
<td>1,327</td>
<td>1,465</td>
<td>1,500</td>
</tr>
<tr>
<td>Days Per Animal:</td>
<td>6.0</td>
<td>5.6</td>
<td>5.5</td>
</tr>
<tr>
<td>Males per 100 Females</td>
<td>39</td>
<td>37</td>
<td></td>
</tr>
<tr>
<td>Juveniles per 100 Females</td>
<td>71</td>
<td>75</td>
<td></td>
</tr>
</tbody>
</table>

Population Objective (± 20%): 5000 (4000 - 6000)
Management Strategy: Special
Percent population is above (+) or below (-) objective: -21.2%
Number of years population has been + or - objective in recent trend: 10
Model Date: 2/17/2018

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

<table>
<thead>
<tr>
<th></th>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old:</td>
<td>3%</td>
<td>2%</td>
</tr>
<tr>
<td>Males ≥ 1 year old:</td>
<td>23%</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>6%</td>
<td>6%</td>
</tr>
</tbody>
</table>

Proposed change in post-season population: +8% +9%

Population Size - Postseason

![Population Size - Postseason Chart](chart.png)
### 2012 - 2017 Postseason Classification Summary

for Mule Deer Herd MD212 - OWL CREEK/MEETEETSE

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>Male Ylg</th>
<th>Male Cls 1</th>
<th>Male Cls 2</th>
<th>Male Cls 3</th>
<th>Male Total</th>
<th>Female Total</th>
<th>Juvenile Total</th>
<th>Males to 100 Females</th>
<th>Young to Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>3,206</td>
<td>34</td>
<td>0</td>
<td>0</td>
<td>130</td>
<td>164</td>
<td>20%</td>
<td>406</td>
<td>50%</td>
<td>241</td>
</tr>
<tr>
<td>2013</td>
<td>3,026</td>
<td>37</td>
<td>0</td>
<td>0</td>
<td>113</td>
<td>150</td>
<td>18%</td>
<td>413</td>
<td>51%</td>
<td>250</td>
</tr>
<tr>
<td>2014</td>
<td>3,275</td>
<td>27</td>
<td>0</td>
<td>0</td>
<td>81</td>
<td>108</td>
<td>18%</td>
<td>265</td>
<td>44%</td>
<td>228</td>
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<tr>
<td>2015</td>
<td>3,400</td>
<td>89</td>
<td>70</td>
<td>51</td>
<td>15</td>
<td>225</td>
<td>16%</td>
<td>635</td>
<td>46%</td>
<td>518</td>
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<tr>
<td>2016</td>
<td>3,634</td>
<td>100</td>
<td>126</td>
<td>90</td>
<td>27</td>
<td>343</td>
<td>20%</td>
<td>789</td>
<td>47%</td>
<td>554</td>
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<tr>
<td>2017</td>
<td>3,941</td>
<td>48</td>
<td>66</td>
<td>61</td>
<td>13</td>
<td>188</td>
<td>17%</td>
<td>509</td>
<td>47%</td>
<td>383</td>
</tr>
<tr>
<td>Hunt Area</td>
<td>Type</td>
<td>Season Dates</td>
<td>Quota</td>
<td>License</td>
<td>Limitations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>------</td>
<td>--------------</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>Opens</td>
<td>Closes</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>116</td>
<td>1</td>
<td>Oct. 15</td>
<td>Oct. 31</td>
<td>75</td>
<td>Limited quota</td>
<td>Antlered mule deer or any white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116, 117, 118</td>
<td>3</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td>100</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>6</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>50</td>
<td>Limited quota</td>
<td>Doe or fawn valid on private land</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116</td>
<td>7</td>
<td>Sep. 1</td>
<td>Oct. 14</td>
<td>100</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer valid on private land in the Wood River drainage</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>116, 117, 118</td>
<td>8</td>
<td>Oct. 15</td>
<td>Nov. 30</td>
<td>150</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>117</td>
<td>1</td>
<td>Sep. 15</td>
<td>Oct. 15</td>
<td>50</td>
<td>Limited quota</td>
<td>Antlered mule deer or any white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>1</td>
<td>Oct. 15</td>
<td>Oct. 31</td>
<td>25</td>
<td>Limited quota</td>
<td>Antlered deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>118</td>
<td>1</td>
<td>Nov. 1</td>
<td>Nov. 30</td>
<td></td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>1</td>
<td>Nov. 1</td>
<td>Nov. 15</td>
<td>50</td>
<td>Limited quota</td>
<td>Antlered deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119, 120</td>
<td>2</td>
<td>Oct. 1</td>
<td>Oct. 15</td>
<td>75</td>
<td>Limited quota</td>
<td>Antlered deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119, 120</td>
<td>3</td>
<td>Oct. 1</td>
<td>Nov. 30</td>
<td>75</td>
<td>Limited quota</td>
<td>Any white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>119</td>
<td>6</td>
<td>Sep. 1</td>
<td>Oct. 15</td>
<td>75</td>
<td>Limited quota</td>
<td>Doe or fawn on or within one-half (1/2) mile of irrigated land</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>1</td>
<td>Nov. 1</td>
<td>Nov. 15</td>
<td>75</td>
<td>Limited quota</td>
<td>Antlered deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>120</td>
<td>8</td>
<td>Sep. 1</td>
<td>Dec. 15</td>
<td>150</td>
<td>Limited quota</td>
<td>Doe or fawn white-tailed deer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Special Archery Season**

<table>
<thead>
<tr>
<th>Hunt Areas</th>
<th>Season Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>116, 117, 118, 119, 120</td>
<td>Sep. 1 - Sep. 30</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Hunt Area</th>
<th>Type</th>
<th>Quota change from 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>116</td>
<td>6</td>
<td>+50, new license</td>
</tr>
<tr>
<td>119</td>
<td>3</td>
<td>+25</td>
</tr>
<tr>
<td><strong>HU Total</strong></td>
<td><strong>3</strong></td>
<td><strong>+25</strong></td>
</tr>
<tr>
<td></td>
<td><strong>6</strong></td>
<td><strong>+50</strong></td>
</tr>
</tbody>
</table>
**Management Evaluation**  
**Current Postseason Population Management Objective:** 5,000  
**Management Strategy:** Special  
**2017 Postseason Population Estimate:** 3900  
**2017 Proposed Postseason Population Estimate:** 4300  
**2016 Hunter Satisfaction:** 75% satisfied, 12% neutral, 13% 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 a 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
Winter conditions since 2010 have not been harsh enough to cause any significant mortality in this deer herd, except for the winter of 2016/17, which resulted in semi-severe conditions, with higher than normal snow cover and below normal temperatures. 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. Between May 2017-2018 precipitation levels were mostly below normal, with slightly cooler temperatures occurring in the southern portions and above normal temperatures in the western portions of the herd unit. The 2017/18 winter was mostly snow free with only moderate winter temperatures.

### Departure from normal precipitation (in) for the Bighorn Basin, WY. May 2017-May 2018

### Departure from normal temperature (°F) for the Bighorn Basin, WY. May 2017-May 2018

### Habitat
Annual precipitation has been higher than average for the last three years, which has contributed to higher fawn/doe ratios compared to previous years. 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. In 2017, this project was completed.

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 classification 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 2014. However, in 2015 the number of deer classified increased to nearly 1400, and in 2016 to nearly 1700 deer, but dropped to 1,100 deer for 2017. Three years of record high fawn production since 2014 has helped increase deer numbers in this herd. The past 4-year average fawn ratio is 84:100, 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, as well as during the 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 60, along with a very good fit (n=21) of the model vs. field male ratios. The 2017 population estimate seems reasonable, and reflects field personnel perceptions, harvest and classification sample size trends, which indicate a slightly 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 all hunt areas appear adequate at this time; with most of these areas having license quota reductions in recent years. A type 6 license, valid on private land, was added to area 116 at the request of a landowner wanting the opportunity to harvest mule deer does. In recent years mule deer numbers have increased along the Greybull River, and it’s likely other landowners will also take advantage of this new type 6 license. A slight increase in type 3 licenses for area 119/120 will occur to provide additional white-tailed deer harvest. The projected 2018 harvest is roughly 275 mule deer, which should help this herd to increase.
**2017 - JCR Season Setting Form**

**SPECIES:** Mule Deer  
**PERIOD:** 6/1/2017 - 5/31/2018  
**HERD:** MD215 - UPPER SHOSHONE  
**HUNT AREAS:** 110-115  
**PREPARED BY:** TONY MONG

<table>
<thead>
<tr>
<th>2012 - 2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population:</td>
<td>9,660</td>
<td>8,600</td>
</tr>
<tr>
<td>Harvest:</td>
<td>918</td>
<td>711</td>
</tr>
<tr>
<td>Hunters:</td>
<td>1,692</td>
<td>1,555</td>
</tr>
<tr>
<td>Hunter Success:</td>
<td>54%</td>
<td>46%</td>
</tr>
<tr>
<td>Active Licenses:</td>
<td>1,728</td>
<td>1,590</td>
</tr>
<tr>
<td>Active License Success:</td>
<td>53%</td>
<td>45%</td>
</tr>
<tr>
<td>Recreation Days:</td>
<td>8,428</td>
<td>7,933</td>
</tr>
<tr>
<td>Days Per Animal:</td>
<td>9.2</td>
<td>11.2</td>
</tr>
<tr>
<td>Males per 100 Females</td>
<td>24</td>
<td>18</td>
</tr>
<tr>
<td>Juveniles per 100 Females</td>
<td>62</td>
<td>50</td>
</tr>
</tbody>
</table>

**Population Objective (± 20%):**  
12000 (9600 - 14400)

**Management Strategy:** Recreational

**Percent population is above (+) or below (-) objective:** -28.3%

**Number of years population has been + or - objective in recent trend:** 10

**Model Date:** 2/22/2018

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

<table>
<thead>
<tr>
<th>JCR Year</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Females ≥ 1 year old:</td>
<td>1.5%</td>
</tr>
<tr>
<td>Males ≥ 1 year old:</td>
<td>41%</td>
</tr>
<tr>
<td>Total:</td>
<td>10%</td>
</tr>
</tbody>
</table>

**Proposed change in post-season population:** -5% | 15%

---

**Population Size - Postseason**

![Population Size - Postseason Graph](image-url)

---

81
Harvest

Number of Active Licenses

Harvest Success
## 2012 - 2017 Postseason Classification Summary

for Mule Deer Herd MD215 - UPPER SHOSHONE

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>Males Ylg</th>
<th>Males Cls 1</th>
<th>Males Cls 2</th>
<th>Males Cls 3</th>
<th>Males UnCls</th>
<th>Total</th>
<th>Total %</th>
<th>Females Cls 1</th>
<th>Females Cls 2</th>
<th>Females Cls 3</th>
<th>Females UnCls</th>
<th>Total</th>
<th>Total %</th>
<th>Total Obj</th>
<th>Total Int</th>
<th>Total Males to 100 Females</th>
<th>Young to Adult</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>8,900</td>
<td>79</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>139</td>
<td>218</td>
<td>10%</td>
<td>1,165</td>
<td>52%</td>
<td>863</td>
<td>38%</td>
<td>2,246</td>
<td>1,148</td>
<td>7</td>
<td>12</td>
<td>19 ± 2</td>
<td>74 ± 4</td>
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<tr>
<td>2013</td>
<td>9,400</td>
<td>127</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>117</td>
<td>244</td>
<td>14%</td>
<td>946</td>
<td>53%</td>
<td>607</td>
<td>34%</td>
<td>1,797</td>
<td>1,148</td>
<td>13</td>
<td>12</td>
<td>26 ± 2</td>
<td>64 ± 4</td>
</tr>
<tr>
<td>2014</td>
<td>9,200</td>
<td>98</td>
<td>101</td>
<td>20</td>
<td>4</td>
<td>0</td>
<td>223</td>
<td>13%</td>
<td>945</td>
<td>56%</td>
<td>512</td>
<td>30%</td>
<td>1,680</td>
<td>1,010</td>
<td>10</td>
<td>13</td>
<td>24 ± 2</td>
<td>54 ± 3</td>
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<td>10,000</td>
<td>76</td>
<td>143</td>
<td>43</td>
<td>1</td>
<td>0</td>
<td>263</td>
<td>12%</td>
<td>1,200</td>
<td>55%</td>
<td>722</td>
<td>33%</td>
<td>2,185</td>
<td>1,020</td>
<td>6</td>
<td>16</td>
<td>22 ± 2</td>
<td>60 ± 3</td>
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<td>2016</td>
<td>10,800</td>
<td>189</td>
<td>163</td>
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<td>6</td>
<td>0</td>
<td>398</td>
<td>16%</td>
<td>1,365</td>
<td>54%</td>
<td>782</td>
<td>31%</td>
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<td>15</td>
<td>29 ± 2</td>
<td>57 ± 3</td>
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<td>7</td>
<td>0</td>
<td>202</td>
<td>10%</td>
<td>1,154</td>
<td>60%</td>
<td>582</td>
<td>30%</td>
<td>1,938</td>
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<td>5</td>
<td>13</td>
<td>18 ± 2</td>
<td>50 ± 3</td>
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<tr>
<td>Hunt Area</td>
<td>Type</td>
<td>Season Dates</td>
<td>Quota</td>
<td>License</td>
<td>Limitations</td>
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Region F nonresident general license quota = 750

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Management Evaluation

Current Postseason Population Management Objective: 12,000
Management Strategy: Recreational
2017 Postseason Population Estimate: 8,600
2018 Proposed Postseason Population Estimate: 9,900
2017 Hunter Satisfaction: 60% Satisfied, 23% Neutral, 17% Dissatisfied

Herd Unit Issues

The ability for WGFD to manage the Upper Shoshone mule deer herd has been challenging due to the inability to harvest deer on summer/early fall habitats and the overall low productivity of the herd. Harvesting mule deer in the Upper Shoshone herd unit relies on deer availability along migration routes outside of Yellowstone NP since there are low numbers of non-migratory deer in the North and South Fork Shoshone River valleys. Many of the issues that arise due to this type of hunt revolve around the timing of this migration. Although there is variation between years when peak numbers of deer move along these routes, it is consistent that mule deer bucks become more available to harvest during periods of migration on public lands when those periods coincide with the pre-rut and rutting season. This is also reflected in check station records, which show that ~73% of mule deer bucks harvested each year are taken during the 10 day November portion of the season and the greatest proportion of bucks during those 10 days are taken in the last five days of the season. If deer are in the process of migrating through public land during this time period we can see high proportions of mature buck harvested and thus difficulty in maintaining acceptable buck ratios. In addition, the availability and visibility of bucks coupled with being the latest general deer season in Wyoming, attracts large numbers of hunters looking to harvest a “good” mature buck during rutting/migration activities. If we take into account the mediocre productivity of this herd, it makes for a difficult management scenario and one that may require new ideas and thinking “outside of the box” when it comes to setting seasons for this herd.
Weather

Weather conditions during the 2016-2017 winter were very difficult with high amounts of snowfall and colder than normal temperatures (figures 1 and 2). Precipitation levels in most of the herd unit were 200% or more of normal. These higher than normal precipitation events through the winter created a very wet summer and vegetative response was phenomenal with good growth throughout the herd unit. Current winter conditions (2017-2018) are much milder with early snows but melting occurring throughout the season and overall more mild conditions within the herd unit.

Figure 1. Percent of normal precipitation for the herd unit from January to March 2017.

Figure 2. Departure from normal temperature for the herd unit from January to March 2017.

Habitat
Two sagebrush transects are monitored in this herd unit; one in the North Fork of the Shoshone River and one in the South Fork of the Shoshone River, but no data for the 2016 biological year is available. Previous years’ summary data can be found in the Cody Region’s habitat report in the appendix.

Field Data

The low productivity of this deer herd coupled with hunting seasons focusing on the migratory and rut time period creates difficulties in managing for stable buck:doe ratios in this herd. The deer exhibit low productivity, as evidenced by the 20-year (1998-2017) average fawn:doe ratio of 62 fawns:100 does (range 42:100 – 74:100). The last 5-year average (57:100, range = 50:100 to 64:100) is even lower and coupled with periodic low fawn to yearling survival. One indication of fawn survival is to look at a change in ratio of fawns to adults from our November data collection compared to our April data collection. The 2016-17 collection period change in ratio from 44:100 adults to 17:100 adults a -61% change. This is almost 35% higher than the previous 3-year average of -27%. The 2017-18 winter was much milder and we saw better fawn survival at a change in ratio of only -35% which is within the normal range of loss. In addition, difficult migration terrain and the complete suite of predators within the area make it difficult to grow the population over the short and long term.

The average buck:doe ratio over the last 10 years is 26:100 does, however the ratio ranged from 18:100 to 32:100. This wide range over a relatively short time period is indicative of the history of this herd over the last 35 years with an average buck:doe ratio of 24:100, but ranging from 9:100 to 35:100 during that time period. The 2017 classification count yielded a ratio of 18:100 total bucks, which is one of the lowest ever recorded for this herd. A typical prescription for a low post-season buck ratio (below 20:100) is to implement a 4-point antler point restriction (APR) to decrease buck harvest, and increase numbers of young bucks. Using an APR has had limited success in the past with the last 4-point occurring in 2004 and 2005 yielding a 5-year post adult buck ratio average of 14.8:100 (range = 12:100 to 16:100) compared to the previous five years average of 13:100 (range = 10:100 to 17:100). We predict a slight increase in adult buck ratios with a 4-point APR in 2018 due to a decrease in the harvest of younger age class bucks and an overall decrease in hunter numbers. However, we plan to work on a more robust long term strategy to maintain higher and more stable adult buck ratios that involves a targeted public process.

Harvest Data

Buck harvest in the Upper Shoshone deer herd has been variable over the last 5 years (avg = 887, range = 711 to 1,008) with low doe harvest rates (avg. = 77, range = 63 to 108). Hunter numbers in the herd unit are relatively high with an average of 1,700 (range = 1,555 to 1,821) total hunters. Recently non-residents make up between 31% and 43% of total hunter numbers over the last 5 years (avg. = 37%) compared to an average of 39% over the last 35 years (range = 26% to 51%). As mentioned above a majority of harvest occurs during the last 10 days of the season (Nov. 1 to Nov. 10). Date of harvest data shows that 73% of those reporting harvest dates, harvested between Nov. 1 and Nov. 10 with 53% of that harvest occurring between Nov. 5 and
Nov. 10. Antlerless harvest has been low over the last five years with very few doe mule deer harvested throughout the season (average = 77, range 63 to 108). Hunter satisfaction across the herd unit has been declining overall since 2013, with 2017 (59.9%) being lower than the 5-year average of 64%. This satisfaction has been following the weather patterns and the population over the last five years and caused the big drop from 2016 (69% satisfied) to 2017 (59.9% satisfied).

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, based on having the lowest relative AICc and fitting the on the ground population trends we have seen. The postseason population estimate for 2017 is 8,600 deer, or 28% below the population objective. More conservative antlerless seasons have been implemented but due to a severe winter in 2016-2017 we have seen a large decline in the population. Because of the severe winter and limited collar data within the TSJ, CA model we constrained adult survival to a lower level (0.7 to 0.80). The spreadsheet model seems to be a useful tool for this herd; however, without an independent estimate of the population size we must be cautious in the use of this model as our only source of information.

Management Summary

We are going to limit doe harvest to allow for maximum population growth potential and use a 4-point APR and no increase in NR quotas to decrease buck harvest to increase buck numbers in the short term. The mild winter of 2017-2018 should create a situation that will result in high survival and high fawn crops during the summer of 2018 allowing the population to begin to recover from a tough 2016-2017 winter.
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**Parameters:**

- Adult Survival = 0.832
- Initial Total Male Pop/10,000 = 0.176
- Initial Female Pop/10,000 = 0.636

**MODEL ASSUMPTIONS**

- Sex Ratio (% Males) = 50%
- Wounding Loss (total males) = 10%
- Wounding Loss (females) = 10%
- Wounding Loss (juveniles) = 10%
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<tr>
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<td>1299</td>
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<tr>
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<td>817</td>
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<td>1114</td>
</tr>
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<td>4</td>
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</table>
2017 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2017 - 5/31/2018

HERD: MD216 - CLARKS FORK
HUNT AREAS: 105-106, 109
PREPARED BY: TONY MONG

<table>
<thead>
<tr>
<th></th>
<th>2012-2016 Average</th>
<th>2017</th>
<th>2018 Proposed</th>
</tr>
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<td>3,300</td>
<td>3,600</td>
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<td>Harvest</td>
<td>803</td>
<td>338</td>
<td>320</td>
</tr>
<tr>
<td>Hunters</td>
<td>1,528</td>
<td>773</td>
<td>700</td>
</tr>
<tr>
<td>Hunter Success</td>
<td>53%</td>
<td>44%</td>
<td>46%</td>
</tr>
<tr>
<td>Active Licenses</td>
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<td>Active License Success</td>
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<td>43%</td>
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<td>Recreation Days</td>
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<tr>
<td>Days Per Animal</td>
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<tr>
<td>Males per 100 Females</td>
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<td>Juveniles per 100 Females</td>
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</table>

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

Management Strategy: Recreational

Percent population is above (+) or below (-) objective: -28%

Number of years population has been + or - objective in recent trend: 10

Model Date: 02/22/2018

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

<table>
<thead>
<tr>
<th></th>
<th>Proposed</th>
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<tbody>
<tr>
<td>Females ≥ 1 year old: 2.5%</td>
<td>1.4%</td>
</tr>
<tr>
<td>Males ≥ 1 year old: 37%</td>
<td>39%</td>
</tr>
<tr>
<td>Total: 8%</td>
<td>8%</td>
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</table>

Proposed change in post-season population: -4.5% 0%

Population Size - Postseason

![(

[Graph showing population sizes and objective range over years]

93
### 2012 - 2017 Postseason Classification Summary
for Mule Deer Herd MD216 - CLARKS FORK

<table>
<thead>
<tr>
<th>Year</th>
<th>Post Pop</th>
<th>Ylg</th>
<th>Cls 1</th>
<th>Cls 2</th>
<th>Cls 3</th>
<th>UnCls</th>
<th>Total</th>
<th>% Total</th>
<th>% Total</th>
<th>Cls Obj</th>
<th>Ylng</th>
<th>Adult</th>
<th>Total</th>
<th>Conf</th>
<th>100 Fem</th>
<th>Conf</th>
<th>100 Adult</th>
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</thead>
<tbody>
<tr>
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<td>0</td>
<td>0</td>
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<td>85</td>
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<td>386</td>
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<td>270</td>
<td>36%</td>
<td>741</td>
<td>947</td>
<td>6</td>
<td>16</td>
<td>± 3</td>
</tr>
<tr>
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<td>0</td>
<td>95</td>
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<td>576</td>
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<td>390</td>
<td>34%</td>
<td>1,132</td>
<td>1,083</td>
<td>12</td>
<td>16</td>
<td>± 3</td>
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<td>39</td>
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<td>0</td>
<td>161</td>
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<td>550</td>
<td>55%</td>
<td>288</td>
<td>29%</td>
<td>999</td>
<td>893</td>
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<td>21</td>
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<td>18</td>
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<td>15%</td>
<td>580</td>
<td>53%</td>
<td>344</td>
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<td>800</td>
<td>7</td>
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<td>59</td>
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<td>33</td>
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<td>179</td>
<td>17%</td>
<td>564</td>
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<td>336</td>
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<td>420</td>
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<td>748</td>
<td>0</td>
<td>9</td>
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### 2018 Hunting Seasons
#### Clarks Fork Mule Deer Herd (MD216)

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<th>Type</th>
<th>Season Dates</th>
<th>Quota</th>
<th>License</th>
<th>Limitations</th>
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<td>Oct. 1</td>
<td>Oct. 31</td>
<td>General</td>
<td>Antlered mule deer or any white-tailed deer valid on national forest</td>
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<tr>
<td>105</td>
<td></td>
<td>Nov. 1</td>
<td>Nov. 5</td>
<td>General</td>
<td>Any deer valid off national forest</td>
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<tr>
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<td>Nov. 6</td>
<td>Nov. 30</td>
<td>General</td>
<td>Antlerless deer valid off national forest</td>
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<td>105, 106, 109</td>
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<td>Nov. 30</td>
<td>25</td>
<td>Limited quota</td>
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<tr>
<td>106</td>
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<td>Oct. 1</td>
<td>Oct. 31</td>
<td>General</td>
<td>Antlered mule deer or any white-tailed deer</td>
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</table>

Region F Nonresident General License Quota = 750

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<table>
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<tr>
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Management Evaluation

Current Postseason Population Management Objective: 5,000
Management Strategy: Recreational
2017 Postseason Population Estimate: 3,300
2018 Proposed Postseason Population Estimate: 3,600
2017 Hunter Satisfaction: 60% Satisfied, 18% Neutral, 23% Dissatisfied

Herd Unit Issues

Managing the Clark’s Fork mule deer herd can be challenging because of the mix of migratory and non-migratory deer in the herd unit and the susceptibility of the herd to harsh winters. A majority of deer in this area can be characterized as migrants spending the summer and early fall in Yellowstone National Park. Creating hunting seasons for migratory deer can be problematic.
due to the variable timing of movement in relation to weather patterns and the vulnerability of deer along migration routes. Migratory deer also exhibit relatively low productivity, while deer associated with agricultural fields have much higher productivity complicating both the ability to manage and the regulations related to that management. Consequently, damage situations arise with non-migratory deer in Hunt Area 105 because poor productivity requires conservative management of the migratory portion of the deer herd. Winter severity and subsequent population impacts are an issue for most mule deer herds in Wyoming and for the Clarks Fork herd it can be intensified because of the location and topography where they winter. A majority of the herd winter in areas that can make it difficult to escape tough winter conditions. Severe winter impacts can be magnified due to the inability of this herd to escape those conditions.

Weather

Weather conditions during the 2016-2017 winter were very difficult with high amounts of snowfall and colder than normal temperatures (figures 1 and 2). Precipitation levels in most of the herd unit were 200% or more of normal. These higher than normal precipitation events through the winter created a very wet summer and vegetative response was phenomenal with good growth throughout the herd unit. Current winter conditions (2017-2018) are much milder with early snows but melting occurring throughout the season and overall more mild conditions within the herd unit (figure 3).

Figure 1. Percent of normal precipitation for the herd unit from January to March 2017.
Habitat

No habitat monitoring data is collected in this herd unit.

Field Data

The migratory nature of the majority of mule deer in this population may be causing depressed fawn ratios. Long-term data (35 years) shows an overall average fawn ratio of 62:100 does (range = 51:100 to 76:100). In addition, the last 10-year average of fawn ratios (58:100, range = 51:100 to 70:100) is lower than the first 10-years of available data (1983 to 1992, average = 65:100, range 56:100 to 76:100). However, this decrease is a consistent trend across Wyoming
but this herd unit typically falls below statewide averages (figure 5). Unfortunately lower fawn ratios may be causing a slower population response after difficult winters and/or to low fawn survival rates. Fawn ratios are an indication of production for the year, but another aspect of production is the survival of fawns over winter. One way to look at fawn survival over winter is the change in ratio of fawns to adults from our November data collection compared to our April data collection. The 2016-17 collection period change in ratio from 45:100 adults to 18:100 adults is a -60% change. This is almost 20% higher than the previous 3-year average of -44%. Despite a seemingly more miled 2017-18 winter we still saw poor fawn survival at a change in ratio of -58%. Change in ratio data since the 2011-12 winter indicates that on average the Clark’s Fork herd has a much higher loss of fawns at -50% compared to an adjacent herd the Upper Shoshone which averages at -35%.

Figure 5. Comparison of historic (1983 – 1992) and more recent (2008 – 2017) fawn ratios between the Clark’s Fork herd and Statewide data. Statewide averages dropped 6.1 fawns:100 does compared to 7.4 fawns:100 does for the Clark’s Fork herd.

The hunting season structure implemented in 2008 has benefited the adult buck:doe ratio over the last 10 years. The 10 years prior to the removal of the November general season yields a adult buck ratio of 12:100 (range = 9:100 to 15:100) versus the 10 years after the change in season of 19 (range = 16 to 22). Fawn ratios during these same time periods decreased from 61:100 (range = 51:100 to 66:100) during the 10 years prior to 58:100 (range = 51:100 to 70:100) after the change in season. Total buck ratios over the last 5 years (average 29:100, range = 27:100 to 32:100) has been higher than historical ratios (average 25:100, range = 12:100 to 42:100). Although there have been variable winter conditions and patterns over the last 35 years, the major change that has influenced buck ratios is the hunting season structure.

Harvest Data

The Clark’s Fork herd is one of the few in the state that relies on harvesting during the migration period of mule deer ecology. This type of hunt becomes challenging due to variability in migration timing and vulnerability of deer while they are migrating. Buck harvest since removal of the general license seasons (2008) in November have been relatively stable at an average buck
harvest of 303 (range = 246 to 362) compared to 392 (range = 224 to 511) from the 10 years prior to the change in season. The biggest decrease came within Hunt Area 106 with a change from an average buck harvest of 247 prior to the change in season to 161 after the change. The intent of the change in season was to decrease overall buck harvest to allow for higher buck ratios and more consistent older age class bucks in the population. This strategy has worked as shown by increased adult buck ratios and the stable higher buck ratios seen in the herd (see “Field Data” section). Harvest success has been relatively high with a 5-year average of 46% herd unit wide which is a bit higher than the 2017 success rate of 43%. The 5-year average (46%) and the 2017 success rate (43%) is running higher than the statewide general area success rate of 41.1%. Between hunt areas success rates are variable with a 5-year average of 45% for Hunt Area 105, 35% for Hunt Area 106 and 74% for Hunt Area 109. 2017 saw a lower than average success rate for Hunt Area 105 (43%), similar for hunt are 106 (35%) and a decreased success rate in Hunt Area 109 (69%). Hunter satisfaction is variable between the hunt areas with general hunting seasons (HA 105, 106) and limited quota Hunt Area 109 (figure 6). Satisfaction data has been collected since 2013 and there is some variation for Hunt Areas 105 and 106, and a steady decline in satisfaction in Hunt Area 109 (figure 7). Satisfaction in 2017 was lower than normal for Hunt Areas 105 (60%) and 106 (59%) compared to the 5-year average (63% and 62%); and in Hunt Area 109 satisfaction was the lowest recorded. Decreased satisfaction was most likely due to the decrease in deer after the winter of 2017 in Hunt Area 109.

Figure 6. Hunter satisfaction for the Clark’s Fork mule deer herd in 2017.
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, based on fitting the on-the-ground population trends we have seen. The postseason population estimate for 2017 is 3,300 deer, or 34% below the population objective. Very little antlerless harvest occurs in this area but due to a severe winter in 2016-2017 we have seen a large decline in the population. Because of the severe winter and limited collar data within the TSJ, CA model we constrained adult and juvenile survival to lower levels (0.7 to 0.80 and 0.4 and 0.5 respectively). The spreadsheet model seems to be a useful tool for this herd; however, without an independent estimate of the population size we must be cautious in the use of this model as our only source of information.

Management Summary

We will continue with the current management structure for migratory deer, which consists of conservative buck seasons, with very little antlerless harvest, while continuing to address specific damage situations in Hunt Area 105. We will be watching population size, hunter success rates and buck ratios closely over the short-term and may need to adjust the late season type 1 season based on this information. In addition because of the severe winter of 2016-2017 and the residual impact to fawn ratios in 2017 there will be 2 years of decreased numbers of new individuals entering the population. This may cause a decrease in overall and adult buck availability over the next several years which may require more restrictive seasons to allow the population to recover. However, we are optimistic that we will see an increased fawn ratio in 2018 because of the mild winter conditions and the good moisture levels in the higher elevation summer ranges. This could dampen the impacts of the previous 2 years of low fawn ratio/survival allowing for similar seasons into the future.
## MODELS SUMMARY

<table>
<thead>
<tr>
<th>Model</th>
<th>Function</th>
<th>Fit</th>
<th>Relative AICc</th>
<th>Check best model to create report</th>
<th>Notes</th>
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<td>Constant Juvenile &amp; Adult Survival</td>
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<td>132</td>
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<td>90</td>
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<td>Time-Specific Juvenile &amp; Constant Adult Survival</td>
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<td>153</td>
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</table>

## Population Estimates from Top Model

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<th>Posthunt Population Est. Field Est</th>
<th>Field SE</th>
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FIGURES

Model vs Field Posthunt Total Male/Female Ratios

Field Est vs Derived Est

Estimated Posthunt Population

Model Population Est vs Total Classified

Survival

Estimated versus Observed Survival Rates

Model Annual Adult Model Winter Juvenile