2013 - JCR Evaluation Form

| SPECIES: Pronghorn |  | PERIOD: 6/1/2013-5/31/2014 |  |
| :--- | :---: | :---: | :---: |
| HERD: PR308 - CLEARMONT |  |  |  |
| HUNT AREAS: 15 |  |  |  |
|  |  |  |  |

## Population Size - Postseason

$\square$ PR308-POPULATION - PR308-OBJECTIVE


Harvest


Number of Hunters


Harvest Success

PR308 - Hunter Success \% PR308 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR308 - Days


Preseason Animals per 100 Females
PR308-Males

- PR308 - Juveniles

for Pronghorn Herd PR308-CLEARMONT

|  |  | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | Cls <br> Obj | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Pre Pop | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 5,918 | 74 | 253 | 327 | 27\% | 562 | 46\% | 344 | 28\% | 1,233 | 1,752 | 13 | 45 | 58 | $\pm 6$ | 61 | $\pm 6$ | 39 |
| 2009 | 5,362 | 37 | 251 | 288 | 24\% | 597 | 51\% | 296 | 25\% | 1,181 | 1,258 | 6 | 42 | 48 | $\pm 5$ | 50 | $\pm 5$ | 33 |
| 2010 | 5,003 | 100 | 178 | 278 | 26\% | 525 | 48\% | 282 | 26\% | 1,085 | 1,410 | 19 | 34 | 53 | $\pm 6$ | 54 | $\pm 6$ | 35 |
| 2011 | 4,818 | 18 | 44 | 62 | 19\% | 161 | 50\% | 102 | 31\% | 325 | 1,568 | 11 | 27 | 39 | $\pm 9$ | 63 | $\pm 13$ | 46 |
| 2012 | 4,770 | 44 | 73 | 117 | 22\% | 251 | 47\% | 163 | 31\% | 531 | 1,624 | 18 | 29 | 47 | $\pm 8$ | 65 | $\pm 10$ | 44 |
| 2013 | 4,720 | 42 | 89 | 131 | 22\% | 280 | 47\% | 182 | 31\% | 593 | 1,798 | 15 | 32 | 47 | $\pm 8$ | 65 | $\pm 10$ | 44 |

## 2014 HUNTING SEASONS CLEARMONT PRONGHORN HERD (PR308)

| Hunt <br> Area | Type | Dates of Seasons <br> Opens |  | Closes | Quota |
| :---: | :---: | :--- | :--- | :--- | :--- | Limitations |  |  |  |  |  |
| :---: | :---: | :--- | :--- | :--- |
| 15 | 1 | Oct. 1 | Oct. 14 | 500 |
|  | 6 | Oct. 1 | Oct. 31 | 400 |
| Archery |  | Aug. 15 | Sep. 30 |  |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 15 | 1 | -300 |
|  | 6 | -400 |
| Herd Unit Total | $\mathbf{1}$ | $-\mathbf{3 0 0}$ |
|  | $\mathbf{6}$ | -400 |

## Management Evaluation

Current Postseason Population Management Objective: 3,000
Management Strategy: Recreational
2013 Postseason Population Estimate: ~6,200
2014 Proposed Postseason Population Estimate: ~6,100

## Herd Unit Issues

The management objective for the Clearmont Pronghorn Herd Unit is a post-season population objective of 3,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1996.

Industrial scale oil and gas development and outfitting in the herd unit have resulted in restricted hunting access to some private lands. There are very few public land hunting opportunities in this herd unit. The restricted access has made it difficult to attain adequate harvest to regulate the pronghorn population in most of this herd.

## Weather

The spring and summer of 2013 was generally cool and wet, resulting in good conditions for forage production throughout the region. The winter of 2013-14 was more severe than recent winters, with snow fall starting in late September and continuing through the winter. There were several bouts of extreme cold temperatures lasting up to a week in duration. Temperatures reached $\sim 30^{\circ}$ F below zero, something not seen since the 1990s. Several thaw/freeze cycles during parts of the winter resulted in hard, crusted snow that was difficult for animals to paw through to access forage.

## Habitat

The SR-Buffalo Creek Divide habitat transect is located in the central portion of this herd unit and the Coal Creek Road habitat transect is located in the south-central portion of this herd unit. Both habitat transects occur on State Trust Lands. Both habitat transects monitor annual growth and utilization of Wyoming big sage-brush. These transects have not been read for several years.

## Field Data

Starting in 2011, we moved from aerial classification surveys to ground classification surveys to reduce risk for employees and reduce costs associated with aircraft rentals. As such, our total number of animals classified has decreased by about one half.

Fawn production, as measured by observed fawn:doe ratios, has not exceeded 70 fawns per 100 does during the past 21 years, limiting the potential for this herd to grow quickly. This has helped keep this herd from growing even more above the management objective. In August, 2013, we classified 593 pronghorn, well below the desired sample size of 1,798 at the $90 \%$ confidence level. We observed 65 fawns: 100 does, similar to recent years. This appears to be sufficient to maintain this population at its current level.

We observed 47 males ( 15 yearling; 32 adult): 100 does during August classification surveys, the same as in 2012. While an observed buck to doe ratio this high would normally be considered Special Management, restricted access to private lands limits our ability to obtain higher buck harvest. We have sufficient males in this population to sustain a higher buck harvest in this herd unit, if we had adequate access.

Hunter satisfaction has remained high, with $95 \%$ of surveyed hunters ( $\mathrm{n}=60$ ) satisfied or very satisfied. The high hunter satisfaction level likely reflects Department personnel efforts to advise perspective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license.

## Harvest Data

Since 2007, we have issued 1,600 licenses; 800 Type 1 (any antelope) and 800 Type 6 (doe or fawn). We have not sold all available licenses since raising numbers since 2006. In 2013, we sold 429 Type 1 licenses ( $54 \%$ ) and only 295 Type 6 licenses ( $37 \%$ ), similar to license sales in 2012.

In 2013, hunters harvested an estimated 556 pronghorn, a $30 \%$ increase in harvest from 2012, but similar to the previous four years $(2008-2011$ mean harvest $=559)$. Decreased success and harvest in 2012 was likely a function of extremely dry conditions and reduced access due to fire danger. Hunters average about $91 \%$ success over the past 10 years, compared to $93 \%$ success in 2013. License success follows a similar trend ( 10 year mean $=83 \% ; 2013=88 \%$ ). Hunter effort, as measured by the number of days hunted per animal harvested, was 3.3 days/animal, compared to 3.7 days/animal over the past 10 years. These data suggest that pronghorn numbers are likely relatively stable over the past 10 years. Access, or lack thereof, has likely remained about the same over this time period also.

## Population

The 2013 post-season population estimate is well above the established management objective, at about 6,200 with the population trending slowly downward from the high of about 7,200 pronghorn in 2005-2006. The last line transect survey was conducted in June 2013, which resulted in an estimated end-of-biological-year population of 7,266 pronghorn. The current model aligns below this estimate, suggesting we may be under estimating this population.

The "Constant Juvenile - Constant Adult Survival Rate" (CJ,CA) spreadsheet model was chosen to estimate the post-season population for this herd. This model had the second lowest relative Akaike information criterion (AIC) value ( 70 compared to 68 for SCI,SCA model) of the three possible models but appears to better represent the perceived population dynamics of this herd. The population dynamics of this model appear reasonable and consistent with observed dynamics in the field. Since we have limited data and are below the independent 2013 line transect estimate, we consider this a "fair" simulation model.

Landowners, hunters and Department field personnel have noted a decline in this population over the past several years. Of landowners ( $\mathrm{n}=22$ ) who returned an annual survey, $41 \%(\mathrm{n}=9)$ indicated pronghorn numbers were at or near desired levels and most (59\%) suggested similar season strategies for 2014.

## Management Summary

The regular hunting season traditionally runs two weeks (October $1-14$ ) for Type 1 licenses, and four weeks (October 1 - 31) for Type 6 licenses since the 2005 season. An archery preseason generally runs August 15 - September 30. Hunters in this herd unit are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, which allows hunters the opportunity to harvest multiple animals. There is limited pronghorn hunting on State Trust Lands near Ulm. This parcel receives considerable hunting pressure and most pronghorn move onto adjoining private lands after only a few days of hunting pressure. We consistently observe high buck numbers, as measured by buck:doe ratios, in this herd unit, averaging 50 bucks: 100 does. This is likely a function of limited access to private lands where the majority of pronghorn occur.

Since we have not sold all of the available licenses since 2006, we have reduced the license allocation for the 2014 season to better reflect demand and available opportunity. Even with the reduction in licenses, we should meet the demand of all hunters based on the past 7 years of license sales. This reduction will reduce the perception that we have lots of opportunity because of hundreds of left-over licenses.

We project a harvest of approximately 540 pronghorn in 2014, resulting in an estimated postseason population of about 6,100 pronghorn. These predictions assume near normal fawn production and survival, as well as similar license sales and success rates for the 2014 hunting season. Due to limited access, we will likely not reach the management objective for this herd unit with hunting alone. This herd unit management objective will be reviewed and alternative management objective and strategy considered.





8

Comments: In 996, only total males observed was recorded. Yearling and adult ratios were estimated based on 5-year average (3 years prior and 2 years post 1996).

PH308 - Clearmont
HA 15
Revised - $4 / 87$

2013 - JCR Evaluation Form

| SPECIES: Pronghorn |  | PERIOD: 6/1/2013-5/31/2014 |  |
| :--- | :---: | :---: | :---: |
| HERD: PR309 - PUMPKIN BUTTES |  |  |  |
| HUNT AREAS: 23 |  | PREPARED BY: ERIKA |  |
|  |  |  |  |
|  | PECKHAM |  |  |

## Population Size - Postseason

$\square$ PR309-POPULATION - PR309-OBJECTIVE


## Harvest



Number of Hunters


Harvest Success
$\square$ PR309 - Hunter Success \% PR309 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR309-Days


Preseason Animals per 100 Females

for Pronghorn Herd PR309-PUMPKIN BUTTES

|  |  | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | Cls <br> Obj | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Pre Pop | Ylg | Adult | Total | \% | Total | \% |  |  |  |  | Ylng | Adult | Total | Conf Int | $\begin{gathered} 100 \\ \text { Fem } \end{gathered}$ | $\begin{gathered} \text { Conf } \\ \text { Int } \end{gathered}$ | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 41,260 | 368 | 495 | 863 | 26\% | 1,408 | 43\% | 1,038 | 31\% | 3,309 | 2,276 | 26 | 35 | 61 | $\pm 4$ | 74 | $\pm 5$ | 46 |
| 2009 | 30,284 | 254 | 568 | 822 | 27\% | 1,313 | 43\% | 915 | 30\% | 3,050 | 2,918 | 19 | 43 | 63 | $\pm 4$ | 70 | $\pm 5$ | 43 |
| 2010 | 28,653 | 248 | 536 | 784 | 27\% | 1,294 | 44\% | 867 | 29\% | 2,945 | 2,740 | 19 | 41 | 61 | $\pm 4$ | 67 | $\pm 5$ | 42 |
| 2011 | 27,760 | 172 | 284 | 456 | 25\% | 796 | 44\% | 563 | 31\% | 1,815 | 2,713 | 22 | 36 | 57 | $\pm 5$ | 71 | $\pm 6$ | 45 |
| 2012 | 26,683 | 195 | 188 | 383 | 25\% | 672 | 44\% | 479 | 31\% | 1,534 | 2,748 | 29 | 28 | 57 | $\pm 6$ | 71 | $\pm 7$ | 45 |
| 2013 | 24,303 | 183 | 317 | 500 | 22\% | 1,129 | 49\% | 695 | 30\% | 2,324 | 2,050 | 16 | 28 | 44 | $\pm 4$ | 62 | $\pm 5$ | 43 |


| Hunt <br> Area | Type | Dates of Seasons <br> Opens | Closes | Quota | Limitations |
| :---: | :---: | :--- | :--- | :--- | :--- |
| 23 | 1 | Oct. 1 | Oct. 31 | 1,750 | Limited quota licenses; any <br> antelope |
| Archery | 6 | Oct. 1 | Oct. 31 | 1,300 | Limited quota licenses; doe or <br> fawn |
|  | Sep. 1 | Sep. 30 | Refer to Section 3 of this <br> Chapter |  |  |

## Management Evaluation <br> Current Postseason Population Management Objective: 18,000 <br> Management Strategy: Recreational <br> 2013 Postseason Population Estimate: ~21,600 <br> 2014 Proposed Postseason Population Estimate: ~19,700

## Herd Unit Issues

The postseason population objective for the Pumpkin Buttes Pronghorn Herd Unit is 18,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1989.

During the early to mid-2000's, extensive coal bed methane development occurred in the herd unit and resulted in a network of roads and other development associated with the infrastructure required to support coal bed methane extraction. This development has tapered off and in some portions of this herd unit wells are being abandoned and reclaimed. Proper reclamation will be integral in keeping habitat intact. Portions of this herd unit are experiencing increased activity pertaining to conventional oil well drilling and production, with many wells transitioning from the planning to development stage. In the southern part of this herd unit there is also uranium mining that is occurring. Although this herd unit has experienced various forms of energy development, it still contains excellent pronghorn habitat. The largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

## Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winter of 2012-2013 was mild and 2013-14 was moderate, though neither experienced much for snow accumulation, nor prolonged snow cover. Early October 2013 produced a non-typical
snowstorm in excess of two feet in certain areas. This did not significantly affect survival, as it melted rapidly, however it did negatively affect harvest rates in this time period, as it corresponded to the first week of the pronghorn hunting season. Although the winter of 20132014 experienced periods of sub-zero temperatures, it was not combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas, allowing for forage. During the majority of these two winters, the ground was open, with minimal snowpack. As a result over winter survival was likely high. In general, the spring and summer of 2013 the range conditions were favorable, although there were areas in the southern portion of this herd unit that experienced drier more drought-like conditions.

## Habitat

The Schoonover habitat transect is located within this herd unit. The utilization is typically very light on this transect with 2013 showing a $16 \%$ utilization. In the fall of 2013 the transect survey showed the average leader growth to be 14 mm .

## Field Data

This herd has the potential for rapid growth as has been seen in years past. Historically there have been years where $80+$ fawns per 100 does have been classified. High fawn to doe ratios coupled with limited access and low harvest have allowed this herd to exceed the management objective in the past. In 2013 the fawn to doe ratio was 62, which is the lowest observed in the past 30 years. During 2013 classifications we were unable to meet the objective of 2,748 animals, classifying only 2,324 . This was however, a vast improvement over the 1,534 animals that were classified in 2012. Hunter satisfaction in 2013 was quite high, with $82 \%$ of total respondents indicating that they were either satisfied or very satisfied.

Having adequate licenses available is imperative to keep harvest up on this herd when numbers warrant.

## Harvest

In 2013 there were 3,050 licenses available, 1,750 Type 1 and 1,300 Type 6 . There were 85 Type 1 licenses that went unsold, while all of the Type 6 licenses were sold by the season's close. Hunter success in this herd unit has averaged $93 \%$ over the preceding 5 years. 2013 had an overall success rate of $98 \%$.

## Population

The "Constant Juvenile - Constant Adult Mortality Rate" (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd (AIC value 142). The model appears to generally represent the population trend and population and is considered a fair model. The 2013 post-season population estimate was 21,600 . The last line transect survey was conducted in this herd unit in June of 2013, which resulted in an estimated population of 14,300 pronghorn at that time. Line transects were also flown in 2006 and 2009, with estimates of 32,900 and 18,000 , respectively. Unfortunately, there is not information present to calculate the Standard Error for the 2006 line transect. Until or unless this information is found, this line transect estimate is of little use to this model, except to evaluate the model on the point estimates.

## Management Strategy

The traditional season in this hunt area has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. The number of Type 1 and Type 6 licenses were not changed. The majority ( $82 \%$ ) of landowners that responded to the survey indicated that they feel antelope are either around where they should be or are lower than they would like to see. Although, 2011 and 2012 saw a drastic decrease in number of animals classified as compared to previous years, in 2013 a notably higher number of individuals were classified.

If we attain the projected harvest of 2,470 and near normal fawn recruitment, it is projected by the model that the population will decline.



















Appendix A:
Pumpkin Buttes Pronghorn Line Transect Survey
Bio-Year 2012-Results and Histogram


Estimation Summary: Encounter Rates

|  | Estimate | scV | df | 95\% Confidence Interval |  |
| :--- | ---: | :---: | :---: | :---: | :---: |
|  | n | 351.00 |  |  |  |
| k | 33.000 |  |  |  |  |
| L | 1071.5 |  |  |  |  |
| $\mathrm{n} / \mathrm{L}$ | 0.32759 | 8,85 | 17.00 | 0.27189 | 0.39469 |
| Left | 0.0000 |  |  |  |  |
| Width | 208.67 |  |  |  |  |


|  | Estimate | \%CV | df | 95\% Confidence Interval |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Average cluster size |  |  |  |  |  |
|  | 1.8120 | 5.12 | 350.00 | 1.6385 | 2.0038 |
| Uniform/Cosine |  |  |  |  |  |
| $r$ | -0.70379E-01 |  |  |  |  |
| $r-p$ | $0.94174 \mathrm{E}-01$ |  |  |  |  |
| E (S) | 1.6347 | 3.33 | 349.00 | 1.5310 | 1.7455 |

## Estimation Summary-Detection Probability



Estimation Summary-Expected Cluster Size




PH309 - Pumpkin Buttes
HA 23
Revised - 3/87

|  |  |  |  |
| :--- | :---: | :---: | :---: |
| HERD: PR316 - HIGHLIGHT |  | PERIOD: 6/1/2013-5/31/2014 |  |
| HUNT AREAS: 24 |  | PREPARED BY: ERIKA |  |
|  |  |  |  |
|  | PECKHAM |  |  |

Population Size - Postseason


## Harvest



Number of Hunters


Harvest Success
$\square$ PR316 - Hunter Success \% PR316 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR316 - Days


Preseason Animals per 100 Females

for Pronghorn Herd PR316-HIGHLIGHT

| Year | Pre Pop | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | $\begin{aligned} & \mathrm{Cls} \\ & \mathrm{Obj} \end{aligned}$ | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{array}{r} 100 \\ \text { Fem } \end{array}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 23,113 | 307 | 450 | 757 | 32\% | 1,022 | 43\% | 580 | 25\% | 2,359 | 2,040 | 30 | 44 | 74 | $\pm 6$ | 57 | $\pm 5$ | 33 |
| 2009 | 21,263 | 134 | 510 | 644 | 26\% | 1,133 | 45\% | 728 | 29\% | 2,505 | 1,899 | 12 | 45 | 57 | $\pm 4$ | 64 | $\pm 5$ | 41 |
| 2010 | 19,900 | 168 | 530 | 698 | 30\% | 981 | 43\% | 621 | 27\% | 2,300 | 2,710 | 17 | 54 | 71 | $\pm 5$ | 63 | $\pm 5$ | 37 |
| 2011 | 16,194 | 101 | 316 | 417 | 28\% | 681 | 45\% | 409 | 27\% | 1,507 | 1,975 | 15 | 46 | 61 | $\pm 6$ | 60 | $\pm 6$ | 37 |
| 2012 | 10,915 | 116 | 155 | 271 | 27\% | 509 | 50\% | 238 | 23\% | 1,018 | 1,611 | 23 | 30 | 53 | $\pm 6$ | 47 | $\pm 6$ | 31 |
| 2013 | 7,809 | 146 | 191 | 337 | 27\% | 557 | 44\% | 374 | 29\% | 1,268 | 1,982 | 26 | 34 | 61 | $\pm 6$ | 67 | $\pm 7$ | 42 |

## 2014 HUNTING SEASONS HIGHLIGHT PRONGHORN HERD (PR316)

| Hunt <br> Area | Type | Dates of Seasons <br> Opens | Closes | Quota | Limitations |
| :---: | :---: | :--- | :---: | :--- | :--- |
| 24 | 1 | Oct. 1 | Oct. 31 | 700 | Limited quota licenses; any <br> antelope |
|  | 6 | Oct. 1 | Oct. 31 | 400 | Limited quota licenses; doe or <br> fawn |
| Archery |  | Sep. 1 | Sep. 30 | Refer to Section 3 of this <br> Chapter |  |

Management Evaluation<br>Current Postseason Population Management Objective: 11,000<br>Management Strategy: Recreational<br>2013 Postseason Population Estimate: 7,100<br>2014 Proposed Postseason Population Estimate: 7,400

## Herd Unit Issues

The postseason population objective for the Highlight Pronghorn Herd Unit is 11,000 pronghorn. The management strategy is recreational management. It is currently being proposed that the Highlight Herd Unit be combined with the Cheyenne River Herd Unit during the next herd unit review. Although this herd is bounded by highway 59 on the west, highway 450 on the south and the interstate on the north, it is suspected that the eastern border allows for some movement. Due to this interchange, the model is not useable and these animals are likely moving back and forth between the Cheyenne River Herd. The objective and management strategy were last revised in 1994. The largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

## Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winter of 2012-2013 was mild and 2013-14 was moderate, though neither experienced much for snow accumulation nor prolonged snow cover. Early October 2013 produced a non-typical snowstorm in excess of two feet in certain areas. This did not significantly affect survival, as it melted rapidly, however it did negatively affect harvest rates in this time period, as it corresponded to the first week of the pronghorn hunting season. Although the winter of 20132014 experienced periods of sub-zero temperatures, it was not combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas, allowing for forage. During the majority of these two winters, the ground was open, with minimal snowpack. As a result over
winter survival was likely high. In general, the spring and summer of 2013 the range conditions were favorable, although there were areas in the southern portion of this herd unit that experienced drier more drought-like conditions. In 2013 the fawn to doe ratio was 67, which is notably better than the 2012 ratio of 47 .

## Habitat

There is no habitat transect located within this herd unit. The Schoonover habitat transect is the closest one to this herd unit and utilization is typically very light on this transect. In the fall of 2013, the transect survey showed the average leader growth to be 14 mm .

## Field Data

In past times, this herd has had the potential for rapid growth. High fawn to doe ratios coupled with limited access and low harvest have allowed this herd to exceed the management objective in the past. However, at this time, the population is below objective. In 2013 there were 1,100 licenses available, 700 Type 1 and 400 Type 6 . Both license types sold out by the close of the season.

During 2013 classifications, we were unable to meet the objective of 1,611 animals, classifying only 1,268 . The doe to fawn ratio was estimated to be 42 . This is slightly higher than the preceding 5 year average of 36 . Buck ratios have remained fairly steady over the last several years with 2013 experiencing 61 bucks per 100 does.

## Harvest Data

Hunter success in this herd unit has averaged $86 \%$ over the last 5 years. However, 2013 had an overall success rate of $78 \%$, which is the third year that this has been in a declining trend, albeit only slightly.

In addition to the declining success, 2013 respondent data shows that on average it took 4.3 days to harvest an animal. This is the longest on record for this herd, which goes back to 1982.

Overall, the harvest data indicates that this herd is in a declining trend.

## Population

Modeling this herd with the spreadsheet model has been problematic due to widely fluctuating buck ratios and harvest estimates during the 1990's. Furthermore, the 2011 line transect survey results are thought to be inaccurate due to the animals being dispersed in larger clumps than normal after the difficult winter. The estimate was exceptionally low and was not used in the model. To account for the fluctuating harvest estimates, the model was abbreviated and now begins in 1996. The model aligns well above the confidence intervals of line transect estimates for 1997, 1998, 2000 and 2003, which leads to questions of accuracy. A line transect was flown in 2013, however this was done in preparation for potentially combining this herd unit with the Cheyenne River Herd. Therefore the line spacing used in this line transect was conducted at
intervals suitable for an overall picture of the Cheyenne River Herd Unit, and is not suitable for analysis separately. This herd has typically not modeled well and it is felt that it would be better represented by being combined with the Cheyenne River Herd Unit.

The "Time-Specific Juvenile \& Constant Adult Survival" (TSJ-CA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model comes closest to a realistic post-season population estimate and the population trends over time appear to be accurate, however, the numbers are not consistent with LT's flown. The TSJ-CA did not have the lowest AIC value (258); however it was felt that it was the best representation of what was occurring. Confidence in the model is low and this model is considered of poor value. It is likely that this herd unit has some immigration and emigration on the eastern boundary, which could be the cause for widely fluctuating buck ratios and the potential inaccuracy of this model. This furthers illustrates the logic behind combining with the Cheyenne River Herd Unit.

## Management Summary

The traditional season in this hunt area has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. We have recommended the number of both Type 1 and Type 6 licenses to remain the same. All landowners that responded to the survey have said that the number of animals is below or at where they would like to see them and there are reports of landowners taking fewer hunters than they have in the past. Additionally, 2012 and 2013 saw a decrease in harvest success from a preceding 5 year average of $86 \%$.

If we attain the estimated harvest of 620 and near normal fawn recruitment, it is projected that the population will increase slightly.





Revised - $2 / 93$

2013 - JCR Evaluation Form

| SPECIES: Pronghorn |  |  | PERIOD: 6/1/2013-5/31/2014 |
| :---: | :---: | :---: | :---: |
| HERD: PR318-CRAZY WOMAN |  |  |  |
| HUNT AREAS: 22, 113 |  |  | PREPARED BY: DAN THIELE |
|  | 2008-2012 Average | $\underline{2013}$ | 2014 Proposed |
| Population: | 13,446 | 11,815 | 11,528 |
| Harvest: | 1,706 | 1,790 | 1,700 |
| Hunters: | 1,652 | 2,034 | 2,000 |
| Hunter Success: | 103\% | 88\% | 85\% |
| Active Licenses: | 1,859 | 2,252 | 2,200 |
| Active License Percent: | 92\% | 79\% | 77\% |
| Recreation Days: | 5,749 | 7,415 | 7,400 |
| Days Per Animal: | 3.4 | 4.1 | 4.4 |
| Males per 100 Females | 63 | 50 |  |
| Juveniles per 100 Females | 76 | 78 |  |
| Population Objective: |  |  | 11,000 |
| Management Strategy: |  |  | Recreational |
| Percent population is above (+) or below (-) objective: |  |  | 7\% |
| Number of years population has been + or - objective in recent trend: |  |  | 10 |
| Model Date: |  |  | 2/11/2014 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |  |
|  |  | JCR Year | Proposed |
|  | Females $\geq 1$ year old: | 18\% | 20\% |
|  | Males $\geq 1$ year old: | 36\% | 25\% |
|  | Juveniles (<1 year old): | 0\% | 1\% |
|  | Total: | 16\% | 15\% |
| Proposed cha | n post-season population: | -11\% | -2\% |

Population Size - Postseason


## Harvest



Number of Hunters


Harvest Success
$\square$ PR318 - Hunter Success \% PR318 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR318-Days


Preseason Animals per 100 Females

for Pronghorn Herd PR318-CRAZY WOMAN

| Year | Pre Pop | Ylg | MALES |  |  | FEMALES |  | JUVENILES |  | Tot Cls | $\begin{aligned} & \text { Cls } \\ & \text { Obj } \end{aligned}$ | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  | Adult | Total | \% | Total | \% | Total | \% |  |  | YIng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | Conf Int | $100$ <br> Adult |
| 2008 | 15,471 | 235 | 723 | 958 | 24\% | 1,717 | 44\% | 1,256 | 32\% | 3,931 | 2,569 | 14 | 42 | 56 | $\pm 3$ | 73 | $\pm 4$ | 47 |
| 2009 | 15,927 | 355 | 1,031 | 1,386 | 30\% | 1,945 | 42\% | 1,303 | 28\% | 4,634 | 2,537 | 18 | 53 | 71 | $\pm 3$ | 67 | $\pm 3$ | 39 |
| 2010 | 16,049 | 153 | 808 | 961 | 28\% | 1,392 | 41\% | 1,054 | 31\% | 3,407 | 2,727 | 11 | 58 | 69 | $\pm 4$ | 76 | $\pm 5$ | 45 |
| 2011 | 14,885 | 100 | 395 | 495 | 21\% | 936 | 40\% | 888 | 38\% | 2,319 | 3,889 | 11 | 42 | 53 | $\pm 4$ | 95 | $\pm 7$ | 62 |
| 2012 | 14,282 | 172 | 371 | 543 | 25\% | 911 | 41\% | 743 | 34\% | 2,197 | 3,069 | 19 | 41 | 60 | $\pm 5$ | 82 | $\pm 6$ | 51 |
| 2013 | 13,784 | 64 | 344 | 408 | 22\% | 818 | 44\% | 635 | 34\% | 1,861 | 2,745 | 8 | 42 | 50 | $\pm 5$ | 78 | $\pm 6$ | 52 |


| Dates of Seasons |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Area | Type | Opens | Closes | Quota | Limitations |
| 22 | 1 | Oct. 1 | Oct. 31 | 1,000 | Limited quota licenses; any antelope |
|  | 6 | Sep. 1 | Sep. 30 | 800 | Limited quota licenses; doe or fawn valid on private land in that portion of Area 22 north of Crazy Woman Creek |
|  |  | Oct. 1 | Oct. 31 |  | Unused Area 22 Type 6 licenses valid in the entire area |
| 113 | 1 | Oct. 1 | Oct. 31 | 200 | Limited quota licenses; any antelope |
|  | 2 | Óct. 11 | Oct. 31 | 200 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Oct. 31 | 350 | Limited quota licenses; doe or fawn |
| Archery |  | Aug. 15 | Sep. 30 |  | Refer to Section 3 of this Chapter |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 22 | 6 | -100 |
|  |  |  |
| 113 |  | No change |
| Herd Unit Total | $\mathbf{6}$ | $\mathbf{- 1 0 0}$ |

## Management Evaluation

Current Postseason Population Management Objective: 11,000
Management Strategy: Recreational
2013 Postseason Population Estimate: ~11,800
2014 Proposed Postseason Population Estimate: ~11,500

## Herd Unit Issues

The Crazy Woman Pronghorn Herd Unit post-season population objective was reviewed in 2013 and revised to 11,000 pronghorn. The management strategy remains recreational management.

Area 22 is largely private land with limited public land hunting opportunities. Therefore, access to hunt is largely determined by landowners. Increased outfitter leasing of ranches typically results in more restrictive access. Area 113 contains a large amount of inaccessible public land. A cooperative agreement between private landowners, the BLM and the WGFD ended in 2008 when one of the remaining two landowners withdrew from the program. In 2012, the Mieke Ranch sold most of its property which has significantly reduced hunter access. Even with the expansive outfitting industry, at the herd unit level increasing numbers of hunters are finding hunting opportunity. This may be due in part to GPS technology that allows hunters to readily identify public and private land boundaries. The past two hunting seasons both buck harvest and total harvest rivaled highs set in 1985 of 1,143 and 2,048 , respectively.

## Weather

Weather in the area of the Crazy Woman Herd Unit during 2012 and 2013 turned extremely warm and dry after several good moisture years. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed "extreme drought" conditions for January 2013. May and June precipitation was $66 \%$ of normal. However, the southern part of Climate Division 5 was very dry compared to the Sheridan and Gillette areas. In fact, little spring green up occurred in the Kaycee area. Conditions progressed to "moderately moist" by January 2014. Fall precipitation was well above normal improving soil moisture due to more than six inches of moisture ( $240 \%$ of normal) in September and October coming in the form of rain and snow.

## Habitat

There is one Wyoming big sagebrush transect in this herd unit. Production measured in October 2013 averaged 8 mm per leader compared to 12 mm per leader in 2012. Fall precipitation provided for late season green up which should have allowed for improved animal body condition going into winter. Winter conditions were normal so above average mortality was not observed. Utilization during the 2013-14 winter was very light (less than $5 \%$ of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range.

## Field Data

Classifications in 2013 yielded a fawn ratio of 78:100 and a buck ratio of 50:100. The fawn ratio decreased for the second year in a row but remained above the five year average suggesting drought did not noticeably affect production and survival the last two years. Buck ratios in this herd often exceed the 60:100 threshold designated for trophy management although high buck ratios are not managed for. Buck ratios exceeded 60:100 in three of the past six years. The 2013 ratio was the lowest of the six year period (50:100). However, the Area 22 ratio remained high at 56:100. The annual postseason landowner survey was conducted following the hunting season with responses showing that $83 \%$ of landowners at the herd unit scale are satisfied with current pronghorn numbers. The five year trend shows a strong indication that this population is decreasing, reflecting the trend of the population model. The last line transect was flown in 2010 with a resulting end of year population estimate of 13,163 pronghorn, the highest estimate to date. Hunter satisfaction was high with Areas 22 and 113 hunters reporting $81 \%$ and $72 \%$ positive responses, respectively.

## Harvest Data

The 2013 harvest survey reported the second highest harvest for bucks and total harvest of the six year period while doe/fawn harvest decreased slightly. Hunter numbers were up $3 \%$ to a six year high of 2,034 . However, hunter success and active license success decreased to the lowest levels of the six year period, $88 \%$ and $79 \%$, respectively. The lower success rates were likely the result of a combination of lower pronghorn numbers combined with wet weather during the hunting season opener which hampered hunter access. Likewise, hunter effort continued an increasing trend reaching a six year high of 4.1 days per animal harvested. Ninety-five percent of Area 22 Type 1 licenses sold while $88 \%$ of Type 6 licenses sold. In Area 113, all but three Type 1 and 2 licenses sold and $99 \%$ of Type 6 licenses sold. Interest in hunting northeast Wyoming hunt areas has increased as license quotas have become more conservative in other areas of the state.

## Population

This population is estimated at 11,800 pronghorn, $7 \%$ above the new objective of 11,000 pronghorn. This population objective corresponds well with the $83 \%$ of responding landowners who are satisfied with the current population. The population estimate was generated with the newly adopted EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult (SCJ/SCA) model was chosen as it produced the lowest AIC value (55) and results are consistent with harvest and landowner survey trends. The model attempts to track three line transect surveys over the last 10 years. The 2010 line transect estimate is the highest to date and the model does not track though the confidence interval. The model indicates this population has decreased about $30 \%$ from its 2005 high of nearly 17,000 pronghorn and about $17 \%$ since 2009. Widely fluctuating buck ratios due to inadequate classification samples and conversion from aerial to ground surveys likely complicate modeling efforts. The model is considered a fair model due to inadequate classification samples and lack of independent survival estimates.

## Management Summary

The population model is considered a fair model as the population trend and estimate appear reasonable. Harvest data, landowner surveys and WGFD field observations confirm the trend represented in the model. A decrease of 100 Type 6 licenses is proposed although this shouldn't have a significant impact on the hunting season since licenses went unsold in 2013. A larger decrease in license quotas was considered with the declining population, however, with the severe drought in the southern part of the herd unit, managing for a lower population is warranted. Furthermore, the 2013 fawn ratio of 78:100 exceeds the five year average suggesting good production and recruitment. More conservative seasons will be warranted if the population continues to decrease. If projected harvest is achieved a postseason population of 11,500 pronghorn is projected.





Comments:


HERD: PR339 - NORTH BLACK HILLS
HUNT AREAS: 1-3, 18-19
PREPARED BY: ERIKA PECKHAM

|  | 2008-2012 Average | $\underline{2013}$ | 2014 Proposed |
| :---: | :---: | :---: | :---: |
| Population: | 12,852 | 10,910 | 10,758 |
| Harvest: | 1,271 | 668 | 540 |
| Hunters: | 1,407 | 792 | 700 |
| Hunter Success: | 90\% | 84\% | 77\% |
| Active Licenses: | 1,590 | 892 | 800 |
| Active License Percent: | 80\% | 75\% | 68\% |
| Recreation Days: | 5,382 | 2,890 | 2,300 |
| Days Per Animal: | 4.2 | 4.3 | 4.3 |
| Males per 100 Females | 44 | 36 |  |
| Juveniles per 100 Females | 63 | 74 |  |
| Population Objective: |  |  | 14,000 |
| Management Strategy: |  |  | Recreational |
| Percent population is above (+) or below (-) objective: |  |  | -22.1\% |
| Number of years population has been + or - objective in recent trend: |  |  | 2 |
|  |  |  | 02/27/2014 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |  |
|  |  | JCR Year | Proposed |
|  | Females $\geq 1$ year old: | 5.4\% | 1.6\% |
|  | Males $\geq 1$ year old: | 39.5\% | 23.8\% |
|  | Juveniles (<1 year old): | 0\% | 0\% |
|  | Total: | 8.1\% | 4.8\% |
| Proposed ch | n post-season population: | -32\% | -1.3\% |

Population Size - Postseason
$\square$ PR339-POPULATION - PR339- OBJECTIVE


Harvest


Number of Hunters


Harvest Success
$\square$ PR339 - Hunter Success \% PR339 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR339-Days


Preseason Animals per 100 Females


2008-2013 Preseason Classification Summary
for Pronghorn Herd PR339-NORTH BLACK HILLS

|  |  | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | $\begin{aligned} & \text { Cls } \\ & \text { Obj } \end{aligned}$ | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Pre Pop | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 15,674 | 177 | 275 | 452 | 21\% | 1,032 | 48\% | 673 | 31\% | 2,157 | 2,828 | 17 | 27 | 44 | $\pm 4$ | 65 | $\pm 5$ | 45 |
| 2009 | 16,082 | 160 | 423 | 583 | 25\% | 1,137 | 48\% | 649 | 27\% | 2,369 | 2,732 | 14 | 37 | 51 | $\pm 4$ | 57 | $\pm 4$ | 38 |
| 2010 | 13,986 | 103 | 320 | 423 | 23\% | 874 | 48\% | 511 | 28\% | 1,808 | 1,761 | 12 | 37 | 48 | $\pm 4$ | 58 | $\pm 5$ | 39 |
| 2011 | 12,384 | 51 | 137 | 188 | 17\% | 595 | 52\% | 353 | 31\% | 1,136 | 1,662 | 9 | 23 | 32 | $\pm 4$ | 59 | $\pm 6$ | 45 |
| 2012 | 13,123 | 31 | 148 | 179 | 16\% | 513 | 46\% | 419 | 38\% | 1,111 | 2,330 | 6 | 29 | 35 | $\pm 5$ | 82 | $\pm 8$ | 61 |
| 2013 | 11,645 | 75 | 229 | 304 | 17\% | 841 | 48\% | 621 | 35\% | 1,766 | 1,878 | 9 | 27 | 36 | $\pm 4$ | 74 | $\pm 6$ | 54 |

NORTH BLACK HILLS PRONGHORN HERD (PR339)

| Hunt <br> Area | Dates of Seasons |  |  | Quota | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Type | Opens | Closes |  |  |
| 1 | 1 | Oct. 1 | Nov. 20 | 200 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Nov. 20 | 100 | Limited quota licenses; doe or fawn |
| 2 | 1 | Oct. 1 | Nov. 20 | 100 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Nov. 20 | 50 | Limited quota licenses; doe or fawn |
| 3 | 1 | Oct. 1 | Nov. 20 | 100 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Nov. 20 | 25 | Limited quota licenses; doe or fawn |
| 18 | 1 | Oct. 1 | Oct. 20 | 100 | Limited quota licenses; any antelope |
| 19 | 1 | Oct. 1 | Oct. 20 | 250 | Limited quota licenses; any antelope |
| 19 | 6 | Oct. 1 | Oct. 20 | 100 | Limited quota licenses; doe or fawn valid on private land |
| Archery |  | Sep. 1 | Sep. 30 |  | Refer to Section 3 of this Chapter |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 2 | 6 | +25 |
| 18 | 1 | -50 |
| 18,19 | 6 | -50 |
| 18 | 6 | Unavailable |
| Herd Unit Total | $\mathbf{1}$ | $\mathbf{- 5 0}$ |
|  | $\mathbf{6}$ | $\mathbf{- 2 5}$ |

Management Evaluation
Current Postseason Population Management Objective: 14,000
Management Strategy: Recreational
2013 Postseason Population Estimate: ~10,900
2014 Proposed Postseason Population Estimate: ~10,800

## Herd Unit Issues

The management objective for the North Black Hills Herd Unit is a post-season population objective of 14,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1994.

The 2013 post-season population estimate was about 10,900. Since 2006, this population has been declining. Currently, the population is estimated to be below the management objective. Issues related to adverse winter and spring weather, and low fawn production have been observed in this herd over the past several seasons. The winters of 2008 to 2010 appeared to have taken a toll on this herd in the form of increased winter mortality and decreased fawn recruitment. Heavy spring snows and cold spring temperatures in 2009 \& 2010 likely reduced fawn survival, particularly in Areas 18 and 19. Pronghorn in Areas 18 and 19 have not rebounded yet and numbers warranted a decrease in licenses issued. The last line transect survey was conducted in this herd unit was in June 2012 and appeared to be a reasonable estimate.

## Weather

Weather conditions throughout 2013 and into 2014 were very favorable to big game populations in this area. The winters of 2012-2013 and 2013-14 were mild to moderate and did not see much for snow accumulation. Early October 2013 produced a non-typical snowstorm in excess of two feet in certain areas. This did not significantly affect survival, as it melted rapidly, however it did possibly affect harvest rates in this time period, as it corresponded to the first week of pronghorn seasons in this herd unit. Although the winter of 2013-2014 experienced periods of sub-zero temperatures, it was not combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas, allowing for forage. During the majority of these 2 winters, the ground was open in many areas, with minimal snowpack. As a result over winter survival was high. The spring and summer of 2013 saw excellent range conditions in this herd unit with continued rainfall throughout much of the summer. In 2013 the fawn to doe ratio was 74, down slightly from the preceding year of 82 . Body condition going into the winter season appeared to be very good.

## Habitat

The Stewart Creek habitat transect is located within this herd unit. The utilization is typically very light on this transect, with the spring of 2013 have around $8 \%$ utilization. In the fall of 2013, the transect survey showed the average leader growth at 48 mm , which is in line with the favorable growing season that this area experienced.

## Field Data

From 2009-2011, fawn ratios were fairly low, 57, 58 and 59, respectively. Although 2012 saw an increase up to 82 fawn per 100 does, 2013 again experienced a slight decrease in the fawn to doe ratios at 74. However, this is still up from the preceding five year average of 66. Although the preceding two years have seen an increased fawn ratio, this has still not been able to make up for three difficult years with poor fawn recruitment. This herd still struggles to commence an upswing in the trend.

In addition to low fawn ratios, this herd has also experienced lower buck ratios than it historically has. The last 3 years have averaged around 34 buck per 100 does. The preceding 5 years experienced an average of 49 bucks per 100 does.

Despite the population still being slightly depressed, $74 \%$ of all hunters reported being either very satisfied or satisfied.

## Harvest

In 2013 there were 1,100 licenses available, 800 Type 1 and 300 Type 6 . All but 23 of the Type 1 licenses in Hunt Area 19 were sold out by the season's close. All of the available Type 6 licenses were sold out by the season's end in this herd unit. The largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

Hunter success in this herd unit averaged $87 \%$ over the last 5 years, with only slightly higher success in preceding years. 2013 had an overall success rate of $84 \%$.

## 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. This model had the lowest relative AIC (167) and appeared to most accurately represent what was occurring on the ground. We conducted line transect surveys in 1995, 1997, 1999, 2002, 2004, 2008 and 2012 which provided independent population estimates that were similar to the model estimates. This model appears to track fairly well with line transect estimates and overall seems to mirror what was seen on the ground and is considered a fair model. The model currently predicts only a slight decrease in post-season population. Although this herd appears to be holding fairly steady, it has not yet recovered from the Winters/Springs of 2008-2010. This is particularly noticeable in Hunt Areas 18 and 19, hence the reason for the slight decrease in licenses in these areas. Hunt Area 18 has a reasonable amount of public land and numbers in this area have failed to rebound. Additionally, this area receives high levels of hunting pressure. With continued favorable weather conditions and improving fawn to doe ratios, it seems that this herd should continue in an upward trend.

## Management Strategy

The traditional season in this hunt area has been the entire month of October and part of November in Hunt Areas 1, 2 and 3, and the entire month of October in Areas 18 and 19. This season time and length seems to be adequate to allow a reasonable harvest. The number of both Type 1 and Type 6 licenses were decreased by 50 and 25 , respectively. This reduction of licenses pertains to Hunt Areas 18 and 19, where numbers are still struggling to rebound. In the past, Type 6 licenses were valid for both Hunt Areas 18 and 19. In addition to a slight reduction, this year they are valid only in Hunt Area 19, which is predominantly private land. 2013 license numbers were increased by a total of 200 as it appeared that things were recovering at that time. Although the 2012-2013 winter and 2013 range conditions were both favorable, there was a slight decrease in fawn ratios and in particular Hunt Areas 18 and 19 still appeared to be struggling and warranted a decrease in license numbers.

If we attain the projected harvest of 540 and near normal fawn recruitment, pronghorn population growth will slow and potentially decline slightly. Based on the population model, we predict a 2014 post-season population of about 10,800 .






Population Size - Postseason


## Harvest



Number of Hunters


Harvest Success
$\square$ PR351 - Hunter Success \% PR351 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR351 - Days


Preseason Animals per 100 Females


## 2008-2013 Preseason Classification Summary <br> for Pronghorn Herd PR351-GILLETTE

|  |  | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | Cls Obj | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Pre Pop | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 14,982 | 201 | 396 | 597 | 29\% | 1,043 | 50\% | 449 | 21\% | 2,089 | 2,328 | 19 | 38 | 57 | $\pm 4$ | 43 | $\pm 4$ | 27 |
| 2009 | 13,076 | 144 | 486 | 630 | 26\% | 1,250 | 52\% | 527 | 22\% | 2,407 | 1,385 | 12 | 39 | 50 | $\pm 4$ | 42 | $\pm 3$ | 28 |
| 2010 | 11,550 | 112 | 437 | 549 | 26\% | 1,126 | 54\% | 429 | 20\% | 2,104 | 1,920 | 10 | 39 | 49 | $\pm 4$ | 38 | $\pm 3$ | 26 |
| 2011 | 11,095 | 75 | 301 | 376 | 18\% | 1,111 | 52\% | 640 | 30\% | 2,127 | 1,639 | 7 | 27 | 34 | $\pm 3$ | 58 | $\pm 4$ | 43 |
| 2012 | 11,428 | 78 | 214 | 292 | 18\% | 779 | 48\% | 545 | 34\% | 1,616 | 1,970 | 10 | 27 | 37 | $\pm 4$ | 70 | $\pm 6$ | 51 |
| 2013 | 11,692 | 175 | 235 | 410 | 21\% | 950 | 49\% | 574 | 30\% | 1,934 | 1,758 | 18 | 25 | 43 | $\pm 4$ | 60 | $\pm 5$ | 42 |


| Hunt <br> Area | Type | Dates of Seasons <br> Opens | Closes | Quota | Limitations |
| :---: | :---: | :--- | :---: | :--- | :--- |
| 17 | 1 | Oct. 1 | Oct. 31 | 1,100 | Limited quota licenses; any <br> antelope |
|  | 6 | Oct. 1 | Oct. 31 | 400 | Limited quota licenses; doe or <br> fawn |
| Archery |  | Sep. 1 | Sep. 30 | Refer to Section 3 of this <br> Chapter |  |

## Management Evaluation <br> Current Postseason Population Management Objective: 11,000 <br> Management Strategy: Recreational <br> 2013 Postseason Population Estimate: ~10,500 <br> 2014 Proposed Postseason Population Estimate: ~10,150

## Herd Unit Issues

The postseason population objective for the Gillette Pronghorn Herd Unit is 11,000 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1994. The largest issue with achieving adequate harvest in this herd is access, as most of the pronghorn are found on private lands.

Extensive coal bed methane development has occurred in the herd unit and has resulted in a network of roads and other development associated with the infrastructure required to support coal bed methane extraction. The increased traffic was an issue with hunting in the past, however in recent years, development and activity has tapered off substantially. The more pressing issue in this herd unit will be proper reclamation as these wells are abandoned.

## Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal, in much of the Gillette area, however, North of Gillette in this particular Herd Unit experienced timely and plentiful rainfall. The winter of 2012-2013 was mild and 2013-14 was moderate, though neither experienced much for snow accumulation, nor prolonged snow cover. Early October 2013 produced a non-typical snowstorm in excess of two feet in certain areas. This did not significantly affect survival, as it melted rapidly, however it did negatively affect harvest rates in this time period, as it corresponded to the first week of the pronghorn hunting season. Although the winter of 2013-2014 experienced periods of sub-zero temperatures, it was not
combined with heavy snowfall and would typically experience a melt, leaving bare ground in areas, allowing for forage. During the majority of these two winters, the ground was open, with minimal snowpack. As a result over winter survival was likely high.

## Habitat

The SA Creek habitat transect is located within this herd unit. The utilization is typically very light on this transect. In the fall of 2013, the transect survey showed the average leader growth to be 16 mm , which is lower than anticipated, given the favorable conditions that were experienced in the 2013 growing season.

## Field Data

This herd has the potential for rapid growth as has been seen in years past. High fawn to doe ratios coupled with limited access have allowed this herd to exceed management objective in the past. In 2013 the fawn to doe ratio was 60, which is down from a ratio of 70 in 2012.

Buck ratios have overall remained fairly steady in this herd. 2011 and 2012 saw some lower than normal ratios at 34 and 37. 2013 saw a slightly improved buck to doe ratio at 43. This is in line with preceding 5 year average of 45 .

## Harvest Data

Hunter success in this herd unit has averaged $89 \%$ over the last 5 years, with similar success in preceding years as well. 2013 had an overall success rate of $83 \%$. The aforementioned storm in October of 2013 could be a contributing factor to this sharp decrease in success. $82 \%$ of respondents indicated being very satisfied or satisfied with the 2013 hunting season.

## Population

The "Time Specific Juvenile - Constant Adult Mortality Rate" (TSJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. Although this model did not have the lowest relative AIC (176), they were all fairly close and this one appeared to most accurately represent what was occurring on the ground, and made best use of the available information. We conducted line transect surveys in 1995, 1998, 2000, 2002, 2008 and 2013 which provided independent population estimates that were similar to the model estimates. With the exception of the 2002 line transect population estimate, the model projections were in line with the line transect surveys. This model is considered a fair model.

The 2013 post-season population estimate was about 10,500 , which only illustrates a slight decrease from the 2012 post-season estimate. From 2007 the population declined, hitting a low in 2011 at an estimate of 8,500 individuals. This herd experienced poor fawn ratios from 20072011 with an average of 58 fawn:doe ratio in the preceding 5 years. 2013 saw a decrease with a fawn:doe ratio of 60 . With the exception of 2012, the preceding 6 years of classification data shows a fawn to doe ratio of not above 60 . The last line transect survey was conducted in this herd unit in June 2013, which resulted in an estimated population of 8,300 pronghorn at that time.

## Management Strategy

Having adequate licenses available is imperative to keep harvest up on this herd when numbers warrant. In 2013 there were 1,500 licenses available, 1,100 Type 1 and 400 Type 6 . In 2013 license numbers were increased slightly, as all available information illustrated that the population could support an increase in harvest. Although all of the Type 6 licenses were sold, there remained 85 Type 1 licenses at the season's close. The traditional season in this hunt area has been the entire month of October. This season time and length seems to be adequate to allow a reasonable harvest. The number of licenses available for 2014 was unchanged. The majority of landowners within this herd unit ( $80 \%$ ) felt that a similar, or more conservative season as last year would be in line with their observations of antelope.

If we attain the projected harvest of 1,030 and near normal fawn recruitment pronghorn population, growth will slow and potentially decline slightly. Based on the population model, we predict a 2014 post-season population of about 10,150 .



| Classification Counts |  |  |  |  |  |  | Harvest |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Juvenile/Female Ratio |  |  | Total Male/Female Ratio |  |  | Males | Females | Juveniles | Total Harvest | Segment Harvest Rate (\% of <br> Total Males Females |  |
|  | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE |  |  |  |  |  |  |
| 1993 |  | 37.16 | 1.92 | 50.14 | 52.89 | 2.42 | 791 | 698 | 39 | 1528 | 19.7 |  |
| 1994 |  | 88.50 | 3.84 | 47.82 | 46.19 | 2.44 | 995 | 771 | 81 | 1847 | 31.3 | 11.6 |
| 1995 |  | 44.03 | 2.67 | 47.25 | 43.47 | 2.65 | 955 | 954 | 150 | 2059 | 33.8 | 15.9 |
| 1996 |  | 68.13 | 3.90 | 48.81 | 54.71 | 3.35 | 863 | 460 | 73 | 1396 | 33.9 | 8.8 |
| 1997 |  | 43.03 | 3.07 | 46.83 | 45.48 | 3.18 | 853 | 98 | 26 | 977 | 36.4 | 2.0 |
| 1998 |  | 44.44 | 3.26 | 40.98 | 52.74 | 3.65 | 449 | 15 | 0 | 464 | 21.5 | 0.3 |
| 1999 |  | 57.38 | 3.71 | 37.29 | 27.70 | 2.32 | 363 | 21 | 0 | 384 | 20.5 | 0.4 |
| 2000 |  | 69.08 | 4.03 | 45.22 | 53.34 | 3.38 | 650 | 46 | 7 | 703 | 27.5 | 0.9 |
| 2001 |  | 46.20 | 3.08 | 49.54 | 58.03 | 3.59 | 526 | 43 | 4 | 573 | 17.7 | 0.7 |
| 2002 |  | 50.49 | 3.27 | 50.38 | 42.76 | 2.93 | 507 | 26 | 2 | 535 | 16.4 | 0.4 |
| 2003 |  | 55.30 | 3.66 | 53.39 | 62.31 | 3.97 | 542 | 78 | 5 | 625 | 15.5 | 1.2 |
| 2004 |  | 73.42 | 5.18 | 55.83 | 57.17 | 4.35 | 587 | 120 | 20 | 727 | 15.2 | 1.7 |
| 2005 |  | 81.20 | 4.34 | 54.69 | 56.01 | 3.34 | 739 | 226 | 9 | 974 | 20.1 | 3.4 |
| 2006 |  | 106.73 | 8.03 | 52.82 | 49.12 | 4.63 | 886 | 274 | 32 | 1192 | 25.6 | 4.2 |
| 2007 |  | 61.65 | 3.48 | 59.74 | 63.96 | 3.57 | 948 | 533 | 0 | 1481 | 19.8 | 6.6 |
| 2008 |  | 43.05 | 2.43 | 56.54 | 57.24 | 2.94 | 894 | 563 | 105 | 1562 | 21.8 | 7.8 |
| 2009 |  | 42.16 | 2.19 | 51.21 | 50.40 | 2.46 | 770 | 358 | 0 | 1128 | 24.5 | 5.8 |
| 2010 |  | 38.10 | 2.16 | 44.96 | 48.76 | 2.54 | 787 | 413 | 8 | 1208 | 32.7 | 7.7 |
| 2011 |  | 57.61 | 2.86 | 36.57 | 33.84 | 2.02 | 751 | 312 | 0 | 1063 | 45.4 | 6.9 |
| 2012 |  | 69.96 | 3.91 | 36.96 | 37.48 | 2.57 | 792 | 185 | 23 | 1000 | 44.6 | 3.8 |
| 2013 |  | 60.42 | 3.19 | 43.16 | 43.16 | 2.55 | 709 | 307 | 32 | 1048 | 31.5 | 5.9 |
| 2014 |  | 61.05 | 3.22 | 42.29 | 42.11 | 2.51 | 700 | 300 | 30 | 1030 | 32.8 | 5.9 |
| 2015 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2016 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2017 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2018 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2019 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2020 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2021 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2022 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2023 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2024 |  |  |  |  |  |  |  |  |  |  |  |  |
| 2025 |  |  |  |  |  |  |  |  |  |  |  |  |



Appendix A:

Bio-Year 2012-Results and Histogram

Measurement Units
Density: Numbers/Sq. miles
ESW: meters
Component Percentages of Var(D)
Detection probability $:$
Encounter rate
Cluster size

Estimation Summary: Encounter Rate

|  | Estimate | \%CV | df | 95\% Confidence Interval |  |
| :--- | ---: | :--- | :--- | :--- | :--- |
|  |  | 183.00 |  |  |  |
| n | 30.000 |  |  |  |  |
| k | 1160.0 |  |  |  |  |
| L | 15.01 | 15.00 | 0.11476 | 0.21686 |  |
| $\mathrm{n} / \mathrm{I}$ | 0.15775 |  |  |  |  |
| Ieft | 0.0000 |  |  |  |  |
| Width | 208.67 |  |  |  |  |

Estimation Summary: Detection Probability

|  | Estimate | 8 \% ${ }^{\text {c/ }}$ | df | 95\% Confide | nce Interval |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Uniform/Polynomial |  |  |  |  |  |
| m | 1.0000 |  |  |  |  |
| InL | -282.37 |  |  |  |  |
| AIC | 566.75 |  |  |  |  |
| AICc | 566.77 |  |  |  |  |
| BIC | 569.96 |  |  |  |  |
| Chi-p | 0.72359 |  |  |  |  |
| f (0) | $0.67493 \mathrm{E}-02$ | 5.02 | 182.00 | $0.61130 \mathrm{E}-02$ | $0.74520 \mathrm{E}-02$ |
| p | 0.71003 | 5.02 | 182.00 | 0.64309 | 0.78395 |
| ESW | 148.16 | 5.02 | 182.00 | 134.19 | 163.59 |

Estimation Summary-Expected Cluster Size

|  | Estimate | \%CV | df | 95\% Con | ce Interval |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Average cluster size |  |  |  |  |  |
|  | 1.7049 | 6.00 | 182.00 | 1.5148 | 1.9188 |
| Uniform/Polynomial |  |  |  |  |  |
| $r$ | $0.11846 \mathrm{E}-01$ |  |  |  |  |
| $r-p$ | 0.56323 |  |  |  |  |
| E (S) | 1.6520 | 4.40 | 181.00 | 1.5146 | 1.8018 |

Estimation Summary-Density and Abundance

|  | Estimate | scV | df | 95 \% Confidence Interval |  |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Uniform/Polynomial |  |  |  |  |  |
| DS | 2.7576 | 15.83 | 18.53 | 1.9828 | 3.8352 |
| D | 4.5556 | 16.43 | 21.49 | 3.2459 | 6.3937 |
| N | 8337.0 | 16.43 | 21.49 | 5940.0 | 11701. |



PH351-Gillette
HA 17
Revised - 3/87

2013 - JCR Evaluation Form

| SPECIES: Pronghorn HERD: PR352 - MIDDLE FORK |  | PERIOD: 6/1/2013-5/31/2014 |
| :---: | :---: | :---: |
|  |  |  |
| HUNT AREAS: 21 |  | PREPARED BY: DAN THIELE |
| 2008-2012 Average | 2013 | 2014 Proposed |
| Population: 5,233 | 5,946 | 6,236 |
| Harvest: 845 | 823 | 850 |
| Hunters: 923 | 1,156 | 1,000 |
| Hunter Success: 92\% | 71\% | 85 \% |
| Active Licenses: 1,014 | 1,220 | 1,050 |
| Active License Percent: 83\% | 67\% | 81 \% |
| Recreation Days: 3,455 | 4,366 | 4,250 |
| Days Per Animal: 4.1 | 5.3 | 5 |
| Males per 100 Females 58 | 71 |  |
| Juveniles per 100 Females 82 | 80 |  |
| Population Objective: |  | 6,000 |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | -0.9\% |
| Number of years population has been + or - objective in rece | rend: | 1 |
| Model Date: |  | 2/11/2014 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: | 14\% | 10\% |
| Males $\geq 1$ year old: | 34\% | 33\% |
| Juveniles (<1 year old): | 3\% | 2\% |
| Total: | 12\% | 12\% |
| Proposed change in post-season population: | -4\% | +5\% |

## Population Size - Postseason

$\square$ PR352 - POPULATION - PR352 - OBJECTIVE


Harvest


Number of Hunters


Harvest Success
$\square$ PR352 - Hunter Success \% PR352 - Active License Success


## Active Licenses



## Preseason Animals per 100 Females


for Pronghorn Herd PR352-MIDDLE FORK

| Year | Pre Pop | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | Cls <br> Obj | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | YIng | Adult | Total | $\begin{gathered} \text { Conf } \\ \text { Int } \end{gathered}$ | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | $\begin{aligned} & \text { Conf } \\ & \text { Int } \end{aligned}$ | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 5,267 | 49 | 184 | 233 | 24\% | 388 | 40\% | 349 | 36\% | 970 | 2,845 | 13 | 47 | 60 | $\pm 7$ | 90 | $\pm 10$ | 56 |
| 2009 | 5,721 | 64 | 185 | 249 | 25\% | 412 | 41\% | 332 | 33\% | 993 | 2,285 | 16 | 45 | 60 | $\pm 7$ | 81 | $\pm 9$ | 50 |
| 2010 | 6,242 | 73 | 137 | 210 | 24\% | 379 | 43\% | 283 | 32\% | 872 | 2,196 | 19 | 36 | 55 | $\pm 7$ | 75 | $\pm 9$ | 48 |
| 2011 | 6,378 | 39 | 130 | 169 | 23\% | 321 | 43\% | 249 | 34\% | 739 | 2,305 | 12 | 40 | 53 | $\pm 8$ | 78 | $\pm 10$ | 51 |
| 2012 | 7,206 | 84 | 142 | 226 | 25\% | 362 | 40\% | 309 | 34\% | 897 | 2,824 | 23 | 39 | 62 | $\pm 8$ | 85 | $\pm 10$ | 53 |
| 2013 | 6,851 | 85 | 280 | 365 | 28\% | 513 | 40\% | 412 | 32\% | 1,290 | 2,490 | 17 | 55 | 71 | $\pm 7$ | 80 | $\pm 8$ | 47 |

## 2014 HUNTING SEASONS

MIDDLE FORK PRONGHORN HERD (PR352)

| Hunt <br> Area | Type | Dates of Seasons <br> Opens | Closes | Quota | Limitations |
| :---: | :---: | :--- | :--- | :--- | :--- |
|  |  |  |  |  |  |
| 21 | 1 | Oct. 15 | Oct. 31 | 650 | Limited quota licenses; any antelope <br>  |
|  | 6 | Oct. 15 | Oct. 31 | 500 | Limited quota licenses; doe or fawn <br> Nov. 1 |
| Nov. 15 |  | Unid on private land <br> valid licenses |  |  |  |
| Archery |  | Aug. 15 | Oct. 14 |  | Refer to Section 3 of this Chapter |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 21 | 1 | -100 |
|  | 6 | -100 |
| Herd Unit Total | $\mathbf{1}$ | $\mathbf{- 1 0 0}$ |
|  | $\mathbf{6}$ | $\mathbf{- 1 0 0}$ |

## Management Evaluation

Current Postseason Population Management Objective: 6,000
Management Strategy: Recreational
2013 Postseason Population Estimate: ~5,950
2014 Proposed Postseason Population Estimate: ~6,200

## Herd Unit Issues

The Middle Fork Pronghorn Herd Unit post-season population objective was reviewed in 2013 and revised to 6,000 pronghorn. The management strategy remains recreational management.

Area 21 extends from Interstate Highway 25 west to the Bighorn Mountain divide. Antelope densities are highest in the eastern section of the hunt area and lower on the mountain slope. The southeast corner of the hunt area and the mountain slope have large amounts of public land but the majority of the hunt area is private. Hunting on private land is controlled by outfitters and landowners who charge trespass fees and take a limited number of hunters. This causes a disproportionate amount of hunting pressure on accessible public lands. In many cases, the outfitted hunting which takes place on private land limits access as well as the ability to achieve adequate doe/fawn harvest. Private lands are under hunted and outfitters are doing little to manage this pronghorn population.

## Weather

Weather in the area of the Middle Fork Herd Unit during 2012 and 2013 turned extremely warm and dry after several good moisture years. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed "extreme drought" conditions for

January 2013 but progressed to "moderately moist" by January 2014. May and June precipitation was $66 \%$ of normal. However, the southern part of Climate Division 5 was very dry compared to the Sheridan and Gillette areas. In fact, little spring green up occurred in the Kaycee area. Fall precipitation was well above normal improving soil moisture due to more than six inches of moisture ( $240 \%$ of normal) in September and October coming in the form of rain and snow.

## Habitat

There is one Wyoming big sagebrush habitat transect in this herd unit. Production measured in October 2013 averaged 36 mm per leader compared to 8 mm per leader in 2012. The notable production occurred even though drought persisted through much of the summer. However, abundant fall precipitation may have prompted late season growth. Fall green up helped wildlife gain body condition after the dry summer. Winter conditions were normal but above average mortality may have occurred given the severe drought in this area. Utilization during the 201314 winter was very light (less than $5 \%$ of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range.

## Field Data

Preseason classifications again failed to achieve an adequate sample. The survey yielded a fawn ratio of $80: 100$, slightly below the five year average of $82: 100$, but providing adequate production to support an increasing harvest trend. The buck ratio reached its highest level of the six year period at 71:100. No significant mortality events have been documented in the last six years. Postseason landowner surveys indicate that the population has decreased over the last five years. In 2013, $53 \%$ of landowners were satisfied with pronghorn numbers while $13 \%$ desired more pronghorn and $33 \%$ reported there were too many pronghorn. The last line transect survey was flown in 2012 resulting in an end of year population estimate of 4,200 pronghorn, well below the 6,200 pronghorn estimated in 2006. The hunter satisfaction survey showed $65 \%$ of hunters in 2013 were either satisfied or very satisfied, well below the $85 \%$ recorded in 2012. This decrease reflects lower hunter success, high hunter densities on public lands and difficult access conditions due to wet weather during the hunting season opener.

## Harvest Data

Harvest for the six year period peaked in 2012 at 939 pronghorn which is also the highest harvest since at least 1985. The 2012 buck harvest matched the 1985 high of 520 bucks. Doe/fawn harvest reached a new high in 2011. Harvest decreased in 2013 to 481 bucks and 823 total pronghorn. The decrease was attributed to lower pronghorn numbers and wet field conditions during the hunting season opener which hampered hunter access. Hunter numbers increased to a six year high, however, hunter success and active license success fell to six year lows. The active license success of $67 \%$ was well below the five year average of $83 \%$. Type 1 license success was $70 \%$ whereas Type 6 license success was only $64 \%$. Conversely, hunter effort increased nearly 1 day per animal harvested reaching a six year high of 5.3 days per animal harvested. License sales continued an increasing trend and both Type 1 and Type 6 licenses nearly sold out in 2013.

## Population

This population is estimated at about 5,950 pronghorn putting this herd at the revised population objective. The population estimate was generated with the EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult (SCJ/SCA) model was chosen as it produced the lowest AIC value (89). The model attempts to track eight line transect survey estimates over the last 20 years, the last obtained in 2012. The 2006 estimate was the highest to date but the model does not align though its confidence interval. The 2012 estimate was $35 \%$ lower with a much narrower confidence interval. This was the first of the surveys flown using a one observer plane. The model indicates this population has nearly doubled since 2007 and shows little influence from the record high harvest of recent years. This is highly unlikely. Inadequate classification samples and the fluctuating buck ratios may contribute to the questionable results. The population estimate is similar to the POP-II estimate, however, the POP-II model predicted a decreasing trend.

The population model's increasing trend conflicts with the harvest data, landowner surveys and field observations which suggest a decreasing population. Harvest data clearly shows decreasing hunter success and increasing hunter effort reflective of tougher hunting conditions due to lower pronghorn numbers. Given that record harvest is not dampening the model's growth rate it is difficult to put much credibility in the outputs. Therefore, the model is considered a poor model.

## Management Summary

Changes made for the 2014 hunting season included decreasing the Type 1 and Type 6 license quotas by 100 licenses each to address decreasing active license success and increasing hunter effort. Harvest could be similar to 2013 if hunter success increases with fewer hunters in the field. A larger decrease in license quotas was considered, however, with the severe drought in this herd unit, managing for a lower population is warranted. If expected harvest is achieved a postseason population estimate of 6,200 pronghorn is projected by the EXCEL model. However, managers expect this population to actually decrease with this level of harvest.

## Line Transect Survey

A 2012 end-of-year_population estimate for this herd was derived using line transect sampling on June 5 and 6, 2013. The survey was flown by Laird Flying Service of Ekalaka, Montana using a Husky Aviat with a single observer. Transect beginning and ending locations and group observations including distance band, group size and elevation were recorded using a GPS, radar altimeter and notebook computer interfaced with Bluetooth capabilities.

Twenty-one north-south transects were flown at 3,000 meter intervals. The survey included the entire herd unit ( $628 \mathrm{mi}^{2}$ ). One-hundred-thirty-six groups were observed, 15 in Band A, 26 in Band B, 32 in Band C, 36 in Band D and 27 in Band E. Average elevation was 328 feet. Mean group size was 1.7 pronghorn for all distance bands. The data were analyzed with DISTANCE 6.0 v 2 .

A population estimate of $4,194(3,068-5,734)$ pronghorn was obtained using a uniform polynomial model. The pronghorn group density was $4.1 \mathrm{groups} / \mathrm{mi}^{2}$ and the pronghorn density
was 6.7 pronghorn $/ \mathrm{mi}^{2}$. The percent coefficient of variation for both the population and pronghorn density estimates was $15 \%$. The number of groups observed in Band A was lower than expected, likely due to the observer not concentrating on the line. Therefore, the detection probability plot did not fit the histogram as desired. The estimate is $34 \%$ lower than the 2006 line transect estimate indicating this population has decreased significantly over the past six years.

Detection Probability Plot



FIGURES
${ }^{\text {Camems }}$

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2013 - JCR Evaluation Form

| SPECIES: Pronghorn |  | PERIOD: 6/1/2013-5/31/2014 |
| :---: | :---: | :---: |
| HERD: PR353-UCROSS |  |  |
| HUNT AREAS: 10, 16 |  | PREPARED BY: TIM THOMAS |
| 2008-2012 Average | $\underline{2013}$ | 2014 Proposed |
| Population: 6,895 | 7,457 | 7,763 |
| Harvest: 692 | 775 | 725 |
| Hunters: 696 | 792 | 750 |
| Hunter Success: 99\% | 98\% | 97\% |
| Active Licenses: 822 | 958 | 900 |
| Active License Percent: 84\% | 81\% | 81\% |
| Recreation Days: 2,521 | 2,597 | 2,550 |
| Days Per Animal: 3.6 | 3.4 | 3.5 |
| Males per 100 Females 61 | 63 |  |
| Juveniles per 100 Females 65 | 82 |  |
| Population Objective: |  | 2,500 |
| Management Strategy: |  | Recreational |
| Percent population is above (+) or below (-) objective: |  | 198\% |
| Number of years population has been + or - objective in rece | nd: | 20 |
| Model Date: |  | 02/26/2014 |
| Proposed harvest rates (percent of pre-season estimate for each sex/age group): |  |  |
|  | JCR Year | Proposed |
| Females $\geq 1$ year old: |  | 9\% |
| Males $\geq 1$ year old: | 21\% | 18\% |
| Juveniles (<1 year old): | 1\% | 1\% |
| Total: | 9\% | 8\% |
| Proposed change in post-season population: | 3\% | 4\% |

Population Size - Postseason


## Harvest



Number of Hunters


Harvest Success
$\square$ PR353 - Hunter Success \% PR353 - Active License Success


## Active Licenses



Days Per Animal Harvested
$\square$ PR353 - Days


Preseason Animals per 100 Females


## 2008-2013 Preseason Classification Summary

for Pronghorn Herd PR353 - UCROSS

| Year | Pre Pop | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | $\begin{aligned} & \mathrm{Cls} \\ & \mathrm{Obj} \end{aligned}$ | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{array}{r} 100 \\ \text { Fem } \end{array}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 7,899 | 166 | 427 | 593 | 28\% | 938 | 44\% | 583 | 28\% | 2,114 | 2,057 | 18 | 46 | 63 | $\pm 5$ | 62 | $\pm 5$ | 38 |
| 2009 | 7,321 | 46 | 271 | 317 | 29\% | 505 | 47\% | 254 | 24\% | 1,076 | 1,887 | 9 | 54 | 63 | $\pm 7$ | 50 | $\pm 6$ | 31 |
| 2010 | 7,148 | 111 | 259 | 370 | 28\% | 603 | 46\% | 335 | 26\% | 1,308 | 1,801 | 18 | 43 | 61 | $\pm 6$ | 56 | $\pm 6$ | 34 |
| 2011 | 7,691 | 51 | 156 | 207 | 22\% | 406 | 43\% | 328 | 35\% | 941 | 2,612 | 13 | 38 | 51 | $\pm 7$ | 81 | $\pm 9$ | 54 |
| 2012 | 8,222 | 104 | 172 | 276 | 25\% | 446 | 41\% | 373 | 34\% | 1,095 | 2,743 | 23 | 39 | 62 | $\pm 7$ | 84 | $\pm 9$ | 52 |
| 2013 | 8,427 | 88 | 174 | 262 | 26\% | 414 | 41\% | 340 | 33\% | 1,016 | 2,700 | 21 | 42 | 63 | $\pm 8$ | 82 | $\pm 9$ | 50 |

## 2014 HUNTING SEASONS

| Hunt Area | Dates of Seasons |  |  | Quota | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: |
|  | Type | Opens | Closes |  |  |
| 10 | 1 | Oct. 1 | Oct. 14 | 200 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Oct. 31 | 300 | Limited quota licenses; doe or fawn |
| 16 | 1 | Oct. 1 | Oct. 14 | 500 | Limited quota licenses; any antelope |
|  | 6 | Oct. 1 | Oct. 31 | 300 | Limited quota licenses; doe or fawn |
| Archery |  | Aug. 15 | Sep. 30 |  | Refer to Section 3 of this Chapter |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 10 | 1 | -150 |
|  | 6 | -200 |
| 16 | 6 | -100 |
| Herd Unit Total | $\mathbf{1}$ | $\mathbf{- 1 5 0}$ |
|  | $\mathbf{6}$ | $\mathbf{- 3 0 0}$ |

## Management Evaluation

Current Postseason Population Management Objective: 2,500
Management Strategy: Recreational
2013 Postseason Population Estimate: ~7,500
2014 Proposed Postseason Population Estimate: ~7,800

## Herd Unit Issues

The management objective for the Ucross Pronghorn Herd Unit is a post-season population objective of 2,500 pronghorn. The management strategy is recreational management. The objective and management strategy were last revised in 1996.

Industrial scale oil and gas development and outfitting in the herd unit have resulted in restricted hunting access to some private lands. There are very few public land hunting opportunities in this herd unit. The restricted access has made it difficult to attain adequate harvest to regulate pronghorn populations in portions of this herd.

## Weather

The spring and summer of 2013 was generally cool and wet, resulting in good conditions for forage production, in the northwest portion of the Sheridan region. Conditions generally became drier and hot as you moved south and east, resulting in more drought-like conditions. The winter of 2013-14 was more severe than recent winters, with snow fall starting in late September and continuing through the winter. There were several bouts of extreme cold temperatures lasting up
to a week in duration. Temperatures reached $\sim 30^{\circ} \mathrm{F}$ below zero, something not seen since the 1990s. Several thaw/freeze cycles during parts of the winter resulted in hard, crusted snow that was difficult for animals to paw through to access forage.

## Habitat

The Petrified Tree habitat transect is located in the south-central portion of this herd unit on BLM land. The habitat transect monitors annual growth and utilization of Wyoming big sagebrush. This transect has not been read for several years.

## Field Data

In August, we conducted herd classification surveys. Starting in 2011, we moved from aerial classification surveys to ground classification surveys to reduce risk for employees and reduce costs associated with aircraft rentals. Unlike in other areas, the total number of animals classified did not decrease significantly with the switch in survey techniques. In 2013, we classified 1,016 pronghorn, well below the desired sample size of 2,700 pronghorn at the $90 \%$ confidence level.

Fawn production, as measured by observed fawn:doe ratios, has exceeded 80 fawns per 100 does during the past three years, suggesting this herd has the potential to increase quickly under favorable conditions. This year, we observed 82 fawns: 100 does, higher than the long-term average of 74 fawns: 100 does.

Observed buck to doe ratios average about 63 bucks: 100 does, well above the desired number of bucks for recreational management. Restricted hunter access to private lands limits our ability to obtain additional buck harvest, which would be easily sustainable in this herd unit based on the observed buck to doe ratio.

Hunter satisfaction has remained high, with $84 \%$ of surveyed hunters ( $\mathrm{n}=149$ ) satisfied or very satisfied, suggesting those hunters who do obtain access to private lands experience a quality hunt. The high hunter satisfaction level likely reflects Department personnel efforts to advise perspective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license. Area 16 does have limited public land and PLPW Walk-In Area access, which may give some hunters higher than deserved hope of a quality pronghorn hunt.

## Harvest Data

Since 2007, we have issued a total of 1,750 licenses between two hunt areas in this herd unit; 850 Type 1 (any antelope) and 900 Type 6 (doe or fawn). We have not sold all available licenses since raising numbers to this level. In 2013, we sold 589 Type 1 licenses ( $69 \%$ ) and only 440 Type 6 licenses (49\%). Type 1 license sales decreased slightly while Type 6 license sales increased slightly compared to 2012 license sales.

In 2013, hunters harvested an estimated 775 pronghorn, the highest harvest ever reported in this herd unit and a $3 \%$ increase over the 2012 harvest. Hunters average about $101 \%$ success over the past 10 years, compared to $98 \%$ success in 2013. Success by individual license follows a similar trend $(10$ year mean $=86 \% ; 2013=81 \%)$. Hunter effort, as measured by the number of
days hunted per animal harvested, was 3.4 days/animal, compared to 3.3 days/animal over the past 10 years. Access has varied over the past 10 years, with changes in ownership of several large ranches influencing hunter access.

## Population

The 2013 post-season population estimate of $\sim 7,500$ pronghorn is well above the established management objective of 2,500 , with the population trending upward. This population likely bottomed out in the late 1990s and has been increasing since then. A line transect survey was conducted in June 2013, which resulted in an estimated end-of-biological-year population of 5,990 pronghorn.

The "Constant Juvenile - Constant Adult Survival Rate" (CJ,CA) spreadsheet model was chosen to estimate the post-season population for this herd. This model had the lowest relative Akaike information criterion (AIC) value (93) of the three possible models. The population dynamics of this model appear reasonable and consistent with observed dynamics in the field. The model aligns very well with the most recent line transect estimate. While we have limited population dynamic data available for this herd, the model does align well with the most recent line transect estimate, so we consider this a "good" model.

Landowners, hunters and Department field personnel have noted an increase in this population over the past several years. Of landowners ( $\mathrm{n}=18$ ) who responded to an annual survey, $67 \%$ $(\mathrm{n}=12)$ indicated the population was at or near desired levels and most ( $67 \%, \mathrm{n}=12$ ) suggested similar season strategies for 2014. No landowners thought they had fewer than desired numbers of pronghorn, and only one landowner suggested more restrictive harvest strategies.

## Management Summary

The regular hunting season traditionally runs two weeks (October $1-14$ ) for Type 1 licenses, and four weeks (October 1 - 31) for Type 6 licenses since the 2003 season. An archery preseason generally runs August 15 - September 30. In 2009, the Type 6 season was extended to the end of November in Area 10 to address some damage concerns of private landowners. These concerns have abated and closing date has been moved back to October 31 for the 2014 season.

Hunters in this herd unit are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, which allows hunters the opportunity to harvest multiple animals. There is limited pronghorn hunting on scattered State Trust and BLM land, as well as one Walk-In Area and one Hunter Management Area. We observe high buck numbers, as measured by buck:doe ratios, averaging 68 bucks: 100 does. This is likely a function of limited access to private lands where the majority of pronghorn occur.

Since we have not sold all of the available licenses since 2006, we have reduced the license allocation for the 2014 season to better reflect demand and available opportunity. Even with the reduction in licenses, we should meet the demand of all hunters based on the past 7 years of license sales. This reduction will reduce the perception that we have lots of opportunity because of hundreds of left-over licenses.

We project a harvest of approximately 725 pronghorn in 2014 , resulting in an estimated postseason population of about 7,800 pronghorn. These predictions assume near normal fawn
production and survival, as well as similar license sales and success rates for the 2014 hunting season. Due to limited access, we will likely not reach the management objective for this herd unit with hunting alone. This herd unit management objective will be reviewed and alternative management objective and strategy considered.






## 2013 - JCR Evaluation Form



Proposed harvest rates (percent of pre-season estimate for each sexlage group):

|  | JCR Year | Proposed |
| ---: | :---: | :---: |
|  | $22 \%$ | $27 \%$ |
| Males $\geq 1$ year old: | year old: | $28 \%$ |
| Juveniles (< 1 year old): | $4 \%$ | $37 \%$ |
| Total: | $25 \%$ | $4 \%$ |
| Projected change in post-season population: | $-25 \%$ | $-28 \%$ |

PR354 Satisfaction Survey Percentages


Harvest


Number of Hunters


Hunter Success


## Active Licenses

\author{

- PH354 - Licenses
}

| 2,500 | 1,709 | 1,674 | 1,620 | 1,486 | 1,706 |
| :---: | :---: | :---: | :---: | :---: | :---: |
| 2,000 | 1,500 |  |  |  |  |
| 1,000 |  |  |  |  |  |
| 500 | 2008 | 2009 | 2010 | 2011 |  |
| 0 |  |  |  |  |  |
|  |  |  |  |  |  |



## Postseason Animals per 100 Females



## 2008-2013 Preseason Classification Summary

for Pronghorn Herd PR354-BUFFALO

|  |  | MALES |  |  |  | FEMALES |  | JUVENILES |  |  |  | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| Year | Pre Pop | Ylg | Adult | Total | \% | Total | \% | Total | \% | Tot <br> Cls | Obj | YIng | Adult | Total | Conf Int | $\begin{aligned} & 100 \\ & \text { Fem } \end{aligned}$ | $\begin{aligned} & \text { Conf } \\ & \text { Int } \end{aligned}$ | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 12,479 | 229 | 656 | 885 | 28\% | 1,290 | 41\% | 1,006 | 32\% | 3,181 | 2,342 | 18 | 51 | 69 | $\pm 2$ | 78 | $\pm 2$ | 46 |
| 2009 | 12,501 | 268 | 736 | 1,004 | 30\% | 1,348 | 41\% | 949 | 29\% | 3,301 | 1,906 | 20 | 55 | 74 | $\pm 1$ | 70 | $\pm 1$ | 40 |
| 2010 | 10,220 | 161 | 601 | 762 | 27\% | 1225 | 44\% | 786 | 29\% | 2,773 | 1,707 | 19 | 70 | 199 | $\pm 8$ | 91 | $\pm 10$ | 30 |
| 2011 | 9,822 | 117 | 362 | 479 | 26\% | 730 | 39\% | 666 | 36\% | 1,875 | 2,092 | 16 | 50 | 66 | $\pm 4$ | 91 | $\pm 5$ | 55 |
| 2012 | 9,414 | 253 | 512 | 765 | 27\% | 1,020 | 36\% | 1,032 | 37\% | 2,817 | 2,147 | 25 | 50 | 75 | $\pm 2$ | 101 | $\pm 2$ | 58 |
| 2013 | 7,806 | 211 | 430 | 641 | 30\% | 817 | 38\% | 688 | 32\% | 2,146 | 2,827 | 26 | 53 | 78 | $\pm 0$ | 84 | $\pm 0$ | 47 |

## 2014 HUNTING SEASONS BUFFALO PRONGHORN HERD (PR354)

| Hunt | Dates of Seasons |  |  | Quota | Limitations |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Area | Type | Opens | Closes |  |  |
| 20 | 1 | Oct. 15 | Nov. 15 | 800 | Limited quota licenses; any antelope |
|  | 6 | Oct. 15 | Nov. 15 | 800 | Limited quota licenses; doe or fawn |
| 102 | 1 | Oct. 15 | Nov. 15 | 500 | Limited quota licenses; any antelope |
|  | 6 | Sep. 1 | Sep. 30 | 500 | Limited quota licenses; doe or fawn valid on private land Unused Area 102 licenses valid for the entire area |
|  |  | Oct. 15 | Nov. 15 |  |  |
| Archery |  | Aug. 15 | Oct. 14 |  | Refer to Section 3 of this Chapter |
|  |  | unt Area | Type | Quota change | rom 2013 |
|  |  | 20 |  | No cha |  |
|  |  | 102 | 1 | -50 |  |
|  | Herd | Unit Total | 1 | -50 |  |

## Management Evaluation

Current Postseason Population Management Objective: 60\% Landowner/Hunter Satisfaction
Management Strategy: Private Lands
2013 Landowner Satisfaction Survey: 65\%
2013 Hunter Satisfaction Survey: 84\%
2013 Postseason Population Estimate: ~6,350
2014 Proposed Postseason Population Estimate: ~4,550

## Herd Unit Issues

The Buffalo (Hunt Area 102) and Upper Powder River (Hunt Area 20) Pronghorn Herd Units were combined in 2013, adopting a landowner and hunter satisfaction post-season population objective and a private lands management strategy. The objective and management strategy were last revised in 1988.

This herd unit is predominately private land with limited public land hunting opportunity resulting in a disproportionate amount of hunting pressure on accessible public land. Restrictive access to private land and landlocked public land aggravates this situation. In recent years several ranches have changed ownership resulting in reduced hunting access. Typically, traditional ranching operations are bought by nonresident landowners with more conservative hunting philosophies. Increased outfitter leasing of ranches reduces the number of hunters a given ranch will take. These factors contribute to high buck ratios, difficulty in placing hunters
and attaining needed harvest. Additionally, pronghorn are often displaced from ranches that allow hunting to neighboring ranches that take limited numbers of hunters, or no hunters.

Habitat is a combination traditional sagebrush grassland habitat with interspersed irrigated hay meadows. The population is characterized by high densities of pronghorn with high fawn ratios and high buck ratios. The Area 102 segment is somewhat immune from effects of drought because of the occurrence of irrigated meadows throughout much of the herd unit. Complaints of crop depredation are common in Area 102. Available hunter access largely determines the number of licenses sold.

## Weather

Weather in the area of the Buffalo Herd Unit during 2012 and 2013 turned extremely warm and dry after several good moisture years. The Palmer drought index for Climate Division 5 (Powder, Little Missouri and Tongue drainages) showed "extreme drought" conditions for January 2013 but progressed to "moderately moist" by January 2014. May and June precipitation was $66 \%$ of normal. However, the southern part of Climate Division 5 was very dry compared to the Sheridan and Gillette areas. In fact, little spring green up occurred in the Kaycee area. Therefore, Area 102 fared better than Area 20. Fall precipitation was well above normal improving soil moisture due to more than six inches of moisture ( $240 \%$ of normal) in September and October coming in the form of rain and snow.

## Habitat

There are no established habitat transects in this herd unit. However, in two adjacent herd units production for two Wyoming big sagebrush transects measured in October 2013 averaged 36 mm and 8 mm per leader compared to 12 mm and 8 mm per leader in 2012, respectively. Winter utilization during the 2013-14 winter was very light (less than $5 \%$ of leaders browsed) as pronghorn and mule deer were dispersed over winter/yearlong range. Winter conditions were normal so above average mortality was not observed.

## Field Data

Classifications the last three years showed fawn ratios exceeding 80:100 suggesting this herd should be increasing even with the increased doe harvest. It should be noted however that with the elimination of aerial classifications in Area 20, fawn ratios showed a notable increase suggesting inaccessible areas with lower fawn productivity are not being represented in the sample. Buck ratios have fluctuated but are trending up the last three years due to the lack of Type 1 license sales. A June 2012 line transect survey of Area 20 indicated that pronghorn numbers had decreased $50 \%$ from the 2007 line transect survey. However, there is question as to the accuracy of this estimate. Sixty-five percent of responding landowners surveyed following the hunting season indicated that numbers were acceptable while $7 \%$ desired more pronghorn and $28 \%$ thought numbers were too high. Landowners in Area 20 are generally satisfied (83\%) with pronghorn numbers. The landowner survey over the past several years shows a trend suggesting numbers are decreasing in Area 20 whereas Area 102 landowners believe numbers remain too high. Hunters responding to the 2013 hunter satisfaction survey reported high hunter satisfaction for the two hunt areas with $89 \%$ and $87 \%$ positive responses for Areas 20 and 102, respectively.

## Harvest Data

Total harvest increased for the second year in a row but remained below the six year high of 1,493 pronghorn harvested in 2009. The increase was due to a $35 \%$ harvest increase in Area 102 even though active license success decreased slightly. There has been an obvious increase in hunting interest as license sales hit a six year high. However, hunter success has trended down over the period while hunter effort increased. Active license success fell to $74 \%$ compared to a five year average of $81 \%$. Hunter effort increased to 4.8 days per animal harvested compared to a five year average of 3.9 days per animal harvested. Private land access is essential to achieving harvest objectives. There appears to be increased interest in hunting in this part of Wyoming as license quotas have been reduced in other areas of the state. Public land hunters have benefited from GPS technology that allows them to readily identify public and private land boundaries.

## Population

This herd has a 2013 post-season population estimate of 6,345 pronghorn, $22 \%$ below the 2012 estimate. The population estimate was generated with the EXCEL spreadsheet model. The constant juvenile/constant adult (CJ/CA) option was chosen as it produced the lowest AIC value (63) and it generated a more realistic population estimate. Modeling efforts are complicated in the new herd unit as no herd unit wide line transect estimate is available for a given year. The model suggests a steadily decreasing population from a high of nearly 14,000 pronghorn in 2005. This model trend is supported by the harvest data showing lower hunter success and higher hunter effort, although the decreasing trend may be too steep. Modeling into 2014 and 2015 suggest the current level of harvest will decrease this population at an even more exaggerated rate. Conversely, the high fawn ratios the last three years and private land access would suggest it is not possible to decrease this population to the extent modeled by hunting alone. Therefore, the model is considered a poor model and warrants an abundance estimate with which to align this new herd model. A more accurate population estimate is desirable but not immediately necessary to manage this herd. The population is now managed under a landowner and hunter satisfaction objective which is appropriate for this private land herd. The management objective for landowner satisfaction has been exceeded the last two years largely due to more favorable responses in Area 20. Hunter satisfaction has easily exceeded the $60 \%$ objective for the two years the survey has been conducted.

## Management Summary

The 2014 hunting season includes continuation of the Area 102 September Type 6 season to address landowner concerns with depredation to irrigated hay meadows. This season has increased in popularity and corresponds to a doe/fawn white-tailed deer season because landowners deal with high numbers of both species. Harvest objectives will likely not be attained as some licenses will not sell. In 2013, $72 \%$ of Type 1 licenses sold ( 226 unsold) and $73 \%$ of Type 6 licenses sold ( 217 unsold) in Area 20. In Area 102, $80 \%$ of Type 1 licenses sold ( 110 unsold) and $99 \%$ of Type 6 licenses sold ( 4 unsold). License quotas are more than adequate to address depredation concerns if hunter access is available.

Given the decreasing hunter success and increasing hunter effort in Area 20, a reduction in license quotas may be warranted. However, given the severity of the 2012 and 2013 drought no change is proposed. The opportunity to manage a lower population is reasonable given the continuing drought and limited sagebrush habitat in the two hunt areas. Private land access will ultimately determine the level of harvest achieved in these hunt areas.

A harvest of 2,380 pronghorn is projected for the 2014 hunting season if access improves and hunter success increases. In reality, harvest is expected to be similar to 2013 as there is no reason to expect license sales to increase significantly. A postseason population of 4,450 pronghorn is projected.



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2013 - JCR Evaluation Form


## Population Size - Postseason

```
\(\square\) PR355-POPULATION - PR355-OBJECTIVE
```



## Harvest



Number of Hunters


Harvest Success

PR355 - Hunter Success \% PR355 - Active License Success


## Active Licenses



Preseason Animals per 100 Females


## 2008-2013 Preseason Classification Summary <br> for Pronghorn Herd PR355-BECKTON

| Year | Pre Pop | MALES |  |  |  | FEMALES |  | JUVENILES |  | Tot Cls | $\begin{aligned} & \text { Cls } \\ & \text { Obj } \end{aligned}$ | Males to 100 Females |  |  |  | Young to |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Ylg | Adult | Total | \% | Total | \% | Total | \% |  |  | Ylng | Adult | Total | Conf Int | $\begin{array}{r} 100 \\ \text { Fem } \end{array}$ | Conf Int | $\begin{gathered} 100 \\ \text { Adult } \end{gathered}$ |
| 2008 | 1,320 | 14 | 29 | 43 | 18\% | 139 | 57\% | 61 | 25\% | 243 | 665 | 10 | 21 | 31 | $\pm 8$ | 44 | $\pm 10$ | 34 |
| 2009 | 1,346 | 24 | 47 | 71 | 28\% | 117 | 47\% | 62 | 25\% | 250 | 929 | 21 | 40 | 61 | $\pm 14$ | 53 | $\pm 12$ | 33 |
| 2010 | 1,459 | 12 | 32 | 44 | 22\% | 95 | 48\% | 61 | 30\% | 200 | 969 | 13 | 34 | 46 | $\pm 13$ | 64 | $\pm 16$ | 44 |
| 2011 | 1,523 | 0 | 0 | 0 | 0\% | 0 | 0\% | 0 | 0\% | 0 | 0 | 0 | 0 | 0 | $\pm 0$ | 0 | $\pm 0$ | 0 |
| 2012 | 1,428 | 18 | 34 | 52 | 20\% | 145 | 56\% | 60 | 23\% | 257 | 623 | 12 | 23 | 36 | $\pm 9$ | 41 | $\pm 9$ | 30 |
| 2013 | 1,332 | 16 | 38 | 54 | 25\% | 105 | 50\% | 53 | 25\% | 212 | 792 | 15 | 36 | 51 | $\pm 13$ | 50 | $\pm 13$ | 33 |

## 2014 HUNTING SEASONS BECKTON PRONGHORN HERD (PR355)

| Hunt <br> Area | Type | Dates of Seasons |  |  |  |
| :---: | :---: | :--- | :--- | :--- | :--- |
| Opens | Closes | Quota | Limitations |  |  |
|  |  |  |  |  |  |
| 109 | 1 | Sep. 15 | Nov. 30 | 350 | Limited quota licenses; any antelope |
|  | 6 | Sep. 15 | Nov. 30 | 300 | Limited quota licenses; doe or fawn |
| Archery |  | Aug. 15 | Sep. 14 |  | Refer to Section 3 of this Chapter |


| Hunt Area | Type | Quota change from 2013 |
| :---: | :---: | :---: |
| 109 | 1 | +50 |
| Herd Unit Total |  | +50 |

## Management Evaluation

Current Postseason Population Management Objective: 100
Management Strategy: Recreational
2013 Postseason Population Estimate: ~1,500
2014 Proposed Postseason Population Estimate: ~1,200

## Herd Unit Issues

The Beckton Pronghorn Herd Unit is located west of Interstate Highway 90, north of Piney Creek and off national forest. This herd unit contains the towns of Story, Big Horn, Sheridan, Ranchester and Dayton, as well as significant rural-residential development.

The majority of this herd unit is private lands, much of it developed as rural residential areas. There are few public land hunting opportunities available in this herd unit. The restricted access has made it difficult to attain adequate harvest to regulate pronghorn populations in this herd unit.

## Weather

The spring and summer of 2013 was generally cool and wet, resulting in good conditions for forage production throughout the region. The winter of 2013-14 was more severe than recent winters, with snow fall starting in late September and continuing through the winter. There were several bouts of extreme cold temperatures lasting up to a week in duration. Temperatures reached $\sim 30^{\circ}$ F below zero, something not seen since the 1990s. Several thaw/freeze cycles during parts of the winter resulted in hard, crusted snow that was difficult for animals to paw through to access forage.

## Habitat

There are no habitat transects within or near this herd unit. This herd unit is located along the foothills of the Bighorn Mountains and contains open rangeland dominated by short-grass prairie and big sage brush, dry land and irrigated crop lands, and numerous rural subdivisions.

## Field Data

Fawn production, as measured by the observed fawn:doe ratios, has exceeded 60 fawns per 100 does only once in the past 10 years, suggesting this herd is not likely to grow quickly, even with limited harvest. In 2013 we classified 212 pronghorn, only $27 \%$ of the desired sample size ( $\mathrm{n}=792$ ) at the $90 \%$ confidence level. We observed a ratio of 50 fawns: 100 does, below the level of production considered sufficient to maintain a population. While we have continued to increase harvest in this herd unit, the population appears to have at least remained steady and distribution continues to expand. This suggests the low observed doe:fawn ratio may not limit population growth as additional range is occupied.

We observed 51 bucks: 100 does in 2013. The observed buck to doe ratio can be highly variable between years in this herd unit, likely due to bias associated with small sample sizes. We have sufficient bucks to maintain adequate breeding of females as well as provide the current level of harvest in this herd unit.

Hunter satisfaction has remained high, with $92 \%$ of surveyed hunters ( $\mathrm{n}=60$ ) satisfied or very satisfied. The high hunter satisfaction level likely reflects Department personnel efforts to advise perspective hunters of the limited access opportunities and the need to make arrangements for access prior to purchasing a license.

## Harvest Data

Since 2006, we have issued 600 licenses; 300 Type 1 (any antelope) and 300 Type 6 (doe or fawn). We had not sold all allocated licenses in this herd unit since 2005, until the 2013 season. In 2013, we sold 300 Type 1 licenses ( $100 \%$ ) and 237 Type 6 licenses ( $79 \%$ ). This is the most licenses ever sold in this herd unit.

Harvest increased $12 \%$ in 2013 compared to 2012 and $66 \%$ compared to 2011, to an estimated 352 pronghorn, the highest harvest ever recorded in this herd unit. Hunters average about $87 \%$ success over the past 10 years, similar to $86 \%$ success in 2013. License success follows a similar trend ( 10 year mean $=74 \% ; 2013=78 \%$ ). Hunter effort, as measured by the number of days hunted per animal harvested, was 4.0 days/animal, below the 10 year average of 4.6 days/animal. These data suggest a relatively stable population. Success and effort are similar to the statewide average.

## Population

The 2013 post-season population estimate is well above the established management objective, at about 1,500 pronghorn, with the population likely relatively stable. This management objective is unrealistic and needs to be revised during the next herd unit review. Due to this herd's small size, both in population size and geographically, we have never flown a line transect
survey. A trend count was last conducted in May 1999, when 382 pronghorn were counted and resulted in an estimated 1,500 pronghorn ( $25 \%$ sightability estimated).

The "Constant Juvenile - Constant Adult Survival Rate" (CJ,CA) spreadsheet simulation model was chosen to estimate the post-season population for this herd. This model had the lowest relative Akaike information criterion (AIC) value (75) and the best fit of the three possible models. Since we have limited management data, small survey sample size, and no independent population estimate for this herd unit, we consider this a "poor" population model.

Landowners, hunters and WGFD field personnel have not seen any significant increase or decrease in this herd unit in recent years. Landowners who responded $(\mathrm{n}=29)$ to an annual survey indicated pronghorn populations where at (41\%) or above (55\%) desired levels, similar to others years; and suggested similar (48\%) or more liberal (52\%) hunting season strategies as in recent years.

## Management Summary

The regular hunting season in this herd unit traditionally runs 10 weeks (September 15 November 30) for both Type 1 and Type 6 licenses, with an archery pre-season August 15 September 14. Hunters in this herd unit are able to purchase two Type 1 (any antelope) licenses and four Type 6 (doe or fawn antelope) licenses, which allows hunters the opportunity to harvest multiple animals. There is limited pronghorn hunting on scattered State Trust Lands, as well as three Walk-In Areas and one Hunter Management Area. We commonly observe high buck numbers, as measured by buck:doe ratios, averaging 43 bucks: 100 does over the long-term ( $\mathrm{n}=28$ years). This is likely a function of limited access to private lands where the majority of pronghorn occur.

We project a harvest of approximately 335 pronghorn in 2013, resulting in an estimated postseason population of about 1,200 pronghorn. These predictions assume near normal fawn production and survival, as well as similar license sales and success rates for the 2013 hunting season. Due to limited access, we will likely not reach the management objective for this herd unit with hunting alone. The management objective will be reviewed, and this herd should be considered for the alternative management objective of landowner and hunter satisfaction.



FIGURES


[^1]

PH355 - Beckton<br>HA 109<br>Revised - 4/87


[^0]:    del Est
    $\qquad$
    
    

[^1]:    Comments: In 1996, only total male pronghorn observed was recorded. I averaged the proportion of yearling vs. adult males for 3 years prior (1993-1995) and 2 years post (1997-98) for values.
    Classification data were not available for 2005 and 2011. 5 -year averages were used. Trend data was adjusted by $80 \%$ in 1994 and $85 \%$ in 1996 based on hours flown ( 3.5 hrs in 1994 and 3.0 hrs in 1996 ).

