

TABLE OF CONTENTS

| SPECIES | HERD UNIT | PAGE |
|--------------------------|---|-------------|
| <u>PRONGHORN</u> | | |
| | Clearmont (PR308) - Area 15..... | 1 |
| | Pumpkin Butte (PR309) - Area 23..... | 13 |
| | Highlight (PR316) - Area 24..... | 27 |
| | Crazy Woman (PR318) - Area 22 & 113..... | 39 |
| | North Black Hills (PR339) - Areas 1, 2, 3, 18 & 19..... | 51 |
| | Gillette (PR351) - Area 17..... | 65 |
| | Middle Fork (PR352) - Area 21..... | 81 |
| | Ucross (PR353) - Areas 10 & 16..... | 95 |
| | Buffalo (PR354) - Areas 20 & 102..... | 109 |
| | Beckton (PR355) - Area 109..... | 123 |
| <u>MULE DEER</u> | | |
| | Powder River (MD319) - Areas 17, 18, 23, & 26..... | 135 |
| | Pumpkin Buttes (MD320) - Areas 19, 20, 29, & 31..... | 149 |
| | North Bighorn (MD321) - Areas 24, 25, 27, 28, 50, 51, 52 & 53 | 161 |
| | Upper Powder River (MD322) - Areas 30, 32, 33, 163 & 169..... | 175 |
| <u>WHITE TAILED DEER</u> | | |
| | Powder River (WT303) - Areas 17 - 20, 23 - 33, 163 & 169..... | 187 |

| SPECIES | HERD UNIT | PAGE |
|---------|-----------|------|
|---------|-----------|------|

ELK

| | |
|---|-----|
| Fortification (EL320) - Area 2..... | 201 |
| North Bighorn (EL321) - Areas 35, 36, 37, 38, 39 & 40..... | 213 |
| South Bighorn (EL322) - Areas 33, 34, 47, 48, 49 & 120..... | 225 |
| Rochelle Hills (EL344) - Areas 113 & 123 | 239 |

MOOSE

| | |
|---|-----|
| Bighorn Moose (MO313) - Areas 1, 34, 42 & 43..... | 247 |
|---|-----|

APPENDICES

| | | |
|------------|---|-----|
| APPENDIX A | Landowner Survey-Sheridan Biologist District..... | 259 |
| APPENDIX B | Landowner Survey-Gillette Biologist District..... | 265 |
| APPENDIX C | Landowner Survey-Buffalo/Kaycee Biologist District..... | 275 |
| APPENDIX D | Shurb Monitoring Report | 287 |
| APPENDIX E | Campbell County Hunter Assistance Service..... | 301 |
| APPENDIX F | Herd Unit & Hunt Area Maps..... | 307 |

2013 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR308 - CLEARMONT

HUNT AREAS: 15

PREPARED BY: TIM THOMAS

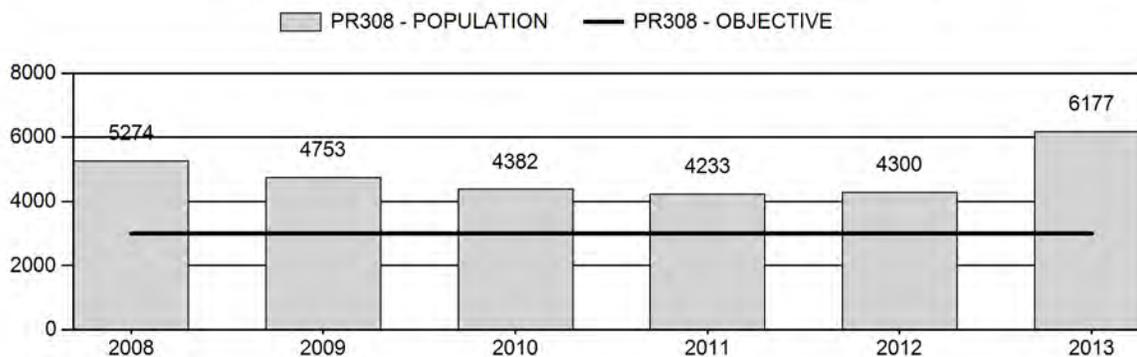
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 4,588 | 6,177 | 6,083 |
| Harvest: | 533 | 556 | 540 |
| Hunters: | 597 | 596 | 600 |
| Hunter Success: | 89% | 93% | 90% |
| Active Licenses: | 674 | 633 | 650 |
| Active License Percent: | 79% | 88% | 83% |
| Recreation Days: | 2,144 | 1,862 | 1,850 |
| Days Per Animal: | 4.0 | 3.3 | 3.4 |
| Males per 100 Females | 51 | 47 | |
| Juveniles per 100 Females | 57 | 65 | |

| | |
|---|--------------|
| Population Objective: | 3,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 106% |
| Number of years population has been + or - objective in recent trend: | 20 |
| Model Date: | 2/26/2014 |

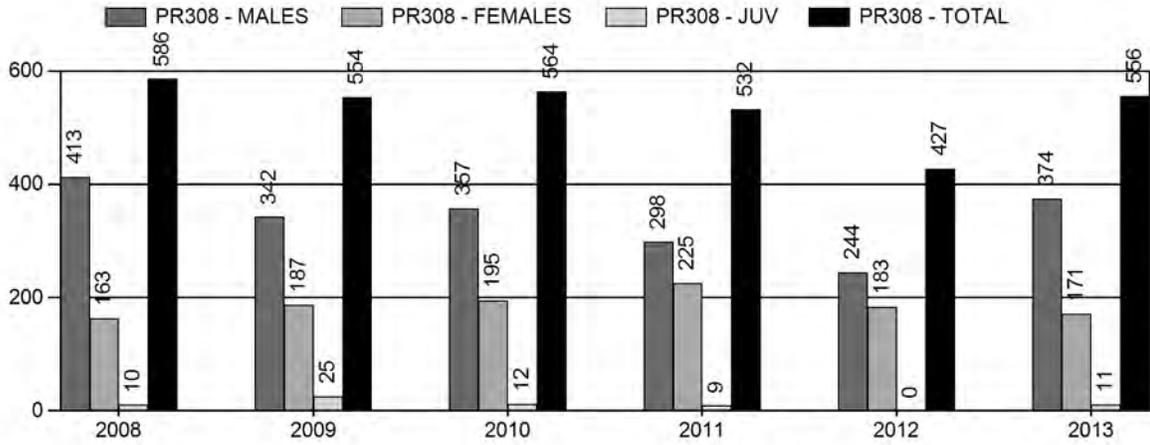
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 6% | 6% |
| Males ≥ 1 year old: | 25% | 23% |
| Juveniles (< 1 year old): | 1% | 1% |
| Total: | 9% | 8% |
| Proposed change in post-season population: | -2% | -1% |

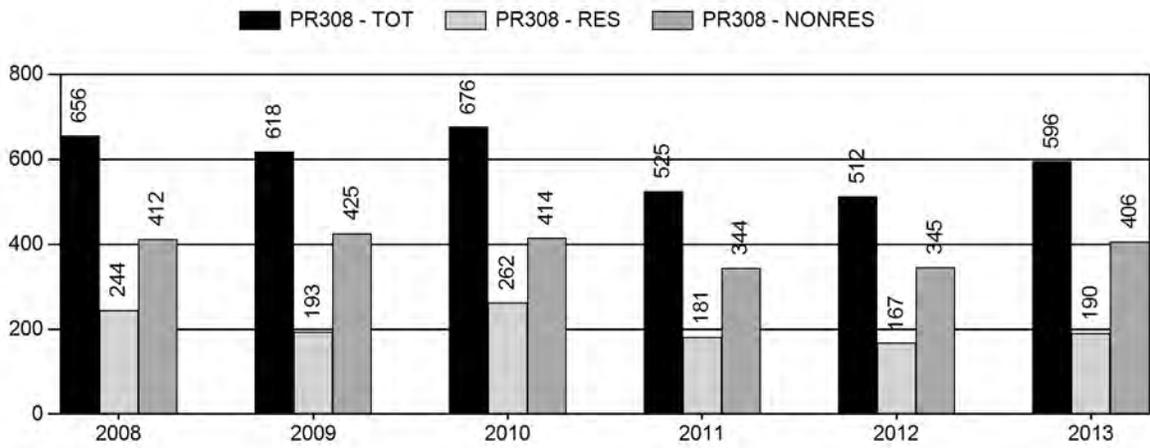
Population Size - Postseason



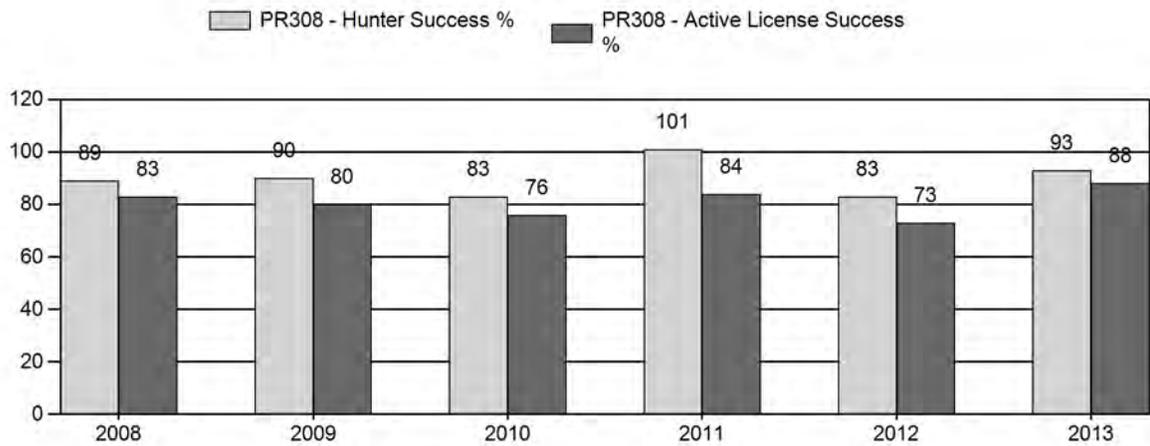
Harvest



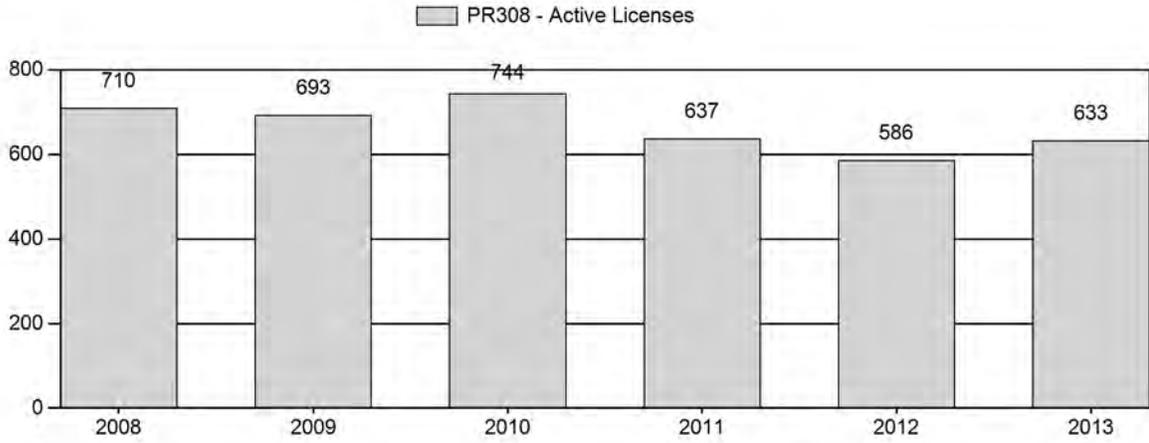
Number of Hunters



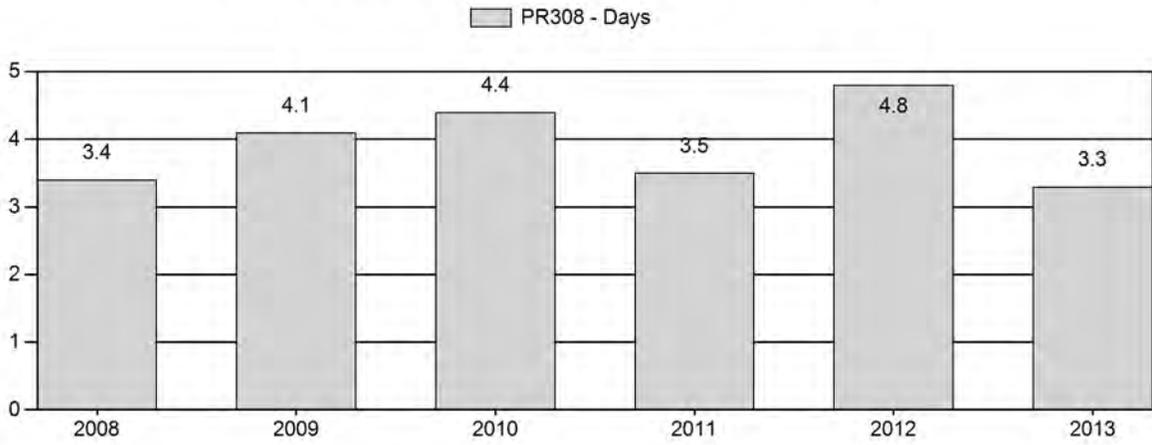
Harvest Success



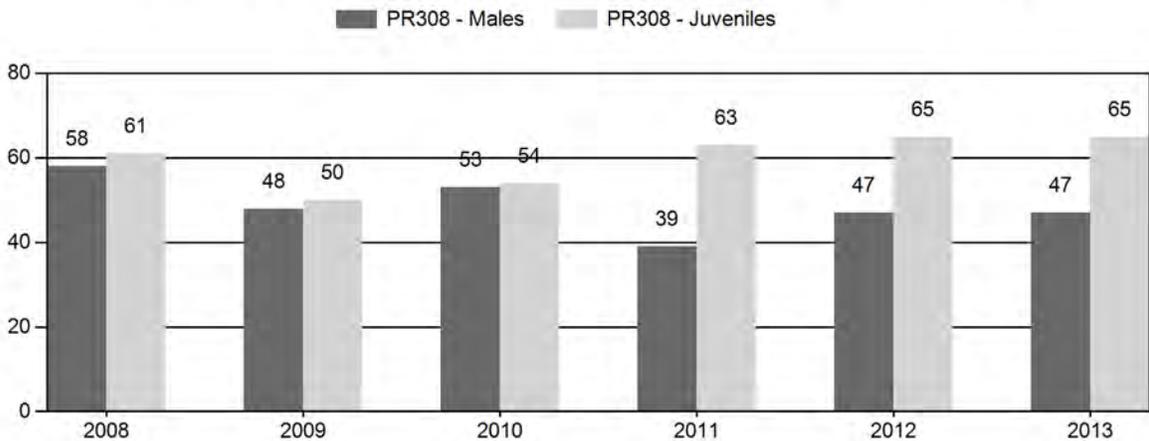
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR308 - CLEARMONT

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

**2014 HUNTING SEASONS
CLEARMONT PRONGHORN HERD (PR308)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|------------------------------------|--------------------------------------|
| | | Opens | Closes | | |
| 15 | 1 | Oct. 1 | Oct. 14 | 500 | Limited quota licenses; any antelope |
| | 6 | Oct. 1 | Oct. 31 | 400 | 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 |
|------------------------|----------|------------------------|
| 15 | 1 | - 300 |
| | 6 | - 400 |
| Herd Unit Total | 1 | - 300 |
| | 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 ~30° 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 (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 (n=22) who returned an annual survey, 41% (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 pre-season 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 post-season 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.

| | |
|------------------|---|
| INPUT | |
| Species: | Pronghorn Timothy P. Thomas Clearmont PR308 |
| Herd Unit & No.: | 02/26/13 |
| Model date: | |

| MODELS SUMMARY | | | Notes |
|----------------|---|-----|--|
| | Relative AICc | Fit | |
| CJ,CA | Constant Juvenile & Adult Survival | 61 | <input type="checkbox"/> Clear form Check best model to create report <input checked="" type="checkbox"/> CJ,CA Model <input type="checkbox"/> SCJ,SCA Mod <input type="checkbox"/> TSJ,CA Model |
| SCJ,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 54 | |
| TSJ,CA | Time-Specific Juvenile & Constant Adult Survival | 33 | |

| Year | Predicted Prehunt Population (year /) | | Predicted Posthunt Population (year /) | | Predicted adult End-of-bio-year Pop (year /) | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------|--|-------|--|---------|------------------------|----------|-------------|-----------|
| | Juveniles | Total | Juveniles | Total | Total Males | Females | Field Est | Field SE | | |
| 1993 | 1405 | 1265 | 1359 | 746 | 988 | 3005 | 4382 | 1229 | | 3000 |
| 1994 | 1700 | 969 | 1660 | 503 | 867 | 2734 | 3600 | | | 3000 |
| 1995 | 1738 | 849 | 1659 | 550 | 920 | 2527 | 3447 | 1143 | | 3000 |
| 1996 | 1431 | 902 | 1431 | 519 | 833 | 2609 | 3442 | 751 | | 3000 |
| 1997 | 910 | 817 | 910 | 519 | 692 | 2514 | 3206 | 483 | | 3000 |
| 1998 | 1722 | 678 | 1722 | 443 | 868 | 2686 | 3554 | | | 3000 |
| 1999 | 1706 | 851 | 1706 | 683 | 1087 | 2833 | 3920 | 822 | | 3000 |
| 2000 | 1835 | 1066 | 1835 | 886 | 1305 | 2998 | 4303 | | | 3000 |
| 2001 | 1593 | 1279 | 1587 | 1089 | 1412 | 3079 | 4490 | 762 | | 3000 |
| 2002 | 2011 | 1384 | 2011 | 1188 | 1625 | 3270 | 4894 | 712 | | 3000 |
| 2003 | 1785 | 1592 | 1785 | 1352 | 1701 | 3365 | 5066 | | | 3000 |
| 2004 | 2249 | 1667 | 2249 | 1363 | 1838 | 3601 | 5438 | 898 | | 3000 |
| 2005 | 2426 | 1801 | 2406 | 1452 | 1953 | 3650 | 5603 | | | 3000 |
| 2006 | 2469 | 1914 | 2441 | 1527 | 2023 | 3570 | 5593 | | | 3000 |
| 2007 | 2160 | 1983 | 2121 | 1533 | 1926 | 3480 | 5406 | | | 3000 |
| 2008 | 2088 | 1887 | 2077 | 1433 | 1829 | 3475 | 5304 | | | 3000 |
| 2009 | 1689 | 1792 | 1661 | 1416 | 1699 | 3319 | 5018 | | | 3000 |
| 2010 | 1747 | 1665 | 1734 | 1272 | 1593 | 3198 | 4791 | | | 3000 |
| 2011 | 1986 | 1561 | 1976 | 1233 | 1702 | 3181 | 4883 | | | 3000 |
| 2012 | 2024 | 1668 | 2024 | 1399 | 1663 | 3190 | 4853 | | | 3000 |
| 2013 | 2032 | 1630 | 2020 | 1218 | 1658 | 3191 | 4849 | 832 | | 3000 |
| 2014 | 1924 | 1625 | 1913 | 1240 | 1658 | 3191 | 4849 | | | 3000 |
| 2015 | | | | | | | | | | |
| 2016 | | | | | | | | | | |
| 2017 | | | | | | | | | | |
| 2018 | | | | | | | | | | |
| 2019 | | | | | | | | | | |
| 2020 | | | | | | | | | | |
| 2021 | | | | | | | | | | |
| 2022 | | | | | | | | | | |
| 2023 | | | | | | | | | | |
| 2024 | | | | | | | | | | |
| 2025 | | | | | | | | | | |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.57 | | 0.88 | |
| 1994 | 0.57 | | 0.88 | |
| 1995 | 0.57 | | 0.88 | |
| 1996 | 0.57 | | 0.88 | |
| 1997 | 0.57 | | 0.88 | |
| 1998 | 0.57 | | 0.88 | |
| 1999 | 0.57 | | 0.88 | |
| 2000 | 0.57 | | 0.88 | |
| 2001 | 0.57 | | 0.88 | |
| 2002 | 0.57 | | 0.88 | |
| 2003 | 0.57 | | 0.88 | |
| 2004 | 0.57 | | 0.88 | |
| 2005 | 0.57 | | 0.88 | |
| 2006 | 0.57 | | 0.88 | |
| 2007 | 0.57 | | 0.88 | |
| 2008 | 0.57 | | 0.88 | |
| 2009 | 0.57 | | 0.88 | |
| 2010 | 0.57 | | 0.88 | |
| 2011 | 0.57 | | 0.88 | |
| 2012 | 0.57 | | 0.88 | |
| 2013 | 0.57 | | 0.88 | |
| 2014 | 0.57 | | 0.88 | |
| 2015 | 0.57 | | 0.88 | |
| 2016 | 0.57 | | 0.88 | |
| 2017 | 0.57 | | 0.88 | |
| 2018 | 0.57 | | 0.88 | |
| 2019 | 0.57 | | 0.88 | |
| 2020 | 0.57 | | 0.88 | |
| 2021 | 0.57 | | 0.88 | |
| 2022 | 0.57 | | 0.88 | |
| 2023 | 0.57 | | 0.88 | |
| 2024 | 0.57 | | 0.88 | |
| 2025 | 0.57 | | 0.88 | |

Parameters:

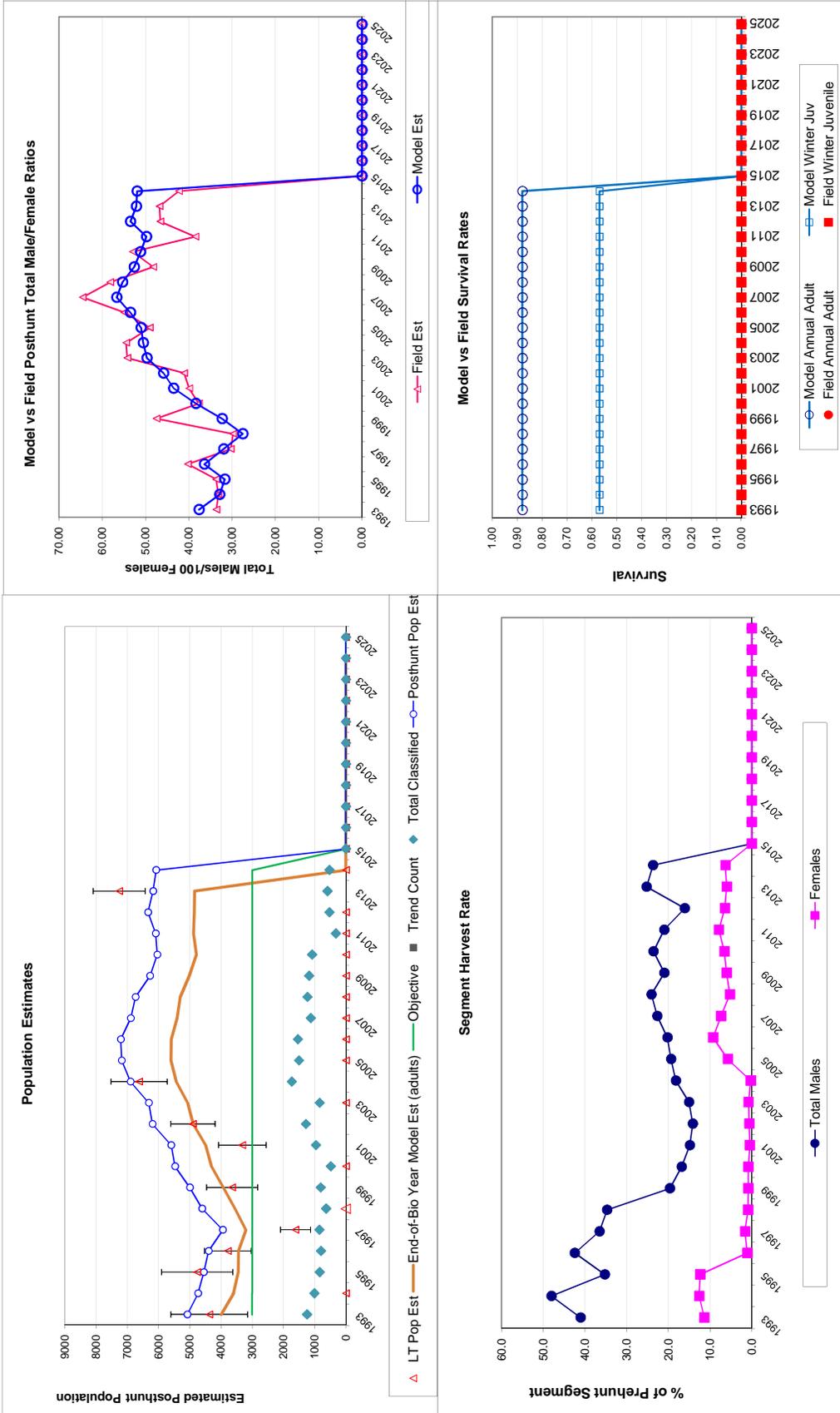
| | |
|---------------------------------|-------|
| Juvenile Survival = | 0.569 |
| Adult Survival = | 0.879 |
| Initial Total Male Pop/10,000 = | 0.126 |
| Initial Female Pop/10,000 = | 0.336 |

MODEL ASSUMPTIONS

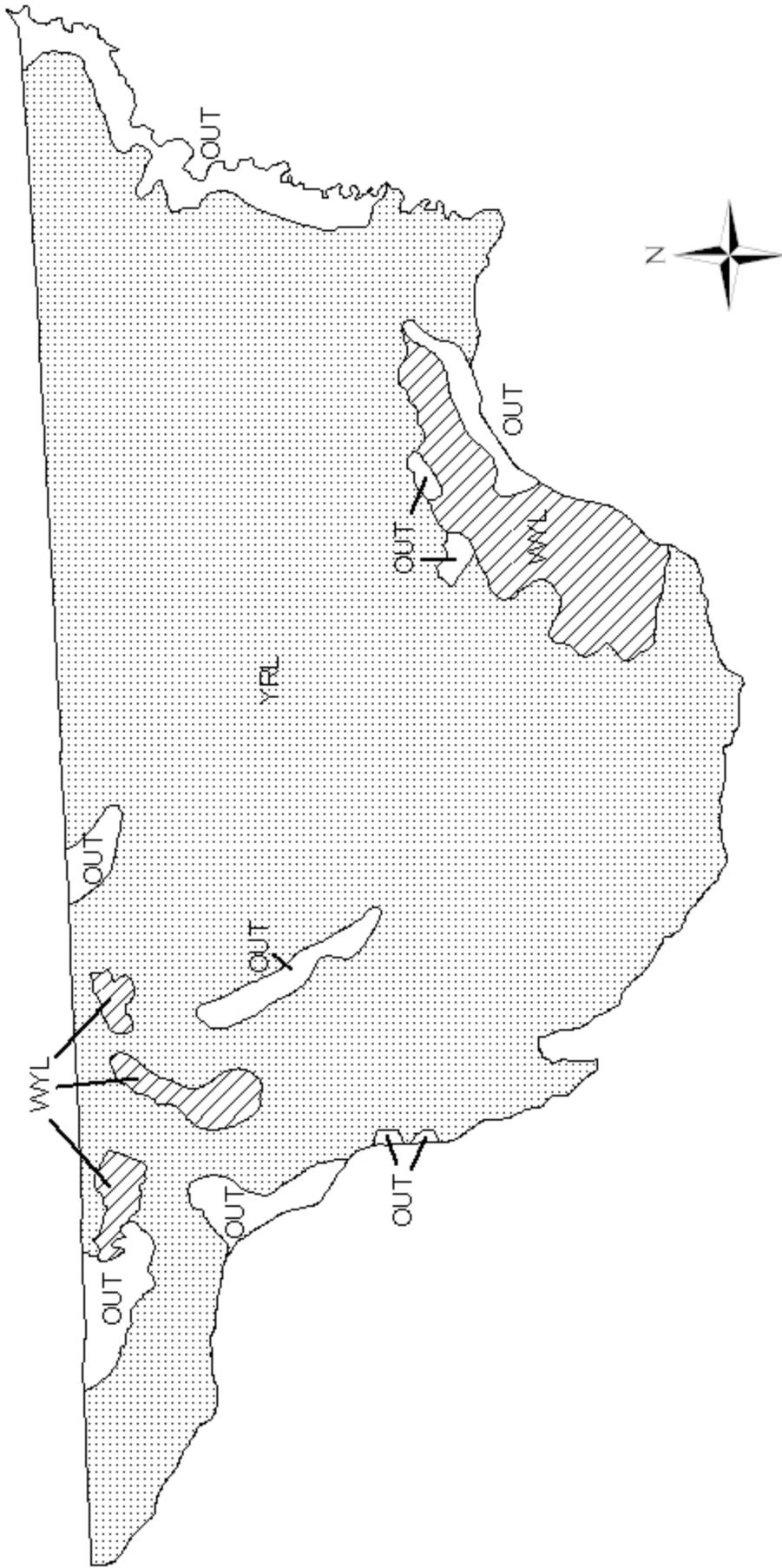
| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | | | | | | | Harvest | | |
|------|-----------------------|-----------|----------|-------------|-----------|-------------------------|-------|---------|-----|---------------|----------------------------|---------|--|
| | Juvenile/Female Ratio | | | | | Total Male/Female Ratio | | | | | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juv | Total Harvest | Total Males | Females | |
| 1993 | | 41.83 | 2.89 | 37.65 | 33.66 | 2.52 | 472 | 348 | 42 | 862 | 41.1 | 11.4 | |
| 1994 | | 57.74 | 4.15 | 32.89 | 33.21 | 2.89 | 423 | 338 | 37 | 798 | 48.0 | 12.6 | |
| 1995 | | 64.86 | 5.02 | 31.70 | 33.73 | 3.26 | 272 | 302 | 72 | 646 | 35.2 | 12.4 | |
| 1996 | | 57.78 | 4.74 | 36.41 | 40.25 | 3.73 | 348 | 24 | 0 | 372 | 42.4 | 1.1 | |
| 1997 | | 35.60 | 3.06 | 31.94 | 30.35 | 2.77 | 271 | 38 | 0 | 309 | 36.5 | 1.6 | |
| 1998 | | 69.91 | 6.10 | 27.54 | 29.78 | 3.48 | 214 | 20 | 0 | 234 | 34.7 | 0.9 | |
| 1999 | | 64.83 | 5.30 | 32.31 | 47.51 | 4.29 | 152 | 20 | 0 | 172 | 19.7 | 0.8 | |
| 2000 | | 66.11 | 6.78 | 38.39 | 37.66 | 4.66 | 163 | 21 | 0 | 184 | 16.8 | 0.8 | |
| 2001 | | 54.23 | 4.11 | 43.54 | 39.92 | 3.36 | 173 | 13 | 6 | 192 | 14.9 | 0.5 | |
| 2002 | | 66.67 | 4.24 | 45.86 | 41.10 | 3.06 | 178 | 17 | 0 | 195 | 14.2 | 0.6 | |
| 2003 | | 55.72 | 4.65 | 49.69 | 54.23 | 4.56 | 218 | 23 | 0 | 241 | 15.1 | 0.8 | |
| 2004 | | 68.21 | 3.84 | 50.55 | 54.49 | 3.29 | 276 | 8 | 0 | 284 | 18.2 | 0.3 | |
| 2005 | | 68.74 | 4.10 | 51.04 | 49.06 | 3.25 | 317 | 185 | 18 | 520 | 19.4 | 5.8 | |
| 2006 | | 69.04 | 4.12 | 53.51 | 54.94 | 3.52 | 352 | 302 | 26 | 680 | 20.2 | 9.3 | |
| 2007 | | 61.72 | 4.47 | 56.67 | 64.53 | 4.61 | 409 | 235 | 35 | 679 | 22.7 | 7.4 | |
| 2008 | | 61.21 | 4.19 | 55.33 | 58.19 | 4.05 | 413 | 163 | 10 | 586 | 24.1 | 5.3 | |
| 2009 | | 49.58 | 3.52 | 52.63 | 48.24 | 3.46 | 342 | 187 | 25 | 554 | 21.0 | 6.0 | |
| 2010 | | 53.71 | 3.97 | 51.19 | 52.95 | 3.93 | 357 | 195 | 12 | 564 | 23.6 | 6.6 | |
| 2011 | | 63.35 | 8.02 | 49.80 | 38.51 | 5.76 | 298 | 225 | 9 | 532 | 21.0 | 7.9 | |
| 2012 | | 64.94 | 6.53 | 53.50 | 46.61 | 5.22 | 244 | 183 | 0 | 427 | 16.1 | 6.5 | |
| 2013 | | 65.00 | 6.19 | 52.13 | 46.79 | 4.95 | 374 | 171 | 11 | 556 | 25.2 | 6.0 | |
| 2014 | | 61.54 | 6.18 | 51.97 | 42.31 | 4.81 | 350 | 180 | 10 | 540 | 23.7 | 6.3 | |
| 2015 | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | |

FIGURES



Comments: In 1996, 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

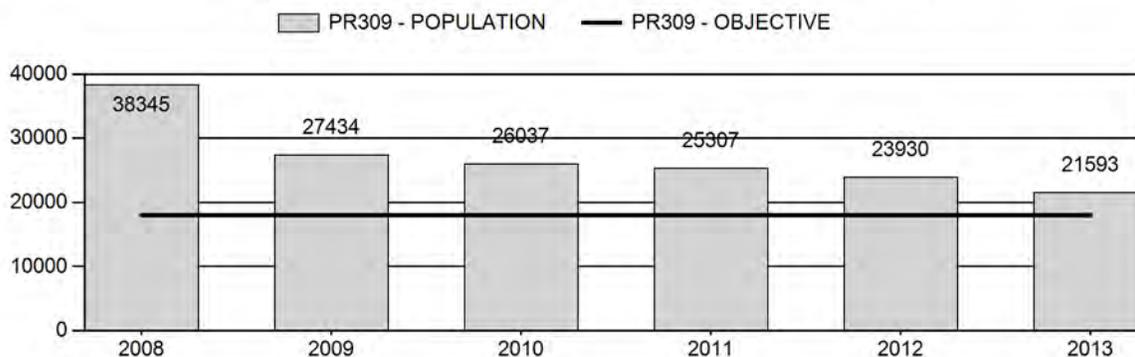
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 28,211 | 21,593 | 19,706 |
| Harvest: | 2,469 | 2,464 | 2,470 |
| Hunters: | 2,653 | 2,524 | 2,500 |
| Hunter Success: | 93% | 98% | 99% |
| Active Licenses: | 2,734 | 2,685 | 2,650 |
| Active License Percent: | 90% | 92% | 93% |
| Recreation Days: | 7,944 | 9,287 | 9,250 |
| Days Per Animal: | 3.2 | 3.8 | 3.7 |
| Males per 100 Females | 60 | 44 | |
| Juveniles per 100 Females | 70 | 62 | |

| | |
|---|--------------|
| Population Objective: | 18,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 20% |
| Number of years population has been + or - objective in recent trend: | 7 |
| Model Date: | 03/05/2014 |

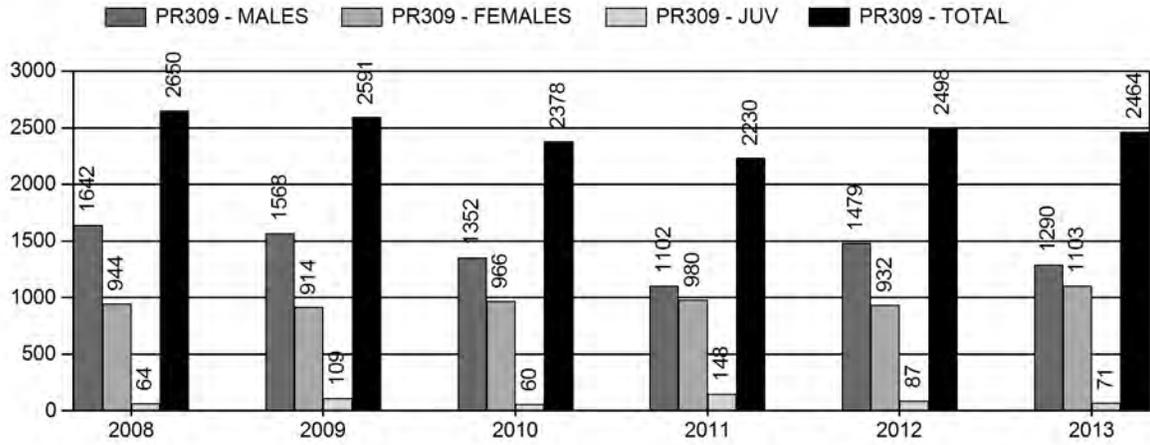
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | | 11.9% |
| Males ≥ 1 year old: | 16.8% | 25.0% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 6.6% | 11% |
| Proposed change in post-season population: | -1.8% | -8.7% |

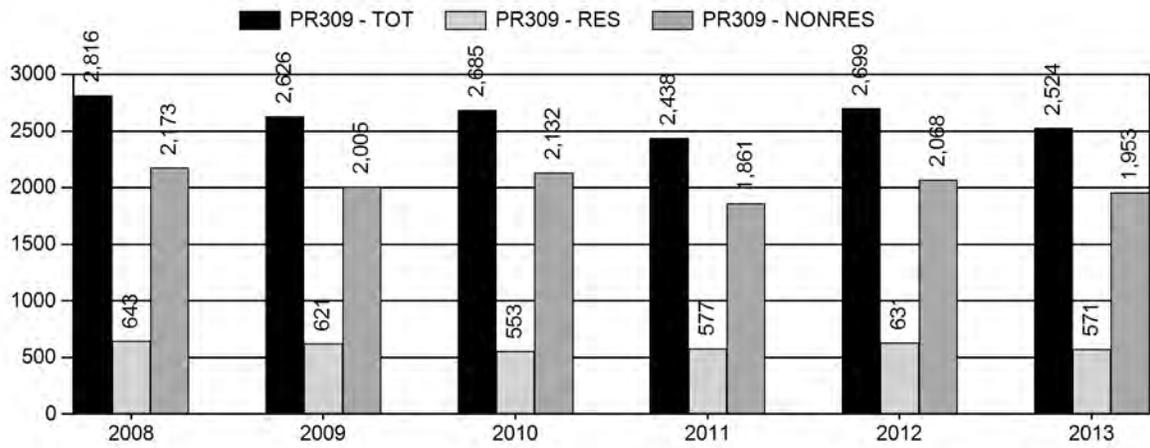
Population Size - Postseason



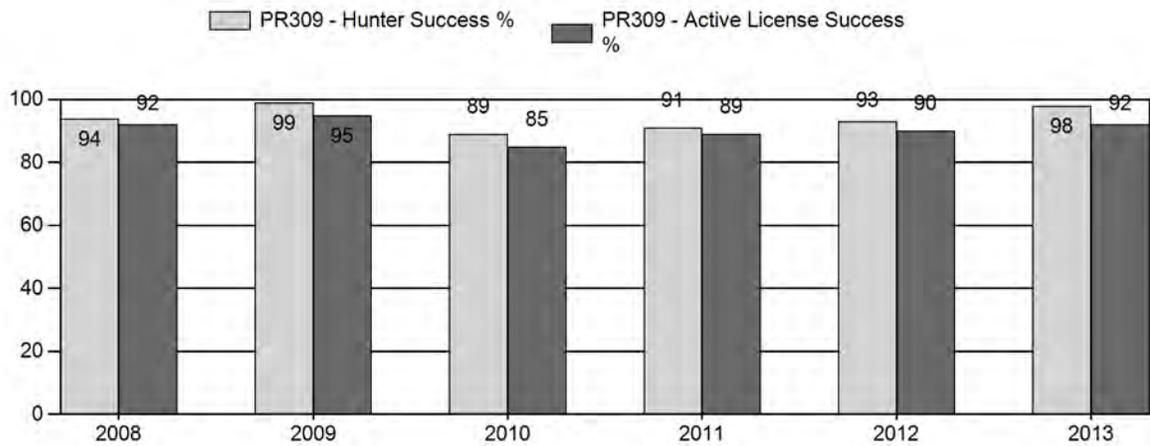
Harvest



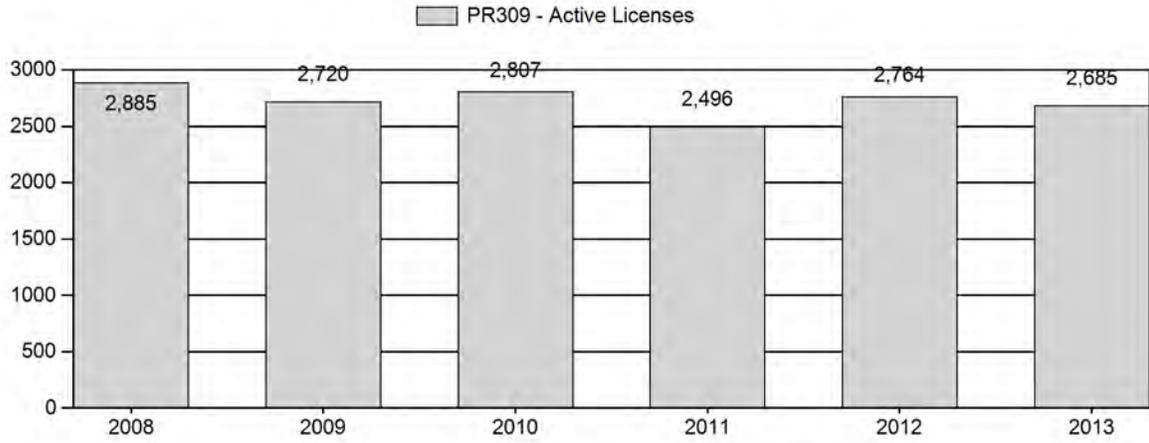
Number of Hunters



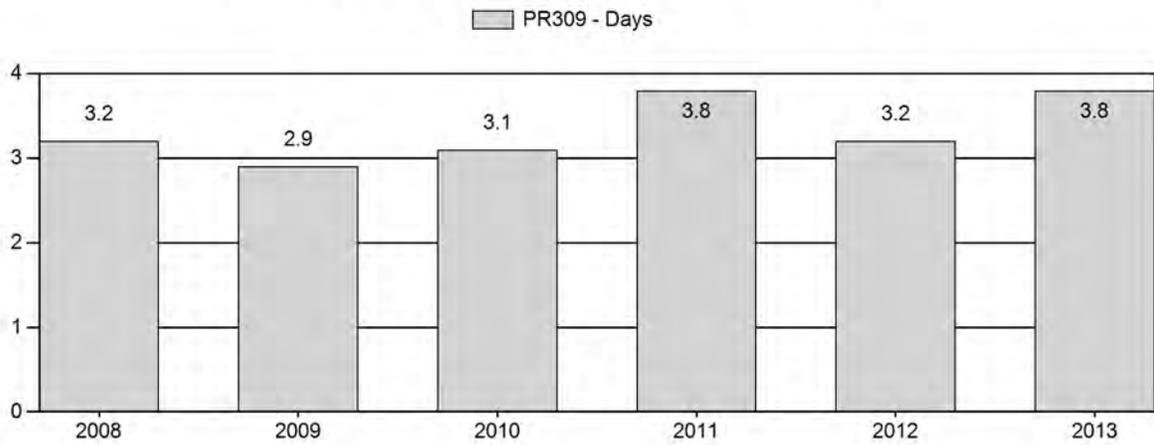
Harvest Success



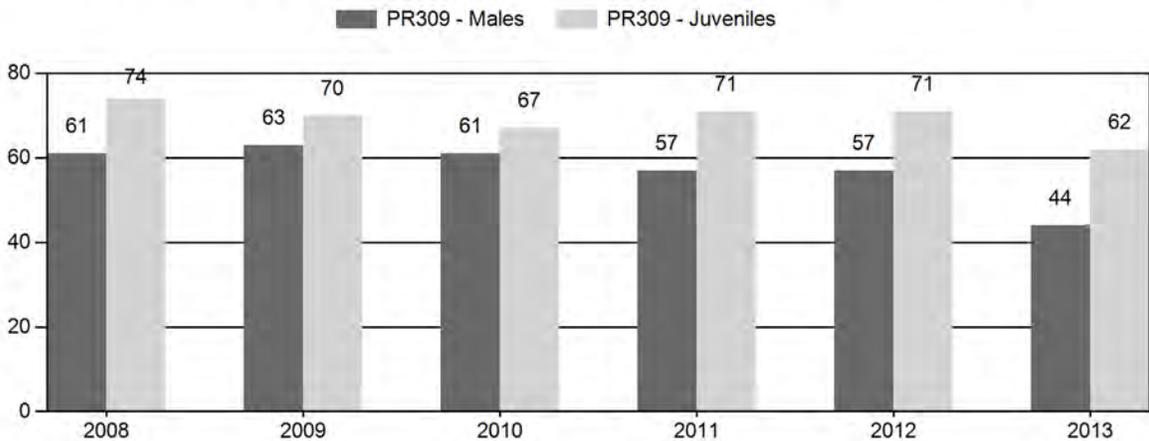
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR309 - PUMPKIN BUTTES

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

**2014 HUNTING SEASONS
PUMPKIN BUTTES PRONGHORN HERD (PR309)**

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

Management Evaluation

Current Postseason Population Management Objective: 18,000

Management Strategy: Recreational

2013 Postseason Population Estimate: ~21,600

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 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. 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 14mm.

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.

INPUT
 Species: Pronghorn
 Biologist: Erika Peckham
 Herd Unit & No.: PR309-PumpkinButtes
 Model date: 02/21/14

Clear form

| MODELS SUMMARY | | | Notes |
|----------------|---------------|-----|--|
| | Relative AICc | Fit | |
| CJ,CA | 151 | 142 | <input checked="" type="checkbox"/> C,J,CA Model <input type="checkbox"/> SCJ,SCA M. <input type="checkbox"/> TSJ,CA Model |
| SCJ,SCA | 173 | 164 | |
| TSJ,CA | 175 | 60 | |

Check best model to create report

| Year | Predicted Prehunt Population (year t) | | | Predicted Posthunt Population (year t) | | | Population Estimates from Top Model | | | Predicted adult End-of-bio-year Pop (year t) | | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------------|---------|--|-----------|-------------|-------------------------------------|-------|-------------|--|--------------|-----------|------------------------|--|-------------|-----------|
| | Juveniles | Total Males | Females | Total | Juveniles | Total Males | Females | Total | Total Males | Females | Total Adults | Field Est | Field SE | | | |
| 1993 | 8143 | 6780 | 12691 | 27613 | 7826 | 4712 | 11149 | 23686 | 5811 | 11587 | 17398 | | | | 18000 | |
| 1994 | 11176 | 5695 | 11355 | 28227 | 10802 | 3293 | 9153 | 23248 | 5253 | 10473 | 15726 | | | | 18000 | |
| 1995 | 8371 | 5148 | 10264 | 23783 | 8029 | 3455 | 8716 | 20200 | 4793 | 9475 | 14269 | | | | 18000 | |
| 1996 | 8056 | 4698 | 9286 | 22040 | 7942 | 3538 | 8521 | 20001 | 4975 | 9444 | 14419 | | | | 18000 | |
| 1997 | 7260 | 4875 | 9255 | 21390 | 7234 | 3716 | 8860 | 19809 | 4974 | 9636 | 14610 | | | | 18000 | |
| 1998 | 8311 | 4874 | 9443 | 22628 | 8306 | 3767 | 9392 | 21466 | 5305 | 10433 | 15738 | | | | 18000 | |
| 1999 | 8256 | 5199 | 10224 | 23679 | 8243 | 4120 | 10160 | 22523 | 5603 | 11093 | 16696 | | | | 18000 | |
| 2000 | 9432 | 5491 | 10871 | 25794 | 9404 | 4332 | 10675 | 24411 | 6072 | 11823 | 17896 | | | | 18000 | |
| 2001 | 9136 | 5951 | 11587 | 26674 | 9101 | 4827 | 11353 | 25280 | 6437 | 12340 | 18777 | | | | 18000 | |
| 2002 | 9823 | 6308 | 12093 | 29554 | 11132 | 5026 | 11679 | 27836 | 7113 | 13126 | 20239 | | | | 18000 | |
| 2003 | 10667 | 6971 | 12864 | 29657 | 9792 | 5589 | 12533 | 27914 | 7255 | 13550 | 20805 | | | | 18000 | |
| 2004 | 11805 | 7110 | 13279 | 31056 | 10629 | 5775 | 12769 | 29173 | 7638 | 13947 | 21585 | | | | 18000 | |
| 2005 | 11440 | 7485 | 13668 | 32959 | 11713 | 6130 | 13072 | 30915 | 8211 | 14466 | 22678 | | | | 18000 | |
| 2006 | 9253 | 8047 | 14177 | 33665 | 11404 | 6511 | 13335 | 31250 | 8460 | 14602 | 23063 | | | | 18000 | |
| 2007 | 10139 | 8291 | 14310 | 31854 | 9196 | 6694 | 13353 | 29243 | 8047 | 14034 | 22081 | | | | 18000 | |
| 2008 | 8649 | 7886 | 13754 | 31779 | 10069 | 6080 | 12715 | 28864 | 7693 | 13677 | 21371 | | | | 18000 | |
| 2009 | 8649 | 7540 | 13404 | 30284 | 9221 | 5815 | 12398 | 27434 | 7241 | 13172 | 20413 | | | | 18000 | |
| 2010 | 8682 | 7096 | 12908 | 28653 | 8583 | 5609 | 11846 | 26037 | 6941 | 12526 | 19467 | | 2105 | | 18000 | |
| 2011 | 8430 | 6803 | 12275 | 27760 | 8519 | 5590 | 11197 | 25307 | 6559 | 12088 | 18626 | | | | 18000 | |
| 2012 | 6872 | 6427 | 11826 | 26683 | 8328 | 4778 | 10823 | 23930 | 6396 | 11391 | 17787 | | | | 18000 | |
| 2013 | 6492 | 6268 | 11163 | 24303 | 6794 | 4849 | 9950 | 21593 | 5847 | 10409 | 16256 | | 1544 | | 18000 | |
| 2014 | | | 10201 | 22423 | 6415 | 4300 | 8991 | 19706 | | | | | | | 18000 | |
| 2015 | | | | | | | | | | | | | | | 18000 | |
| 2016 | | | | | | | | | | | | | | | 18000 | |
| 2017 | | | | | | | | | | | | | | | 18000 | |
| 2018 | | | | | | | | | | | | | | | 18000 | |
| 2019 | | | | | | | | | | | | | | | 18000 | |
| 2020 | | | | | | | | | | | | | | | 18000 | |
| 2021 | | | | | | | | | | | | | | | 18000 | |
| 2022 | | | | | | | | | | | | | | | 18000 | |
| 2023 | | | | | | | | | | | | | | | 18000 | |
| 2024 | | | | | | | | | | | | | | | 18000 | |
| 2025 | | | | | | | | | | | | | | | 18000 | |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|------------|-----------------------------|------------|
| | Model Est. | Field Est. | Model Est. | Field Est. |
| 1993 | 0.50 | | 0.87 | |
| 1994 | 0.50 | | 0.87 | |
| 1995 | 0.50 | | 0.87 | |
| 1996 | 0.50 | | 0.87 | |
| 1997 | 0.50 | | 0.87 | |
| 1998 | 0.50 | | 0.87 | |
| 1999 | 0.50 | | 0.87 | |
| 2000 | 0.50 | | 0.87 | |
| 2001 | 0.50 | | 0.87 | |
| 2002 | 0.50 | | 0.87 | |
| 2003 | 0.50 | | 0.87 | |
| 2004 | 0.50 | | 0.87 | |
| 2005 | 0.50 | | 0.87 | |
| 2006 | 0.50 | | 0.87 | |
| 2007 | 0.50 | | 0.87 | |
| 2008 | 0.50 | | 0.87 | |
| 2009 | 0.50 | | 0.87 | |
| 2010 | 0.50 | | 0.87 | |
| 2011 | 0.50 | | 0.87 | |
| 2012 | 0.50 | | 0.87 | |
| 2013 | 0.50 | | 0.87 | |
| 2014 | 0.50 | | 0.87 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

Parameters:

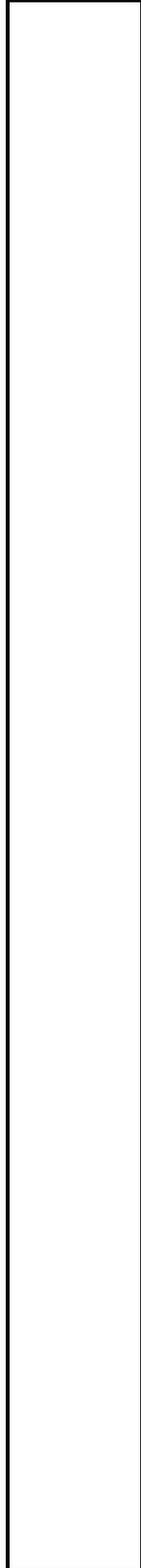
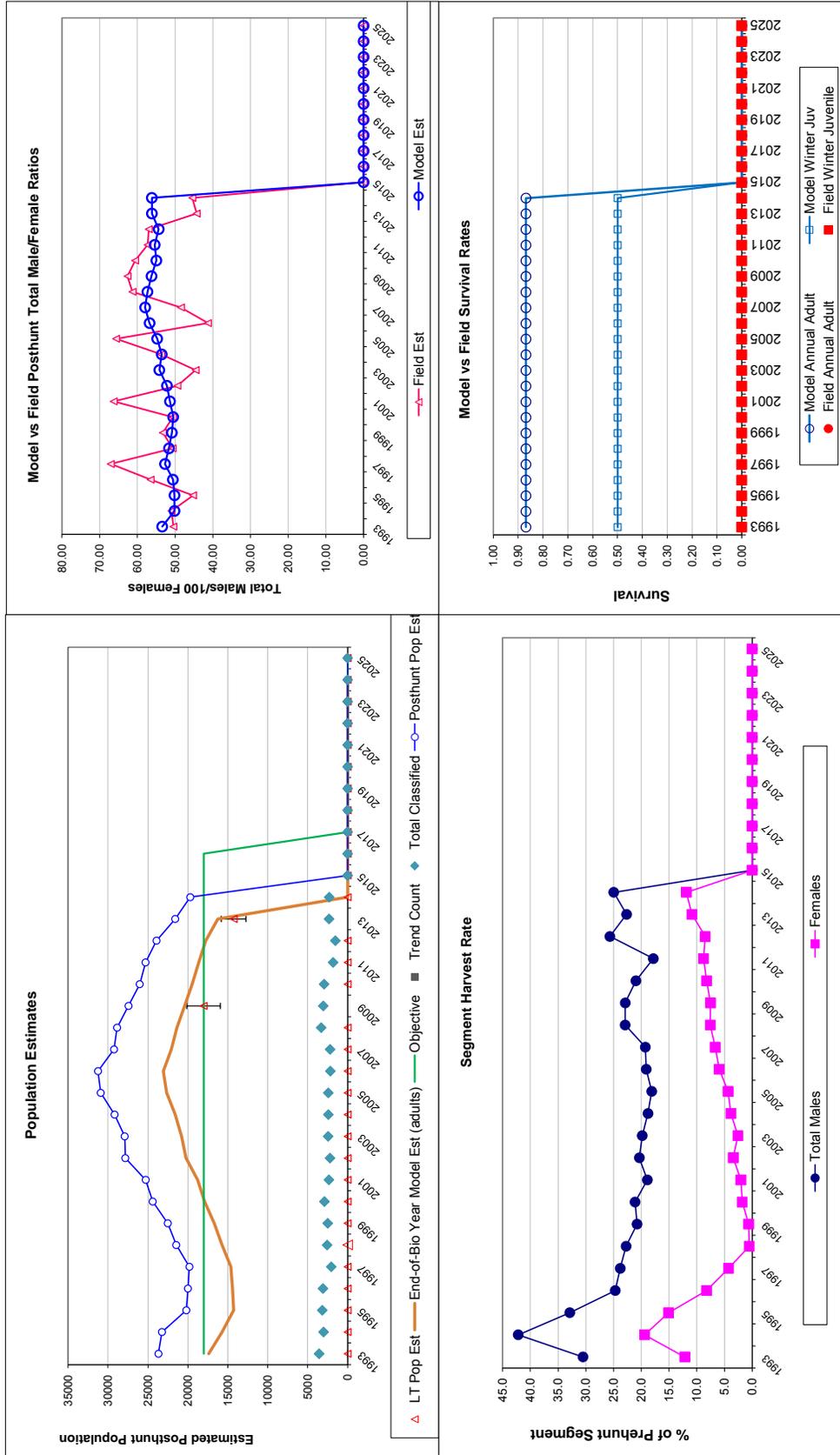
| | |
|---------------------------------|-------|
| Juvenile Survival = | 0.499 |
| Adult Survival = | 0.869 |
| Initial Total Male Pop/10,000 = | 0.678 |
| Initial Female Pop/10,000 = | 1.269 |

MODEL ASSUMPTIONS

| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | Total Male/Female Ratio | | | | Harvest | | | | | | | | | | | | |
|------|-----------------------|-----------|----------|----------|-------------------------|-----------|-----------|----------|----------|---------|-----------|---------------|-------------|---------|-------------|---------|---------------|--|----------------------------|--|--|
| | Juvenile/Female Ratio | | Field SE | | Derived Est | | Field Est | | Field SE | | Males | | Females | | Juvéniles | | Total Harvest | | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Field SE | Derived Est | Field Est | Field Est | Field SE | Males | Females | Juvéniles | Total Harvest | Total Males | Females | Total Males | Females | | | | | |
| 1994 | 64.16 | 2.52 | 53.42 | 2.14 | 50.45 | 1880 | 1402 | 288 | 3570 | 30.5 | 12.2 | | | | | | | | | | |
| 1995 | 98.43 | 4.02 | 50.16 | 2.52 | 50.99 | 2184 | 2002 | 340 | 4526 | 42.2 | 19.4 | | | | | | | | | | |
| 1996 | 81.56 | 3.25 | 50.16 | 2.17 | 45.25 | 1539 | 1407 | 311 | 3257 | 32.9 | 15.1 | | | | | | | | | | |
| 1997 | 86.76 | 3.57 | 50.59 | 2.64 | 56.50 | 1054 | 695 | 104 | 1853 | 24.7 | 8.2 | | | | | | | | | | |
| 1998 | 78.44 | 4.09 | 52.68 | 3.66 | 67.07 | 1054 | 359 | 24 | 1437 | 23.8 | 4.3 | | | | | | | | | | |
| 1999 | 88.01 | 3.92 | 51.62 | 2.66 | 50.65 | 1007 | 46 | 4 | 1057 | 22.7 | 0.5 | | | | | | | | | | |
| 2000 | 80.75 | 3.70 | 50.85 | 2.77 | 53.24 | 981 | 58 | 12 | 1051 | 20.8 | 0.6 | | | | | | | | | | |
| 2001 | 86.76 | 3.64 | 50.51 | 2.49 | 50.57 | 1054 | 178 | 26 | 1258 | 21.1 | 1.8 | | | | | | | | | | |
| 2002 | 78.85 | 3.84 | 51.36 | 3.40 | 66.28 | 1022 | 213 | 32 | 1267 | 18.9 | 2.0 | | | | | | | | | | |
| 2003 | 92.22 | 4.41 | 52.16 | 2.84 | 49.40 | 1166 | 376 | 19 | 1561 | 20.3 | 3.4 | | | | | | | | | | |
| 2004 | 76.36 | 3.49 | 54.19 | 2.42 | 44.57 | 1256 | 301 | 28 | 1585 | 19.8 | 2.6 | | | | | | | | | | |
| 2005 | 80.33 | 3.75 | 53.54 | 2.83 | 53.68 | 1214 | 463 | 34 | 1711 | 18.8 | 3.8 | | | | | | | | | | |
| 2006 | 86.37 | 4.09 | 54.76 | 3.36 | 65.66 | 1232 | 542 | 84 | 1858 | 18.1 | 4.4 | | | | | | | | | | |
| 2007 | 80.70 | 3.87 | 56.76 | 2.45 | 41.27 | 1397 | 765 | 33 | 2195 | 19.1 | 5.9 | | | | | | | | | | |
| 2008 | 64.66 | 3.22 | 57.94 | 2.64 | 48.45 | 1452 | 870 | 52 | 2374 | 19.3 | 6.7 | | | | | | | | | | |
| 2009 | 73.72 | 3.02 | 61.29 | 2.65 | 61.29 | 1642 | 944 | 64 | 2650 | 22.9 | 7.6 | | | | | | | | | | |
| 2010 | 69.69 | 3.00 | 56.25 | 2.78 | 62.60 | 1568 | 914 | 109 | 2591 | 22.9 | 7.5 | | | | | | | | | | |
| 2011 | 67.00 | 2.94 | 54.97 | 2.74 | 60.59 | 1352 | 966 | 60 | 2378 | 21.0 | 8.2 | | | | | | | | | | |
| 2012 | 70.73 | 3.89 | 55.42 | 3.36 | 57.29 | 1102 | 980 | 148 | 2230 | 17.8 | 8.8 | | | | | | | | | | |
| 2013 | 71.28 | 4.26 | 54.35 | 3.65 | 56.99 | 1499 | 912 | 92 | 2503 | 25.7 | 8.5 | | | | | | | | | | |
| 2014 | 61.56 | 2.97 | 56.15 | 2.38 | 44.29 | 1290 | 1103 | 71 | 2464 | 22.6 | 10.9 | | | | | | | | | | |
| 2015 | 63.64 | 3.08 | 56.17 | 2.45 | 45.45 | 1300 | 1100 | 70 | 2470 | 25.0 | 11.9 | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | | | | | | | | |

FIGURES



END

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

```
Effort      : 1071.472
# samples   : 33
Width      : 208.6700
Left       : 0.0000000
# observations: 351
```

```
Model 2
Uniform key, k(y) = 1/W
Cosine adjustments of order(s) : 1
```

| Parameter | Point Estimate | Standard Error | Percent Coef. of Variation | 95% Percent Confidence Interval | |
|-----------|----------------|----------------|----------------------------|---------------------------------|--------|
| DS | 5.7022 | 0.58693 | 10.29 | 4.6249 | 7.0305 |
| E(S) | 1.6347 | 0.54502E-01 | 3.33 | 1.5310 | 1.7455 |
| D | 9.3215 | 1.0085 | 10.82 | 7.4923 | 11.597 |
| N | 14271. | 1544.1 | 10.82 | 11471. | 17755. |

Measurement Units

```
-----
Density: Numbers/Sq. miles
ESW: meters
```

Component Percentages of Var(D)

```
-----
Detection probability : 23.6
Encounter rate       : 66.9
Cluster size         : 9.5
```

Estimation Summary: Encounter Rates

| | Estimate | %CV | df | 95% Confidence Interval | |
|-------|----------|------|-------|-------------------------|---------|
| n | 351.00 | | | | |
| k | 33.000 | | | | |
| L | 1071.5 | | | | |
| n/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 | 0.94174E-01 | | | | |
| E(S) | 1.6347 | 3.33 | 349.00 | 1.5310 | 1.7455 |

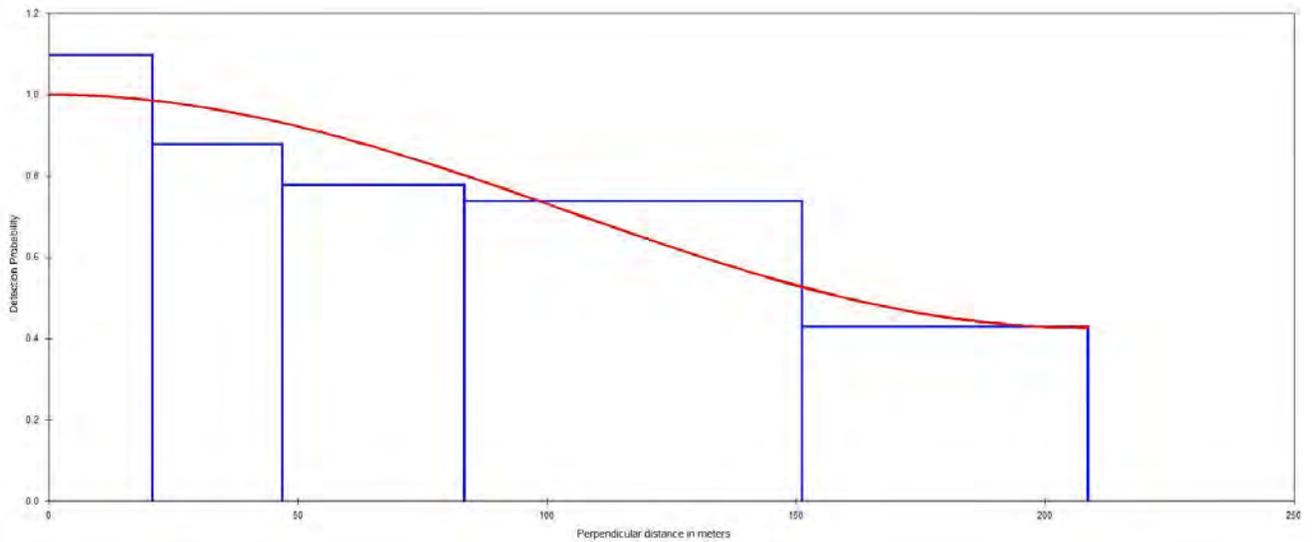
Estimation Summary-Detection Probability

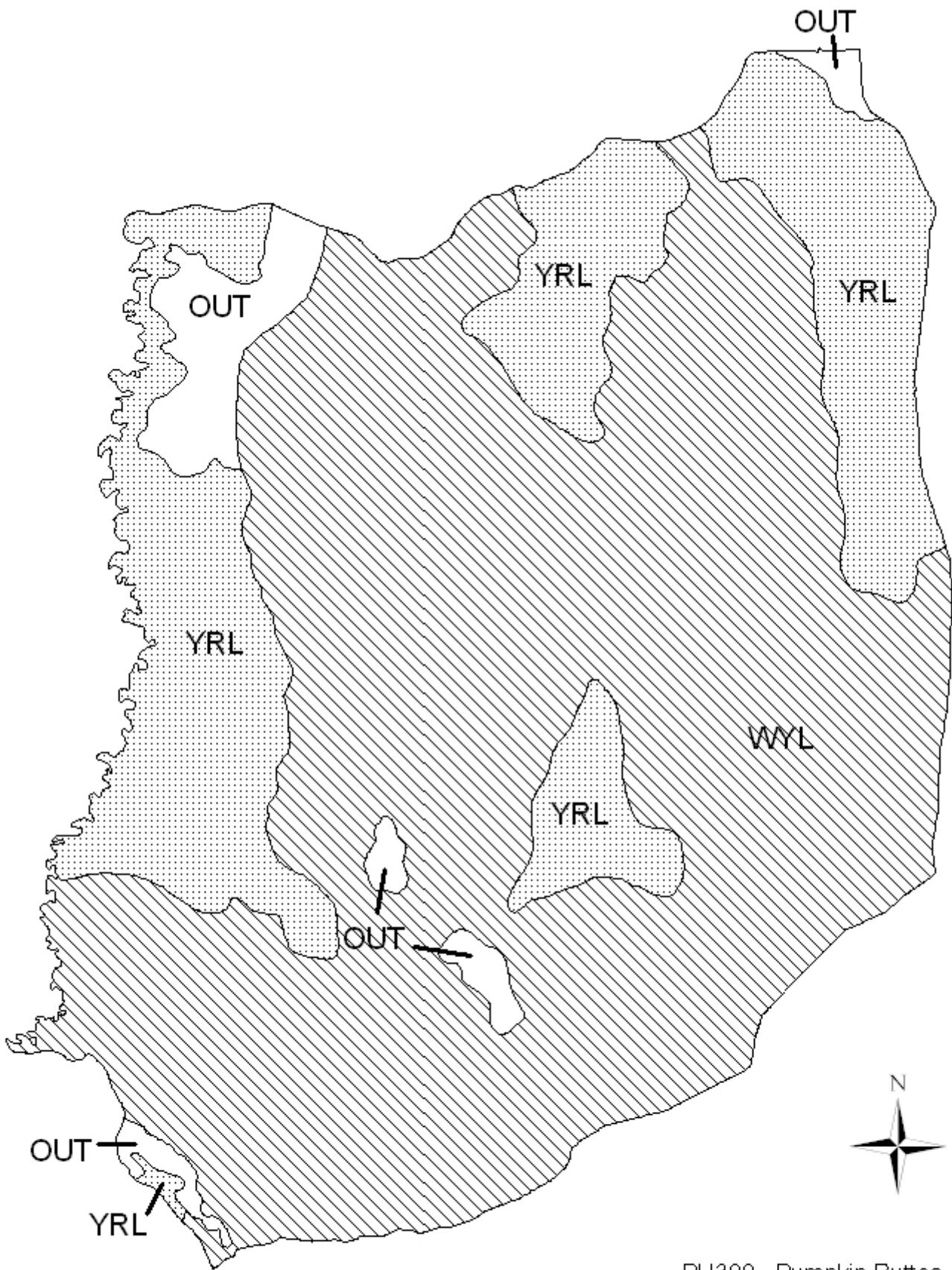
| | Estimate | %CV | df | 95% Confidence Interval | |
|----------------|-------------|------|--------|-------------------------|-------------|
| ----- | | | | | |
| Uniform/Cosine | | | | | |
| m | 1.0000 | | | | |
| LnL | -547.96 | | | | |
| AIC | 1097.9 | | | | |
| AICc | 1097.9 | | | | |
| BIC | 1101.8 | | | | |
| Chi-p | 0.30700 | | | | |
| f(0) | 0.67208E-02 | 5.26 | 350.00 | 0.60611E-02 | 0.74522E-02 |
| p | 0.71305 | 5.26 | 350.00 | 0.64306 | 0.79065 |
| ESW | 148.79 | 5.26 | 350.00 | 134.19 | 164.99 |

Estimation Summary-Expected Cluster Size

| | 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 | 0.94174E-01 | | | | |
| E(S) | 1.6347 | 3.33 | 349.00 | 1.5310 | 1.7455 |

| | Estimate | %CV | df | 95% Confidence Interval | |
|----------------|----------|-------|-------|-------------------------|--------|
| ----- | | | | | |
| Uniform/Cosine | | | | | |
| DS | 5.7022 | 10.29 | 30.92 | 4.6249 | 7.0305 |
| D | 9.3215 | 10.82 | 37.72 | 7.4923 | 11.597 |
| N | 14271. | 10.82 | 37.72 | 11471. | 17755. |





PH309 - Pumpkin Buttes
HA 23
Revised - 3/87

2013 - JCR Evaluation Form

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

HERD: PR316 - HIGHLIGHT

HUNT AREAS: 24

PREPARED BY: ERIKA
PECKHAM

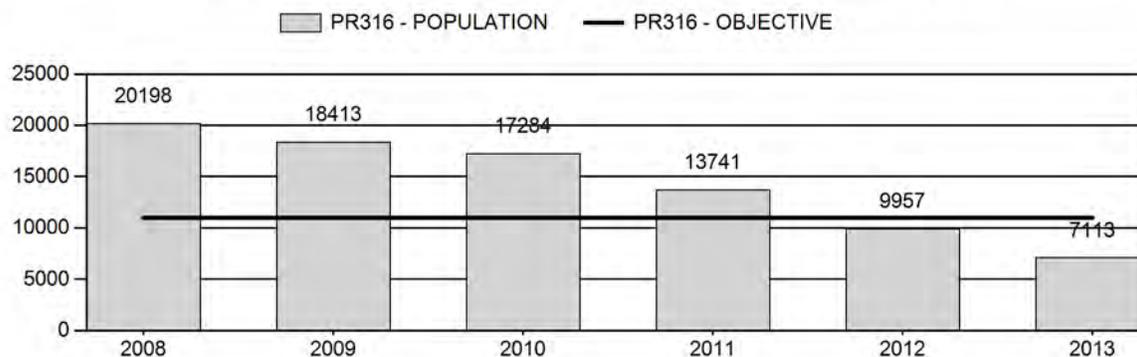
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 15,919 | 7,113 | 7,353 |
| Harvest: | 1,078 | 632 | 620 |
| Hunters: | 1,189 | 808 | 800 |
| Hunter Success: | 91% | 78% | 78 % |
| Active Licenses: | 1,253 | 869 | 800 |
| Active License Percent: | 86% | 73% | 78 % |
| Recreation Days: | 3,815 | 2,723 | 2,700 |
| Days Per Animal: | 3.5 | 4.3 | 4.4 |
| Males per 100 Females | 64 | 61 | |
| Juveniles per 100 Females | 60 | 67 | |

| | |
|---|--------------|
| Population Objective: | 11,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | -35.3% |
| Number of years population has been + or - objective in recent trend: | 1 |
| Model Date: | 02/18/2014 |

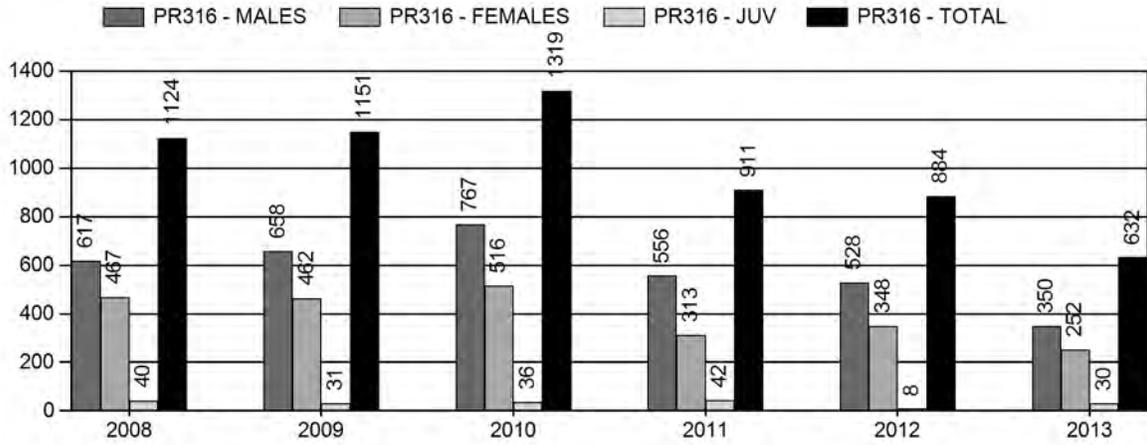
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 6.7% | 7.6% |
| Males ≥ 1 year old: | 19.3% | 19.3% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 7.4% | 7.7% |
| Proposed change in post-season population: | -8.1% | 3% |

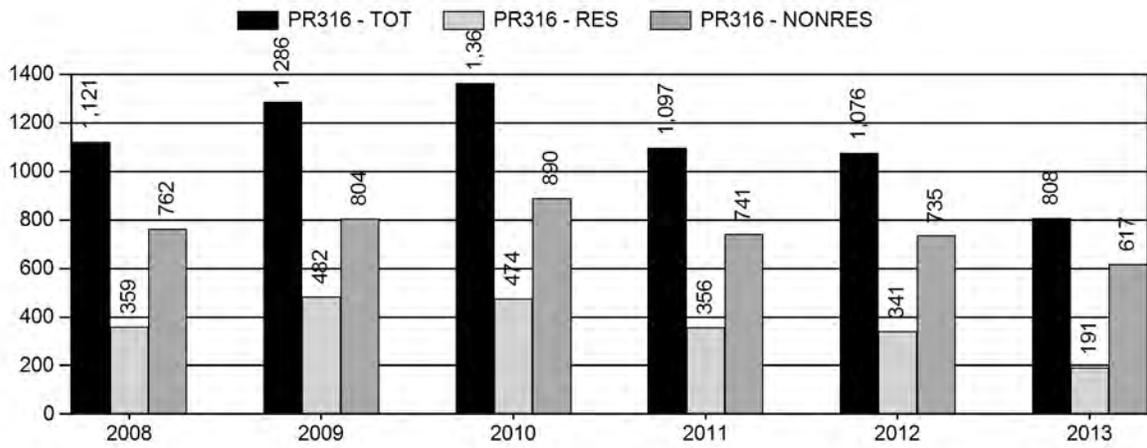
Population Size - Postseason



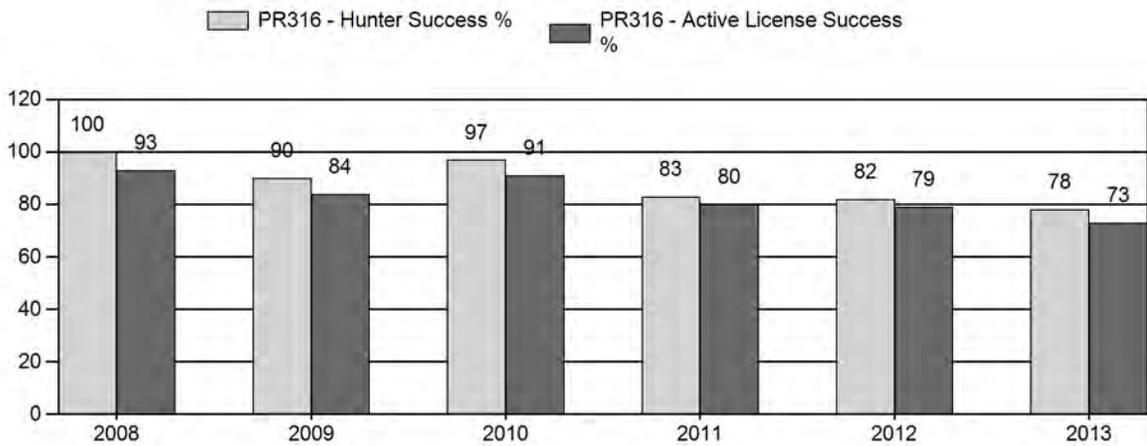
Harvest



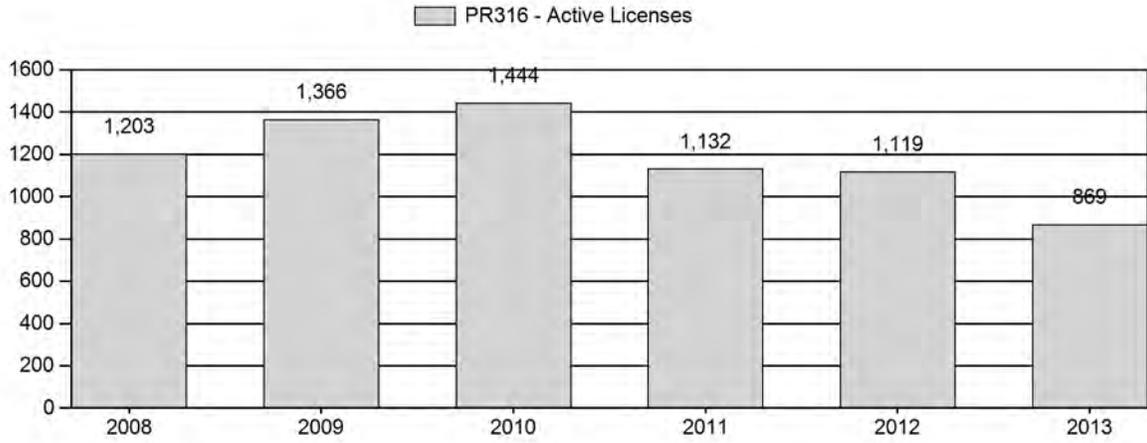
Number of Hunters



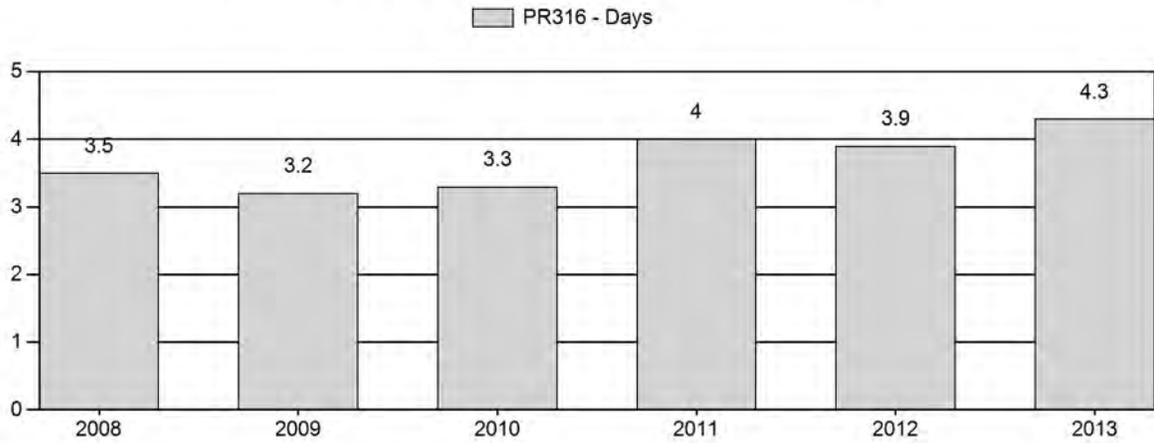
Harvest Success



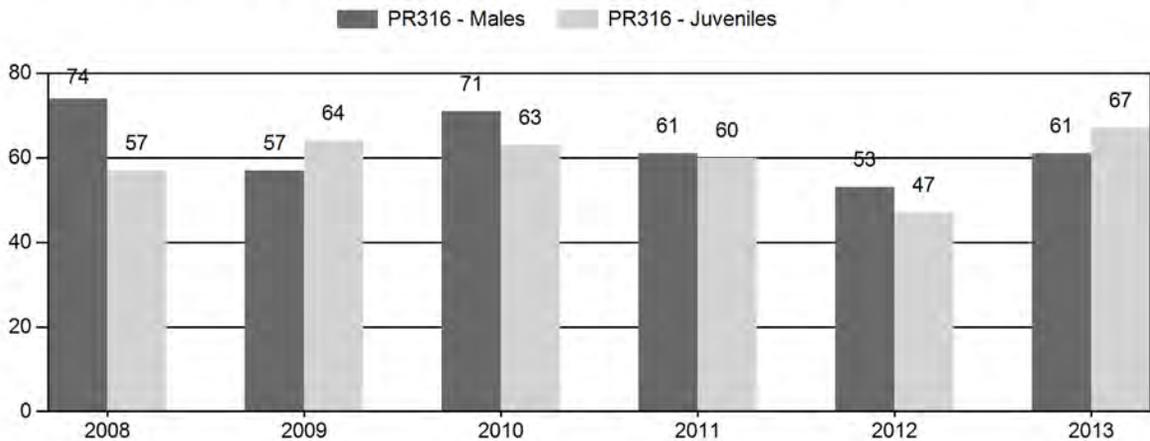
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR316 - HIGHLIGHT

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

**2014 HUNTING SEASONS
HIGHLIGHT PRONGHORN HERD (PR316)**

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

Management Evaluation

Current Postseason Population Management Objective: 11,000

Management Strategy: Recreational

2013 Postseason Population Estimate: 7,100

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 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. 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 14mm.

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.

| | |
|------------------|-----------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Erika Peckham |
| Herd Unit & No.: | PR316-Highlight |
| Model date: | 02/18/14 |

| MODELS SUMMARY | | | Notes |
|----------------|---|---------------|--|
| | Fit | Relative AICc | |
| CJ,CA | Constant Juvenile & Adult Survival | 405 | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 201 | <input type="checkbox"/> CJ,CA Model |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 259 | <input type="checkbox"/> SC,J,SCA Model <input checked="" type="checkbox"/> TS,J,CA Model |

Clear form

Check best model to create report

| Year | Predicted Prehunt Population (year t) | | | Predicted Posthunt Population (year t) | | | Population Estimates from Top Model | | | Predicted adult End-of-bio-year Pop (year t) | | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------------|---------|--|-------------|---------|-------------------------------------|-------------|---------|--|-----------|----------|------------------------|-------|-------------|-----------|
| | Juveniles | Total Males | Females | Juveniles | Total Males | Females | Total | Total Males | Females | Total Adults | Field Est | Field SE | | | | |
| 1996 | 6401 | 3647 | 7764 | 6287 | 2488 | 6999 | 15773 | 2900 | 6503 | 9403 | 4305 | 953 | 11000 | | | |
| 1997 | 3853 | 2842 | 6373 | 3826 | 1683 | 5978 | 11487 | 2595 | 6060 | 8596 | 5196 | 1207 | 11000 | | | |
| 1998 | 4051 | 2485 | 5939 | 4047 | 1377 | 5889 | 11312 | 2659 | 6423 | 9082 | | | 11000 | | | |
| 1999 | 4689 | 2606 | 6295 | 4676 | 1527 | 6231 | 12434 | 3071 | 6975 | 10046 | | | 11000 | | | |
| 2000 | 5299 | 3010 | 6835 | 5271 | 1850 | 6639 | 13760 | 3575 | 7532 | 11107 | | | 11000 | | | |
| 2001 | 5478 | 3504 | 7382 | 5443 | 2380 | 7147 | 14970 | 4074 | 7997 | 12071 | 5831 | 988 | 11000 | | | |
| 2002 | 5305 | 3993 | 7837 | 5284 | 2710 | 7423 | 15417 | 4220 | 8095 | 12316 | | | 11000 | | | |
| 2003 | 5978 | 4136 | 7933 | 5947 | 2754 | 7602 | 16303 | 4534 | 8558 | 13093 | | | 11000 | | | |
| 2004 | 7540 | 4444 | 8387 | 5947 | 3108 | 7878 | 18489 | 5535 | 9443 | 14978 | | | 11000 | | | |
| 2005 | 8723 | 5424 | 9255 | 8630 | 4069 | 8658 | 21358 | 6792 | 10544 | 17336 | | | 11000 | | | |
| 2006 | 7532 | 6656 | 10333 | 7496 | 5119 | 9492 | 22107 | 7046 | 10614 | 17660 | | | 11000 | | | |
| 2007 | 6273 | 6905 | 10402 | 6216 | 5308 | 9445 | 20969 | 6589 | 9961 | 16550 | | | 11000 | | | |
| 2008 | 5540 | 6458 | 9761 | 5469 | 4651 | 8723 | 18944 | 5685 | 9036 | 14721 | | | 11000 | | | |
| 2009 | 5690 | 5571 | 8856 | 5570 | 3846 | 7850 | 17267 | 5122 | 8410 | 13532 | | | 11000 | | | |
| 2010 | 5217 | 5020 | 8242 | 5151 | 3533 | 7179 | 15863 | 3871 | 6809 | 10680 | | | 11000 | | | |
| 2011 | 4008 | 3794 | 6673 | 3845 | 2582 | 5595 | 12021 | 2447 | 4822 | 7269 | | | 11000 | | | |
| 2012 | 2210 | 2398 | 4725 | 2201 | 1828 | 4346 | 8375 | 1729 | 3733 | 5462 | | | 11000 | | | |
| 2013 | 2456 | 1695 | 3658 | 2423 | 1310 | 3381 | 7113 | 2035 | 3672 | 5707 | | | 11000 | | | |
| 2014 | 2442 | 1995 | 3598 | 2420 | 1610 | 3323 | 7353 | | | | | | 11000 | | | |
| 2015 | | | | | | | | | | | | | | 11000 | | |
| 2016 | | | | | | | | | | | | | | 11000 | | |
| 2017 | | | | | | | | | | | | | | 11000 | | |
| 2018 | | | | | | | | | | | | | | 11000 | | |
| 2019 | | | | | | | | | | | | | | 11000 | | |
| 2020 | | | | | | | | | | | | | | 11000 | | |
| 2021 | | | | | | | | | | | | | | 11000 | | |
| 2022 | | | | | | | | | | | | | | 11000 | | |
| 2023 | | | | | | | | | | | | | | 11000 | | |
| 2024 | | | | | | | | | | | | | | 11000 | | |
| 2025 | | | | | | | | | | | | | | 11000 | | |
| 2026 | | | | | | | | | | | | | | 11000 | | |
| 2027 | | | | | | | | | | | | | | 11000 | | |
| 2028 | | | | | | | | | | | | | | 11000 | | |

Survival and Initial Population Estimates

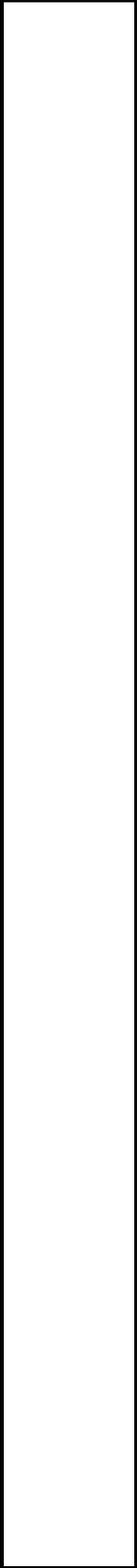
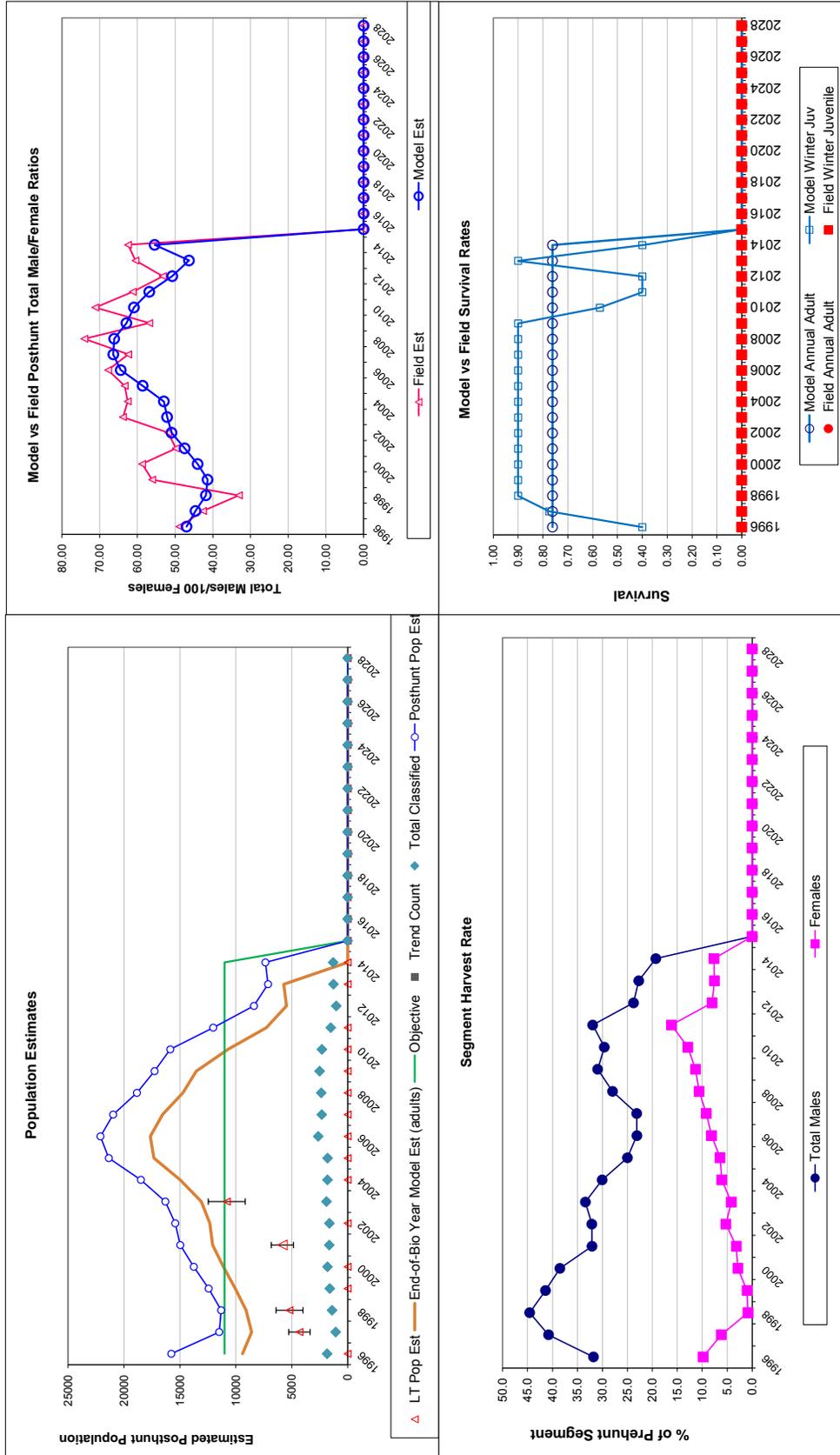
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|----|-----------------------------|----|
| | Field Est. | SE | Model Est. | SE |
| 1996 | 0.40 | | 0.76 | |
| 1997 | 0.77 | | 0.76 | |
| 1998 | 0.90 | | 0.76 | |
| 1999 | 0.90 | | 0.76 | |
| 2000 | 0.90 | | 0.76 | |
| 2001 | 0.90 | | 0.76 | |
| 2002 | 0.90 | | 0.76 | |
| 2003 | 0.90 | | 0.76 | |
| 2004 | 0.90 | | 0.76 | |
| 2005 | 0.90 | | 0.76 | |
| 2006 | 0.90 | | 0.76 | |
| 2007 | 0.90 | | 0.76 | |
| 2008 | 0.90 | | 0.76 | |
| 2009 | 0.90 | | 0.76 | |
| 2010 | 0.57 | | 0.76 | |
| 2011 | 0.40 | | 0.76 | |
| 2012 | 0.40 | | 0.76 | |
| 2013 | 0.90 | | 0.76 | |
| 2014 | 0.40 | | 0.76 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |
| 2026 | | | | |
| 2027 | | | | |
| 2028 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Adult Survival = | | 0.762 |
| Initial Total Male Pop/10,000 = | | 0.365 |
| Initial Female Pop/10,000 = | | 0.776 |

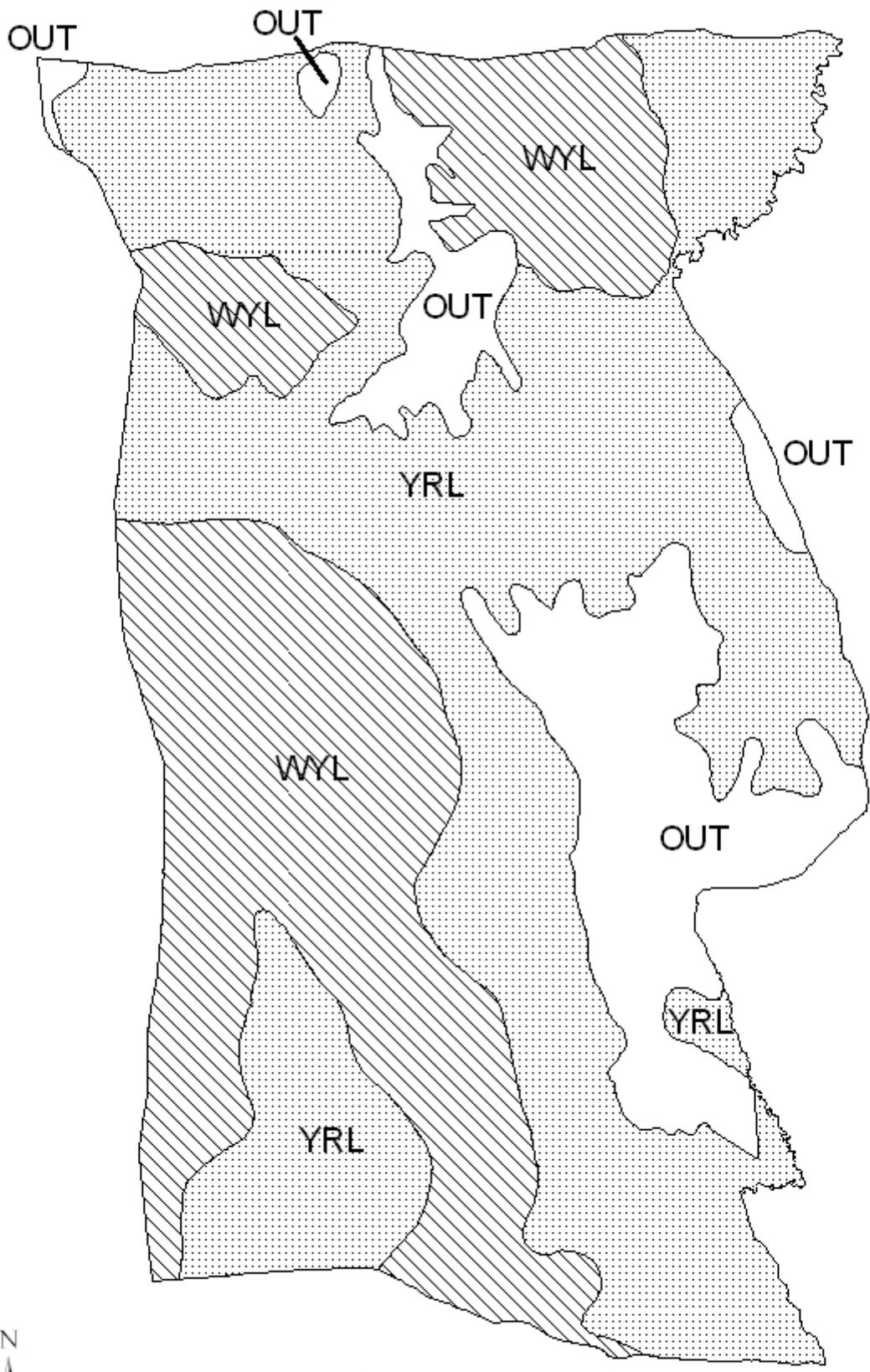
| MODEL ASSUMPTIONS | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | Harvest | | | | | | |
|------|-----------------------|----------|-------------------------|-----------|----------|-------|---------|-----------|---|-------------|---------|
| | Juvenile/Female Ratio | | Total Male/Female Ratio | | Males | | Females | | Segment Harvest Rate (% of Total Harvest) | | |
| | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juveniles | Total Harvest | Total Males | Females |
| 1996 | 82.45 | 4.36 | 46.98 | 48.86 | 3.03 | 1054 | 685 | 104 | 1855 | 31.8 | 9.8 |
| 1997 | 60.46 | 4.29 | 44.60 | 42.59 | 3.40 | 1054 | 359 | 24 | 1437 | 40.8 | 6.2 |
| 1998 | 68.21 | 4.07 | 41.84 | 33.09 | 2.52 | 1007 | 46 | 4 | 1057 | 44.6 | 0.9 |
| 1999 | 74.49 | 4.34 | 41.40 | 56.09 | 3.56 | 981 | 58 | 12 | 1051 | 41.4 | 1.0 |
| 2000 | 77.53 | 4.25 | 44.03 | 58.74 | 3.50 | 1054 | 178 | 26 | 1258 | 38.5 | 2.9 |
| 2001 | 74.22 | 4.20 | 47.47 | 49.80 | 3.19 | 1022 | 213 | 32 | 1267 | 32.1 | 3.2 |
| 2002 | 67.70 | 3.91 | 50.95 | 51.82 | 3.25 | 1166 | 376 | 19 | 1561 | 32.1 | 5.3 |
| 2003 | 75.35 | 4.09 | 52.13 | 63.84 | 3.64 | 1256 | 301 | 28 | 1585 | 33.4 | 4.2 |
| 2004 | 89.90 | 4.89 | 52.98 | 62.55 | 3.78 | 1214 | 463 | 34 | 1711 | 30.1 | 6.1 |
| 2005 | 94.25 | 5.13 | 58.61 | 63.36 | 3.86 | 1232 | 542 | 84 | 1858 | 25.0 | 6.4 |
| 2006 | 72.89 | 3.40 | 64.42 | 67.77 | 3.23 | 1397 | 765 | 33 | 2195 | 23.1 | 8.1 |
| 2007 | 60.31 | 3.05 | 66.39 | 62.43 | 3.13 | 1452 | 870 | 52 | 2374 | 23.1 | 9.2 |
| 2008 | 56.75 | 2.95 | 66.15 | 74.07 | 3.55 | 1642 | 944 | 64 | 2650 | 28.0 | 10.6 |
| 2009 | 64.25 | 3.05 | 62.91 | 56.84 | 2.81 | 1568 | 914 | 109 | 2591 | 31.0 | 11.4 |
| 2010 | 63.30 | 3.25 | 60.91 | 71.15 | 3.52 | 1352 | 966 | 60 | 2378 | 29.6 | 12.9 |
| 2011 | 60.06 | 3.76 | 56.86 | 61.23 | 3.81 | 1102 | 980 | 148 | 2230 | 32.0 | 16.2 |
| 2012 | 46.76 | 3.67 | 50.75 | 53.24 | 4.00 | 518 | 345 | 8 | 871 | 23.8 | 8.0 |
| 2013 | 67.15 | 4.49 | 46.33 | 60.50 | 4.18 | 350 | 252 | 30 | 632 | 22.7 | 7.6 |
| 2014 | 67.86 | 4.51 | 55.44 | 62.50 | 4.26 | 350 | 250 | 20 | 620 | 19.3 | 7.6 |
| 2015 | | | | | | | | | | | |
| 2016 | | | | | | | | | | | |
| 2017 | | | | | | | | | | | |
| 2018 | | | | | | | | | | | |
| 2019 | | | | | | | | | | | |
| 2020 | | | | | | | | | | | |
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| 2026 | | | | | | | | | | | |
| 2027 | | | | | | | | | | | |
| 2028 | | | | | | | | | | | |

FIGURES



END



PH316 - Highlight
HA 24
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

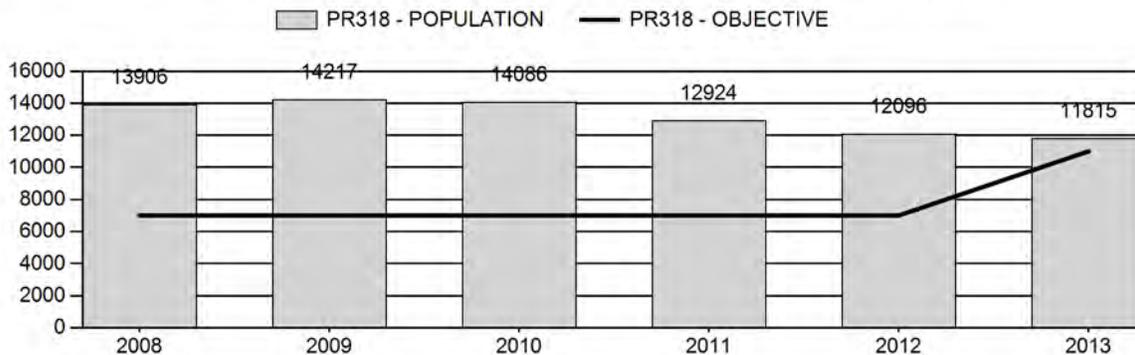
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 13,446 | 11,815 | 11,528 |
| Harvest: | 1,706 | 1,790 | 1,700 |
| Hunters: | 1,652 | 2,034 | 2,000 |
| Hunter Success: | 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 |

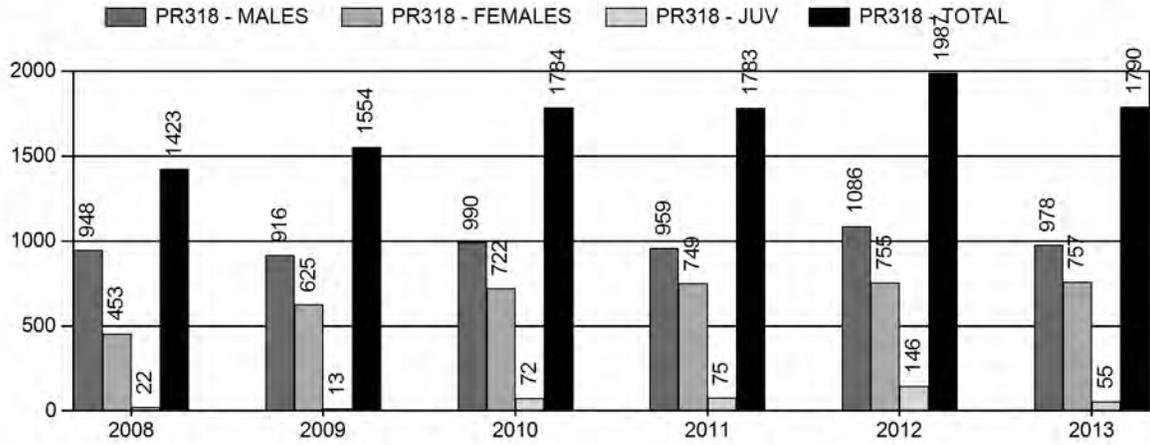
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 18% | 20% |
| Males ≥ 1 year old: | 36% | 25% |
| Juveniles (< 1 year old): | 0% | 1% |
| Total: | 16% | 15% |
| Proposed change in post-season population: | -11% | -2% |

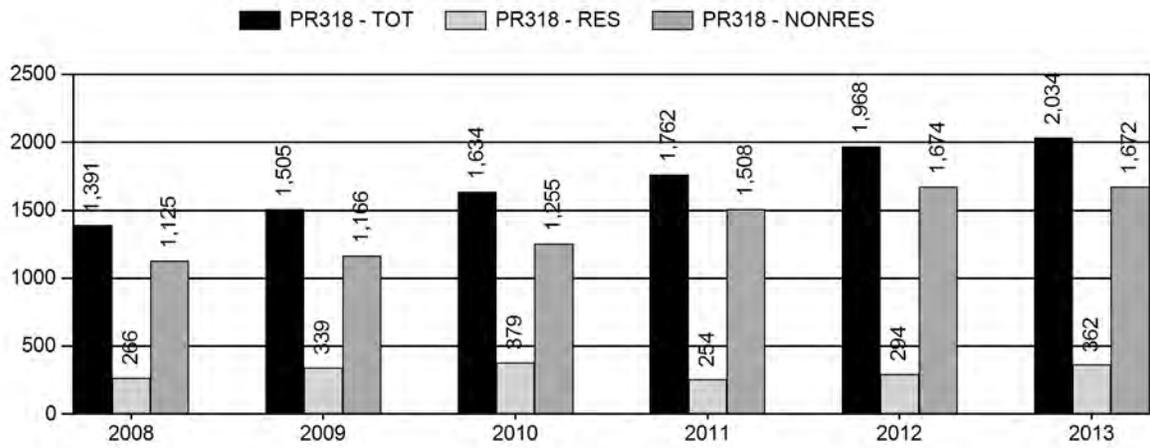
Population Size - Postseason



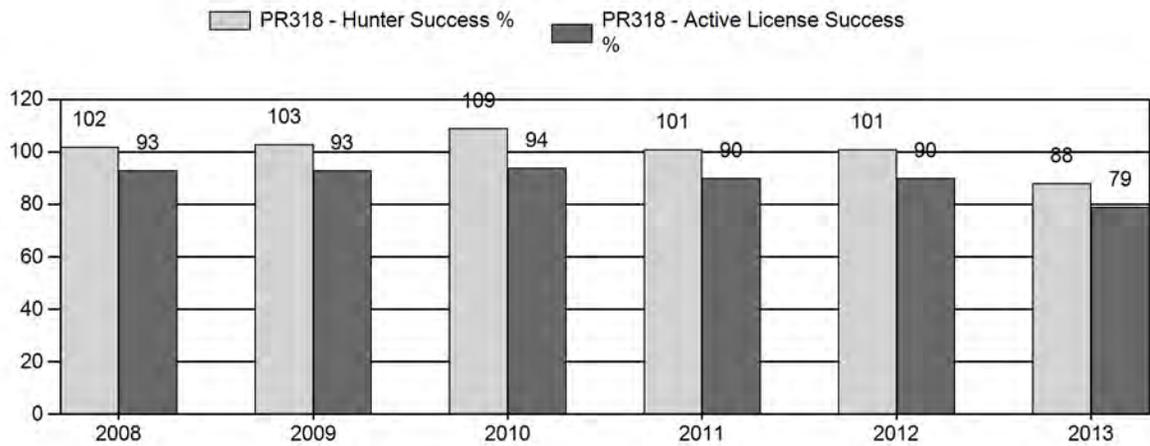
Harvest



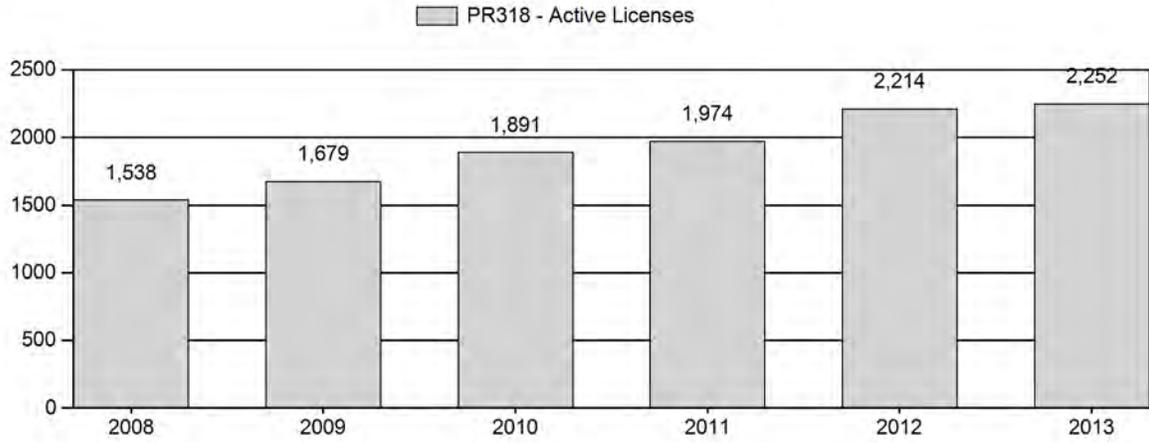
Number of Hunters



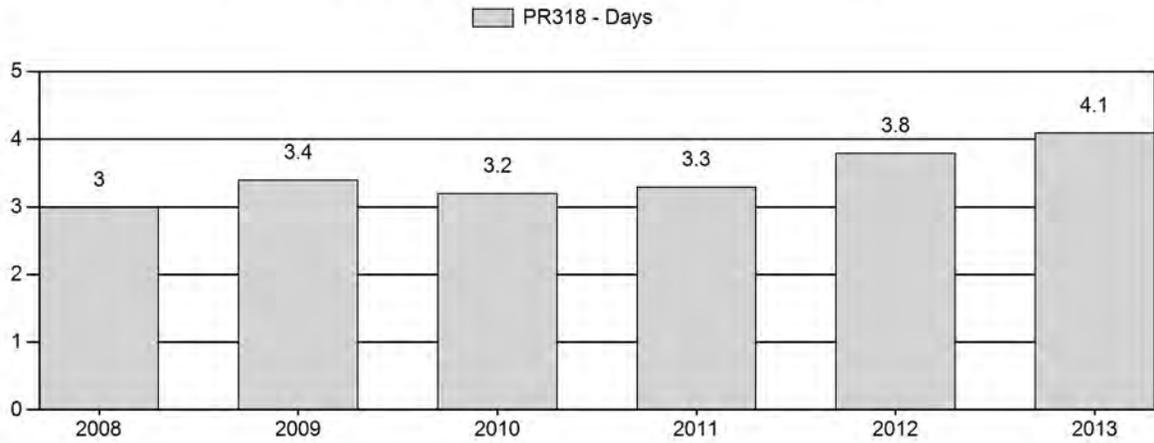
Harvest Success



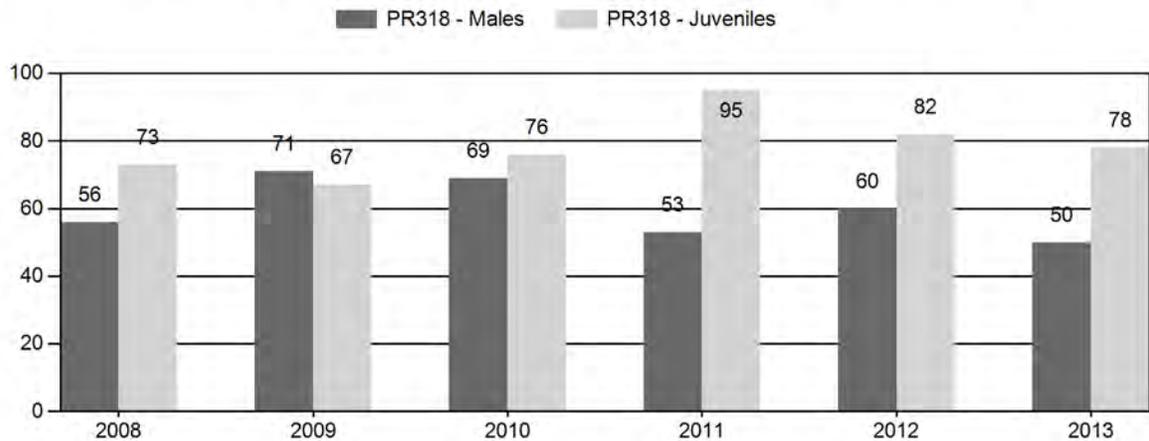
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR318 - CRAZY WOMAN

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

**2014 HUNTING SEASONS
CRAZY WOMAN PRONGHORN HERD (PR318)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|---|
| | | Opens | Closes | | |
| 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 | Oct. 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 | 6 | -100 |

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 through 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.

| | |
|------------------|-------------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Dan Thiele |
| Herd Unit & No.: | Crazy woman (318) |
| Model date: | 02/11/14 |

Clear form

| MODELS SUMMARY | | Fit | Relative AICc | Notes |
|----------------|---|-----|---------------|---|
| CJ,CA | Constant Juvenile & Adult Survival | 81 | 90 | <input type="checkbox"/> CJ,CA Model <input checked="" type="checkbox"/> SCJ,S,CA Mod <input type="checkbox"/> TSJ,CA Model |
| SCJ,S,CA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 47 | 55 | |
| TSJ,CA | Time-Specific Juvenile & Constant Adult Survival | 49 | 140 | |

Check best model to create report

| Year | Predicted Prehunt Population (year t) | | | Predicted Posthunt Population (year t) | | | Predicted adult End-of-bio-year Pop (year t) | | | Trend Count | Objective |
|------|---------------------------------------|-------------|---------|--|-------------|---------|--|---------|--------------|-------------|-----------|
| | Juveniles | Total Males | Females | Juveniles | Total Males | Females | Total Males | Females | Total Adults | | |
| 1993 | 3676 | 3574 | 6265 | 3610 | 2819 | 5593 | 11822 | 3571 | 6177 | 9749 | 7000 |
| 1994 | 4520 | 3500 | 6054 | 4375 | 2571 | 5176 | 12122 | 2916 | 5167 | 8083 | 7000 |
| 1995 | 4197 | 2857 | 5064 | 4035 | 2016 | 4404 | 10455 | 2376 | 4463 | 6839 | 7000 |
| 1996 | 3920 | 2329 | 4373 | 3862 | 1644 | 4057 | 9521 | 2078 | 4172 | 6249 | 7000 |
| 1997 | 3049 | 2036 | 4088 | 3049 | 1585 | 4057 | 8691 | 2538 | 4734 | 7272 | 7000 |
| 1998 | 4218 | 2487 | 4639 | 4209 | 2020 | 4626 | 10855 | 2841 | 5158 | 7999 | 7000 |
| 1999 | 4795 | 2784 | 5055 | 4781 | 2283 | 5030 | 12094 | 2858 | 5300 | 8158 | 7000 |
| 2000 | 3861 | 2801 | 5194 | 3861 | 2313 | 5175 | 11349 | 2702 | 5243 | 7945 | 7000 |
| 2001 | 3451 | 2648 | 5138 | 3451 | 2151 | 5072 | 10674 | 2542 | 5127 | 7669 | 7000 |
| 2002 | 3682 | 2491 | 5025 | 3669 | 2005 | 4945 | 10620 | 3146 | 5743 | 8890 | 7000 |
| 2003 | 5390 | 3083 | 5629 | 5374 | 2489 | 5538 | 13402 | 3512 | 6218 | 9730 | 7000 |
| 2004 | 5444 | 3442 | 6094 | 5424 | 2837 | 5959 | 14219 | 4307 | 7071 | 11377 | 7000 |
| 2005 | 6612 | 4220 | 6929 | 6576 | 3579 | 6734 | 16890 | 4312 | 7101 | 11413 | 7000 |
| 2006 | 6005 | 4226 | 6959 | 5993 | 3547 | 6546 | 16087 | 4266 | 6892 | 11158 | 7000 |
| 2007 | 5021 | 4181 | 6754 | 4974 | 3369 | 6179 | 14521 | 4222 | 6680 | 10902 | 7000 |
| 2008 | 4789 | 4137 | 6546 | 4764 | 3095 | 6048 | 13907 | 4442 | 7073 | 11514 | 7000 |
| 2009 | 4643 | 4353 | 6931 | 4629 | 3346 | 6244 | 14218 | 4316 | 6863 | 11179 | 7000 |
| 2010 | 5093 | 4229 | 6726 | 5013 | 3140 | 5932 | 14086 | 3531 | 5982 | 9513 | 7000 |
| 2011 | 5562 | 3460 | 5862 | 5479 | 2405 | 5038 | 12923 | 3602 | 6042 | 9644 | 7000 |
| 2012 | 4830 | 3530 | 5922 | 4669 | 2335 | 5091 | 12095 | 3589 | 5898 | 9487 | 7000 |
| 2013 | 4487 | 3518 | 5780 | 4426 | 2442 | 4947 | 11815 | 3462 | 5691 | 9153 | 11000 |
| 2014 | 4565 | 3393 | 5577 | 4483 | 2293 | 4752 | 11528 | 3314 | 5476 | 8791 | 11000 |
| 2015 | 4393 | 3248 | 5367 | 4311 | 2148 | 4542 | 11000 | | | | 11000 |
| 2016 | | | | | | | | | | | 11000 |
| 2017 | | | | | | | | | | | 11000 |
| 2018 | | | | | | | | | | | 11000 |
| 2019 | | | | | | | | | | | 11000 |
| 2020 | | | | | | | | | | | 11000 |
| 2021 | | | | | | | | | | | 11000 |
| 2022 | | | | | | | | | | | 11000 |
| 2023 | | | | | | | | | | | 11000 |
| 2024 | | | | | | | | | | | 11000 |
| 2025 | | | | | | | | | | | 11000 |

Survival and Initial Population Estimates

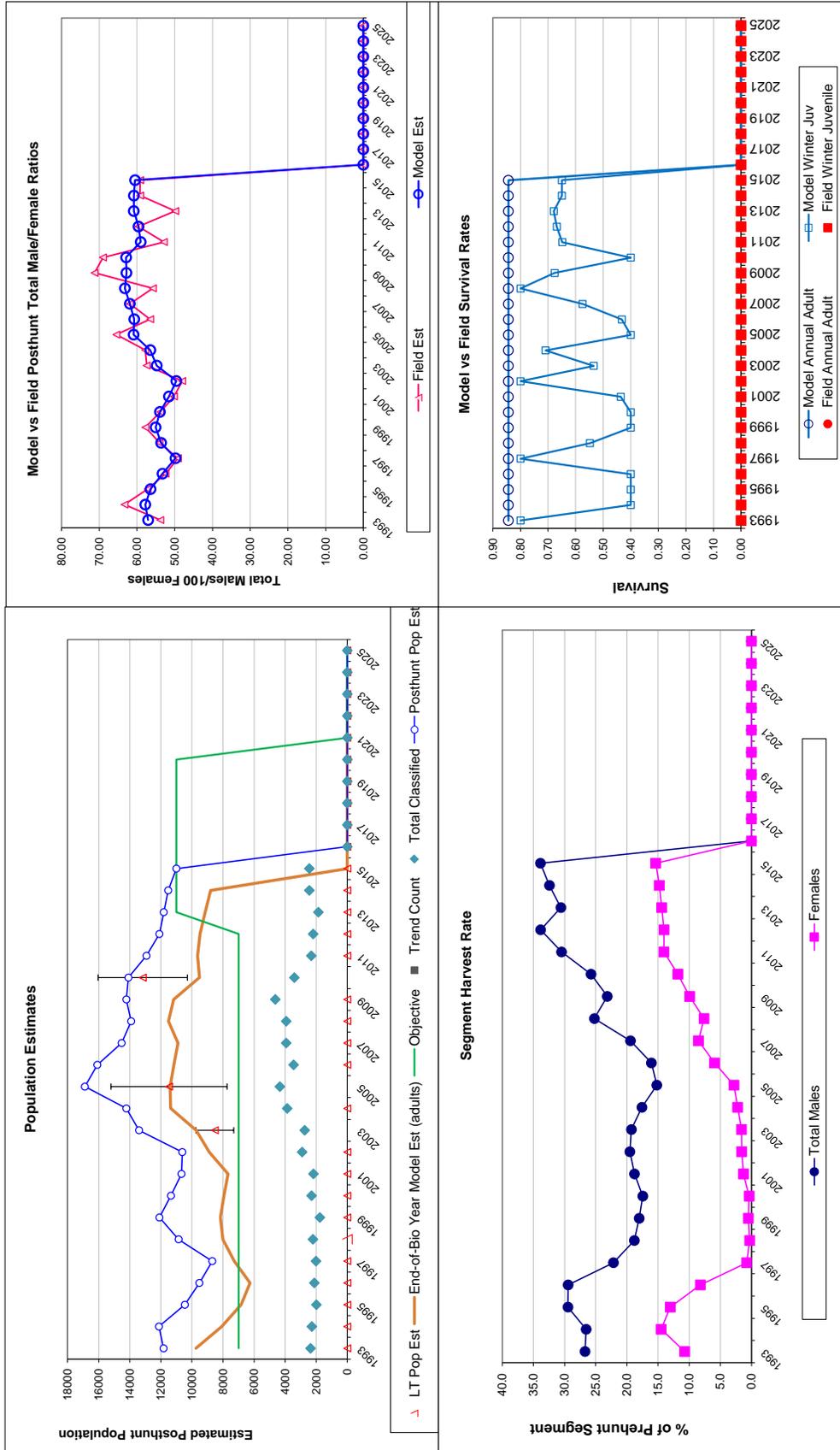
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.80 | | 0.84 | |
| 1994 | 0.40 | | 0.84 | |
| 1995 | 0.40 | | 0.84 | |
| 1996 | 0.40 | | 0.84 | |
| 1997 | 0.80 | | 0.84 | |
| 1998 | 0.55 | | 0.84 | |
| 1999 | 0.40 | | 0.84 | |
| 2000 | 0.40 | | 0.84 | |
| 2001 | 0.44 | | 0.84 | |
| 2002 | 0.80 | | 0.84 | |
| 2003 | 0.53 | | 0.84 | |
| 2004 | 0.71 | | 0.84 | |
| 2005 | 0.40 | | 0.84 | |
| 2006 | 0.43 | | 0.84 | |
| 2007 | 0.58 | | 0.84 | |
| 2008 | 0.80 | | 0.84 | |
| 2009 | 0.68 | | 0.84 | |
| 2010 | 0.40 | | 0.84 | |
| 2011 | 0.65 | | 0.84 | |
| 2012 | 0.67 | | 0.84 | |
| 2013 | 0.68 | | 0.84 | |
| 2014 | 0.65 | | 0.84 | |
| 2015 | 0.65 | | 0.84 | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Juvenile Survival = | | 0.650 |
| Adult Survival = | | 0.844 |
| Initial Total Male Pop/10,000 = | | 0.357 |
| Initial Female Pop/10,000 = | | 0.627 |

| MODEL ASSUMPTIONS | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

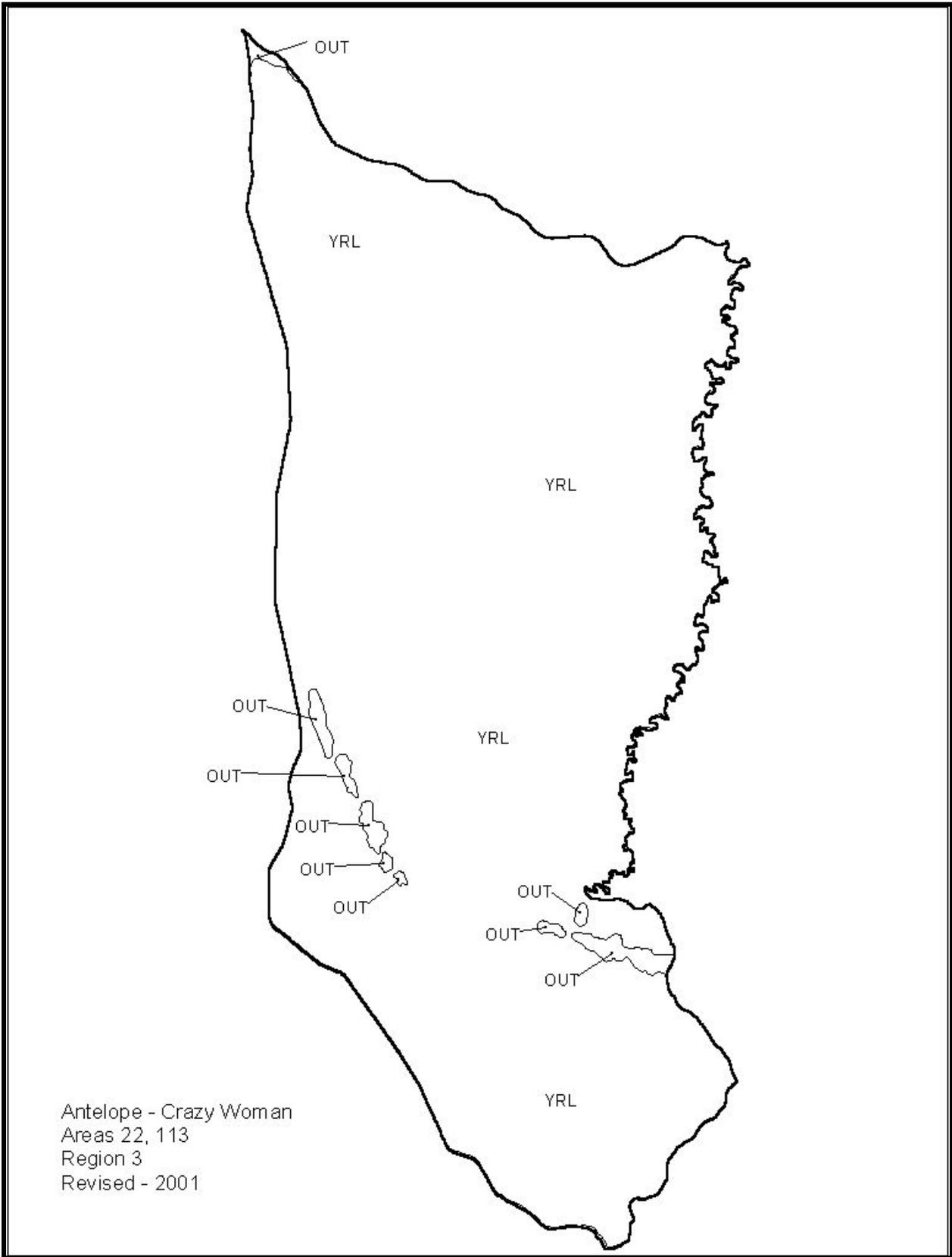
| Year | Classification Counts | | | | | | Harvest | | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|-----------|----------|---------|---------|-----------|---------------|-------------|---------|---|--|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Males | | | Females | | | Segment Harvest Rate (% of Total Harvest) | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juveniles | Total Harvest | Total Males | Females | | |
| 1993 | | | | | | | | | | | | | | |
| 1994 | 58.67 | 74.66 | 2.89 | 57.05 | 53.82 | 2.73 | 868 | 611 | 60 | 1539 | 26.7 | 10.7 | | |
| 1995 | 82.87 | 84.4 | 3.69 | 56.42 | 63.30 | 3.29 | 844 | 798 | 132 | 1774 | 26.5 | 14.5 | | |
| 1996 | 89.62 | 76.5 | 4.28 | 53.25 | 57.18 | 3.02 | 623 | 600 | 147 | 1512 | 29.5 | 13.0 | | |
| 1997 | 74.58 | 49.80 | 4.40 | 49.80 | 52.45 | 2.85 | 410 | 29 | 52 | 1001 | 22.2 | 0.8 | | |
| 1998 | 90.92 | 94.85 | 3.80 | 53.62 | 49.17 | 3.04 | 425 | 12 | 8 | 439 | 18.8 | 0.3 | | |
| 1999 | 94.85 | 74.33 | 5.14 | 55.08 | 54.04 | 3.61 | 456 | 23 | 12 | 445 | 18.0 | 0.5 | | |
| 2000 | 74.33 | 67.17 | 3.58 | 53.93 | 57.80 | 2.86 | 444 | 17 | 0 | 461 | 17.4 | 0.4 | | |
| 2001 | 73.29 | 67.17 | 3.35 | 51.54 | 53.82 | 2.74 | 452 | 60 | 0 | 512 | 18.8 | 1.3 | | |
| 2002 | 95.75 | 73.29 | 3.11 | 49.59 | 48.02 | 2.33 | 442 | 72 | 12 | 526 | 19.5 | 1.6 | | |
| 2003 | 89.33 | 95.75 | 4.16 | 54.78 | 57.43 | 2.89 | 540 | 82 | 14 | 636 | 19.3 | 1.6 | | |
| 2004 | 95.43 | 89.33 | 3.29 | 56.47 | 57.83 | 2.41 | 550 | 123 | 18 | 691 | 17.6 | 2.2 | | |
| 2005 | 86.30 | 95.43 | 3.35 | 60.91 | 65.48 | 2.55 | 583 | 177 | 33 | 793 | 15.2 | 2.8 | | |
| 2006 | 74.34 | 86.30 | 3.36 | 60.72 | 56.50 | 2.49 | 617 | 375 | 11 | 1003 | 16.1 | 5.9 | | |
| 2007 | 73.15 | 74.34 | 2.79 | 61.90 | 61.90 | 2.45 | 738 | 523 | 43 | 1304 | 19.4 | 8.5 | | |
| 2008 | 66.99 | 73.15 | 2.72 | 63.20 | 55.79 | 2.25 | 948 | 453 | 22 | 1423 | 25.2 | 7.6 | | |
| 2009 | 75.72 | 66.99 | 2.40 | 62.81 | 71.26 | 2.50 | 916 | 625 | 13 | 1554 | 23.1 | 9.9 | | |
| 2010 | 94.87 | 75.72 | 3.09 | 62.88 | 69.04 | 2.90 | 990 | 722 | 72 | 1784 | 25.7 | 11.8 | | |
| 2011 | 81.56 | 94.87 | 4.44 | 59.03 | 52.88 | 2.94 | 959 | 749 | 75 | 1783 | 30.5 | 14.1 | | |
| 2012 | 77.63 | 81.56 | 4.03 | 59.61 | 59.60 | 3.23 | 1086 | 755 | 146 | 1987 | 33.8 | 14.0 | | |
| 2013 | 81.85 | 77.63 | 4.11 | 60.86 | 49.88 | 3.02 | 978 | 757 | 55 | 1790 | 30.6 | 14.4 | | |
| 2014 | 81.85 | 81.85 | 3.83 | 60.83 | 59.17 | 3.05 | 1000 | 750 | 75 | 1825 | 32.4 | 14.8 | | |
| 2015 | 81.85 | 81.85 | 3.83 | 60.51 | 59.17 | 3.05 | 1000 | 750 | 75 | 1825 | 33.9 | 15.4 | | |
| 2016 | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | |

FIGURES



Comments:

END



2013 - JCR Evaluation Form

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

HERD: PR339 - NORTH BLACK HILLS

HUNT AREAS: 1-3, 18-19

PREPARED BY: ERIKA
PECKHAM

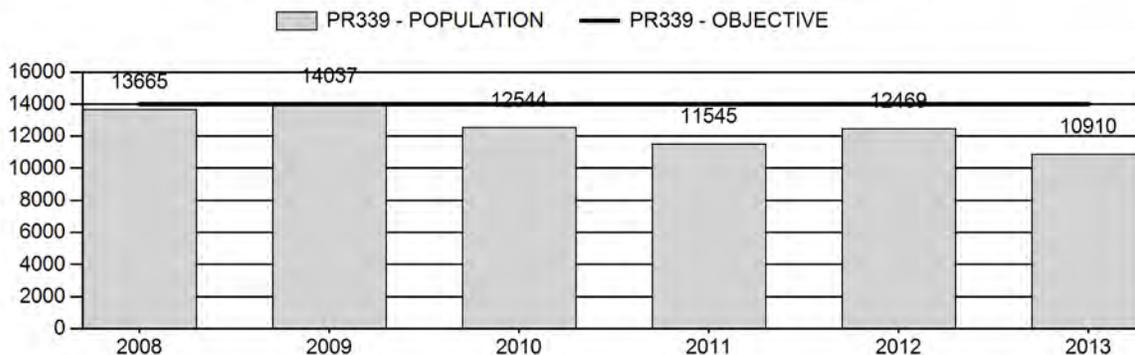
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 12,852 | 10,910 | 10,758 |
| Harvest: | 1,271 | 668 | 540 |
| Hunters: | 1,407 | 792 | 700 |
| Hunter Success: | 90% | 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 |
| Model Date: | 02/27/2014 |

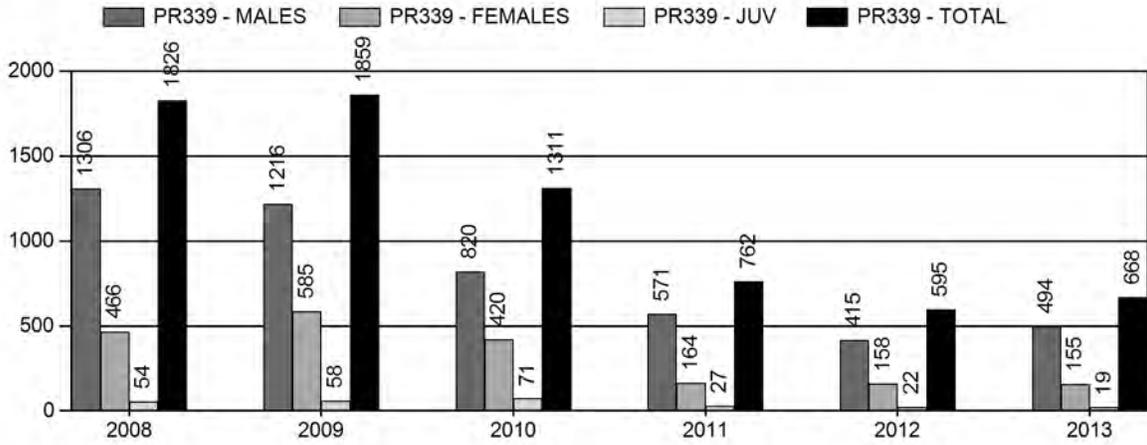
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 5.4% | 1.6% |
| Males ≥ 1 year old: | 39.5% | 23.8% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 8.1% | 4.8% |
| Proposed change in post-season population: | -32% | -1.3% |

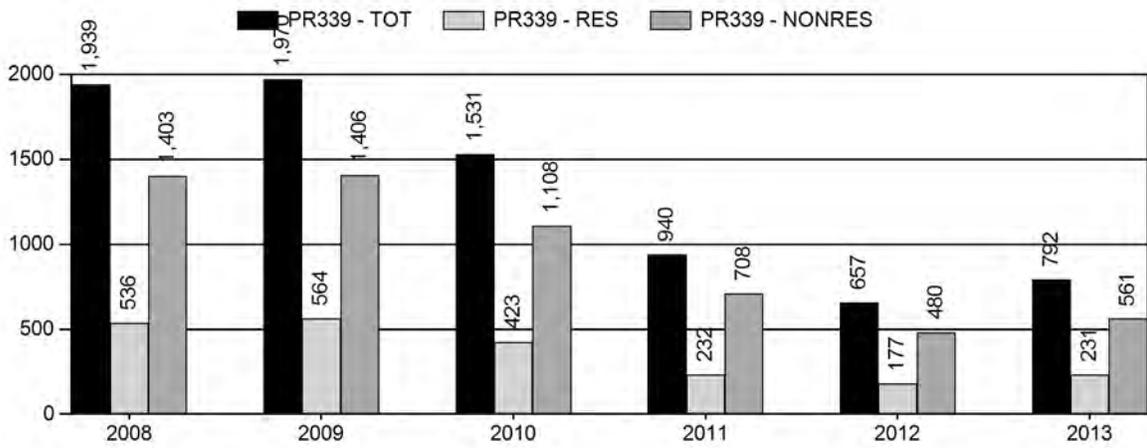
Population Size - Postseason



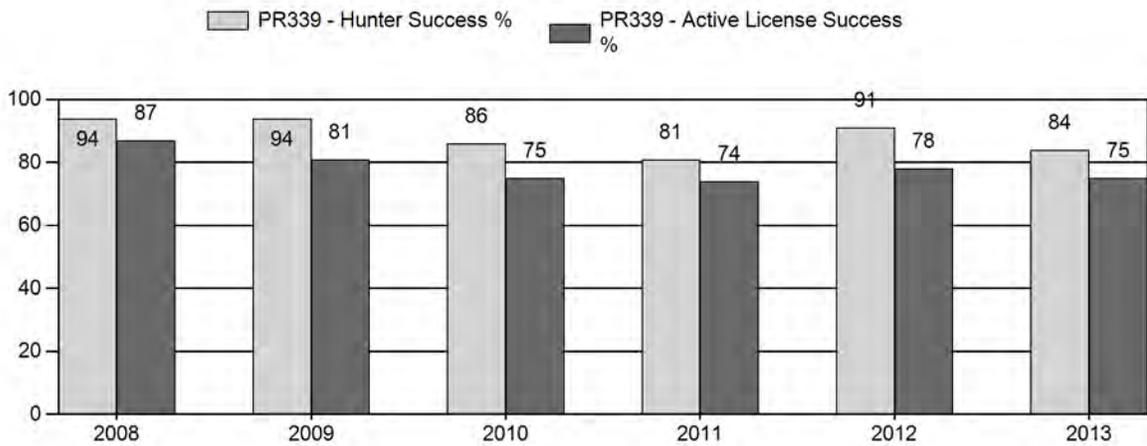
Harvest



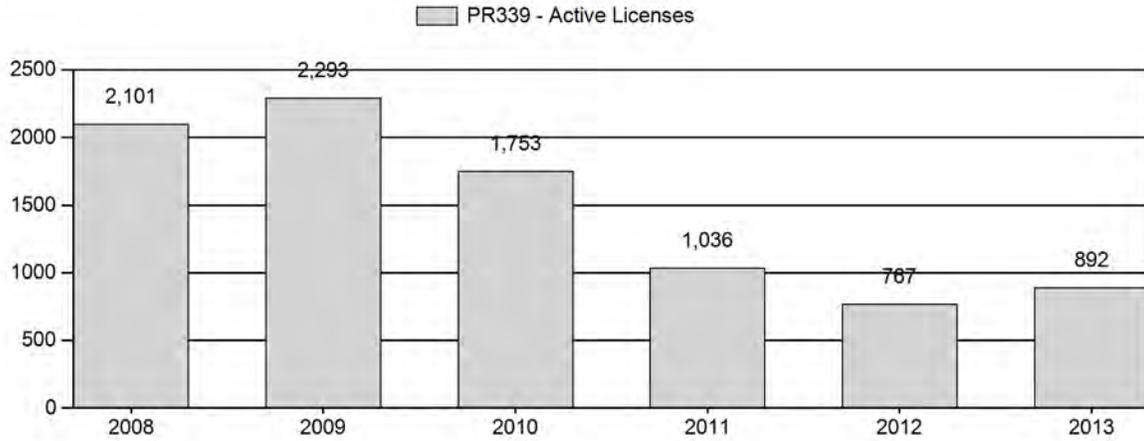
Number of Hunters



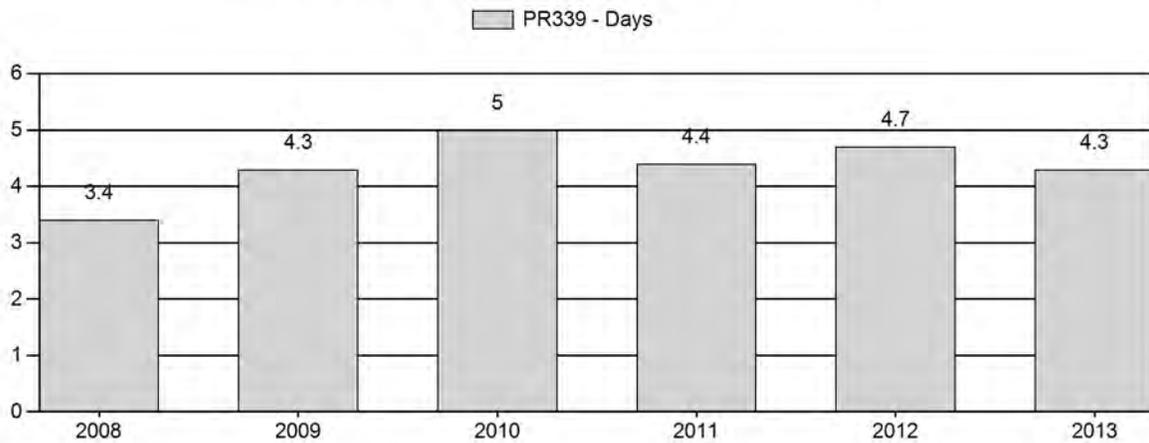
Harvest Success



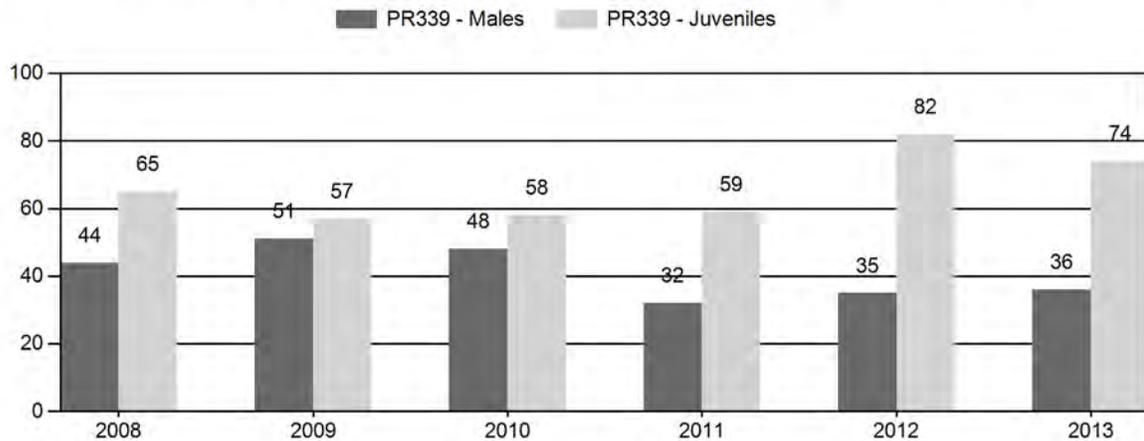
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR339 - NORTH BLACK HILLS

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

**2014 HUNTING SEASONS
NORTH BLACK HILLS PRONGHORN HERD (PR339)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|---|
| | | 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 | 1 | -50 |
| | 6 | -25 |

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 48mm, 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.

| | |
|------------------|----------------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Erika Peckham |
| Herd Unit & No.: | North Black Hill 339 |
| Model date: | 02/12/14 |

| MODELS SUMMARY | | |
|---|-----|---------------|
| | Fit | Relative AICc |
| CJ,CA Constant Juvenile & Adult Survival | 175 | 184 |
| SC,J,SCA Semi-Constant Juvenile & Semi-Constant Adult Survival | 175 | 184 |
| TS,J,CA Time-Specific Juvenile & Constant Adult Survival | 65 | 167 |

Clear form

Check best model to create report

- CJ,CA Model
- SC,J,SCA M.
- TS,J,CA Model

Notes

| Year | Predicted Prehunt Population (year t) | | | Predicted Posthunt Population (year t) | | | Population Estimates from Top Model | | | Predicted adult End-of-bio-year Pop (year t) | | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------------|---------|--|-------------|---------|-------------------------------------|-------------|---------|--|-----------|----------|------------------------|------|-------------|-----------|
| | Juveniles | Total Males | Females | Juveniles | Total Males | Females | Total | Total Males | Females | Total Adults | Field Est | Field SE | | | | |
| 1993 | 5425 | 4093 | 8974 | 18491 | 2360 | 7371 | 14980 | 2786 | 7136 | 9921 | | | | | 14000 | |
| 1994 | 6110 | 2730 | 6993 | 15833 | 1068 | 5580 | 12536 | 3355 | 7293 | 10648 | | | | | 14000 | |
| 1995 | 5946 | 3288 | 7147 | 16381 | 1968 | 6055 | 13745 | 2931 | 6498 | 9428 | | | 6518 | 1508 | 14000 | |
| 1996 | 5412 | 2872 | 6368 | 14651 | 2028 | 5562 | 12897 | 2671 | 5731 | 8402 | | | | | 14000 | |
| 1997 | 3898 | 2618 | 5616 | 12132 | 2007 | 5270 | 11138 | 2415 | 5276 | 7691 | | | 7835 | 1696 | 14000 | |
| 1998 | 4111 | 2367 | 5170 | 11648 | 1938 | 5005 | 11038 | 2758 | 5449 | 8206 | | | | | 14000 | |
| 1999 | 4465 | 2702 | 5340 | 12507 | 2289 | 5242 | 11972 | 2812 | 5413 | 8225 | | | 11352 | 3097 | 14000 | |
| 2000 | 4764 | 2756 | 5305 | 12824 | 2041 | 5133 | 11893 | 2601 | 5358 | 7959 | | | | | 14000 | |
| 2001 | 4336 | 2549 | 5251 | 12136 | 1976 | 5076 | 11893 | 2957 | 5698 | 8654 | | | | | 14000 | |
| 2002 | 4450 | 2898 | 5584 | 12931 | 2295 | 5381 | 12104 | 3921 | 6650 | 10571 | | | 13946 | 1754 | 14000 | |
| 2003 | 5339 | 3842 | 6517 | 15698 | 2906 | 6203 | 14402 | 3431 | 6377 | 9808 | | | | | 14000 | |
| 2004 | 5231 | 3363 | 6249 | 14843 | 2225 | 5866 | 13267 | 2784 | 6048 | 8832 | | | 14638 | 2690 | 14000 | |
| 2005 | 4684 | 2728 | 5927 | 13339 | 1558 | 5503 | 11649 | 3265 | 6791 | 10055 | | | | | 14000 | |
| 2006 | 5942 | 3199 | 6655 | 15796 | 2010 | 6039 | 13924 | 4021 | 7592 | 11613 | | | | | 14000 | |
| 2007 | 5484 | 3941 | 7440 | 16865 | 2565 | 6777 | 14754 | 3553 | 7304 | 10856 | | | | | 14000 | |
| 2008 | 4668 | 3482 | 7158 | 15307 | 2045 | 6645 | 13298 | 3656 | 7774 | 11430 | | | 15209 | 3424 | 14000 | |
| 2009 | 4349 | 3582 | 7619 | 15550 | 2245 | 6975 | 13505 | 2685 | 6880 | 9565 | | | | | 14000 | |
| 2010 | 3942 | 2631 | 6743 | 13316 | 1729 | 6281 | 11874 | 2118 | 6119 | 8237 | | | | | 14000 | |
| 2011 | 3558 | 2075 | 5997 | 11630 | 1447 | 5817 | 10792 | 2051 | 5733 | 7784 | | | | | 14000 | |
| 2012 | 4589 | 2010 | 5618 | 12217 | 1551 | 5446 | 11562 | 2119 | 5617 | 7735 | | | 8115 | 1134 | 14000 | |
| 2013 | 4064 | 2076 | 5504 | 11645 | 1533 | 5334 | 10910 | 2118 | 5496 | 7614 | | | | | 14000 | |
| 2014 | 3890 | 2076 | 5386 | 11352 | 1581 | 5298 | 10758 | | | | | | | | 14000 | |
| 2015 | | | | | | | | | | | | | | | | 14000 |
| 2016 | | | | | | | | | | | | | | | | 14000 |
| 2017 | | | | | | | | | | | | | | | | 14000 |
| 2018 | | | | | | | | | | | | | | | | 14000 |
| 2019 | | | | | | | | | | | | | | | | 14000 |
| 2020 | | | | | | | | | | | | | | | | 14000 |
| 2021 | | | | | | | | | | | | | | | | 14000 |
| 2022 | | | | | | | | | | | | | | | | 14000 |
| 2023 | | | | | | | | | | | | | | | | 14000 |
| 2024 | | | | | | | | | | | | | | | | 14000 |
| 2025 | | | | | | | | | | | | | | | | 14000 |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|----|-----------------------------|----|
| | Field Est. | SE | Model Est. | SE |
| 1993 | 0.40 | | 0.85 | |
| 1994 | 0.90 | | 0.85 | |
| 1995 | 0.51 | | 0.85 | |
| 1996 | 0.40 | | 0.85 | |
| 1997 | 0.40 | | 0.85 | |
| 1998 | 0.55 | | 0.85 | |
| 1999 | 0.40 | | 0.85 | |
| 2000 | 0.40 | | 0.85 | |
| 2001 | 0.61 | | 0.85 | |
| 2002 | 0.90 | | 0.85 | |
| 2003 | 0.40 | | 0.85 | |
| 2004 | 0.40 | | 0.85 | |
| 2005 | 0.90 | | 0.85 | |
| 2006 | 0.83 | | 0.85 | |
| 2007 | 0.57 | | 0.85 | |
| 2008 | 0.90 | | 0.85 | |
| 2009 | 0.44 | | 0.85 | |
| 2010 | 0.40 | | 0.85 | |
| 2011 | 0.40 | | 0.85 | |
| 2012 | 0.40 | | 0.85 | |
| 2013 | 0.40 | | 0.85 | |
| 2014 | 0.90 | | 0.85 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

Parameters:

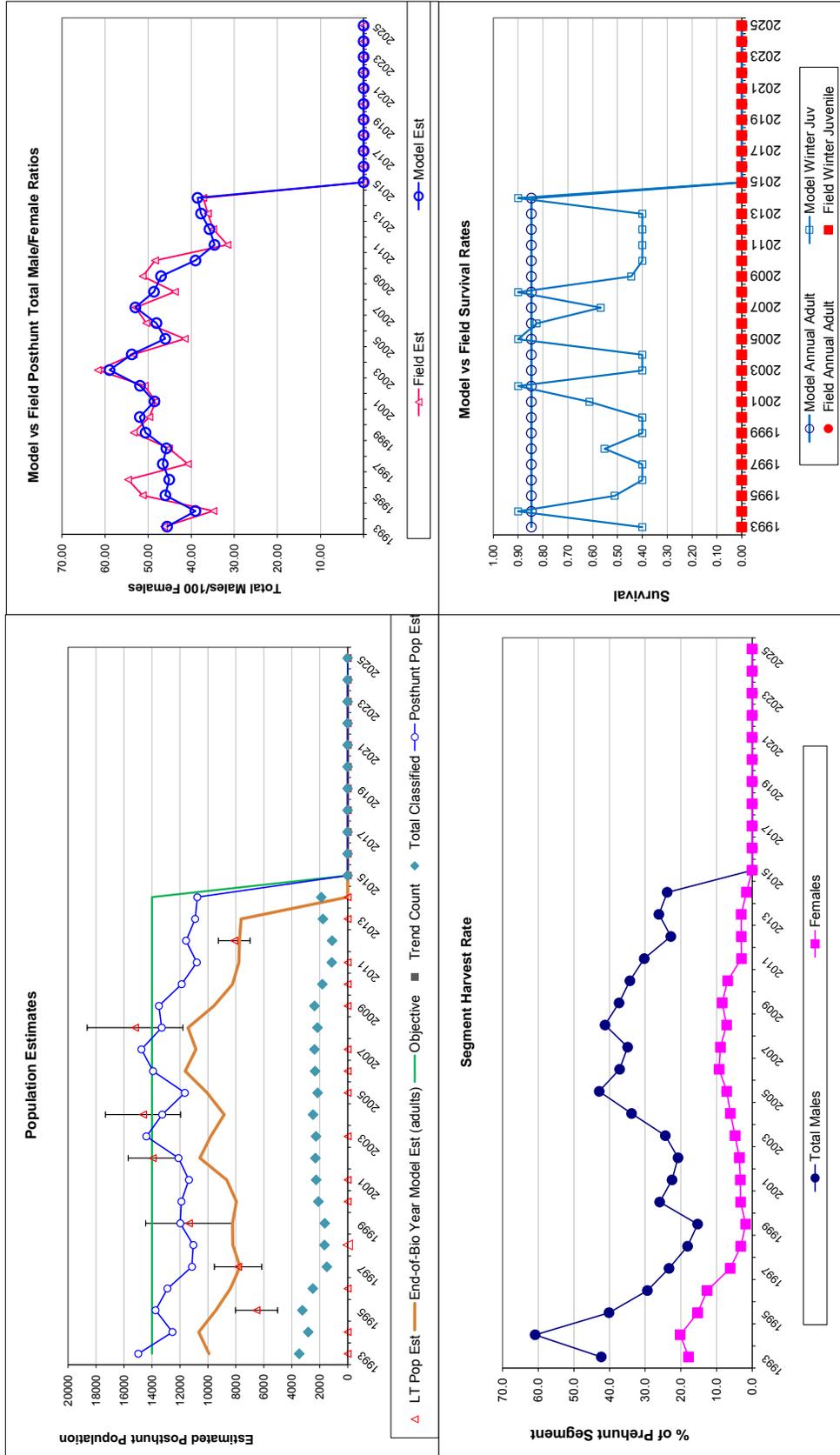
| | |
|---------------------------------|-------------|
| Adult Survival = | Optim cells |
| Initial Total Male Pop/10,000 = | 0.847 |
| Initial Female Pop/10,000 = | 0.409 |
| | 0.897 |

MODEL ASSUMPTIONS

| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

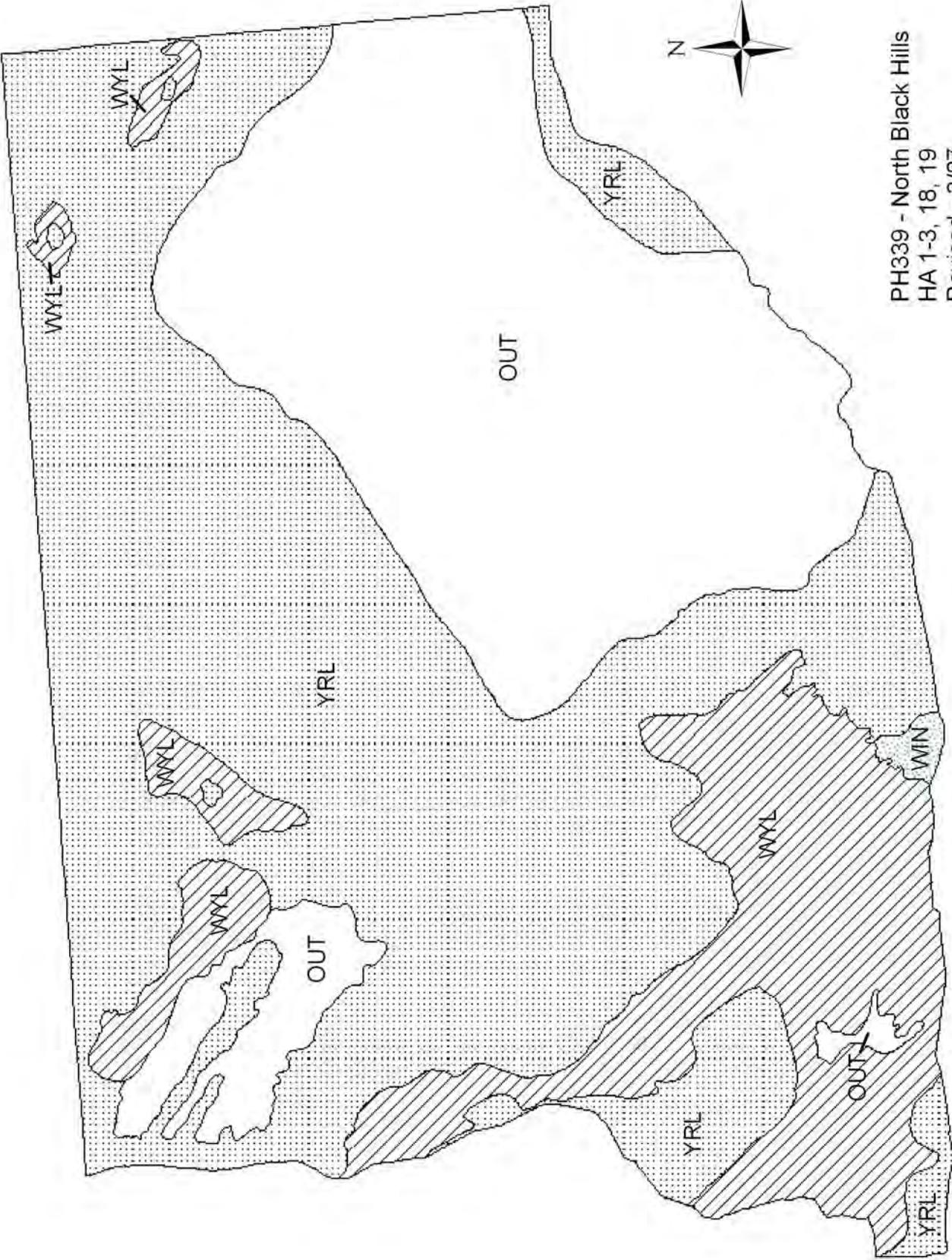
| Year | Classification Counts | | | | Total Male/Female Ratio | | | | Harvest | | | | | | | | | | | |
|------|-----------------------|-----------|----------|----------|-------------------------|-----------|-----------|----------|----------|---------|-----------|---------------|-------------|---------|-------------|---------|---------------|--|----------------------------|--|
| | Juvenile/Female Ratio | | Field SE | | Derived Est | | Field Est | | Field SE | | Males | | Females | | Juvéniles | | Total Harvest | | Segment Harvest Rate (% of | |
| | Derived Est | Field Est | Field SE | Field SE | Derived Est | Field Est | Field Est | Field SE | Males | Females | Juveniles | Total Harvest | Total Males | Females | Total Males | Females | | | | |
| 1993 | | 60.45 | 2.41 | 2.01 | 45.61 | 46.30 | 2.01 | 1575 | 1457 | 160 | 3192 | 42.3 | 17.9 | | | | | | | |
| 1994 | | 87.38 | 3.59 | 1.93 | 39.04 | 34.86 | 1.93 | 1511 | 1284 | 203 | 2998 | 60.9 | 20.2 | | | | | | | |
| 1995 | | 83.20 | 3.32 | 2.37 | 46.00 | 51.27 | 2.37 | 1200 | 993 | 203 | 2396 | 40.1 | 15.3 | | | | | | | |
| 1996 | | 84.99 | 3.89 | 2.85 | 45.11 | 54.67 | 2.85 | 767 | 732 | 96 | 1595 | 29.4 | 12.6 | | | | | | | |
| 1997 | | 69.41 | 4.08 | 2.85 | 46.61 | 40.79 | 2.85 | 555 | 315 | 34 | 904 | 23.3 | 6.2 | | | | | | | |
| 1998 | | 79.51 | 4.40 | 2.98 | 45.79 | 45.18 | 2.98 | 390 | 150 | 14 | 554 | 18.1 | 3.2 | | | | | | | |
| 1999 | | 83.62 | 4.72 | 3.44 | 50.61 | 53.33 | 3.44 | 376 | 89 | 22 | 487 | 15.3 | 1.8 | | | | | | | |
| 2000 | | 89.81 | 4.91 | 2.92 | 51.95 | 49.71 | 2.92 | 650 | 156 | 40 | 846 | 25.9 | 3.2 | | | | | | | |
| 2001 | | 82.58 | 3.93 | 2.71 | 48.55 | 48.26 | 2.71 | 521 | 159 | 30 | 710 | 22.5 | 3.3 | | | | | | | |
| 2002 | | 79.70 | 3.78 | 2.77 | 51.90 | 50.80 | 2.77 | 548 | 184 | 20 | 752 | 20.8 | 3.6 | | | | | | | |
| 2003 | | 81.92 | 4.01 | 3.28 | 58.96 | 61.68 | 3.28 | 851 | 286 | 41 | 1178 | 24.4 | 4.8 | | | | | | | |
| 2004 | | 83.72 | 3.84 | 2.80 | 53.81 | 53.35 | 2.80 | 1034 | 348 | 51 | 1433 | 33.8 | 6.1 | | | | | | | |
| 2005 | | 79.03 | 3.81 | 2.46 | 46.03 | 41.52 | 2.46 | 1064 | 385 | 88 | 1537 | 42.9 | 7.1 | | | | | | | |
| 2006 | | 89.29 | 4.17 | 2.80 | 48.08 | 50.46 | 2.80 | 1081 | 560 | 61 | 1702 | 37.2 | 9.3 | | | | | | | |
| 2007 | | 73.71 | 3.50 | 2.78 | 52.97 | 52.96 | 2.78 | 1251 | 603 | 65 | 1919 | 34.9 | 8.9 | | | | | | | |
| 2008 | | 65.21 | 3.23 | 2.47 | 48.65 | 43.80 | 2.47 | 1306 | 466 | 54 | 1826 | 41.3 | 7.2 | | | | | | | |
| 2009 | | 57.08 | 2.81 | 2.61 | 47.02 | 51.28 | 2.61 | 1216 | 585 | 58 | 1859 | 37.3 | 8.4 | | | | | | | |
| 2010 | | 58.47 | 3.26 | 2.87 | 39.02 | 48.40 | 2.87 | 820 | 420 | 71 | 1311 | 34.3 | 6.9 | | | | | | | |
| 2011 | | 59.33 | 3.99 | 2.64 | 34.60 | 31.60 | 2.64 | 571 | 164 | 27 | 762 | 30.3 | 3.0 | | | | | | | |
| 2012 | | 81.68 | 5.38 | 3.03 | 35.78 | 34.89 | 3.03 | 417 | 156 | 22 | 595 | 22.8 | 3.1 | | | | | | | |
| 2013 | | 73.84 | 3.91 | 2.42 | 37.72 | 36.15 | 2.42 | 494 | 155 | 19 | 668 | 26.2 | 3.1 | | | | | | | |
| 2014 | | 72.22 | 3.72 | 2.38 | 38.55 | 37.22 | 2.38 | 450 | 80 | 10 | 540 | 23.8 | 1.6 | | | | | | | |
| 2015 | | | | | | | | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | | | | | | | |

FIGURES



Comments:

END



PH339 - North Black Hills
 HA 1-3, 18, 19
 Revised - 3/87

2013 - JCR Evaluation Form

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

HERD: PR351 - GILLETTE

HUNT AREAS: 17

PREPARED BY: ERIKA
PECKHAM

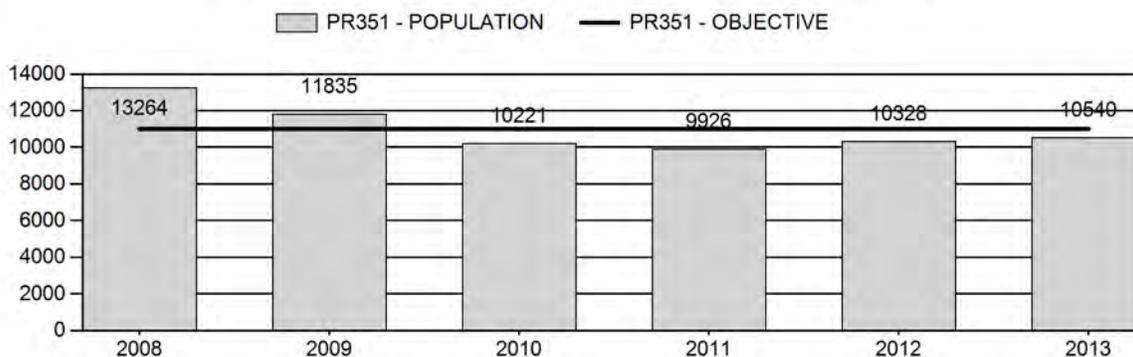
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 11,115 | 10,540 | 10,151 |
| Harvest: | 1,190 | 1,048 | 1,030 |
| Hunters: | 1,303 | 1,259 | 1,250 |
| Hunter Success: | 91% | 83% | 82 % |
| Active Licenses: | 1,394 | 1,320 | 1,300 |
| Active License Percent: | 85% | 79% | 79 % |
| Recreation Days: | 4,212 | 3,652 | 3,650 |
| Days Per Animal: | 3.5 | 3.5 | 3.5 |
| Males per 100 Females | 46 | 43 | |
| Juveniles per 100 Females | 49 | 60 | |

| | |
|---|--------------|
| Population Objective: | 11,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | -4.2% |
| Number of years population has been + or - objective in recent trend: | 1 |
| Model Date: | 02/24/2014 |

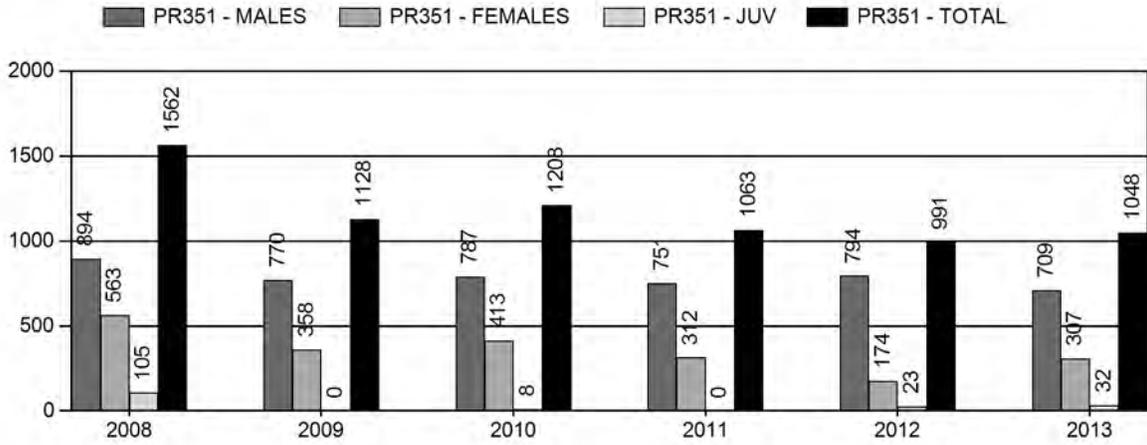
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 5.0% | 5.9% |
| Males ≥ 1 year old: | 41.2% | 32.8% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 10.3% | 8.9% |
| Proposed change in post-season population: | -11.0% | -10% |

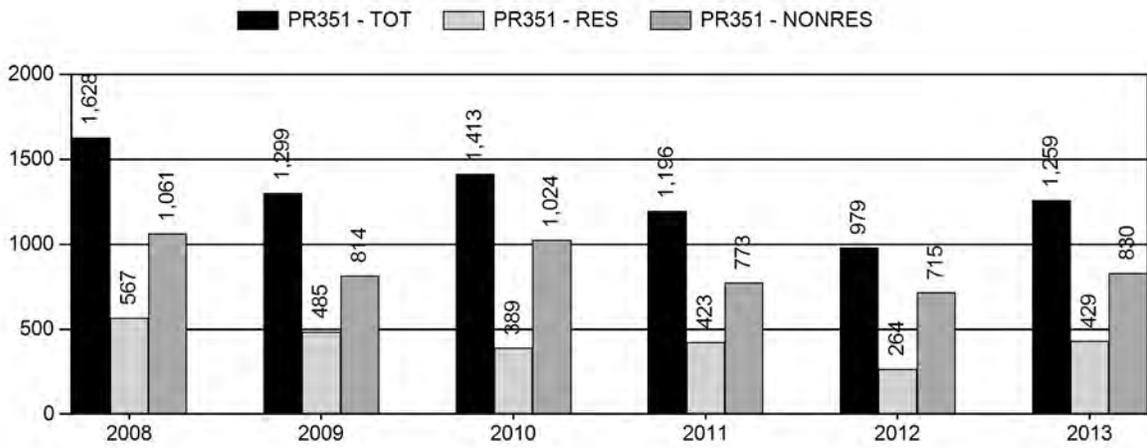
Population Size - Postseason



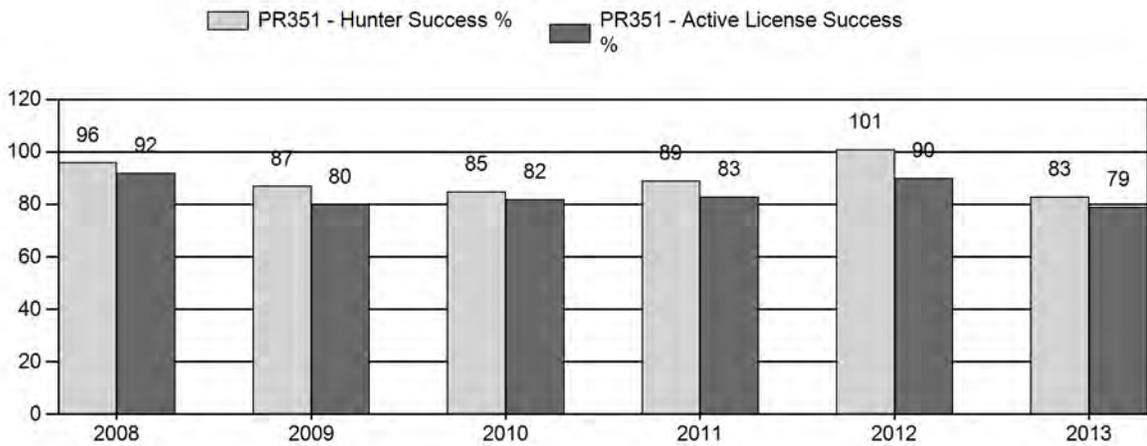
Harvest



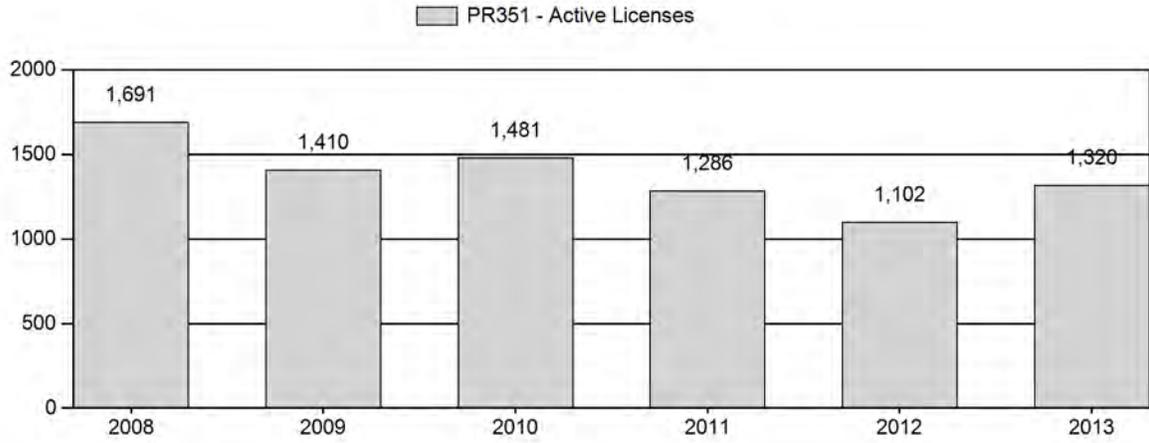
Number of Hunters



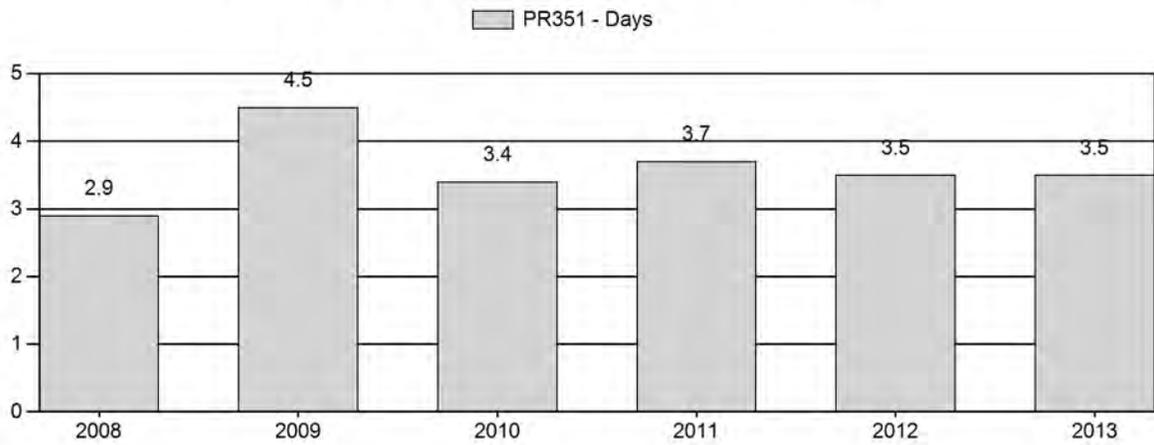
Harvest Success



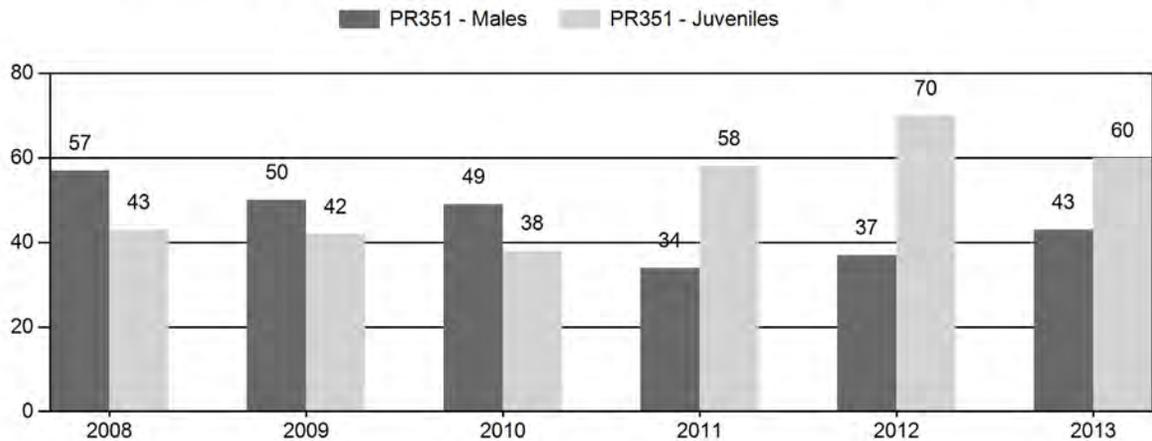
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR351 - GILLETTE

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

**2014 HUNTING SEASONS
GILLETTE PRONGHORN HERD (PR351)**

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

Management Evaluation

Current Postseason Population Management Objective: 11,000

Management Strategy: Recreational

2013 Postseason Population Estimate: ~10,500

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 16mm, 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 2007-2011 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.

| | |
|------------------|----------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Erika Peckham |
| Herd Unit & No.: | PR351-Gillette |
| Model date: | 02/21/2014:12 |

| MODELS SUMMARY | | |
|----------------|-----|---------------|
| | Fit | Relative AICc |
| CJ,CA | 165 | 174 |
| SC,J,SCA | 158 | 167 |
| TS,J,CA | 72 | 176 |

Clear form

Check best model to create report

- CJ,CA Model
 SC,J,SCA M.
 TS,J,CA Model

Notes

| Year | Predicted Prehunt Population (year t) | | Predicted Posthunt Population (year t) | | Population Estimates from Top Model | | Predicted adult End-of-bio-year Pop (year t) | | LT Population Estimate Field Est | Trend Count | Objective | |
|------|---------------------------------------|-------|--|-------|-------------------------------------|---------|--|--------------|----------------------------------|-------------|-----------|--|
| | Juveniles | Total | Juveniles | Total | Total Males | Females | Total Males | Total Adults | | | | |
| 1993 | 3268 | 16473 | 3225 | 14792 | 3540 | 8027 | 3565 | 11021 | | | 11000 | |
| 1994 | 6466 | 17266 | 6377 | 15234 | 2399 | 6458 | 3174 | 9891 | 6860 | | 11000 | |
| 1995 | 2899 | 12592 | 2734 | 10327 | 2060 | 5534 | 2860 | 8720 | 1624 | | 11000 | |
| 1996 | 3912 | 12458 | 3832 | 10923 | 1854 | 5237 | 2633 | 8257 | | | 11000 | |
| 1997 | 2372 | 10464 | 2343 | 9389 | 1642 | 5404 | 2345 | 8068 | | | 11000 | |
| 1998 | 2493 | 10400 | 2493 | 9889 | 1805 | 5592 | 1989 | 7324 | 6840 | 1706 | 11000 | |
| 1999 | 3000 | 10177 | 3000 | 9755 | 1550 | 5205 | 2653 | 8521 | | | 11000 | |
| 2000 | 3972 | 12323 | 3965 | 11550 | 1885 | 5700 | 3336 | 10069 | 9141 | 1718 | 11000 | |
| 2001 | 3049 | 12917 | 3044 | 12286 | 2690 | 6552 | 3469 | 6887 | | | 11000 | |
| 2002 | 3408 | 13557 | 3406 | 12968 | 2842 | 6720 | 3930 | 11292 | 16636 | 2122 | 11000 | |
| 2003 | 3989 | 15056 | 3984 | 14368 | 3255 | 7129 | 4328 | 12080 | | | 11000 | |
| 2004 | 5578 | 17416 | 5566 | 16617 | 3596 | 7465 | 4130 | 11683 | | | 11000 | |
| 2005 | 6010 | 17459 | 6000 | 16387 | 3235 | 7153 | 3887 | 11245 | | | 11000 | |
| 2006 | 7696 | 18716 | 7661 | 17405 | 2835 | 6910 | 5378 | 14379 | | | 11000 | |
| 2007 | 5439 | 19531 | 5439 | 17901 | 4227 | 8235 | 4596 | 12725 | | | 11000 | |
| 2008 | 3429 | 15900 | 3314 | 14181 | 3521 | 7347 | 3527 | 10414 | 10625 | 2003 | 11000 | |
| 2009 | 2846 | 13051 | 2846 | 11810 | 2609 | 6356 | 2701 | 8707 | | | 11000 | |
| 2010 | 2243 | 10776 | 2234 | 9447 | 1781 | 5432 | 1855 | 6927 | | | 11000 | |
| 2011 | 2863 | 9652 | 2863 | 8483 | 992 | 4628 | 1995 | 7394 | | | 11000 | |
| 2012 | 3702 | 10948 | 3676 | 9848 | 1084 | 5088 | 2529 | 8390 | | | 11000 | |
| 2013 | 3470 | 11692 | 3435 | 10540 | 1699 | 5406 | 2395 | 8057 | 8337 | 1370 | 11000 | |
| 2014 | 3388 | 11284 | 3355 | 10151 | 1577 | 5219 | | | | | 11000 | |
| 2015 | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|------------|-----------------------------|------------|
| | Model Est. | Field Est. | Model Est. | Field Est. |
| 1993 | 0.40 | | 0.85 | |
| 1994 | 0.40 | | 0.85 | |
| 1995 | 0.90 | | 0.85 | |
| 1996 | 0.61 | | 0.85 | |
| 1997 | 0.90 | | 0.85 | |
| 1998 | 0.40 | | 0.85 | |
| 1999 | 0.90 | | 0.85 | |
| 2000 | 0.90 | | 0.85 | |
| 2001 | 0.80 | | 0.85 | |
| 2002 | 0.90 | | 0.85 | |
| 2003 | 0.79 | | 0.85 | |
| 2004 | 0.40 | | 0.85 | |
| 2005 | 0.40 | | 0.85 | |
| 2006 | 0.79 | | 0.85 | |
| 2007 | 0.40 | | 0.85 | |
| 2008 | 0.40 | | 0.85 | |
| 2009 | 0.40 | | 0.85 | |
| 2010 | 0.40 | | 0.85 | |
| 2011 | 0.90 | | 0.85 | |
| 2012 | 0.87 | | 0.85 | |
| 2013 | 0.59 | | 0.85 | |
| 2014 | 0.40 | | 0.85 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

Parameters:

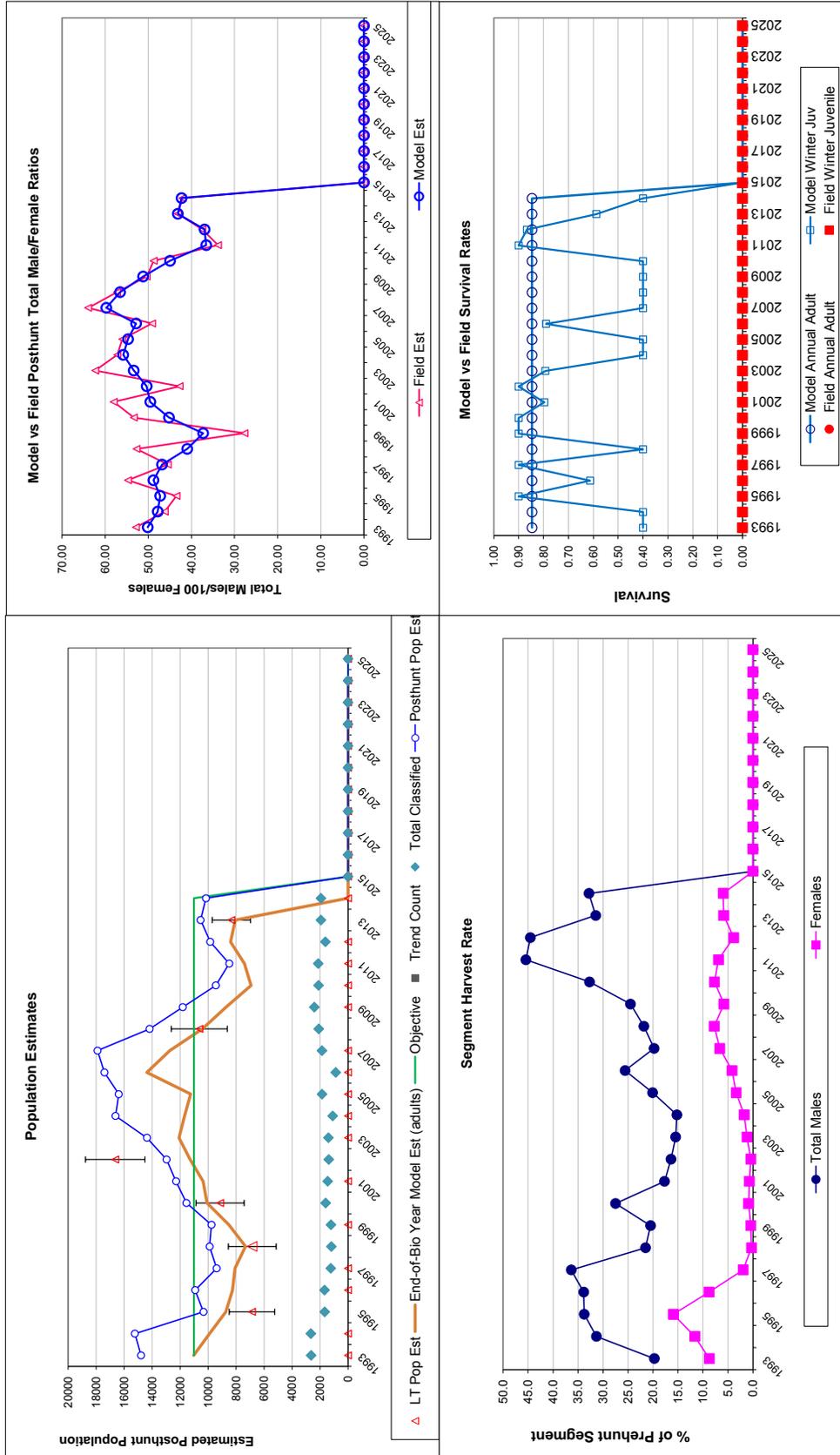
| | |
|---------------------------------|-------------|
| Adult Survival = | Optim cells |
| Initial Total Male Pop/10,000 = | 0.846 |
| Initial Female Pop/10,000 = | 0.441 |
| | 0.680 |

MODEL ASSUMPTIONS

| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | Total Male/Female Ratio | | | | Harvest | | | | | | | | | | | |
|------|-----------------------|-----------|----------|----------|-------------------------|-----------|-----------|----------|-------------|-----------|----------|-------|---------|-----------|---------------|-------------|---------------|-------------|----------------------------|--|
| | Juvenile/Female Ratio | | Field SE | | Derived Est | | Field Est | | Field SE | | Males | | Females | | Juvéniles | | Total Harvest | | Segment Harvest Rate (% of | |
| | Derived Est | Field Est | Field SE | Field SE | Derived Est | Field Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juvéniles | Total Harvest | Total Males | Females | Total Males | Females | |
| 1993 | | 37.16 | 1.92 | | 50.14 | 52.89 | 2.42 | | 791 | 688 | 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 | | | | | | | | | | | | | | | | | | | | |

FIGURES



Comments:

Appendix A:

Bio-Year 2012-Results and Histogram

```

Effort      :    1160.037
# samples   :     30
Width       :    208.6700
Left        :     0.0000000
# observations:  183
    
```

Model

```

Uniform key, k(y) = 1/W
Simple polynomial adjustments of order(s) : 2
    
```

| Parameter | Point Estimate | Standard Error | Percent Coef. of Variation | 95 Percent Confidence Interval | |
|-----------|----------------|----------------|----------------------------|--------------------------------|-------------|
| A(1) | -0.8699 | 0.1070 | | | |
| f(0) | 0.67493E-02 | 0.33898E-03 | 5.02 | 0.61130E-02 | 0.74520E-02 |
| p | 0.71003 | 0.35661E-01 | 5.02 | 0.64309 | 0.78395 |
| ESW | 148.16 | 7.4413 | 5.02 | 134.19 | 163.59 |

Measurement Units

```

Density: Numbers/Sq. miles
ESW: meters
    
```

Component Percentages of Var(D)

```

Detection probability : 9.3
Encounter rate       : 83.5
Cluster size         : 7.2
    
```

Estimation Summary: Encounter Rate

| | Estimate | %CV | df | 95% Confidence Interval | |
|-------|----------|-------|-------|-------------------------|---------|
| n | 183.00 | | | | |
| k | 30.000 | | | | |
| L | 1160.0 | | | | |
| n/L | 0.15775 | 15.01 | 15.00 | 0.11476 | 0.21686 |
| Left | 0.0000 | | | | |
| Width | 208.67 | | | | |

Estimation Summary: Detection Probability

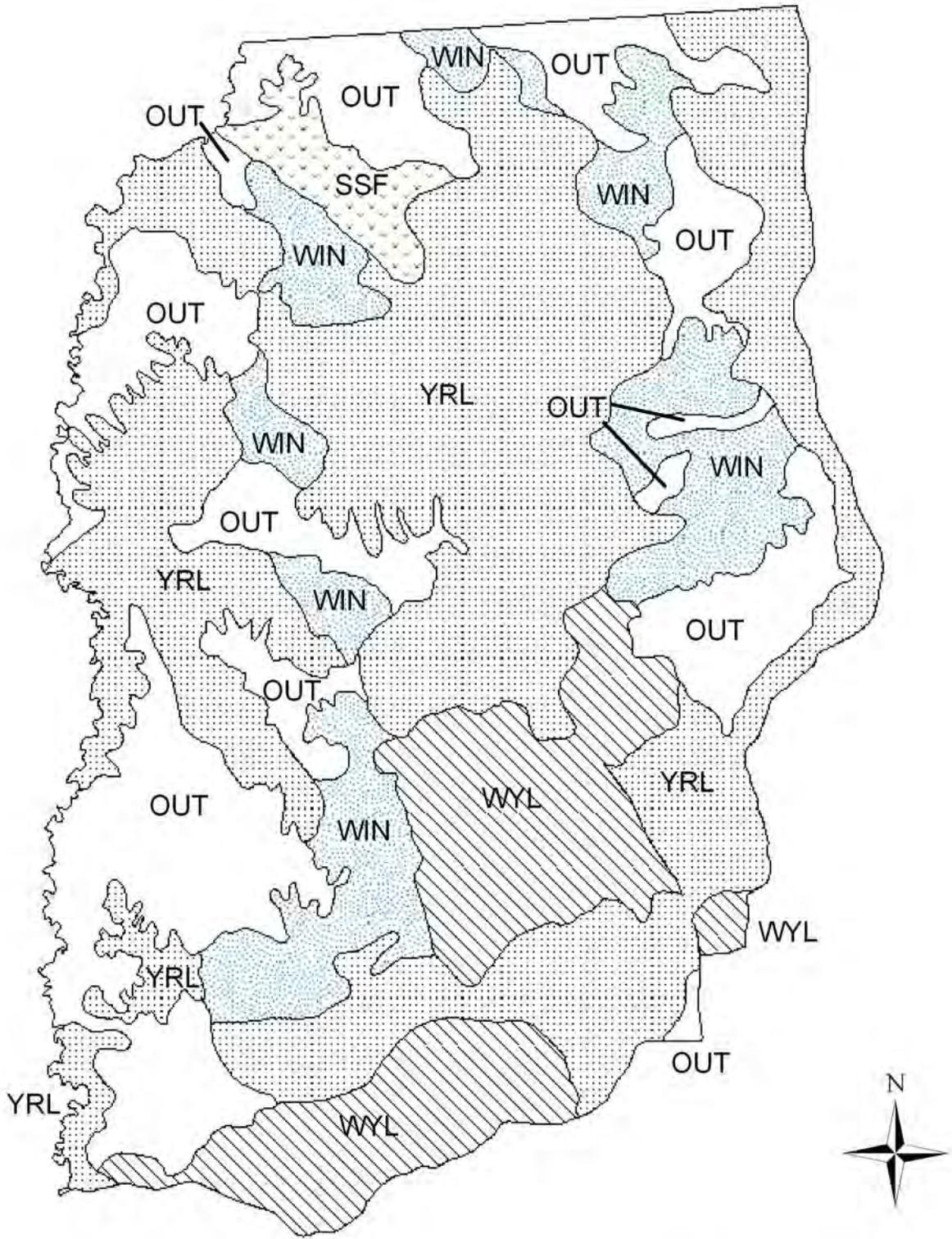
| | Estimate | %CV | df | 95% Confidence Interval | |
|--------------------|-------------|------|--------|-------------------------|-------------|
| ----- | | | | | |
| Uniform/Polynomial | | | | | |
| m | 1.0000 | | | | |
| lnL | -282.37 | | | | |
| AIC | 566.75 | | | | |
| AICc | 566.77 | | | | |
| BIC | 569.96 | | | | |
| Chi-p | 0.72359 | | | | |
| f(0) | 0.67493E-02 | 5.02 | 182.00 | 0.61130E-02 | 0.74520E-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% Confidence Interval | |
|----------------------|-------------|------|--------|-------------------------|--------|
| ----- | | | | | |
| Average cluster size | | | | | |
| | 1.7049 | 6.00 | 182.00 | 1.5148 | 1.9188 |
| Uniform/Polynomial | | | | | |
| r | 0.11846E-01 | | | | |
| r-p | 0.56323 | | | | |
| E(S) | 1.6520 | 4.40 | 181.00 | 1.5146 | 1.8018 |

Estimation Summary-Density and Abundance

| | Estimate | %CV | 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

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

HERD: PR352 - MIDDLE FORK

HUNT AREAS: 21

PREPARED BY: DAN THIELE

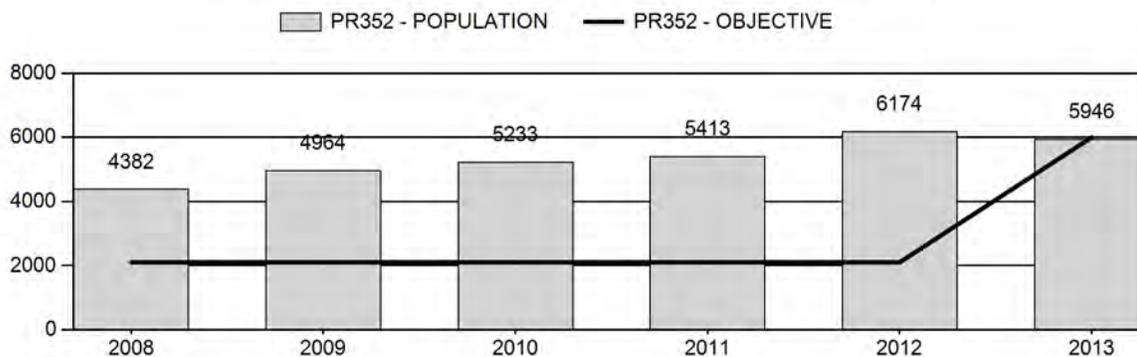
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 5,233 | 5,946 | 6,236 |
| Harvest: | 845 | 823 | 850 |
| Hunters: | 923 | 1,156 | 1,000 |
| Hunter Success: | 92% | 71% | 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 recent trend: | 1 |
| Model Date: | 2/11/2014 |

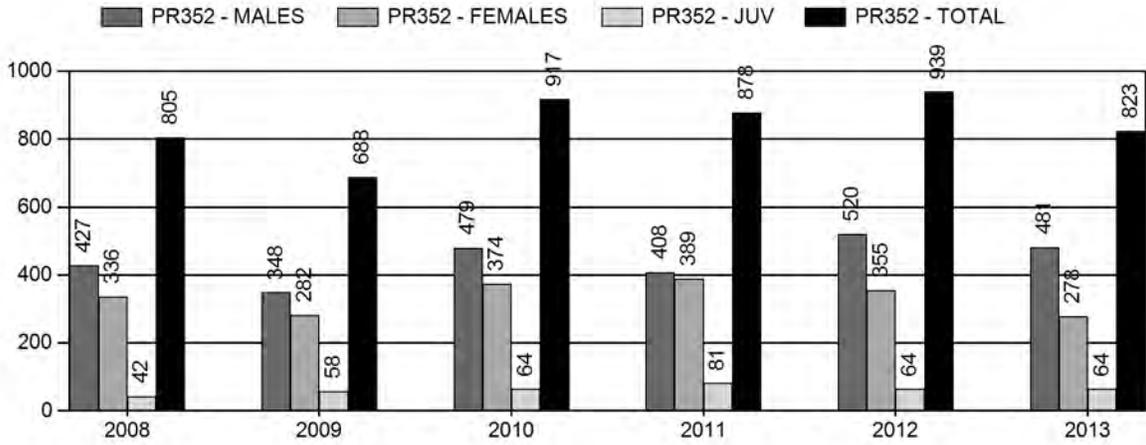
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 14% | 10% |
| Males ≥ 1 year old: | 34% | 33% |
| Juveniles (< 1 year old): | 3% | 2% |
| Total: | 12% | 12% |
| Proposed change in post-season population: | -4% | +5% |

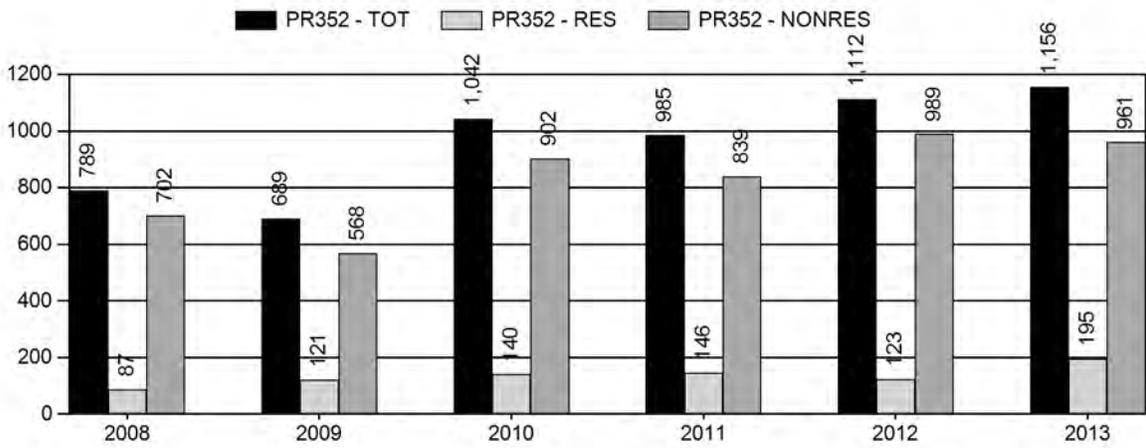
Population Size - Postseason



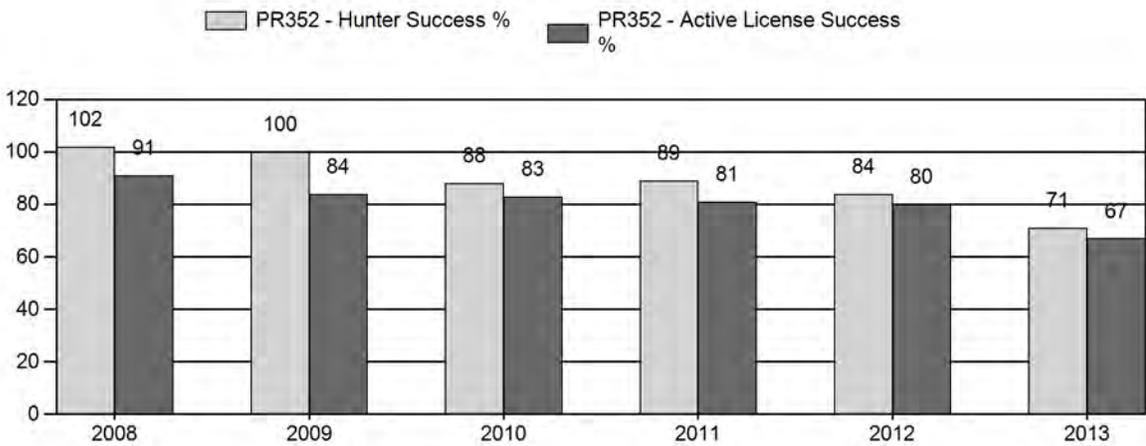
Harvest



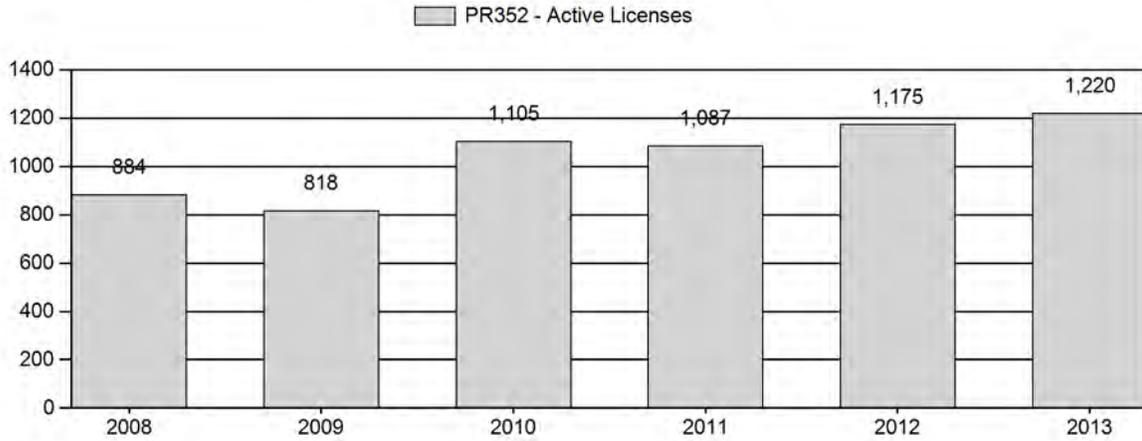
Number of Hunters



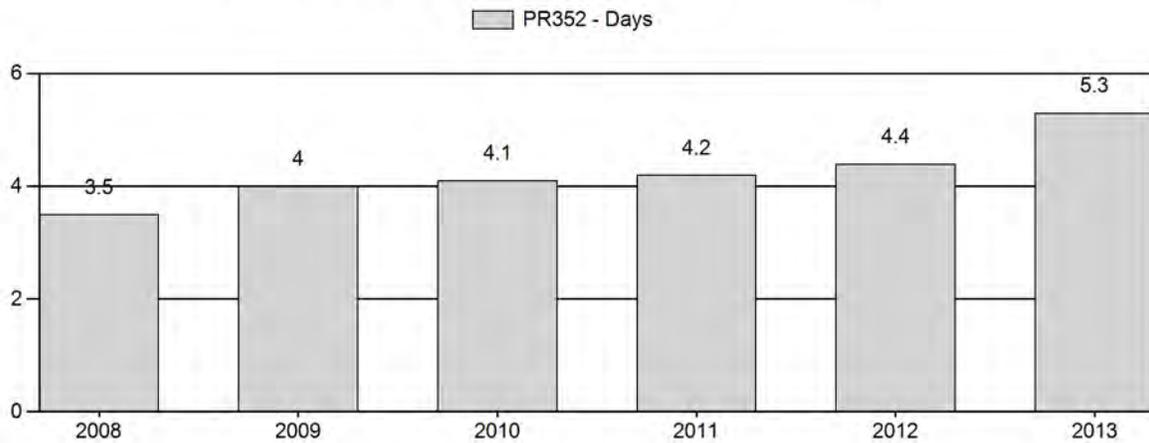
Harvest Success



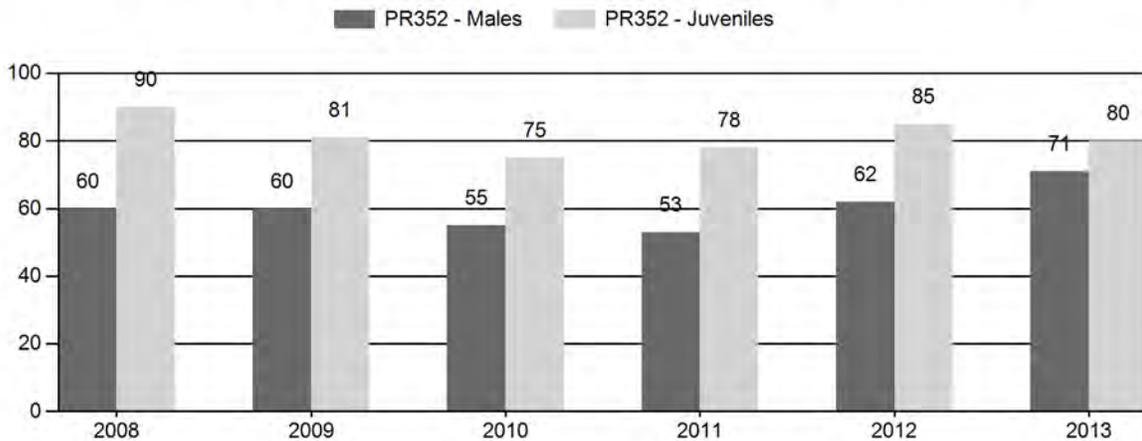
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR352 - MIDDLE FORK

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

**2014 HUNTING SEASONS
MIDDLE FORK PRONGHORN HERD (PR352)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--|
| | | Opens | Closes | | |
| 21 | 1 | Oct. 15 | Oct. 31 | 650 | Limited quota licenses; any antelope |
| | 6 | Oct. 15 | Oct. 31 | 500 | Limited quota licenses; doe or fawn |
| | | Nov. 1 | Nov. 15 | | Unused Area 21 Type 6 licenses valid on private land |
| 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 | 1 | -100 |
| | 6 | -100 |

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 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

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

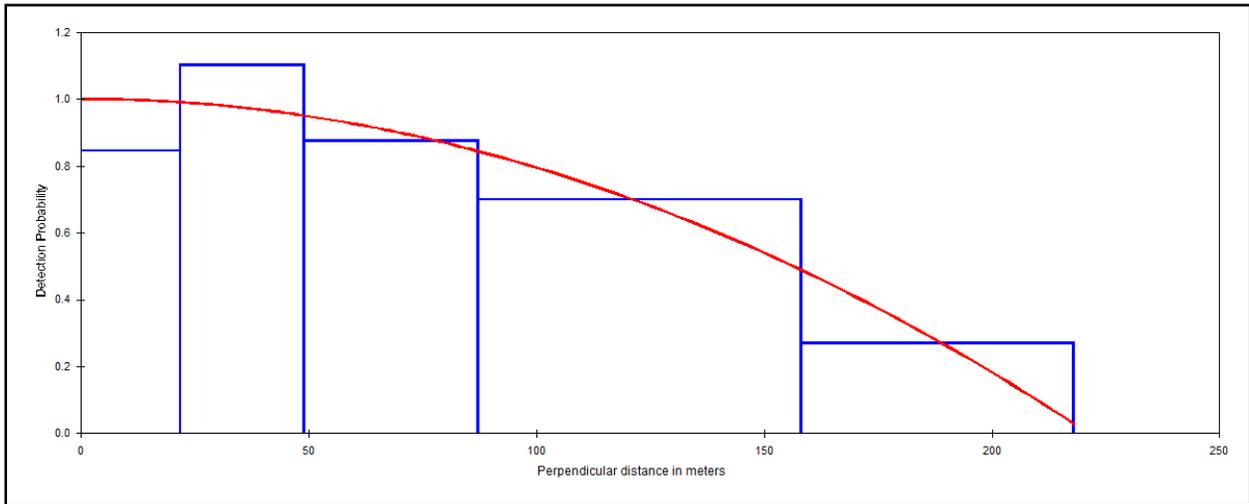
A 2012 end-of-year population estimate for this herd was derived using line transect sampling on June 5 and 6, 2013. The survey was flown by Laird Flying Service of Ekalaka, Montana using a Husky Aviat with a single observer. Transect beginning and ending locations and group observations including distance 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 mi²). 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 6.0v2.

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 groups/mi² and the pronghorn density

was 6.7 pronghorn/mi². 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



| | |
|-----------------------------|--|
| INPUT | Pronghorn Dan Thiele Middle Fork (352) 02/11/14 |
| Species: | Pronghorn |
| Biologist: | Dan Thiele |
| Herd Unit & No.: | Middle Fork (352) |
| Model date: | 02/11/14 |

| MODELS SUMMARY | | | Fit | Relative AICc | Notes |
|----------------|---|-----|-----|---------------|-------|
| CJ,CA | Constant Juvenile & Adult Survival | 133 | | | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 89 | | | |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 158 | | | |

| Year | Predicted Prehunt Population (year t) | | | Predicted Posthunt Population (year t) | | | Population Estimates from Top Model | | | Predicted adult End-of-bio-year Pop (year t) | | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------------|---------|--|-------------|---------|-------------------------------------|-------------|---------|--|-------------|---------|------------------------|----------|-------------|-----------|
| | Juveniles | Total Males | Females | Juveniles | Total Males | Females | Total | Total Males | Females | Total Adults | Total Males | Females | Field Est | Field SE | | |
| 1993 | 682 | 707 | 1378 | 644 | 450 | 1141 | 2235 | 522 | 1174 | 1696 | 522 | 1174 | 1670 | 700 | 2100 | |
| 1994 | 879 | 511 | 1150 | 861 | 321 | 917 | 2099 | 636 | 1193 | 1830 | 636 | 1193 | 1830 | 739 | 2100 | |
| 1995 | 801 | 623 | 1169 | 771 | 440 | 1017 | 2228 | 547 | 1092 | 1639 | 547 | 1092 | 1467 | 739 | 2100 | |
| 1996 | 972 | 536 | 1070 | 945 | 432 | 983 | 2288 | 582 | 1029 | 1611 | 582 | 1029 | 1473 | 270 | 2100 | |
| 1997 | 722 | 570 | 1009 | 718 | 405 | 1023 | 2133 | 566 | 1155 | 1640 | 566 | 1155 | 1473 | 270 | 2100 | |
| 1998 | 960 | 545 | 1062 | 960 | 405 | 1023 | 2389 | 790 | 1458 | 1721 | 790 | 1458 | 3367 | 623 | 2100 | |
| 1999 | 1026 | 555 | 1131 | 1014 | 413 | 1113 | 2540 | 968 | 1719 | 2247 | 968 | 1719 | 3264 | 1104 | 2100 | |
| 2000 | 1012 | 774 | 1428 | 1008 | 607 | 1393 | 3008 | 1182 | 1964 | 3146 | 1182 | 1964 | 5190 | 2637 | 2100 | |
| 2001 | 1103 | 949 | 3736 | 1092 | 797 | 1622 | 3510 | 1250 | 2111 | 3361 | 1250 | 2111 | 6375 | 1949 | 2100 | |
| 2002 | 1375 | 1158 | 1925 | 1337 | 976 | 1880 | 4193 | 1475 | 2412 | 3887 | 1475 | 2412 | 1104 | 630 | 2100 | |
| 2003 | 1641 | 1225 | 2069 | 1630 | 981 | 1966 | 4577 | 1106 | 2346 | 3452 | 1106 | 2346 | 2637 | 630 | 2100 | |
| 2004 | 1744 | 1445 | 2364 | 1719 | 1162 | 2311 | 5192 | 1031 | 2228 | 3815 | 1031 | 2228 | 1949 | 630 | 2100 | |
| 2005 | 1802 | 1384 | 2462 | 1780 | 1031 | 2178 | 5122 | 919 | 2282 | 3452 | 919 | 2282 | 1949 | 630 | 2100 | |
| 2006 | 1404 | 1272 | 2467 | 1371 | 884 | 2010 | 4518 | 684 | 2010 | 3318 | 684 | 2010 | 1949 | 630 | 2100 | |
| 2007 | 1076 | 1084 | 2299 | 1038 | 684 | 1871 | 3732 | 541 | 1871 | 3800 | 541 | 1871 | 1949 | 630 | 2100 | |
| 2008 | 2016 | 1011 | 2241 | 1969 | 541 | 1871 | 4382 | 862 | 2169 | 3800 | 862 | 2169 | 1949 | 630 | 2100 | |
| 2009 | 1997 | 1245 | 2479 | 1934 | 862 | 2169 | 4964 | 976 | 2302 | 4302 | 976 | 2302 | 1949 | 630 | 2100 | |
| 2010 | 2026 | 1503 | 2713 | 1955 | 976 | 2302 | 5233 | 1062 | 2313 | 4339 | 1062 | 2313 | 1949 | 630 | 2100 | |
| 2011 | 2126 | 1511 | 2741 | 2037 | 1062 | 2313 | 5413 | 1099 | 2596 | 4752 | 1099 | 2596 | 1949 | 630 | 2100 | |
| 2012 | 2549 | 1671 | 2986 | 2479 | 1099 | 2596 | 6174 | 992 | 2651 | 4568 | 992 | 2651 | 1949 | 630 | 2100 | |
| 2013 | 2374 | 1521 | 2956 | 2304 | 992 | 2651 | 5946 | 1019 | 2782 | 4777 | 1019 | 2782 | 1949 | 630 | 2100 | |
| 2014 | 2490 | 1569 | 3112 | 2435 | 1019 | 2782 | 6236 | 1155 | 3017 | 5156 | 1155 | 3017 | 1949 | 630 | 2100 | |
| 2015 | 2678 | 1705 | 3347 | 2623 | 1155 | 3017 | 6795 | | | | | | | | 2100 | |
| 2016 | | | | | | | | | | | | | | | 2100 | |
| 2017 | | | | | | | | | | | | | | | 2100 | |
| 2018 | | | | | | | | | | | | | | | 2100 | |
| 2019 | | | | | | | | | | | | | | | 2100 | |
| 2020 | | | | | | | | | | | | | | | 2100 | |
| 2021 | | | | | | | | | | | | | | | 2100 | |
| 2022 | | | | | | | | | | | | | | | 2100 | |
| 2023 | | | | | | | | | | | | | | | 2100 | |
| 2024 | | | | | | | | | | | | | | | 2100 | |
| 2025 | | | | | | | | | | | | | | | 2100 | |

Survival and Initial Population Estimates

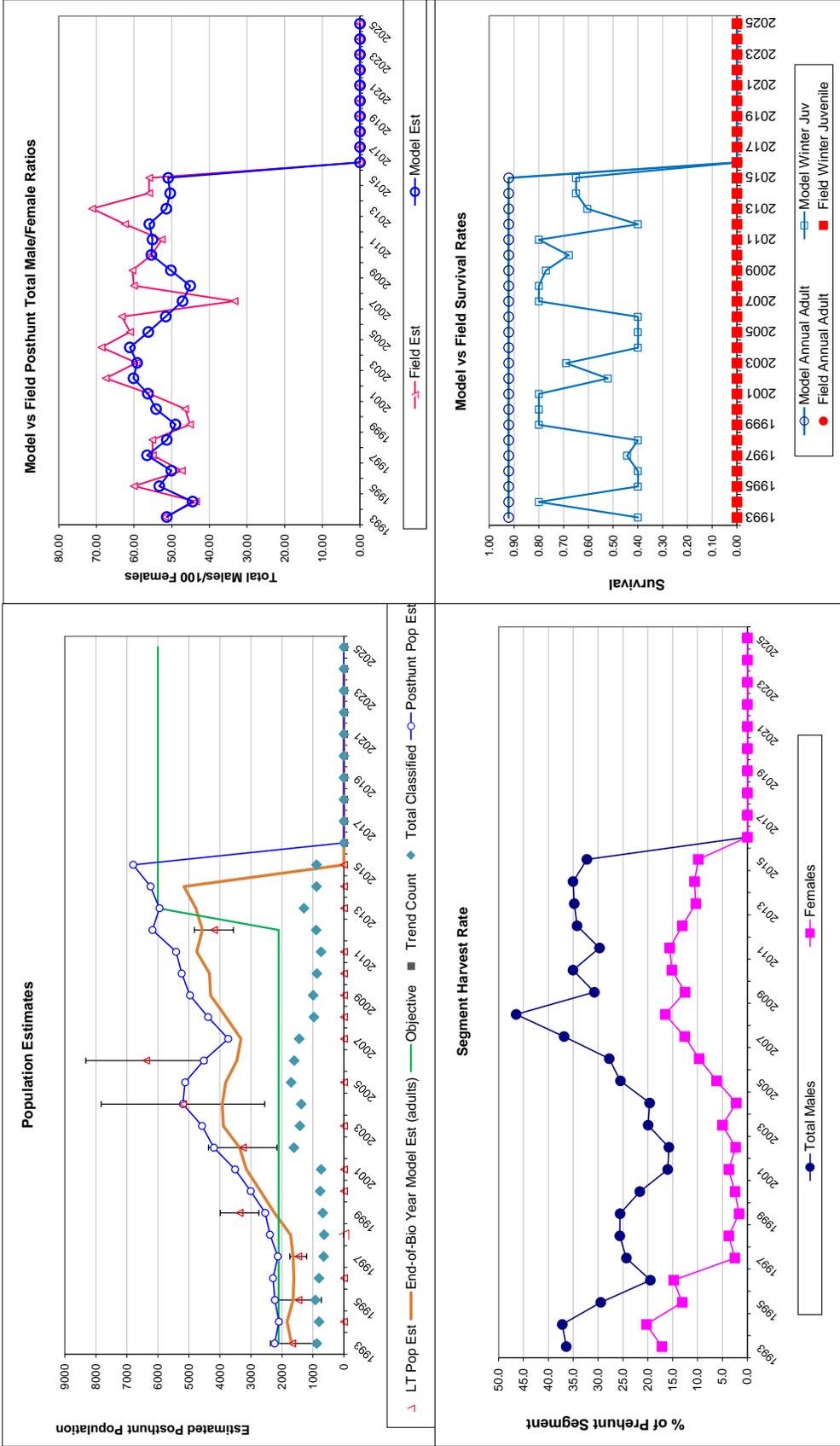
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.40 | | 0.92 | |
| 1994 | 0.80 | | 0.92 | |
| 1995 | 0.40 | | 0.92 | |
| 1996 | 0.40 | | 0.92 | |
| 1997 | 0.44 | | 0.92 | |
| 1998 | 0.40 | | 0.92 | |
| 1999 | 0.80 | | 0.92 | |
| 2000 | 0.80 | | 0.92 | |
| 2001 | 0.80 | | 0.92 | |
| 2002 | 0.52 | | 0.92 | |
| 2003 | 0.69 | | 0.92 | |
| 2004 | 0.40 | | 0.92 | |
| 2005 | 0.40 | | 0.92 | |
| 2006 | 0.40 | | 0.92 | |
| 2007 | 0.80 | | 0.92 | |
| 2008 | 0.80 | | 0.92 | |
| 2009 | 0.77 | | 0.92 | |
| 2010 | 0.68 | | 0.92 | |
| 2011 | 0.80 | | 0.92 | |
| 2012 | 0.40 | | 0.92 | |
| 2013 | 0.60 | | 0.92 | |
| 2014 | 0.65 | | 0.92 | |
| 2015 | 0.65 | | 0.92 | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Juvenile Survival = | | 0.650 |
| Adult Survival = | | 0.922 |
| Initial Total Male Pop/10,000 = | | 0.071 |
| Initial Female Pop/10,000 = | | 0.138 |

| MODEL ASSUMPTIONS | |
|-----------------------------------|------------|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

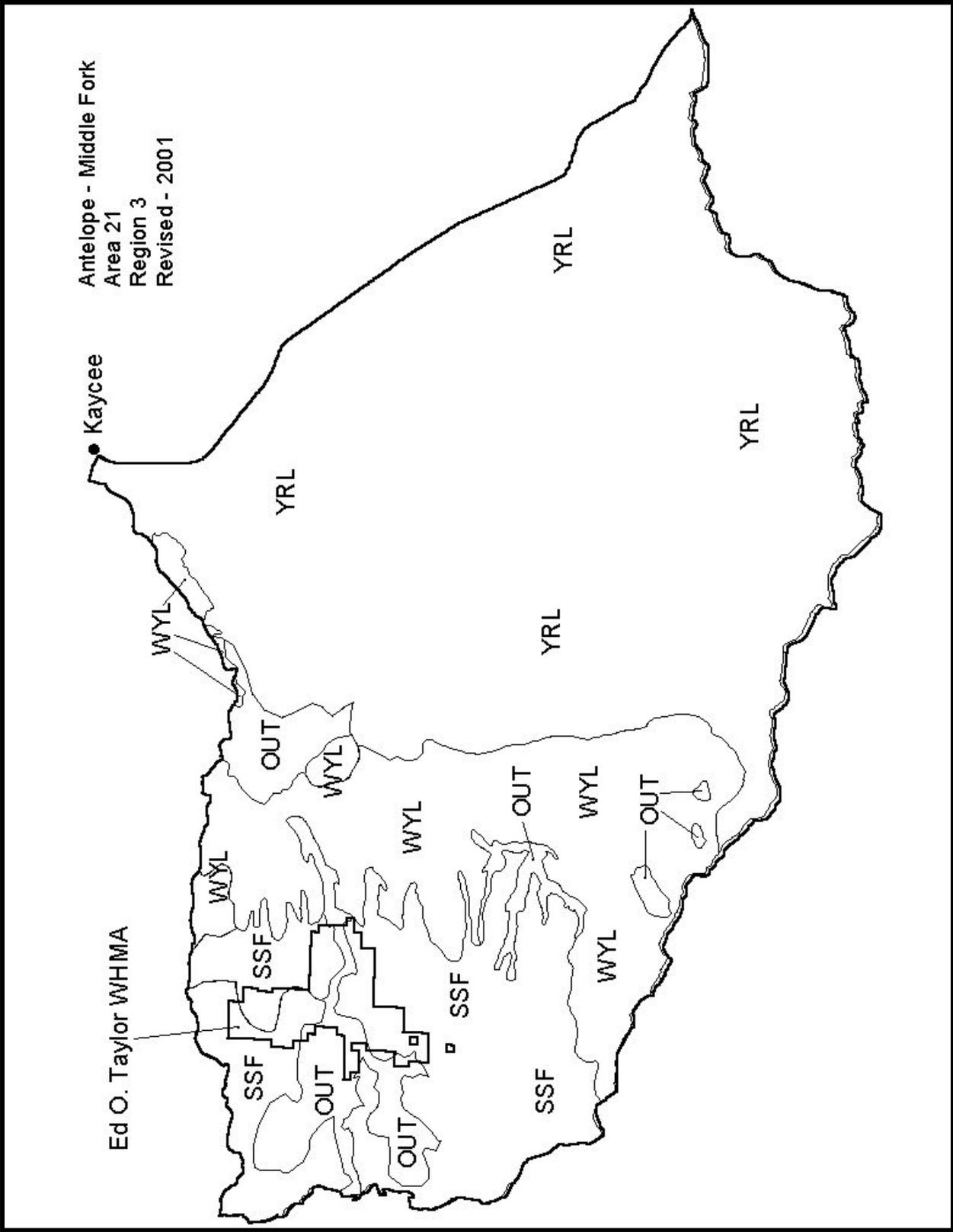
| Year | Classification Counts | | | | | | Harvest | | | | | |
|------|-----------------------|-----------|----------|-------------------------|-----------|----------|---------------|---------|-----------|----------------------------|-------------|---------|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Total Harvest | | | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juveniles | Total Harvest | Total Males | Females |
| 1993 | | | | | | | | | | | | |
| 1994 | 49.54 | 76.44 | 4.13 | 51.84 | 43.56 | 4.26 | 234 | 215 | 35 | 484 | 36.4 | 17.2 |
| 1995 | 68.49 | 68.49 | 6.08 | 60.05 | 60.05 | 4.88 | 173 | 139 | 17 | 402 | 37.2 | 20.3 |
| 1996 | 90.83 | 90.83 | 5.35 | 47.34 | 47.34 | 4.54 | 167 | 144 | 27 | 333 | 29.5 | 13.1 |
| 1997 | 71.63 | 71.63 | 7.16 | 56.55 | 56.55 | 4.54 | 95 | 126 | 25 | 264 | 19.5 | 14.8 |
| 1998 | 90.42 | 90.42 | 8.12 | 55.17 | 55.17 | 5.43 | 126 | 23 | 4 | 153 | 24.3 | 2.5 |
| 1999 | 90.69 | 90.69 | 7.72 | 45.17 | 45.17 | 4.76 | 129 | 36 | 0 | 163 | 25.6 | 3.7 |
| 2000 | 70.82 | 70.82 | 5.85 | 46.46 | 46.46 | 4.39 | 152 | 32 | 11 | 187 | 25.6 | 1.7 |
| 2001 | 65.47 | 65.47 | 5.70 | 55.86 | 55.86 | 5.11 | 138 | 57 | 3 | 205 | 21.6 | 2.5 |
| 2002 | 71.41 | 71.41 | 4.26 | 67.56 | 67.56 | 4.10 | 166 | 41 | 10 | 205 | 16.0 | 3.7 |
| 2003 | 79.33 | 79.33 | 4.89 | 59.33 | 59.33 | 3.99 | 222 | 94 | 10 | 326 | 15.8 | 2.3 |
| 2004 | 73.77 | 73.77 | 4.75 | 68.66 | 68.66 | 4.52 | 258 | 48 | 23 | 329 | 19.9 | 5.0 |
| 2005 | 73.18 | 73.18 | 4.18 | 61.07 | 61.07 | 3.68 | 321 | 138 | 20 | 479 | 19.6 | 2.2 |
| 2006 | 56.93 | 56.93 | 3.50 | 63.24 | 63.24 | 3.76 | 321 | 217 | 30 | 568 | 25.5 | 6.2 |
| 2007 | 46.82 | 46.82 | 2.93 | 33.33 | 33.33 | 2.36 | 363 | 263 | 35 | 661 | 27.8 | 9.7 |
| 2008 | 89.95 | 89.95 | 6.64 | 60.05 | 60.05 | 4.98 | 427 | 336 | 42 | 805 | 36.8 | 12.6 |
| 2009 | 80.58 | 80.58 | 5.94 | 60.44 | 60.44 | 4.85 | 348 | 282 | 58 | 688 | 46.5 | 16.5 |
| 2010 | 74.67 | 74.67 | 5.87 | 55.41 | 55.41 | 4.77 | 479 | 374 | 64 | 917 | 30.7 | 12.5 |
| 2011 | 77.57 | 77.57 | 6.55 | 52.65 | 52.65 | 5.00 | 408 | 389 | 81 | 878 | 35.1 | 15.2 |
| 2012 | 85.36 | 85.36 | 6.61 | 62.43 | 62.43 | 5.29 | 520 | 355 | 64 | 939 | 29.7 | 15.6 |
| 2013 | 80.31 | 80.31 | 5.31 | 71.15 | 71.15 | 4.87 | 481 | 278 | 64 | 823 | 34.2 | 13.1 |
| 2014 | 80.00 | 80.00 | 6.20 | 56.00 | 56.00 | 4.83 | 500 | 300 | 50 | 850 | 34.8 | 10.3 |
| 2015 | 80.00 | 80.00 | 6.20 | 56.00 | 56.00 | 4.83 | 500 | 300 | 50 | 850 | 35.1 | 10.6 |
| 2016 | | | | | | | 500 | 300 | 50 | 850 | 32.3 | 9.9 |
| 2017 | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |

FIGURES



Comments:

END



2013 - JCR Evaluation Form

SPECIES: Pronghorn
 HERD: PR353 - UCROSS
 HUNT AREAS: 10, 16

PERIOD: 6/1/2013 - 5/31/2014
 PREPARED BY: TIM THOMAS

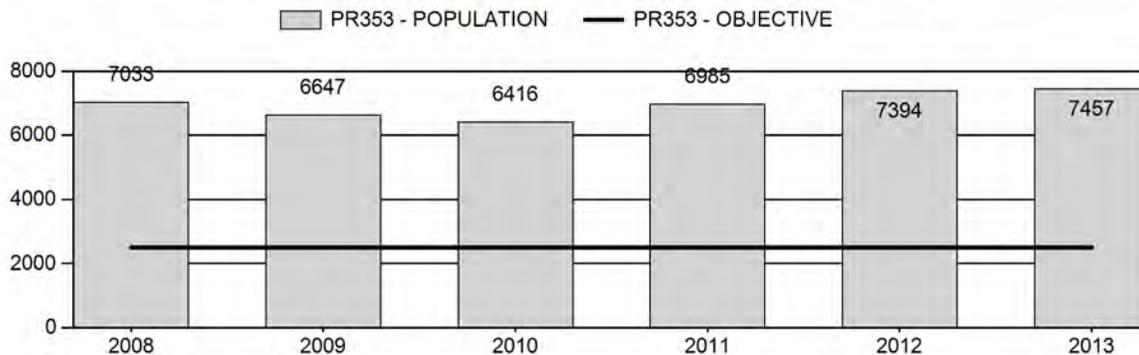
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 6,895 | 7,457 | 7,763 |
| Harvest: | 692 | 775 | 725 |
| Hunters: | 696 | 792 | 750 |
| Hunter Success: | 99% | 98% | 97% |
| 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 recent trend: 20
 Model Date: 02/26/2014

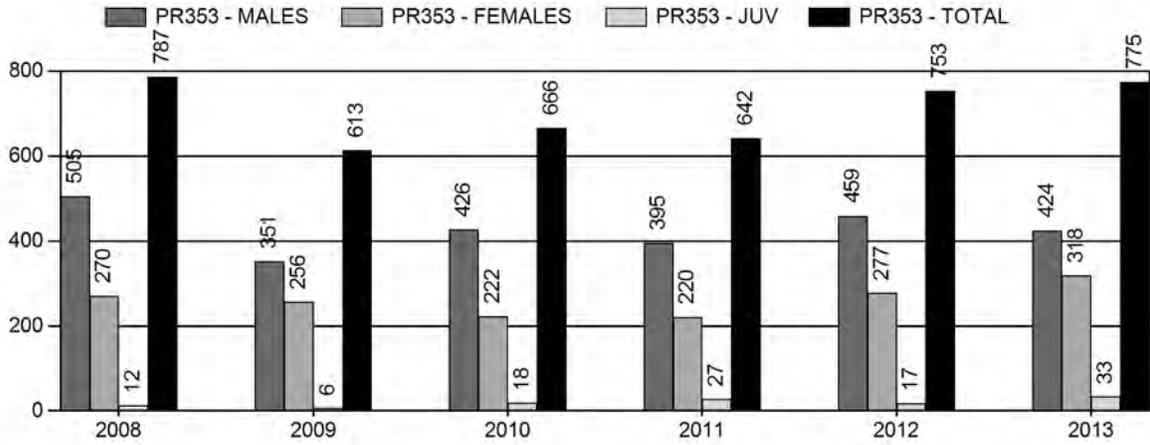
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | | 9% |
| Males ≥ 1 year old: | 21% | 18% |
| Juveniles (< 1 year old): | 1% | 1% |
| Total: | 9% | 8% |
| Proposed change in post-season population: | 3% | 4% |

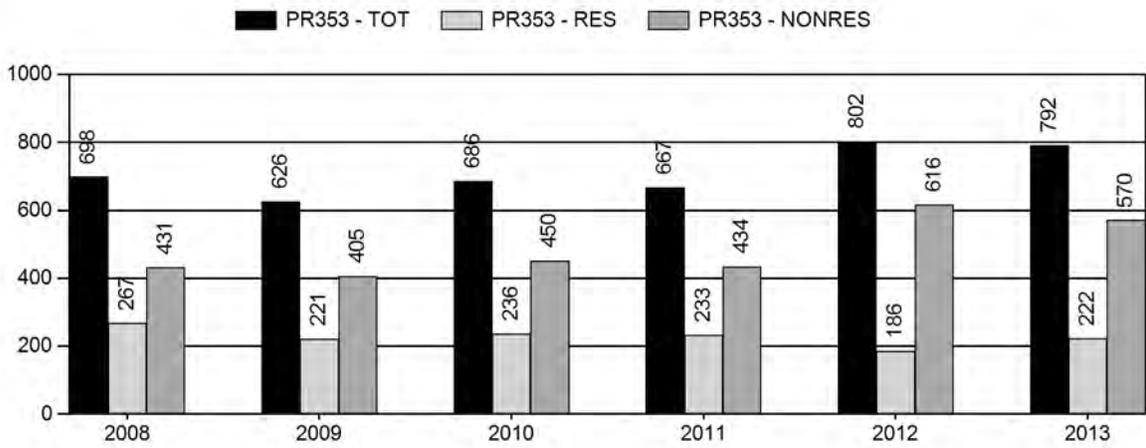
Population Size - Postseason



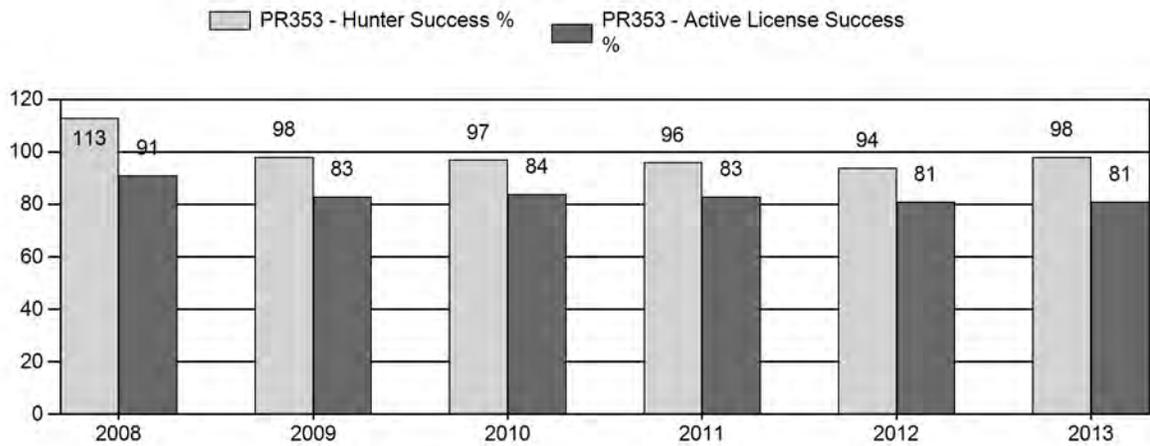
Harvest



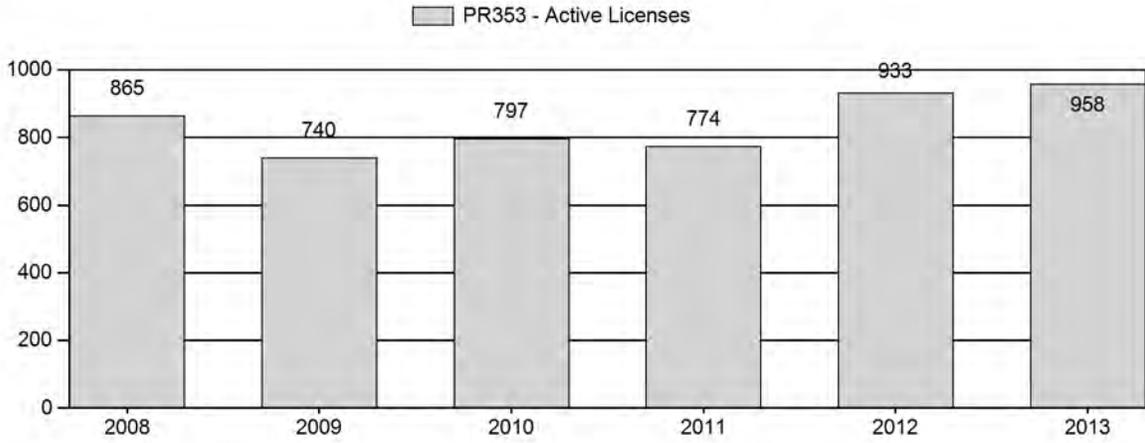
Number of Hunters



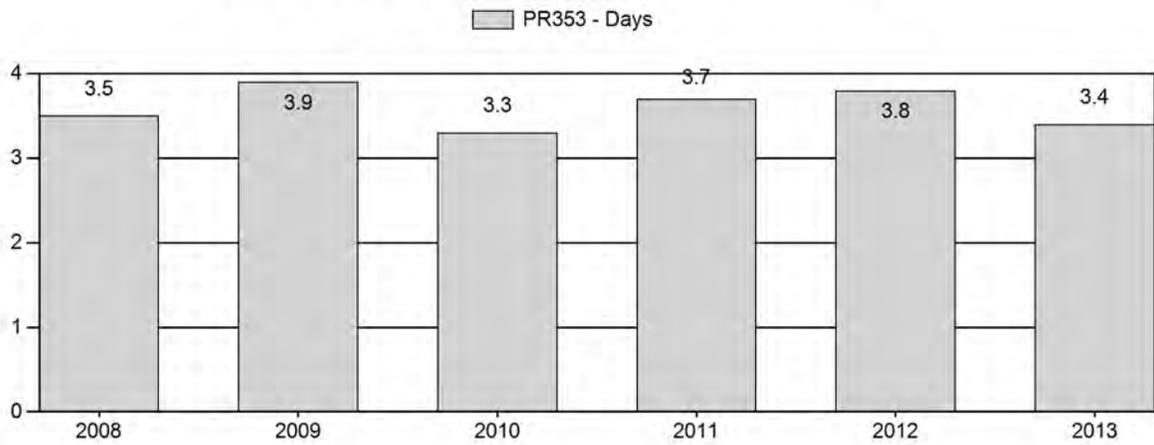
Harvest Success



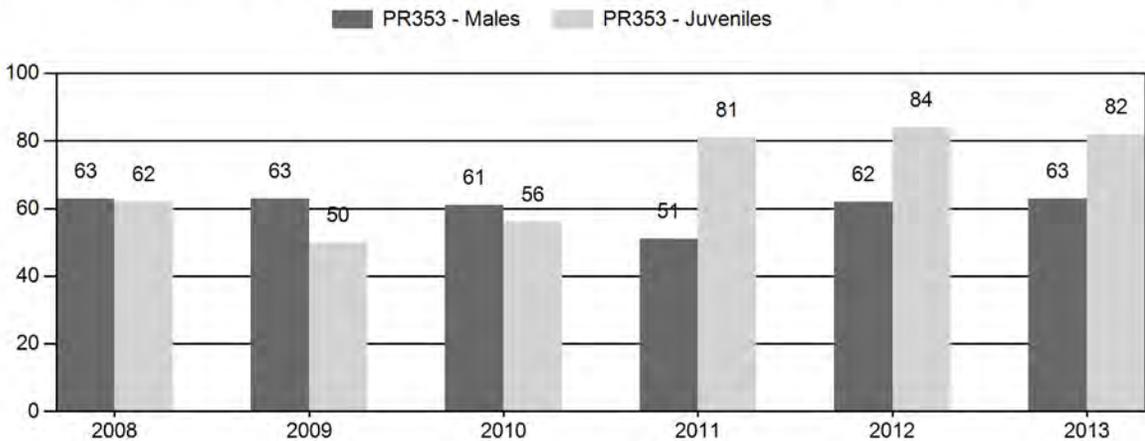
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR353 - UCROSS

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

2014 HUNTING SEASONS

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--------------------------------------|
| | | 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 | 1 | - 150 |
| | 6 | - 300 |

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 ~30° 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 (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 ~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 (n=18) who responded to an annual survey, 67% (n=12) indicated the population was at or near desired levels and most (67%, 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 pre-season 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 post-season 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.

| | |
|------------------|-------------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Timothy P. Thomas |
| Herd Unit & No.: | Ucross PR353 |
| Model date: | 02/26/14 |

| MODELS SUMMARY | | Relative AICc | Fit | Notes |
|-----------------------|---|---------------|-----|-------|
| C,J,CA | Constant Juvenile & Adult Survival | 93 | 85 | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 98 | 84 | |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 146 | 62 | |

Clear form

Check best model to create report

- C,J,CA Model
- SC,J,SCA Mod
- TS,J,CA Model

| Year | Predicted Prehunt Population (year /) | | Total | Predicted Posthunt Population (year /) | | Total | Predicted adult End-of-bio-year Pop (year /) | | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------------|-------|--|-----------|-------|--|---------|--------------|------------------------|----------|-------------|-----------|
| | Juveniles | Total Males | | Females | Juveniles | | Total Males | Females | Total Adults | Field Est | Field SE | | |
| 1993 | 951 | 1428 | 1817 | 4197 | 925 | 1137 | 1586 | 1276 | 1672 | 2948 | 3536 | 2493 | 2500 |
| 1994 | 817 | 1251 | 1638 | 3706 | 807 | 949 | 1377 | 1071 | 1445 | 2516 | 2919 | 1990 | 2500 |
| 1995 | 927 | 1050 | 1416 | 3393 | 894 | 731 | 1252 | 912 | 1383 | 2295 | 2279 | 731 | 2500 |
| 1996 | 878 | 894 | 1356 | 3127 | 867 | 614 | 1257 | 811 | 1391 | 2201 | 2186 | 336 | 2500 |
| 1997 | 753 | 794 | 1363 | 2910 | 749 | 570 | 1358 | 737 | 1449 | 2186 | 1020 | 336 | 2500 |
| 1998 | 1026 | 723 | 1420 | 3169 | 1026 | 482 | 1404 | 766 | 1593 | 2359 | 2533 | 350 | 2500 |
| 1999 | 1145 | 751 | 1561 | 3457 | 1143 | 536 | 1546 | 861 | 1759 | 2620 | 2533 | 350 | 2500 |
| 2000 | 1378 | 844 | 1724 | 3945 | 1378 | 645 | 1707 | 1047 | 1987 | 3034 | 2814 | 662 | 2500 |
| 2001 | 1108 | 1026 | 1947 | 4081 | 1106 | 865 | 1931 | 1138 | 2074 | 3212 | 3763 | 752 | 2500 |
| 2002 | 1622 | 1115 | 2032 | 4769 | 1622 | 895 | 2024 | 1351 | 2353 | 3704 | 5845 | 899 | 2500 |
| 2003 | 1826 | 1324 | 2305 | 5455 | 1822 | 1077 | 2243 | 1579 | 2608 | 4186 | 5845 | 899 | 2500 |
| 2004 | 1924 | 1547 | 2556 | 6026 | 1913 | 1289 | 2491 | 1792 | 2853 | 4645 | 5845 | 899 | 2500 |
| 2005 | 2364 | 1756 | 2796 | 6916 | 2339 | 1437 | 2732 | 2070 | 3222 | 5292 | 5845 | 899 | 2500 |
| 2006 | 2736 | 2029 | 3157 | 7922 | 2686 | 1566 | 2930 | 2287 | 3494 | 5781 | 5845 | 899 | 2500 |
| 2007 | 2155 | 2241 | 3424 | 7821 | 2138 | 1735 | 3176 | 2219 | 3496 | 5716 | 5845 | 899 | 2500 |
| 2008 | 2130 | 2175 | 3426 | 7731 | 2116 | 1620 | 3129 | 2104 | 3440 | 5544 | 5845 | 899 | 2500 |
| 2009 | 1696 | 2062 | 3371 | 7129 | 1689 | 1676 | 3090 | 2018 | 3246 | 5264 | 5845 | 899 | 2500 |
| 2010 | 1767 | 1978 | 3181 | 6926 | 1747 | 1509 | 2937 | 1882 | 3142 | 5024 | 5845 | 899 | 2500 |
| 2011 | 2487 | 1844 | 3079 | 7411 | 2458 | 1410 | 2837 | 2016 | 3278 | 5295 | 5845 | 899 | 2500 |
| 2012 | 2687 | 1976 | 3213 | 7875 | 2668 | 1471 | 2908 | 2245 | 3423 | 5668 | 5845 | 899 | 2500 |
| 2013 | 2755 | 2200 | 3355 | 8310 | 2719 | 1734 | 3005 | 2490 | 3591 | 6081 | 5990 | 852 | 2500 |
| 2014 | 2601 | 2440 | 3519 | 8560 | 2574 | 2000 | 3189 | 2490 | 3591 | 6081 | 5990 | 852 | 2500 |
| 2015 | | | | | | | | | | | | | |
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| 2024 | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.75 | | 0.84 | |
| 1994 | 0.75 | | 0.84 | |
| 1995 | 0.75 | | 0.84 | |
| 1996 | 0.75 | | 0.84 | |
| 1997 | 0.75 | | 0.84 | |
| 1998 | 0.75 | | 0.84 | |
| 1999 | 0.75 | | 0.84 | |
| 2000 | 0.75 | | 0.84 | |
| 2001 | 0.75 | | 0.84 | |
| 2002 | 0.75 | | 0.84 | |
| 2003 | 0.75 | | 0.84 | |
| 2004 | 0.75 | | 0.84 | |
| 2005 | 0.75 | | 0.84 | |
| 2006 | 0.75 | | 0.84 | |
| 2007 | 0.75 | | 0.84 | |
| 2008 | 0.75 | | 0.84 | |
| 2009 | 0.75 | | 0.84 | |
| 2010 | 0.75 | | 0.84 | |
| 2011 | 0.75 | | 0.84 | |
| 2012 | 0.75 | | 0.84 | |
| 2013 | 0.75 | | 0.84 | |
| 2014 | 0.75 | | 0.84 | |
| 2015 | | | | |
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Parameters:

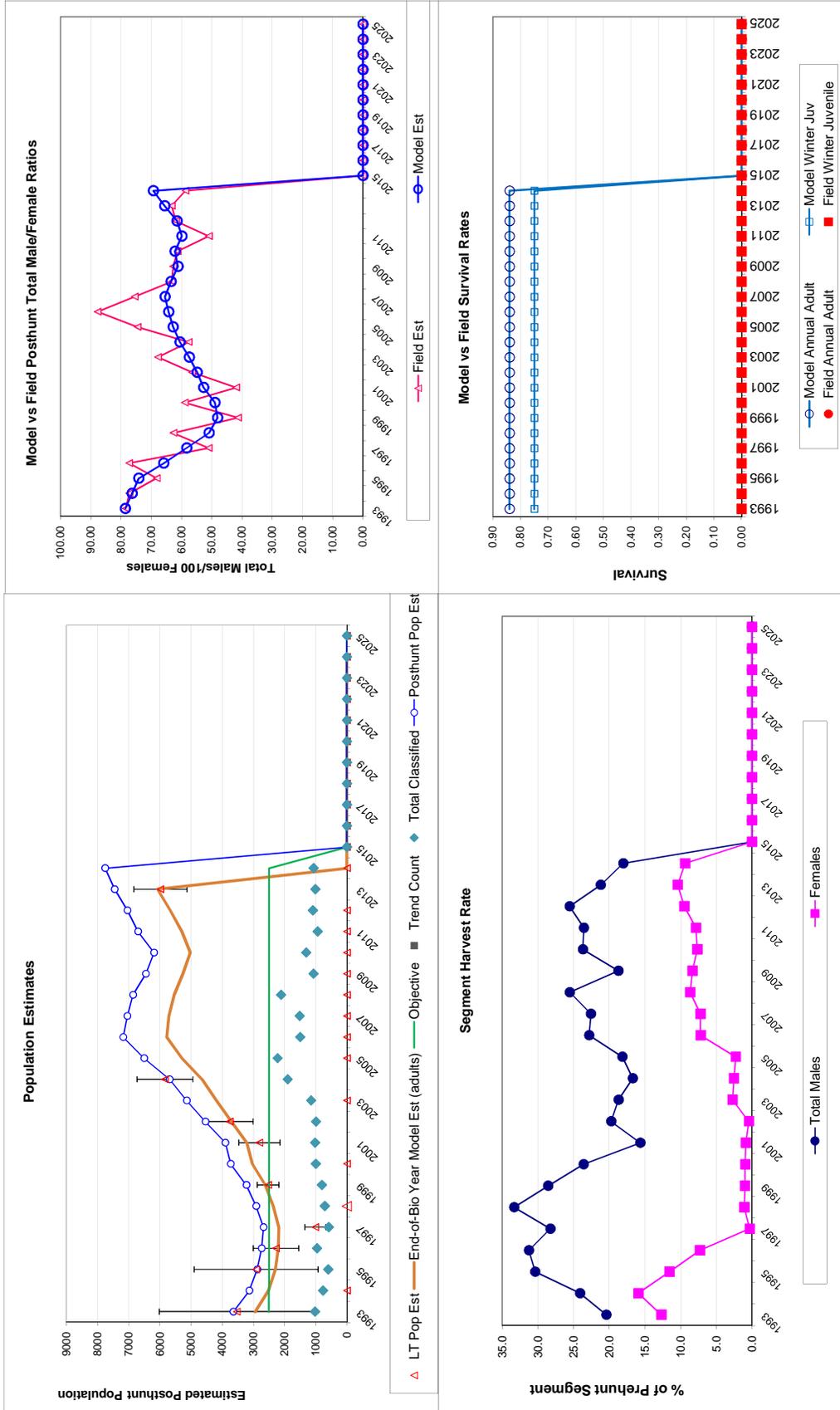
| | |
|---------------------------------|-------|
| Juvenile Survival = | 0.750 |
| Adult Survival = | 0.839 |
| Initial Total Male Pop/10,000 = | 0.143 |
| Initial Female Pop/10,000 = | 0.182 |

MODEL ASSUMPTIONS

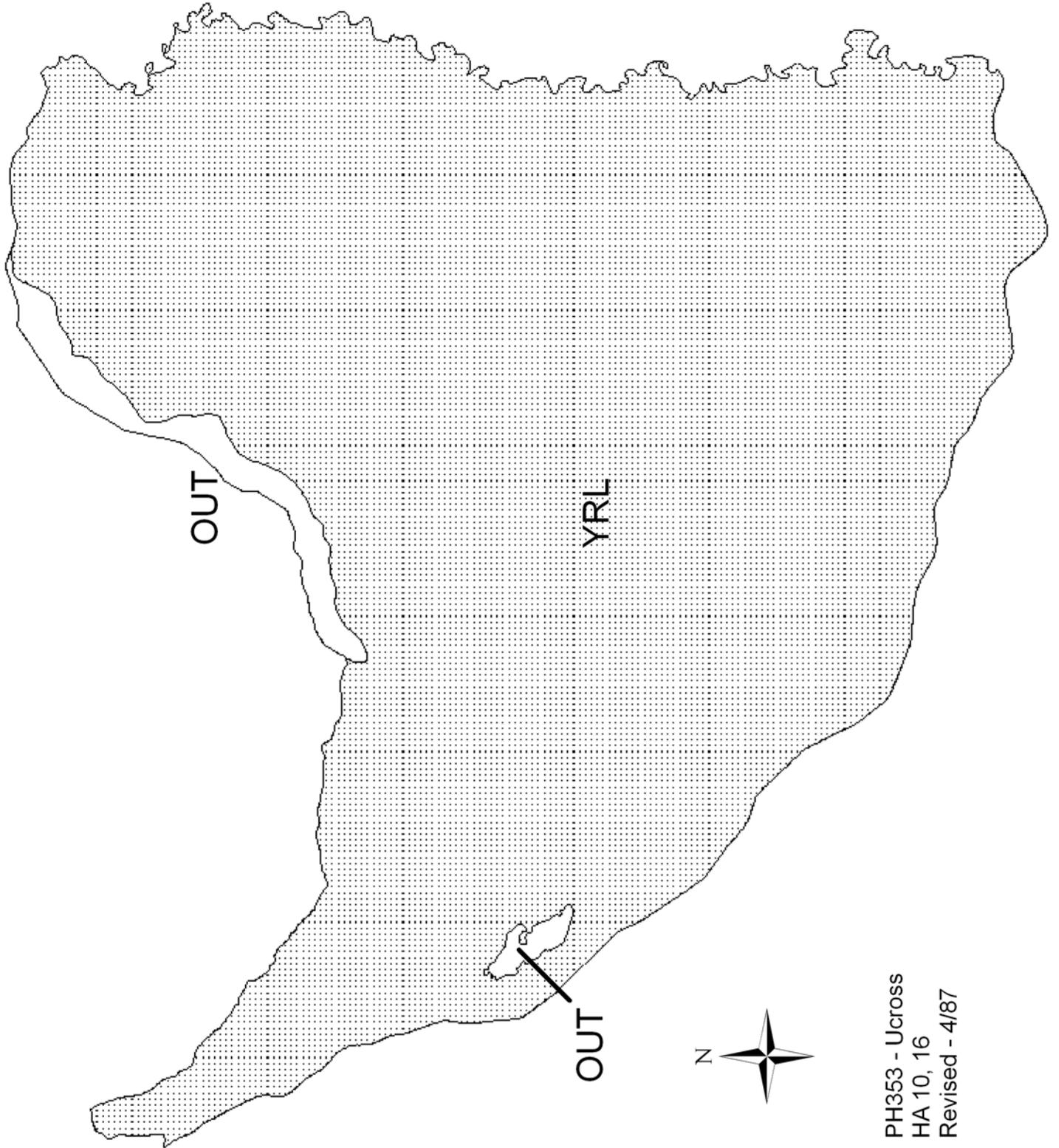
| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | | | Harvest | | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|-----------|----------|---------|---------|-----|---------------|-------------|---------|---|---------|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Males | | | Females | | | Segment Harvest Rate (% of Total Harvest) | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juv | Total Harvest | Total Males | Females | Total Males | Females |
| 1993 | | 52.36 | 4.23 | 78.58 | 78.43 | 5.61 | 265 | 210 | 24 | 499 | 20.4 | 12.7 | | |
| 1994 | | 49.85 | 4.69 | 76.36 | 77.29 | 6.36 | 274 | 237 | 9 | 520 | 24.1 | 15.9 | | |
| 1995 | | 65.50 | 6.48 | 74.16 | 68.22 | 6.67 | 290 | 149 | 30 | 469 | 30.4 | 11.6 | | |
| 1996 | | 64.74 | 5.18 | 65.91 | 77.33 | 5.88 | 254 | 90 | 10 | 354 | 31.3 | 7.3 | | |
| 1997 | | 55.28 | 5.50 | 58.29 | 51.06 | 5.21 | 204 | 4 | 4 | 212 | 28.2 | 0.3 | | |
| 1998 | | 72.28 | 6.41 | 50.90 | 62.71 | 5.80 | 219 | 14 | 0 | 233 | 33.3 | 1.1 | | |
| 1999 | | 73.33 | 5.82 | 48.08 | 41.33 | 3.95 | 195 | 14 | 2 | 211 | 28.6 | 1.0 | | |
| 2000 | | 79.95 | 5.86 | 48.96 | 58.95 | 4.73 | 181 | 15 | 0 | 196 | 23.6 | 1.0 | | |
| 2001 | | 56.89 | 4.16 | 52.70 | 41.94 | 3.40 | 146 | 15 | 2 | 163 | 15.7 | 0.8 | | |
| 2002 | | 79.81 | 5.84 | 54.87 | 56.53 | 4.58 | 200 | 8 | 0 | 208 | 19.7 | 0.4 | | |
| 2003 | | 79.18 | 5.52 | 57.44 | 67.81 | 4.94 | 225 | 57 | 3 | 285 | 18.7 | 2.7 | | |
| 2004 | | 75.28 | 4.02 | 60.54 | 57.65 | 3.34 | 235 | 59 | 10 | 304 | 16.7 | 2.5 | | |
| 2005 | | 84.53 | 4.26 | 62.80 | 74.53 | 3.89 | 290 | 58 | 23 | 371 | 18.2 | 2.3 | | |
| 2006 | | 86.65 | 5.44 | 64.26 | 87.75 | 5.49 | 421 | 207 | 45 | 673 | 22.8 | 7.2 | | |
| 2007 | | 62.95 | 4.01 | 65.46 | 75.51 | 4.56 | 460 | 225 | 16 | 701 | 22.6 | 7.2 | | |
| 2008 | | 62.15 | 3.28 | 63.48 | 63.22 | 3.32 | 505 | 270 | 12 | 787 | 25.5 | 8.7 | | |
| 2009 | | 50.30 | 3.87 | 61.17 | 62.77 | 4.50 | 351 | 256 | 6 | 613 | 18.7 | 8.4 | | |
| 2010 | | 55.56 | 3.79 | 62.17 | 61.36 | 4.05 | 426 | 222 | 18 | 666 | 23.7 | 7.7 | | |
| 2011 | | 80.79 | 6.00 | 59.90 | 50.99 | 4.35 | 395 | 220 | 27 | 642 | 23.6 | 7.9 | | |
| 2012 | | 83.63 | 5.87 | 61.51 | 61.88 | 4.74 | 459 | 277 | 17 | 753 | 25.6 | 9.5 | | |
| 2013 | | 82.13 | 6.01 | 65.58 | 63.29 | 5.00 | 424 | 318 | 33 | 775 | 21.2 | 10.4 | | |
| 2014 | | 73.91 | 5.29 | 69.33 | 58.70 | 4.50 | 400 | 300 | 25 | 725 | 18.0 | 9.4 | | |
| 2015 | | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | |
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| 2024 | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | |

FIGURES



Comments:



2013 - JCR Evaluation Form

Species: Pronghorn

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

Herd: PH354 - Buffalo

Hunt Areas: 20, 102

Prepared By: Dan Thiele

| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------------|----------------------------|-------------|----------------------|
| Hunter Satisfaction Percent: | N/A | 88% | 60% |
| Landowner Satisfaction Percent: | 57% | 65% | 60% |
| Hunters: | 1,462 | 1,684 | 1,600 |
| Hunter Success: | 95% | 84% | 86% |
| Active Licenses: | 1,639 | 1,911 | 1,700 |
| Active License Percent: | 85% | 74% | 81% |
| Recreation Days: | 5,431 | 6,878 | 6,500 |
| Days Per Animal: | 3.9 | 4.8 | 4.7 |
| Ratio Males per 100 Females | 69 | 79 | |
| Ratio Juveniles per 100 Females | 81 | 84 | |

Population Objective: 60% Landowner/Hunter Satisfaction

Management Strategy: Private Lands

Percent population is above (+) or below (-) objective: N/A

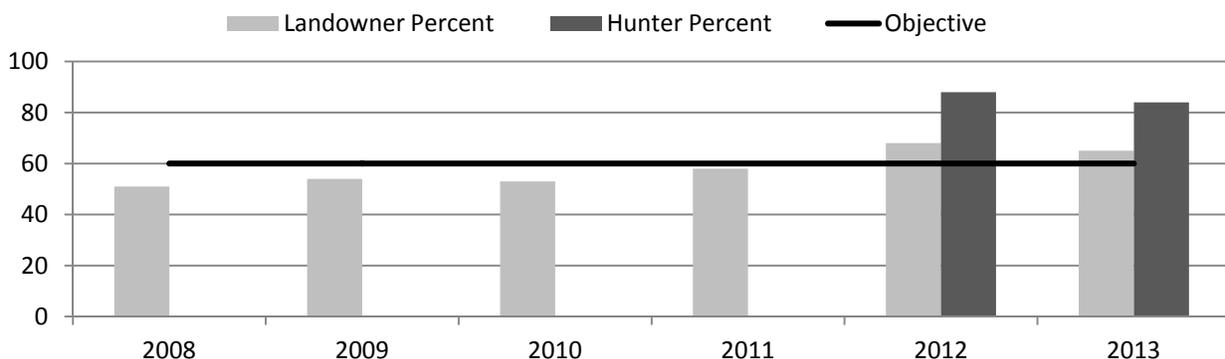
Number of years population has been + or - objective in recent trend:

Model Date: 02/14/2014

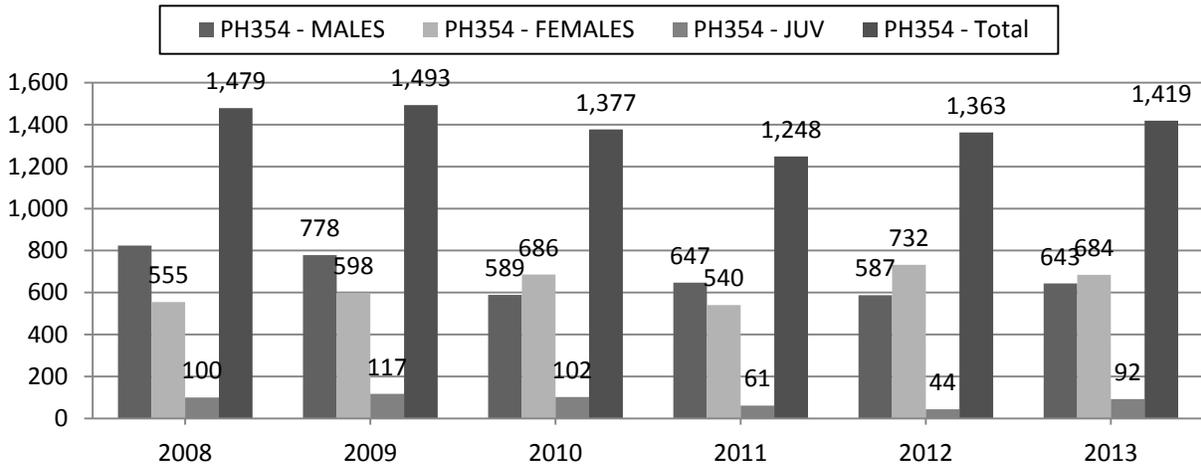
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|---|-----------------|-----------------|
| Females ≥ 1 year old: | 22% | 27% |
| Males ≥ 1 year old: | 28% | 37% |
| Juveniles (< 1 year old): | 4% | 4% |
| Total: | 25% | 28% |
| Projected change in post-season population: | -25% | -28% |

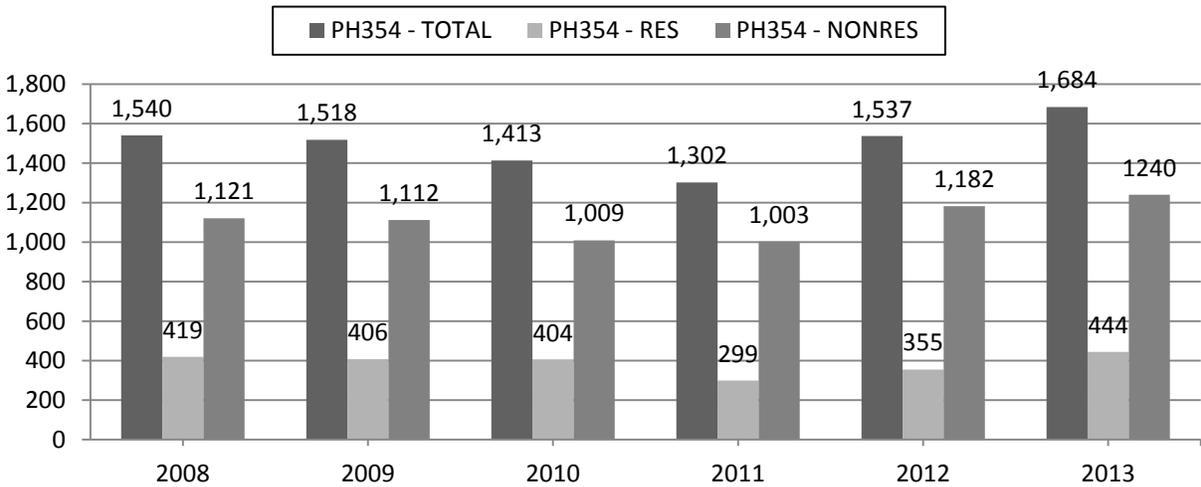
PR354 Satisfaction Survey Percentages



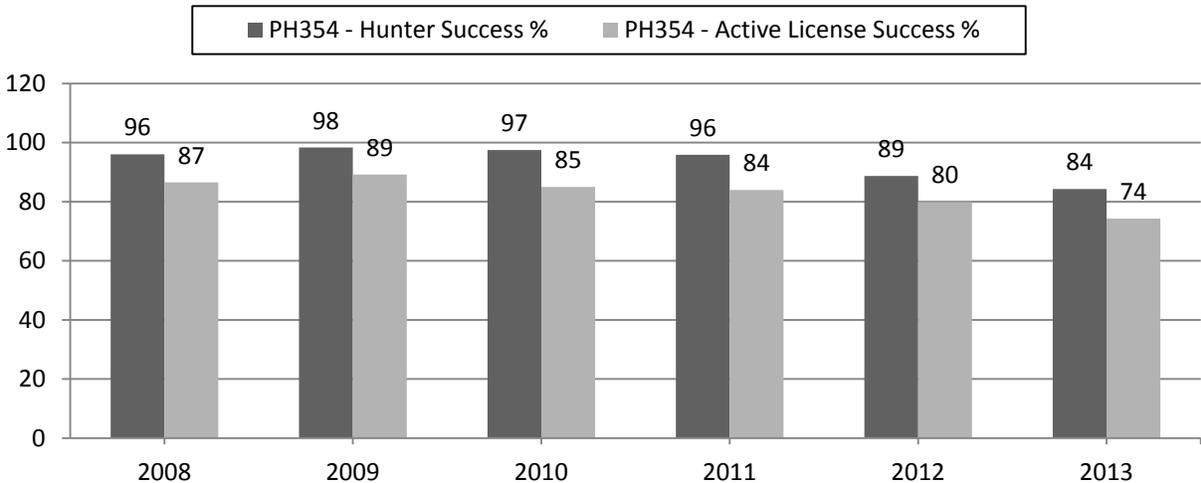
Harvest



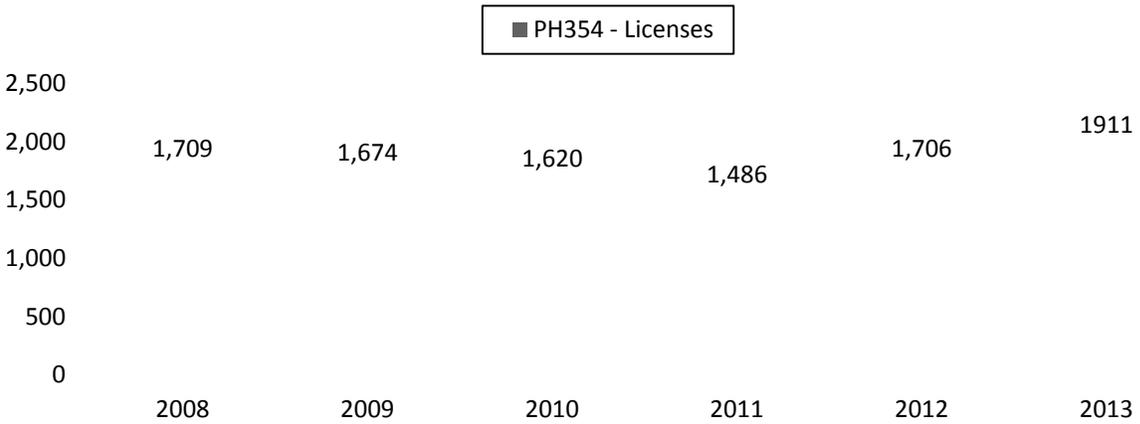
Number of Hunters



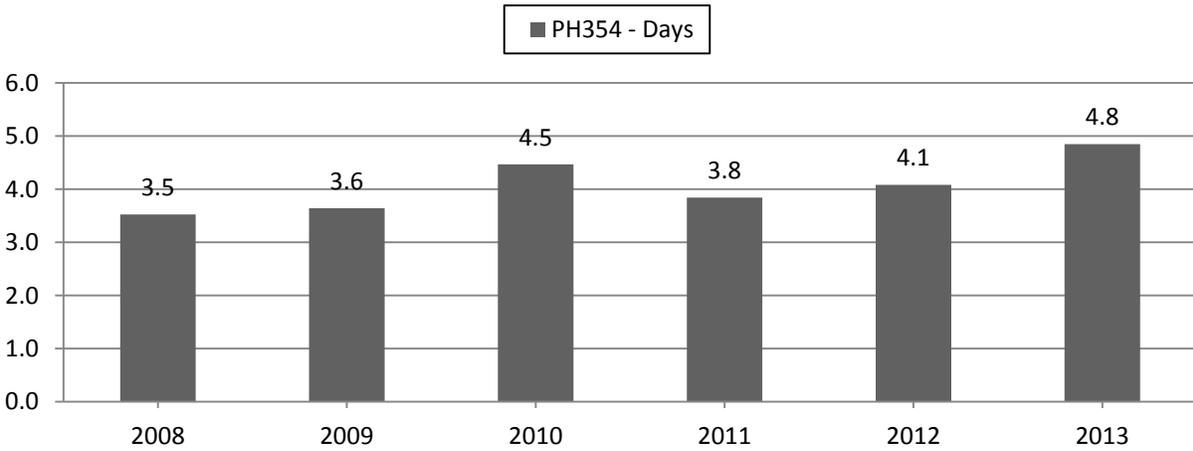
Hunter Success



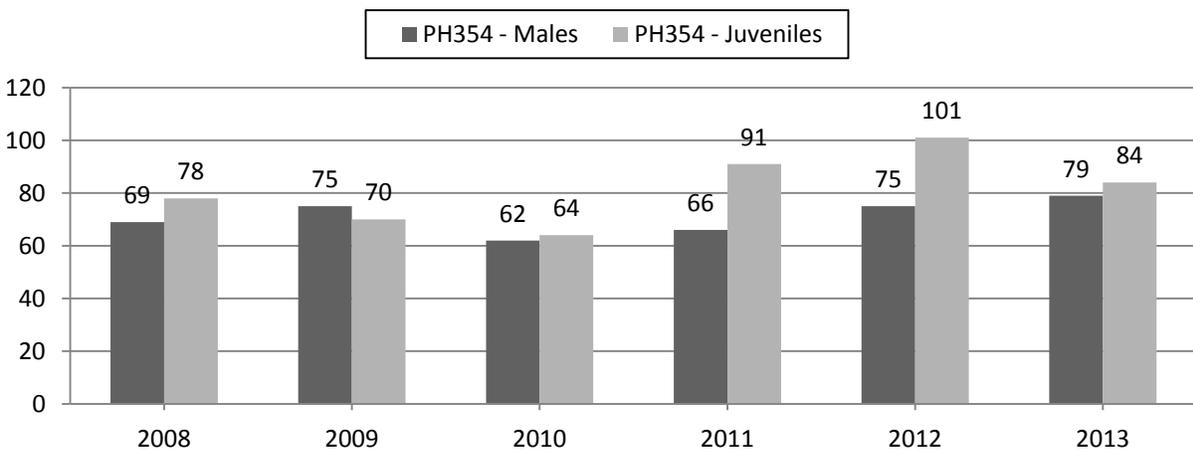
Active Licenses



Days Per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary
for Pronghorn Herd PR354 - BUFFALO

| Year | Pre Pop | MALES | | | | FEMALES | | JUVENILES | | Tot | | Males to 100 Females | | | | Young to | | |
|------|---------|-------|-------|-------|-----|---------|-----|-----------|-----|-------|-------|----------------------|-------|-------|----------|----------|----------|-----------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | Cls | Obj | Yng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 12,479 | 229 | 656 | 885 | 28% | 1,290 | 41% | 1,006 | 32% | 3,181 | 2,342 | 18 | 51 | 69 | ± 2 | 78 | ± 2 | 46 |
| 2009 | 12,501 | 268 | 736 | 1,004 | 30% | 1,348 | 41% | 949 | 29% | 3,301 | 1,906 | 20 | 55 | 74 | ± 1 | 70 | ± 1 | 40 |
| 2010 | 10,220 | 161 | 601 | 762 | 27% | 1,225 | 44% | 786 | 29% | 2,773 | 1,707 | 19 | 70 | 199 | ± 8 | 91 | ± 10 | 30 |
| 2011 | 9,822 | 117 | 362 | 479 | 26% | 730 | 39% | 666 | 36% | 1,875 | 2,092 | 16 | 50 | 66 | ± 4 | 91 | ± 5 | 55 |
| 2012 | 9,414 | 253 | 512 | 765 | 27% | 1,020 | 36% | 1,032 | 37% | 2,817 | 2,147 | 25 | 50 | 75 | ± 2 | 101 | ± 2 | 58 |
| 2013 | 7,806 | 211 | 430 | 641 | 30% | 817 | 38% | 688 | 32% | 2,146 | 2,827 | 26 | 53 | 78 | ± 0 | 84 | ± 0 | 47 |

**2014 HUNTING SEASONS
BUFFALO PRONGHORN HERD (PR354)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--|
| | | 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 |
| | | Oct. 15 | Nov. 15 | | Unused Area 102 licenses valid for the entire area |
| Archery | | Aug. 15 | Oct. 14 | | Refer to Section 3 of this Chapter |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 20 | | No change |
| 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.

| | |
|------------------|---------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Dan Thiele |
| Herd Unit & No.: | Buffalo PR354 |
| Model date: | 02/14/14 |

Clear form

| MODELS SUMMARY | | Fit | Relative AICc | Notes |
|----------------|---|-----|---------------|--|
| CJ,CA | Constant Juvenile & Adult Survival | 103 | 112 | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 54 | 63 | <input type="checkbox"/> CJ,CA Model |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 476 | 602 | <input checked="" type="checkbox"/> SC,J,SCA Mod <input type="checkbox"/> TS,J,CA Model |

Check best model to create report

| Year | Predicted Prehunt Population (year <i>t</i>) | | | Predicted Posthunt Population (year <i>t</i>) | | | Population Estimates from Top Model | | | Predicted adult End-of-bio-year Pop (year <i>t</i>) | | LT Population Estimate | | Trend Count | Objective |
|------|---|-------------|---------|--|-------------|---------|-------------------------------------|-----------|-------------|--|-------------|------------------------|--------------|-------------|-----------|
| | Juveniles | Total Males | Females | Juveniles | Total Males | Females | Total | Juveniles | Total Males | Females | Total Males | Females | Total Adults | | |
| 1993 | 2839 | 3986 | 4940 | 2777 | 3113 | 4224 | 11765 | 2777 | 3113 | 4224 | 10115 | 3122 | 7233 | | |
| 1994 | 2681 | 3060 | 4029 | 2555 | 2102 | 3235 | 9769 | 2555 | 2102 | 3235 | 7891 | 2165 | 5339 | | |
| 1995 | 2853 | 2122 | 3111 | 2681 | 1414 | 2572 | 8086 | 2681 | 1414 | 2572 | 6688 | 2199 | 5430 | | |
| 1996 | 2691 | 2155 | 3166 | 2632 | 1566 | | 8012 | 2632 | 1566 | | 7125 | 2340 | 5916 | | |
| 1997 | 2854 | 2293 | 3504 | 2854 | 1704 | 3367 | 8652 | 2854 | 1704 | 3367 | 7925 | 2557 | 6627 | | |
| 1998 | 3239 | 2506 | 3989 | 3233 | 1907 | 3950 | 9734 | 3233 | 1907 | 3950 | 9090 | 2225 | 6311 | | |
| 1999 | 3036 | 2181 | 4004 | 3007 | 1682 | 3889 | 9221 | 3007 | 1682 | 3889 | 8577 | 1991 | 5958 | | |
| 2000 | 2929 | 1951 | 3888 | 2900 | 1395 | 3665 | 8768 | 2900 | 1395 | 3665 | 7961 | 2181 | 6385 | | |
| 2001 | 2698 | 2137 | 4120 | 2661 | 1573 | 3852 | 8955 | 2661 | 1573 | 3852 | 8086 | 2211 | 6449 | | |
| 2002 | 3636 | 2167 | 4153 | 3594 | 1518 | 3860 | 9956 | 3594 | 1518 | 3860 | 8973 | 2684 | 7458 | | |
| 2003 | 4397 | 2631 | 4678 | 4345 | 1997 | 4340 | 11706 | 4345 | 1997 | 4340 | 10682 | 3317 | 8714 | | |
| 2004 | 4385 | 3250 | 5290 | 4316 | 2628 | 4905 | 12925 | 4316 | 2628 | 4905 | 11848 | 3944 | 9904 | | |
| 2005 | 5176 | 3665 | 5840 | 5087 | 3270 | 5398 | 14882 | 5087 | 3270 | 5398 | 13755 | 3763 | 9399 | | |
| 2006 | 4428 | 3688 | 5523 | 4384 | 3003 | 5017 | 13639 | 4384 | 3003 | 5017 | 12404 | 3388 | 8553 | | |
| 2007 | 3447 | 3320 | 5062 | 3321 | 2589 | 4528 | 11829 | 3321 | 2589 | 4528 | 10438 | 3483 | 8680 | | |
| 2008 | 3972 | 3414 | 5093 | 3662 | 2507 | 4483 | 12479 | 3662 | 2507 | 4483 | 10852 | 3607 | 8976 | | |
| 2009 | 3704 | 3535 | 5262 | 3576 | 2679 | 4604 | 12501 | 3576 | 2679 | 4604 | 10859 | 2890 | 7482 | | |
| 2010 | 2888 | 2832 | 4501 | 2776 | 2184 | 3746 | 10220 | 2776 | 2184 | 3746 | 8706 | 2560 | 6462 | | |
| 2011 | 3489 | 2509 | 3824 | 3422 | 1797 | 3230 | 9822 | 3422 | 1797 | 3230 | 8449 | 2704 | 6389 | | |
| 2012 | 3653 | 2650 | 3611 | 3605 | 2004 | 2805 | 9914 | 3605 | 2004 | 2805 | 8415 | 3116 | 5443 | | |
| 2013 | 2572 | 2281 | 3054 | 2470 | 1573 | 2301 | 7906 | 2470 | 1573 | 2301 | 6345 | 1778 | 4227 | | |
| 2014 | 1932 | 1742 | 2401 | 1844 | 1027 | 1686 | 6075 | 1844 | 1027 | 1686 | 4557 | 1425 | 3423 | | |
| 2015 | 1576 | 1397 | 1958 | 1488 | 682 | 1243 | 4930 | 1488 | 682 | 1243 | 3412 | | | | |
| 2016 | | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | | |
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| 2025 | | | | | | | | | | | | | | | |

Survival and Initial Population Estimates

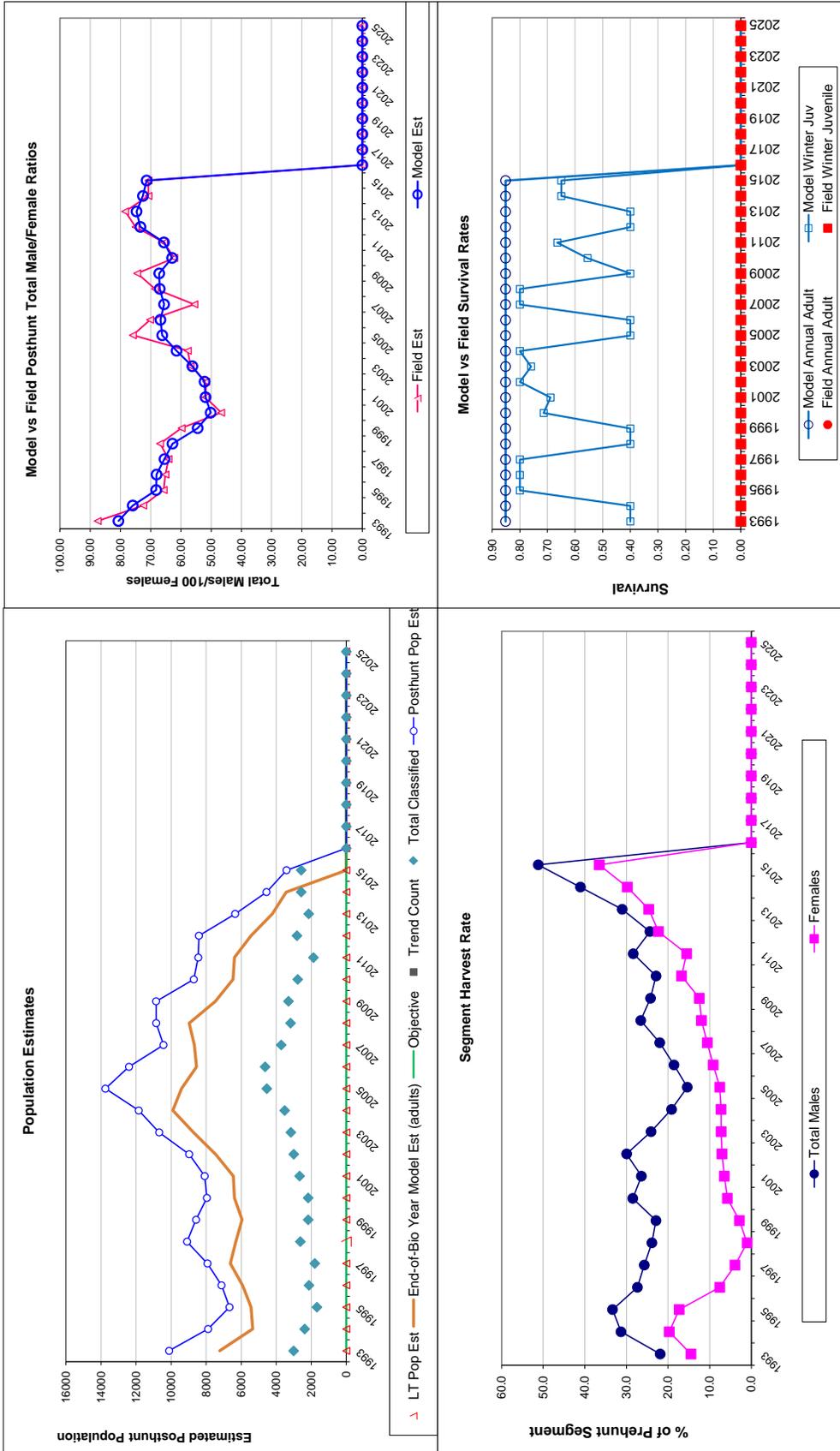
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.40 | | 0.85 | |
| 1994 | 0.40 | | 0.85 | |
| 1995 | 0.80 | | 0.85 | |
| 1996 | 0.80 | | 0.85 | |
| 1997 | 0.80 | | 0.85 | |
| 1998 | 0.40 | | 0.85 | |
| 1999 | 0.40 | | 0.85 | |
| 2000 | 0.71 | | 0.85 | |
| 2001 | 0.69 | | 0.85 | |
| 2002 | 0.80 | | 0.85 | |
| 2003 | 0.76 | | 0.85 | |
| 2004 | 0.80 | | 0.85 | |
| 2005 | 0.40 | | 0.85 | |
| 2006 | 0.40 | | 0.85 | |
| 2007 | 0.80 | | 0.85 | |
| 2008 | 0.80 | | 0.85 | |
| 2009 | 0.40 | | 0.85 | |
| 2010 | 0.55 | | 0.85 | |
| 2011 | 0.66 | | 0.85 | |
| 2012 | 0.40 | | 0.85 | |
| 2013 | 0.40 | | 0.85 | |
| 2014 | 0.65 | | 0.85 | |
| 2015 | 0.65 | | 0.85 | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Juvenile Survival = | | 0.650 |
| Adult Survival = | | 0.852 |
| Initial Total Male Pop/10,000 = | | 0.399 |
| Initial Female Pop/10,000 = | | 0.494 |

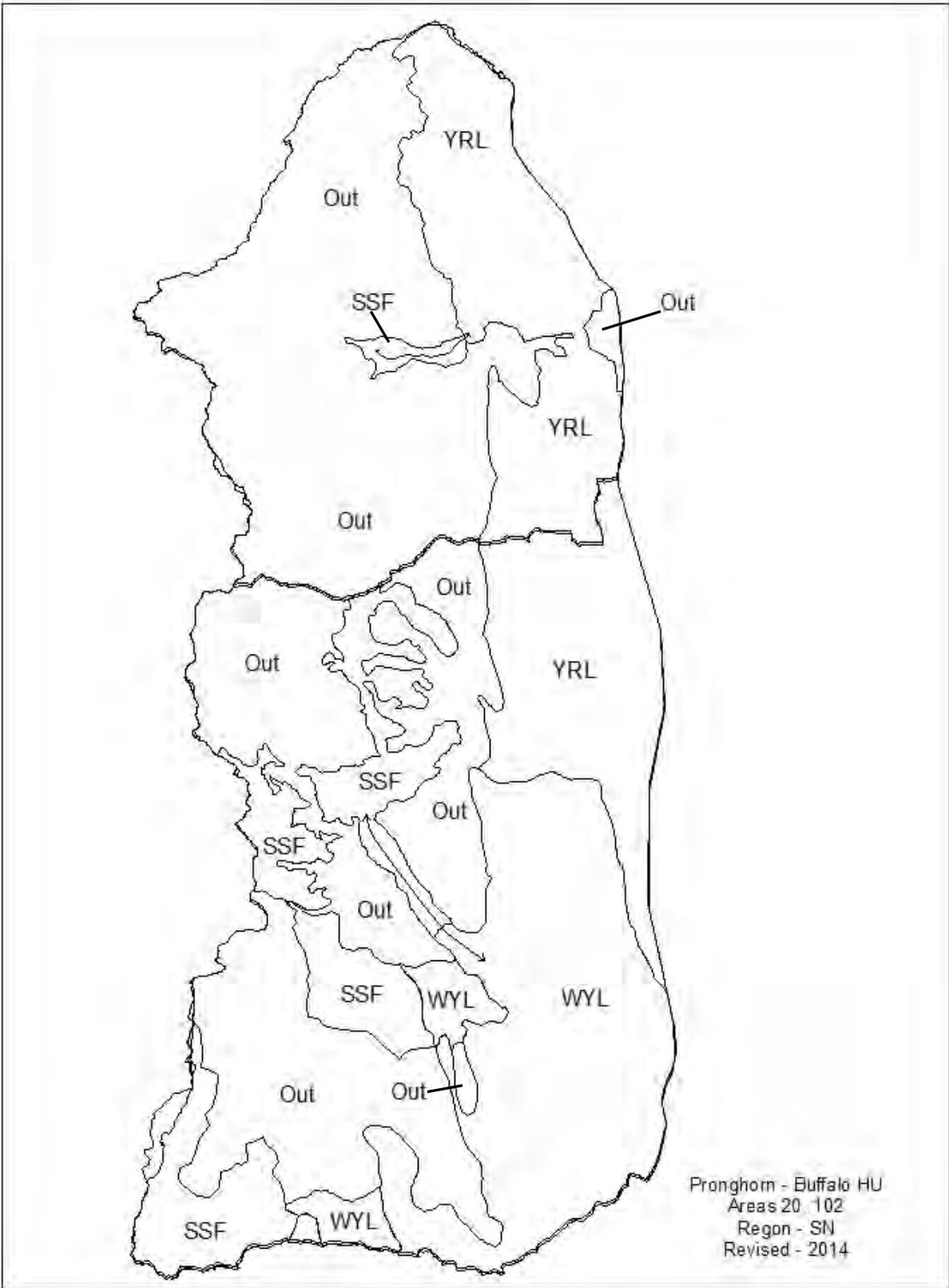
| MODEL ASSUMPTIONS | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | | | Harvest | | | | | |
|------|-----------------------|-----------|----------|-------------------------|-----------|----------|---------------|---------|-----------|----------------------------|-------------|---------|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Total Harvest | | | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juveniles | Total Harvest | Total Males | Females |
| 1993 | | | | | | | | | | | | |
| 1994 | 57.46 | 66.53 | 2.72 | 80.68 | 87.53 | 3.66 | 793 | 651 | 56 | 1500 | 21.9 | 14.5 |
| 1995 | 91.71 | 84.98 | 3.34 | 75.94 | 72.46 | | 871 | 722 | 114 | 1707 | 31.3 | 19.7 |
| 1996 | 84.98 | 81.45 | 5.20 | 68.19 | 65.75 | 4.09 | 643 | 490 | 156 | 1289 | 33.3 | 17.3 |
| 1997 | 81.45 | 75.84 | 4.30 | 68.07 | 65.14 | 3.55 | 536 | 218 | 53 | 807 | 27.4 | 7.6 |
| 1998 | 81.19 | 75.33 | 4.49 | 65.44 | 64.12 | 3.79 | 536 | 125 | 0 | 661 | 25.7 | 3.9 |
| 1999 | 75.84 | 75.33 | 3.73 | 62.81 | 66.92 | 3.25 | 544 | 36 | 5 | 585 | 23.9 | 1.0 |
| 2000 | 75.33 | 75.33 | 3.80 | 54.47 | 59.80 | 3.22 | 454 | 104 | 27 | 585 | 22.9 | 2.9 |
| 2001 | 65.50 | 65.50 | 3.67 | 50.17 | 46.69 | 2.64 | 505 | 203 | 26 | 734 | 28.5 | 5.7 |
| 2002 | 87.56 | 87.56 | 2.97 | 51.88 | 51.67 | 2.50 | 513 | 243 | 34 | 790 | 26.4 | 6.5 |
| 2003 | 93.98 | 93.98 | 3.62 | 52.18 | 51.88 | 2.66 | 590 | 266 | 38 | 894 | 29.9 | 7.0 |
| 2004 | 82.90 | 82.90 | 3.00 | 56.23 | 56.81 | 2.50 | 576 | 308 | 47 | 931 | 24.1 | 7.2 |
| 2005 | 88.63 | 88.63 | 3.22 | 61.45 | 57.73 | 2.66 | 566 | 350 | 63 | 979 | 19.2 | 7.3 |
| 2006 | 80.17 | 80.17 | 3.12 | 66.19 | 75.92 | 2.79 | 541 | 402 | 81 | 1024 | 15.4 | 7.6 |
| 2007 | 68.09 | 68.09 | 2.79 | 66.78 | 70.18 | 2.54 | 623 | 460 | 40 | 1123 | 18.6 | 9.2 |
| 2008 | 77.98 | 77.98 | 2.63 | 65.58 | 55.57 | 2.28 | 664 | 486 | 114 | 1264 | 22.0 | 10.6 |
| 2009 | 70.40 | 70.40 | 3.28 | 67.02 | 68.60 | 2.99 | 824 | 555 | 100 | 1479 | 26.6 | 12.0 |
| 2010 | 64.16 | 64.16 | 2.98 | 67.18 | 74.48 | 3.10 | 778 | 598 | 117 | 1493 | 24.2 | 12.5 |
| 2011 | 91.23 | 91.23 | 2.93 | 62.92 | 62.20 | 2.87 | 589 | 686 | 102 | 1377 | 22.9 | 16.8 |
| 2012 | 101.18 | 101.18 | 4.89 | 65.62 | 65.62 | 3.86 | 647 | 540 | 61 | 1248 | 28.4 | 15.5 |
| 2013 | 84.21 | 84.21 | 4.47 | 73.40 | 75.00 | 3.59 | | | 732 | 1363 | 24.4 | 22.3 |
| 2014 | 80.49 | 80.49 | 4.36 | 74.69 | 78.46 | 4.14 | | | 684 | 1419 | 31.0 | 24.6 |
| 2015 | 80.49 | 80.49 | 3.76 | 72.57 | 70.73 | 3.43 | | | 650 | 1380 | 41.0 | 29.8 |
| 2016 | 80.49 | 80.49 | 3.76 | 71.35 | 70.73 | 3.43 | | | 650 | 1380 | 51.2 | 36.5 |
| 2017 | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |

FIGURES



Comments:



2013 - JCR Evaluation Form

SPECIES: Pronghorn

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

HERD: PR355 - BECKTON

HUNT AREAS: 109

PREPARED BY: TIM THOMAS

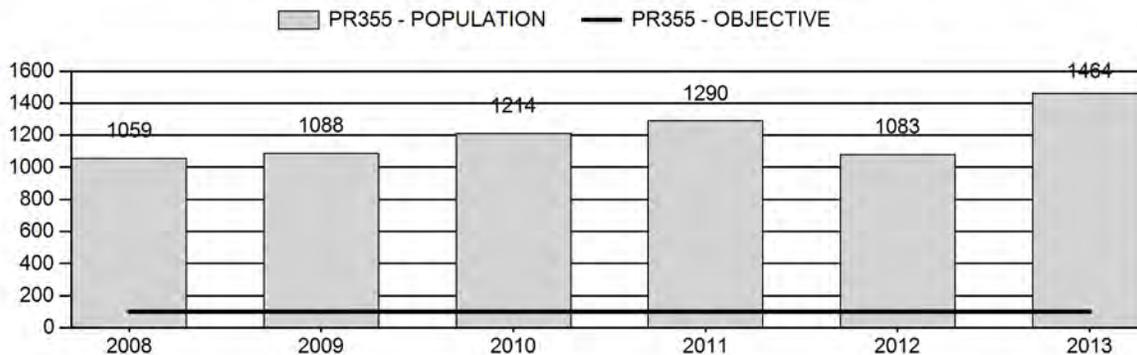
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 1,147 | 1,464 | 1,153 |
| Harvest: | 244 | 352 | 335 |
| Hunters: | 285 | 407 | 410 |
| Hunter Success: | 86% | 86% | 82% |
| Active Licenses: | 337 | 451 | 450 |
| Active License Percent: | 72% | 78% | 74 % |
| Recreation Days: | 1,169 | 1,391 | 1,500 |
| Days Per Animal: | 4.8 | 4.0 | 4.5 |
| Males per 100 Females | 42 | 51 | |
| Juveniles per 100 Females | 49 | 50 | |

| | |
|---|--------------|
| Population Objective: | 100 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 1364% |
| Number of years population has been + or - objective in recent trend: | 20 |
| Model Date: | 02/11/2014 |

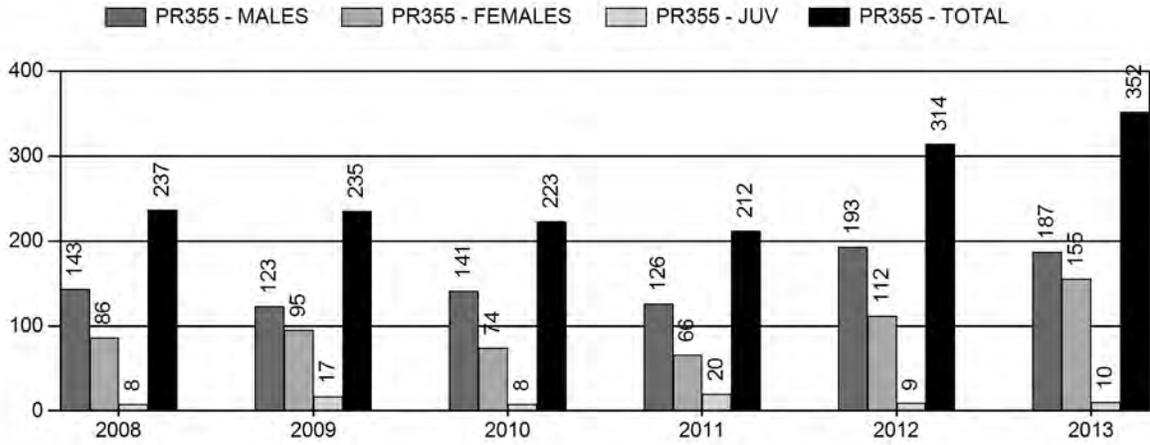
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | | 21% |
| Males ≥ 1 year old: | 53% | 68% |
| Juveniles (< 1 year old): | 2% | 2% |
| Total: | 19% | 22% |
| Proposed change in post-season population: | -13% | -21% |

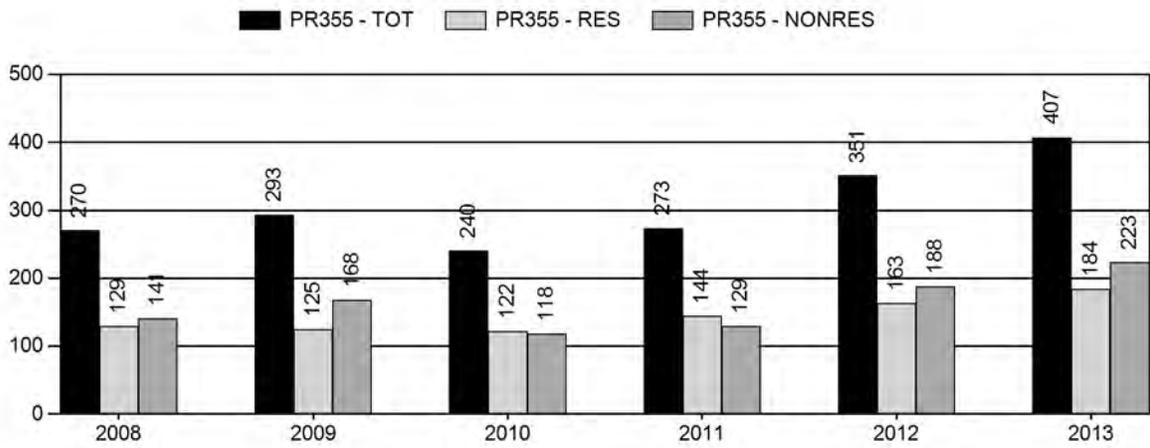
Population Size - Postseason



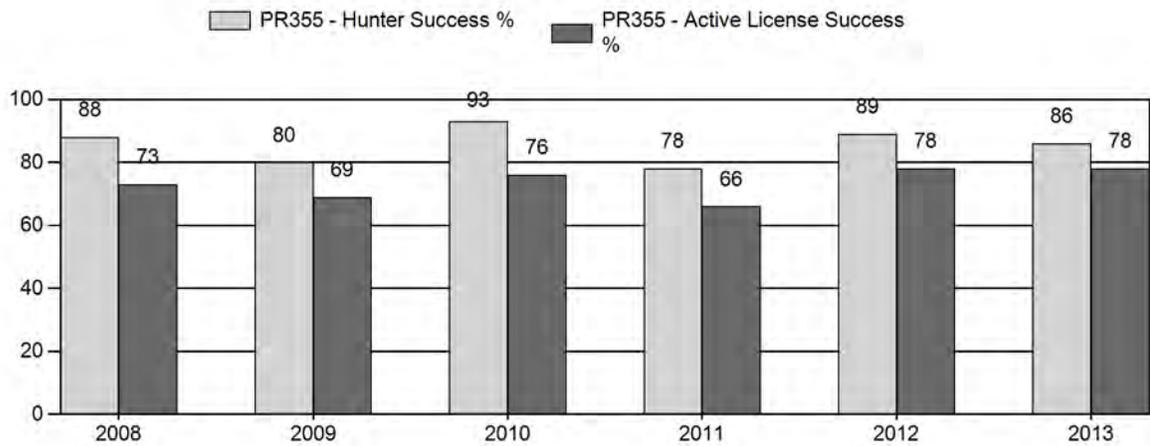
Harvest



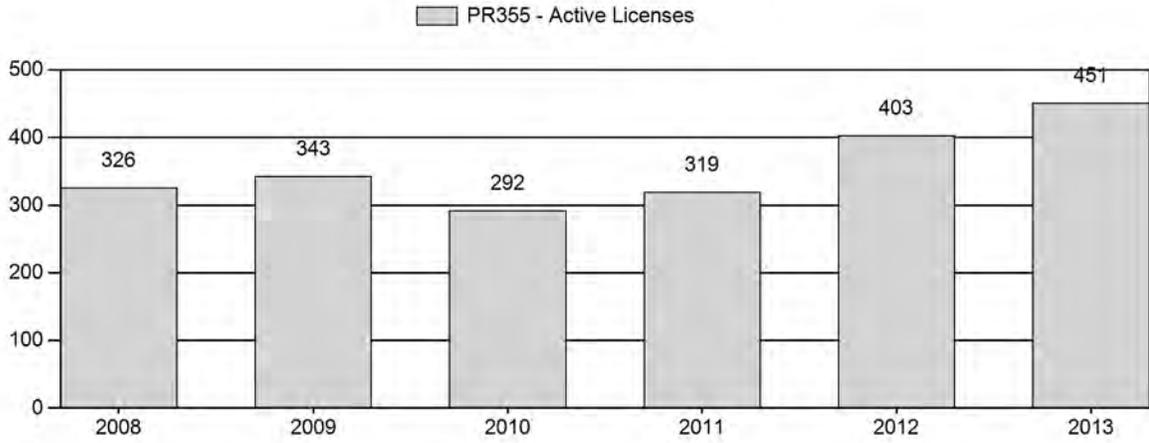
Number of Hunters



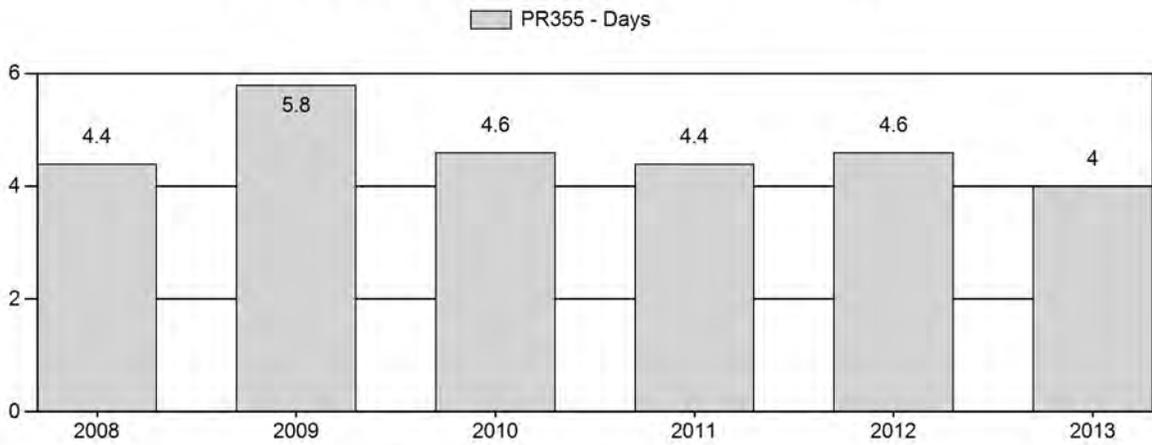
Harvest Success



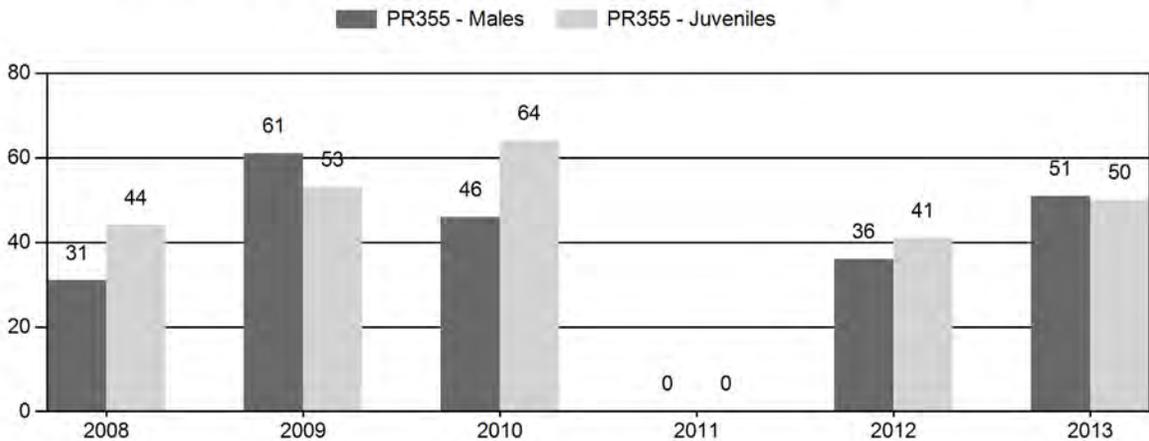
Active Licenses



Days Per Animal Harvested



Preseason Animals per 100 Females



2008 - 2013 Preseason Classification Summary

for Pronghorn Herd PR355 - BECKTON

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

**2014 HUNTING SEASONS
BECKTON PRONGHORN HERD (PR355)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--------------------------------------|
| | | Opens | Closes | | |
| 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 ~30° 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 (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 (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 (n = 29) to an annual survey indicated pronghorn populations were 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 (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 post-season 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.

| | |
|------------------|-------------------|
| INPUT | |
| Species: | Pronghorn |
| Biologist: | Timothy P. Thomas |
| Herd Unit & No.: | Beckton PR 355 |
| Model date: | 02/11/14 |

 Clear form

| MODELS SUMMARY | | Notes |
|----------------|---------------|---|
| | Relative AICc | |
| CJ,CA | 75 | Constant Juvenile & Adult Survival |
| SC,J,SCA | 126 | Semi-Constant Juvenile & Semi-Constant Adult Survival |
| TS,J,CA | 695 | Time-Specific Juvenile & Constant Adult Survival |

Clear form
 Check best model to create report
 CJ,CA Model
 SC,J,SCA Mod
 TS,J,CA Model

| Year | Predicted Prehunt Population (year /) | | Predicted Posthunt Population (year /) | | Predicted adult End-of-bio-year Pop (year /) | | LT Population Estimate | | Trend Count | Objective |
|------|---------------------------------------|-------|--|-------|--|---------|------------------------|----------|-------------|-----------|
| | Juveniles | Total | Juveniles | Total | Total Males | Females | Field Est | Field SE | | |
| 1993 | 258 | 1389 | 249 | 1389 | 213 | 919 | 1131 | | | 100 |
| 1994 | 643 | 1752 | 629 | 1752 | 271 | 939 | 1210 | | | 100 |
| 1995 | 555 | 1741 | 545 | 1741 | 315 | 937 | 1253 | | | 100 |
| 1996 | 715 | 1942 | 706 | 1942 | 387 | 952 | 1340 | | | 100 |
| 1997 | 343 | 1656 | 333 | 1656 | 382 | 917 | 1299 | | | 100 |
| 1998 | 538 | 1811 | 538 | 1811 | 421 | 943 | 1364 | | | 100 |
| 1999 | 611 | 1947 | 606 | 1947 | 476 | 984 | 1460 | | | 100 |
| 2000 | 740 | 2171 | 738 | 2171 | 574 | 1054 | 1628 | | | 100 |
| 2001 | 651 | 2246 | 645 | 2246 | 635 | 1115 | 1749 | | | 100 |
| 2002 | 806 | 2521 | 798 | 2521 | 724 | 1196 | 1920 | | | 100 |
| 2003 | 670 | 2551 | 664 | 2551 | 779 | 1231 | 2010 | | | 100 |
| 2004 | 456 | 2426 | 445 | 2426 | 743 | 1224 | 1967 | | | 100 |
| 2005 | 776 | 2704 | 751 | 2704 | 765 | 1257 | 2021 | | | 100 |
| 2006 | 627 | 2608 | 618 | 2608 | 701 | 1234 | 1935 | | | 100 |
| 2007 | 554 | 2450 | 548 | 2450 | 645 | 1199 | 1844 | | | 100 |
| 2008 | 515 | 2323 | 507 | 2323 | 573 | 1179 | 1751 | | | 100 |
| 2009 | 612 | 2329 | 593 | 2329 | 539 | 1164 | 1703 | | | 100 |
| 2010 | 732 | 2401 | 724 | 2401 | 514 | 1203 | 1717 | | | 100 |
| 2011 | 599 | 2282 | 577 | 2282 | 410 | 1175 | 1585 | | | 100 |
| 2012 | 477 | 2030 | 467 | 2030 | 325 | 1039 | 1364 | | | 100 |
| 2013 | 514 | 1851 | 503 | 1851 | 255 | 927 | 1182 | | | 100 |
| 2014 | 363 | 1521 | 352 | 1521 | | | | | | 100 |
| 2015 | | | | | | | | | | 100 |
| 2016 | | | | | | | | | | 100 |
| 2017 | | | | | | | | | | 100 |
| 2018 | | | | | | | | | | 100 |
| 2019 | | | | | | | | | | 100 |
| 2020 | | | | | | | | | | 100 |
| 2021 | | | | | | | | | | 100 |
| 2022 | | | | | | | | | | 100 |
| 2023 | | | | | | | | | | 100 |
| 2024 | | | | | | | | | | 100 |
| 2025 | | | | | | | | | | 100 |

Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.40 | | 0.98 | |
| 1994 | 0.40 | | 0.98 | |
| 1995 | 0.40 | | 0.98 | |
| 1996 | 0.40 | | 0.98 | |
| 1997 | 0.40 | | 0.98 | |
| 1998 | 0.40 | | 0.98 | |
| 1999 | 0.40 | | 0.98 | |
| 2000 | 0.40 | | 0.98 | |
| 2001 | 0.40 | | 0.98 | |
| 2002 | 0.40 | | 0.98 | |
| 2003 | 0.40 | | 0.98 | |
| 2004 | 0.40 | | 0.98 | |
| 2005 | 0.40 | | 0.98 | |
| 2006 | 0.40 | | 0.98 | |
| 2007 | 0.40 | | 0.98 | |
| 2008 | 0.40 | | 0.98 | |
| 2009 | 0.40 | | 0.98 | |
| 2010 | 0.40 | | 0.98 | |
| 2011 | 0.40 | | 0.98 | |
| 2012 | 0.40 | | 0.98 | |
| 2013 | 0.40 | | 0.98 | |
| 2014 | 0.40 | | 0.98 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

Parameters:

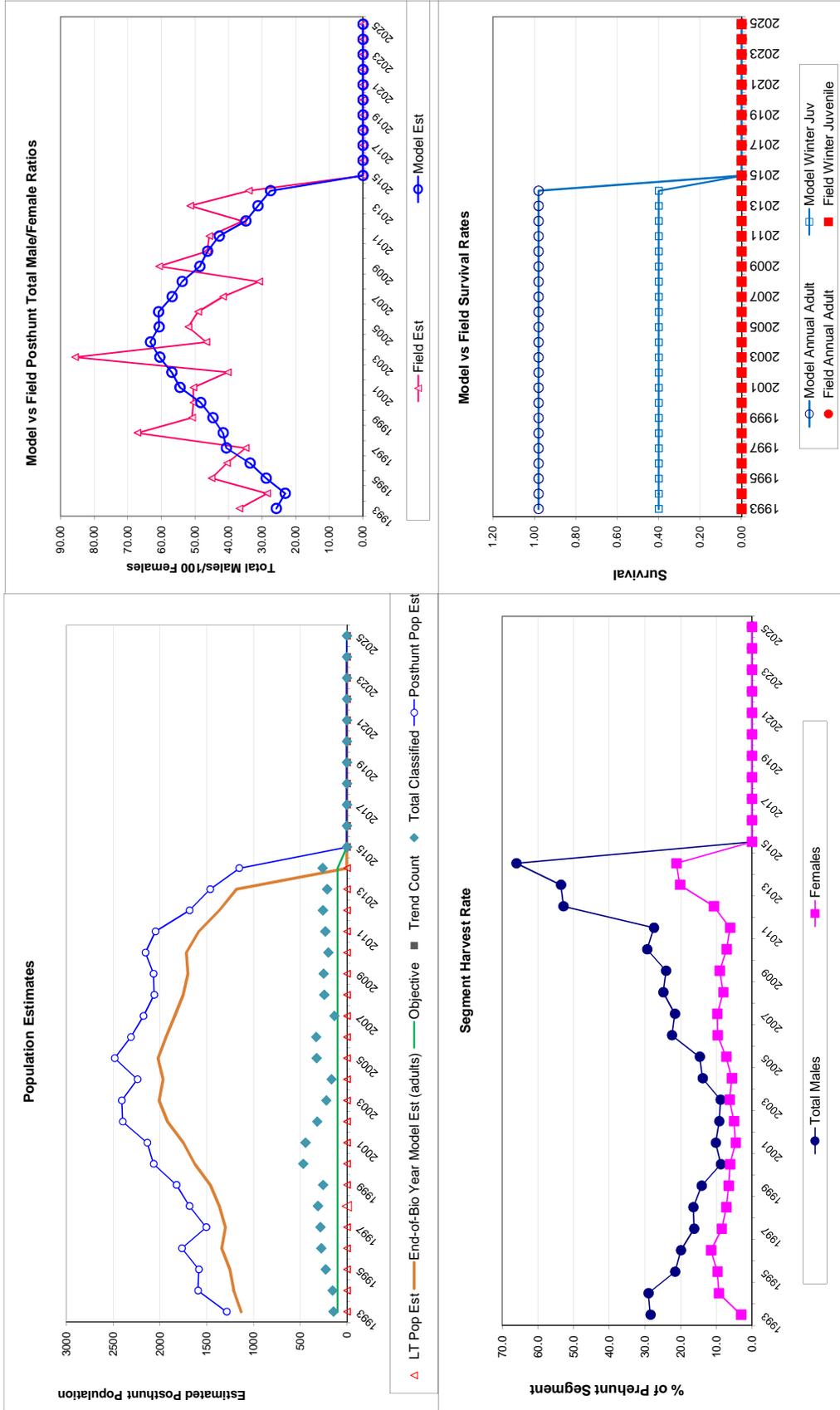
| | |
|---------------------------------|-------|
| Juvenile Survival = | 0.400 |
| Adult Survival = | 0.980 |
| Initial Total Male Pop/10,000 = | 0.023 |
| Initial Female Pop/10,000 = | 0.090 |

MODEL ASSUMPTIONS

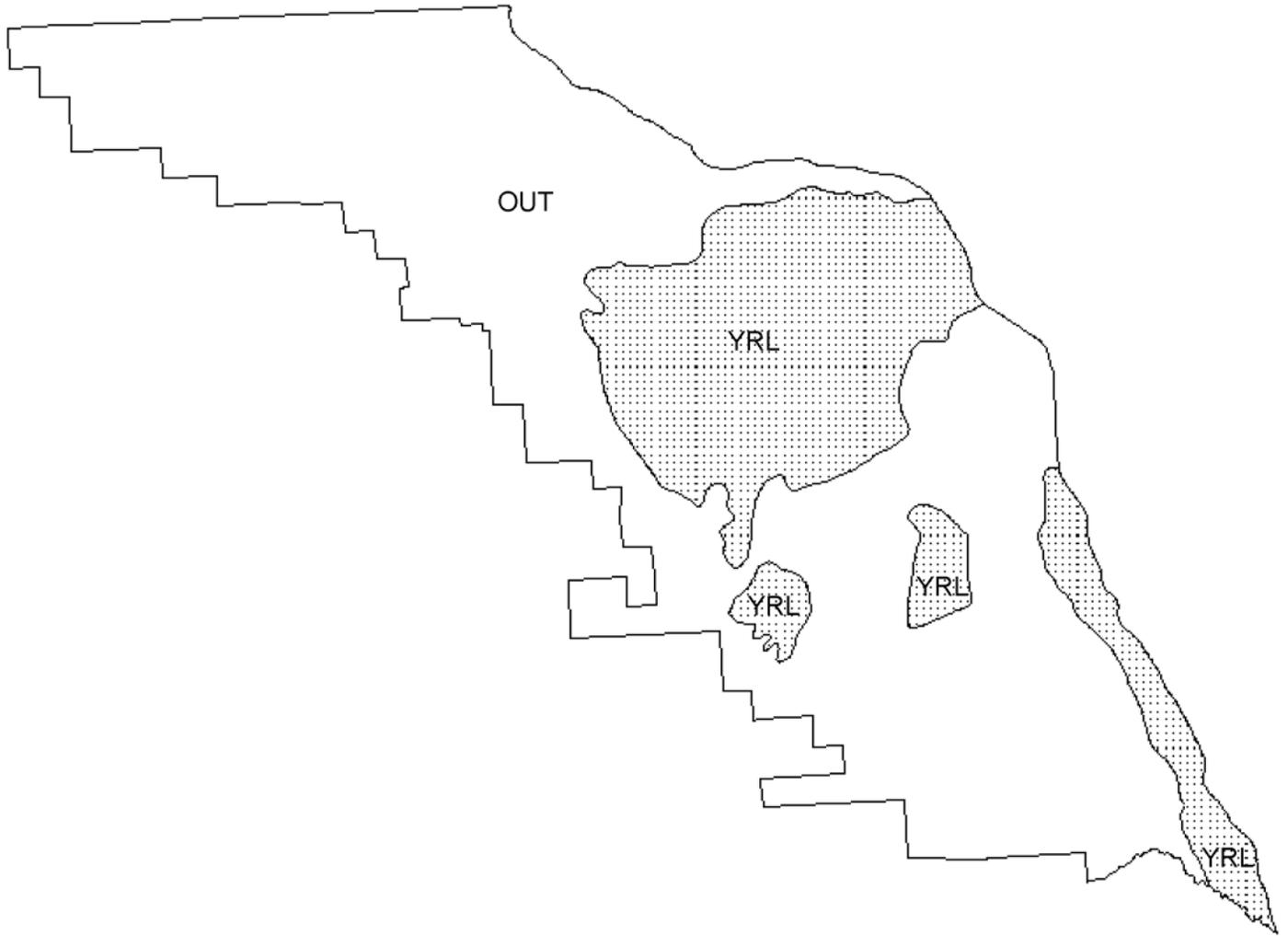
| | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Over-summer adult survival | 98% |

| Year | Classification Counts | | | | | | Harvest | | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|-----------|----------|---------|---------|-----|---------------|-------------|---------|---|--|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Males | | | Females | | | Segment Harvest Rate (% of Total Harvest) | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est | Field SE | Males | Females | Juv | Total Harvest | Total Males | Females | | |
| 1993 | | 28.74 | 6.52 | 25.81 | 36.78 | 7.60 | 60 | 25 | 8 | 93 | 28.5 | 3.1 | | |
| 1994 | | 71.43 | 12.61 | 23.16 | 28.57 | 6.91 | 55 | 76 | 13 | 144 | 29.0 | 9.3 | | |
| 1995 | | 60.36 | 9.34 | 28.83 | 45.05 | 7.67 | 52 | 81 | 9 | 142 | 21.6 | 9.7 | | |
| 1996 | | 77.78 | 10.48 | 33.63 | 40.48 | 6.72 | 56 | 96 | 8 | 160 | 19.9 | 11.5 | | |
| 1997 | | 36.75 | 5.50 | 40.68 | 34.94 | 5.33 | 56 | 72 | 9 | 137 | 16.2 | 8.5 | | |
| 1998 | | 59.85 | 8.36 | 41.61 | 67.15 | 9.05 | 56 | 59 | 0 | 115 | 16.5 | 7.2 | | |
| 1999 | | 66.10 | 9.65 | 44.67 | 50.85 | 8.06 | 53 | 55 | 4 | 112 | 14.1 | 6.5 | | |
| 2000 | | 76.70 | 8.11 | 48.31 | 50.49 | 6.07 | 37 | 54 | 2 | 93 | 8.7 | 6.2 | | |
| 2001 | | 62.98 | 7.02 | 54.50 | 50.48 | 6.04 | 52 | 43 | 5 | 100 | 10.2 | 4.6 | | |
| 2002 | | 73.83 | 9.28 | 56.92 | 40.27 | 6.16 | 52 | 50 | 8 | 110 | 9.2 | 5.0 | | |
| 2003 | | 57.14 | 9.93 | 60.48 | 85.71 | 13.23 | 57 | 67 | 5 | 129 | 8.8 | 6.3 | | |
| 2004 | | 37.78 | 7.60 | 63.28 | 46.67 | 8.72 | 96 | 62 | 10 | 168 | 13.8 | 5.7 | | |
| 2005 | | 64.67 | 8.43 | 60.69 | 52.00 | 7.26 | 97 | 79 | 23 | 199 | 14.7 | 7.2 | | |
| 2006 | | 50.91 | 6.92 | 60.86 | 49.09 | 6.66 | 153 | 108 | 8 | 269 | 22.5 | 9.6 | | |
| 2007 | | 45.83 | 9.64 | 56.84 | 41.67 | 9.05 | 135 | 107 | 6 | 248 | 21.6 | 9.7 | | |
| 2008 | | 43.88 | 6.74 | 53.84 | 30.94 | 5.40 | 143 | 86 | 8 | 237 | 24.9 | 8.1 | | |
| 2009 | | 52.99 | 8.32 | 48.58 | 60.68 | 9.13 | 123 | 95 | 17 | 235 | 24.1 | 9.0 | | |
| 2010 | | 64.21 | 10.54 | 46.27 | 46.32 | 8.45 | 141 | 74 | 8 | 223 | 29.4 | 7.1 | | |
| 2011 | | 50.85 | 8.06 | 42.78 | 45.76 | 7.52 | 126 | 66 | 20 | 212 | 27.5 | 6.2 | | |
| 2012 | | 41.38 | 6.35 | 34.88 | 35.86 | 5.80 | 193 | 112 | 9 | 314 | 52.9 | 10.7 | | |
| 2013 | | 50.48 | 8.51 | 31.27 | 51.43 | 8.61 | 155 | 187 | 10 | 352 | 53.5 | 20.2 | | |
| 2014 | | 40.00 | 6.11 | 27.51 | 34.00 | 5.51 | 150 | 175 | 10 | 335 | 66.0 | 21.2 | | |
| 2015 | | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | |

FIGURES



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).



PH355 - Beckton
HA 109
Revised - 4/87

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD319 - POWDER RIVER

HUNT AREAS: 17-18, 23, 26

PREPARED BY: ERIKA PECKHAM

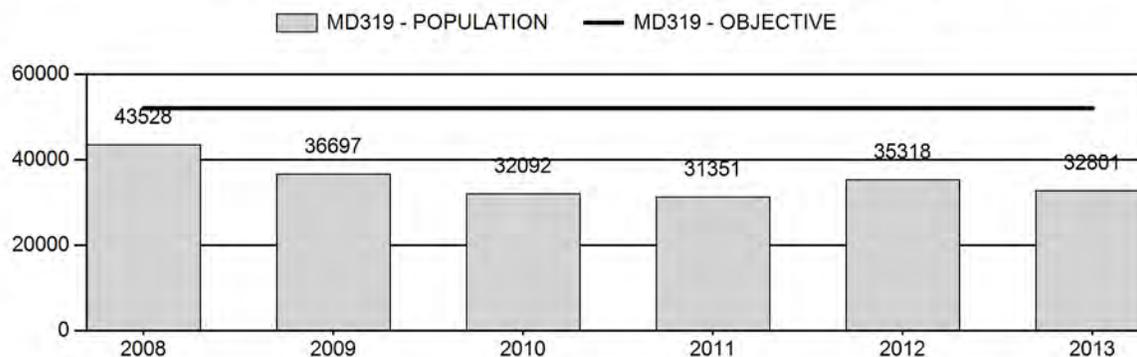
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 35,797 | 32,801 | 30,420 |
| Harvest: | 2,949 | 2,398 | 2,510 |
| Hunters: | 4,332 | 3,590 | 3,675 |
| Hunter Success: | 68% | 67% | 67 % |
| Active Licenses: | 4,503 | 3,728 | 3,800 |
| Active License Percent: | 65% | 64% | 65 % |
| Recreation Days: | 17,116 | 13,841 | 13,900 |
| Days Per Animal: | 5.8 | 5.8 | 5.6 |
| Males per 100 Females | 38 | 39 | |
| Juveniles per 100 Females | 67 | 71 | |

| | |
|---|--------------|
| Population Objective: | 52,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | -36.9% |
| Number of years population has been + or - objective in recent trend: | 2 |
| Model Date: | 02/25/2014 |

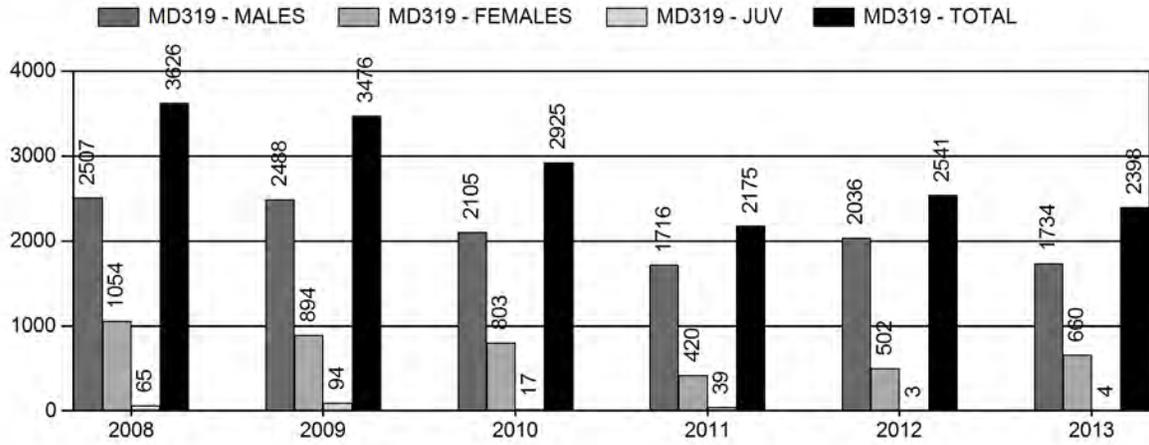
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | | 5.4% |
| Males ≥ 1 year old: | 25.5% | 24.6% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 7.6% | 7.6% |
| Proposed change in post-season population: | -7.7% | -8.3% |

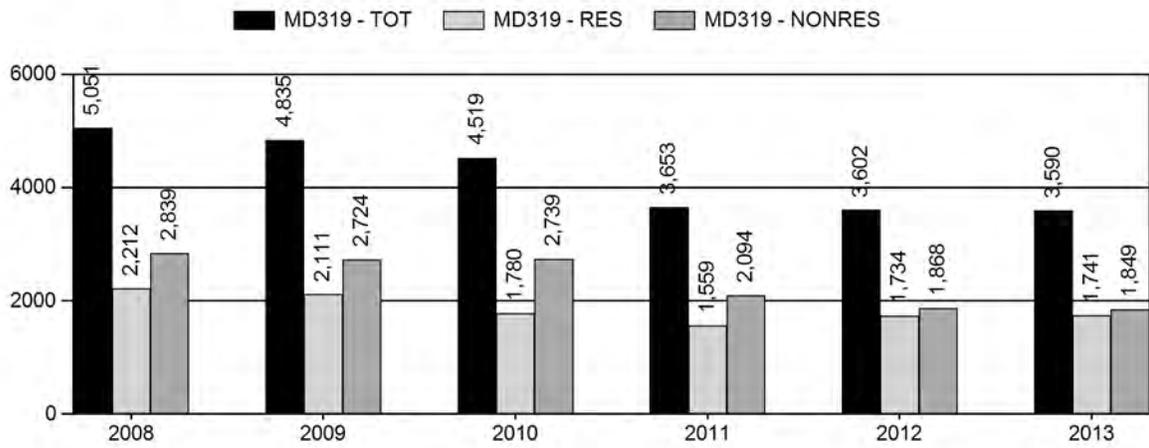
Population Size - Postseason



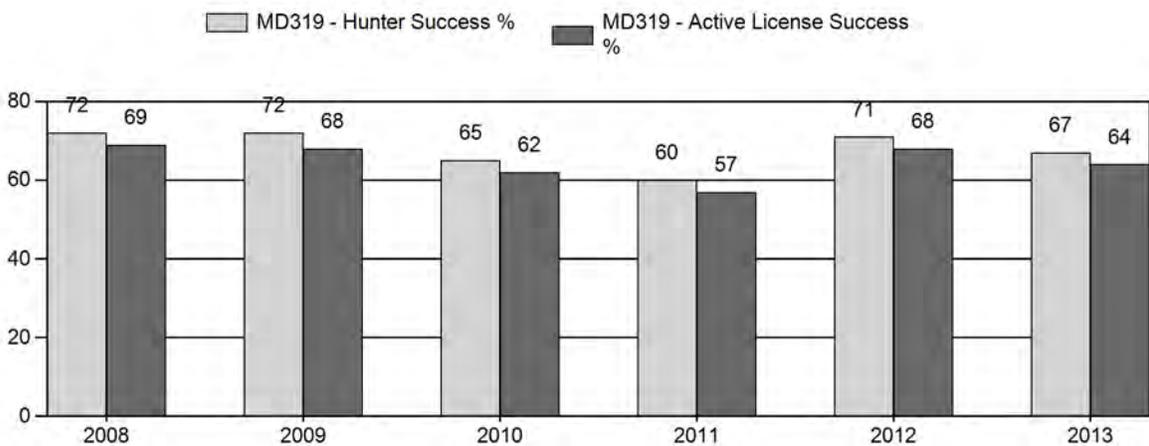
Harvest



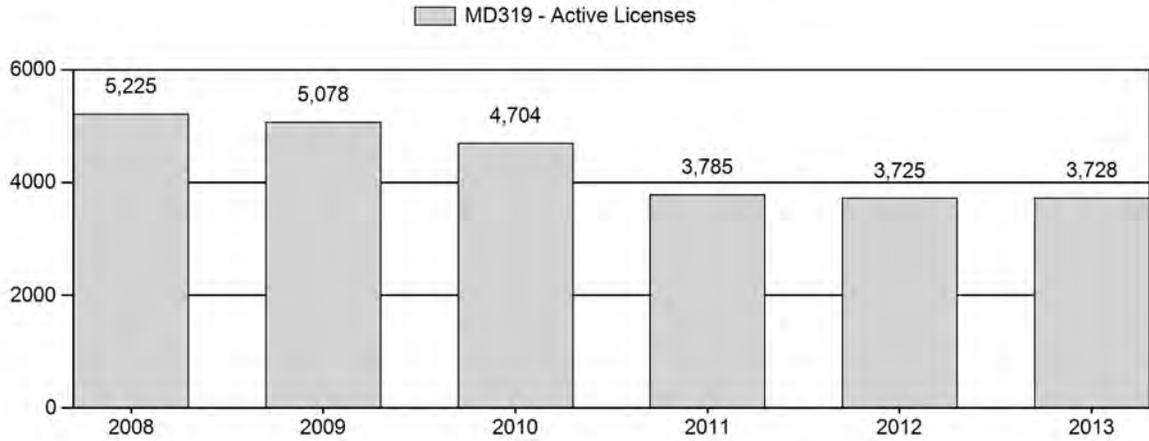
Number of Hunters



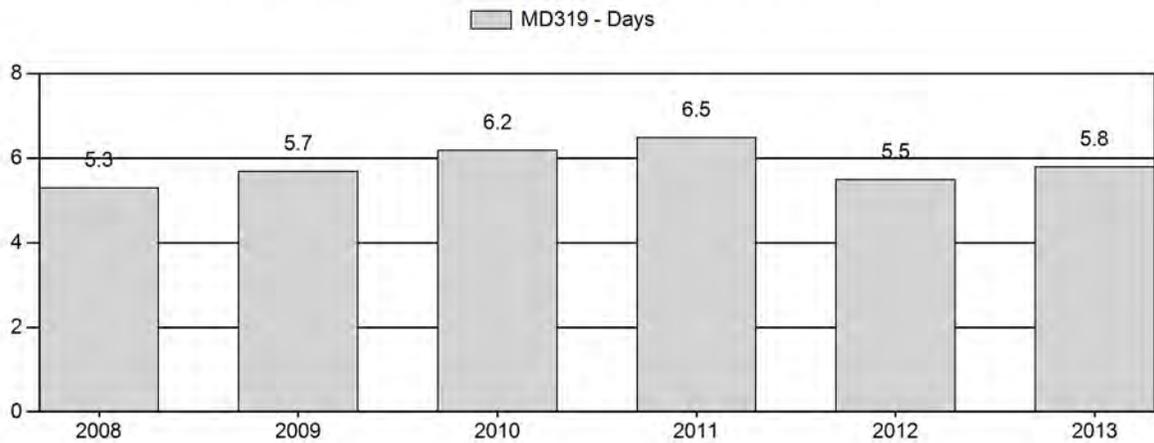
Harvest Success



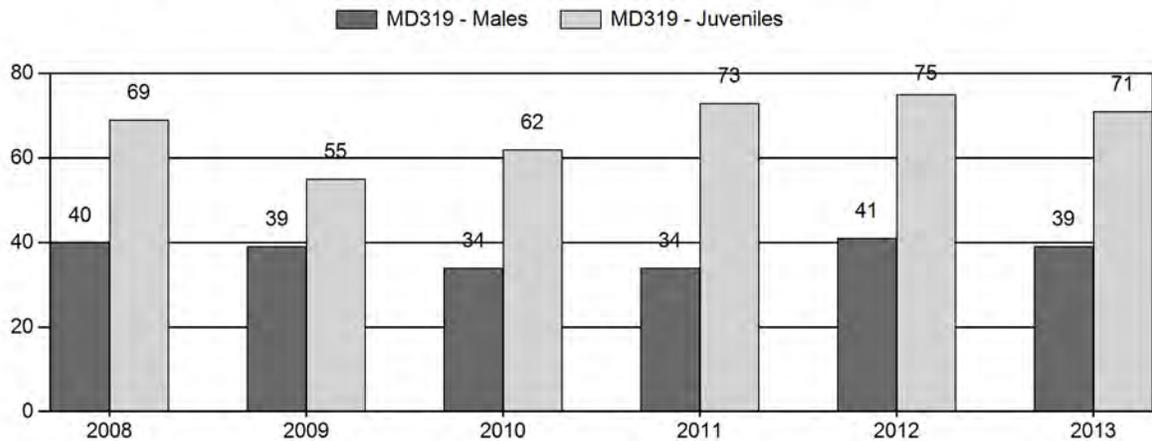
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD319 - POWDER RIVER

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | Ylng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 43,528 | 215 | 499 | 714 | 19% | 1,775 | 48% | 1,222 | 33% | 3,711 | 1,403 | 12 | 28 | 40 | ± 2 | 69 | ± 3 | 49 |
| 2009 | 36,697 | 103 | 415 | 518 | 20% | 1,336 | 52% | 736 | 28% | 2,590 | 920 | 8 | 31 | 39 | ± 2 | 55 | ± 3 | 40 |
| 2010 | 32,092 | 91 | 364 | 455 | 17% | 1,348 | 51% | 832 | 32% | 2,635 | 1,494 | 7 | 27 | 34 | ± 2 | 62 | ± 3 | 46 |
| 2011 | 31,351 | 110 | 241 | 351 | 16% | 1,040 | 48% | 755 | 35% | 2,146 | 1,645 | 11 | 23 | 34 | ± 3 | 73 | ± 4 | 54 |
| 2012 | 35,318 | 260 | 332 | 592 | 19% | 1,459 | 46% | 1,088 | 35% | 3,139 | 1,785 | 18 | 23 | 41 | ± 2 | 75 | ± 4 | 53 |
| 2013 | 32,801 | 168 | 488 | 656 | 18% | 1,665 | 47% | 1,247 | 35% | 3,568 | 1,594 | 10 | 29 | 39 | ± 2 | 75 | ± 3 | 54 |

**2014 HUNTING SEASONS
POWDER RIVER MULE DEER HERD (MD319)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|----------------|------|------------------|---------|-------|---|
| | | Opens | Closes | | |
| 17 | Gen | Oct. 1 | Oct. 20 | | General License; antlered mule deer or any white-tailed deer |
| 18 | Gen | Oct. 1 | Oct. 20 | | General License; antlered mule deer or any white-tailed deer |
| 23 | Gen | Oct. 1 | Oct. 14 | | General license; antlered deer off private land, any deer on private land |
| 26 | Gen | Oct. 1 | Oct. 14 | | General license; antlered deer off private land, any deer on private land |
| 23,26 | 6 | Oct. 1 | Dec.15 | 1,700 | Limited quota licenses; doe or fawn valid on private land |
| Archery | | Sep. 1 | Sep. 30 | | Refer to Section 4 of this Chapter |
| Region C Quota | | | | 2,100 | |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 18 | 6 | -50 |
| 23,26 | 6 | +200 |
| Herd Unit Total | 6 | +150 |
| Region C | | -100 |

Management Evaluation

Current Postseason Population Management Objective: 52,000

Management Strategy: Recreational

2013 Postseason Population Estimate: ~32,800

2014 Proposed Postseason Population Estimate: ~30,400

Herd Unit Issues

The postseason population objective for the Powder River Mule Deer herd is 52,000 mule deer. The management strategy is recreational management. The objective and management strategy were last revised in 1989.

Issues associated with this herd include hunter access to private land and trying to balance private and public land use. Nearly all landowners charge access fees or outfit for buck hunting, and tend to cater to nonresident hunters. New GPS technologies are helping hunters find smaller pieces of unmarked public lands, but at the same time this new accessibility has increased complaints of trespass and congestion by neighboring landowners.

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. This development has tapered off substantially and in certain areas wells are being plugged and abandoned. Proper reclamation will be integral in keeping the habitat intact going into the future.

A continuing issue with portions of this herd unit is that the population is well below objective. The 2013 post-season population estimate was about 33,000, which is only slightly lower than the preceding 5-year average of 35,800. Since around 2008 the population has experienced a declining trend in numbers and poor fawn recruitment, likely influenced by weather factors. This has been especially true in Hunt Areas 17 and 18.

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 likely 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 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. In general, during spring and summer of 2013, the range conditions were favorable, with more than adequate moisture received during the growing season.

Habitat

Overall, the growing season of 2013 was very productive. Moisture was received at critical points throughout the growing season, which allowed for excellent rangeland conditions in some areas. Additionally, cooler than normal temperatures throughout the summer allowed for prolonged growth and vegetation that stayed green well into the summer. The body condition of

the animals going into the winter appeared to be very good. Given the moderate winter of 2013-2014, the deer continue to be in good condition.

Field Data

As stated previously, this herd is below objective. Though Hunt Areas 23 and 26 appear to be rebounding to some degree, this is not the case for Hunt Areas 17 and 18. In 2009 there was a sharp drop in the fawn:doe ratio to 55. This drop in fawn numbers was probably due to heavy snows in early 2009 followed by a very cold and wet spring. In 2010, there was continued poor fawn recruitment with observations indicating 62 fawns per 100 does. In addition to two years of poor fawn recruitment, a drought was experienced in 2012. Although in 2013, fawn production increased into the 70's, the population was still depressed enough to where it may take some more time and favorable conditions to begin to see noticeable improvement in numbers.

It was estimated that 78% of hunters were either very satisfied or satisfied. As Game and Fish personnel talk to hunters they advise people to obtain private access in this portion of the state as there is limited public land. Hunters that hunt on private land usually enjoy a high success rate. However, it should be noted that in speaking to people on public lands, many people were disappointed with the lack of animals.

As this is a predominantly private land area, landowner surveys are also considered. In Hunt Area 23, 82% of respondents stated that deer were at or below desired levels. In Hunt Area 26 62% of respondents felt that deer were below desired levels and the remainder felt that they were at desired levels. Sentiments in Hunt Area 17 and 18 were similar, with all respondents in these areas stating that deer were either at or below desired levels. In Hunt Area 17, 70% of respondents felt mule deer were below objective.

Harvest

In 2013 there were around 2,400 animals harvested in this herd unit. Comments have been received from landowners and hunters that licenses sold out in 2013 and they were unable to achieve desired harvest on private lands, primarily for white-tailed deer. These comments pertained primarily to Hunt Areas 23 and 26. Fifty Type 6 licenses were removed from Hunt Area 18. These licenses were made available to address concerns over primarily white-tailed deer in a particular area. In Areas 23 and 26 the Type 6 limited quota licenses were increased from 1,500 to 1,700 licenses for 2014, still valid only on private land. It is anticipated that the majority of the harvest with these licenses will be white-tailed deer. Hunter success in this herd unit has averaged 68% over the preceding 5 years, with 2013 having an overall success rate of 67%.

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

AIC value (106) and seemed to represent what has been occurring on the ground and is considered a fair model. Although there are no independent population estimates or other survival estimates, it is felt that this model's results are biologically defensible. The model aligns well with the observed buck ratios, further strengthening its selection as a good fit.

Management Summary

If we attain the projected harvest of 2,510 deer and experience similar fawn recruitment as seen the last few years, it is anticipated that the population will still decline slightly. Based on the population model we predict a 2014 post-season population of about 30,400. While the Powder River Deer Herd is seemingly rebounding in Hunt Areas 23 and 26, numbers in Hunt Areas 17 and 18 are still lacking. As a substantial portion of this herd is still struggling to recover, we recommended a reduction of 100 licenses from the Region C quota to reduce pressure on public lands.

| | |
|------------------|-----------------|
| INPUT | |
| Species: | Deer |
| Biologist: | Erika Peckham |
| Herd Unit & No.: | Powder River MD |
| Model date: | 02/25/14 |

| MODELS SUMMARY | | | Relative AICc | Notes |
|----------------|---|-----|---------------|---|
| CJ,CA | Constant Juvenile & Adult Survival | Fit | 241 | <input type="checkbox"/> C.J,CA Model <input type="checkbox"/> SC,J,SCA IV <input checked="" type="checkbox"/> TSJ,CA Model |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 232 | 117 | |
| TSJ,CA | Time-Specific Juvenile & Constant Adult Survival | 103 | 106 | |
| | | 5 | | |

| Year | Posthunt Population Est. | | Trend Count | Population Estimates from Top Model | | | | Objective | | | | |
|------|--------------------------|----------|-------------|-------------------------------------|-------|------------------------------|-------------------------------|-----------|-------|-------|-------|-------|
| | Field Est | Field SE | | Juveniles | Total | Predicted Prehunt Population | Predicted Posthunt Population | | | | | |
| | | | | Juveniles | Total | Total Males | Females | Total | | | | |
| 1993 | | | | 17690 | 12637 | 34611 | 64938 | 17407 | 8827 | 31955 | 58189 | 52000 |
| 1994 | | | | 18823 | 12387 | 30890 | 62099 | 18792 | 9420 | 30360 | 56572 | 52000 |
| 1995 | | | | 21200 | 11294 | 28046 | 60540 | 21196 | 8045 | 27596 | 56838 | 52000 |
| 1996 | | | | 18203 | 12950 | 28591 | 59744 | 18168 | 10177 | 28175 | 56520 | 52000 |
| 1997 | | | | 12072 | 12346 | 26745 | 51162 | 12072 | 9198 | 26664 | 47934 | 52000 |
| 1998 | | | | 16176 | 11081 | 25054 | 52311 | 16176 | 7985 | 25043 | 49204 | 52000 |
| 1999 | | | | 15264 | 9623 | 23270 | 48196 | 15259 | 6260 | 23203 | 44722 | 52000 |
| 2000 | | | | 13436 | 10277 | 23831 | 47545 | 13429 | 6618 | 23592 | 43638 | 52000 |
| 2001 | | | | 10619 | 11337 | 24916 | 46873 | 10604 | 7696 | 24667 | 42967 | 52000 |
| 2002 | | | | 11257 | 10538 | 24114 | 45908 | 11247 | 7007 | 23820 | 42074 | 52000 |
| 2003 | | | | 16046 | 10147 | 23598 | 49791 | 16032 | 6476 | 23219 | 45727 | 52000 |
| 2004 | | | | 13859 | 11805 | 25200 | 50864 | 13803 | 8240 | 24531 | 46574 | 52000 |
| 2005 | | | | 17143 | 10358 | 23390 | 47545 | 17084 | 7501 | 22609 | 47194 | 52000 |
| 2006 | | | | 16188 | 13688 | 25775 | 55651 | 16162 | 9979 | 24838 | 50960 | 52000 |
| 2007 | | | | 14349 | 11452 | 23339 | 49141 | 14301 | 8603 | 22156 | 45060 | 52000 |
| 2008 | | | | 14400 | 11131 | 21973 | 47504 | 14329 | 8373 | 20813 | 43516 | 52000 |
| 2009 | | | | 10555 | 10003 | 19955 | 40513 | 10452 | 7266 | 18972 | 36689 | 52000 |
| 2010 | | | | 10131 | 7903 | 17268 | 35302 | 10113 | 5588 | 16384 | 32085 | 52000 |
| 2011 | | | | 11070 | 7014 | 15651 | 33735 | 11027 | 5126 | 15189 | 31343 | 52000 |
| 2012 | | | | 12223 | 8889 | 16939 | 38050 | 12220 | 6649 | 16387 | 35255 | 52000 |
| 2013 | | | | 10925 | 8362 | 16152 | 35439 | 10921 | 6455 | 15426 | 32801 | 52000 |
| 2014 | | | | 10381 | 7812 | 14989 | 33181 | 10359 | 5887 | 14175 | 30420 | 52000 |
| 2015 | | | | | | | | | | | | 52000 |
| 2016 | | | | | | | | | | | | 52000 |
| 2017 | | | | | | | | | | | | 52000 |
| 2018 | | | | | | | | | | | | 52000 |
| 2019 | | | | | | | | | | | | 52000 |
| 2020 | | | | | | | | | | | | 52000 |
| 2021 | | | | | | | | | | | | 52000 |
| 2022 | | | | | | | | | | | | 52000 |
| 2023 | | | | | | | | | | | | 52000 |
| 2024 | | | | | | | | | | | | 52000 |
| 2025 | | | | | | | | | | | | 52000 |

Survival and Initial Population Estimates

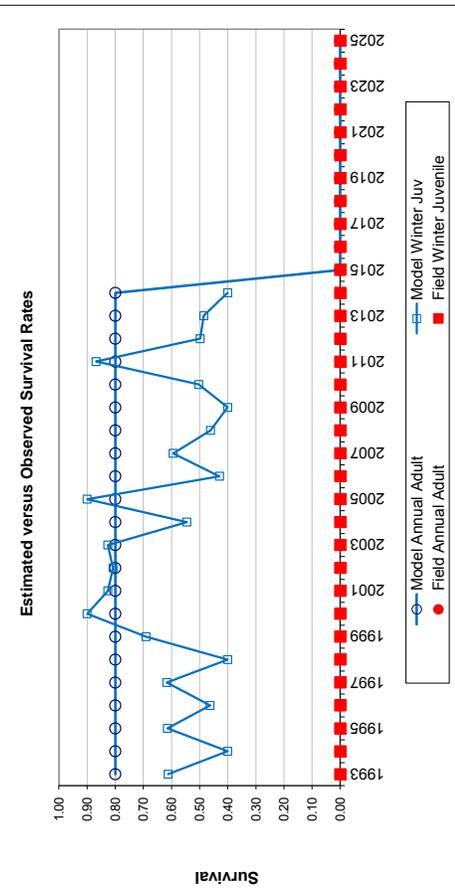
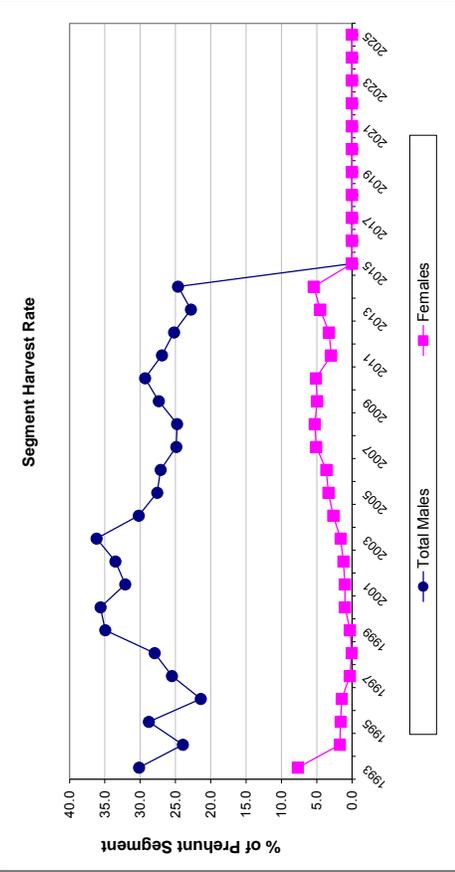
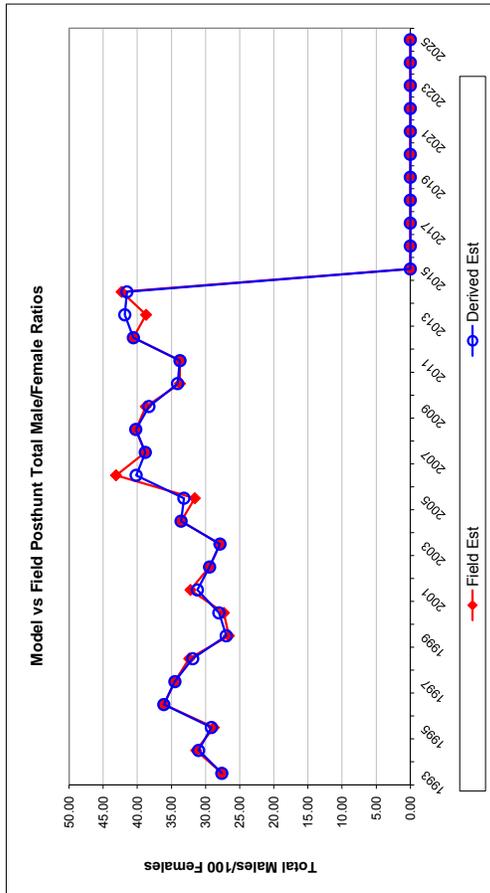
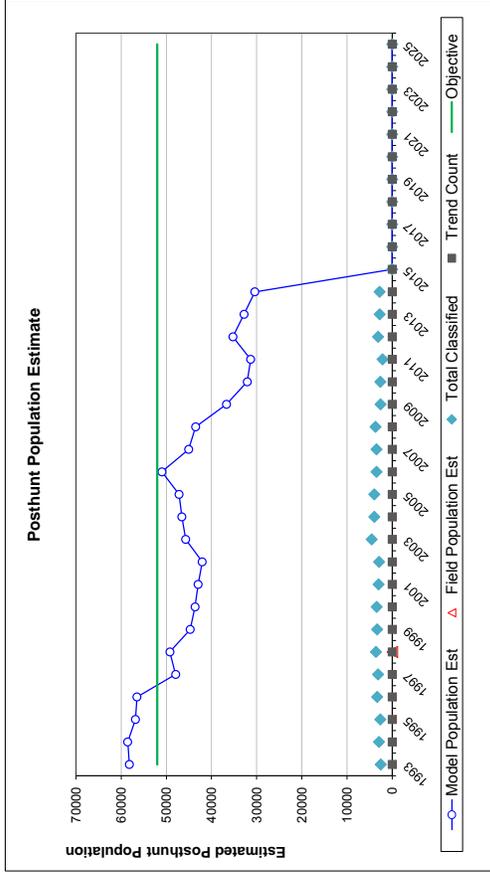
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|------|-----------------------------|-----------|
| | Field Est | SE | Model Est | Field Est |
| 1993 | | 0.61 | 0.80 | |
| 1994 | | 0.40 | 0.80 | |
| 1995 | | 0.61 | 0.80 | |
| 1996 | | 0.46 | 0.80 | |
| 1997 | | 0.62 | 0.80 | |
| 1998 | | 0.40 | 0.80 | |
| 1999 | | 0.69 | 0.80 | |
| 2000 | | 0.90 | 0.80 | |
| 2001 | | 0.83 | 0.80 | |
| 2002 | | 0.81 | 0.80 | |
| 2003 | | 0.83 | 0.80 | |
| 2004 | | 0.55 | 0.80 | |
| 2005 | | 0.90 | 0.80 | |
| 2006 | | 0.43 | 0.80 | |
| 2007 | | 0.59 | 0.80 | |
| 2008 | | 0.46 | 0.80 | |
| 2009 | | 0.40 | 0.80 | |
| 2010 | | 0.50 | 0.80 | |
| 2011 | | 0.87 | 0.80 | |
| 2012 | | 0.50 | 0.80 | |
| 2013 | | 0.48 | 0.80 | |
| 2014 | | 0.40 | 0.80 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | Optim cells |
|---------------------------------|-------------|
| Adult Survival = | 0.800 |
| Initial Total Male Pop/10,000 = | 0.883 |
| Initial Female Pop/10,000 = | 3.196 |

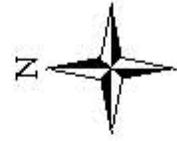
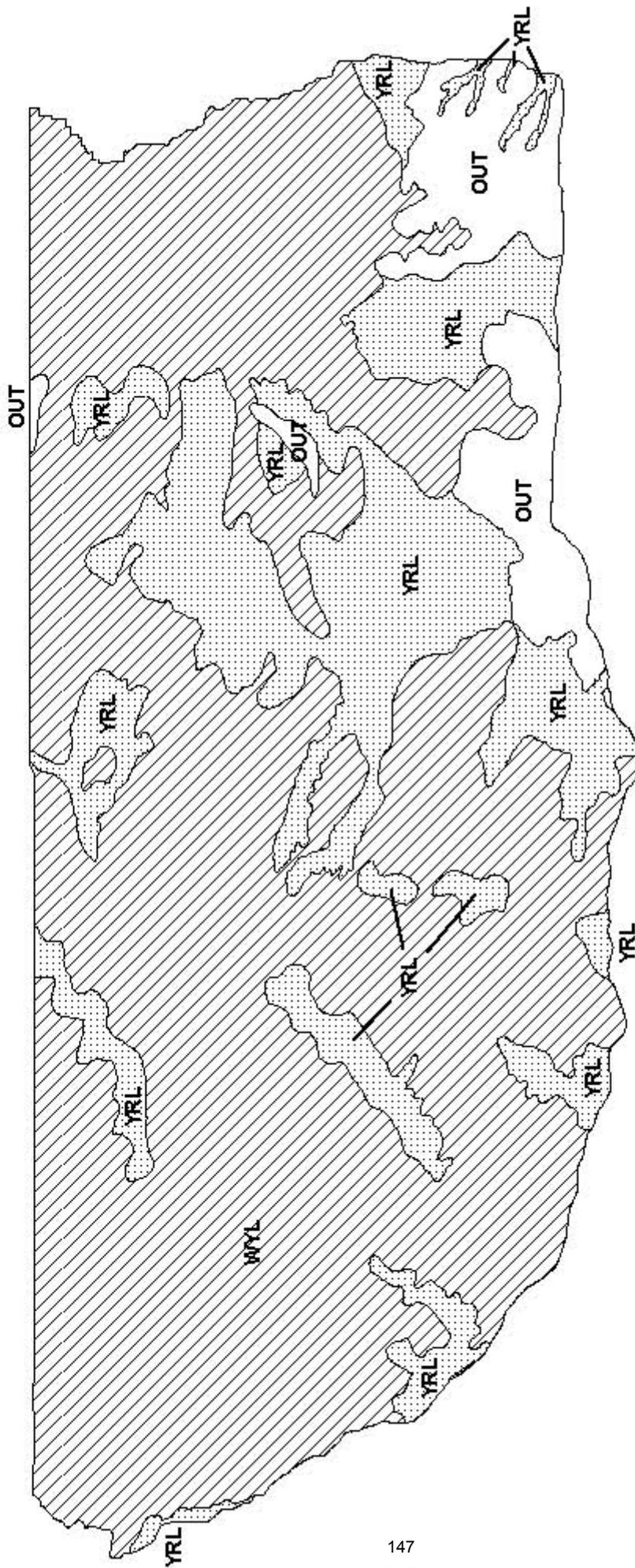
| MODEL ASSUMPTIONS | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total mates) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |

| Year | Classification Counts | | | | | Harvest | | | | | | |
|------|-----------------------|----------|-------------------------|------------------------|----------|---------|-------|---------|---------------|----------------------------|---------|--|
| | Juvenile/Female Ratio | | Total Male/Female Ratio | | | Juv | Males | Females | Total Harvest | Segment Harvest Rate (% of | | |
| | Field Est | Field SE | Derived Est | Field Est w/o bull adj | Field SE | | | | | Total Males | Females | |
| 1993 | 54.47 | 2.45 | 27.82 | 27.63 | 1.59 | 257 | 3464 | 2414 | 6165 | 30.2 | 7.7 | |
| 1994 | 61.90 | 2.57 | 31.03 | 31.38 | 1.65 | 28 | 2697 | 482 | 3207 | 24.0 | 1.7 | |
| 1995 | 76.81 | 3.25 | 29.15 | 28.79 | 1.70 | 3 | 2954 | 409 | 3366 | 28.8 | 1.6 | |
| 1996 | 64.48 | 2.52 | 36.12 | 36.12 | 1.72 | 32 | 2521 | 378 | 2931 | 21.4 | 1.5 | |
| 1997 | 45.27 | 1.94 | 34.49 | 34.50 | 1.63 | 0 | 2862 | 73 | 2935 | 25.5 | 0.3 | |
| 1998 | 64.59 | 2.41 | 31.88 | 32.40 | 1.53 | 0 | 2815 | 10 | 2825 | 27.9 | 0.0 | |
| 1999 | 65.77 | 2.50 | 26.98 | 26.58 | 1.39 | 4 | 3057 | 61 | 3122 | 34.9 | 0.3 | |
| 2000 | 56.92 | 2.18 | 28.05 | 27.31 | 1.36 | 7 | 3327 | 218 | 3552 | 35.6 | 1.0 | |
| 2001 | 42.99 | 1.89 | 31.20 | 32.21 | 1.57 | 14 | 3310 | 227 | 3551 | 32.1 | 1.0 | |
| 2002 | 47.22 | 2.05 | 29.41 | 29.42 | 1.52 | 9 | 3210 | 267 | 3486 | 33.5 | 1.2 | |
| 2003 | 69.04 | 2.25 | 27.89 | 27.89 | 1.24 | 13 | 3337 | 344 | 3694 | 36.2 | 1.6 | |
| 2004 | 56.27 | 2.05 | 33.59 | 33.59 | 1.47 | 51 | 3241 | 608 | 3900 | 30.2 | 2.7 | |
| 2005 | 75.56 | 2.63 | 33.18 | 31.58 | 1.47 | 54 | 2597 | 710 | 3361 | 27.6 | 3.3 | |
| 2006 | 65.07 | 2.53 | 40.18 | 43.12 | 1.92 | 23 | 3372 | 852 | 4247 | 27.1 | 3.6 | |
| 2007 | 64.55 | 2.49 | 38.83 | 38.83 | 1.77 | 44 | 2590 | 1076 | 3710 | 24.9 | 5.1 | |
| 2008 | 68.85 | 2.56 | 40.23 | 40.23 | 1.78 | 65 | 2507 | 1054 | 3626 | 24.8 | 5.3 | |
| 2009 | 55.09 | 2.53 | 38.30 | 38.77 | 2.01 | 94 | 2488 | 894 | 3476 | 27.4 | 4.9 | |
| 2010 | 61.72 | 2.72 | 34.10 | 33.75 | 1.83 | 17 | 2105 | 803 | 2925 | 29.3 | 5.1 | |
| 2011 | 72.60 | 3.47 | 33.75 | 33.75 | 2.08 | 39 | 1716 | 420 | 2175 | 26.9 | 3.0 | |
| 2012 | 74.57 | 2.99 | 40.58 | 40.58 | 1.98 | 3 | 2036 | 502 | 2541 | 25.2 | 3.3 | |
| 2013 | 70.79 | 3.02 | 41.84 | 38.72 | 2.01 | 4 | 1734 | 660 | 2398 | 22.8 | 4.5 | |
| 2014 | 73.08 | 3.12 | 41.53 | 42.31 | 2.15 | 20 | 1750 | 740 | 2510 | 24.6 | 5.4 | |
| 2015 | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | |

FIGURES



END



Mule Deer (MD319) - Powder River
HA 17, 18, 23, 26
Revised - 3/87

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD320 - PUMPKIN BUTTES

HUNT AREAS: 19-20, 29, 31

PREPARED BY: DAN THIELE

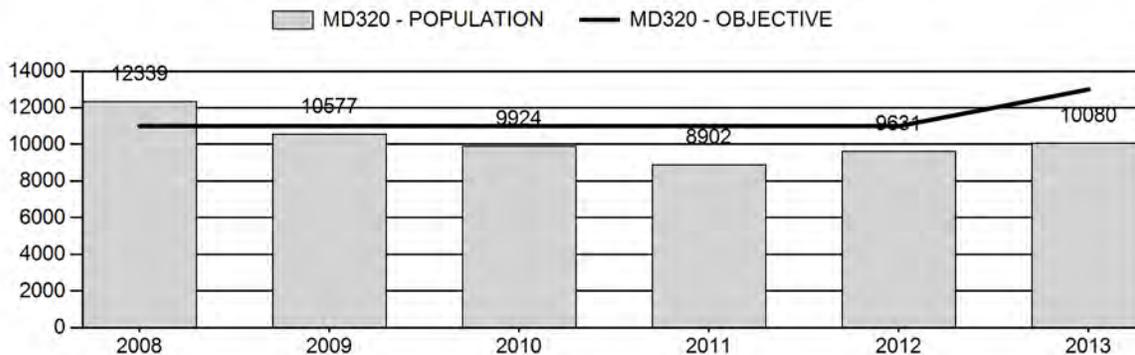
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 10,275 | 10,080 | 10,300 |
| Harvest: | 728 | 629 | 630 |
| Hunters: | 1,071 | 980 | 1,000 |
| Hunter Success: | 68% | 64% | 63% |
| Active Licenses: | 1,112 | 982 | 1,000 |
| Active License Percent: | 65% | 64% | 63% |
| Recreation Days: | 4,054 | 3,349 | 3,550 |
| Days Per Animal: | 5.6 | 5.3 | 5.6 |
| Males per 100 Females | 45 | 43 | |
| Juveniles per 100 Females | 68 | 54 | |

| | |
|---|------------|
| Population Objective: | 13,000 |
| Management Strategy: | Private |
| Percent population is above (+) or below (-) objective: | -22.5% |
| Number of years population has been + or - objective in recent trend: | 5 |
| Model Date: | 02/21/2014 |

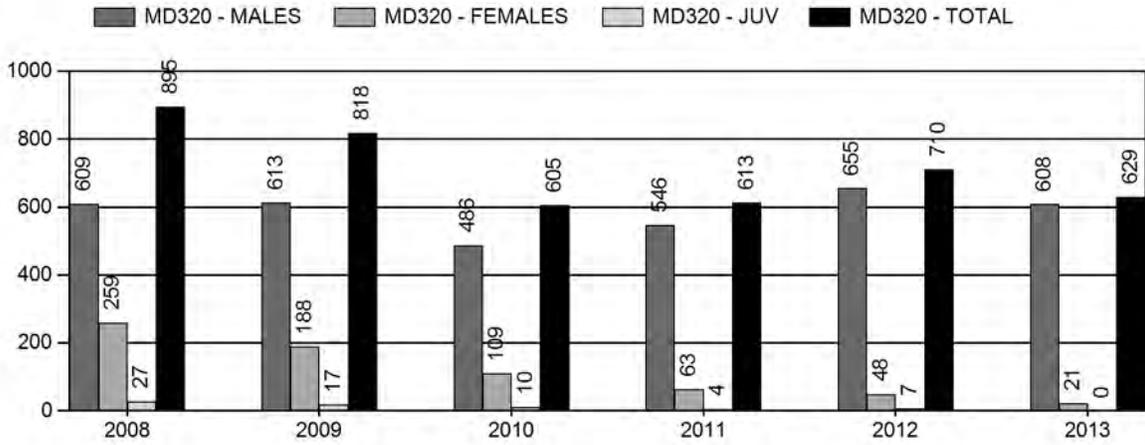
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 1% | 1% |
| Males ≥ 1 year old: | 30% | 22% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 7% | 6% |
| Proposed change in post-season population: | -3% | +2% |

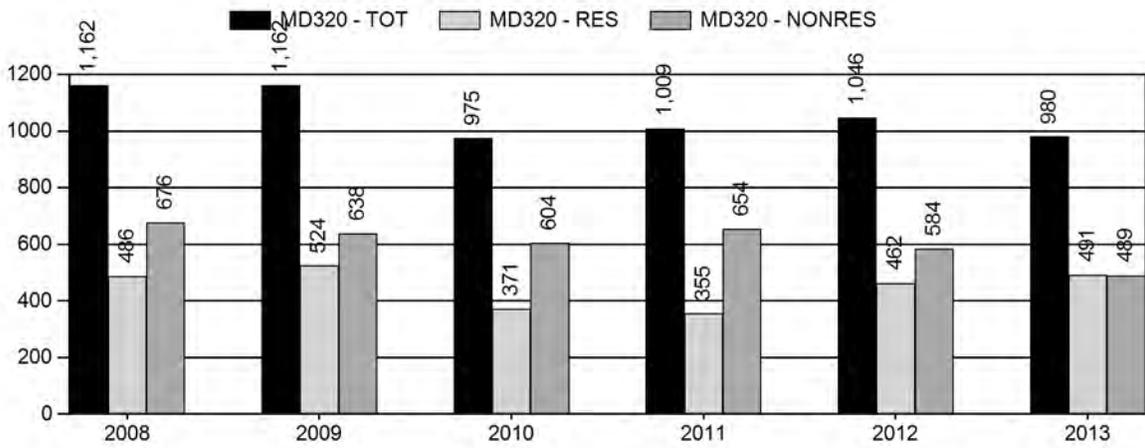
Population Size - Postseason



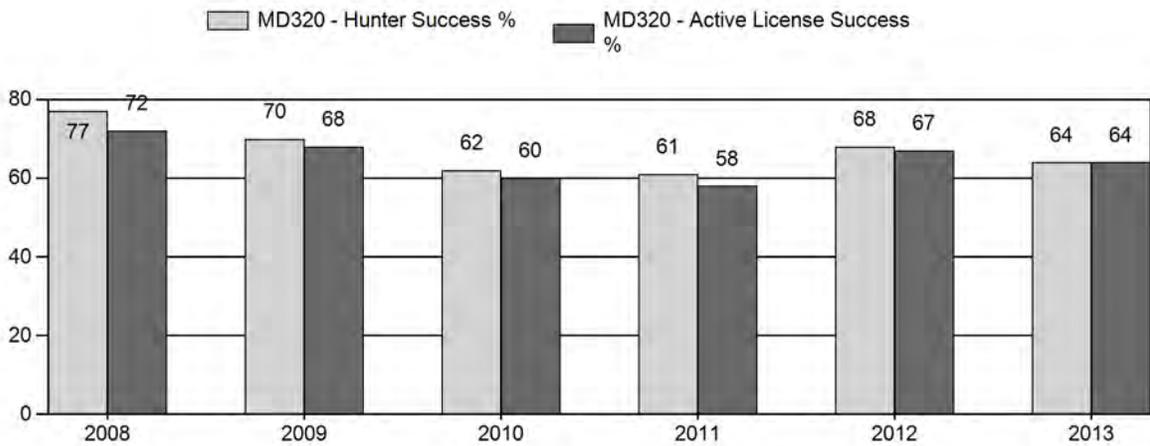
Harvest



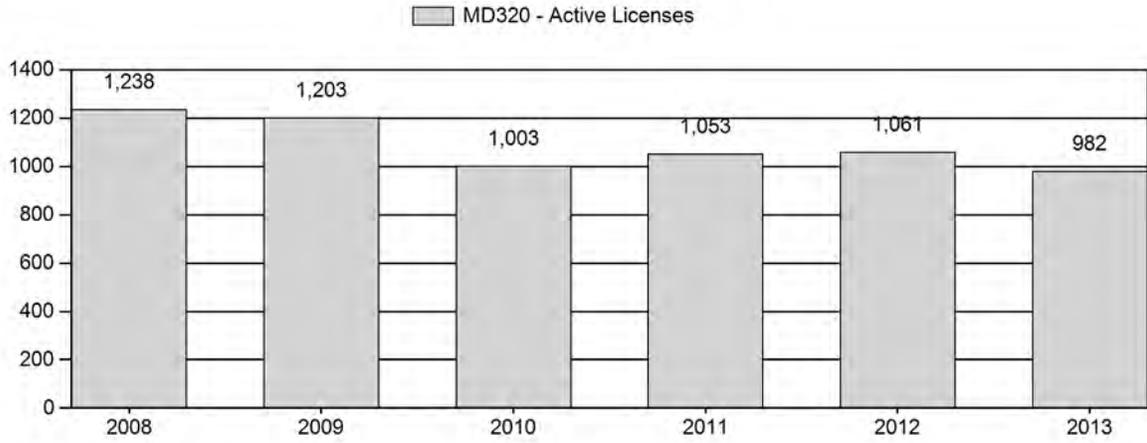
Number of Hunters



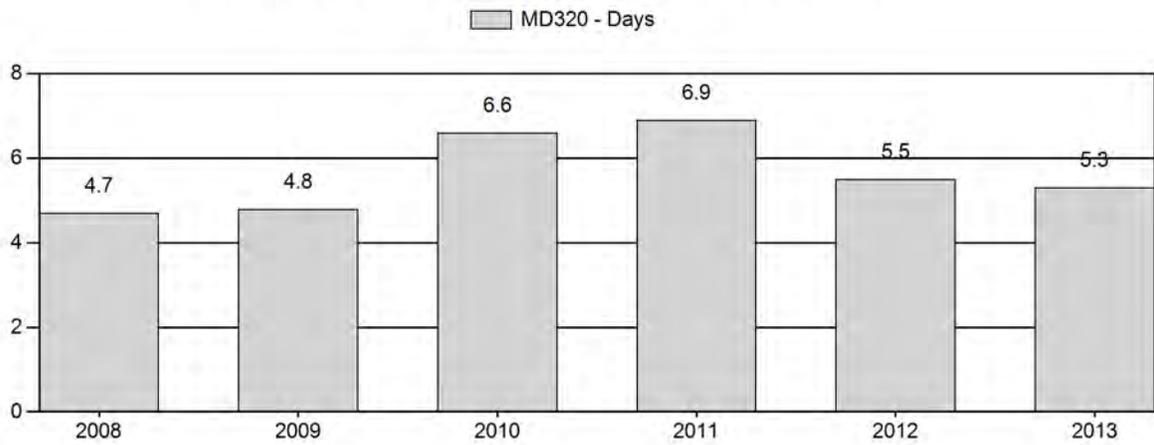
Harvest Success



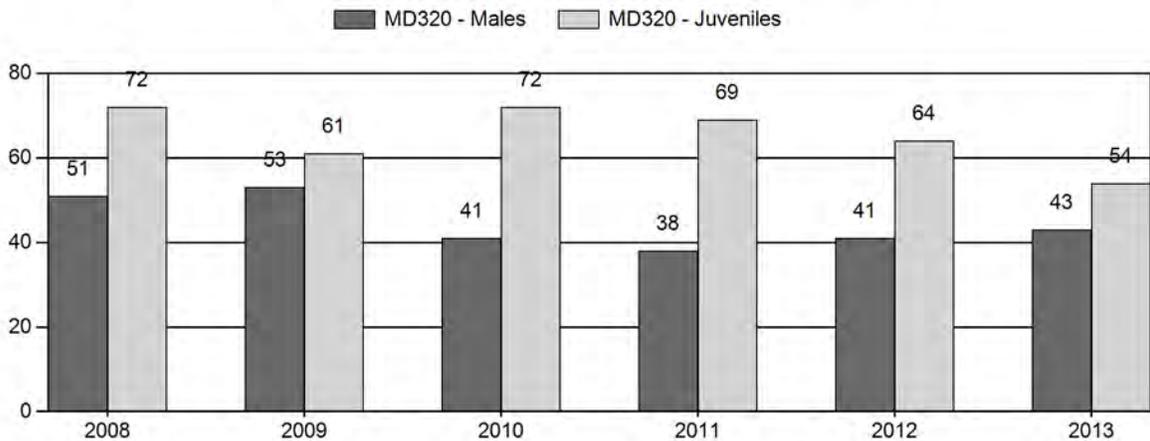
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD320 - PUMPKIN BUTTES

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot CIs | CIs Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|---------|---------|----------------------|-------|-------|----------|----------|----------|-----------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 12,339 | 137 | 300 | 437 | 23% | 861 | 45% | 622 | 32% | 1,920 | 1,605 | 16 | 35 | 51 | ± 4 | 72 | ± 4 | 48 |
| 2009 | 10,577 | 111 | 269 | 380 | 25% | 715 | 47% | 433 | 28% | 1,528 | 1,250 | 16 | 38 | 53 | ± 4 | 61 | ± 4 | 40 |
| 2010 | 9,924 | 75 | 198 | 273 | 19% | 659 | 47% | 477 | 34% | 1,409 | 1,493 | 11 | 30 | 41 | ± 4 | 72 | ± 5 | 51 |
| 2011 | 8,902 | 76 | 225 | 301 | 18% | 795 | 48% | 545 | 33% | 1,641 | 1,362 | 10 | 28 | 38 | ± 3 | 69 | ± 4 | 50 |
| 2012 | 9,631 | 119 | 182 | 301 | 20% | 732 | 49% | 470 | 31% | 1,503 | 1,234 | 16 | 25 | 41 | ± 3 | 64 | ± 4 | 45 |
| 2013 | 10,080 | 96 | 324 | 420 | 22% | 977 | 51% | 525 | 27% | 1,922 | 979 | 10 | 33 | 43 | ± 3 | 54 | ± 3 | 38 |

**2014 HUNTING SEASONS
PUMPKIN BUTTES MULE DEER HERD (MD320)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|---|
| | | Opens | Closes | | |
| 19 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer |
| 20 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer |
| 19, 20 | 6 | Oct. 1 | Oct. 20 | 25 | Limited quota licenses; doe or fawn valid on private land |
| 29 | | Oct. 1 | Oct. 14 | | General license, antlered deer off private land; any deer on private land |
| 31 | | Oct. 1 | Oct. 10 | | General license; antlered deer |
| Archery | | Sep. 1 | Sep. 30 | | Refer to Section 3 of this Chapter |
| Region C | | | | 2,100 | |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|-----------------|------------------------|
| | | |
| Herd Unit Total | | |
| | Region C | -100 |

Management Evaluation

Current Postseason Population Management Objective: 13,000

Management Strategy: Private Lands

2013 Postseason Population Estimate: ~10,100

2014 Proposed Postseason Population Estimate: ~10,300

Herd Unit Issues

The Pumpkin Buttes Mule Deer Herd Unit post-season population objective was reviewed in 2013 and revised from 11,000 to 13,000 deer. The management strategy was changed from recreational to private lands management. The objective and management strategy were last revised in 1988.

This herd unit is largely private land with limited areas of accessible public lands. Limiting hunting on public lands to antlered deer helps maintain hunting recreation for those unable or unwilling to access private lands.

Coalbed methane gas development has slowed after 10 years of intense development in Areas 19 and 20 and the northeast portion of Area 29. Interest in deep oil is increasing at this time. Publicly accessible BLM and state lands in the northern portions of Areas 19 and 29 are particularly problematic as intensive development activity reduced quality hunting opportunity. In recent years these lands attracted fewer hunters.

Weather

Weather in the area of the Pumpkin Buttes Herd Unit during 2012 and 2013 turned extremely warm and dry after several good moisture years. In fact, little spring green up occurred in the Kaycee area in 2013. The southern part of Climate Division 5 was very dry compared to the Sheridan and Gillette areas. 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. Fall precipitation was well above normal improving soil moisture with the more than six inches of moisture (240% of normal) received in September and October coming in the form of rain and snow.

Habitat

There are two Wyoming big sagebrush transects in this herd unit. Production measured in October 2013 averaged 8 mm per leader at Indian Creek compared to 12 mm per leader in 2012. The Schoonover transect averaged 14 mm in 2013 compared to 13 mm in fall 2012. Fall precipitation provided late season green up benefiting wildlife, particularly in the southern portion of the herd unit. Utilization during the 2013-14 winter was very light (less than 5% of leaders browsed) as mule deer and pronghorn were dispersed over winter/yearlong range.

Field Data

Classifications following the hunting season resulted in a fawn ratio of 54:100 and a buck ratio of 43:100. The fawn ratio was the lowest of the last six years and was influenced by drought the past two summers. The yearling buck ratio (10:100) matched that of 2011 and indicates fawn recruitment has been lower two of the last three years. Buck ratios have trended up the last two years and remain above the special management threshold due to the private land status of this herd unit and the conservative hunting philosophy of outfitters who lease private land hunting rights. Hunters were highly satisfied with the 2013 hunting season with 79% expressing satisfaction with their hunt.

Harvest Data

The 2013 harvest survey reported slight decreases in harvest, hunter numbers and hunter success from 2012. The decrease in hunter numbers was due to a reduced Region C nonresident quota (-200 licenses). Harvest and hunter success were most likely affected by wet field conditions the first week of the hunting season which hampered hunter access. Buck harvest reached a six year high in 2012 but fell slightly in 2013. Even though hunting conditions were difficult this past fall, hunting has improved with the reduced nonresident quota as harvest and hunter success has improved the last two years and hunter effort has decreased. Mule deer numbers remain depressed as evidenced by the hunter statistics and landowner survey responses. The postseason landowner survey shows a strong indication that landowners believe the population has decreased since 2005. In 2005, 38% of responding landowners thought deer numbers were too

low compared to 2013 when 64% reported deer numbers too low. The Region C quota sold out during the draw for the first time in more than 10 years. However, 27 applicants received licenses on second choice.

Population

This population is estimated at about 10,100 mule deer, 22% below the revised population objective. The population estimate was generated with the newly adopted EXCEL spreadsheet model. No independent population estimates have been collected for this herd. The Time Specific Juvenile/Constant Adult model (TSJ/CA) was chosen over the Constant Juvenile/Constant Adult model (CJ/CA) even though it had a higher AIC value (115 vs. 100). This model produced fawn survival estimates within the range of parameters selected while the CJ/CA model selected the lowest possible survival rate allowed. Furthermore, both the CJ/CA and Semi-Constant Juvenile/Semi-Constant Adult (SCJ/SCA) predict a long-term stable population whereas the selected model reflects a decreasing population from 2009 to 2011, reflective of harvest data, classifications, the landowner survey and anecdotal observations. The model indicates this population decreased nearly 30% from 2008 through 2011 followed by a 13% increase the last two years. Antlerless harvest has been minimal so the increase can be attributed to improved recruitment even though the fawn ratio has been below the five year average the last two years. The significant differences in the three models leads to some uncertainty in the credibility of the model. Additionally, independent survival estimates are lacking for this herd so the user manual suggested starting values are applied. Therefore, this model is considered a fair model.

Management Summary

The nonresident Region C license quota has been reduced 500 licenses (18%) over the last two hunting seasons. This adjustment reversed trends in decreasing hunter success and increasing hunter effort. Hunting seasons are very conservative with minimal antlerless harvest occurring (1%) so harvest strategies are not limiting the growth of this herd. Although the population increased slightly the last two years, growth was limited due to declining fawn ratios. Growth is expected to be negligible in 2014 due to effects of drought on fawn production and recruitment. Conservative hunting seasons will continue thereby accommodating landowner and public desire for higher deer numbers. The Region C quota was reduced another 100 licenses to address low deer numbers and high public land hunting pressure. The decreased quota is expected to eliminate nonresidents obtaining licenses after the first draw thereby reducing the potential for additional public land hunters. This population is expected to remain stable in 2014.

INPUT
 Species: Mule Deer
 Biologist: Dan Thiele
 Herd Unit & No.: Pumpkin Buttes
 Model date: 05/23/13

Clear form

| MODELS SUMMARY | | Fit | Relative AICc | Notes |
|----------------|---|-----|---------------|---|
| CJ,CA | Constant Juvenile & Adult Survival | 91 | 100 | <input type="checkbox"/> CJ,CA Model |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 115 | 127 | <input type="checkbox"/> SC,J,SCA Mod |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 14 | 121 | <input checked="" type="checkbox"/> TS,J,CA Model |

Check best model to create report

| Year | Posthunt Population Est. Field Est | Field SE | Trend Count | Predicted Prehunt Population | | | Predicted Posthunt Population | | | Objective |
|------|------------------------------------|----------|-------------|------------------------------|-------------|---------|-------------------------------|-------------|---------|-----------|
| | | | | Juveniles | Total Males | Females | Juveniles | Total Males | Females | |
| 1993 | | | | 3537 | 2623 | 6627 | 3483 | 1709 | 6195 | 11000 |
| 1994 | | | | 3689 | 2495 | 6100 | 3667 | 1753 | 5923 | 11000 |
| 1995 | | | | 3596 | 2143 | 5494 | 3570 | 1259 | 5203 | 11000 |
| 1996 | | | | 3984 | 2450 | 5619 | 3984 | 1908 | 5560 | 11000 |
| 1997 | | | | 3182 | 2440 | 5375 | 3167 | 1708 | 5291 | 11000 |
| 1998 | | | | 4186 | 2798 | 5677 | 4173 | 1888 | 5587 | 11000 |
| 1999 | | | | 4063 | 3135 | 6109 | 4058 | 1977 | 5967 | 11000 |
| 2000 | | | | 3410 | 3415 | 6622 | 3405 | 2354 | 6525 | 11000 |
| 2001 | | | | 2329 | 3253 | 6605 | 2318 | 2384 | 6452 | 11000 |
| 2002 | | | | 2483 | 2494 | 5764 | 2466 | 1674 | 5591 | 11000 |
| 2003 | | | | 4096 | 2378 | 5526 | 4055 | 1528 | 5415 | 11000 |
| 2004 | | | | 2804 | 2275 | 5400 | 2780 | 1544 | 5206 | 11000 |
| 2005 | | | | 4195 | 2492 | 5435 | 4149 | 1770 | 5165 | 11000 |
| 2006 | | | | 3780 | 3290 | 6018 | 3776 | 2537 | 5694 | 11000 |
| 2007 | | | | 3291 | 3131 | 5669 | 3276 | 2457 | 5427 | 11000 |
| 2008 | | | | 4040 | 3449 | 5835 | 4010 | 2779 | 5551 | 11000 |
| 2009 | | | | 3103 | 3073 | 5300 | 3085 | 2398 | 5094 | 11000 |
| 2010 | | | | 3334 | 2545 | 4711 | 3323 | 2010 | 4591 | 11000 |
| 2011 | | | | 2942 | 2280 | 4354 | 2937 | 1679 | 4285 | 11000 |
| 2012 | | | | 3019 | 2649 | 4743 | 3012 | 1929 | 4691 | 11000 |
| 2013 | | | | 3004 | 2225 | 4445 | 2993 | 1510 | 4401 | 11000 |
| 2014 | | | | | | | | | | 11000 |
| 2015 | | | | | | | | | | 11000 |
| 2016 | | | | | | | | | | 11000 |
| 2017 | | | | | | | | | | 11000 |
| 2018 | | | | | | | | | | 11000 |
| 2019 | | | | | | | | | | 11000 |
| 2020 | | | | | | | | | | 11000 |
| 2021 | | | | | | | | | | 11000 |
| 2022 | | | | | | | | | | 11000 |
| 2023 | | | | | | | | | | 11000 |
| 2024 | | | | | | | | | | 11000 |
| 2025 | | | | | | | | | | 11000 |

Survival and Initial Population Estimates

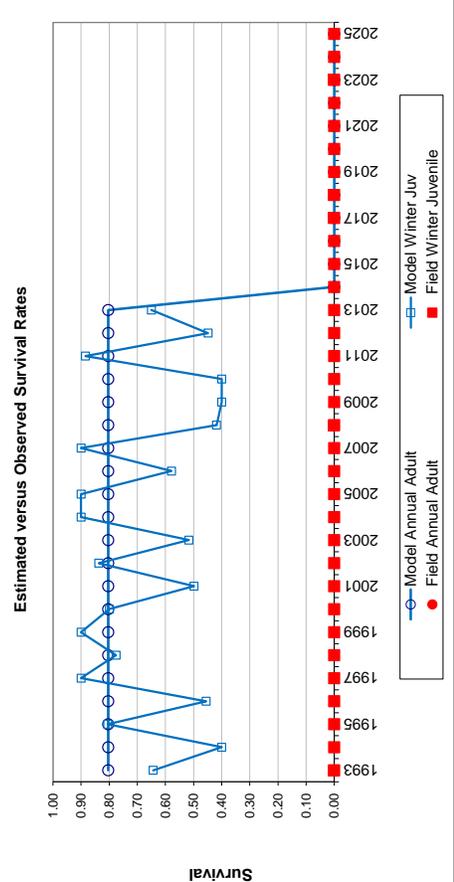
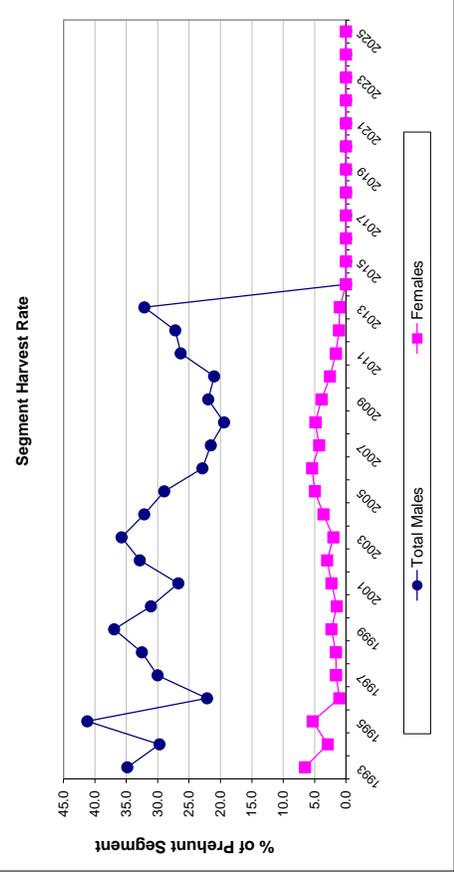
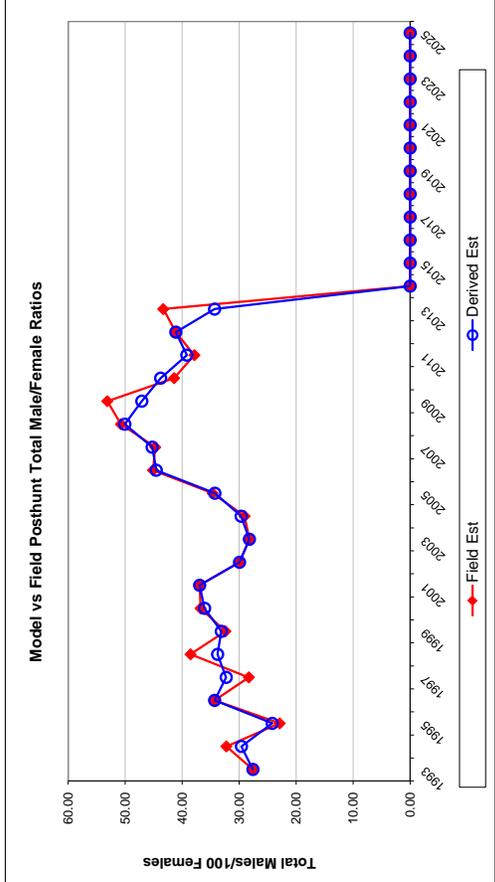
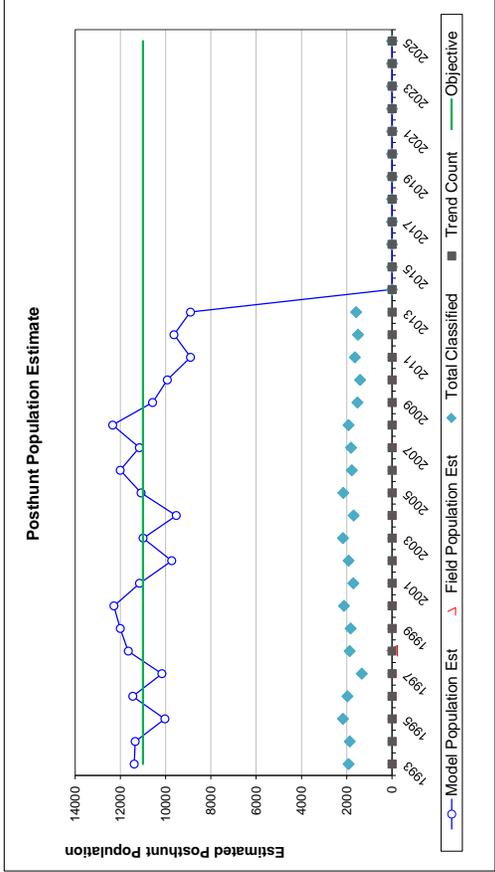
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|--------------|-----------------------------|--------------|
| | Model Est | Field Est SE | Model Est | Field Est SE |
| 1993 | 0.64 | | 0.80 | |
| 1994 | 0.40 | | 0.80 | |
| 1995 | 0.81 | | 0.80 | |
| 1996 | 0.46 | | 0.80 | |
| 1997 | 0.90 | | 0.80 | |
| 1998 | 0.78 | | 0.80 | |
| 1999 | 0.90 | | 0.80 | |
| 2000 | 0.80 | | 0.80 | |
| 2001 | 0.50 | | 0.80 | |
| 2002 | 0.84 | | 0.80 | |
| 2003 | 0.52 | | 0.80 | |
| 2004 | 0.90 | | 0.80 | |
| 2005 | 0.90 | | 0.80 | |
| 2006 | 0.58 | | 0.80 | |
| 2007 | 0.90 | | 0.80 | |
| 2008 | 0.42 | | 0.80 | |
| 2009 | 0.40 | | 0.80 | |
| 2010 | 0.40 | | 0.80 | |
| 2011 | 0.88 | | 0.80 | |
| 2012 | 0.45 | | 0.80 | |
| 2013 | 0.65 | | 0.80 | |
| 2014 | | | | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Adult Survival = | | 0.804 |
| Initial Total Male Pop/10,000 = | | 0.171 |
| Initial Female Pop/10,000 = | | 0.619 |

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

| Year | Classification Counts | | | | | | Harvest | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|------------------------|----------|---------|-------|---------|---------------|----------------------------|---------|--|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Juv | Males | Females | Total Harvest | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est w/o bull adj | Field SE | | | | | Total Males | Females | |
| 1993 | | 56.23 | 2.90 | 27.59 | 27.59 | 1.84 | 49 | 831 | 393 | 1273 | 34.8 | 6.5 | |
| 1994 | | 61.91 | 3.23 | 29.60 | 32.26 | 1.84 | 20 | 674 | 161 | 855 | 29.7 | 2.9 | |
| 1995 | | 68.61 | 3.20 | 24.21 | 22.90 | 1.58 | 24 | 803 | 265 | 1092 | 41.2 | 5.3 | |
| 1996 | | 71.65 | 3.59 | 34.31 | 34.31 | 2.20 | 0 | 493 | 54 | 547 | 22.1 | 1.1 | |
| 1997 | | 59.86 | 3.67 | 32.28 | 28.31 | 2.26 | 14 | 666 | 77 | 757 | 30.0 | 1.6 | |
| 1998 | | 74.69 | 3.86 | 33.79 | 38.54 | 2.47 | 12 | 827 | 82 | 921 | 32.5 | 1.6 | |
| 1999 | | 68.02 | 3.54 | 33.14 | 32.42 | 2.17 | 4 | 1053 | 129 | 1186 | 36.9 | 2.3 | |
| 2000 | | 52.18 | 2.66 | 36.07 | 36.78 | 2.12 | 5 | 965 | 88 | 1058 | 31.1 | 1.5 | |
| 2001 | | 35.93 | 2.22 | 36.94 | 36.94 | 2.26 | 10 | 790 | 139 | 939 | 26.7 | 2.3 | |
| 2002 | | 44.10 | 2.40 | 29.95 | 29.95 | 1.88 | 16 | 745 | 157 | 912 | 32.9 | 3.0 | |
| 2003 | | 74.88 | 3.50 | 28.21 | 28.21 | 1.84 | 38 | 773 | 101 | 912 | 35.8 | 2.0 | |
| 2004 | | 53.39 | 2.97 | 29.66 | 29.06 | 2.01 | 22 | 665 | 176 | 863 | 32.1 | 3.6 | |
| 2005 | | 80.32 | 3.80 | 34.27 | 34.67 | 2.16 | 42 | 656 | 245 | 943 | 29.0 | 5.0 | |
| 2006 | | 66.31 | 3.62 | 44.56 | 45.12 | 2.79 | 4 | 684 | 295 | 983 | 22.9 | 5.4 | |
| 2007 | | 60.36 | 3.31 | 45.28 | 44.73 | 2.71 | 14 | 613 | 220 | 847 | 21.5 | 4.3 | |
| 2008 | | 72.24 | 3.80 | 50.07 | 50.75 | 2.98 | 27 | 609 | 259 | 895 | 19.4 | 4.9 | |
| 2009 | | 60.56 | 3.69 | 47.09 | 53.15 | 3.37 | 17 | 613 | 188 | 818 | 21.9 | 3.9 | |
| 2010 | | 72.98 | 4.35 | 43.78 | 41.43 | 2.98 | 10 | 486 | 109 | 605 | 21.0 | 2.5 | |
| 2011 | | 68.55 | 3.81 | 39.19 | 37.86 | 2.56 | 4 | 546 | 63 | 613 | 26.3 | 1.6 | |
| 2012 | | 64.21 | 3.80 | 41.12 | 41.12 | 2.82 | 7 | 655 | 48 | 710 | 27.2 | 1.1 | |
| 2013 | | 68.00 | 3.90 | 34.32 | 43.33 | 2.88 | 10 | 650 | 40 | 700 | 32.1 | 1.0 | |
| 2014 | | | | | | | | | | | | | |
| 2015 | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | |

FIGURES



Comments:

END

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD321 - NORTH BIGHORN

HUNT AREAS: 24-25, 27-28, 50-53

PREPARED BY: TIM THOMAS

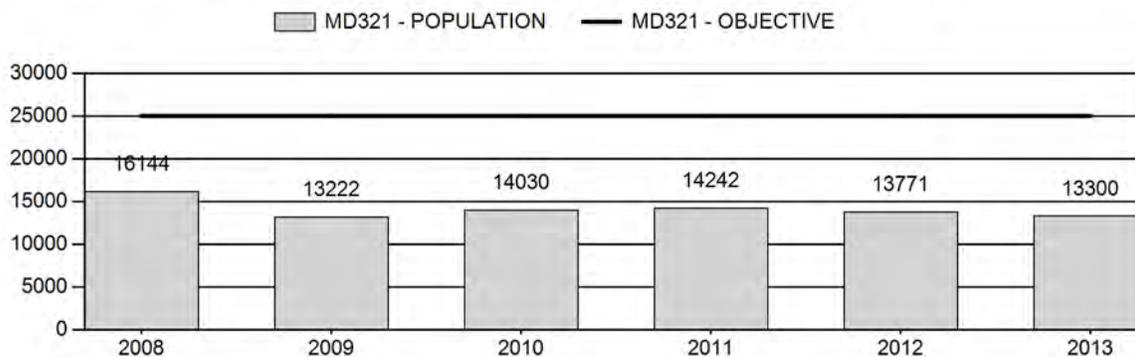
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 14,282 | 13,500 | 13,000 |
| Harvest: | 1,843 | 1,416 | 1,475 |
| Hunters: | 4,007 | 3,078 | 3,200 |
| Hunter Success: | 46% | 46% | 46 % |
| Active Licenses: | 4,272 | 3,194 | 3,400 |
| Active License Percent: | 43% | 44% | 43 % |
| Recreation Days: | 19,973 | 15,549 | 16,000 |
| Days Per Animal: | 10.8 | 11.0 | 10.8 |
| Males per 100 Females | 31 | 31 | |
| Juveniles per 100 Females | 72 | 75 | |

| | |
|---|--------------|
| Population Objective: | 25,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | -46% |
| Number of years population has been + or - objective in recent trend: | 8 |
| Model Date: | 3/4/2013 |

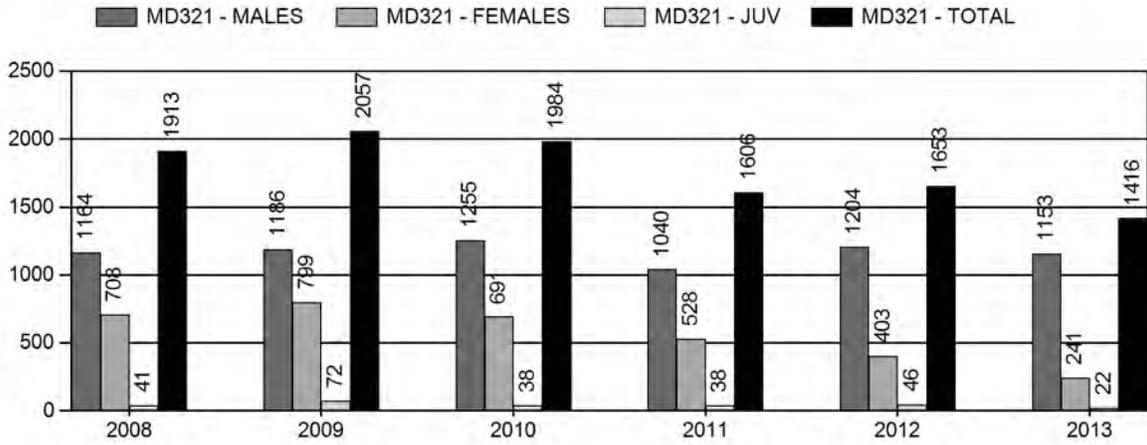
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 4% | 4% |
| Males ≥ 1 year old: | 38% | 41% |
| Juveniles (< 1 year old): | 1% | 1% |
| Total: | 10% | 10% |
| Proposed change in post-season population: | -3% | -2% |

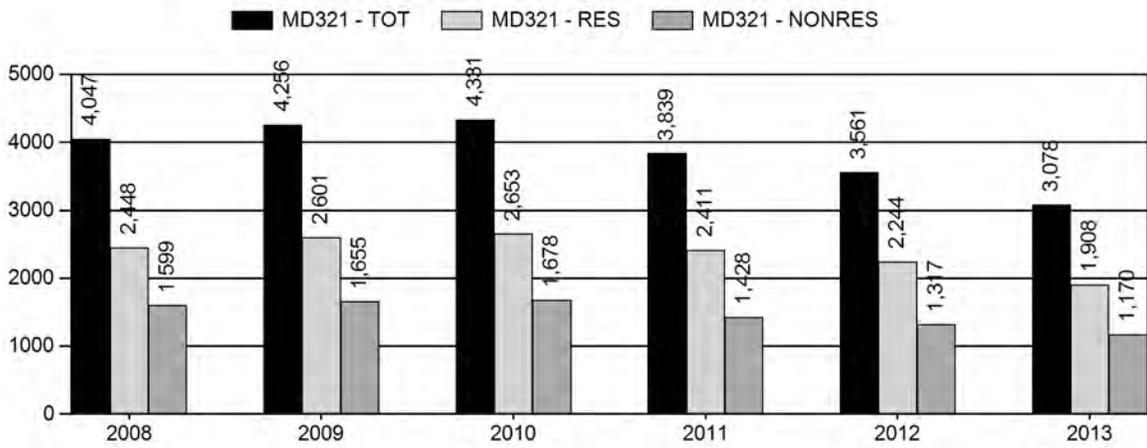
Population Size - Postseason



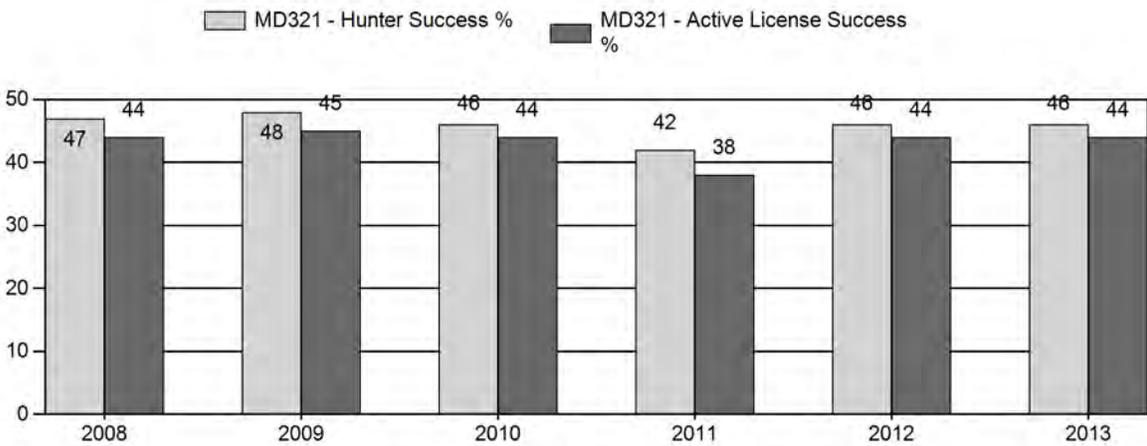
Harvest



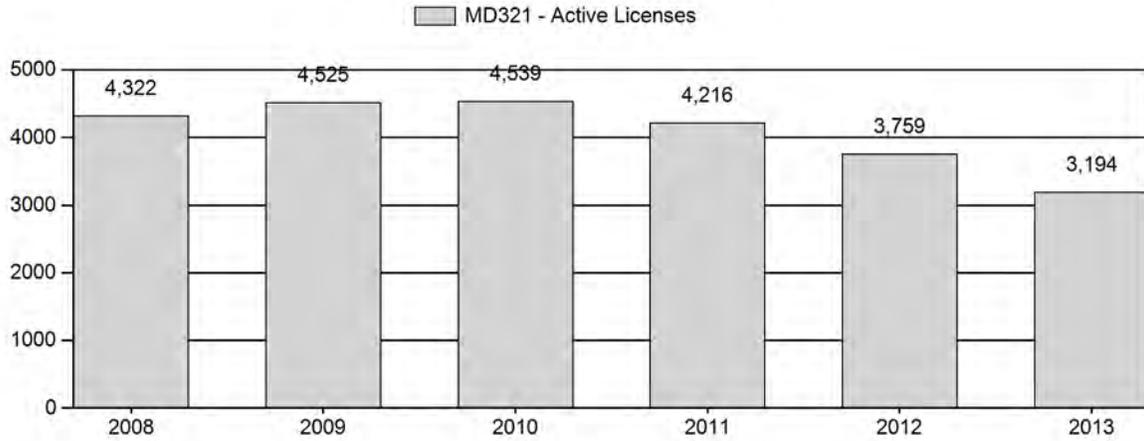
Number of Hunters



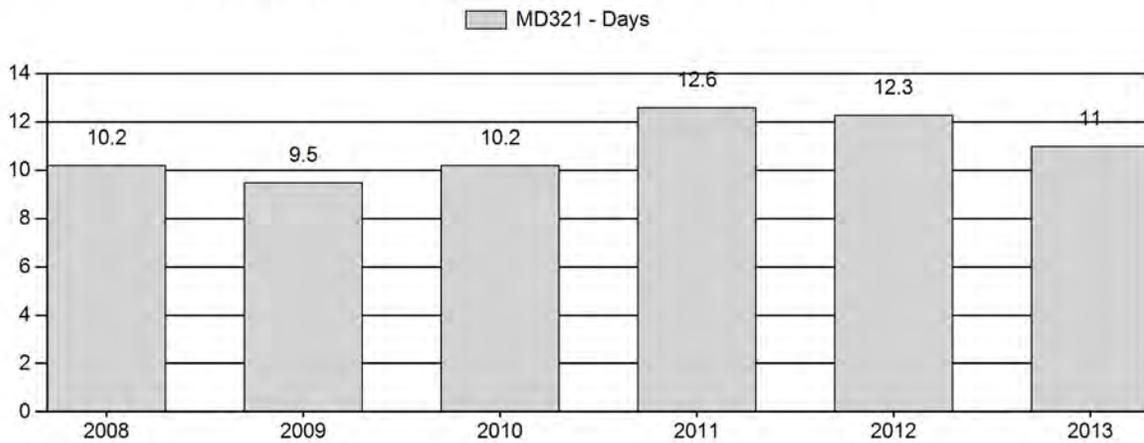
Harvest Success



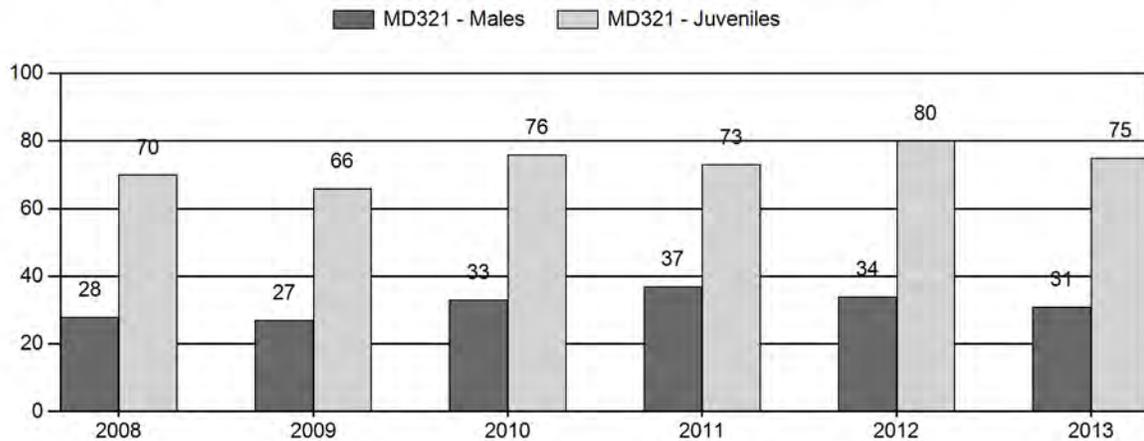
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD321 - NORTH BIGHORN

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 16,144 | 126 | 235 | 361 | 14% | 1,286 | 51% | 896 | 35% | 2,543 | 1,448 | 10 | 18 | 28 | ± 2 | 70 | ± 4 | 54 |
| 2009 | 13,222 | 117 | 204 | 321 | 14% | 1,204 | 52% | 792 | 34% | 2,317 | 1,289 | 10 | 17 | 27 | ± 2 | 66 | ± 4 | 52 |
| 2010 | 14,030 | 136 | 226 | 362 | 16% | 1,099 | 48% | 838 | 36% | 2,299 | 1,672 | 12 | 21 | 33 | ± 2 | 76 | ± 4 | 57 |
| 2011 | 14,242 | 133 | 226 | 359 | 18% | 962 | 47% | 705 | 35% | 2,026 | 1,588 | 14 | 23 | 37 | ± 3 | 73 | ± 4 | 53 |
| 2012 | 13,771 | 118 | 135 | 253 | 16% | 749 | 47% | 596 | 37% | 1,598 | 1,886 | 16 | 18 | 34 | ± 3 | 80 | ± 5 | 59 |
| 2013 | 13,300 | 128 | 190 | 318 | 15% | 1,012 | 49% | 754 | 36% | 2,084 | 1,409 | 13 | 19 | 31 | ± 2 | 75 | ± 4 | 57 |

**2014 HUNTING SEASONS
NORTH BIGHORN MULE DEER HERD (MD321)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--|
| | | Opens | Closes | | |
| 24 | 6 | Oct. 15 | Oct. 31 | 400 | General license; antlered deer off private land, any deer on private land Limited quota licenses; doe or fawn valid on private land |
| | | Sep. 1 | Dec. 15 | | |
| 25 | | Oct. 15 | Oct. 31 | | General license; antlered mule deer or any white-tailed deer |
| 27 | | Oct. 15 | Oct. 31 | | General license; any deer |
| 28 | | Oct. 15 | Oct. 31 | | General license; antlered mule deer or any white-tailed deer |
| 50 | | Oct. 15 | Oct. 24 | | General license; antlered deer |
| 51 | 6 | Oct. 15 | Oct. 24 | 50 | General license; any deer Limited quota licenses; doe or fawn valid within one (1) mile of Shell Creek |
| | | Oct. 1 | Nov. 30 | | |
| 52 | | Oct. 15 | Oct. 24 | | General license; any deer |
| 53 | | Oct. 15 | Oct. 31 | | General license; antlered deer |
| Archery | | Sep. 1 | Sep. 30 | | General license; any deer Limited quota licenses; Refer to Section 4 of this Chapter |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 24 | 6 | - 200 |
| 51 | 6 | - 50 |
| 50 | 6 | - 25 |
| Herd Unit Total | 6 | - 275 |
| Region Y | | No Change |
| Region R | | - 250 |

Management Evaluation

Current Postseason Population Management Objective: 25,000

Management Strategy: Recreational

2013 Postseason Population Estimate: ~ 13,300

2014 Proposed Postseason Population Estimate: ~ 13,000

Herd Unit Issues

The management objective for the North Bighorn Mule Deer Herd Unit is a post-season population objective of 25,000 mule deer and the management strategy is recreational management. The objective and management strategy were last revised in 1996 and are scheduled for review this year.

This mule deer herd has been below the management objective for many years, despite limited doe harvest and relatively conservative seasons. There are other factors limiting this herd from reaching the desired management objective, which likely include, but are not limited to, habitat issues and competition from other ungulates for preferred forage.

Weather

The spring and summer of 2013 were 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 ~30° 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 during much of the winter.

Habitat

We do not have an established habitat transect in this herd unit. Most deer in this herd unit migrate to higher elevations in the Bighorn Mountains during the spring. Deer return to the foothills of the Bighorn Mountains in the fall and spend the winter at lower elevations, often on private lands, especially on the eastside of the Bighorn Mountains.

Field Data

During November and December, field personnel classified mule deer in this herd unit using both aerial (helicopter – Hunt Areas 50-53) and ground (Hunt Areas 24, 25, 27, and 28) techniques. We classified a total of 2,084 mule deer, above the sample desired at the 80% confidence level (n=1,409). In 2013, we observed 75 fawns:100 does. Fawn production, based on observed doe to fawn ratios, has been good the past 4 years (73-80 fawns:100 does; mean = 76 fawns:100 does), which should help this population increase towards objective.

The observed bucks to doe ratio continues to be in the 30s (31 bucks:100 does), but a lot of these bucks appear to be young aged animals. Mature bucks (i.e. 5+ years old) seem to be lacking in this population, resulting in smaller antlered animals generally available for harvest. Habitat quality can also be playing a role in below desired antler development. Even though the

management strategy for this herd unit is recreational hunting, hunters, both resident and non-resident, have consistently requested better quality (i.e. larger antlered) deer in this herd unit.

Deer hunters in this herd unit were generally satisfied with their hunt, according to the hunter satisfaction survey. Of 829 hunters who responded to the satisfaction survey, the majority (70%) were satisfied or very satisfied, while only 14% indicated they were dissatisfied or very dissatisfied. The balance of responses were neutral. We anticipated a lower satisfaction level in 2013 due to adverse winter weather conditions during much of October which limited hunting opportunities on much of the public lands in this herd unit.

Non-resident hunters (n=324) were generally more satisfied (76.2%) than resident hunters (n=505; 65.2%). Hunters were generally more satisfied on the west side (Hunt Areas 50-53) of the Bighorns compared to the east side (Hunt Areas 24, 25, 27, and 28) [73.6% vs. 62.7%]. Hunt Areas 25, 27 and 28 had the lowest satisfaction rate (62.8%, 62.5, and 53.9% respectively) while Hunt Areas 50, 51, and 53 had the highest rates of satisfaction (74.7%, 78.1%, and 72.6% respectively).

Harvest

In 2013, hunters harvested an estimated 1,416 mule deer, a 14% decrease from 2013 and 25% below the 10 year average harvest. Female harvest decreased 40% while buck harvest decreased 4%. The decline in doe harvest was mostly a result of reduced licenses for antlerless harvest and reduced access to private lands for mule deer doe harvest (i.e. landowners reducing access due to perceived decrease in mule deer numbers).

Hunter success was 46%, similar to 2012 and the 10 year average. Hunters spent about 11.0 days hunting per deer harvested, similar to the 10 year average of 10.7 days/harvest. Hunter numbers decreased 15% in 2013, to the lowest level in over 30 years. This could have been partly a function of adverse weather conditions during most of October, which severely limited opportunity in some areas. Mountainous areas such as Hunt Areas 25 and 28 saw the lowest harvest in at least 30 years. These areas also received significant snow events starting in late September and lasting through November.

Population

The 2013 post-season population estimate was about 13,300 with the population relatively stable to trending slowly downward. This population likely peaked in recent years around 2006 and has decreased since then. Hunters and field personnel have noticed a decline in this deer population over the past several years.

The “Time-Specific Juvenile – Constant Adult Survival Rate” (TSJ,CA) spreadsheet model was chosen to estimate the postseason population estimate of this herd. This simulation model had the second highest relative Akaike information criterion (AIC) value of all the models (106 compared to 91 or 107), but also had the lowest fit (4 compared to 56 or 98). This model was selected because it appeared to reasonably simulate the perceived population dynamics of this herd unit. Since we do not have an independent population estimate or survival data for this herd, we consider this simulation model “fair”. The SCJ,SCA model had the lowest relative AIC value, but we do not have any year specific survival rates for this, or surrounding, herd units to

use to properly adjust this model with. The CJ,CJ model has a similar relative AIC value as the TSJ,CA model, but models the population significantly higher than thought by managers.

Management Summary

Hunting seasons traditionally run during the last two weeks of October, opening on October 15 and closing on different dates, depending on the hunt area and year. Season length is generally 10-17 days. An archery pre-season occurs the entire month of September for any deer. Hunting on public land, primarily the Bighorn National Forest, has generally been conservative. Hunting on private land has generally been more liberal, often designed to address damage complaints on private lands and cultivated crops.

We reduced Area 24 Type 6 (doe/fawn deer) licenses for 2014. These licenses are valid only on private land. In 2013, about 70% of the harvest on this license type was white-tailed deer. Unlimited Area 24 Type 8 (doe/fawn white-tailed deer) licenses will be available in 2014, which should address any demand for white-tailed deer harvest.

We reduced the Area 51 Type 6 licenses for 2014 as the damage complaints in this area have decreased. The Area 52 Type 6 licenses were reduced in 2013 and eliminated in 2014 for the same reason.

We estimate a harvest of 1,475 deer in 2014. With average recruitment and the proposed harvest, we estimate a 2014 post-season population of about 13,000 mule deer, still well below the management objective.

Deer Control within the Cities of Buffalo and Sheridan

Higher deer numbers with and adjacent to the Cities of Buffalo and Sheridan have resulted in numerous conflicts, including damage to landscaping, deer-vehicle collisions, and deer-dog interactions. As a result of these various conflicts, the Cities of Buffalo and Sheridan continued deer reduction programs in 2013. Below is a summary of these efforts. Complete reports in compliance with their respective Chapter 56 permit are on file at the Cheyenne Office.

Buffalo

This was the fifth year the City of Buffalo removed deer from within the city limits. Six deer (all white-tail deer) were removed over one day, all of which tested negative for chronic wasting disease. The deer were processed and donated to the food pantry. A summary of the Buffalo program is provided in Table 1.

Table 1. City of Buffalo Deer Reduction Program Summary, 2009-2013.

| | 2009 | 2010 | 2011 | 2012 | 2013 |
|--------------------------|-------------|-------------|-------------|-------------|-------------|
| No Deer Permitted | 50 | 75 | 100 | 75 | 75 |
| No. of Days | 2 | 5 | 4 | 5 | 1 |
| Mule Deer | 16 | 16 | 35 | 10 | 0 |
| White-tailed Deer | 34 | 59 | 26 | 51 | 6 |
| Total | 50 | 75 | 61 | 61 | 6 |
| CWD Positive | 0 | 3 WTD | 0 | 0 | 0 |

Sheridan

This was the third year the City of Sheridan removed deer from within the city limits. All deer are tested for CWD and no deer have tested positive to date. All deer are either donated whole to individuals or processed and donated to area food banks. A summary of the Sheridan program is provided in Table 2.

Table 2. City of Buffalo Deer Reduction Program Summary, 2011-2013.

| | 2011 | 2012 | 2013 |
|--------------------------|-------------|-------------|-------------|
| No Deer Permitted | 100 | 100 | 100 |
| Mule Deer | 51 | 42 | 5 |
| White-tailed Deer | 49 | 39 | 28 |
| Total | 100 | 81 | 33 |
| CWD Positive | 0 | 0 | 0 |

| | |
|------------------|-------------------|
| INPUT | |
| Species: | Mule Deer |
| Biologist: | Timothy P. Thomas |
| Herd Unit & No.: | North Bighorn |
| Model date: | 03/02/14 |

| MODELS SUMMARY | | | Relative AICc | Fit | Notes |
|----------------|---|--|---------------|-----|-------|
| CJ,CA | Constant Juvenile & Adult Survival | | 107 | 98 | |
| SCJ,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | | 91 | 56 | |
| TSJ,CA | Time-Specific Juvenile & Constant Adult Survival | | 106 | 4 | |

| Year | Population Estimates from Top Model | | | | | | | | | | Objective |
|------|-------------------------------------|----------|-------------|-------|------------------------------|-------------|---------|-------------------------------|-------------|---------|-----------|
| | Posthunt Population Est. | | Trend Count | | Predicted Prehunt Population | | | Predicted Posthunt Population | | | |
| | Field Est | Field SE | Juveniles | Total | Juveniles | Total Males | Females | Juveniles | Total Males | Females | |
| 1993 | | | 10630 | 6670 | 17813 | 35114 | 10545 | 3991 | 15821 | 30357 | 25000 |
| 1994 | | | 8897 | 6118 | 15586 | 30602 | 8845 | 3815 | 14284 | 26944 | 25000 |
| 1995 | | | 7961 | 5175 | 13553 | 26689 | 7895 | 3418 | 12642 | 23956 | 25000 |
| 1996 | | | 7365 | 4480 | 11862 | 23707 | 7342 | 2504 | 11250 | 21096 | 25000 |
| 1997 | | | 6830 | 3554 | 10554 | 20938 | 6819 | 2337 | 10364 | 19520 | 25000 |
| 1998 | | | 7197 | 4265 | 10690 | 22152 | 7182 | 2561 | 10573 | 20317 | 25000 |
| 1999 | | | 7876 | 4681 | 11093 | 23650 | 7888 | 2773 | 10968 | 21608 | 25000 |
| 2000 | | | 6192 | 4225 | 10783 | 21199 | 6183 | 2313 | 10605 | 19101 | 25000 |
| 2001 | | | 6710 | 4270 | 10906 | 21885 | 6685 | 2826 | 10603 | 20114 | 25000 |
| 2002 | | | 6385 | 3598 | 9823 | 19806 | 6332 | 2289 | 9555 | 18177 | 25000 |
| 2003 | | | 7142 | 3991 | 9806 | 20939 | 7118 | 2496 | 9637 | 19250 | 25000 |
| 2004 | | | 6990 | 3675 | 9389 | 20054 | 6972 | 1914 | 9076 | 17962 | 25000 |
| 2005 | | | 7173 | 4669 | 10401 | 22243 | 7138 | 2852 | 9960 | 19950 | 25000 |
| 2006 | | | 8253 | 5494 | 11183 | 24930 | 8217 | 3610 | 10681 | 22508 | 25000 |
| 2007 | | | 6498 | 4533 | 10191 | 21222 | 6468 | 3005 | 9464 | 18937 | 25000 |
| 2008 | | | 5681 | 3698 | 8868 | 18247 | 5636 | 2418 | 8089 | 16143 | 25000 |
| 2009 | | | 4580 | 3183 | 7722 | 15485 | 4501 | 1878 | 6843 | 13222 | 25000 |
| 2010 | | | 5182 | 3529 | 7502 | 16213 | 5140 | 2148 | 6741 | 14030 | 25000 |
| 2011 | | | 4998 | 3668 | 7344 | 16009 | 4956 | 2524 | 6763 | 14243 | 25000 |
| 2012 | | | 5186 | 3504 | 6897 | 15587 | 5135 | 2180 | 6454 | 13769 | 25000 |
| 2013 | | | 4830 | 3295 | 6715 | 14841 | 4806 | 2027 | 6450 | 13283 | 25000 |
| 2014 | | | 4580 | 3239 | 6779 | 14598 | 4553 | 1919 | 6504 | 12976 | 25000 |
| 2015 | | | | | | | | | | | 25000 |
| 2016 | | | | | | | | | | | 25000 |
| 2017 | | | | | | | | | | | 25000 |
| 2018 | | | | | | | | | | | 25000 |
| 2019 | | | | | | | | | | | 25000 |
| 2020 | | | | | | | | | | | 25000 |
| 2021 | | | | | | | | | | | 25000 |
| 2022 | | | | | | | | | | | 25000 |
| 2023 | | | | | | | | | | | 25000 |
| 2024 | | | | | | | | | | | 25000 |
| 2025 | | | | | | | | | | | 25000 |

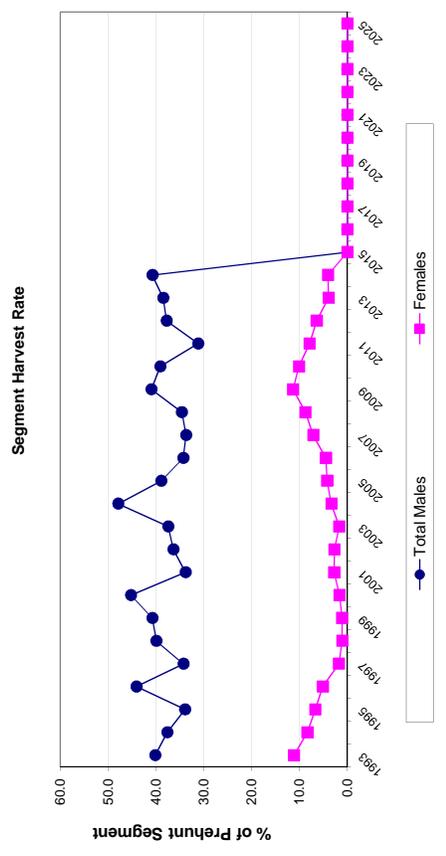
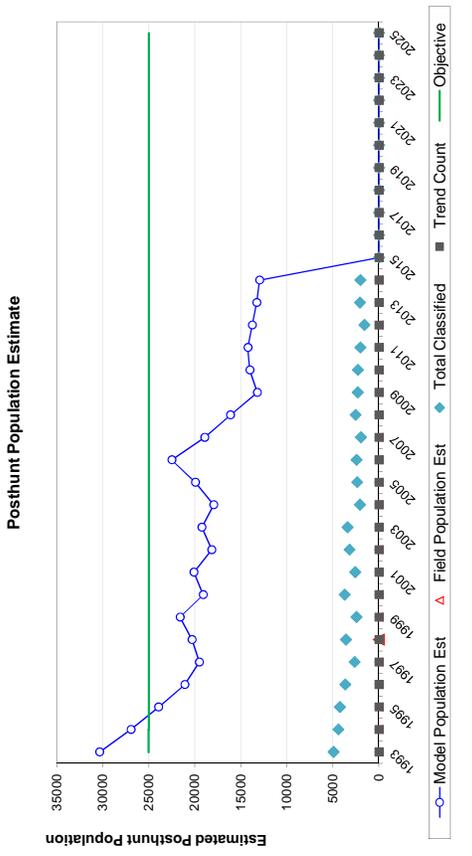
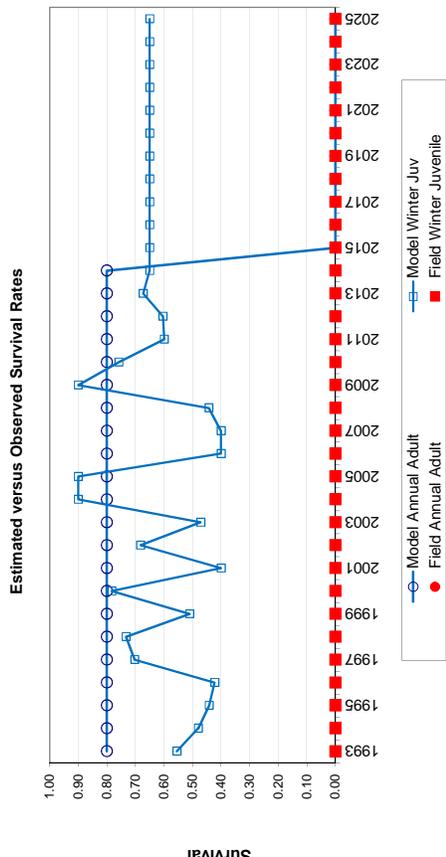
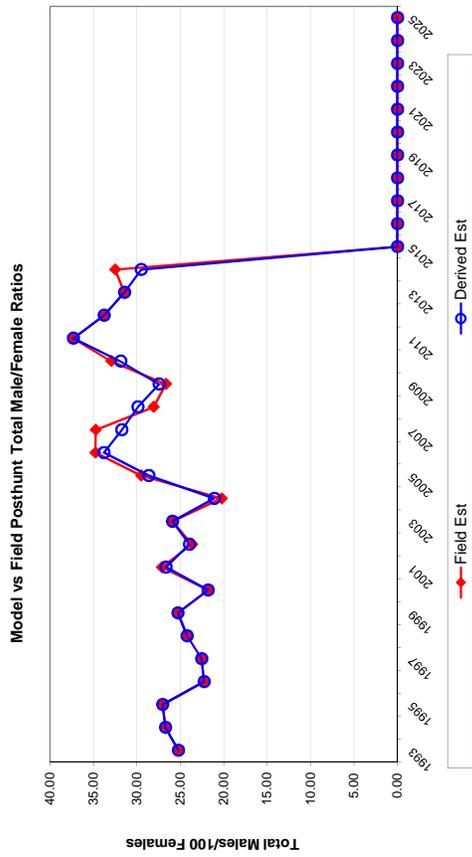
Survival and Initial Population Estimates

| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|--------------|-----------------------------|--------------|
| | Model Est | Field Est SE | Model Est | Field Est SE |
| 1993 | 0.55 | | 0.80 | |
| 1994 | 0.48 | | 0.80 | |
| 1995 | 0.44 | | 0.80 | |
| 1996 | 0.42 | | 0.80 | |
| 1997 | 0.70 | | 0.80 | |
| 1998 | 0.73 | | 0.80 | |
| 1999 | 0.51 | | 0.80 | |
| 2000 | 0.78 | | 0.80 | |
| 2001 | 0.40 | | 0.80 | |
| 2002 | 0.68 | | 0.80 | |
| 2003 | 0.47 | | 0.80 | |
| 2004 | 0.90 | | 0.80 | |
| 2005 | 0.90 | | 0.80 | |
| 2006 | 0.40 | | 0.80 | |
| 2007 | 0.40 | | 0.80 | |
| 2008 | 0.44 | | 0.80 | |
| 2009 | 0.90 | | 0.80 | |
| 2010 | 0.76 | | 0.80 | |
| 2011 | 0.60 | | 0.80 | |
| 2012 | 0.60 | | 0.80 | |
| 2013 | 0.67 | | 0.80 | |
| 2014 | 0.65 | | 0.80 | |
| 2015 | 0.65 | | 0.80 | |
| 2016 | 0.65 | | 0.80 | |
| 2017 | 0.65 | | 0.80 | |
| 2018 | 0.65 | | 0.80 | |
| 2019 | 0.65 | | 0.80 | |
| 2020 | 0.65 | | 0.80 | |
| 2021 | 0.65 | | 0.80 | |
| 2022 | 0.65 | | 0.80 | |
| 2023 | 0.65 | | 0.80 | |
| 2024 | 0.65 | | 0.80 | |
| 2025 | 0.65 | | 0.80 | |

| Parameters: | Optim cells |
|---------------------------------|-------------|
| Adult Survival = | 0.800 |
| Initial Total Male Pop/10,000 = | 0.399 |
| Initial Female Pop/10,000 = | 1.582 |

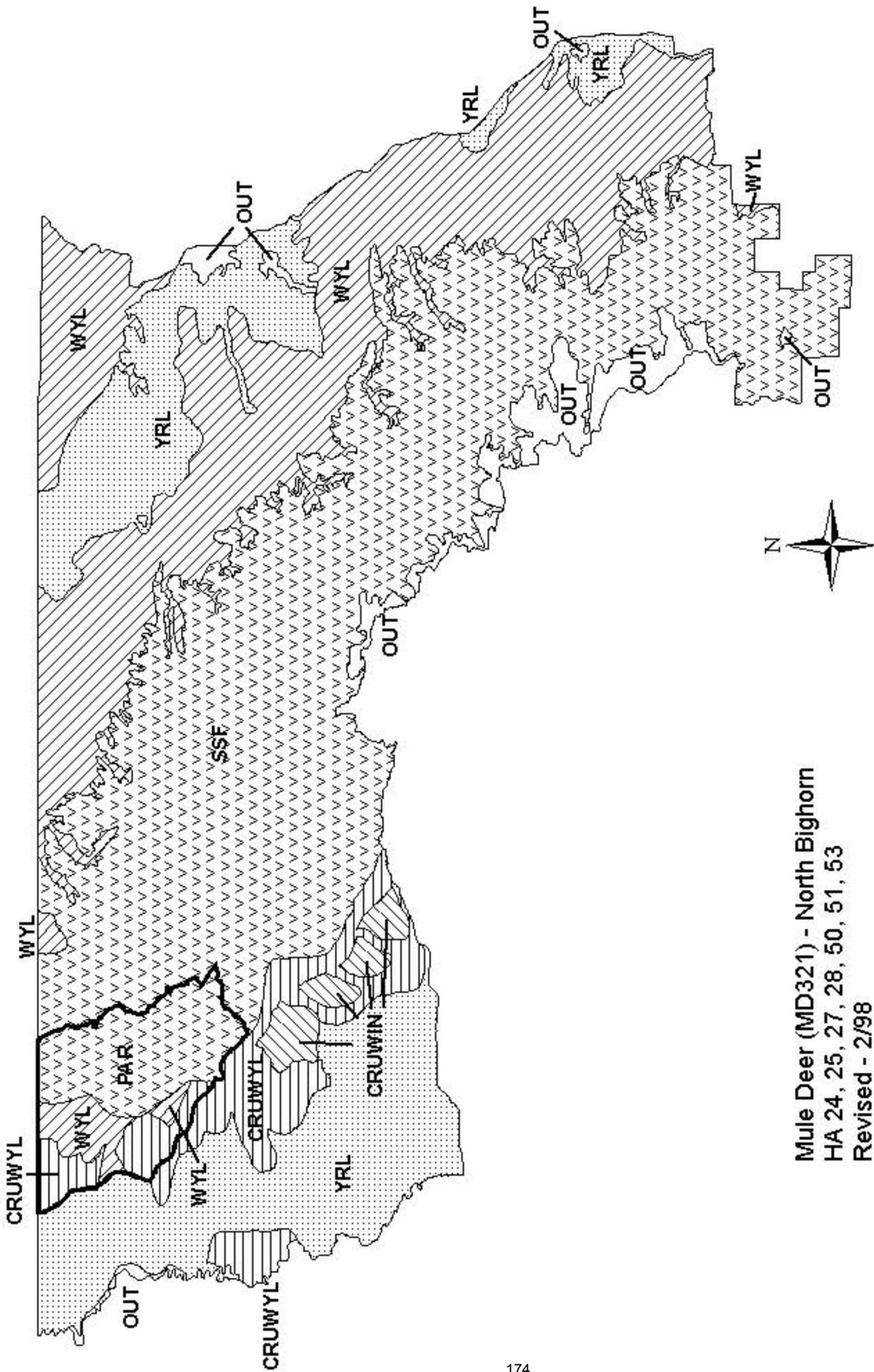
| MODEL ASSUMPTIONS |
|-----------------------------------|
| Sex Ratio (% Males) = 50% |
| Wounding Loss (total males) = 10% |
| Wounding Loss (females) = 10% |
| Wounding Loss (juveniles) = 10% |

| Year | Classification Counts | | | | | | Harvest | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|------------------------|----------|---------|-------|---------|---------------|----------------------------|---------|--|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Juv | Males | Females | Total Harvest | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est w/o bull adj | Field SE | | | | | Total Males | Females | |
| 1993 | | 65.65 | 2.08 | 25.22 | 25.22 | 1.11 | 77 | 2436 | 1811 | 4324 | 40.2 | 11.2 | |
| 1994 | | 61.92 | 2.07 | 26.71 | 26.71 | 1.20 | 47 | 2094 | 1184 | 3325 | 37.6 | 8.4 | |
| 1995 | | 62.45 | 2.13 | 27.04 | 27.04 | 1.24 | 60 | 1597 | 828 | 2485 | 33.9 | 6.7 | |
| 1996 | | 65.26 | 2.34 | 22.26 | 22.26 | 1.18 | 21 | 1796 | 556 | 2373 | 44.1 | 5.2 | |
| 1997 | | 65.79 | 2.79 | 22.55 | 22.55 | 1.40 | 10 | 1107 | 172 | 1289 | 34.3 | 1.8 | |
| 1998 | | 67.93 | 2.47 | 24.23 | 24.23 | 1.27 | 13 | 1549 | 106 | 1668 | 39.9 | 1.1 | |
| 1999 | | 71.74 | 3.15 | 25.28 | 25.28 | 1.60 | 7 | 1735 | 114 | 1856 | 40.8 | 1.1 | |
| 2000 | | 58.31 | 2.11 | 21.81 | 21.81 | 1.13 | 8 | 1738 | 162 | 1908 | 45.3 | 1.7 | |
| 2001 | | 63.05 | 2.75 | 26.65 | 27.13 | 1.59 | 22 | 1313 | 275 | 1610 | 33.8 | 2.8 | |
| 2002 | | 66.27 | 2.56 | 23.96 | 23.65 | 1.32 | 48 | 1190 | 243 | 1481 | 36.4 | 2.7 | |
| 2003 | | 73.86 | 2.74 | 25.90 | 25.90 | 1.38 | 22 | 1359 | 154 | 1535 | 37.5 | 1.7 | |
| 2004 | | 76.82 | 3.58 | 21.09 | 20.25 | 1.52 | 16 | 1601 | 285 | 1902 | 47.9 | 3.3 | |
| 2005 | | 71.67 | 3.23 | 28.63 | 29.52 | 1.80 | 32 | 1652 | 401 | 2085 | 38.9 | 4.2 | |
| 2006 | | 76.93 | 3.44 | 33.80 | 34.78 | 2.02 | 33 | 1713 | 456 | 2202 | 34.3 | 4.5 | |
| 2007 | | 68.35 | 3.44 | 31.75 | 31.75 | 2.19 | 27 | 1389 | 661 | 2077 | 33.7 | 7.1 | |
| 2008 | | 69.67 | 3.03 | 29.89 | 28.07 | 1.67 | 41 | 1164 | 708 | 1913 | 34.6 | 8.8 | |
| 2009 | | 65.78 | 3.01 | 27.45 | 26.66 | 1.67 | 72 | 1186 | 799 | 2057 | 41.0 | 11.4 | |
| 2010 | | 76.25 | 3.50 | 31.87 | 32.94 | 2.00 | 38 | 1255 | 691 | 1984 | 39.1 | 10.1 | |
| 2011 | | 73.28 | 3.63 | 37.32 | 37.32 | 2.31 | 38 | 1040 | 528 | 1606 | 31.2 | 7.9 | |
| 2012 | | 79.57 | 4.37 | 33.78 | 33.78 | 2.46 | 46 | 1204 | 403 | 1653 | 37.8 | 6.4 | |
| 2013 | | 74.51 | 3.58 | 31.42 | 31.42 | 2.02 | 22 | 1153 | 241 | 1416 | 38.5 | 3.9 | |
| 2014 | | 70.00 | 3.45 | 29.51 | 32.50 | 2.08 | 25 | 1200 | 250 | 1475 | 40.8 | 4.1 | |
| 2015 | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | |



Comments:

END



Mule Deer (MD321) - North Bighorn
 HA 24, 25, 27, 28, 50, 51, 53
 Revised - 2/98

2013 - JCR Evaluation Form

SPECIES: Mule Deer

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

HERD: MD322 - UPPER POWDER RIVER

HUNT AREAS: 30, 32-33, 163, 169

PREPARED BY: DAN THIELE

| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 10,822 | 9,830 | 9,500 |
| Harvest: | 985 | 983 | 860 |
| Hunters: | 1,569 | 1,593 | 1,500 |
| Hunter Success: | 63% | 62% | 57 % |
| Active Licenses: | 1,661 | 1,593 | 1,500 |
| Active License Percent: | 59% | 62% | 57 % |
| Recreation Days: | 6,285 | 6,224 | 5,500 |
| Days Per Animal: | 6.4 | 6.3 | 6.4 |
| Males per 100 Females | 35 | 34 | |
| Juveniles per 100 Females | 68 | 58 | |

| | |
|---|------------|
| Population Objective: | 18,000 |
| Management Strategy: | Special |
| Percent population is above (+) or below (-) objective: | -45.4% |
| Number of years population has been + or - objective in recent trend: | 10 |
| Model Date: | 02/21/2014 |

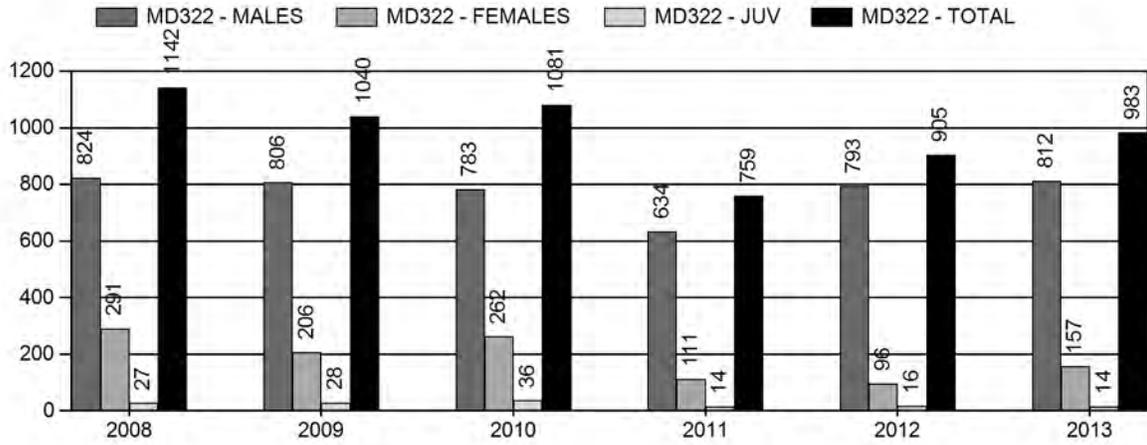
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 2% | 2% |
| Males ≥ 1 year old: | 31% | 31% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 8% | 8% |
| Proposed change in post-season population: | -4% | -3% |

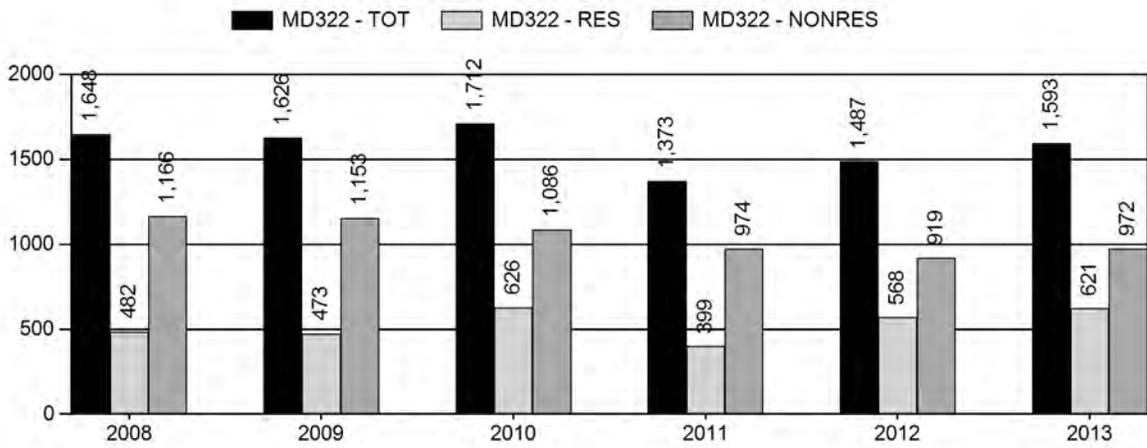
Population Size - Postseason



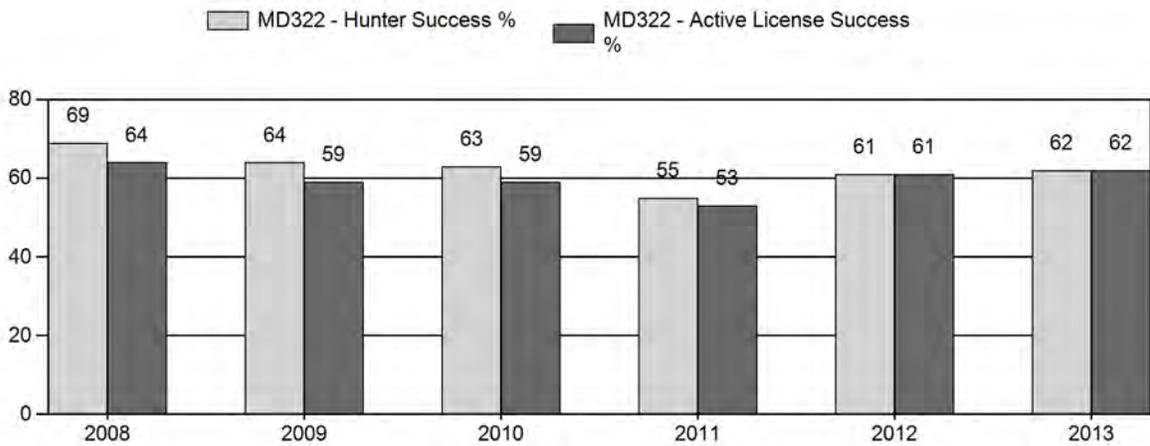
Harvest



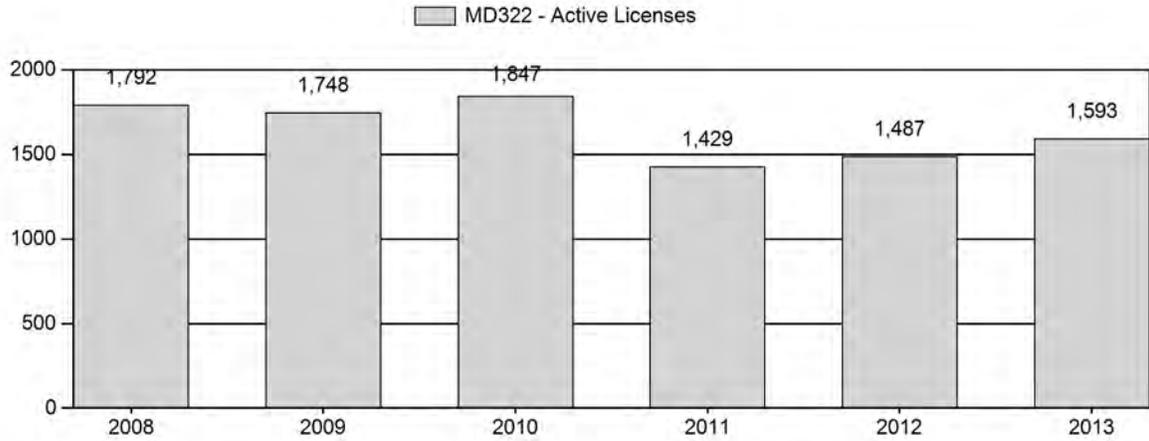
Number of Hunters



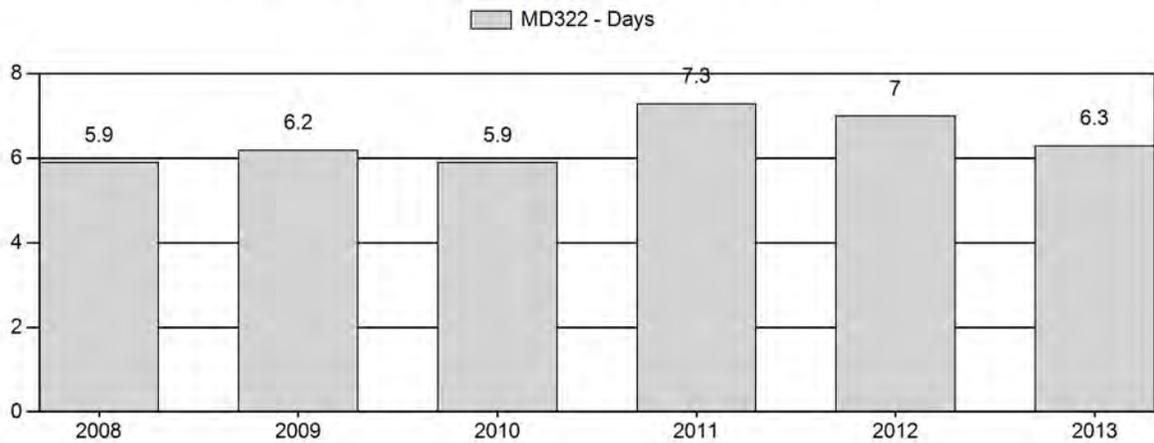
Harvest Success



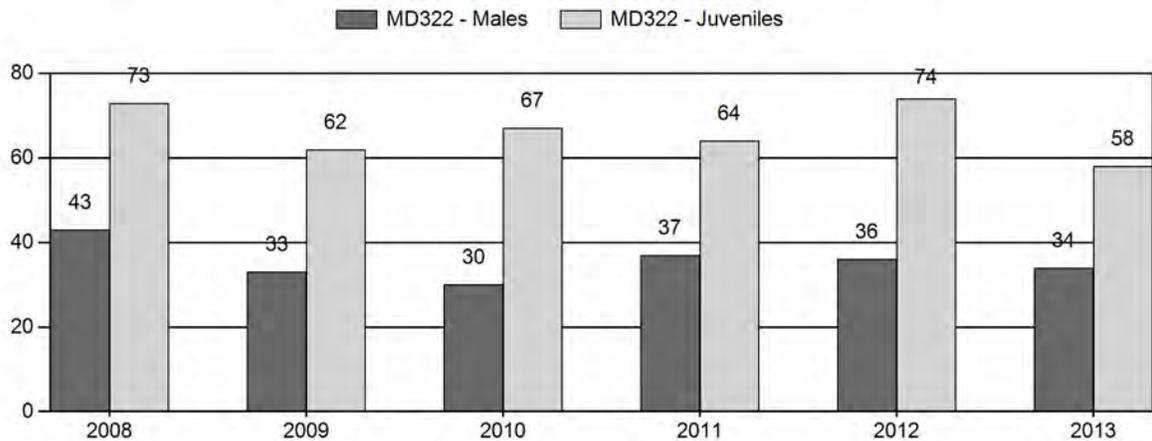
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Mule Deer Herd MD322 - UPPER POWDER RIVER

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot CIs | CIs Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|---------|---------|----------------------|-------|-------|----------|----------|----------|-----------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 11,539 | 117 | 248 | 365 | 20% | 847 | 46% | 616 | 34% | 1,828 | 1,604 | 14 | 29 | 43 | ± 3 | 73 | ± 5 | 51 |
| 2009 | 10,941 | 127 | 165 | 292 | 17% | 880 | 51% | 542 | 32% | 1,714 | 1,170 | 14 | 19 | 33 | ± 3 | 62 | ± 4 | 46 |
| 2010 | 10,572 | 115 | 196 | 311 | 15% | 1,047 | 51% | 697 | 34% | 2,055 | 1,279 | 11 | 19 | 30 | ± 2 | 67 | ± 4 | 51 |
| 2011 | 10,450 | 138 | 246 | 384 | 18% | 1,049 | 50% | 675 | 32% | 2,108 | 1,218 | 13 | 23 | 37 | ± 3 | 64 | ± 4 | 47 |
| 2012 | 10,610 | 134 | 188 | 322 | 17% | 897 | 48% | 662 | 35% | 1,881 | 1,522 | 15 | 21 | 36 | ± 3 | 74 | ± 4 | 54 |
| 2013 | 9,830 | 135 | 214 | 349 | 18% | 1,013 | 52% | 586 | 30% | 1,948 | 1,046 | 13 | 21 | 34 | ± 2 | 58 | ± 3 | 43 |

**2014 HUNTING SEASONS
UPPER POWDER RIVER MULE DEER HERD (MD322)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|-------|--------------------|--------------------|-------|---|
| | | Opens | Closes | | |
| 30 | | Oct. 15 | Oct. 31 | | General license, any deer |
| 32 | | Oct. 15 | Oct. 31 | | General license, any deer |
| 33 | 6 | Oct. 15 Oct. 15 | Oct. 31 Dec. 15 | 50 | General license, any deer Limited quota licenses; doe or fawn deer valid on private land |
| 163, 169 | | Oct. 15 | Oct. 21 | | General license, antlered deer |
| Archery | | Sept. 1 | Sept. 30 | | Refer to Section 3 of this Chapter |
| Region Y | Quota | | | 2,000 | |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|------|------------------------|
| | | |
| Herd Unit Total | | No Change |

Management Evaluation

Current Postseason Population Management Objective: 18,000

Management Strategy: Special

2013 Postseason Population Estimate: ~9,800

2014 Proposed Postseason Population Estimate: ~9,500

Herd Unit Issues

The Upper Powder River Mule Deer Herd Unit objective and management strategy was reviewed in 2013. No change was made to the post-season population objective of 18,000 deer, however, the management strategy was changed from recreational to special management. The objective and management strategy were last revised in 1991.

This herd unit has excellent deer habitat extending from sagebrush grasslands in the east to mountain grasslands and mixed conifer habitats to the west. In the last 5 to 10 years, white-tailed deer numbers have greatly increased creating potential competition issues with mule deer in riparian areas and associated cropland. Accessible public lands are limited in the north but more prevalent to the south with these lands receiving heavy hunting pressure. Areas 163 and 169 contain relatively large areas of accessible public lands and are managed with more conservative hunting seasons. Outfitted and trespass fee hunting of private lands limit hunter access resulting in nonresidents comprising the majority of the hunters in this herd unit. Hunters have found more flexibility in accessing scattered public lands by using GPS map technology

Another factor influencing this population is mortality attributed to mountain lion predation. Most mountain lion habitat and harvest in mountain lion Hunt Area 15 corresponds to this deer herd unit. Area 15 lion harvest reached a record high 31 lions in 2008-09. Harvest remained high the following two hunting seasons (2010-11 harvest 29 lions and 2011-12 harvest 30 lions). Since then harvest has decreased with 16 lions harvested in 2012-13 and the current season's harvest at 15 lions as of May 7, 2014.

Weather

Weather in the area of the Upper Powder River Herd Unit during 2012 and 2013 turned extremely warm and dry after several good moisture years. In fact, little spring green up occurred in the Kaycee area in 2013. The southern part of Climate Division 5 was very dry compared to the Sheridan and Gillette areas. 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. Fall precipitation was well above normal improving soil moisture with the more than six inches of moisture (240% of normal) received in September and October coming in the form of rain and snow.

Habitat

There is one Wyoming big sagebrush habitat transect and one curl-leaf mountain mahogany transect in this herd unit. Sagebrush production measured in September 2013 averaged 36 mm per leader compared to 8 mm per leader in 2012. The sagebrush transect was read in late October after abundant fall precipitation had been received so late season growth may have occurred. Mountain mahogany production averaged 4 mm per leader in 2013 compared to 21 mm per leader in 2012. Utilization during the 2013-14 winter was very light (less than 5% of leaders browsed) due to low mule deer numbers and an open winter.

Field Data

Classifications completed following the hunting season resulted in herd ratios of 58 fawns per 100 does and 24 bucks per 100 does. The fawn ratio was the lowest of the six year period, well below the five year average of 68 per 100. Combined with the summer drought and periods of severe winter weather this will no doubt dampen recruitment and mitigate herd growth. Buck ratios remain solid with ratios of ≥ 30 per 100 in all six years, supporting the change in management strategy to special management. High ratios are influenced by conservative hunting strategies on private land. Hunters were generally satisfied with their hunting experience as 70% responded positively to the hunter satisfaction survey. Only Hunt Areas 163 and 169 had responses below 70% with 58% and 62%, respectively.

Harvest Data

The 2013 harvest survey reported a 2% increase in buck harvest but a 53% increase in antlerless harvest primarily due to the addition of 50 Area 33 Type 6 licenses. Buck harvest increased to the highest harvest since 2008 even though the nonresident Region Y quota was reduced in 2012. Hunter numbers and hunter success increased for the second year in a row while hunter effort decreased for the second year running suggesting that deer hunters found better hunting opportunity. With the exception of the 634 bucks harvested in 2011, buck harvest has been about 800 bucks since 2008. Antlerless deer harvest has decreased from over 300 does/fawns in 2008 to less than 200 does/fawns each of the past three years.

The postseason landowner survey reflects the trend of decreasing deer estimates as evidenced by an increasing percentage of landowners reporting deer numbers below desired levels. In 2013, 71% of responding landowners wanted more deer, the highest percentage to date, while 27% were satisfied with the population. Only one landowner wanted fewer deer. Only 50 doe/fawn licenses were available in 2013 to address an Area 33 landowner's concern of too many deer on irrigated hay meadows. The Region Y quota sold out, however, 84 licenses remained after the draw.

Population

This population is estimated at about 9,800 mule deer, approximately 45% below the population objective. The estimate was generated with the EXCEL spreadsheet model. No independent population estimates have been collected. The Semi-Constant Juvenile/Semi-Constant Adult model (SCJ/SCA) was chosen over the Constant Juvenile/Constant Adult model (CJ/CA) even though it has a slightly higher AIC value (75 vs. 71). This model selected fawn survival estimates within the range of parameters while the CJ/CA model selected the lowest survival rates allowed. The model indicates this population has decreased since 1999, the last year this population was estimated to be at objective. The population has been relatively stable the past four years but decreased 7% in 2013 due to a lower fawn ratio and slightly higher antlerless harvest. The model provides reasonable results that correspond well with management data and field observations. However, because independent survival estimates are lacking for this herd, this model is considered a fair model.

Management Summary

Seasons have been adjusted to limit antlerless harvest in recent years. General license any deer hunting is allowed in three of the five hunt areas and only 50 doe/fawn licenses are available to address crop depredation complaints in Hunt Area 33. The nonresident Region Y license quota was reduced 9% in 2012 to 2,000 licenses. The postseason buck ratio remains adequate but is influenced by private land areas that are hunted more conservatively. Although hunter success and hunter effort improved the last two hunting seasons, herd growth remains stagnant. Fawn ratios have been adequate at 68 per 100 for the five year average. High mountain lion numbers have likely influenced deer numbers in some areas of the herd. Extremely high white-tail deer numbers may be competing with the more productive segments of the mule deer herd, those occurring in and adjacent to riparian corridors with irrigated alfalfa meadows. Effects of the 2012 and 2013 drought are expected to continue into next year so improved production and recruitment are unlikely. No changes were made for hunting seasons including the Region Y license quota. A 2014 population of 9,500 deer is predicted.

INPUT
 Species: Mule Deer
 Biologist: Dan Thiele
 Herd Unit & No.: Upper Powder River
 Model date: 05/23/13

Clear form

| MODELS SUMMARY | | | Relative AICc | Fit | Notes |
|----------------|---|----|---------------|--|-------|
| CJ,CA | Constant Juvenile & Adult Survival | 62 | 71 | <input type="checkbox"/> CJ,CA Model | |
| SCJ,S CA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 64 | 76 | <input checked="" type="checkbox"/> SCJ,S CA Mod | |
| TSJ,J,CA | Time-Specific Juvenile & Constant Adult Survival | 8 | 115 | <input type="checkbox"/> TSJ,J,CA Model | |

Check best model to create report

| Year | Posthunt Population Est. Field Est | Trend Count | Predicted Prehunt Population | | | Predicted Posthunt Population | | | Objective |
|------|------------------------------------|-------------|------------------------------|-------------|---------|-------------------------------|-------------|---------|-----------|
| | | | Juveniles | Total Males | Females | Juveniles | Total Males | Females | |
| 1993 | | | 6078 | 4300 | 12504 | 6051 | 2614 | 11487 | 18000 |
| 1994 | | | 4916 | 3568 | 10546 | 4853 | 2476 | 9886 | 18000 |
| 1995 | | | 5286 | 3592 | 9419 | 5246 | 2535 | 9090 | 18000 |
| 1996 | | | 6539 | 3771 | 8926 | 6449 | 2682 | 8722 | 18000 |
| 1997 | | | 6452 | 4295 | 9045 | 6443 | 2980 | 8785 | 18000 |
| 1998 | | | 4527 | 4895 | 9092 | 6450 | 3445 | 8861 | 18000 |
| 1999 | | | 6221 | 4793 | 9154 | 6208 | 3420 | 8890 | 18000 |
| 2000 | | | 4705 | 3800 | 9095 | 4676 | 3071 | 8895 | 18000 |
| 2001 | | | 3844 | 3999 | 8579 | 3812 | 2824 | 8361 | 18000 |
| 2002 | | | 4431 | 3512 | 7867 | 4390 | 2399 | 7649 | 18000 |
| 2003 | | | 5178 | 3375 | 7503 | 5165 | 2387 | 7267 | 18000 |
| 2004 | | | 4262 | 3627 | 7465 | 4206 | 2520 | 7250 | 18000 |
| 2005 | | | 4841 | 3407 | 7127 | 4778 | 2519 | 6889 | 18000 |
| 2006 | | | 3751 | 3600 | 7037 | 3725 | 2685 | 6745 | 18000 |
| 2007 | | | 2880 | 3374 | 6567 | 2866 | 2271 | 6280 | 18000 |
| 2008 | | | 4095 | 2757 | 5909 | 4065 | 1850 | 5589 | 18000 |
| 2009 | | | 3447 | 2833 | 5773 | 3416 | 1946 | 5546 | 18000 |
| 2010 | | | 3522 | 2888 | 5519 | 3482 | 1827 | 5231 | 18000 |
| 2011 | | | 3343 | 2617 | 5294 | 3328 | 1919 | 5172 | 18000 |
| 2012 | | | 3774 | 2637 | 5195 | 3756 | 1765 | 5089 | 18000 |
| 2013 | | | 3196 | 2661 | 5275 | 3185 | 1836 | 5165 | 18000 |
| 2014 | | | | | | | | | 18000 |
| 2015 | | | | | | | | | 18000 |
| 2016 | | | | | | | | | 18000 |
| 2017 | | | | | | | | | 18000 |
| 2018 | | | | | | | | | 18000 |
| 2019 | | | | | | | | | 18000 |
| 2020 | | | | | | | | | 18000 |
| 2021 | | | | | | | | | 18000 |
| 2022 | | | | | | | | | 18000 |
| 2023 | | | | | | | | | 18000 |
| 2024 | | | | | | | | | 18000 |
| 2025 | | | | | | | | | 18000 |

Survival and Initial Population Estimates

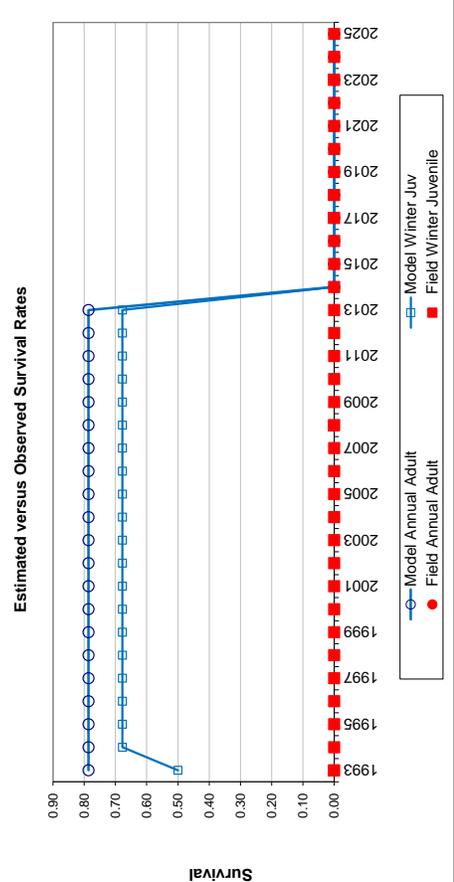
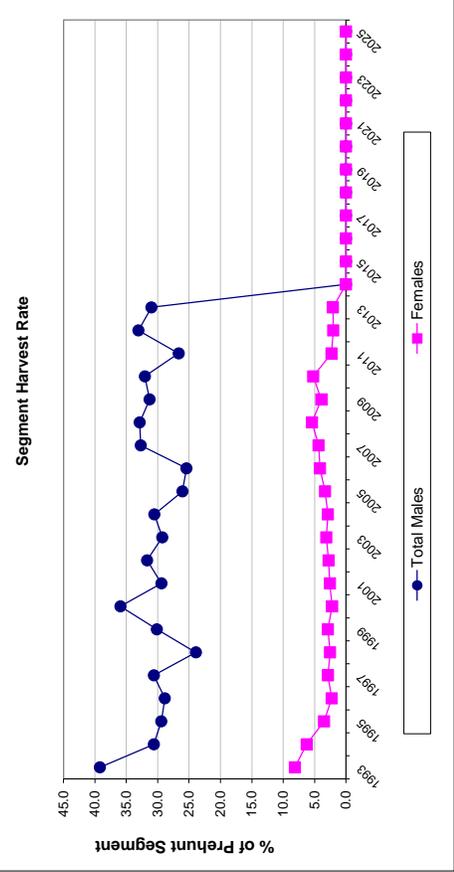
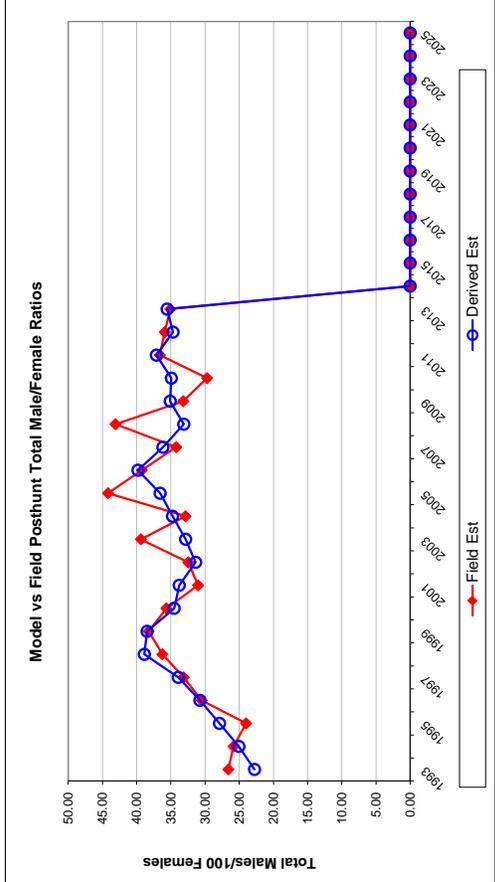
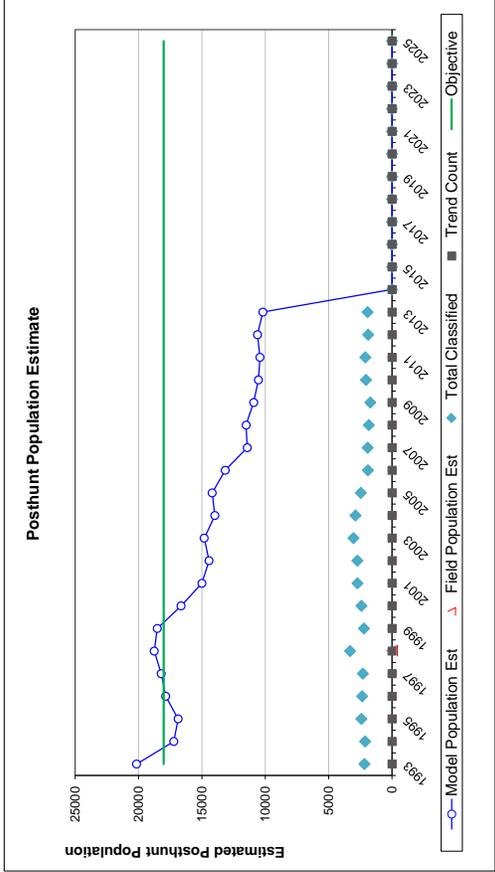
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1993 | 0.50 | | 0.79 | |
| 1994 | 0.68 | | 0.79 | |
| 1995 | 0.68 | | 0.79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

| Parameters: | Optim cells |
|---------------------------------|-------------|
| Juvenile Survival = | 0.678 |
| Adult Survival = | 0.786 |
| Initial Total Male Pop/10,000 = | 0.261 |
| Initial Female Pop/10,000 = | 1.149 |

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

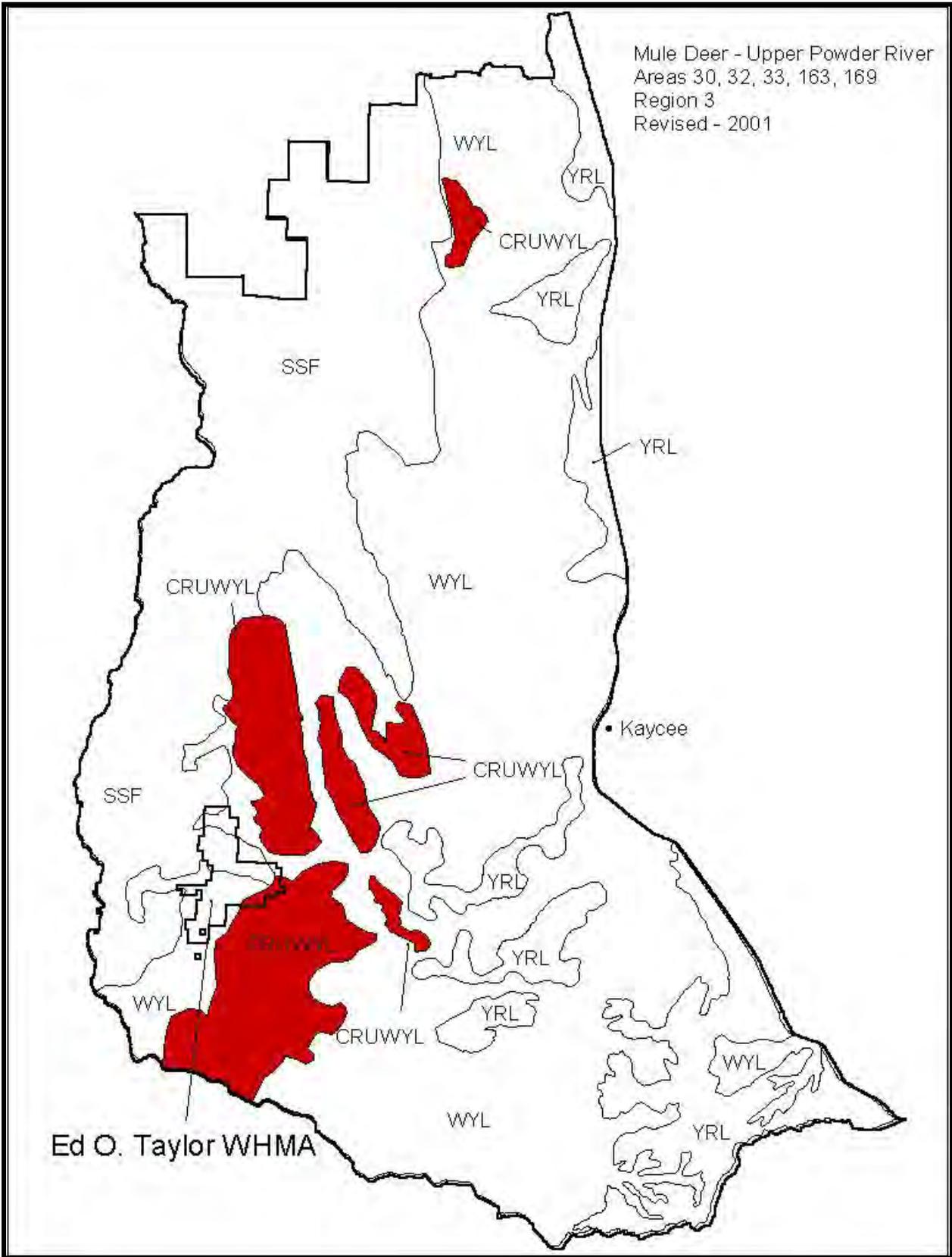
| Year | Classification Counts | | | | | | Harvest | | | | | | |
|------|-----------------------|-----------|----------|-------------------------|------------------------|----------|---------|-------|---------|---------------|----------------------------|---------|--|
| | Juvenile/Female Ratio | | | Total Male/Female Ratio | | | Juv | Males | Females | Total Harvest | Segment Harvest Rate (% of | | |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est w/o bull adj | Field SE | | | | | Total Males | Females | |
| 1993 | | 52.67 | 2.57 | 22.76 | 26.58 | 1.66 | 25 | 1533 | 925 | 2463 | 39.2 | 8.1 | |
| 1994 | | 49.09 | 2.46 | 25.05 | 25.83 | | 57 | 993 | 600 | 1650 | 30.6 | 6.3 | |
| 1995 | | 57.71 | 2.62 | 27.88 | 24.00 | 1.50 | 36 | 961 | 299 | 1296 | 29.4 | 3.5 | |
| 1996 | | 73.94 | 3.34 | 30.75 | 30.50 | 1.86 | 82 | 990 | 185 | 1257 | 28.9 | 2.3 | |
| 1997 | | 73.34 | 3.38 | 33.92 | 33.12 | 1.99 | 8 | 1195 | 236 | 1439 | 30.6 | 2.9 | |
| 1998 | | 72.79 | 2.82 | 38.88 | 36.24 | 1.77 | 18 | 984 | 210 | 1212 | 23.9 | 2.5 | |
| 1999 | | 69.63 | 3.34 | 38.47 | 38.25 | 2.23 | 12 | 1341 | 240 | 1593 | 30.1 | 2.9 | |
| 2000 | | 52.57 | 2.50 | 34.52 | 35.65 | 1.94 | 26 | 1566 | 182 | 1774 | 35.9 | 2.2 | |
| 2001 | | 45.60 | 2.07 | 33.77 | 31.02 | 1.62 | 29 | 1069 | 199 | 1297 | 29.4 | 2.6 | |
| 2002 | | 57.40 | 2.51 | 31.37 | 32.45 | 1.73 | 37 | 1012 | 198 | 1247 | 31.7 | 2.8 | |
| 2003 | | 71.07 | 2.90 | 32.84 | 39.38 | 1.95 | 12 | 898 | 214 | 1124 | 29.3 | 3.1 | |
| 2004 | | 58.01 | 2.46 | 34.75 | 32.85 | 1.70 | 51 | 1007 | 196 | 1254 | 30.5 | 2.9 | |
| 2005 | | 69.36 | 3.19 | 36.57 | 44.18 | 2.35 | 57 | 807 | 216 | 1080 | 26.1 | 3.3 | |
| 2006 | | 55.23 | 2.96 | 39.81 | 39.24 | 2.37 | 24 | 832 | 265 | 1121 | 25.4 | 4.1 | |
| 2007 | | 45.64 | 2.50 | 36.16 | 34.21 | 2.07 | 13 | 1003 | 261 | 1277 | 32.7 | 4.4 | |
| 2008 | | 72.73 | 3.85 | 33.11 | 43.09 | 2.70 | 27 | 824 | 291 | 1142 | 32.9 | 5.4 | |
| 2009 | | 61.59 | 3.36 | 35.09 | 33.18 | 2.24 | 28 | 806 | 206 | 1040 | 31.3 | 3.9 | |
| 2010 | | 66.57 | 3.25 | 34.92 | 29.70 | 1.92 | 36 | 783 | 262 | 1081 | 32.0 | 5.2 | |
| 2011 | | 64.35 | 3.18 | 37.11 | 36.61 | 2.18 | 14 | 634 | 111 | 759 | 26.7 | 2.3 | |
| 2012 | | 73.80 | 3.78 | 34.68 | 35.90 | 2.33 | 16 | 793 | 96 | 905 | 33.1 | 2.0 | |
| 2013 | | 61.66 | 3.19 | 35.54 | 35.07 | 2.20 | 10 | 750 | 100 | 860 | 31.0 | 2.1 | |
| 2014 | | | | | | | | | | | | | |
| 2015 | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | |

FIGURES



Comments:

END



2013 - JCR Evaluation Form

SPECIES: White tailed Deer

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

HERD: WD303 - POWDER RIVER

HUNT AREAS: 17-20, 23-33, 163, 169

PREPARED BY: TIM THOMAS

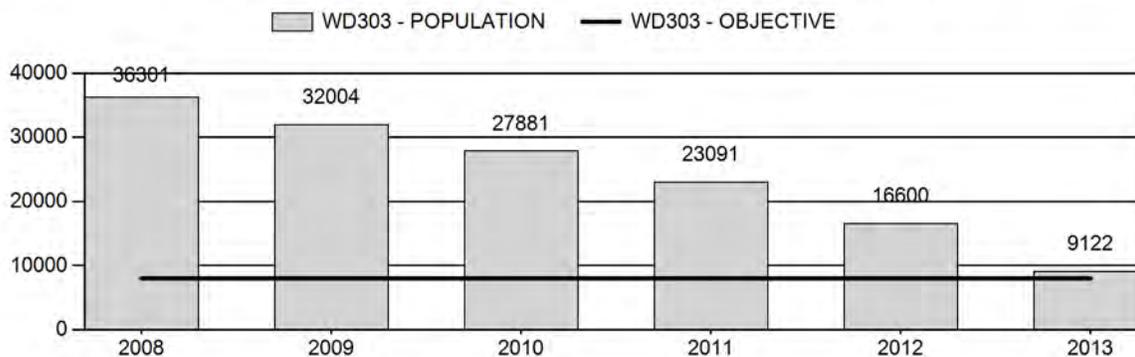
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 27,175 | 9,122 | N/A |
| Harvest: | 5,648 | 5,681 | 5,000 |
| Hunters: | 7,346 | 8,094 | 7,000 |
| Hunter Success: | 77% | 70% | 71 % |
| Active Licenses: | 8,744 | 9,226 | 8,000 |
| Active License Percent: | 65% | 62% | 62 % |
| Recreation Days: | 37,804 | 38,802 | 33,500 |
| Days Per Animal: | 6.7 | 6.8 | 6.7 |
| Males per 100 Females | 37 | 32 | |
| Juveniles per 100 Females | 70 | 63 | |

| | |
|---|--------------|
| Population Objective: | 8,000 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 14% |
| Number of years population has been + or - objective in recent trend: | 10 |
| Model Date: | 03/06/2013 |

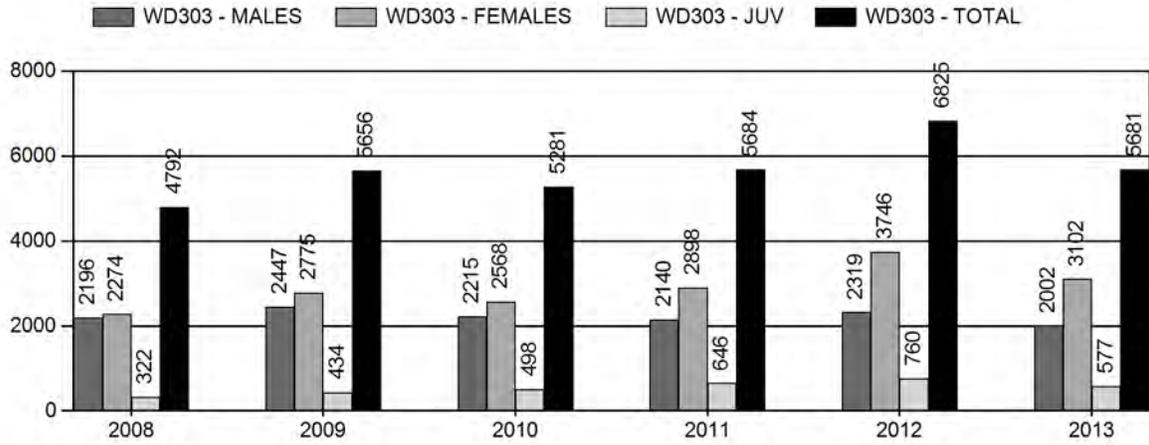
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 0% | 0% |
| Males ≥ 1 year old: | 0% | 0% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 0% | 0% |
| Proposed change in post-season population: | 0% | 0% |

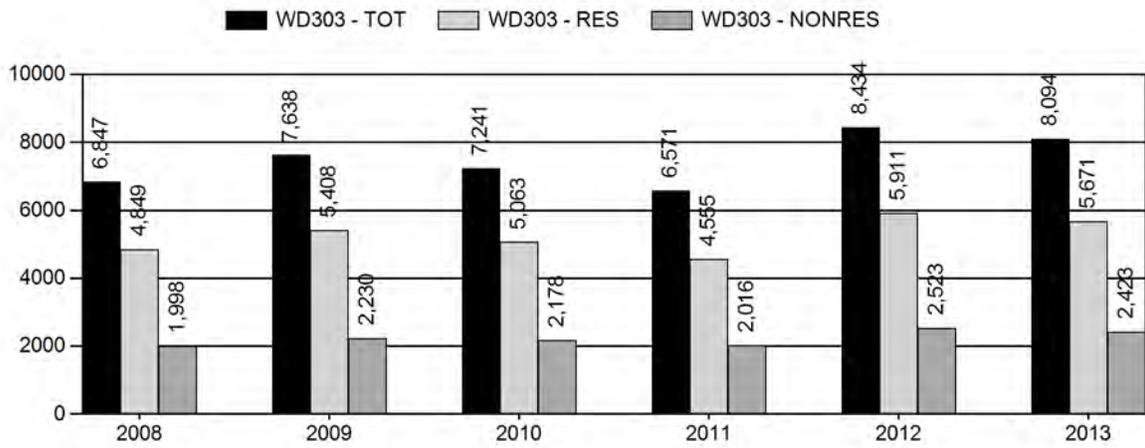
Population Size - Postseason



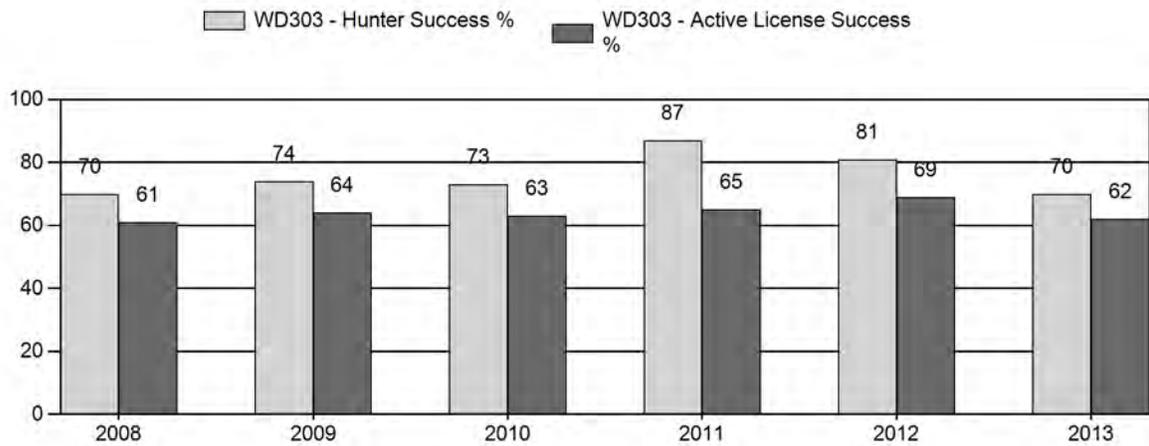
Harvest



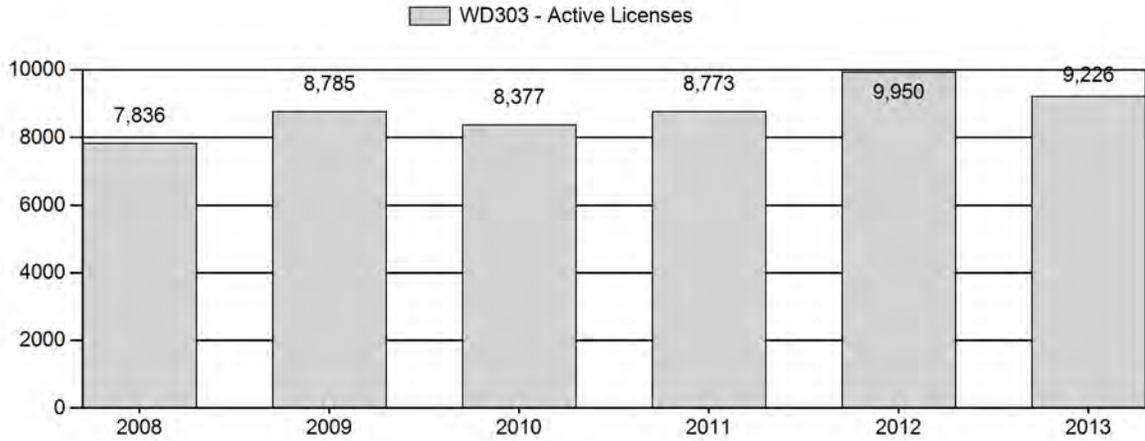
Number of Hunters



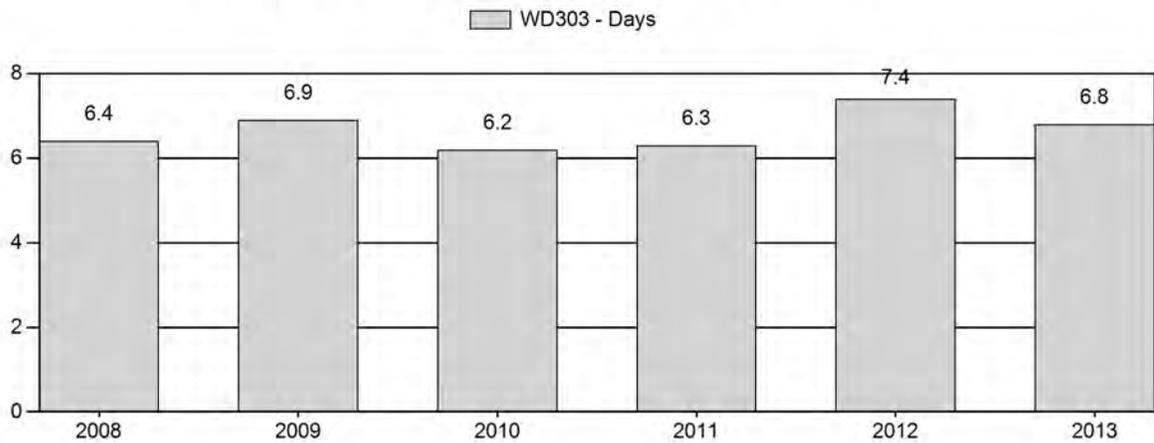
Harvest Success



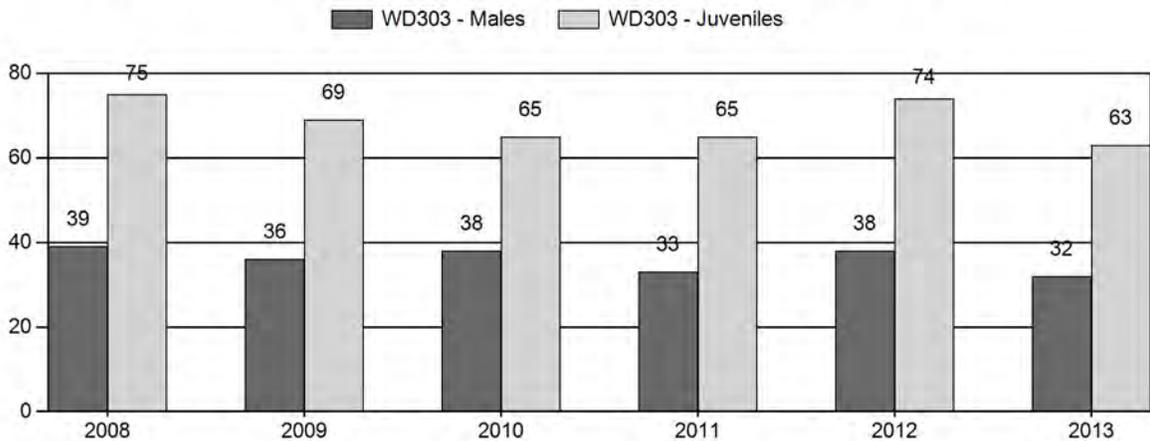
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for White tailed Deer Herd WD303 - POWDER RIVER

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 36,301 | 173 | 312 | 485 | 18% | 1,251 | 47% | 936 | 35% | 2,672 | 1,631 | 14 | 25 | 39 | ± 3 | 75 | ± 4 | 54 |
| 2009 | 32,004 | 180 | 328 | 508 | 18% | 1,393 | 49% | 964 | 34% | 2,865 | 1,435 | 13 | 24 | 36 | ± 2 | 69 | ± 4 | 51 |
| 2010 | 27,881 | 134 | 230 | 364 | 19% | 946 | 49% | 619 | 32% | 1,929 | 1,349 | 14 | 24 | 38 | ± 3 | 65 | ± 4 | 47 |
| 2011 | 23,091 | 162 | 267 | 429 | 17% | 1,302 | 50% | 851 | 33% | 2,582 | 1,286 | 12 | 21 | 33 | ± 2 | 65 | ± 3 | 49 |
| 2012 | 16,600 | 193 | 249 | 442 | 18% | 1,163 | 47% | 861 | 35% | 2,466 | 1,573 | 17 | 21 | 38 | ± 3 | 74 | ± 4 | 54 |
| 2013 | 9,122 | 150 | 303 | 453 | 16% | 1,437 | 51% | 907 | 32% | 2,797 | 1,211 | 10 | 21 | 32 | ± 2 | 63 | ± 3 | 48 |

**2014 HUNTING SEASONS
POWDER RIVER WHITE-TAILED DEER HERD (WD303)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-----------|---|
| | | Opens | Closes | | |
| 17 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer or any white-tailed deer |
| | 8 | Nov. 1 | Nov. 30 | 200 | General license; any white-tailed deer |
| | | Oct. 1 | Nov. 30 | | Limited quota licenses; doe or fawn white-tailed deer |
| 18 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer or any white-tailed deer |
| | 8 | Oct. 1 | Nov. 30 | 50 | Limited quota licenses; doe or fawn white-tailed deer valid on private land |
| 19 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| 19,20 | 6 | Oct. 1 | Oct. 20 | 25 | Limited quota licenses; doe or fawn valid on private land |
| 20 | | Oct. 1 | Oct. 20 | | General license; antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| 23 | | Oct. 1 | Oct. 14 | | General license; antlered deer off private land, any deer on private land |
| | | Nov. 1 | Nov. 30 | | General license; any white-tailed deer |
| 23,26 | 3 | Nov. 1 | Nov. 30 | 100 | Limited quota licenses; any white-tailed deer |
| | 6 | Oct. 1 | Dec. 15 | 1,700 | Limited quota licenses; doe or fawn valid on private land |
| 24 | | Oct. 15 | Oct. 31 | | General license; antlered deer off private land, any deer on private land |
| | | Nov. 1 | Nov. 30 | | General license; any white-tailed deer |
| | | Dec. 1 | Dec. 15 | | General license; antlerless white-tailed deer |
| | 3 | Nov. 1 | Nov. 30 | 150 | Limited quota licenses; any white-tailed deer |
| | 6 | Sep. 1 | Dec. 15 | 400 | Limited quota licenses; doe or fawn valid on private land |
| | 8 | Sep. 1 | Dec. 15 | Unlimited | Doe or fawn white-tailed deer |
| 25 | | Oct. 15 | Oct. 31 | | General license; antlered mule deer or any white-tailed deer |

| Hunt Area | Type | Dates of Seasons | | Quota | |
|-----------|------|------------------|---------|-------|--|
| | | Opens | Closes | | |
| 26 | | Oct. 1 | Oct. 14 | | General license; antlered deer off private land, any deer on private land |
| | | Nov. 1 | Nov. 30 | | |
| 27 | 8 | Oct. 15 | Oct. 31 | 1,200 | General license; any deer |
| | | Nov. 1 | Nov. 30 | | General license; any white-tailed deer |
| | | Dec. 1 | Dec. 15 | | General license; antlerless white-tailed deer |
| | | Sep. 1 | Sep. 30 | | Limited quota licenses; doe or fawn white-tailed deer valid on private land |
| | | Oct. 15 | Dec. 15 | | Unused Area 27 Type 8 licenses valid in the entire area |
| 28 | | Oct. 15 | Oct. 31 | | General license; antlered mule deer or any white-tailed deer |
| 29 | 8 | Oct. 1 | Oct. 14 | 700 | General license; antlered deer off private land, any deer on private land |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| | | Nov. 16 | Dec. 15 | | General license; antlerless white-tailed deer |
| | | Sep. 1 | Sep. 30 | | Limited quota licenses; doe or fawn white-tailed deer valid on private land north of Crazy Woman Creek |
| | | Oct. 1 | Dec. 15 | | Unused Area 29 Type 8 licenses valid in the entire area |
| 30 | 8 | Oct. 15 | Oct. 31 | 500 | General license; any deer |
| | | Nov. 1 | Nov. 30 | | General license; any white-tailed deer |
| | | Dec. 1 | Dec. 15 | | General license; antlerless white-tailed deer |
| | | Sep. 1 | Sep. 30 | | Limited quota licenses; doe or fawn white-tailed deer valid on private land |
| | | Oct. 15 | Dec. 15 | | Unused Area 30 Type 8 licenses valid in the entire area |
| 31 | | Oct. 1 | Oct. 10 | | General license; antlered deer |
| 32 | | Oct. 15 | Oct. 31 | | General license; any deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| 32,163 | 8 | Oct. 15 | Nov. 15 | 50 | Limited quota licenses; doe or fawn white-tailed deer |

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|---|
| | | Opens | Closes | | |
| 33 | | Oct. 15 | Oct. 31 | | General license; any deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| | | Nov. 16 | Dec. 15 | | General license; antlerless white-tailed deer |
| | 6 | Oct. 15 | Dec. 15 | 50 | Limited quota licenses; doe or fawn valid on private land |
| | 8 | Sep. 1 | Sep. 30 | 500 | Limited quota licenses; doe or fawn white-tailed deer valid on private land |
| | | Oct. 15 | Dec. 15 | | Unused Area 33 Type 8 licenses valid in the entire area |
| 163 | | Oct. 15 | Oct. 21 | | General license; antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| 169 | | Oct. 15 | Oct. 21 | | General license; antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General license; any white-tailed deer |
| Archery | | Sep. 1 | Sep. 30 | | General license; any deer Limited quota licenses; Refer to Section 4 of this Chapter |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 18 | 6 | - 50 |
| | 8 | + 50 |
| 23,26 | 6 | + 200 |
| 24 | 3 | - 150 |
| 24 | 6 | - 200 |
| 30 | 8 | - 200 |
| Herd Unit Total | 3 | - 150 |
| | 6 | - 50 |
| | 8 | - 150 |
| Region C | | - 100 |
| Region Y | | No Change |

Management Evaluation

Current Postseason Population Management Objective: 8,000

Management Strategy: Recreational

2013 Postseason Population Estimate: No working model

2014 Proposed Postseason Population Estimate: No working model

The management objective for the Powder River White-tailed Deer Herd Unit is a post-season population objective of 8,000 white-tailed deer. The management strategy is recreational management. The objective and management strategy were last revised in 1996 and are scheduled for review this year.

We do not have a reliable population estimate at this time although we are confident it is higher than the management objective and generally above landowner's desires (Fig. 1). The spreadsheet simulation model developed for white-tailed deer populations with postseason classifications does not function with the available data from this herd unit.

Most white-tailed deer in this herd unit occur on private lands. There is substantial rural development in portions of this herd unit that act as refuges for white-tailed deer, allowing them to quickly repopulate surrounding areas that receive harvest. Our ability to control this deer population with hunting is very limited and localized. Mortalities due to deer-vehicle collisions and disease (i.e. viral hemorrhagic diseases) help keep this population from being even higher than it is.

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 region. Conditions generally became warmer and drier as you went south and east, which is consistent with normal weather patterns. This likely did not adversely affect white-tailed deer as they are closely associated with riparian habitats and irrigated croplands. 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 30° 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. White-tailed deer seem to be able to utilize stored hay crops better than mule deer. This fact likely increases their over-winter survival, especially during normal or above normal winter conditions.

Habitat

We do not have an established habitat transect in this herd unit to monitor white-tailed deer use. Monitoring of other habitat programs, such as Conservation Reserve Program (CRP) riparian strips, indicate high white-tailed deer populations have done extensive damage to native deciduous woodlands and riparian areas. Irrigated croplands and refuge areas allow these populations to be maintained at levels higher than native habitats would normally support. Woody species such as native plum and serviceberry, as well as desirable forbs such as

sunflowers, are being eliminated in some woody draw communities along the Bighorn Mountains.

Field Data

Field personnel conducted post-season classification surveys during mid-November through mid-December using ground survey techniques. Personnel were assigned designated routes to survey. We classified a total of 2,797 white-tailed deer, the highest classification count in 4 years despite a reduced population. The higher count could have been influenced by increased snow cover, making deer generally more visible. Also, colder temperatures may have resulted in longer feeding periods where deer were more readily visible.

Fawn production was 63 fawns:100 does, a decrease from the previous year, and below the long-term (n=32 years) average of 77 fawns:100 does. Reduced fawn production could slow the growth of this herd, which has declined in response to increased harvest in recent years and mortalities due to viral hemorrhagic disease. We documented epizootic hemorrhagic disease (EHD) the past 3 years within this herd unit, with the 2013 outbreak the most widespread.

Field personnel observed 32 bucks:100 does, a decrease from recent years. Due to the secretive nature of male white-tailed deer, we likely under observe bucks compared to does and fawns. We are likely maintaining a high buck:doe ratio due to the increased harvest of females and restricted access for harvesting bucks. There are sufficient males in this population to meet recreational management criteria (i.e. 20-29 bucks:100 does).

During the 2013 season, 75% hunters (n=1,454) who completed a harvest survey indicated they were satisfied (43%) or very satisfied (32%) with their hunting experience in this herd unit. At the hunt area level, satisfaction levels varied from 40% (Hunt Area 163) to 87% (Hunt Area 20) although the sample size for several hunt areas was very low.

Nonresident hunters were more satisfied (76%) than resident hunters (68%). Access to private lands through trespass fees or outfitted hunts caters more to nonresident than resident hunters. There is limited buck hunting opportunity for resident hunters in this herd unit, which may lower satisfaction levels for some hunters. Hunter satisfaction in both groups declined in 2013 compared to 2012, likely in response to lower deer numbers due to a disease outbreak.

Harvest

Hunters harvested an estimated 5,681 white-tailed deer in 2013, a decrease of 17% from 2012 and similar to the previous 5 year mean (2008-2012; n=5,648). The hunter success rate was 70%, the lowest success rate since 2008. Effort, as measured by days hunted per deer harvested, was 6.8 days/harvest, a slight decrease from 2012 but similar to the 10 year average (6.7 days/harvest). We experienced a viral hemorrhagic disease outbreak in 2013, starting prior to the hunting season. Mortality varied geographically, with reductions of up to an estimated 70% in some areas. As such, there were fewer deer available for harvest and some landowners restricted harvest in response to disease outbreak. Mature bucks seem to die at a proportionally higher rate than other sex and age classes due to hemorrhagic diseases. This results in fewer mature bucks available for harvest.

Population

We know we have reduced this population through increased harvest over the past decade. We harvested an average of 5,139 white-tailed deer annually (averaged 2,136 bucks; 2,528 does; 474 fawns) during the 2004-2013 seasons, compared to an average of 2,332 white-tailed deer annually (averaged 1,275 bucks; 876 does; 180 fawns) during the 1994-2003 seasons.

Periodic outbreaks of viral hemorrhagic diseases also contribute to reduced numbers. We had an outbreak of epizootic hemorrhagic disease (EHD) in 2013, resulting in white-tailed deer mortality across the herd unit. The level of mortality was localized, and likely varied from ~10% - 70% of the local population.

Of landowners that completed an annual survey (n=66) within the Sheridan Biologist District (Hunt Areas 23, 24, and 26), 62% (n=41) indicated white-tailed deer numbers were higher than desired and 29% (n=19) believed numbers were at or near desired levels. Most respondents suggested similar (42%) or more liberal (50%) season strategies for 2014. Results were similar when responses from the Buffalo Biologist District (Hunt Area 27, 29-33, 163, and 169) were included (Fig. 5).

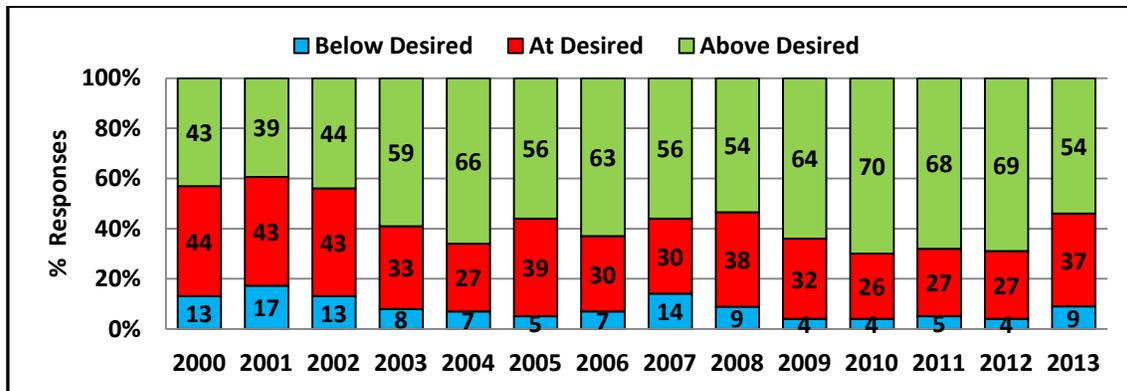


Figure 1. Landowner's perceptions of white-tailed deer populations on their property in Hunt Areas 23, 24, 26, 27, 29, 30, 31, 32, 33, 163, and 169, by percentage. Desired level is a subjective expression of individual landowner tolerance and not necessarily correlated to the established management objective.

Management Summary

The regular hunting season for white-tailed deer has generally been concurrent with mule deer seasons during October, as well as during November. An archery pre-season runs the month of September. Seasons for antlerless white-tailed deer have been extended as early as September 1 and as late as December 15 to provide additional opportunities to harvest deer as well as address damage concerns of landowners.

Most white-tailed deer hunting is on private land within this herd unit. Access for antlered harvest is generally through payment of a trespass fee or an outfitter. Access for antlerless harvest is generally easier, with several landowners on a list allowing free access. Some landowners removed their name from this list in 2013 due to decreased deer numbers resulting from a disease outbreak.

There were changes to legal firearm calibers for the 2013 season. Hunters are able use buck shot (00 or bigger) in shotguns and .22 or larger centerfire cartridges (60 grain minimum bullet weight) starting with the 2013 season. We are not aware of any problems with this change in allowable methods of take.

Landowners were able to bait white-tailed deer - with a permit - starting in 2013. This change was designed to increase harvest of white-tailed deer in areas with safety concerns such as rural developments. In 2013, the Department issued 9 permits to 3 individuals, all in Hunt Area 24 near the Big Horn area. Two permits were for individual landowners with 1 bait site on each property. The other 7 permits were issued to a local outfitter with 11 bait sites on 3 different landowners. All permits were for antlerless white-tailed deer only. An estimated 100 white-tailed deer were harvested at these bait sites in 2013. We are not aware of any problems with this program during the 2013 season. We plan to make these permits available as appropriate for the 2014 season.

We estimate a harvest of about 5,000 white-tailed deer in 2014, a decrease from recent years. The outbreak of EHD in 2013 likely reduced the number of mature males as well as deer numbers in general. As such, we anticipate a decrease in hunter harvest in 2014. We are likely lowering this population in some areas through harvest, but with the numerous refuges that do not allow hunting within this herd unit, it will be difficult to bring this population down to the established management objective. The management objective will be reviewed this year. We will consider an alternative management objective such as landowner/hunter satisfaction using private land strategies for this herd unit.

Deer Control within the Cities of Buffalo and Sheridan

Higher deer numbers with and adjacent to the Cities of Buffalo and Sheridan have resulted in numerous conflicts, including damage to landscaping, deer-vehicle collisions, and deer-dog interactions. As a result of these various conflicts, the Cities of Buffalo and Sheridan continued deer reduction programs in 2013. Below is a summary of these efforts. Complete reports in compliance with their respective Chapter 56 permit are on file at the Cheyenne Office.

Buffalo

This was the fifth year the City of Buffalo removed deer from within the city limits. Six deer (all white-tail deer) were removed over one day, all of which tested negative for chronic wasting disease. The deer were processed and donated to the food pantry. A summary of the Buffalo program is provided in Table 1.

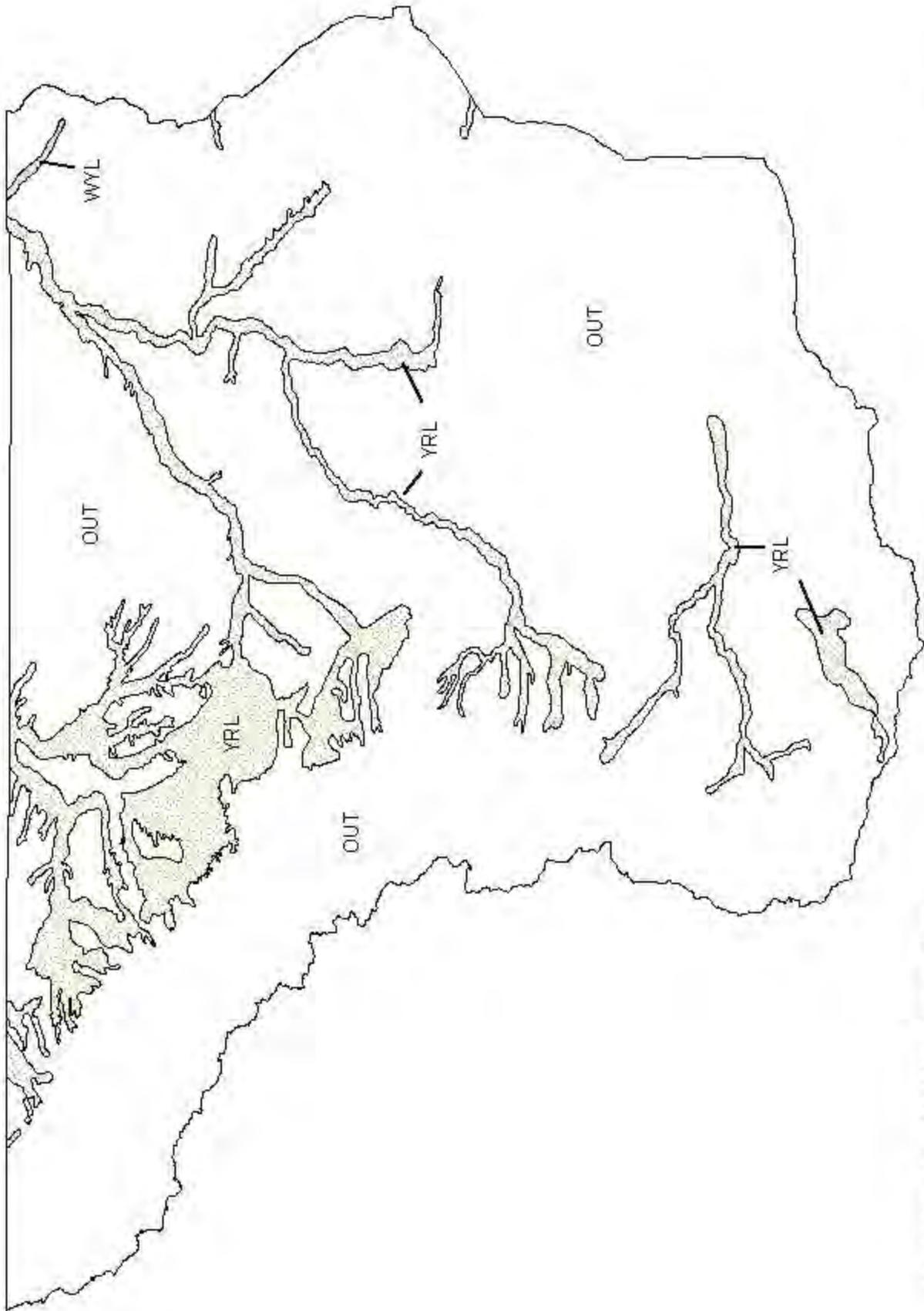
| | 2009 | 2010 | 2011 | 2012 | 2013 |
|--------------------------|-------------|-------------|-------------|-------------|-------------|
| No Deer Permitted | 50 | 75 | 100 | 75 | 75 |
| No. of Days | 2 | 5 | 4 | 5 | 1 |
| Mule Deer | 16 | 16 | 35 | 10 | 0 |
| White-tailed Deer | 34 | 59 | 26 | 51 | 6 |
| Total | 50 | 75 | 61 | 61 | 6 |
| CWD Positive | 0 | 3 WTD | 0 | 0 | 0 |

Sheridan

This was the third year the City of Sheridan removed deer from within the city limits. All deer are tested for CWD and no deer have tested positive to date. All deer are either donated whole to individuals or processed and donated to area food banks. A summary of the Sheridan program is provided in Table 2.

Table 2. City of Buffalo Deer Reduction Program Summary, 2011-2013.

| | 2011 | 2012 | 2013 |
|--------------------------|-------------|-------------|-------------|
| No Deer Permitted | 100 | 100 | 100 |
| Mule Deer | 51 | 42 | 5 |
| White-tailed Deer | 49 | 39 | 28 |
| Total | 100 | 81 | 33 |
| CWD Positive | 0 | 0 | 0 |



White-tailed Deer (WT303) - Powder River
HA 17, 19, 23-33, 163, 169
Revised 4/67

2013 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL320 - FORTIFICATION

HUNT AREAS: 2

PREPARED BY: ERIKA PECKHAM

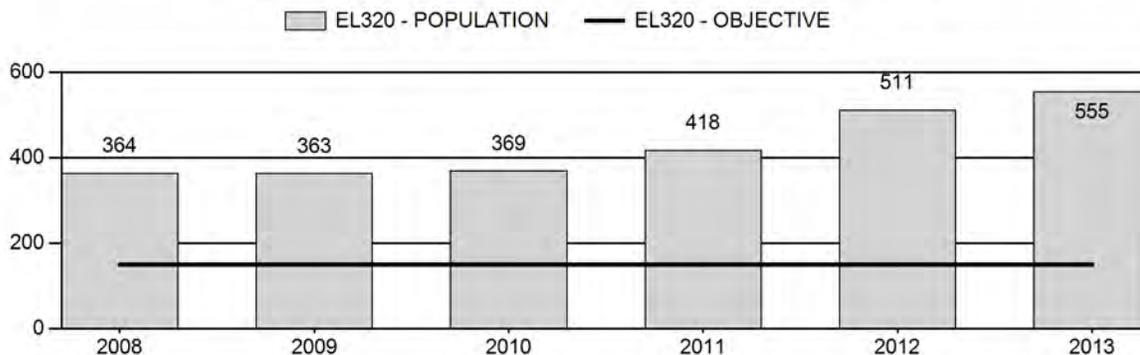
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 405 | 555 | 558 |
| Harvest: | 51 | 71 | 112 |
| Hunters: | 75 | 91 | 150 |
| Hunter Success: | 68% | 78% | 75% |
| Active Licenses: | 75 | 91 | 150 |
| Active License Percent: | 68% | 78% | 75% |
| Recreation Days: | 263 | 361 | 575 |
| Days Per Animal: | 5.2 | 5.1 | 5.1 |
| Males per 100 Females | 52 | 75 | |
| Juveniles per 100 Females | 58 | 66 | |

| | |
|---|--------------|
| Population Objective: | 150 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 270% |
| Number of years population has been + or - objective in recent trend: | 5 |
| Model Date: | 03/03/2014 |

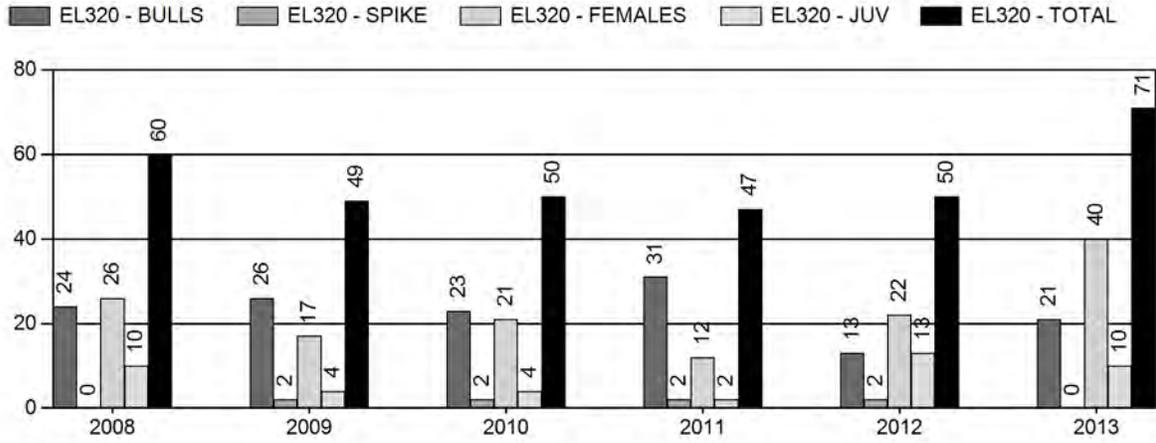
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | | 11.6% |
| Males ≥ 1 year old: | 9.5% | 34.3% |
| Juveniles (< 1 year old): | 0% | 0% |
| Total: | 9.1% | 16.4% |
| Proposed change in post-season population: | 11.3% | .5% |

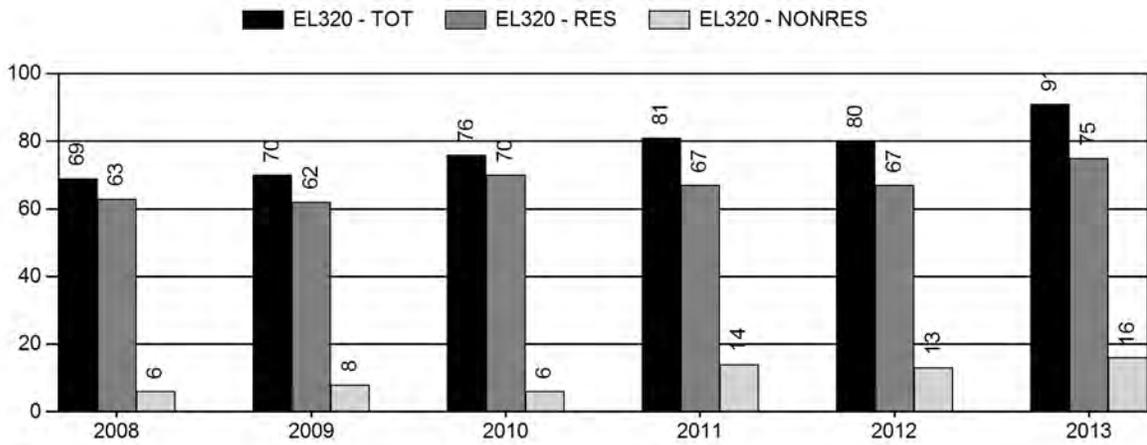
Population Size - Postseason



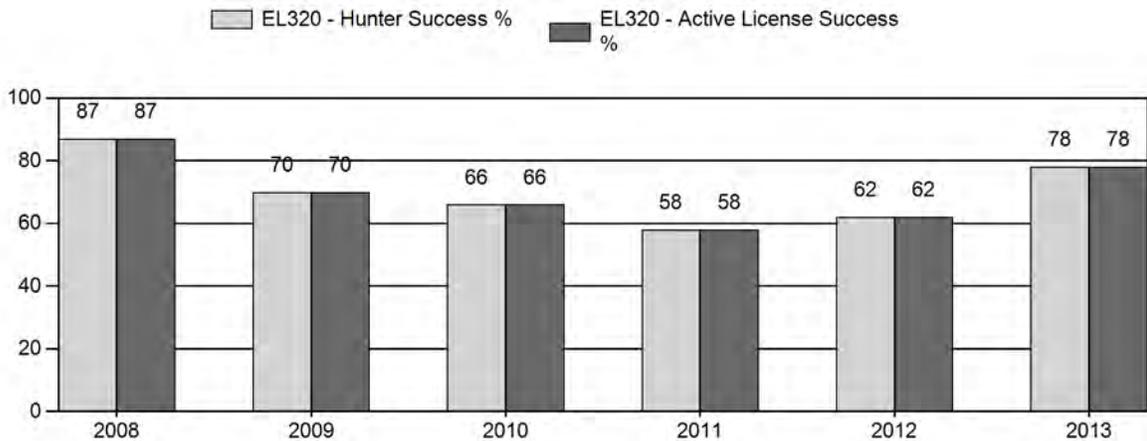
Harvest



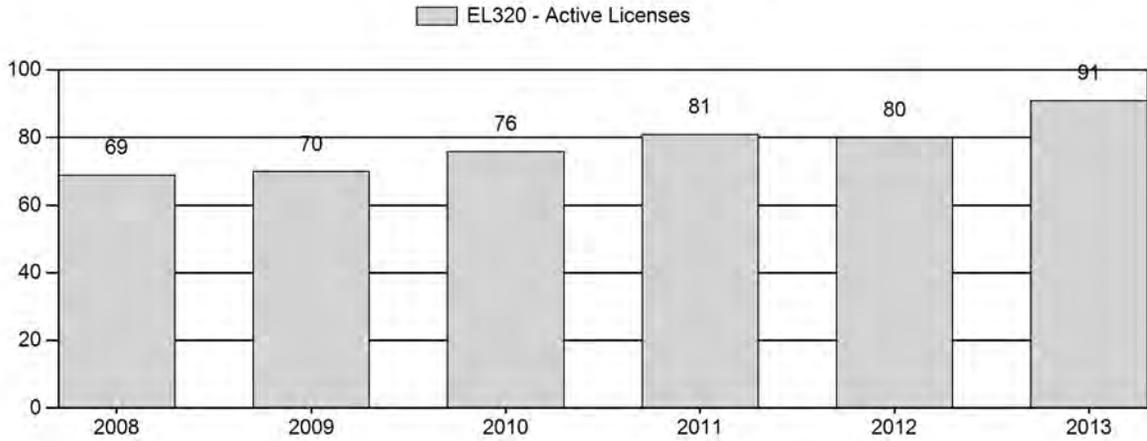
Number of Hunters



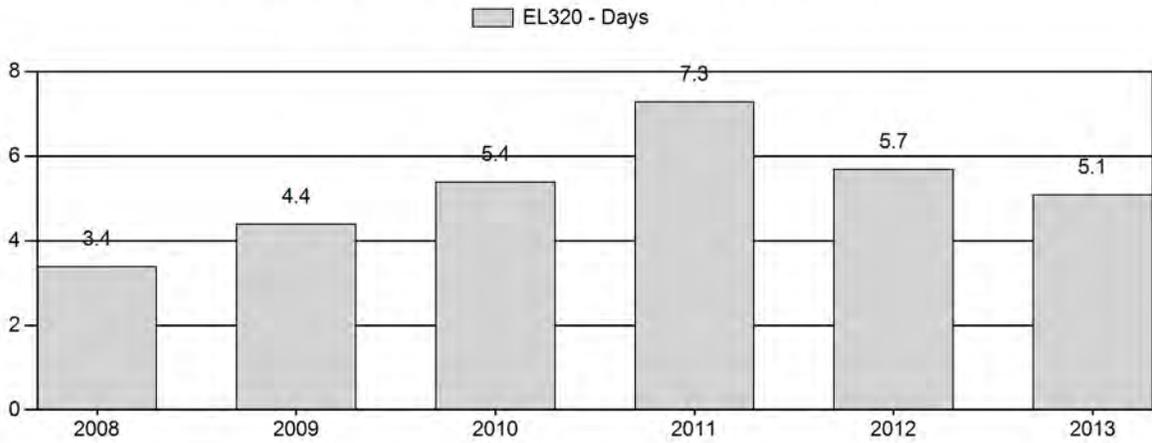
Harvest Success



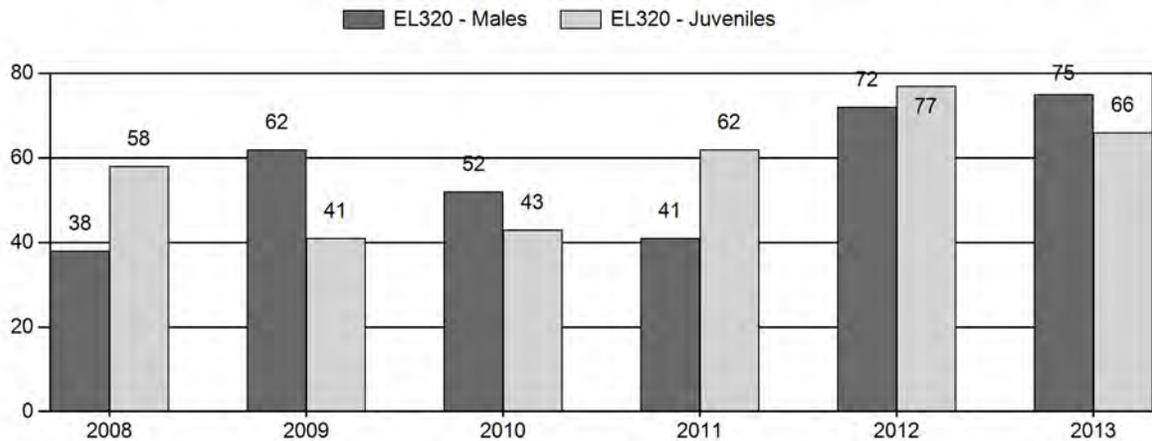
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Elk Herd EL320 - FORTIFICATION

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | Ylng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 364 | 12 | 14 | 26 | 19% | 69 | 51% | 40 | 30% | 135 | 162 | 17 | 20 | 38 | ± 9 | 58 | ± 12 | 42 |
| 2009 | 363 | 1 | 17 | 18 | 31% | 29 | 49% | 12 | 20% | 59 | 188 | 3 | 59 | 62 | ± 22 | 41 | ± 17 | 26 |
| 2010 | 369 | 13 | 31 | 44 | 27% | 84 | 51% | 36 | 22% | 164 | 160 | 15 | 37 | 52 | ± 9 | 43 | ± 8 | 28 |
| 2011 | 418 | 18 | 18 | 36 | 20% | 87 | 49% | 54 | 31% | 177 | 197 | 21 | 21 | 41 | ± 8 | 62 | ± 10 | 44 |
| 2012 | 511 | 32 | 27 | 59 | 29% | 82 | 40% | 63 | 31% | 204 | 215 | 39 | 33 | 72 | ± 12 | 77 | ± 13 | 45 |
| 2013 | 555 | 23 | 63 | 86 | 31% | 114 | 41% | 75 | 27% | 275 | 438 | 20 | 55 | 75 | ± 10 | 66 | ± 9 | 38 |

**2014 HUNTING SEASONS
FORTIFICATION ELK HERD (EL320)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|--------|-------|--|
| | | Opens | Closes | | |
| 2 | 1 | Oct. 21 | Nov. 3 | 130 | Limited quota licenses; any elk |
| | 4 | Oct. 21 | Nov. 3 | 20 | Limited quota licenses; antlerless elk |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 2 | 1 | +100 |
| | 4 | -40 |
| Herd Unit Total | 1 | +100 |
| | 4 | -40 |

Management Evaluation

Current Postseason Population Management Objective: 150

Management Strategy: Recreational

2013 Postseason Population Estimate: ~550

2014 Proposed Postseason Population Estimate: ~560

Herd Unit Issues

The management objective for the Fortification Elk Herd Unit is a post-season population objective of 150 elk. The management strategy is recreational management. The objective and management strategy were last reviewed in 2009.

This herd has great potential for continued growth if access cannot be somewhat improved. Much of the occupied range for this herd includes land administrated by the Bureau of Land Management. Private land is scattered, but also surrounds the herd unit, resulting in a tightly controlled access situation. The opinions of landowners controlling hunting access thus have a great impact on how this herd is managed. Currently, some landowners allowing access to this elk herd seem to be relatively happy with the management direction for this elk herd, and have allowed access to the current number of license-holding hunters.

The 2013 post-season population estimate was around 550 elk. It is probable that this number is inflated, however the herd is most likely trending upwards. Since 2002 the population has been steadily increasing. Both aerial classifications and increasing calf:cow ratios support this observation.

Weather

Weather conditions throughout 2012 and into 2013 were extremely dry and warmer than normal. The winter of 2012-13 was mild and did not see much for snow accumulation. The spring and summer of 2013 experienced excellent range conditions, with good amounts of moisture at optimal times. 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.

Habitat

There are no herbaceous or shrub habitat transects located within in this herd unit. The nearest transect is the SA creek sagebrush transect. The utilization is typically very light on this transect. In the fall of 2013, the transect survey showed the average leader growth to be 16mm, which is somewhat lower than anticipated, given the favorable growing season of 2013.

Field Data

This herd is classified aerially, and with the exception of 2009, the number of animals observed has increased each year since 2007. In 2013, 275 elk were classified, which is the highest number detected since this herd has been monitored. It should however be noted that more time was spent classifying elk in this area in 2013 than is typical. The time normally spent classifying elk in this Herd Unit is ~4 hours. In 2013 ~ 6 hours were spent searching for elk. In addition to surveying the traditional areas where the elk are highly concentrated, outlying areas were scoured, and likely more individuals were detected due to the increased effort. In 2013 the calf to cow ratio was 66, somewhat lower than the 77 observed in 2012.

One difficulty associated with the management of this herd is achieving adequate sample sizes during classification surveys. The elk can be difficult to locate under dense juniper cover and frequently they do not run when disturbed by survey flights. With these habitat factors, sightability is likely decreased and it is probable that there are a fair number of animals that are not detected during classification.

Harvest

In 2013 there were 90 licenses available, 30 Type 1 and 60 Type 4. The last two seasons the focus has been on cow harvest in an effort to keep the continued growth that this herd seems to be experiencing in check. The traditional season in this hunt area has been from October 21 to October 31. This season time and length seems to be adequate to allow a reasonable harvest and works well for the private landowners who allow public access. Hunter success in this herd unit has averaged 69% over the last 5 years, with similar success in preceding years as well. 2013 had an overall success rate of 78%, up from the 2012 success rate of 62%.

Population

The “Constant Juvenile – Constant Adult Mortality Rate” (CJCA) spreadsheet model was chosen to use for the post season population estimate of this herd. This model equals the SCA-CJ model with the lowest AIC value (103) and appears to depict the trend that is occurring. It is possible that the population estimate of ~550 is slightly inflated (fair model), although the increasing trend is likely accurate. Based on landowner input and classification surveys, it estimated that the population is likely between 350-450 elk.

Management Summary

Both BLM and Game and Fish staff have dedicated efforts to studying the behavior and movements of elk with an ongoing radio-collar study. In March of 2011, 35 cow elk were fitted with GPS collars. In addition to that collaring effort, in January of 2014 another 35 cow elk were also fitted with GPS collars. Currently there are 56 collared individuals. The collaring of the elk was funded in part by Anadarko Petroleum. Going forward, the continued data collected will be analyzed by a private consultant to assess the movements of the elk in relation to on-going energy development.

Several nongovernmental organizations have taken a keen interest in the area and the elk herd in particular. The viewpoint of many of these groups is that elk should be more protected within the herd unit. Coal bed methane development in the herd unit has reduced the total amount of effective elk habitat. Conventional oil development is on the rise in the Powder River Basin and this could be a factor in the Fortification Elk Herd Unit. However, even with past and current development, the population is well over the management objective. Harvesting elk towards objective should help reduce risks of overcrowding and degradation of suitable remaining habitat. A high priority is being placed upon maintaining habitat quality during development so that the area can continue to support a healthy herd of elk after energy development has ceased.

If we attain the projected harvest of 112 elk, it is likely that the population will essentially remain unchanged. Based on the population model, we predict a 2014 post-season population of around 560 elk. Typically, the degree of hunter access has been sufficient to allow for around 90 licenses. However, during the latter portion of the 2013 season, an additional landowner felt that numbers of elk warranted further access. During the annual meeting held in January, it was determined that with the additional access the area could support 150 licenses. It was also felt that providing three additional days would perhaps give hunters more opportunity to harvest an animal. Due to the past harvests focusing on cows, the bull ratio has become quite high at 75 bulls: 100 cows. It is hoped that the substantial increase in access, and therefore Type 1 licenses, will bring this ratio down into a more appropriate range.

| | |
|------------------|---------------|
| INPUT | |
| Species: | Elk |
| Biologist: | Erika Peckham |
| Herd Unit & No.: | Fortification |
| Model date: | 03/03/14 |

| MODELS SUMMARY | | Relative AICc | Fit | Notes |
|-----------------------|---|---------------|-----|-------|
| CJ,CA | Constant Juvenile & Adult Survival | 103 | 94 | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 103 | 94 | |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 297 | 165 | |
| TS,J,CA,MSC | Time-Specific Juv, Constant Adult Survival, Male survival coefficient | 217 | 71 | |

Population Estimates from Top Model

| Year | Posthunt Population Est. | | Trend Count | | Predicted Prehunt Population | | | Predicted Posthunt Population | | | Objective | |
|------|--------------------------|----------|-------------|-------|------------------------------|-------------|---------|-------------------------------|-------------|---------|-----------|-------|
| | Field Est | Field SE | Juveniles | Total | Juveniles | Total Males | Females | Juveniles | Total Males | Females | | Total |
| 1993 | | | 63 | 71 | 190 | 324 | 56 | 18 | 161 | 150 | 235 | 150 |
| 1994 | | | 61 | 40 | 180 | 281 | 55 | 12 | 158 | 150 | 225 | 150 |
| 1995 | | | 91 | 34 | 177 | 302 | 90 | 34 | 162 | 150 | 286 | 150 |
| 1996 | | | 120 | 69 | 195 | 385 | 120 | 69 | 195 | 150 | 385 | 150 |
| 1997 | | | 84 | 116 | 239 | 440 | 84 | 116 | 239 | 150 | 440 | 150 |
| 1998 | | | 90 | 147 | 268 | 505 | 63 | 114 | 217 | 150 | 394 | 150 |
| 1999 | | | 137 | 137 | 238 | 512 | 118 | 82 | 186 | 150 | 387 | 150 |
| 2000 | | | 81 | 128 | 230 | 438 | 72 | 70 | 180 | 150 | 322 | 150 |
| 2001 | | | 63 | 97 | 205 | 366 | 59 | 77 | 171 | 150 | 307 | 150 |
| 2002 | | | 67 | 99 | 191 | 358 | 51 | 81 | 127 | 150 | 259 | 150 |
| 2003 | | | 73 | 99 | 145 | 318 | 72 | 84 | 137 | 150 | 294 | 150 |
| 2004 | | | 49 | 103 | 164 | 324 | 49 | 85 | 155 | 150 | 289 | 150 |
| 2005 | | | 66 | 171 | 171 | 340 | 61 | 86 | 158 | 150 | 305 | 150 |
| 2006 | | | 123 | 109 | 180 | 411 | 110 | 91 | 160 | 150 | 361 | 150 |
| 2007 | | | 53 | 134 | 201 | 388 | 52 | 117 | 172 | 150 | 342 | 150 |
| 2008 | | | 104 | 136 | 190 | 430 | 93 | 109 | 161 | 150 | 364 | 150 |
| 2009 | | | 77 | 144 | 195 | 417 | 73 | 114 | 176 | 150 | 363 | 150 |
| 2010 | | | 81 | 141 | 202 | 424 | 77 | 113 | 179 | 150 | 369 | 150 |
| 2011 | | | 122 | 141 | 206 | 469 | 120 | 105 | 193 | 150 | 418 | 150 |
| 2012 | | | 178 | 151 | 237 | 566 | 163 | 134 | 213 | 150 | 511 | 150 |
| 2013 | | | 162 | 197 | 274 | 633 | 151 | 174 | 230 | 150 | 555 | 150 |
| 2014 | | | 165 | 231 | 286 | 681 | 154 | 152 | 253 | 150 | 558 | 150 |
| 2015 | | | | | | | | | | 150 | | 150 |
| 2016 | | | | | | | | | | 150 | | 150 |
| 2017 | | | | | | | | | | 150 | | 150 |
| 2018 | | | | | | | | | | 150 | | 150 |
| 2019 | | | | | | | | | | 150 | | 150 |
| 2020 | | | | | | | | | | 150 | | 150 |
| 2021 | | | | | | | | | | 150 | | 150 |
| 2022 | | | | | | | | | | 150 | | 150 |
| 2023 | | | | | | | | | | 150 | | 150 |
| 2024 | | | | | | | | | | 150 | | 150 |
| 2025 | | | | | | | | | | 150 | | 150 |

Survival and Initial Population Estimates

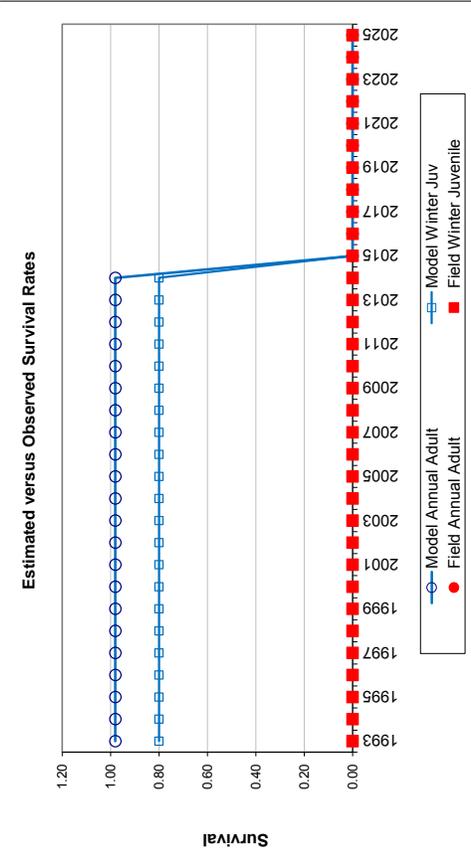
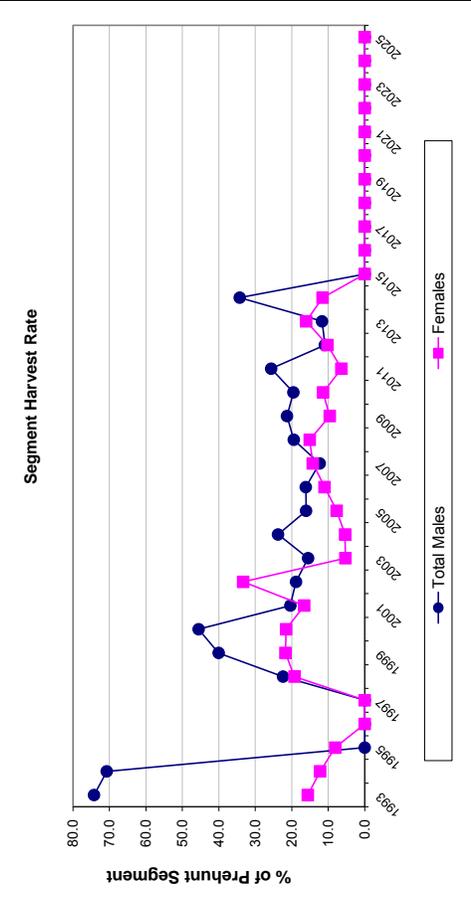
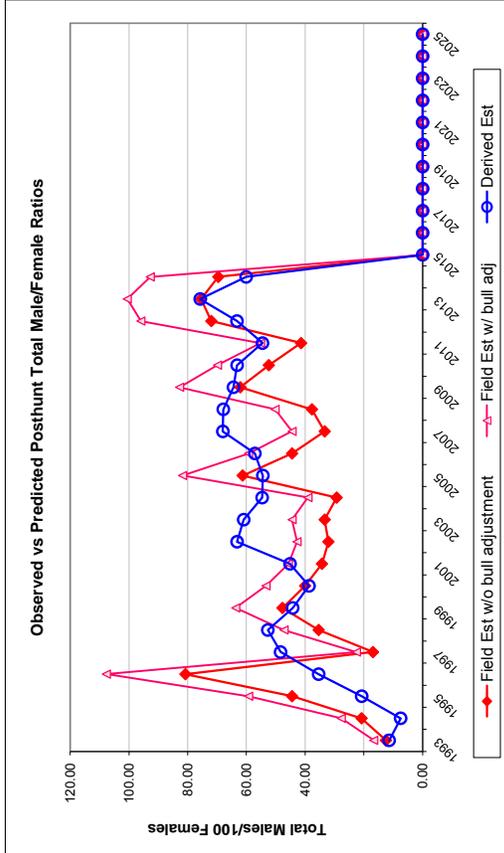
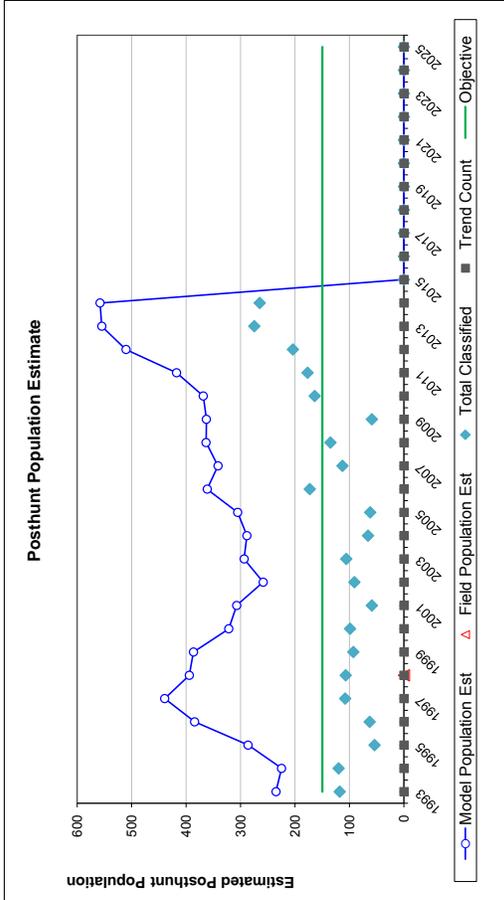
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|------|-----------------------------|------|
| | Field Est | SE | Model Est | SE |
| 1993 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1994 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1995 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1996 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1997 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1998 | 0.80 | 0.98 | 0.98 | 0.98 |
| 1999 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2000 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2001 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2002 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2003 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2004 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2005 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2006 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2007 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2008 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2009 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2010 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2011 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2012 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2013 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2014 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2015 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2016 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2017 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2018 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2019 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2020 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2021 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2022 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2023 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2024 | 0.80 | 0.98 | 0.98 | 0.98 |
| 2025 | 0.80 | 0.98 | 0.98 | 0.98 |

| Parameters: | Optim cells |
|---------------------------------|-------------|
| Juvenile Survival = | 0.800 |
| Adult Survival = | 0.980 |
| Initial Total Male Pop/10,000 = | 0.002 |
| Initial Female Pop/10,000 = | 0.016 |

| MODEL ASSUMPTIONS | |
|-------------------------------|-----|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Total Bulls Adjustment Factor | 75% |

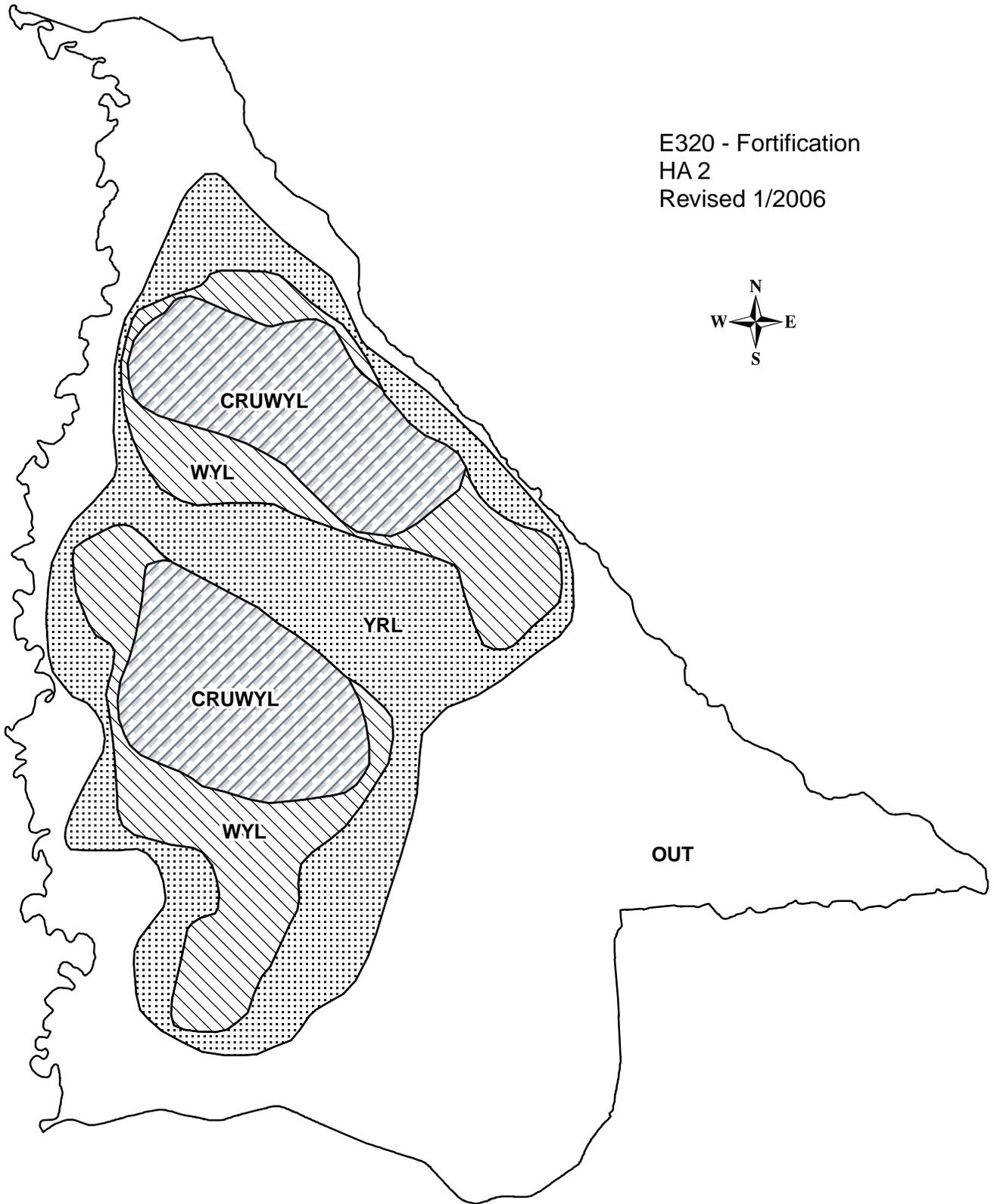
| Year | Classification Counts | | | | | | | | | | Harvest | | | | | Segment Harvest Rate (% of Prehunt Segment) | |
|------|-----------------------|-----------|----------|-------------|-----------------------|-------------------------|----------|-------|--------|-------|---------|-----------|----------|---------|---------------|---|---------|
| | Juvenile/Female Ratio | | | | | Total Male/Female Ratio | | | | | Juv | Yr1 males | 2+ Males | Females | Total Harvest | Total Males | Females |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est w/ bull adj | Field Est w/o bull adj | Field SE | | | | | | | | | | |
| 1993 | | | | | | | | | | | 6 | 23 | 25 | 27 | 81 | 74.3 | 15.6 |
| 1994 | | 35.00 | 7.89 | 11.41 | 16.67 | 12.50 | 4.19 | 7.49 | 27.71 | 20.78 | 5.71 | 12 | 14 | 20 | 51 | 70.8 | 12.2 |
| 1995 | | 35.06 | 7.84 | 7.49 | 59.26 | 44.44 | 15.42 | 20.75 | 44.44 | 44.44 | 15.42 | 0 | 0 | 13 | 14 | 0.0 | 8.1 |
| 1996 | | 61.54 | 17.89 | 20.75 | 107.69 | 80.77 | 23.70 | 35.40 | 80.77 | 80.77 | 23.70 | 0 | 0 | 0 | 0 | 0.0 | 0.0 |
| 1997 | | 35.21 | 8.19 | 48.37 | 22.54 | 16.90 | 5.28 | 48.37 | 47.18 | 35.38 | 8.58 | 0 | 0 | 0 | 0 | 0.0 | 0.0 |
| 1998 | | 29.23 | 7.62 | 52.71 | 63.64 | 47.73 | 12.66 | 44.24 | 63.64 | 47.73 | 12.66 | 24 | 30 | 47 | 101 | 22.4 | 19.3 |
| 1999 | | 63.64 | 15.38 | 44.24 | 44.24 | 40.00 | 10.09 | 44.24 | 63.64 | 47.73 | 12.66 | 17 | 47 | 47 | 114 | 40.1 | 21.8 |
| 2000 | | 40.00 | 10.09 | 38.68 | 53.33 | 40.00 | 10.09 | 38.68 | 53.33 | 40.00 | 10.09 | 8 | 44 | 45 | 106 | 45.6 | 21.6 |
| 2001 | | 34.29 | 11.47 | 45.14 | 45.14 | 34.29 | 11.47 | 45.14 | 45.14 | 34.29 | 11.47 | 4 | 13 | 31 | 53 | 20.4 | 16.6 |
| 2002 | | 39.62 | 10.22 | 63.17 | 42.77 | 32.08 | 8.94 | 63.17 | 42.77 | 32.08 | 8.94 | 15 | 13 | 58 | 90 | 18.8 | 33.4 |
| 2003 | | 52.63 | 11.87 | 60.92 | 44.44 | 33.33 | 8.83 | 60.92 | 44.44 | 33.33 | 8.83 | 1 | 0 | 7 | 22 | 15.5 | 5.3 |
| 2004 | | 31.71 | 10.09 | 54.64 | 39.02 | 29.27 | 9.61 | 54.64 | 39.02 | 29.27 | 9.61 | 0 | 3 | 8 | 32 | 23.8 | 5.4 |
| 2005 | | 38.71 | 13.16 | 54.40 | 81.72 | 61.29 | 17.86 | 54.40 | 81.72 | 61.29 | 17.86 | 4 | 2 | 13 | 31 | 16.1 | 7.7 |
| 2006 | | 69.14 | 12.02 | 57.11 | 59.26 | 44.44 | 8.90 | 57.11 | 59.26 | 44.44 | 8.90 | 11 | 15 | 18 | 45 | 16.2 | 11.0 |
| 2007 | | 30.43 | 7.59 | 68.02 | 44.44 | 33.33 | 8.03 | 68.02 | 44.44 | 33.33 | 8.03 | 2 | 13 | 26 | 42 | 12.4 | 14.3 |
| 2008 | | 57.97 | 11.52 | 67.87 | 50.24 | 37.68 | 8.67 | 67.87 | 50.24 | 37.68 | 8.67 | 10 | 24 | 26 | 60 | 19.5 | 15.1 |
| 2009 | | 41.38 | 14.20 | 64.41 | 82.76 | 62.07 | 18.62 | 64.41 | 82.76 | 62.07 | 18.62 | 4 | 2 | 17 | 49 | 21.3 | 9.6 |
| 2010 | | 42.86 | 8.54 | 63.16 | 69.84 | 52.38 | 9.75 | 63.16 | 69.84 | 52.38 | 9.75 | 4 | 23 | 21 | 50 | 19.6 | 11.4 |
| 2011 | | 62.07 | 10.75 | 54.52 | 55.17 | 41.38 | 8.20 | 54.52 | 55.17 | 41.38 | 8.20 | 2 | 31 | 12 | 47 | 25.7 | 6.4 |
| 2012 | | 76.83 | 12.87 | 63.21 | 95.93 | 71.95 | 12.28 | 63.21 | 95.93 | 71.95 | 12.28 | 13 | 13 | 22 | 50 | 10.9 | 10.2 |
| 2013 | | 65.79 | 9.78 | 75.72 | 100.58 | 75.44 | 10.77 | 75.72 | 100.58 | 75.44 | 10.77 | 0 | 21 | 40 | 71 | 11.7 | 16.1 |
| 2014 | | 60.87 | 9.23 | 60.08 | 92.75 | 69.57 | 10.13 | 60.08 | 92.75 | 69.57 | 10.13 | 10 | 70 | 30 | 112 | 34.3 | 11.6 |
| 2015 | | | | | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | | | | |

FIGURES



Comments:

E320 - Fortification
HA 2
Revised 1/2006



2013 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL321 - NORTH BIGHORN

HUNT AREAS: 35-40

PREPARED BY: TIM THOMAS

| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|----------------------------|----------------------------|-------------|----------------------|
| Trend Count: | 4,540 | 5,437 | 5,300 |
| Harvest: | 1,169 | 1,371 | 1,450 |
| Hunters: | 3,959 | 4,331 | 4,500 |
| Hunter Success: | 30% | 32% | 32% |
| Active Licenses: | 4,053 | 31% | 4,750 |
| Active License Percentage: | 29% | 31% | 31% |
| Recreation Days: | 28,962 | 29,785 | 32,500 |
| Days Per Animal: | 24.8 | 21.7 | 22.4 |
| Males per 100 Females: | 23 | 23 | |
| Juveniles per 100 Females | 51 | 49 | |

Trend Based Objective ($\pm 20\%$) 4,350 (3480 - 5220)

Management Strategy: Special

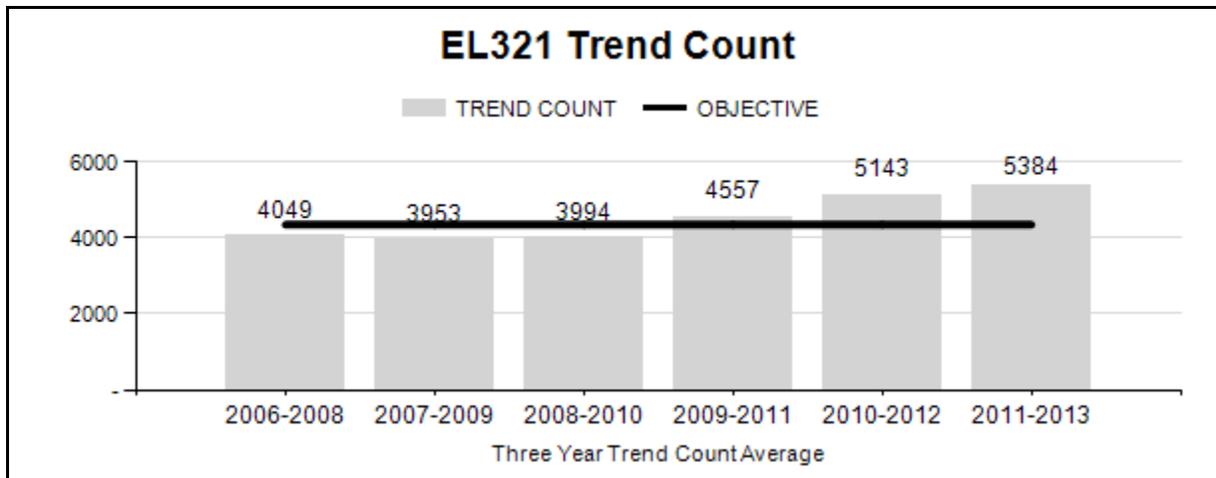
Percent population is above (+) or (-) objective: 25%

Number of years population has been + or - objective in recent trend: 4

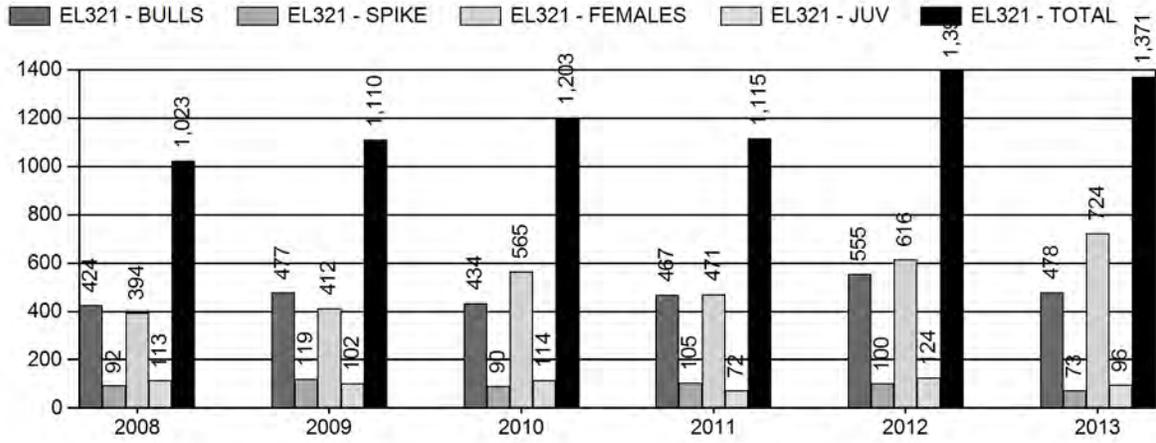
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|------------------------------|-----------------|-----------------|
| Females ≥ 1 year old: | 18% | 18% |
| Males ≥ 1 year old: | 34% | 35% |
| Juveniles (< 1 year old): | 6% | 6% |
| Total: | 20% | 6% |

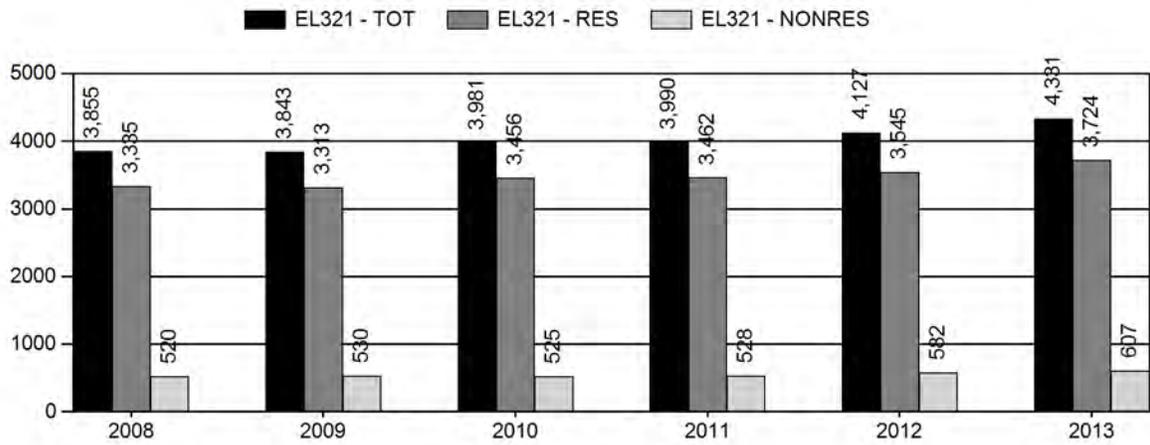
Proposed change in post-season population: -2% -2%



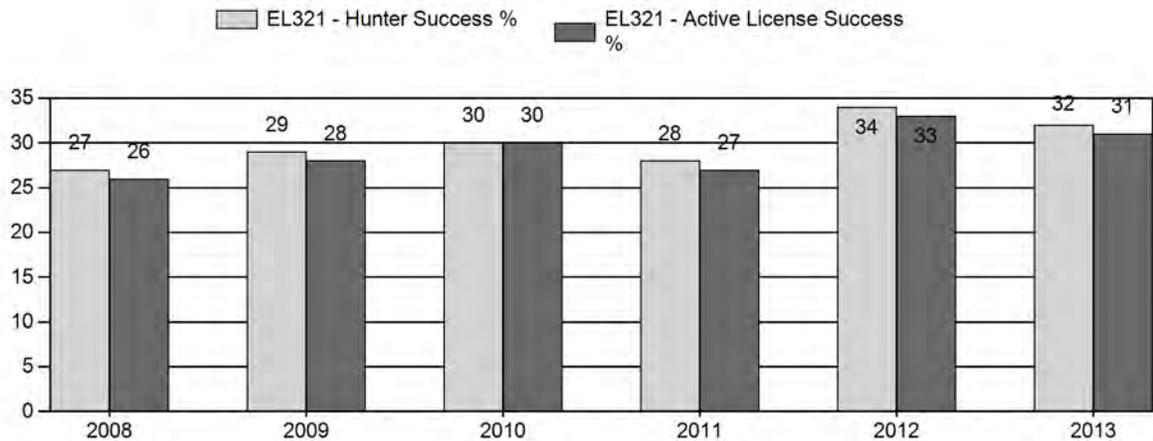
Harvest



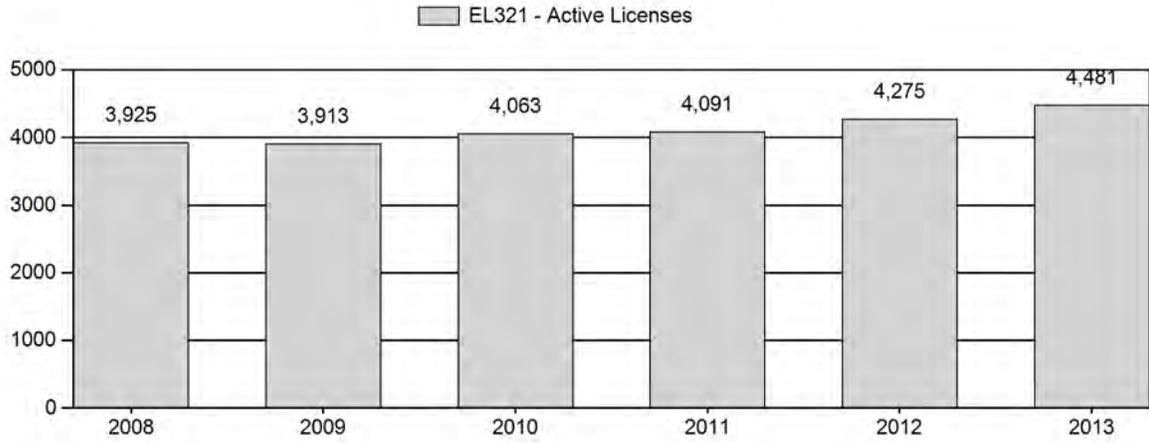
Number of Hunters



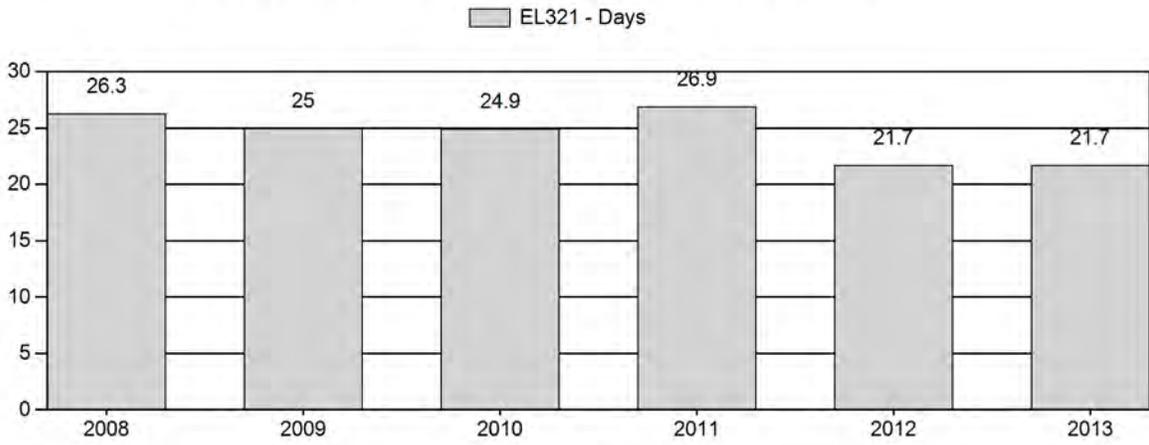
Harvest Success



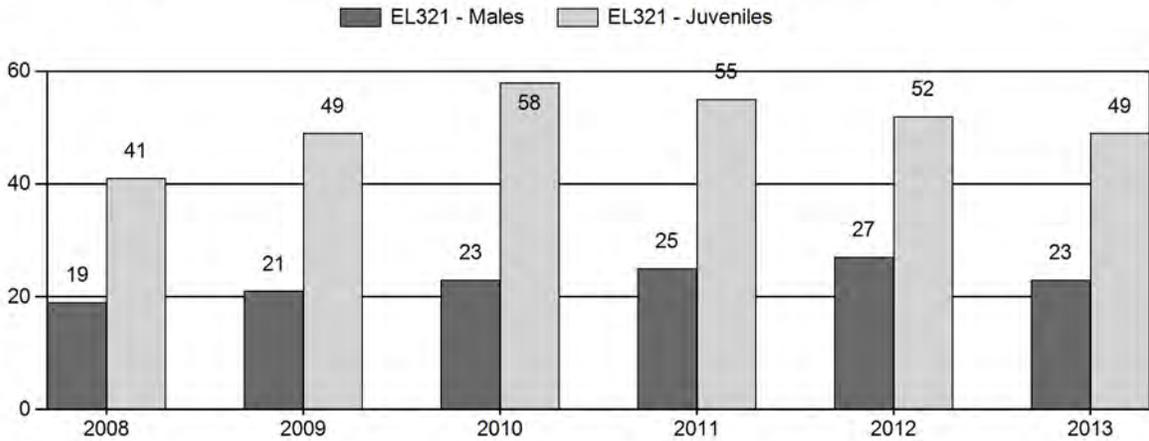
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Elk Herd EL321 - NORTH BIGHORN

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 4,650 | 168 | 66 | 234 | 12% | 1,257 | 63% | 513 | 26% | 2,004 | 538 | 13 | 5 | 19 | ± 1 | 41 | ± 2 | 34 |
| 2009 | 5,530 | 154 | 79 | 233 | 13% | 1,092 | 59% | 538 | 29% | 1,863 | 694 | 14 | 7 | 21 | | | | |
| 2010 | 5,250 | 157 | 76 | 233 | 13% | 1,027 | 55% | 595 | 32% | 1,855 | 907 | 15 | 7 | 23 | ± 0 | 58 | ± 0 | 47 |
| 2011 | 5,500 | 160 | 103 | 263 | 14% | 1,059 | 55% | 587 | 31% | 1,909 | 853 | 15 | 10 | 25 | ± 2 | 55 | ± 3 | 44 |
| 2012 | 5,400 | 148 | 111 | 259 | 15% | 977 | 56% | 509 | 29% | 1,745 | 791 | 15 | 11 | 27 | ± 2 | 52 | ± 3 | 41 |
| 2013 | 0 | 103 | 43 | 146 | 13% | 643 | 58% | 312 | 28% | 1,101 | 736 | 16 | 7 | 23 | ± 0 | 49 | ± 0 | 40 |

**2014 HUNTING SEASONS
NORTH BIGHORN ELK HERD (EL321)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|---|
| | | Opens | Closes | | |
| 35 | 1 | Oct. 15 | Nov. 5 | 150 | Limited quota licenses; antlered elk |
| | 4 | Oct. 15 | Dec. 15 | 150 | Limited quota licenses; antlerless elk |
| | 6 | Oct. 15 | Dec. 15 | 150 | Limited quota licenses; cow or calf elk valid off national forest |
| | 9 | Sep. 1 | Sep. 30 | 50 | Limited quota licenses; any elk, archery only |
| 36 | | Oct. 15 | Nov. 5 | | General license; antlered elk |
| | 4 | Oct. 15 | Nov. 30 | 200 | Limited quota licenses; antlerless elk |
| | 6 | Oct. 15 | Nov. 5 | 200 | Limited quota licenses; cow or calf |
| | 9 | Sep. 1 | Sep. 30 | 50 | Limited quota licenses; any elk, archery only |
| 37 | 6 | Oct. 15 | | | General license; any elk |
| | | Sep. 1 | Sep. 30 | 400 | Limited quota licenses; cow or calf valid off national forest or north of Wolf Creek Trail (U.S.F.S. Trail 001) on national forest |
| | | Oct. 1 | Dec. 21 | | Unused Area 37 Type 6 licenses valid in the entire area |
| | 9 | Sep. 1 | Sep. 30 | 150 | Limited quota licenses; any elk valid off national forest or south of Wolf Creek Trail (U.S.F.S. Trail 001), archery only |
| 38 | 1 | Oct. 15 | Nov. 5 | 400 | Limited quota licenses; any elk |
| | | Nov. 6 | Nov. 15 | | Unused Area 38 Type 1 licenses valid for antlerless elk |
| | 4 | Oct. 1 | Oct. 10 | 500 | Limited quota licenses; antlerless elk |
| | | Oct. 15 | Nov. 15 | | Unused Area 38 Type 4 licenses valid on private land or north of Columbus Creek, the Fools Creek Road (U.S.F.S. Road 168), the Burgess Road (U.S.F.S. 15) to Burgess Junction, and U.S. Highway 14A |

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------------------|--------|------------------|---------|---|---|
| | | Opens | Closes | | |
| 38 | 4 | Nov. 16 | Dec. 21 | | Unused Area 38, Type 4 licenses valid off national forest and off the Wyoming Game and Fish Commission's Amsden and Kerns Wildlife Habitat Management Areas |
| | 9 | Sep. 1 | Sep. 30 | 250 | Limited quota licenses; any elk, archery only |
| 39 | 1 | Oct. 15 | Nov. 4 | 100 | Limited quota licenses; any elk Unused Area 39 Type 1 licenses valid for antlerless elk |
| | | Nov. 5 | Nov. 15 | | |
| | 2 | Oct. 15 | Nov. 4 | 75 | Limited quota licenses; antlered elk |
| | 4 | Oct. 1 | Nov. 15 | 75 | Limited quota licenses; antlerless elk |
| 40 | 9 | Sep. 1 | Sep. 30 | 70 | Limited quota licenses; any elk, archery only |
| | 1 | Oct. 15 | Nov. 4 | 175 | Limited quota licenses; any elk |
| | | 4 | Oct. 15 | Dec. 21 | 200 |
| | 5 | Oct. 1 | Dec. 21 | 100 | Limited quota licenses; antlerless elk |
| | 6 | Sep. 1 | Oct. 14 | 250 | Limited quota licenses; cow or calf valid off national forest |
| | | | Oct. 15 | Dec. 21 | |
| 9 | Sep. 1 | Sep. 30 | 75 | Limited quota licenses; any elk, archery only | |
| Archery 35, 36, 37 | | Sep. 15 | Sep. 30 | | Refer to Section 3 of this Chapter |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|------|------------------------|
| All Areas | | No Changes |
| Herd Unit Total | | No Changes |

Management Evaluation

Current Mid-Winter Trend Management Objective: 4,350

Management Strategy: Special

2013 Winter Trend Count: 5,437

Most Recent 3-year Running Average Winter Trend Count: ~ 5,400

Herd Unit Issues

The management objective for the North Bighorn Elk Herd Unit is a mid-winter trend count objective of 4,350 elk. The management strategy is special management overall, with special management emphasis in limited quota hunt areas (Areas 35, 38, 39 and 40) and recreational management emphasis in general license hunt areas (Areas 36 and 37). The objective and management strategy were last revised in 2012.

There are several areas within hunt areas of this herd unit that act as refugia for elk, protecting them from harvest. This limits manager's ability to maintain these groups within desired population levels, and leads to frustration with the general hunting public as elk move from publically accessible areas to these refuge areas, which are private lands. This problem has grown over the past 25+ years, especially in the eastside hunt areas (Areas 35, 36, 37, and 38), as larger ranches have changed ownership and views on elk management and hunter access have changed.

During the 2012 and 2013 seasons, four hunter harvested elk from Hunt Area 40 tested seropositive for exposure to the bacterium *Brucella abortus*, 2 in each year. *B. abortus* is the bacterium that cause the disease brucellosis in livestock, elk and bison. In 2012, only 25 usable blood samples were collect from hunter harvested elk on the west side of the Bighorn Mountains during routine wildlife testing to monitor for brucellosis. An enhanced brucellosis surveillance effort was initiated in 2013. Over 750 samples were collect, with 437 usable samples (~58%). Within this herd unit, we collected 229 usable samples (Table 1). We plan to continue the enhanced brucellosis surveillance during the 2014 season. As such, antlerless elk seasons were opened earlier than traditionally in Hunt Areas 37, 38, 39 and 40 to accommodate antlerless harvest and sample collection.

Table 1. Usable blood samples collected for enhanced Brucellosis surveillance in Bighorn Mountains during 2013 hunting season. The North Bighorn Elk Herd Unit hunt areas (Areas 35-40) are in bold.

| Hunt Area | | Seropositive |
|--------------|------------|--------------|
| 033 | 20 | 0 |
| 034 | 25 | 0 |
| 035 | 39 | 0 |
| 036 | 17 | 0 |
| 037 | 16 | 0 |
| 038 | 79 | 0 |
| 039 | 32 | 0 |
| 040 | 46 | 2 |
| 041 | 46 | 0 |
| 045 | 52 | 0 |
| 047 | 0 | 0 |
| 048 | 6 | 0 |
| 049 | 45 | 0 |
| 120 | 14 | 0 |
| Total | 437 | 2 |

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 significant snow events during the hunting season, which limited the ability of hunters to access large portions of this herd unit and moved elk towards winter ranges earlier than normal. There were several bouts of extreme cold temperatures lasting up to a week in duration. Temperatures reached ~30° F below zero, something not seen since the 1990s. The above average snowfall combined with the below average temperatures induced elk to move onto private lands and raid stored hay crops, creating numerous damage situations this winter. Weather does not seem to be having an adverse affect on individual elk at this time, but it does influence forage production, and hence elk distribution, during all seasons.

Field Data

We counted 5,437 elk on winter ranges during January-February 2014, which is ~24% above the established mid-winter count objective of 4,350. Seasons have been liberalized in recent years to bring elk populations down to more desired levels. Distribution of elk counted is as follow:

| Hunt Area | Winter Count Obj. | 2011 Winter count | 2012 Winter Count | 2013 Winter Count | 2013 # Over / Under Objective | 3-year (2011-13) Running Mean |
|-----------|-------------------|-------------------|-------------------|-------------------|-------------------------------|-------------------------------|
| 35 | 400 | 847 | 841 | 928 | +528 | 872 (+118%) |
| 36 | 800 | 824 | 914 | 905 | +105 | 881 (+10%) |
| 37 | 800 | 1,319 | 1,175 | 1,598 | +798 | 1,364 (+70%) |
| 38 | 1,000 | 955 | 1,255 | 924 | -76 | 1,044 (+4%) |
| 39 | 500 | 519 | 307 | 290 | -210 | 372 (-26%) |
| 40 | 850 | 992 | 767 | 792 | -58 | 850 (+0%) |
| | 4,350 | 5,456 | 5,259 | 5,437 | +1,087 | 5,384 (+24%) |

We classified over 1,100 elk during January – February 2014, all on the west side of the Bighorn Mountains. We observed 49 calves:100 cows, similar to recent years and the 10-year average of 48 calves:100 cows. This is more than sufficient production to maintain or grow this population.

We observed 23 bulls (16 yearling; 7 adult):100 cows. The observed yearling bull to cow ratio appears to be slowly increasing over the past 10 years, from 12 yearling bulls:100 cows to 16 yearling bulls:100 cows. This suggests sufficient recruitment of bulls into the population to maintain current levels of bull harvest. The total bull to cow ratio is a minimum bull:cow ratio as adult bulls (> 2 yrs old) tend to winter away from cow/calf/young bull groups, making them more difficult to find during surveys. The observed adult bull to cow ratio has remained steady over the past 10 years, averaging 8 adult bulls:100 cows.

While we did not collect classification data from the eastside hunt areas, we did observe over 200 branched antlers bulls in Area 37 and over 100 branched antlered bulls on the Kerns WHMA in Area 38.

According to the hunter satisfaction survey, 62% of 973 hunters were satisfied with their elk hunting experience in this herd unit, 19.2% were dissatisfied, with the balance being neutral. Hunters were more satisfied in the limited quota hunt areas (67%) compared to the general license areas (56%). Nonresident hunters (n=187) tended to be more satisfied (72%) than resident hunters (59%, n=786). Hunter satisfaction is based on an individual values and perceptions and is therefore subjective.

Estimated hunter harvest decreased 2% from 2012, which was the highest harvest ever in this herd unit. Even with the slight decrease in harvest, it was the second highest harvest ever. Bull harvest decreased 16% (n=99 elk) while cow harvest increased 18% (n=108 elk) and calf harvest decreased 23% (n=28 elk) compared to 2012. Hunter success was estimated at 32%, a slight decrease from the 2012 season. Effort stayed at 21.7 days of hunting per elk harvested, the same as in 2012. This is surprising because of adverse winter weather conditions, especially during much of October. Extended seasons helped provide the opportunity for increased antlerless harvest when conditions moderated later in November and December. Bull harvest was most affected by the adverse weather conditions as most of that harvest occurs during September (archery season) and October.

Population

We do not have a spreadsheet model developed for this herd unit because: 1) we do not manage this herd based on a population objective; and 2) up to 20% of this herd migrates onto the Crow Indian Reservation in Montana each fall, where harvest is unregulated and unmonitored. We manage this herd based on mid-winter trend counts. Elk generally winter in traditional areas within this herd unit and we likely count 80-90% of wintering elk in any given year.

Based on elk winter trend counts, it appears this population has increased in recent years (Fig. 1). It is difficult to know how much of this is an actual increase in the population and how much a shift of elk wintering in Wyoming verses Montana. Efforts are being made, through liberalized hunting season strategies, to reduce this population towards objective.

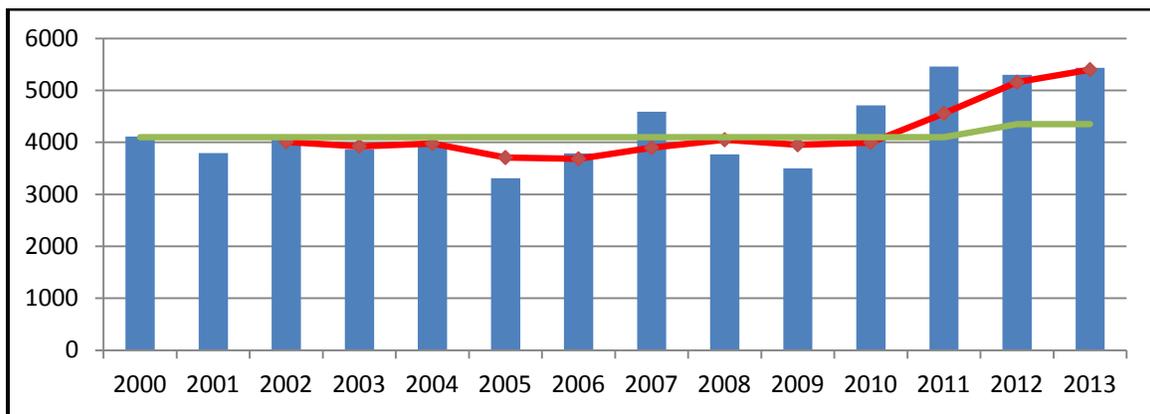


Figure 1. Elk numbers, with 3-year running average (red line), observed during trend and classification surveys from 2000 – 2013 compared to the management objective (green line).

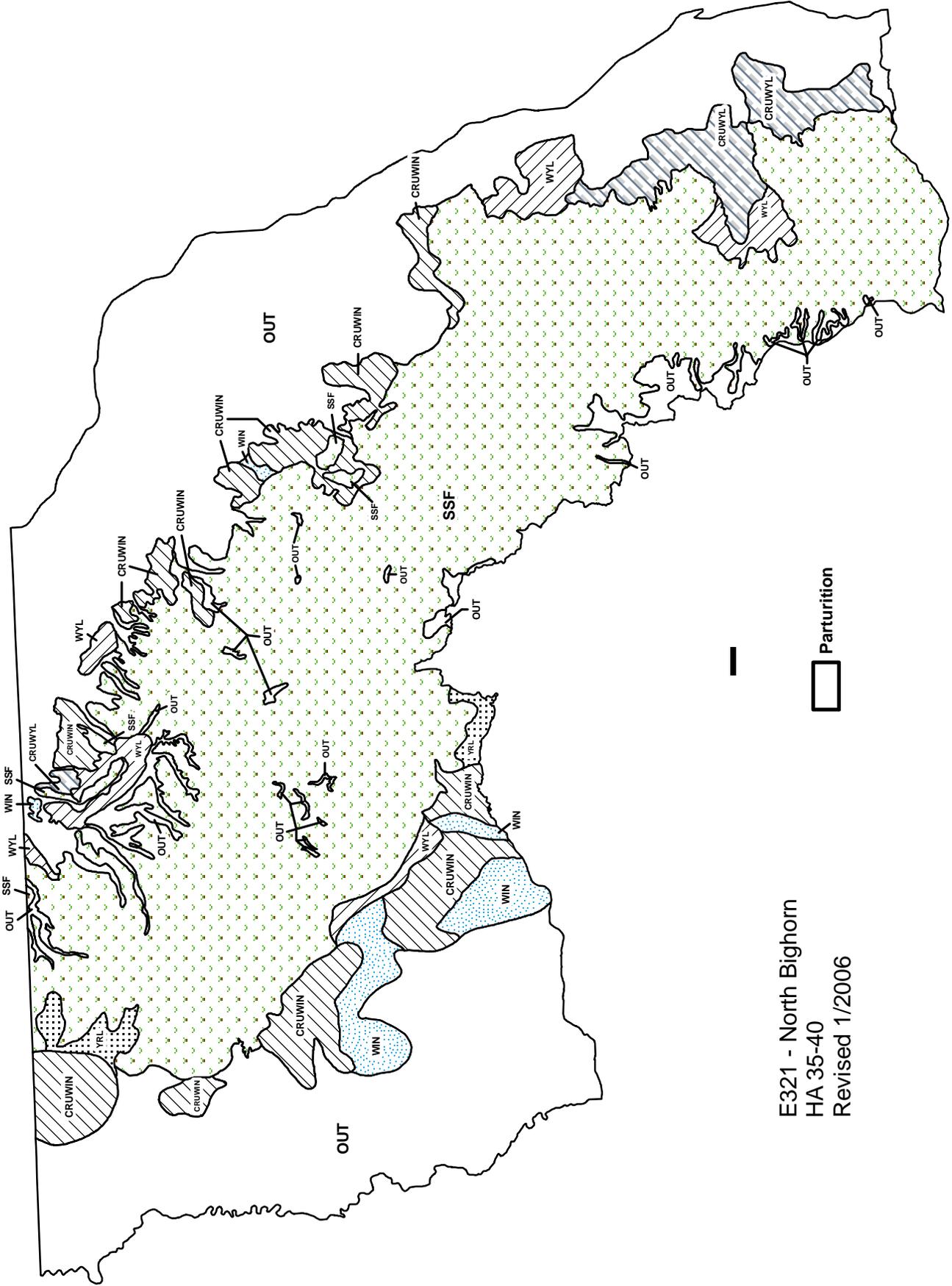
Management Summary

A significant number of elk in Area 35 move to private lands south of U.S. Highway 16 in September to forage on alfalfa meadows. The Area 35 Type 6 season was implemented to target these private land elk, which account for about 50% of the winter count for this hunt area. A Type 6 license was added to Area 36 to encourage increased elk harvest in that area also.

A special early firearm season is open during September in a portion of Area 37. This season strategy is designed to increase harvest as well as block a migration route to private lands, keeping elk on public lands longer. This season has been popular with most hunters and appears to have had at least limited success. This season strategy is being expanded off national forest in anticipation of a major land exchange with the Office of State Lands that would provide opportunities to address high elk numbers north of Wolf Creek in this hunt area as well as potential harvest opportunities near PK Lane and Moncreiffe Ridge.

An extended antlerless season was added in Area 38 address damage issues on private lands. During the 2013-14 winter, about half the elk in this hunt area wintered off of the Amsden and Kerns WHMA, causing significant damage to stored hay on private lands. This season is designed to harvest elk that have become habituated to leaving the WHMAs and feeding on stored hay crops.

With liberal seasons and favorable hunting conditions, we anticipate an increased harvest in 2014 (~1,450 elk) compared to 2013. Continued harvest, especially on cows, should help bring segments of this herd where winter counts exceed management objectives down to desired levels.



E321 - North Bighorn
 HA 35-40
 Revised 1/2006

2013 - JCR Evaluation Form

SPECIES: Elk

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

HERD: EL322 - SOUTH BIGHORN

HUNT AREAS: 33-34, 47-49, 120

PREPARED BY: DAN THIELE

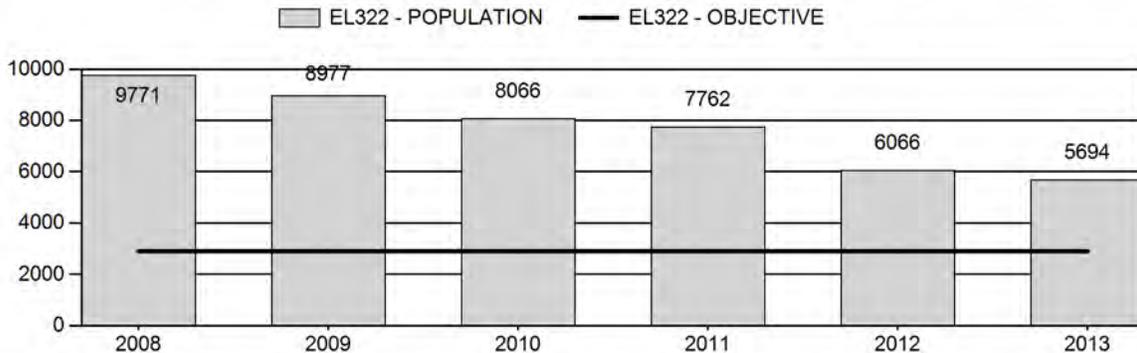
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|----------------------------|-------------|----------------------|
| Population: | 8,128 | 5,694 | 3,750 |
| Harvest: | 1,444 | 1,393 | 1,900 |
| Hunters: | 2,914 | 3,419 | 3,800 |
| Hunter Success: | 50% | 41% | 50% |
| Active Licenses: | 3,031 | 3,592 | 3,900 |
| Active License Percent: | 48% | 39% | 49 % |
| Recreation Days: | 20,336 | 23,261 | 28,000 |
| Days Per Animal: | 14.1 | 16.7 | 14.7 |
| Males per 100 Females | 27 | 22 | |
| Juveniles per 100 Females | 38 | 39 | |

| | |
|---|--------------|
| Population Objective: | 2,900 |
| Management Strategy: | Recreational |
| Percent population is above (+) or below (-) objective: | 96% |
| Number of years population has been + or - objective in recent trend: | 10 |
| Model Date: | 03/04/2014 |

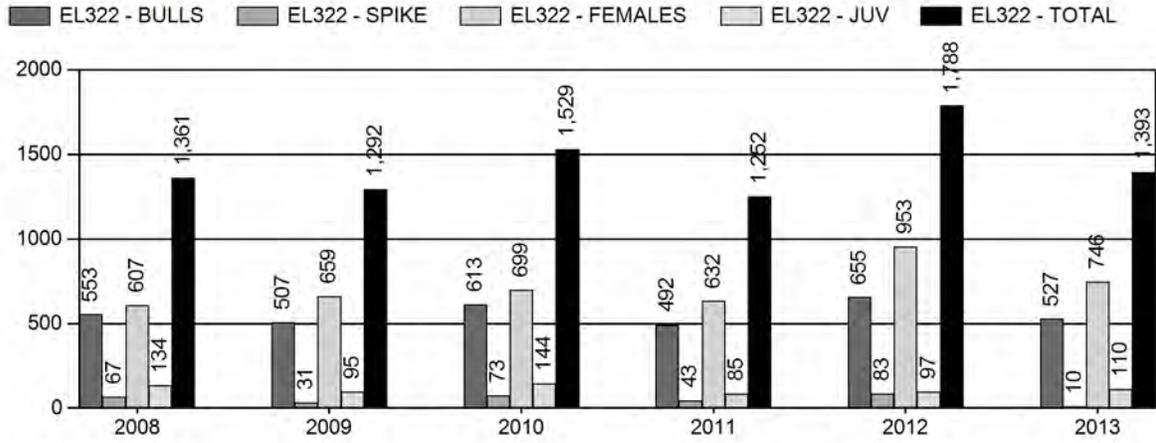
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 18% | 33% |
| Males ≥ 1 year old: | 33% | 50% |
| Juveniles (< 1 year old): | 8% | 11% |
| Total: | 19% | 33% |
| Proposed change in post-season population: | -13% | -34% |

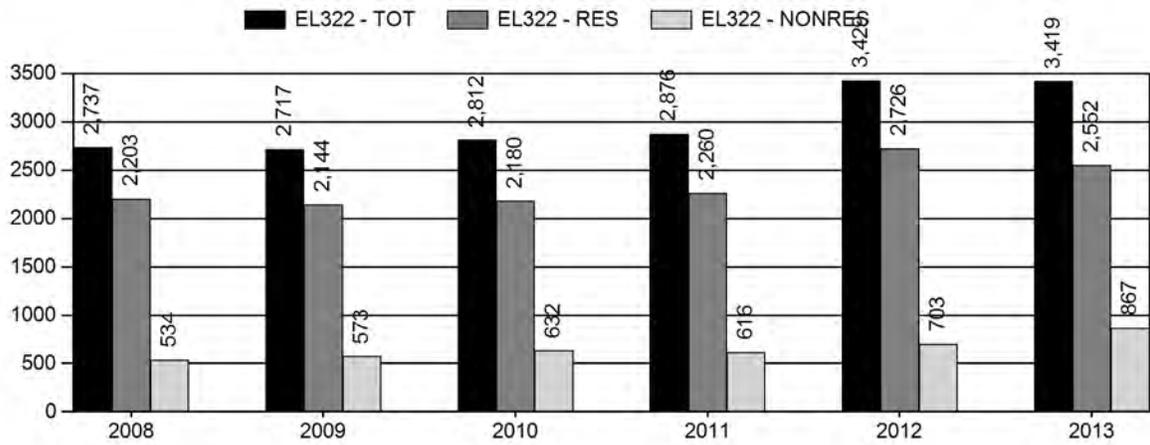
Population Size - Postseason



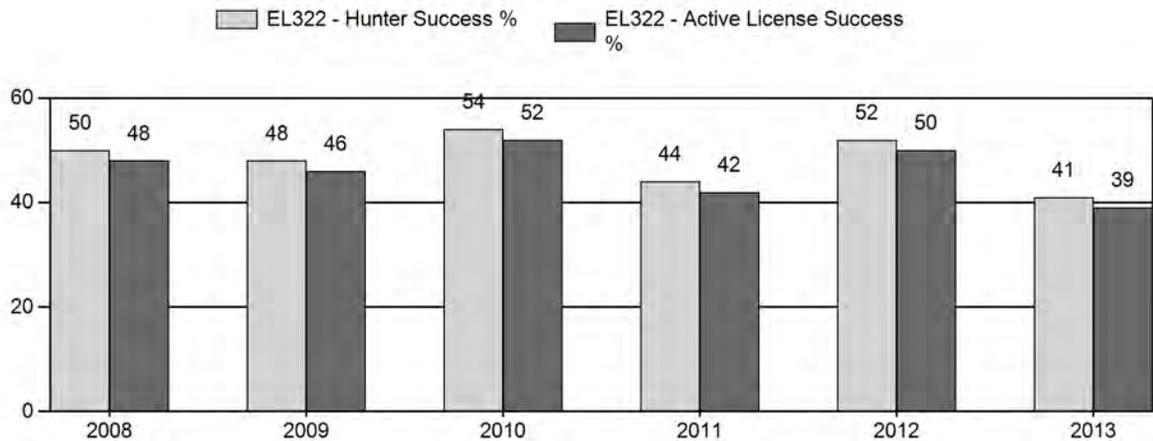
Harvest



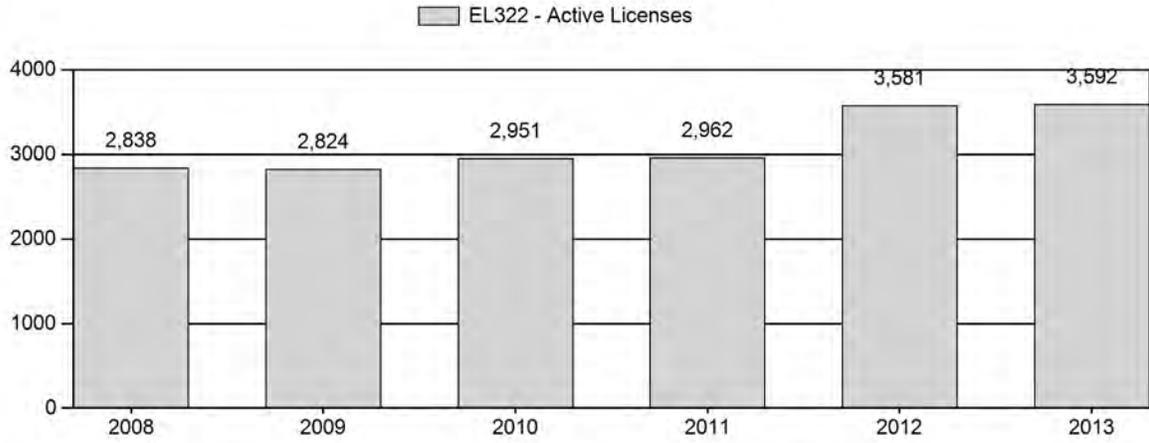
Number of Hunters



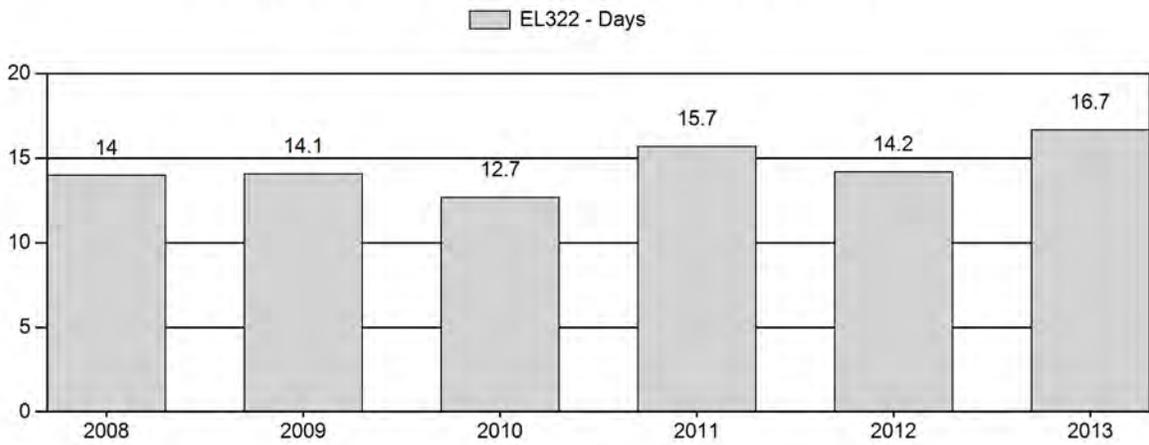
Harvest Success



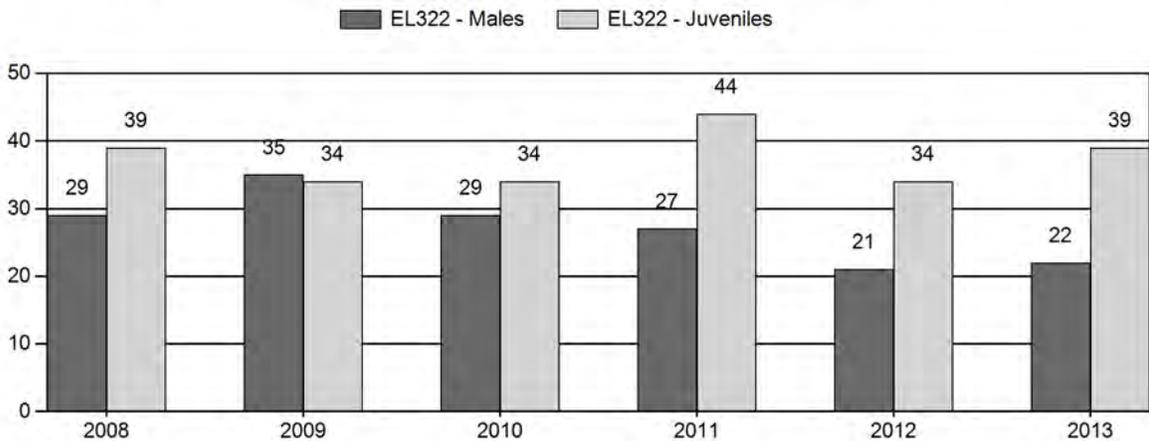
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2013 Postseason Classification Report
for Elk Herd EL322 - SOUTH BIGHORN

| Hunt Area | ----- Males ----- | | | | Female | % of Sample | Juv | % of Sample | Total Sample | Herd Ratios per 100 | | | |
|--------------|-------------------|------------|-------------|--------------|--------------|--------------|------------|--------------|--------------|---------------------|----------------|--------------------|--------------|
| | Yrling | Adult | Total Males | % of Sample | | | | | | Juv to Female | Male to Female | Yearling to Female | Juv to Adult |
| 33 | 62 | 64 | 126 | 15.9% | 437 | 55.2% | 228 | 28.8% | 791 | 52 | 29 | 14 | 40 |
| 34 | 48 | 3 | 51 | 7.0% | 418 | 57.6% | 257 | 35.4% | 726 | 61 | 12 | 11 | 55 |
| 47 | 24 | 46 | 70 | 40% | 81 | 46.3% | 24 | 13.7% | 175 | 30 | 86 | 30 | 16 |
| 48 | 105 | 32 | 137 | 14.8% | 607 | 65.6% | 181 | 19.6% | 925 | 30 | 23 | 17 | 24 |
| 49 | 21 | 19 | 40 | 7.2% | 387 | 69.2% | 132 | 23.6% | 559 | 34 | 10 | 5 | 31 |
| 120 | 30 | 43 | 73 | 17.3% | 294 | 69.5% | 56 | 13.2% | 423 | 19 | 25 | 10 | 15 |
| TOTAL | 290 | 207 | 497 | 13.8% | 2,224 | 61.8% | 878 | 24.4% | 3,599 | 39 | 22 | 13 | 36 |

**2014 HUNTING SEASONS
SOUTH BIGHORN ELK HERD (EL322)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|--------------------|--------------------|-------|--|
| | | Opens | Closes | | |
| 33 | 1 | Oct. 9 Nov. 1 | Oct. 31 Dec. 15 | 200 | Limited quota licenses; any elk Unused Area 33 Type 1 licenses valid for antlerless elk |
| | 4 | Aug. 15 | Sep. 30 | 150 | Limited quota licenses; antlerless elk valid on private lands east of Buffalo Creek and the Bar C Road |
| | | Oct. 9 | Dec. 15 | | Unused Area 33 Type 4 licenses valid in the entire area |
| | 6 | Oct. 9 | Dec. 15 | 300 | Limited quota licenses; cow or calf elk |
| 34 | 1 | Oct. 15 Nov. 16 | Nov. 15 Dec. 15 | 800 | Limited quota licenses; any elk Unused Area 34 Type 1 licenses valid for antlerless elk |
| | 6 | Oct. 15 | Dec. 15 | 600 | Limited quota licenses; cow or calf valid off National Forest |
| 47 | 1 | Oct. 9 | Oct. 31 | 250 | Limited quota licenses; any elk |
| | 2 | Oct. 9 | Oct. 31 | 25 | Limited quota licenses; any elk valid in Fremont County |
| | | Nov. 1 | Dec. 21 | | Unused Area 47 Type 1 and Type 2 licenses valid for antlerless elk |
| | 6 | Oct. 9 | Dec. 21 | 300 | Limited quota licenses; cow or calf |
| 48 | 1 | Oct. 9 | Oct. 31 | 300 | Limited quota licenses; any elk |
| | 4 | Oct. 9 | Oct. 31 | 50 | Limited quota licenses; antlerless elk |
| | 6 | Oct. 9 | Oct. 31 | 500 | Limited quota licenses; cow or calf |
| | | Nov. 8 | Dec. 14 | | Unused Area 48 Type 1, Type 4 and Type 6 licenses valid for antlerless elk |
| 49 | 1 | Oct. 9 Nov. 1 | Oct. 31 Dec. 21 | 325 | Limited quota licenses; any elk Unused Area 49 Type 1 licenses valid for antlerless elk |
| | 4 | Oct. 9 | Dec. 21 | 50 | Limited quota licenses; antlerless elk |
| | 6 | Aug. 15 | Oct. 8 | 100 | Limited quota licenses; cow or calf valid on private land |
| | 7 | Oct. 9 | Dec. 21 | 550 | Limited quota licenses; cow or calf |
| 120 | 1 | Oct. 9 Nov. 1 | Oct. 31 Nov. 30 | 150 | Limited quota licenses; any elk Unused Area 120 Type1 licenses valid for antlerless elk |
| | 4 | Oct. 9 | Nov. 30 | 75 | Limited quota licenses; antlerless elk |
| | 6 | Oct. 9 | Nov. 30 | 75 | Limited quota licenses; cow or calf |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 49 | 1 | +25 |
| | 6 | -50 |
| | 7 | +50 |
| Herd Unit Total | 1 | +25 |
| | 6 | -50 |
| | 7 | +50 |

Management Evaluation

Current Postseason Population Management Objective: 2,900

Management Strategy: Recreational

2013 Postseason Population Estimate: ~5,700

2014 Proposed Postseason Population Estimate: ~3,750

Herd Unit Issues

The South Bighorn Elk Herd Unit has a post-season population objective of 2,900 elk with a recreational management strategy. The objective and management strategy were last revised in 1998 when Areas 33 and 34 from the Southeast Bighorn Herd Unit were combined with Areas 47, 48, 49 and 120 from the Upper Nowood-Copper Mountain Herd Unit. The herd has exceeded the population objective since it was created.

Since 1997, hunting seasons have been liberalized with increased any elk and antlerless elk license quotas, the addition of cow/calf licenses and extended hunting seasons. Harvest has increased significantly, although at less than desired levels because of the inability to sell antlerless and cow/calf licenses in some hunt areas. Last year, 4,775 total licenses were issued for the five hunt areas comprising this herd unit. Lack of access continues to hamper efforts to achieve harvest objectives.

Weather

Weather in the South Bighorn Herd Unit turned extremely warm and dry after several good moisture years. The January 2012 Palmer Drought Index for Climate Divisions 4 (Bighorn drainage) and 5 (Powder, Little Missouri and Tongue drainages) showed “extremely moist” and “very moist” conditions, respectively. By January 2013 conditions had progressed to “moderate drought” in Climate Division 4 and “extreme drought” in Climate Division 5. Fall moisture and early snowfall improved conditions by January 2014 when both climate divisions were rated as moderately moist. As of May 20, 2014, total precipitation reported at the Bighorn Basin and Powder River drainage snowtel sites since October 1st was 113% and 117% of normal, respectively.

Habitat

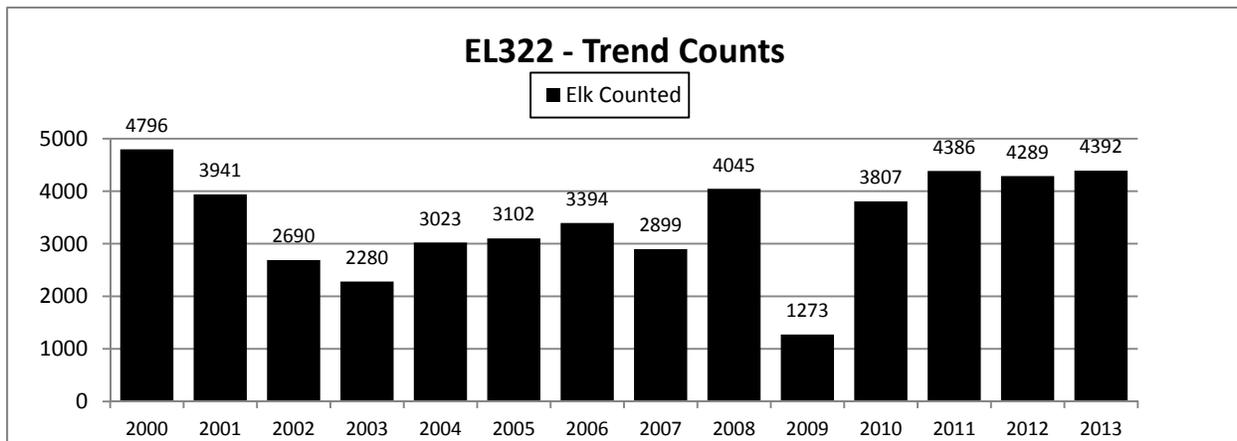
There are no habitat transects for grass production in this herd unit. The South Bighorn Herd Unit is primarily private, state and BLM lands with a limited amount of U.S. Forest Service in Area 34. Cattle and sheep grazing is common. With drought conditions developing in 2012 and

early 2013, heavy utilization occurred. If drought conditions return, landowners may have less tolerance for high elk numbers.

Field Data

Winter trend counts remained relatively stable with 4,392 elk observed in 2013. The count was up from 4,289 elk in 2012 and compares to a high of 4,796 elk observed in 2000 (Figure 1). Given that license quotas and harvest have significantly increased in recent years and hunter success and hunter effort trends remain favorable, it is unreasonable to conclude this population is decreasing to the extent predicted by the model. It is anticipated an alternative objective will be selected during the next objective review.

Figure 1. South Bighorn Elk Herd Unit Winter Trend Counts, 2000-2013.



Postseason classifications resulted in herd ratios of 39 calves per 100 cows and 22 bulls per 100 cows. Productivity in this herd is relatively low with the calf ratio averaging 38 per 100 for the five year average. The bull ratio is believed to be higher based on hunter success and composition of the bull harvest (~90% adult bulls). Representative classifications are difficult to attain due to bulls wintering away from cow/calf herds.

Harvest Data

Harvest data does not indicate bull numbers, or total elk numbers, are significantly decreasing. Limited license (Type 1 and Type 4) hunter success (41%) remained favorable in 2013 and harvest composition showed 98% of the bull harvest was comprised of adult bulls indicating hunters could be selective and were successful in finding adult bulls.

Active license numbers (~3,600) reached a new high indicating continued hunter interest in these areas. However, harvest and hunter success decreased 22% and 9%, respectively, while hunter effort reached a six year high. More difficult hunting conditions were due in part to a major snowstorm that occurred just prior to the October 9th hunting season opening date, restricting access to upper elevation areas. The slow opener contributed to lower harvest and hunter success. Therefore, harvest objectives were not met due to lower hunter success and 533 unsold antlerless and cow/calf licenses in the five hunt areas. Nearly 40% of the unsold licenses were in Area 34 where hunter access to private lands remains problematic.

Hunter satisfaction responses were very positive reflecting decent hunter success, quality bulls and long seasons. At the herd unit scale, 66% of hunters responded positively about their

hunting experience whereas 19% responded negatively and 15% provided a neutral response. The positive response was down from 77% in 2012, likely due to tougher hunting conditions which resulted in lower hunter success. At the hunt area level, positive responses ranged from 56% in Area 120 to 75% in Area 49.

Hunter access is largely contingent on private land access. Six Walk-in Areas provide access to more than 37,000 acres of private lands and adjacent BLM and state lands, most of which are located in Area 120. In addition, two Hunter Management Areas (HMA) provide hunter opportunity in Areas 47 and 48.

Population

The 2013 post-season population is estimated at about 5,700 elk with the population exhibiting a steep decline from more than 10,000 elk in 2007. This population estimate is generated using an EXCEL spreadsheet model. The Semi-Constant Juvenile/Semi-Constant Adult model (SCJ/SCA) was chosen over the other options because it was the only model that produced a 2013 population estimate above the trend count (63% observed). This population estimate and trend are considered questionable due to poor model alignment (AIC score 734) based on harvest data, postseason classifications and winter trend counts. It is more likely this population is stable to slightly decreasing. Fluctuating bull ratios are contributing to the model's poor performance. Representative bull ratios are difficult to determine because adult bulls are segregated from wintering cow/calf herds with detection varying year to year.

Management Summary

Changes for the 2014 season included extending the Areas 33 and 34 closing dates to mid-December to correspond with Area 48. Running the season later targeted elk that migrate into Area 33 to winter. In addition, an early Area 33 Type 4 season opening was added for private lands in the eastern one-half of the area to address depredation concerns on irrigated hay meadows. The Area 33 Type 4 and Type 6 quotas were increased by 100 and 200 licenses, respectively. The changes resulted in a 39% increase in antlerless harvest. No changes will be made for 2014.

No changes were made for Area 34 where an extended season was implemented last year. License sales, harvest and hunter success decreased, probably due to early snows creating access problems.

In Area 47, increased license quotas resulted in reduced bull harvest and similar antlerless harvest as hunter success fell 24%. Landowners continue to express interest in increasing harvest and have been very involved in the Copper Mountain HMA. Since the Copper Mountain HMA was initiated in 2010, harvest has increased by over 100%. A minor closing date change was made for 2014.

In Area 48, nearly 60 Type 6 licenses went unsold in 2013. Therefore no quota changes were made for 2014. Harvest decreased 34% due to only 35% hunter success (five year average 52%). Type 6 hunters experienced 27% hunter success, primarily because the elk were on inaccessible private land during the hunting season.

In Area 49 an increased Type 6 license quota did not increase harvest as antlerless harvest fell over 20% due to lower hunter success. Quotas have been adjusted for 2014 with earlier Type 6 season opening and closing dates to address private land damage situations.

The liberal season in Area 120 provided for fewer harvested elk as hunter success fell to 43% due to weather related access issues. The same season will be implemented in 2014.

This population is over objective and seasons are designed to maintain hunting pressure on the female segment of the herd with liberal quotas and extended seasons. License quota changes are minimal this year after notable increases in 2013. For 2014, license quotas totaling 2,025 any elk 2,750 antlerless and cow/calf licenses will be available. History suggests that a number of antlerless and cow/calf licenses will not sell. Should available licenses sell, harvest may increase over the 2013 total resulting in a questionable postseason population model estimate of 3,750 elk.

| | |
|------------------|-------------------|
| INPUT | |
| Species: | Elk |
| Biologist: | Dan Thiele |
| Herd Unit & No.: | South Bighorn Elk |
| Model date: | 03/04/14 |

Clear form

| MODELS SUMMARY | | Fit | Relative AICc | Check best model to create report | Notes |
|-----------------------|---|-----|---------------|--|-------|
| C/J,CA | Constant Juvenile & Adult Survival | 714 | 723 | <input type="checkbox"/> C/J,CA Model | |
| SC,J,SCA | Semi-Constant Juvenile & Semi-Constant Adult Survival | 723 | 734 | <input checked="" type="checkbox"/> SC,J,SCA Mod | |
| TS,J,CA | Time-Specific Juvenile & Constant Adult Survival | 383 | 494 | <input type="checkbox"/> TS,J,CA Model | |
| TS,J,CA,MSC | Time-Specific Juv, Constant Adult Survival, Male survival coefficient | 499 | 588 | <input type="checkbox"/> TS,J,CA,MSC Model | |

| Year | Posthunting Population Est. | | Trend Count | Predicted Prehunt Population | | Predicted Posthunt Population | | Total | Objective | | | |
|------|-----------------------------|----------|-------------|------------------------------|-------------|-------------------------------|-------|-------|-----------|-----------|-------------|---------|
| | Field Est | Field SE | | Juveniles | Total Males | Females | Total | | | Juveniles | Total Males | Females |
| 1996 | | | 4246 | 2798 | 1706 | 7193 | 11697 | 2688 | 1487 | 6797 | 10872 | 2900 |
| 1997 | | | 3616 | 2723 | 2398 | 7602 | 12723 | 2665 | 2011 | 7038 | 11714 | 2900 |
| 1998 | | | 3484 | 3493 | 2637 | 7563 | 13693 | 3392 | 2251 | 7151 | 12794 | 2900 |
| 1999 | | | 4383 | 2411 | 3054 | 7856 | 13320 | 2233 | | 7307 | 12052 | 2900 |
| 2000 | | | 4796 | 3060 | 3020 | 7719 | 13799 | 2885 | 2508 | 7012 | 12405 | 2900 |
| 2001 | | | 3941 | 2320 | 3179 | 7593 | 13092 | 2157 | 2664 | 6902 | 11724 | 2900 |
| 2002 | | | 2690 | 3386 | 3151 | 7303 | 13840 | 3226 | 2658 | 6655 | 12540 | 2900 |
| 2003 | | | 2280 | 2488 | 3411 | 7329 | 13228 | 2318 | 2866 | 6601 | 11784 | 2900 |
| 2004 | | | 3023 | 2780 | 3388 | 7048 | 13216 | 2642 | 2687 | 6504 | 11833 | 2900 |
| 2005 | | | 3102 | 2292 | 3294 | 7034 | 12620 | 2180 | 2719 | 6395 | 11293 | 2900 |
| 2006 | | | 3394 | 2235 | 3209 | 6812 | 12257 | 2129 | 2644 | 6172 | 10944 | 2900 |
| 2007 | | | 2899 | 2086 | 3123 | 6581 | 11789 | 1973 | 2532 | 5938 | 10443 | 2900 |
| 2008 | | | 4045 | 2325 | 2975 | 6313 | 11612 | 2177 | 2293 | 5645 | 10115 | 2900 |
| 2009 | | | 1273 | 1900 | 2791 | 6076 | 10768 | 1796 | 2199 | 5351 | 9346 | 2900 |
| 2010 | | | 3807 | 1853 | 2604 | 5693 | 10150 | 1694 | 1850 | 4924 | 8468 | 2900 |
| 2011 | | | 4386 | 2110 | 2236 | 5249 | 9596 | 2017 | 1648 | 4554 | 8219 | 2900 |
| 2012 | | | 4289 | 1429 | 2119 | 4967 | 8515 | 1322 | 1307 | 3919 | 6549 | 2900 |
| 2013 | | | 3599 | 1444 | 1612 | 4171 | 7227 | 1323 | 1021 | 3351 | 5694 | 2900 |
| 2014 | | | | 971 | 1331 | 3614 | 5916 | 850 | 605 | 2294 | 3749 | 2900 |
| 2015 | | | | | | | | | | | | 2900 |
| 2016 | | | | | | | | | | | | 2900 |
| 2017 | | | | | | | | | | | | 2900 |
| 2018 | | | | | | | | | | | | 2900 |
| 2019 | | | | | | | | | | | | 2900 |
| 2020 | | | | | | | | | | | | 2900 |
| 2021 | | | | | | | | | | | | 2900 |
| 2022 | | | | | | | | | | | | 2900 |
| 2023 | | | | | | | | | | | | 2900 |
| 2024 | | | | | | | | | | | | 2900 |
| 2025 | | | | | | | | | | | | 2900 |

Survival and Initial Population Estimates

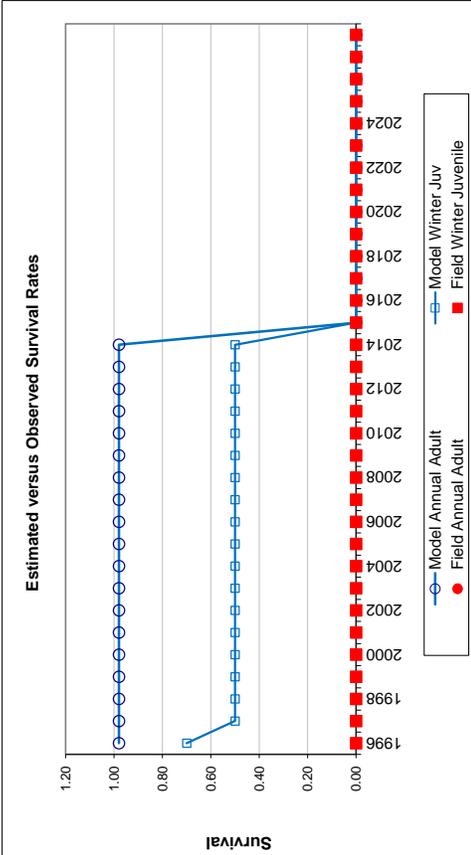
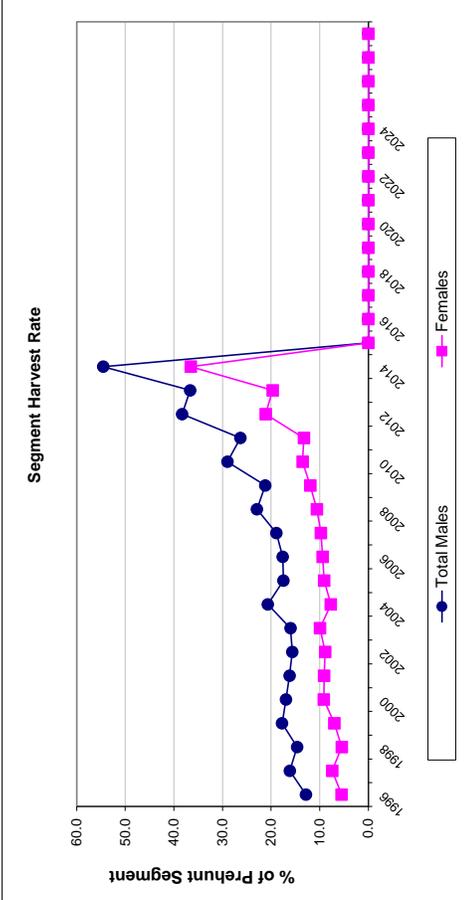
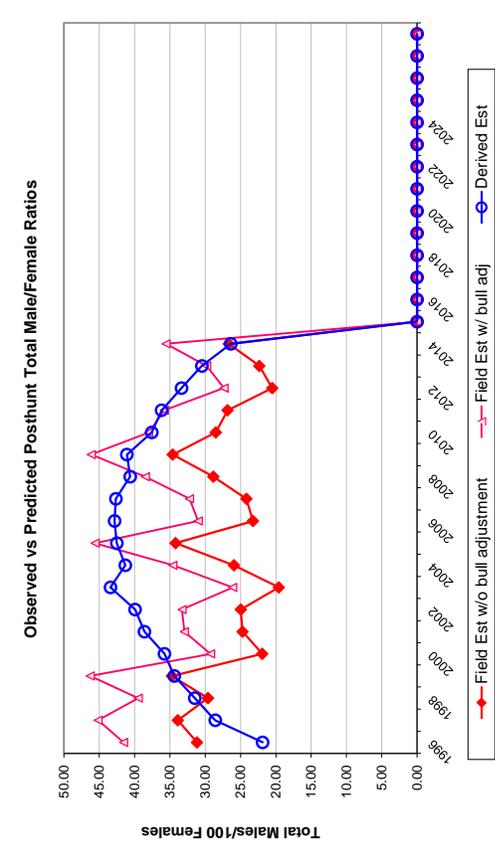
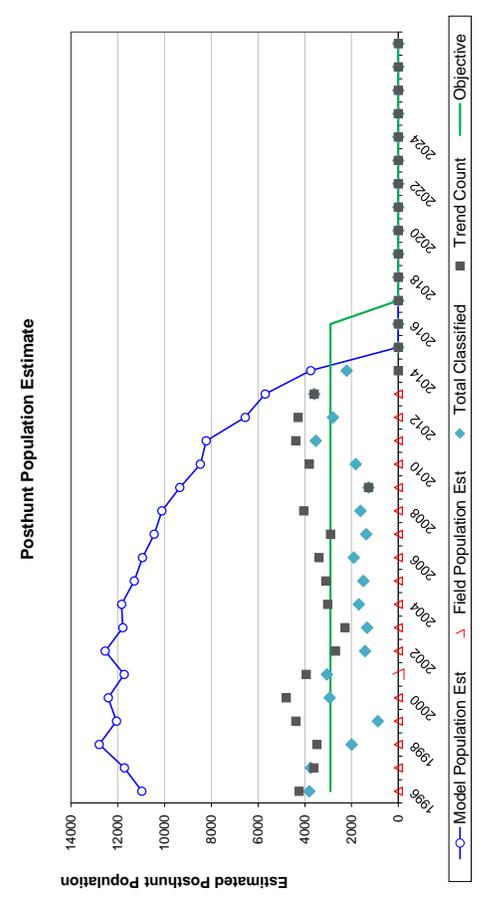
| Year | Annual Juvenile Survival Rates | | Annual Adult Survival Rates | |
|------|--------------------------------|-----------|-----------------------------|-----------|
| | Model Est | Field Est | Model Est | Field Est |
| 1996 | 0.70 | | 0.98 | |
| 1997 | 0.50 | | 0.98 | |
| 1998 | 0.50 | | 0.98 | |
| 1999 | 0.50 | | 0.98 | |
| 2000 | 0.50 | | 0.98 | |
| 2001 | 0.50 | | 0.98 | |
| 2002 | 0.50 | | 0.98 | |
| 2003 | 0.50 | | 0.98 | |
| 2004 | 0.50 | | 0.98 | |
| 2005 | 0.50 | | 0.98 | |
| 2006 | 0.50 | | 0.98 | |
| 2007 | 0.50 | | 0.98 | |
| 2008 | 0.50 | | 0.98 | |
| 2009 | 0.50 | | 0.98 | |
| 2010 | 0.50 | | 0.98 | |
| 2011 | 0.50 | | 0.98 | |
| 2012 | 0.50 | | 0.98 | |
| 2013 | 0.50 | | 0.98 | |
| 2014 | 0.50 | | 0.98 | |
| 2015 | | | | |
| 2016 | | | | |
| 2017 | | | | |
| 2018 | | | | |
| 2019 | | | | |
| 2020 | | | | |
| 2021 | | | | |
| 2022 | | | | |
| 2023 | | | | |
| 2024 | | | | |
| 2025 | | | | |

| Parameters: | | Optim cells |
|---------------------------------|--|-------------|
| Juvenile Survival = | | 0.500 |
| Adult Survival = | | 0.980 |
| Initial Total Male Pop/10,000 = | | 0.149 |
| Initial Female Pop/10,000 = | | 0.680 |

| MODEL ASSUMPTIONS | |
|--------------------------------------|------------|
| Sex Ratio (% Males) = | 50% |
| Wounding Loss (total males) = | 10% |
| Wounding Loss (females) = | 10% |
| Wounding Loss (juveniles) = | 10% |
| Total Bulls Adjustment Factor | 75% |

| Year | Classification Counts | | | | | | | | | | Harvest | | | | | Segment Harvest Rate (% of Prehunt Segment) | |
|------|-----------------------|-----------|----------|-------------|-----------------------|-------------------------|----------|-------|-------|-------|---------|-----------|----------|---------|---------------|---|---------|
| | Juvenile/Female Ratio | | | | | Total Male/Female Ratio | | | | | Juv | Yrl males | 2+ Males | Females | Total Harvest | Total Males | Females |
| | Derived Est | Field Est | Field SE | Derived Est | Field Est w/ bull adj | Field Est w/o bull adj | Field SE | | | | | | | | | | |
| 1996 | | | | | | | | | | | 100 | 37 | 162 | 360 | 659 | 12.8 | 5.5 |
| 1997 | | 39.54 | 1.57 | 21.88 | 41.56 | 31.17 | 1.35 | 28.57 | 45.18 | 33.88 | 52 | 80 | 272 | 513 | 917 | 16.1 | 7.4 |
| 1998 | | 37.87 | 1.55 | 31.48 | 39.48 | 29.61 | 1.44 | 31.48 | 39.48 | 29.61 | 92 | 57 | 294 | 375 | 818 | 14.6 | 5.5 |
| 1999 | | 47.43 | 2.49 | 34.37 | 46.29 | 34.72 | 2.97 | 34.37 | 46.29 | 34.72 | 161 | 97 | 396 | 499 | 1153 | 17.8 | 7.0 |
| 2000 | | 30.57 | 2.74 | 35.77 | 29.24 | 21.93 | 1.22 | 35.77 | 29.24 | 21.93 | 159 | 48 | 417 | 643 | 1267 | 16.9 | 9.2 |
| 2001 | | 41.14 | 1.80 | 38.60 | 32.96 | 24.72 | 1.25 | 38.60 | 32.96 | 24.72 | 148 | 83 | 385 | 628 | 1244 | 16.2 | 9.1 |
| 2002 | | 31.26 | 1.45 | 39.93 | 33.29 | 24.97 | 1.95 | 39.93 | 33.29 | 24.97 | 145 | 17 | 431 | 569 | 1182 | 15.6 | 8.9 |
| 2003 | | 48.48 | 2.96 | 43.41 | 26.11 | 19.58 | 1.65 | 43.41 | 26.11 | 19.58 | 155 | 33 | 463 | 662 | 1313 | 16.0 | 9.9 |
| 2004 | | 35.11 | 2.34 | 41.31 | 34.58 | 25.94 | 1.79 | 41.31 | 34.58 | 25.94 | 125 | 48 | 589 | 495 | 1257 | 20.7 | 7.7 |
| 2005 | | 40.63 | 2.37 | 42.51 | 45.59 | 34.20 | 2.27 | 42.51 | 45.59 | 34.20 | 102 | 78 | 445 | 581 | 1206 | 17.5 | 9.1 |
| 2006 | | 34.08 | 2.27 | 42.83 | 30.99 | 23.24 | 1.54 | 42.83 | 30.99 | 23.24 | 97 | 31 | 483 | 582 | 1193 | 17.6 | 9.4 |
| 2007 | | 34.49 | 1.96 | 42.64 | 32.23 | 24.17 | 1.85 | 42.64 | 32.23 | 24.17 | 103 | 47 | 490 | 584 | 1224 | 18.9 | 9.8 |
| 2008 | | 33.22 | 2.25 | 40.62 | 38.47 | 28.85 | 1.96 | 40.62 | 38.47 | 28.85 | 134 | 67 | 553 | 607 | 1361 | 22.9 | 10.6 |
| 2009 | | 38.57 | 2.35 | 41.10 | 46.15 | 34.61 | 2.48 | 41.10 | 46.15 | 34.61 | 95 | 31 | 507 | 659 | 1292 | 21.2 | 11.9 |
| 2010 | | 33.55 | 2.43 | 37.56 | 38.01 | 28.51 | 1.81 | 37.56 | 38.01 | 28.51 | 144 | 73 | 613 | 699 | 1529 | 29.0 | 13.5 |
| 2011 | | 34.41 | 1.76 | 36.18 | 35.79 | 26.84 | 1.28 | 36.18 | 35.79 | 26.84 | 85 | 43 | 492 | 632 | 1252 | 26.3 | 13.2 |
| 2012 | | 44.28 | 1.58 | 33.36 | 27.34 | 20.51 | 1.17 | 33.36 | 27.34 | 20.51 | 97 | 83 | 655 | 953 | 1788 | 38.3 | 21.1 |
| 2013 | | 33.74 | 1.58 | 30.47 | 29.80 | 22.35 | 1.11 | 30.47 | 29.80 | 22.35 | 110 | 10 | 527 | 746 | 1393 | 36.7 | 19.7 |
| 2014 | | 39.48 | 1.57 | 26.38 | 35.56 | 26.67 | 1.58 | 26.38 | 35.56 | 26.67 | 110 | 60 | 600 | 1200 | 1970 | 54.5 | 36.5 |
| 2015 | | 37.04 | 1.94 | | | | | | | | | | | | | | |
| 2016 | | | | | | | | | | | | | | | | | |
| 2017 | | | | | | | | | | | | | | | | | |
| 2018 | | | | | | | | | | | | | | | | | |
| 2019 | | | | | | | | | | | | | | | | | |
| 2020 | | | | | | | | | | | | | | | | | |
| 2021 | | | | | | | | | | | | | | | | | |
| 2022 | | | | | | | | | | | | | | | | | |
| 2023 | | | | | | | | | | | | | | | | | |
| 2024 | | | | | | | | | | | | | | | | | |
| 2025 | | | | | | | | | | | | | | | | | |

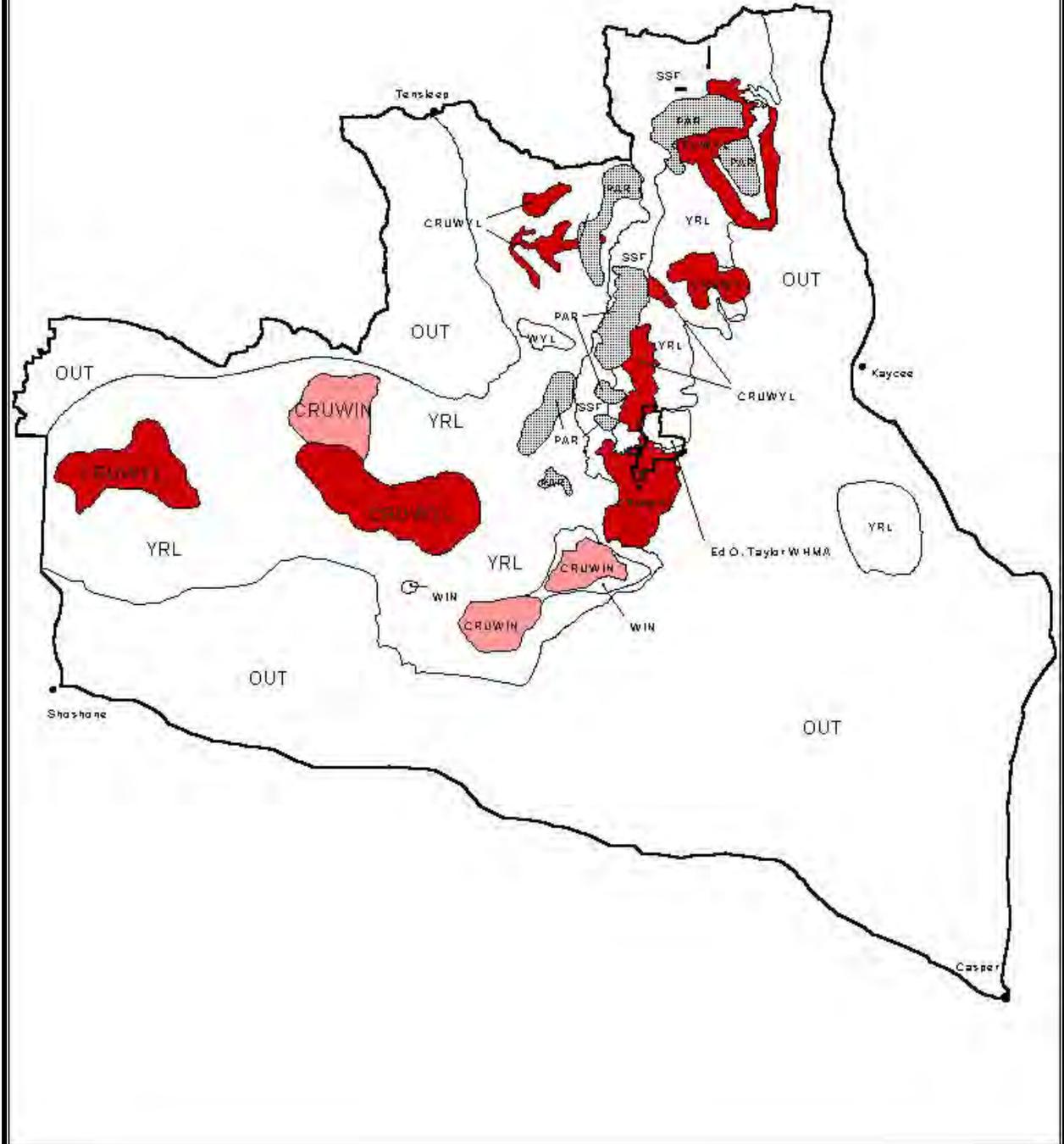
FIGURES



Comments: Unreliable model output possibly due to widely fluctuating bull cow ratios.

END

Elk - South Bighorn (E322)
Areas 33, 34, 47, 48, 49, 120
Region 3
Revised - 2001



2013 - JCR Evaluation Form

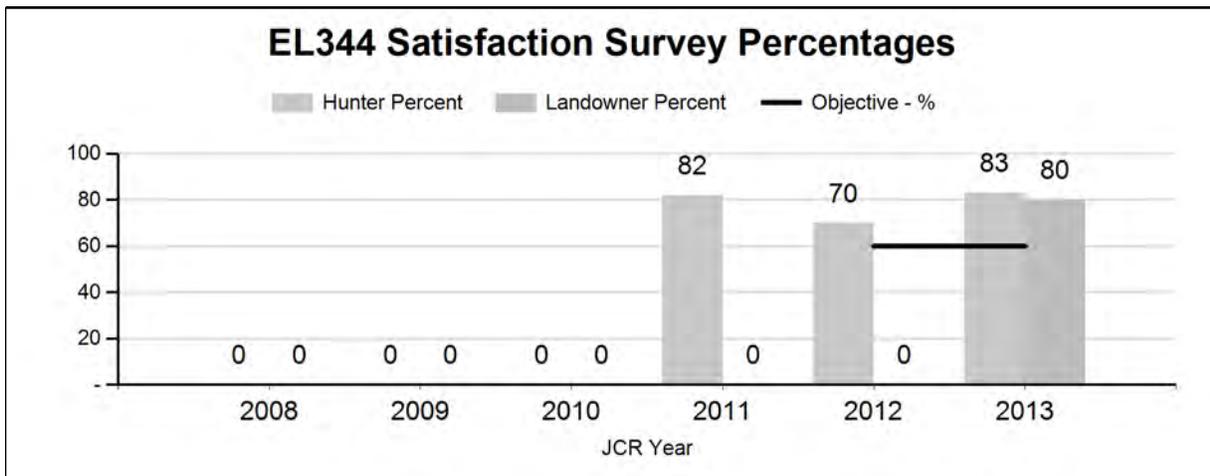
PERIOD: 6/1/2013 - 5/31/2014

HERD: EL344 - ROCHELLE HILLS

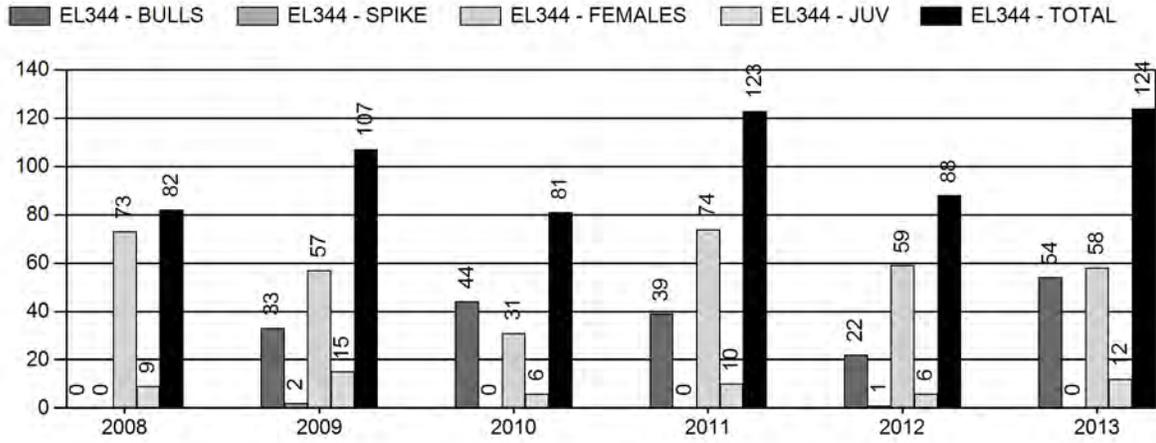
HUNT AREAS: 113, 123

PREPARED BY: ERIKA PECKHAM

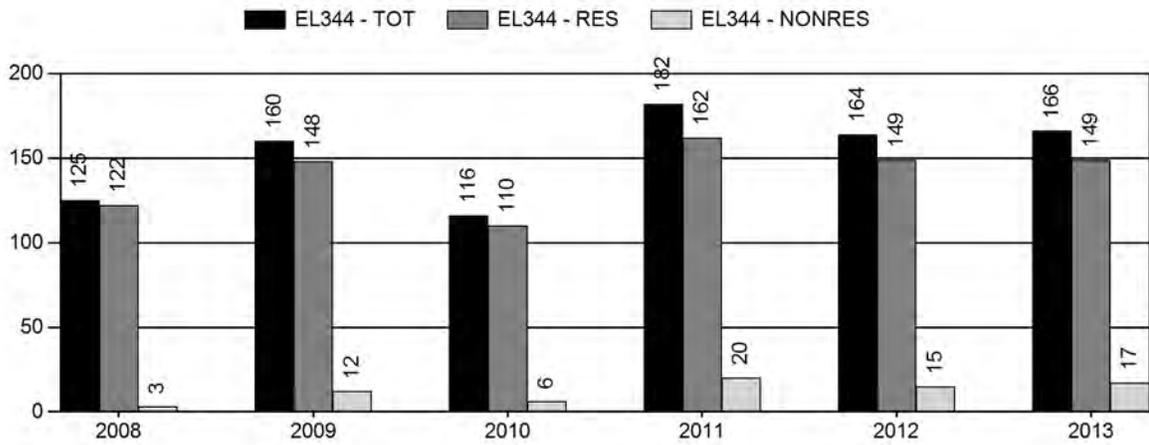
| | <u>2008 - 2012 Average</u> | <u>2013</u> | <u>2014 Proposed</u> |
|---|----------------------------|-------------|----------------------|
| Hunter Satisfaction Percent | 76% | 83% | 60% |
| Landowner Satisfaction Percent | 0% | 80% | 60% |
| Harvest: | 96 | 127 | 60 |
| Hunters: | 149 | 170 | 85 |
| Hunter Success: | 64% | 75% | 71% |
| Active Licenses: | 149 | 71% | 85 |
| Active License Percentage: | 64% | 71% | 71% |
| Recreation Days: | 620 | 780 | 400 |
| Days Per Animal: | 6.5 | 6.1 | 6.7 |
| Males per 100 Females: | 46 | 58 | |
| Juveniles per 100 Females | 43 | 44 | |
| Satisfaction Based Objective | | | 60% |
| Management Strategy: | | | Private |
| Percent population is above (+) or (-) objective: | | | 22% |
| Number of years population has been + or - objective in recent trend: | | | 0 |



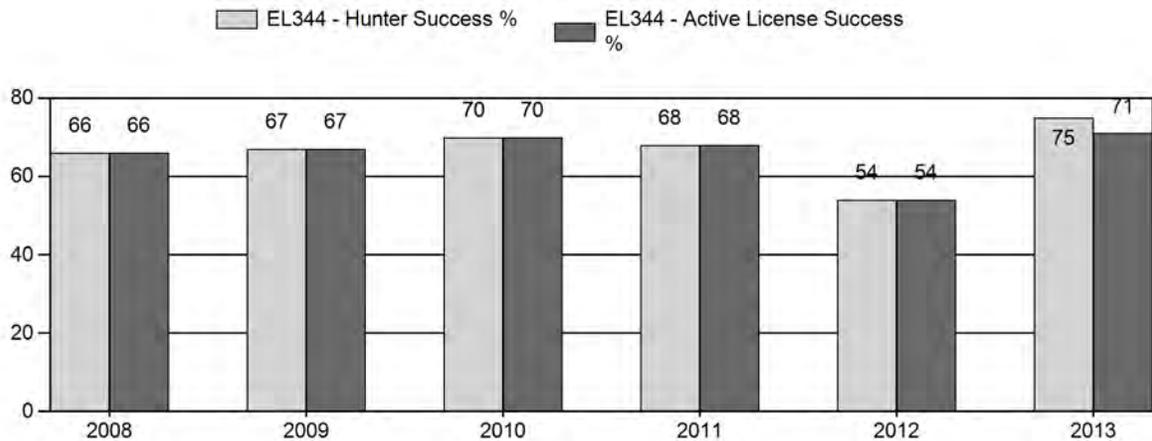
Harvest



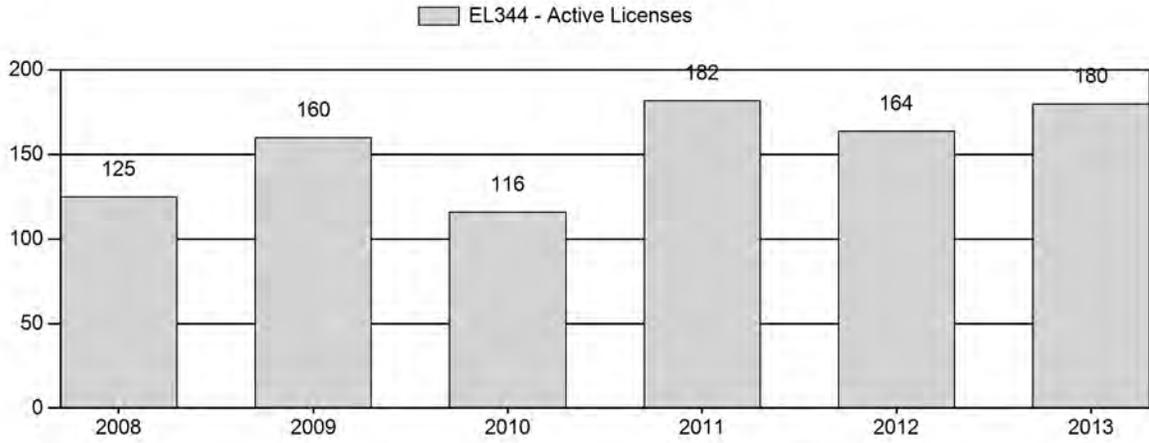
Number of Hunters



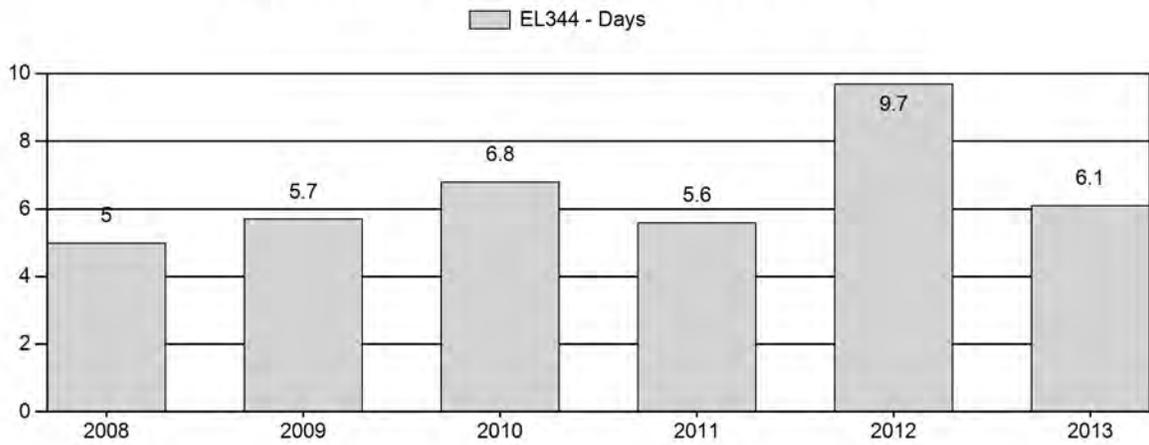
Harvest Success



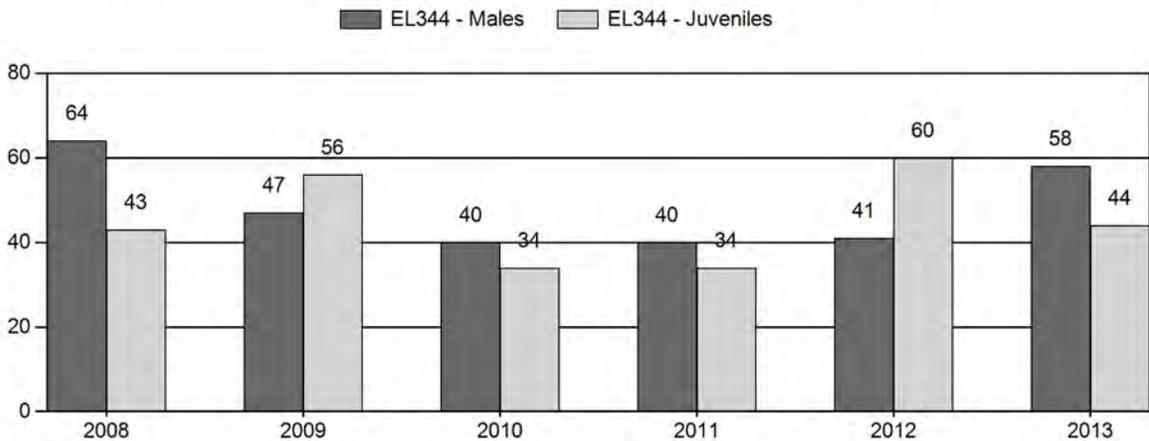
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2008 - 2013 Postseason Classification Summary

for Elk Herd EL344 - ROCHELLE HILLS

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|---------|---------|----------------------|-------|-------|----------|----------|----------|-----------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | Ylng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 712 | 36 | 107 | 143 | 31% | 223 | 48% | 97 | 21% | 463 | 313 | 16 | 48 | 64 | ± 4 | 43 | ± 3 | 27 |
| 2009 | 754 | 67 | 53 | 120 | 23% | 254 | 49% | 141 | 27% | 515 | 443 | 26 | 21 | 47 | ± 0 | 56 | ± 0 | 38 |
| 2010 | 728 | 68 | 57 | 125 | 23% | 316 | 58% | 106 | 19% | 547 | 350 | 22 | 18 | 40 | ± 1 | 34 | ± 1 | 24 |
| 2011 | 741 | 68 | 57 | 125 | 23% | 316 | 58% | 106 | 19% | 547 | 329 | 22 | 18 | 40 | ± 3 | 34 | ± 2 | 24 |
| 2012 | 0 | 32 | 20 | 52 | 20% | 128 | 50% | 77 | 30% | 257 | 0 | 25 | 16 | 41 | ± 0 | 60 | ± 0 | 43 |
| 2013 | 0 | 26 | 30 | 56 | 29% | 96 | 49% | 42 | 22% | 194 | 464 | 27 | 31 | 58 | ± 0 | 44 | ± 0 | 28 |

2014 HUNTING SEASONS

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--|
| | | Opens | Closes | | |
| 113 | 1 | Nov. 5 | Nov. 30 | 50 | Limited quota licenses; any elk |
| 123 | 4 | Oct. 20 | Nov. 30 | 50 | Limited quota licenses; antlerless elk |
| Archery | | Sep. 1 | Sep. 30 | | |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 113 | 1 | +50 |
| | 4 | -25 |
| 123 | 1 | -75 |
| | 6 | -50 |
| Herd Unit Total | 1 | -25 |
| | 4 | -25 |
| | 6 | -50 |

Management Evaluation

Current Landowner/Hunter Satisfaction Management Objective: 60%

Management Strategy: Private Land

Hunter Satisfaction Estimate: 80%

Landowner Satisfaction Estimate: >60%

Herd Unit Issues

The management objective for the Rochelle Hills Elk Herd Unit is based on landowner and hunter satisfaction. The management strategy is private land management strategy. The objective and management strategy were last revised in 2012.

A difficulty with managing this herd is access. The majority of the elk in Area 123 are found on private land and the opinions of landowners on the desired number of elk are not always the same. The elk tend to concentrate in certain areas at particular times of the year so perceptions differ on the number of licenses needed to manage harvest.

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. 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. During the majority of these two winters, the ground was open, with minimal snowpack. In general, during the spring and summer of 2013 the range conditions were favorable, although there were areas in this herd unit that experienced drier more drought-like conditions.

Habitat

There is no habitat transect located within in the herd unit. Observations from field personnel indicated that some portions of this herd unit received moderate rainfall throughout the growing season, resulting in excellent forage production. In general it was noted that the the southern portion of this herd unit experienced drier conditions with less forage production.

Field Data

During the aerial classification survey in December 2013 there were 194 individuals classified, however due to time constraints, it is likely that many more were missed. In 2013 the calf to cow ratio was 44 per 100, down from last year's observed ratio of 60. It should be noted that the sample size this year was the smallest in the last nine years. The number of animals classified has fluctuated over the past several years, however, in general has been on an upward trend. In 2013 the elk appeared to be spread out and in smaller groups than previously seen. Typically Hunt Area 123 has a large group of elk. During this classification survey this group was missed. With limited flight time, the best habitat that is known to contain elk was searched; in this case they were not located in these areas. One problem associated with the management of this herd is achieving adequate sample sizes during classification surveys. This is a large geographical area, with steep, forested terrain, which makes for difficulty in spotting elk in the budgeted flight time. A mid-winter trend count was flown on March 3, 2014 in Hunt Area 123. This flight allowed for detection of the large herd that was not found during the post-season classifications. Elk were scattered throughout the area in small groups, with one large group of around 200 elk. Overall, this population has likely been increasing over the years, based on field personnel and landowner observations.

As this herd is managed based upon landowner and hunter satisfaction, we are aiming for at least 60% of landowners and 60% of hunters to be satisfied. The harvest survey indicated that 83% of hunters were satisfied with the 2013 season. An annual landowner meeting is held in January for Hunt Area 123. As this hunt area is predominantly private, it is crucial that a meeting is held to acquire feedback from the landowners. At this meeting 50% of landowners were in favor of the season. As Hunt Area 113 has more public access, it was decided that personnel would meet individually with landowners. Of these, 80% were satisfied with the season. The overall landowner satisfaction for this herd unit was 62%.

Harvest

Historically, this herd has been hunted conservatively, with Hunt Areas 113 and 123 being closed for two years at a time to allow for trophy bull growth. While this regimen of hunting seasons had the potential to produce high quality bulls, it has also resulted in very high bull to cow ratios in the past. The classification of 2013 showed 58 bulls per 100 cows. This herd has great potential for continued growth if access cannot be somewhat improved, particularly in Area 123. In portions of Hunt Area 113 there is a fair amount of public land, which allows for a reasonable harvest. The overall harvest success was at 75% for this herd unit, which is notably higher than the statewide harvest success rate of 51%.

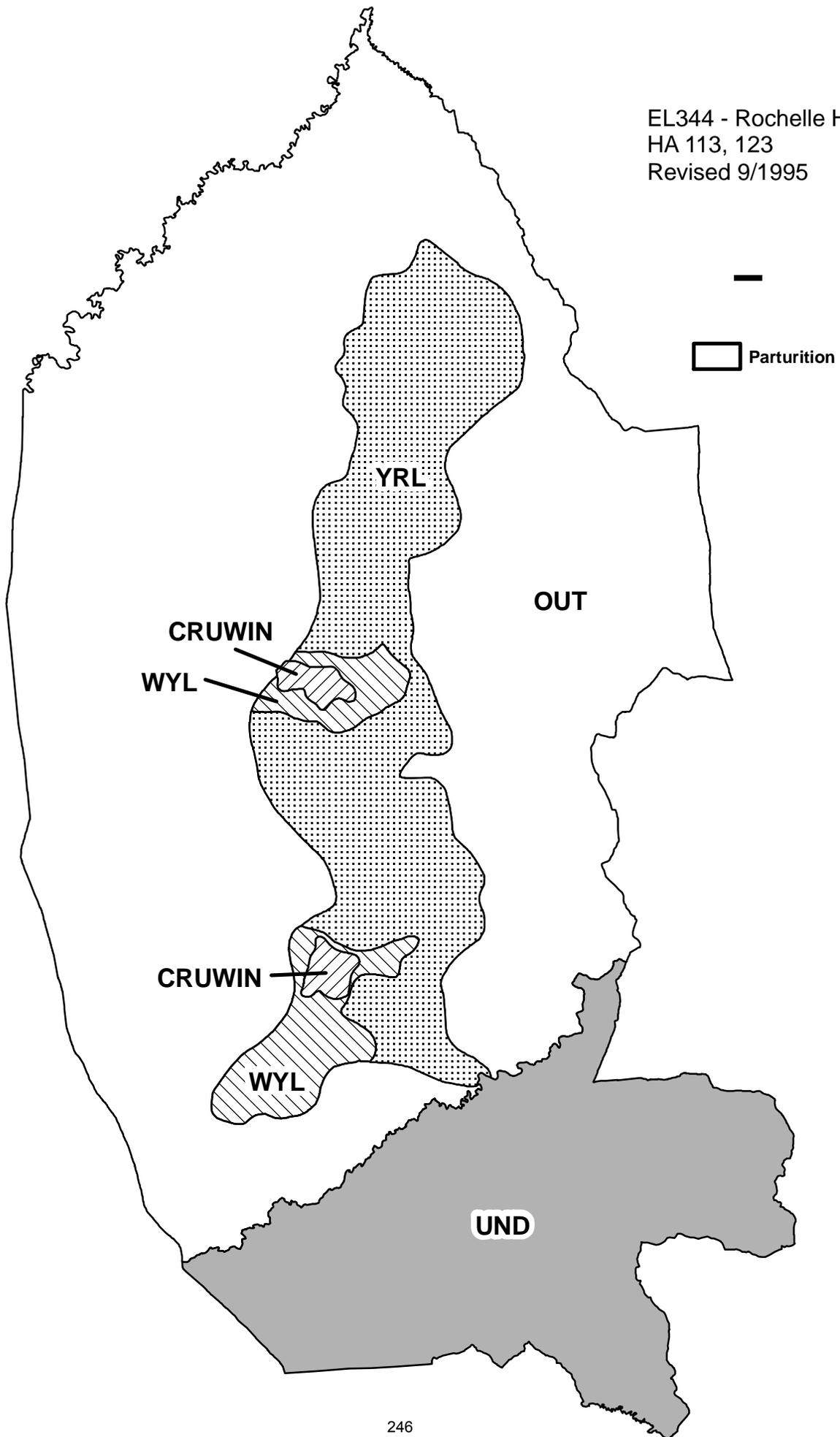
Population

The Rochelle Hills elk herd population appears to have increased in recent years. There is no working population model for this herd. Various factors contribute to not having a reliable model for this herd. Firstly, there is known immigration and emigration to and from this herd. The elk are not geographically or otherwise constrained to the herd unit boundaries. Secondly, this is a small population, relatively speaking, which also contributes to inaccuracies within the model. The 2013 field estimate is around 750 elk.

Management Summary

In 2013 there were Type 1, Type 4 and Type 6 licenses issued in Hunt Area 123 and just Type 4 licenses issued for Hunt Area 113. For 2014, in Hunt Area 113, the Type 1 licenses issued will focus on attaining a reasonable bull harvest in a desirable public lands area, while the Type 4 licenses that are available in Hunt Area 123 will address concerns that landowners have with elk numbers continuing to expand.

EL344 - Rochelle Hills
HA 113, 123
Revised 9/1995



2013 - JCR Evaluation Form

SPECIES: Moose

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

HERD: MO313 - BIGHORN

HUNT AREAS: 1, 34, 42

PREPARED BY: TIM THOMAS

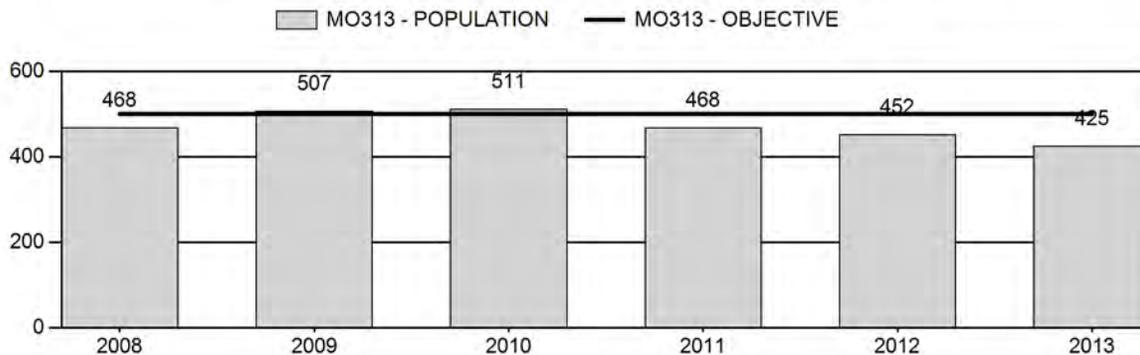
| | | <u>2013</u> | <u>2014 Proposed</u> |
|---------------------------|-----|-------------|----------------------|
| Population: | 481 | 425 | 400 |
| Harvest: | 67 | 71 | 55 |
| Hunters: | 77 | 79 | 60 |
| Hunter Success: | 87% | 90% | 92% |
| Active Licenses: | 77 | 79 | 60 |
| Active License Percent: | 87% | 90% | 92% |
| Recreation Days: | 496 | 453 | 375 |
| Days Per Animal: | 7.4 | 6.4 | 6.8 |
| Males per 100 Females | 91 | 77 | |
| Juveniles per 100 Females | 45 | 69 | |

| | |
|---|---------|
| Population Objective: | 500 |
| Management Strategy: | Special |
| Percent population is above (+) or below (-) objective: | -15% |
| Number of years population has been + or - objective in recent trend: | 2 |
| Model Date: | None |

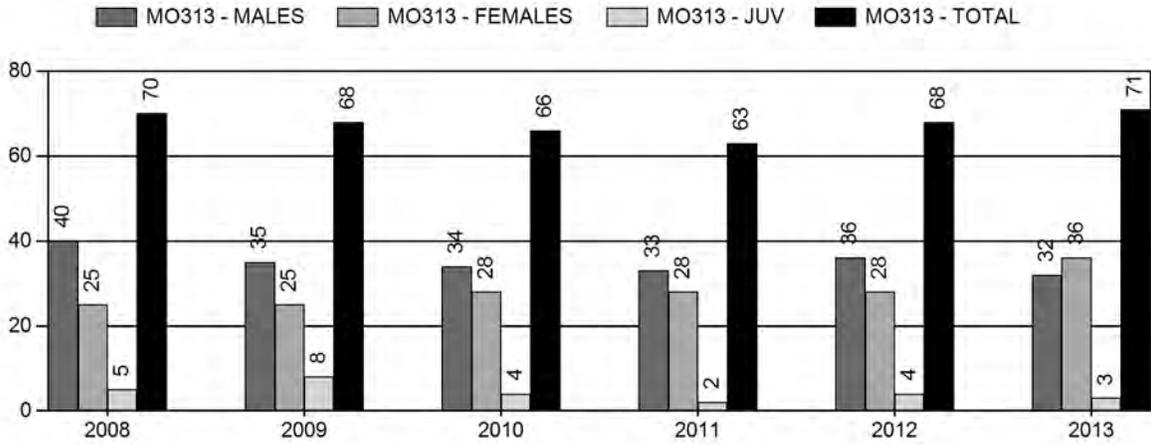
Proposed harvest rates (percent of pre-season estimate for each sex/age group):

| | <u>JCR Year</u> | <u>Proposed</u> |
|--|-----------------|-----------------|
| Females ≥ 1 year old: | 14% | 10% |
| Males ≥ 1 year old: | 23% | 20% |
| Juveniles (< 1 year old): | 3% | 2% |
| Total: | 14% | 12% |
| Proposed change in post-season population: | -2% | 0% |

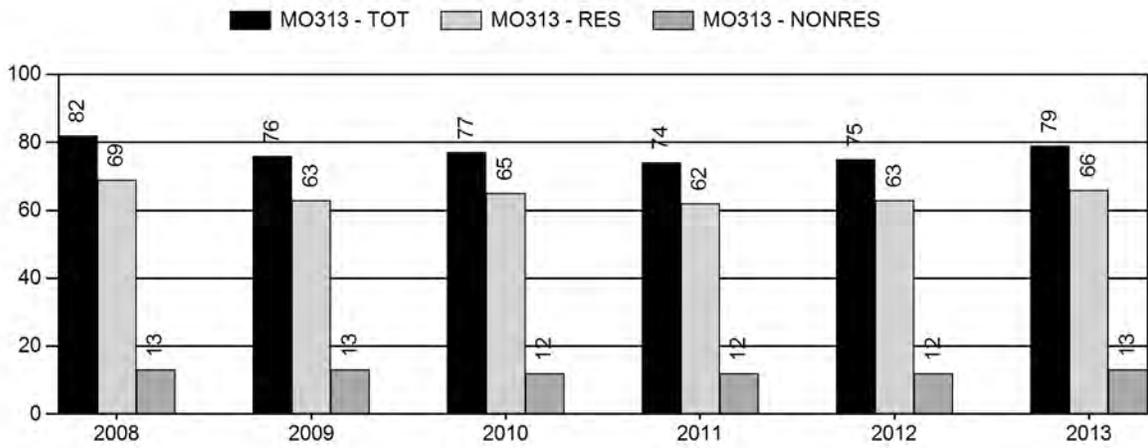
Population Size - Postseason



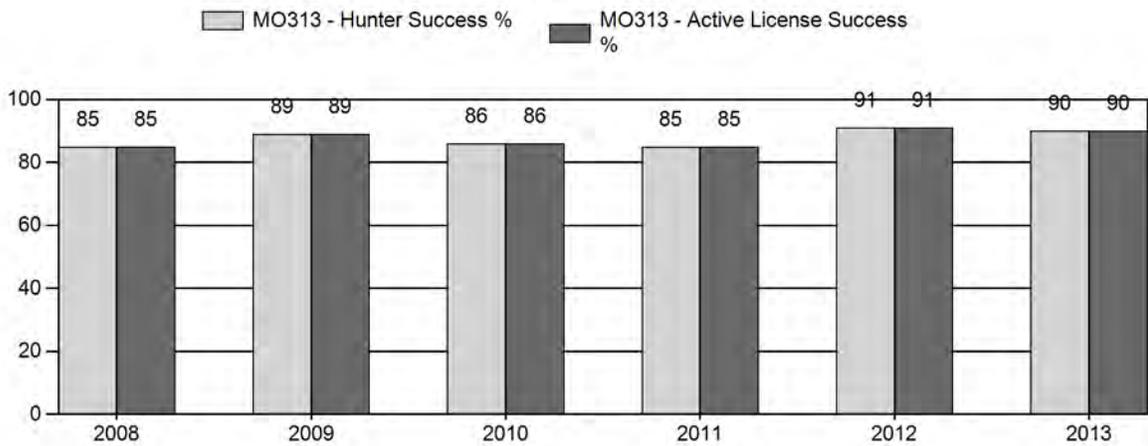
Harvest



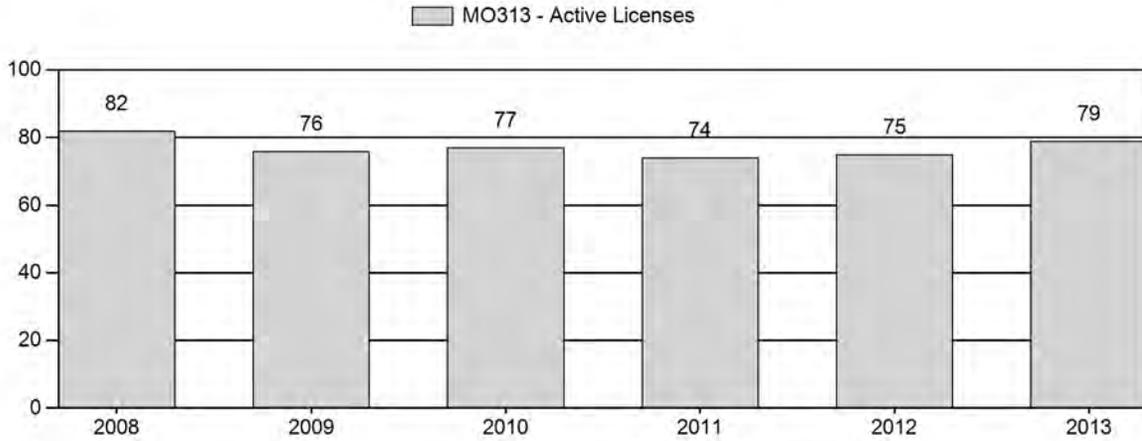
Number of Hunters



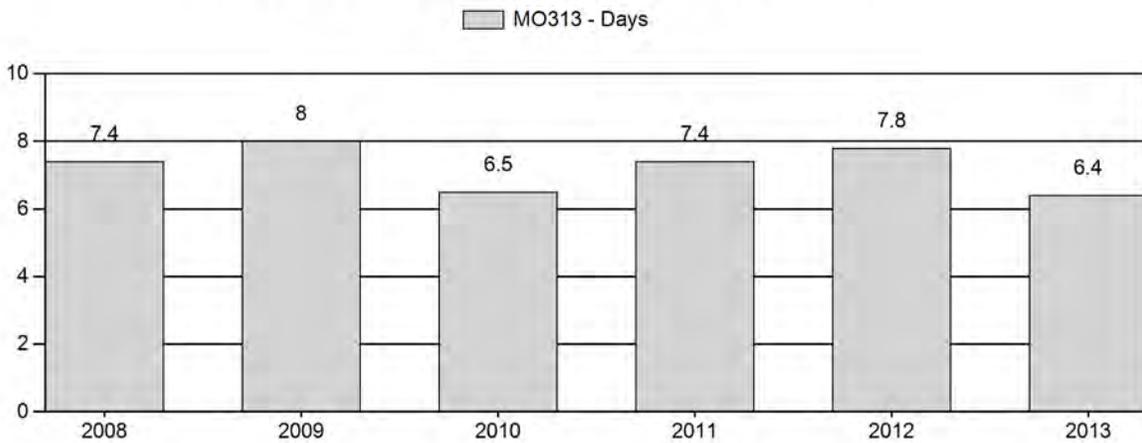
Harvest Success



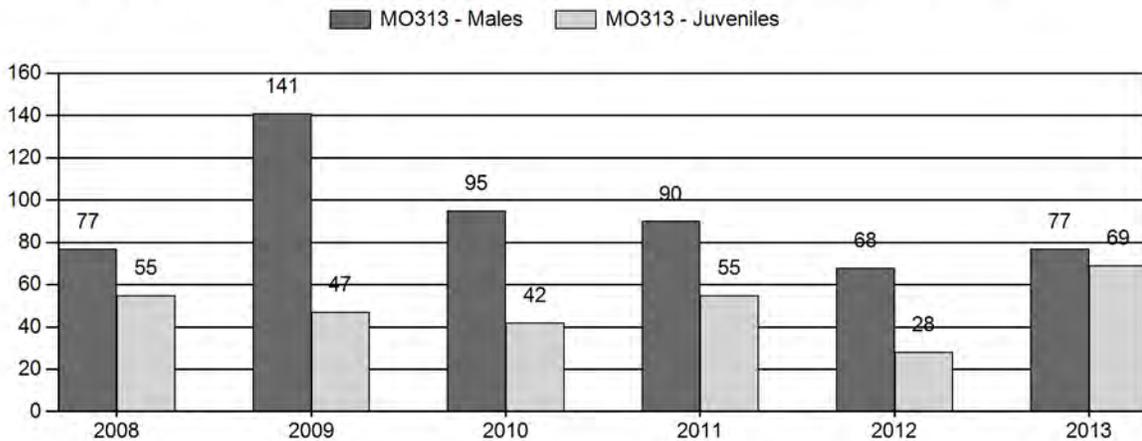
Active Licenses



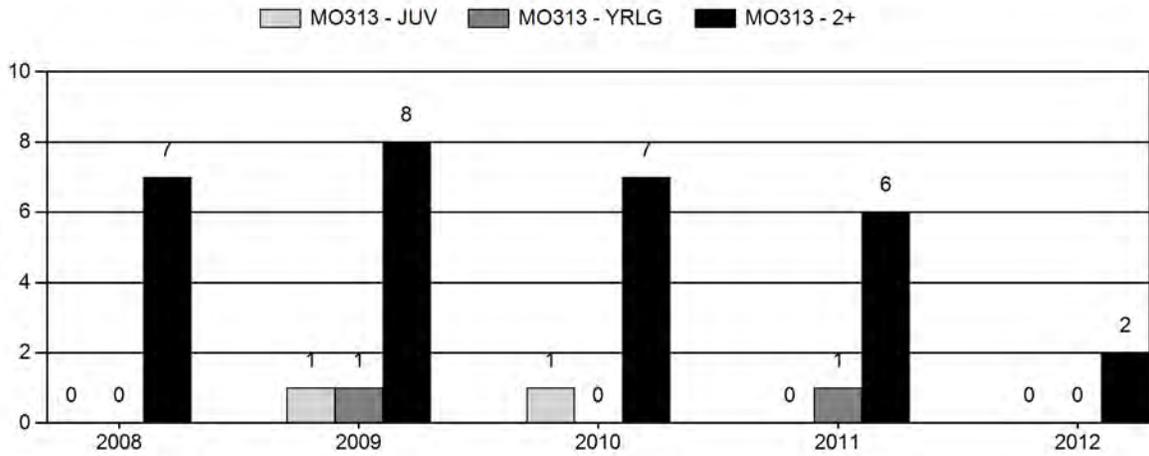
Days per Animal Harvested



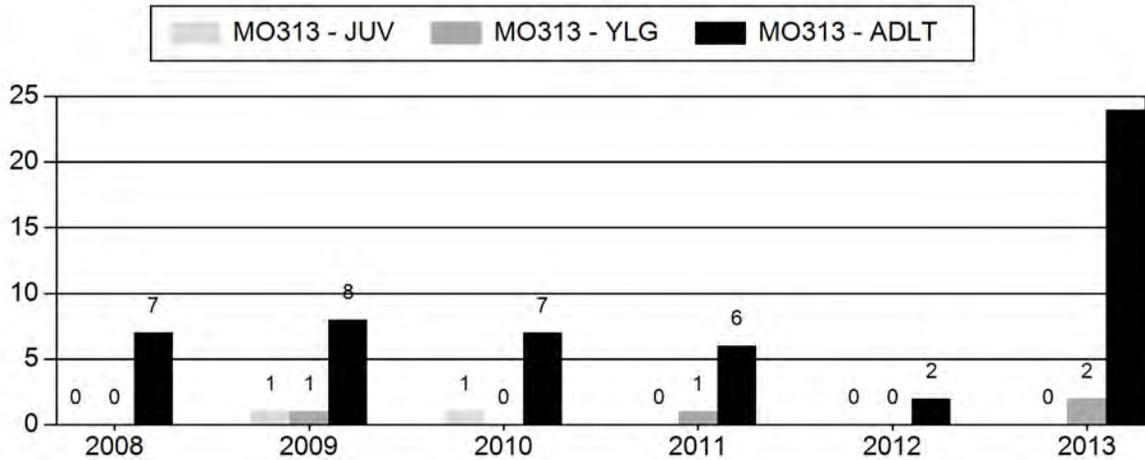
Postseason Animals per 100 Females



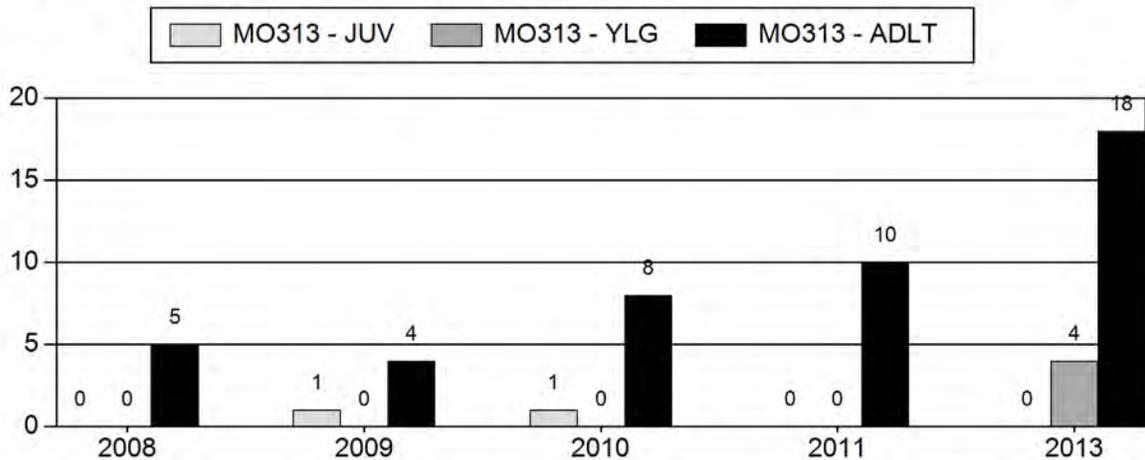
Age Structure of Field Checked Males



Age Structure Data (Field and Laboratory) - Male



Age Structure Data (Field and Laboratory) - Female



2008 - 2013 Postseason Classification Summary

for Moose Herd MO313 - BIGHORN

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot Cls | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|------------|------------|----------------------|-------|-------|-------------|------------|-------------|--------------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | YIng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 2008 | 468 | 0 | 6 | 17 | 33% | 22 | 43% | 12 | 24% | 51 | 0 | 0 | 27 | 77 | ± 0 | 55 | ± 0 | 31 |
| 2009 | 507 | 3 | 18 | 24 | 49% | 17 | 35% | 8 | 16% | 49 | 0 | 18 | 106 | 141 | ± 0 | 47 | ± 0 | 20 |
| 2010 | 511 | 4 | 14 | 18 | 40% | 19 | 42% | 8 | 18% | 45 | 0 | 21 | 74 | 95 | ± 38 | 42 | ± 22 | 22 |
| 2011 | 468 | 1 | 17 | 18 | 37% | 20 | 41% | 11 | 22% | 49 | 0 | 5 | 85 | 90 | ± 35 | 55 | ± 25 | 29 |
| 2012 | 452 | 1 | 16 | 17 | 35% | 25 | 51% | 7 | 14% | 49 | 0 | 4 | 64 | 68 | ± 26 | 28 | ± 14 | 17 |
| 2013 | 425 | 2 | 8 | 10 | 31% | 13 | 41% | 9 | 28% | 32 | 0 | 15 | 62 | 77 | ± 40 | 69 | ± 37 | 39 |

**2014 HUNTING SEASONS
BIGHORN MOOSE HERD (MO313)**

| Hunt Area | Type | Dates of Seasons | | Quota | Limitations |
|-----------|------|------------------|---------|-------|--|
| | | Opens | Closes | | |
| 1 | 1 | Oct. 1 | Oct. 31 | 15 | Limited quota licenses; any moose, except cow moose with calf at side |
| | 4 | Oct. 1 | Oct. 31 | 10 | Limited quota licenses; antlerless moose, except cow moose with calf at side |
| 34 | 1 | Oct. 1 | Oct. 31 | 10 | Limited quota licenses; any moose, except cow moose with calf at side |
| | 4 | Oct. 1 | Oct. 31 | 20 | Limited quota licenses; antlerless moose, except cow moose with calf at side |
| 42 | 1 | Oct. 1 | Oct. 31 | 5 | |
| Archery | | Sep. 15 | Sep. 30 | | Refer to Section 3 of this Chapter |

| Hunt Area | Type | Quota change from 2013 |
|------------------------|----------|------------------------|
| 1 | 1 | - 5 |
| 1 | 4 | - 10 |
| 34 | 4 | - 5 |
| Herd Unit Total | 1 | - 5 |
| | 4 | - 15 |

Management Evaluation

Current Postseason Population Management Objective: 500

Management Strategy: Special

2013 Postseason Population Estimate: ~ 425

2014 Proposed Postseason Population Estimate: ~ 400

Herd Unit Issues

The management objective for the Bighorn Moose Herd Unit is a post-season population objective of 500 moose, with a desired distribution of approximately 350 in Hunt Area 1, 70 moose in Hunt Area 34, and 80 moose in Hunt Area 42. The management strategy for all moose herds is special management, emphasizing trophy quality opportunities. The objective and management strategy were last revised in 1996.

Weather

The spring and summer of 2013 was relatively cool and wet, resulting in near normal conditions in the Bighorn Mountains. The winter of 2013-14 started in late September with significant snow fall that continued through most of the winter. Temperatures have been below average, often dropping well below zero for up to a week at a time. We have not seen temperatures this low, as often, or for extended periods of time since the 1980s.

Moose appear to be sensitive to warmer temperatures, showing signs of increased metabolic rates or heat stress at about 23° F during winter months and 57° F during summer months. Recent research conducted in Massachusetts suggest moose move to thermal cover to avoid heat stress. This can alter feeding and movement patterns. Long-term consequences or effects on fitness are not currently understood.

Habitat

Field Data

Field personnel classify moose in Hunt Areas 1 and 34 annually. In recent years, these surveys were conducted using a Bell 206B JetRanger III. Area 1 is generally surveyed in mid-late August and Area 34 is surveyed during late November – mid-January, depending on survey conditions, snow cover, and aircraft availability. Classification counts are collected occasionally in Area 42, usually incidental to other duties during July and August. Survey results can vary significantly between years, often without easily discernible rationale, making interpretation of data difficult at best (Fig.1). Over time, trends in survey counts can be observed and can provide insight to general population dynamics.

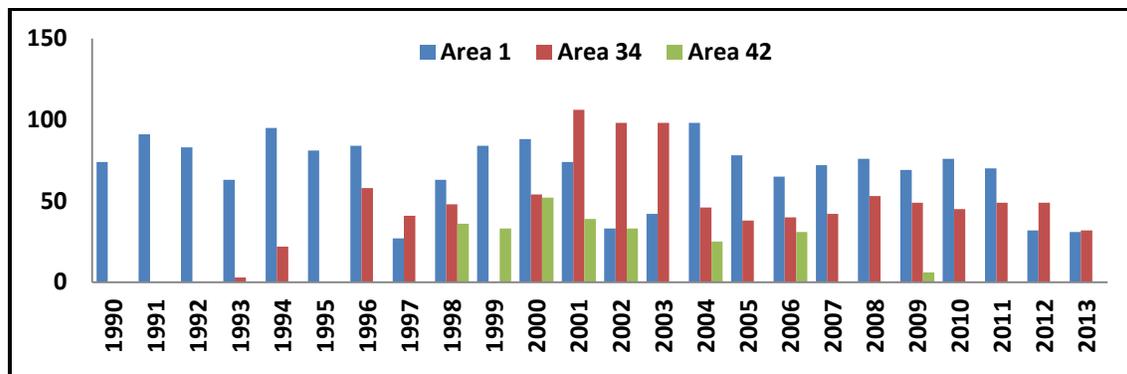


Figure 1. Moose classification/trend counts in Bighorn Herd Unit 1990 – 2013. Area 1 is surveyed in August of each year. Area 34 is surveyed in later November – January of each year. Areas 42 is periodically surveyed during late summer.

During 2013, we classified only 31 moose in Area 1, the lowest count since 1997 (n=27). This is the second year in a row with a very low classification count. We observed only 7 moose in the Goose Creek drainage the past 2 years (n=3 in 2012; n=4 in 2013). We observed 43 bulls and 50 calves per 100 cows. In Area 34, we classified 32 moose, the lowest count since 1998 (n=30). We observed 77 bulls and 69 calves 100 cows. Post-season calf to cow ratio may be skewed upward due to selective harvest of barren cows (i.e. cow without calf at side). The ratio of 50 calves:100 cows in Area 1 may not be sufficient to maintain or grow this population. Low sample size for both areas makes it difficult to have to confidence in these ratios.

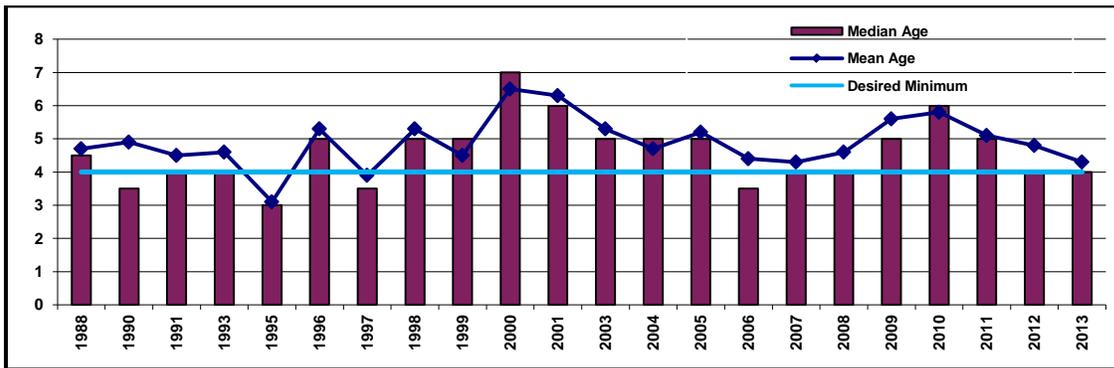


Figure 2. Median and mean age of harvested bull moose in Bighorn Herd Unit. Teeth aged by cementum analyses. Male moose ≥ 1 year old included in analysis.

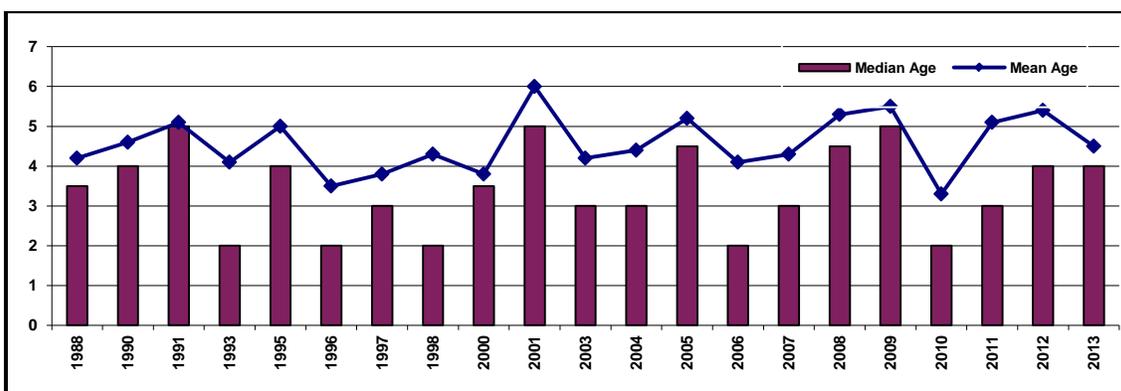


Figure 3. Median and mean age of harvested cow moose in Bighorn Herd Unit. Teeth aged by cementum analyses. Female moose ≥ 1 year old included in analysis. There is no desired minimum threshold established for female moose age data.

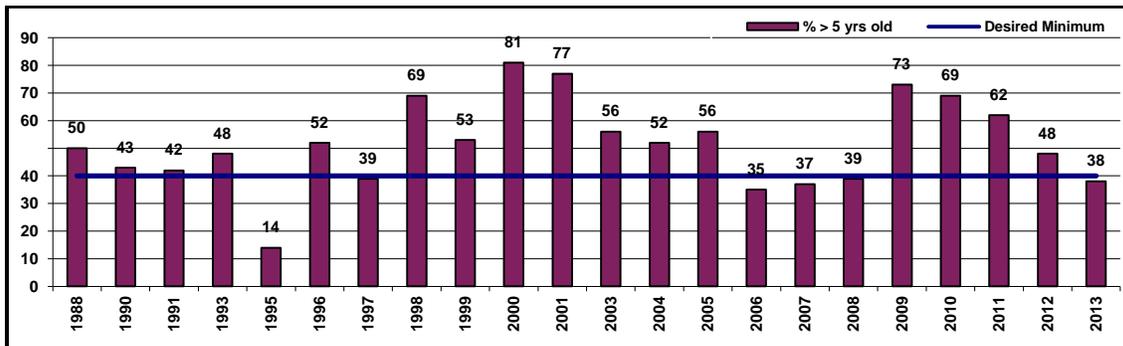


Figure 4. Percentage of harvested bull moose ≥ 5 years old by year.

Harvest Data

Hunters harvested an estimated 71 moose in 2013, similar to the past 5 years. Hunter success was 90% and effort, as measured by days hunted per moose harvested, was 6.4 days/harvest. Effort can vary between years for no discernible reason. Unless there is a significant change in reported effort, it is difficult to use this metric for management decisions. Since moose licenses are often a once-in-a-lifetime opportunity, especially in this herd unit, we try to maintain a sufficient population to assure high (i.e. 85%+) success rates for license holders.

Most hunters checked in the field seemed satisfied with their hunting experience in this herd unit. Most comments submitted with the harvest survey suggested hunters were satisfied with their hunting experience.

Population

We have not developed a spreadsheet model for moose at this time. Population estimates for this herd unit are based on classification counts (Fig. 1), corrected for an estimated sightability bias. The correction factors are based on the observer's perceived idea of survey conditions and results, and have not been calibrated with independent sightability studies specific to this herd unit or habitat type. While the estimated correction factor has not been calibrated, we do obtain a known minimum population from classification surveys which can be viewed as a trend count.

We believe this moose population to be below the post-season objective at this time, at or below 400 moose. We believe the population to be trending slightly downward. Moose no longer occupy several areas along major forest service roads that were occupied 5-10 years ago.

Management Summary

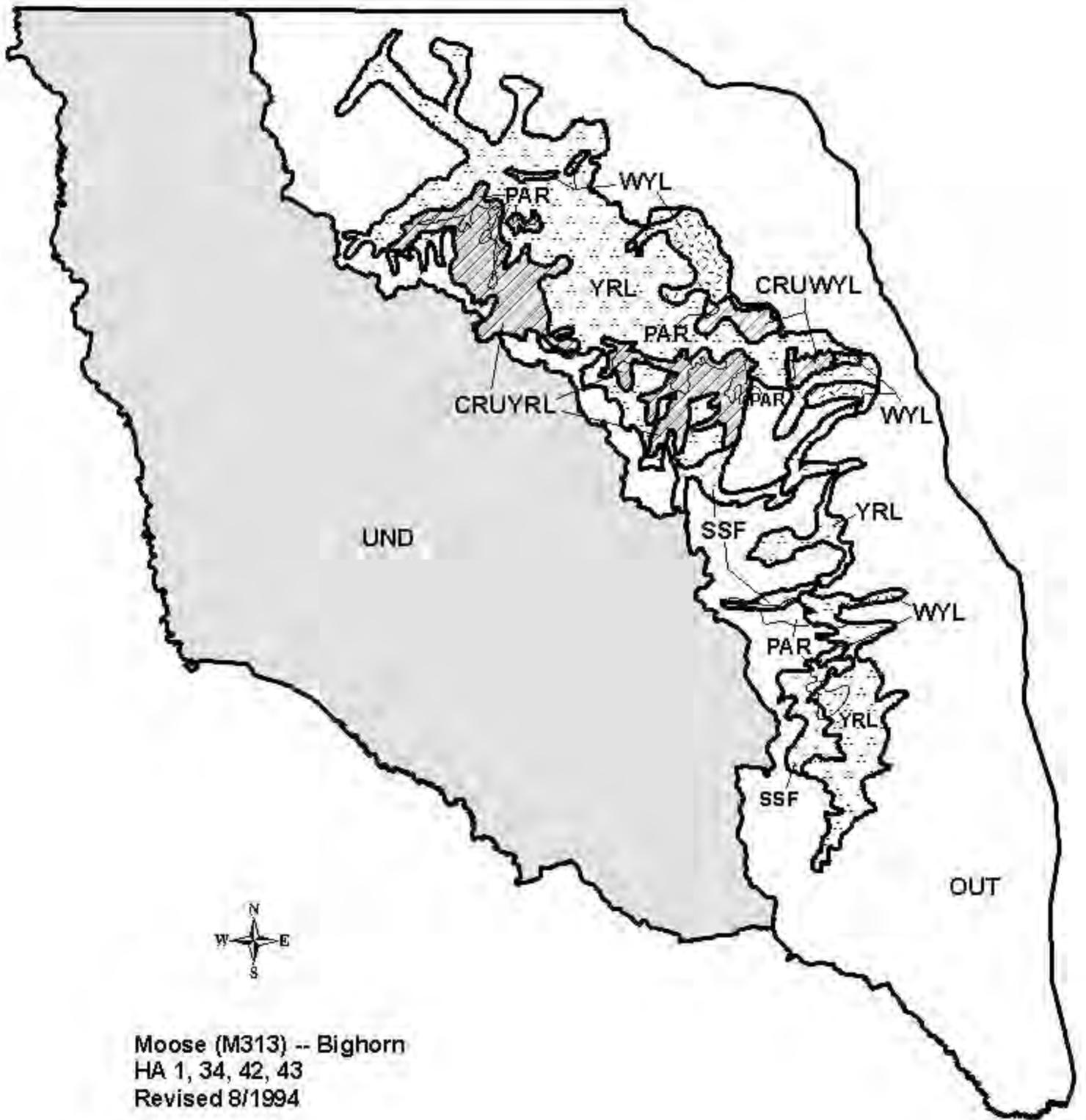
Moose licenses are by limited draw in all hunt areas. The Bighorn Herd Unit is very popular based on the number of applications for licenses available. The regular hunting season runs October 1 – 31 in all hunt areas, with an archery pre-season from September 15 – 30. Archers often harvest up to 50% of the bulls harvested in any given year. Most moose hunting in this herd unit is on the Bighorn National Forest with good access for hunters. Snow can limit access into some areas as the season progresses.

We are concerned that this population may be decreasing faster than desired and lower than desired. Moose no longer use some areas where they were common just 5-10 years ago. Reports of fewer moose, from both hunters and general wildlife viewers, have increased in recent years. Classification counts in 2013 were the lowest in years. We are at or below desired male harvest indices, suggesting we may be harvesting more males than is desired. As such, we reduced licenses in both Areas 1 and 34 this year.

We estimate a harvest of 55 moose in 2014, a decrease from recent years. This should keep the population near the current level. Wyoming Governor's Complimentary moose licenses (n=5) are valid in Hunt Area 1 (i.e. hunt areas with greater than 10 Type 1 licenses), where 1-2 of these licenses are used most years.

This herd unit provides quality wildlife viewing opportunities, with moose visible from U.S. Highways 14, 14A and 16, as well as main forest service roads, throughout the spring and summer. During a recent trip along Highways 14 and 14A in late May, the Sheridan Wildlife Biologist observed 22 moose. In the past, this same trip would result in an observation of 40+ moose.

Habitat, especially riparian and aspen communities, remain a concern on the Bighorn Mountains. We will continue to work with the Bighorn National Forest to address these concerns.



Appendix A

Summary of 2013 Landowner Survey

Perceived Status of Big Game Populations and Suggested Hunting Season Strategies

Sheridan Biologist District

Pronghorn Antelope Areas 10, 15, 16, 109

White-tailed and Mule Deer Areas 23, 24, 26

Elk Areas 37, 38, 129

May 2014

Prepared by:

Timothy P. Thomas
Certified Wildlife Biologist
Sheridan Wildlife Biologist
Wyoming Game & Fish Department

It is imperative that the Wyoming Game & Fish Department (WGFD) works closely with private landowners to manage wildlife populations, specifically deer and pronghorn antelope, in areas that are predominately private lands. In order to gauge landowner perceptions and opinions in an effective manner, the WGFD conducted a survey of landowners who historically allow hunting following the 2007 hunting season. We solicited perceived population status of big game herds and suggestions for 2014 hunting season strategies. A total of 178 landowners within the Sheridan Biologist District were queried on their perceptions of pronghorn antelope, mule deer, white-tailed deer and elk populations on their properties, as well as what hunting season adjustments they would suggest for the 2013 seasons.

Landowners were given the opportunity to choose between three options based on their perception of big game populations (i.e. below, at, or above "desired" levels) for their property. "Desired population" is a measure of landowner acceptance or tolerance of wildlife, and not necessarily correlated to the post-season population management objective established by the WGFD. Landowners were given three options for suggested season strategies (i.e. more conservative, same, or more liberal). Landowners were given the opportunity to provide any additional comments. Attached is a copy of the survey sent to landowners.

Seventy-two useable surveys were returned for a response rate of 40%. Results are provided below. Not all landowners responded to each question or for all species. Some landowners are credited with a response in more than one hunt area. Therefore, total responses may exceed the number of actual survey returns.

Pronghorn Antelope

Table 1. Summary of survey results for pronghorn antelope grouped by hunt area and herd unit.

| Hunt Area | Population | | | Season | | |
|----------------------|---------------------|------------------|---------------------|---------------------|-------------|---------------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | More Liberal Season |
| 10 | 0 | 7 | 5 | 1 | 8 | 3 |
| 16 | 0 | 5 | 1 | 0 | 5 | 1 |
| SubTot (n=18) | 0 (0%) | 12 (67%) | 6 (33%) | 1 (6%) | 13 (72%) | 4 (2%) |
| 15 (n=23) | 4 (17%) | 17 (43%) | 9 (39%) | 2 (9%) | 13 (56%) | 8 (35%) |
| 109 (n=30) | 1 (3%) | 13 (43%) | 16 (53%) | 1 (3%) | 14 (47%) | 15 (50%) |
| 2013 (n=71) | 5 (7%) | 35 (49%) | 31 (44%) | 4 (6%) | 40 (56%) | 27 (38%) |
| 2012 (n=74) | 7 (9%) | 46 (62%) | 21 (28%) | 1 (1%) | 48 (69%) | 20 (30%) |
| 2011 (n=41) | 5 (12%) | 19 (46%) | 17 (41%) | 2 (5%) | 25 (61%) | 14 (34%) |
| 2010 (n=53) | 5 (9%) | 26 (49%) | 22 (42%) | 1 (2%) | 36 (68%) | 16 (30%) |
| 2009 (n=58) | 10 (17%) | 29 (50%) | 19 (33%) | 4 (7%) | 40 (69%) | 14 (24%) |
| 2008 (n=29) | 5 (17%) | 11 (38%) | 13 (45%) | 2 (7%) | 16 (55%) | 11 (38%) |
| 2007 (n=53) | 5 (9%) | 27 (51%) | 21 (40%) | 0 (0%) | 35 (66%) | 18 (34%) |
| 2006 (n=36) | 2 (6%) | 18 (50%) | 16 (44%) | 1 (3%) | 21 (60%) | 13 (37%) |
| 2005 (n=39) | 6 (15%) | 20 (51%) | 13 (33%) | 2 (5%) | 22 (58%) | 14 (37%) |
| 2004 (n=37) | 3 (8%) | 26 (70%) | 8 (22%) | 1 (3%) | 37 (73%) | 9 (24%) |
| 2003 (n=54) | 9 (17%) | 29 (54%) | 16 (30%) | 2 (4%) | 38 (75%) | 11 (21%) |
| 2002 (n=55) | 15 (27%) | 31 (56%) | 9 (16%) | 7 (13%) | 36 (69%) | 9 (17%) |
| 2001 (n=57) | 19 (33%) | 32 (58%) | 5 (9%) | 8 (15%) | 40 (77%) | 4 (8%) |
| 2000 (n=56) | 25 (45%) | 28 (50%) | 3 (5%) | 13 (23%) | 38 (68%) | 5 (9%) |

Ucross Herd Unit (hunt areas 10, 16): We received 18 responses from landowners in this herd unit. All responses (100%) indicated the pronghorn population is at or above desired levels. The majority (94%) suggests maintaining or liberalizing the current season strategy. The current population simulation estimates this population is significantly above the post-season population management objective as established by the WGFD. Most pronghorn within this herd unit occur on private lands, especially in Area 10, with limited opportunities for public land hunting. Some hunting opportunity is provided on a Walk-In Area and small scattered parcels of public lands in Area 16.

Clearmont Herd Unit (hunt area 15): We received 23 responses from landowners in this herd unit. Most respondents (83%) thought the population at or above desired levels. This population is estimated to be significantly above the post-season population management objective as established by the WGFD. The majority of land within the herd unit is private and landowners generally control access to public lands. There are very few opportunities for public-lands antelope hunting in this herd unit. Most landowners (56%) suggested maintaining the current season structure while 35% of respondents suggested liberalizing season strategies.

Beckton Herd Unit (hunt area 109): We received 30 responses from landowners in this herd unit. All but one landowner indicated the population was at or above desired levels. Population estimates, based on winter counts, indicated this herd unit is substantially above the post-

season population management objective as established by the WGFD. This population will likely never be reduced to the population objective due to limited access and urban development which hinders safe hunting opportunities. Most landowners (97%) favored maintaining (47%) or liberalizing (50%) season strategies.

Mule Deer

Table 2. Summary of survey results for mule deer grouped by hunt area and herd unit.

| Hunt Area | Population | | | Season | | |
|----------------------|---------------------|------------------|---------------------|---------------------|-------------|---------------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | More Liberal Season |
| 23 | 8 | 15 | 5 | 4 | 17 | 7 |
| 26 | 8 | 5 | 0 | 7 | 5 | 1 |
| SubTot (n=41) | 16 (39%) | 20 (49%) | 5 (12%) | 11 (27%) | 22 (54%) | 8 (19%) |
| 24 (n=33) | 18 (58%) | 12 (36%) | 2 (6%) | 12 (36%) | 16 (49%) | 5 (15%) |
| 2013 (n=74) | 35 (47%) | 32 (43%) | 7 (10%) | 23 (31%) | 38 (51%) | 13 (18%) |
| 2012 (n=75) | 35 (47%) | 29 (39%) | 11 (15%) | 23 (31%) | 42 (57%) | 9 (12%) |
| 2011 (n=62) | 28 (45%) | 26 (42%) | 8 (13%) | 11 (17%) | 43 (69%) | 8 (13%) |
| 2010 (n=59) | 27(46%) | 20 (34%) | 12 (20%) | 13(22%) | 36(61%) | 10(17%) |
| 2009 (n=59) | 27 (46%) | 20 (34%) | 12 (20%) | 13 (22%) | 36 (61%) | 10 (17%) |
| 2008 (n=28) | 4 (14%) | 19 (68%) | 5 (18%) | 1 (4%) | 24 (86%) | 3 (11%) |
| 2007 (n=59) | 20 (34%) | 33 (56%) | 6 (10%) | 10 (17%) | 39 (66%) | 10 (17%) |
| 2006 (n=41) | 15 (37%) | 15 (37%) | 11 (27%) | 5 (12%) | 27 (65%) | 9 (22%) |
| 2005 (n=46) | 7 (16%) | 23 (51%) | 15 (33%) | 4 (9%) | 27 (59%) | 15 (33%) |
| 2004 (n=48) | 12 (25%) | 21 (44%) | 15 (31%) | 7 (8%) | 27 (56%) | 14 (29%) |
| 2003 (n=65) | 15 (24%) | 34 (55%) | 13 (21%) | 8 (12%) | 42 (65%) | 15 (23%) |
| 2002 (n=65) | 31(48%) | 23 (35%) | 11 (17%) | 16 (25%) | 37 (59%) | 10 (16%) |
| 2001 (n=79) | 38 (48%) | 34 (43%) | 7 (9%) | 19 (25%) | 47 (62%) | 10 (13%) |
| 2000 (n=67) | 22 (32%) | 38 (57%) | 7 (11%) | 15 (24%) | 45 (71%) | 3 (5%) |

North Bighorn Herd Unit (hunt area 24): We received 33 responses from landowners in this herd area. Twelve respondents (36%) thought the population was at desired levels while two (6%) respondents thought the population was above desired levels and 19 (58%) thought the population was below desired levels. This is a change from recent years where most landowners felt the population was at or above desired levels. This likely reflects localized decreased in the mule deer numbers due to environmental conditions, increased doe/fawn harvest, and EHD. Current population simulations estimate the population is below the post-season population management objective as established by the WGFD. The most of landowners (49%) suggested maintaining current season strategies (i.e. 30 September archery season, 15 day general deer season in October and doe/fawn permits) while the other respondents were split between more conservative (36%) and more liberal (15%) season structure.

Powder River Herd Unit (hunt areas 23, 26): We received 41 responses from landowners within these hunt areas. Most respondents (61%) thought the population was at or above desired levels, while 39% thought the population was below desired levels. This is a change in perception from recent years when 90% or more of respondents thought this population was at

or above desired levels. Current population simulations estimate the population is slightly below the post-season population management objective as established by the WGFD. Most landowners (54%) favored maintaining the current season structure (i.e. 30 day September archery season, 15 day general deer season in October and an extended doe/fawn season).

White-tailed Deer

Table 3. Summary of survey results for white-tailed deer grouped by hunt area and herd unit.

| Hunt Area | Population | | | Season | | |
|--------------------|---------------------|------------------|---------------------|---------------------|-------------|---------------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | More Liberal Season |
| 23 | 3 | 6 | 10 | 2 | 7 | 10 |
| 24 | 3 | 11 | 20 | 2 | 16 | 16 |
| 26 | 0 | 2 | 11 | 1 | 5 | 7 |
| 2013 (n=47) | 6 (9%) | 19 (29%) | 41 (62%) | 5 (8%) | 28 (42%) | 33 (50%) |
| 2012 (n=72) | 3 (4%) | 18 (25%) | 51 (71%) | 0 | 30 (41%) | 42 (59%) |
| 2011(n=63) | 2(3%) | 19(30%) | 42(67%) | 0 | 26(41%) | 37(59%) |
| 2010 (n=55) | 2(4%) | 16(29%) | 37(67%) | 0 | 23(42%) | 32(58%) |
| 2009 (n=53) | 4 (7%) | 19 (36%) | 30 (57%) | 1(2%) | 29 (55%) | 23 (43%) |
| 2008 (n=26) | 5 (19%) | 8 (31%) | 13 (50%) | 2 (8%) | 12 (46%) | 12 (46%) |
| 2007 (n=48) | 8 (17%) | 14 (29%) | 26 (54%) | 3 (6%) | 22 (46%) | 23 (48%) |
| 2006 (n=36) | 4 (11%) | 11 (31%) | 21 (58%) | 1 (3%) | 19 (53%) | 16 (44%) |
| 2005 (n=40) | 3 (8%) | 11 (28%) | 26 (65%) | 2 (5%) | 20 (51%) | 17 (44%) |
| 2004 (n=37) | 2 (5%) | 11 (30%) | 24 (65%) | 0 | 14 (38%) | 23 (62%) |
| 2003 (n=57) | 6 (10%) | 14 (25%) | 37 (65%) | 4 (7%) | 25 (45%) | 27 (48%) |
| 2002 (n=58) | 11 (19%) | 19 (33%) | 28 (48%) | 7 (13%) | 28 (50%) | 21 (37%) |
| 2001 (n=68) | 13 (19%) | 30 (44%) | 25 (37%) | 6 (9%) | 45 (66%) | 17 (25%) |
| 2000 (n=58) | 11 (19%) | 21 (36%) | 26 (45%) | 6 (10%) | 31 (53%) | 21 (37%) |

Powder River Herd Unit (hunt areas 23, 24, 26): We received 47 responses from landowners in these hunts areas. The majority (91%) thought the white-tailed deer population was at or above desired levels, while six landowners (9%) felt the population was below desired levels. Current population simulations estimate this population is significantly above the post-season population management objective as established by the WGFD. Most (92%) landowners suggested maintaining or liberalizing current season strategies. During the 2013 season, hunters could harvest any white-tailed deer for up to 91 days, including the 30-day September archery season, with additional time allowed for doe/fawn harvest, depending on hunt area. .

Numerous landowners have expressed concern and frustration with the number of white-tailed deer, especially in the Bighorn area. It is common to see several hundred deer in one field. Landowners in these areas have committed to increasing access for hunters to harvest antlerless deer. The number of deer – vehicle collisions has also increased, most notably along the Big Goose Road and Highway 87/335 from Sheridan to Bighorn.

Elk

Table 4. Summary of survey results for elk.

| Hunt Area | Population | | | Season | | |
|-----------------------|---------------------|------------------|---------------------|---------------------|-------------|----------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | Liberal Season |
| 37 | 5 | 8 | 4 | 2 | 7 | 6 |
| 38 | 0 | 1 | 1 | 0 | 1 | 1 |
| Sub Tot (n=19) | 5 (26%) | 9 (47%) | 5 (26%) | 2 (12%) | 8 (47%) | 7 (41%) |
| 129 (n=16) | 7 (44%) | 6 (37%) | 3 (19%) | 2 (12%) | 10 (63%) | 4 (25%) |
| 2013 (n=35) | 12 (34%) | 15 (43%) | 8 (23%) | 4 (12%) | 18 (55%) | 11 (33%) |
| 2012 (n=27) | 10 (37%) | 10 (37%) | 7 (26%) | 2 (8%) | 13 (50%) | 11 (42%) |
| 2011 (n=20) | 7 (35%) | 8 (40%) | 5 (25%) | 4 (20%) | 11 (55%) | 5 (25%) |
| 2010 (n=19) | 10(53%) | 5(26%) | 4(21%) | 7(37%) | 7(37%) | 5(26%) |
| 2009 (n=19) | 10 (53%) | 5 (26%) | 4 (21%) | 7 (37%) | 7 (37%) | 5 (26%) |
| 2008 (n=12) | 6 (50%) | 3 (25%) | 3 (25%) | 1 (8%) | 10 (83%) | 1 (18%) |
| 2007 (n=16) | 5 (31%) | 6 (38%) | 5 (31%) | 2 (13%) | 8 (50%) | 5 (31%) |
| 2006 (n=20) | 8 (40%) | 7 (35%) | 5 (25%) | 5 (25%) | 8 (40%) | 7 (35%) |
| 2005 (n=18) | 4 (22%) | 10 (56%) | 4 (22%) | 4 (22%) | 9 (50%) | 5 (28%) |
| 2004 (n=12) | 3 (25%) | 9 (75%) | 0 | 0 | 10 (83%) | 2 (17%) |
| 2003 (n=17) | 5 (31%) | 9 (56%) | 2 (13%) | 3 (21%) | 9 (64%) | 2 (14%) |
| 2002 (n=20) | 4 (20%) | 12 (60%) | 4 (20%) | 1 (5%) | 16 (80%) | 3 (15%) |
| 2001 (n=23) | 6 (26%) | 12 (52%) | 5 (22%) | 4 (17%) | 14 (61%) | 5 (22%) |
| 2000 (n=10) | 3 (30%) | 4 (40%) | 3 (30%) | 1 (10%) | 7 (70%) | 2 (20%) |

North Bighorn Herd Unit (hunt areas 37, 38): We received 19 responses from landowners in these hunt areas, all but two from landowners in hunt area 37. Well over half (74%) of the landowners thought the elk population was at or below desired levels, while the rest thought elk numbers were above desired levels. Most landowners (81%) supported similar or more liberal season strategies..

Hunt Area 129: We received responses from 16 landowners in this hunt area. Area 129 encompasses all lands in Campbell, Johnson, and Sheridan counties outside an established elk hunt area. This area was established in 2001 to address expanding elk numbers outside established hunt areas and herd units. Responses were mixed, with some landowners desiring more elk while others want longer seasons so they can kill more elk and reduce their numbers. The WGFD does not wish to actively manage elk in these areas. Most (63%) landowners favored maintaining the current season structure.

Appendix B

**Summary of
2013 Landowner Survey**

**Perceived Status of Deer and Pronghorn Populations
And Suggested Hunting Season Strategies**

Gillette Biologist District

May 2014

Prepared by:

Erika Peckham
Gillette Wildlife Biologist
Wyoming Game & Fish Department

Overview

Questionnaire surveys of landowners within the Gillette Biologist District were conducted following each hunting season from 1996 through 2013. Questionnaires were included with a mailing of the landowner coupon form. Approximately 400 surveys are mailed each year. Landowners completed the surveys and returned them with their coupon forms to their local game warden by March 1st of the following year.

The questions asked for each of the surveys were essentially the same with only slight variation between the first survey and the subsequent surveys. Landowners were asked if the pronghorn and deer herds on their ranches were below desired levels, at desired levels, or above desired levels. They were also asked if they thought that the next year's hunting season should be more conservative, about the same, or more liberal than the previous hunting season.

A brief summary of the 2013 responses relative to the 2014 hunting season is as follows.

Pronghorn Questionnaire Responses

Area 1

- 100% believe pronghorn numbers are at or below desired levels.
- All respondents favor a more conservative or same season for 2014.

Area 3

- 75% of respondents believe that numbers are low.
- All landowners desire a more conservative or the same season for 2014.

Area 7

- Both respondents believed that pronghorn were at desired levels.
- Both respondents desired the same season for 2014.

Area 17

- 60% of landowners surveyed think that pronghorn are at or above desired levels.
- 47% of landowners favor the same season for 2014.

Area 18

- 100% of landowners think that pronghorn numbers on their property are at or below desired levels.
- 100% of landowners favor the same or more conservative season for 2014.

Area 19

- 75% of landowners believe that pronghorn numbers on their property are below desired levels.
- 100% favor the same or more conservative season for 2014.

Area 23

- 64% of landowners surveyed believe that pronghorn numbers on their property are at desired levels, with the remainder evenly divided on whether they are above or below.
- 91% of landowners favor the same or a more conservative season for 2014.

Area 24

- 100% of landowners surveyed believe that pronghorn numbers on their property are at or below desired levels.
- Respondents were evenly divided on the same or more conservative season for 2014.

Area 27

- The 1 respondent felt that numbers are above desired levels and favored a more liberal season.

Overall Pronghorn Survey Results

- Sample size of 66 landowners answered the portion on pronghorn (some incomplete, only answering either the portion regarding population or season and not both, some not indicating hunt area).
- 44% of total respondents think that pronghorn numbers on their property are at desired levels with 47% indicating that pronghorn numbers on their property are below desired levels and 9% indicating that pronghorn numbers on their property are above desired levels.
- Most (48%) favor a more conservative season for 2014 with 8% favoring a more liberal and 44% favoring the same season for 2014. Responses were very similar to those received for the 2013 season, however substantially less surveys were received.

Relationship to 2013 Post-season Population Estimate, Its Objective and Landowner Desires for the 2014 Hunting Season

- North Black Hills Herd Unit is estimated to be below objective. Overall, landowners think pronghorn are at or below the desired level and want either the same or a more conservative season for 2014. License quotas had been reduced for 2013 and were essentially sold out by the end of the season.
- Gillette Herd Unit is estimated to be slightly below objective. The majority of landowners believes the herd is at or above desired levels and most want the same season for 2014.
- Pumpkin Buttes Herd Unit is estimated to be above objective. 82% of all respondents want the same or a more liberal season for 2014.
- Highlight Herd Unit is estimated to be well below objective, also the model is poor. Most landowners believe the herd is at or below desired levels. All respondents want the same or a more conservative season for 2014.
- Winter conditions were moderate in the winter of 2013-2014 with intense periods of cold followed by periods of melting at times. The proposed 2014 seasons address lower pronghorn numbers in those areas that have been impacted by past severe winter conditions, while continuing with persistent harvest in areas where winter conditions were less severe. Thus, proposed seasons should still be reasonable in the Gillette District.

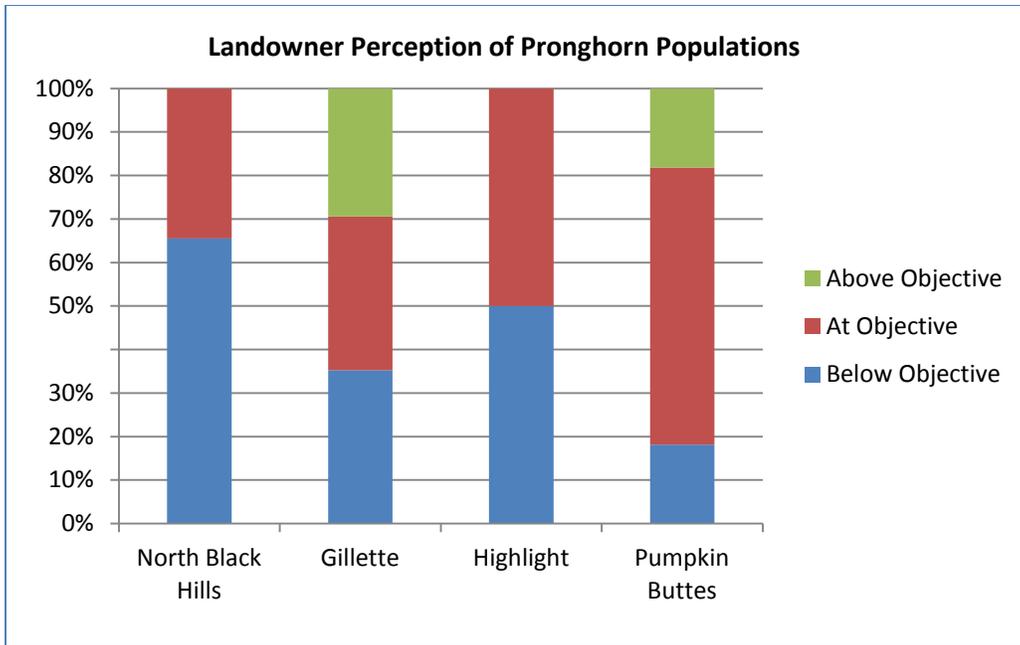


Figure 1. 2013 landowner survey results by herd unit regarding pronghorn herd size compared to herd objective

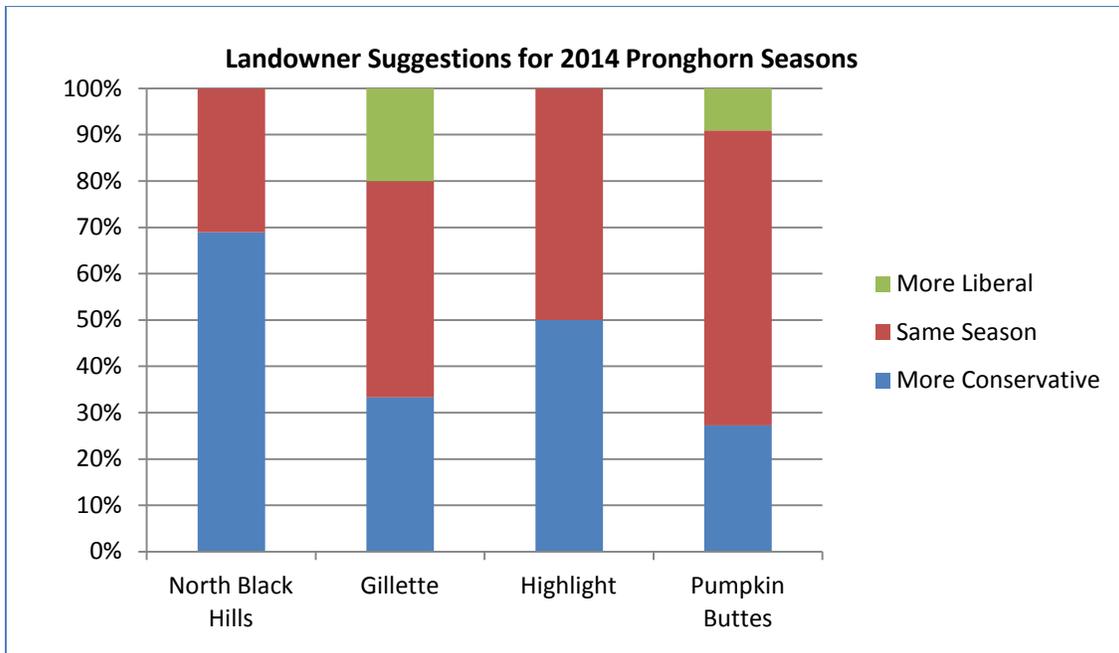


Figure 2. 2013 landowner survey results by herd unit regarding desired 2014 pronghorn hunting seasons.

Table 1. Summary of responses by landowners regarding pronghorn population levels and opinions for pronghorn antelope hunting seasons 1997-2013.

| Hunt Area | Population | | | Season | | |
|--------------|---------------------|------------------|---------------------|---------------------|-------------|---------------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | More Liberal Season |
| 1 | 7 | 4 | 0 | 7 | 4 | 0 |
| 2 | 2 | 1 | 0 | 3 | 0 | 0 |
| 3 | 3 | 1 | 0 | 3 | 1 | 0 |
| 7 | 0 | 2 | 0 | 0 | 2 | 0 |
| 17 | 6 | 6 | 3 | 5 | 7 | 3 |
| 18 | 4 | 3 | 0 | 4 | 3 | 0 |
| 19 | 3 | 1 | 0 | 3 | 1 | 0 |
| 23 | 2 | 7 | 2 | 3 | 7 | 1 |
| 24 | 4 | 4 | 0 | 4 | 4 | 0 |
| 27 | 0 | 0 | 1 | 0 | 0 | 1 |
| YEAR | | | | | | |
| *2013 | 31(47%) | 29(44%) | 6(9%) | 32(48%) | 29(44%) | 5(8%) |
| 2012 | 72(44%) | 82(50%) | 11(6%) | 47(29%) | 103(64%) | 11(7%) |
| 2011 | 30 (37%) | 47 (57%) | 5 (6%) | 25 (32%) | 49 (62%) | 5 (6%) |
| 2010 | 30 (33%) | 45 (49%) | 16 (18%) | 21 (23%) | 52 (57%) | 18 (20%) |
| 2009 | 19 (18%) | 60 (56%) | 29 (27%) | 15 (14%) | 72 (66%) | 22 (20%) |
| 2008 | 7 (6%) | 55 (50%) | 48 (44%) | 9 (8%) | 60 (56%) | 39 (36%) |
| 2007 | 7 (6%) | 58 (48%) | 55 (46%) | 4 (3%) | 69 (57%) | 46 (39%) |
| 2006 | 14 (11%) | 58 (44%) | 61 (46%) | 6 (5%) | 74 (56%) | 53 (40%) |
| 2005 | 6 (10%) | 22 (35%) | 34 (55%) | 4 (7%) | 31 (53%) | 23 (40%) |
| 2004 | 28 (16%) | 86 (50%) | 59 (34%) | 12 (7%) | 98 (57%) | 63 (36%) |
| 2003 | 30 (17%) | 105 (60%) | 43 (24%) | 11 (6%) | 109 (62%) | 56 (32%) |
| 2002 | 24 (18%) | 78 (58%) | 33 (24%) | 17 (13%) | 80 (59%) | 38 (28%) |
| 2001 | 27 (21%) | 74 (59%) | 25 (20%) | 23 (18%) | 73 (58%) | 30 (24%) |
| 2000 | 50 (40%) | 58 (46%) | 17 (14%) | 33 (27%) | 65 (52%) | 26 (21%) |
| 1999 | 48 (46%) | 37 (35%) | 20 (19%) | 30 (29%) | 47 (46%) | 25 (25%) |
| 1998 | 49 (37%) | 64 (48%) | 21 (16%) | 31 (23%) | 73 (54%) | 31 (23%) |
| 1997 | 68 (49%) | 60 (43%) | 11 (8%) | 56 (41%) | 63 (46%) | 18 (13%) |
| | | | | | | |

*Note-Totals of Hunt Area may not equal total for 2013. This is due to some landowners not reporting what area they are in or answering only portions of the survey. Their opinions were factored into the total, but not by Hunt Area.

Deer Questionnaire Responses

Area 1

- 42% believe deer numbers on their property are at desired levels, while 58% believe deer numbers are below desired levels.
- 83% favor the same or a more conservative season for 2014.

Area 3

- All landowners that responded believe deer numbers on their property are at or below desired levels.
- All favor the same or a more conservative season for 2014.

Area 8

- There was only one respondent who believes deer are at desired levels and wanted the same seasons as last year.

Area 10

- There were only 2 respondents. Both respondents felt that deer were at desired level, and that the 2014 seasons should be the same or more conservative.

Area 17

- 75% believe deer numbers on their property are below desired levels.
- 75% favor a more conservative season for 2014.

Area 18

- 100% believe deer numbers on their property are at or below desired levels.
- 100% favor the same or a more conservative season for 2014.

Area 19

- 100% believe deer numbers on their property are at or below desired levels.
- 100% favor the same season or more conservative season for 2014.

Area 20

- All surveyed believe deer numbers on their property are at or below desired levels.
- 88% favor a more conservative season or same for 2014.

Area 21

- All surveyed believe deer numbers on their property are at or below desired levels.
- All favor the same or more conservative season for 2014.

Overall Deer Survey Results

- 69 landowners answered the deer portion of the survey (some incomplete, only answering either the portion regarding population or season and not both, some not indicating hunt area).
- Most (65%) think that deer numbers are below desired levels with 35% of the respondents indicating that the herds are at desired levels and 0% indicating that herds are above desired levels.
- Most (56%) favor a more conservative season for 2014, with 35% indicating the same season and the remaining 9% indicating the need for a more liberal season.

Relationship to 2013 Post-season Population Estimate, Its Objective and Landowner Desires for the 2014 Hunting Season

- Powder River Herd Unit is below objective. Landowners generally desire a higher population of deer in the herd unit and prefer the same or more conservative season in 2014.
- Pumpkin Buttes Herd Unit is below objective. Landowners generally want the same or more conservative season for 2014.
- Black Hills Herd Unit is under objective. The Sheridan Region portion of the herd unit shows landowners indicating that the herd is at or below desired levels for mule deer. Most want to see the same or more conservative season in 2014.
- Cheyenne River Deer herd unit is below objective. The Sheridan Region portion of the herd unit shows landowners indicating that the herd at or below desired levels and favor the same or more conservative seasons for 2014.

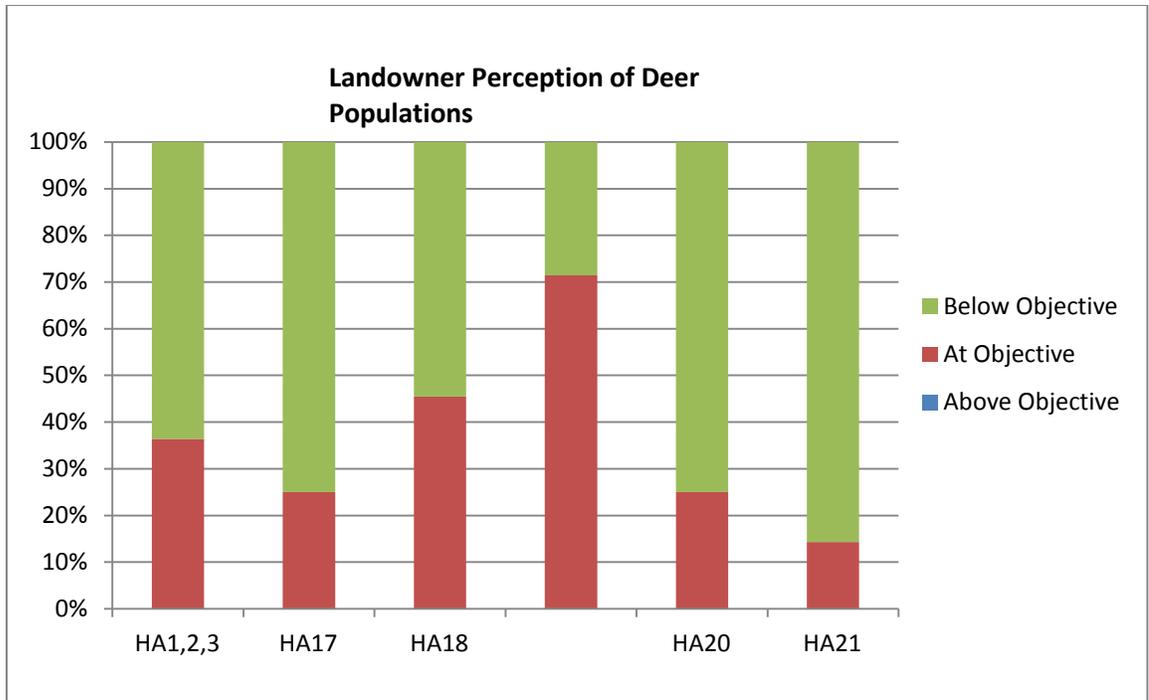


Figure 3. 2013 landowner survey results by herd unit regarding deer herd size compared to herd objective

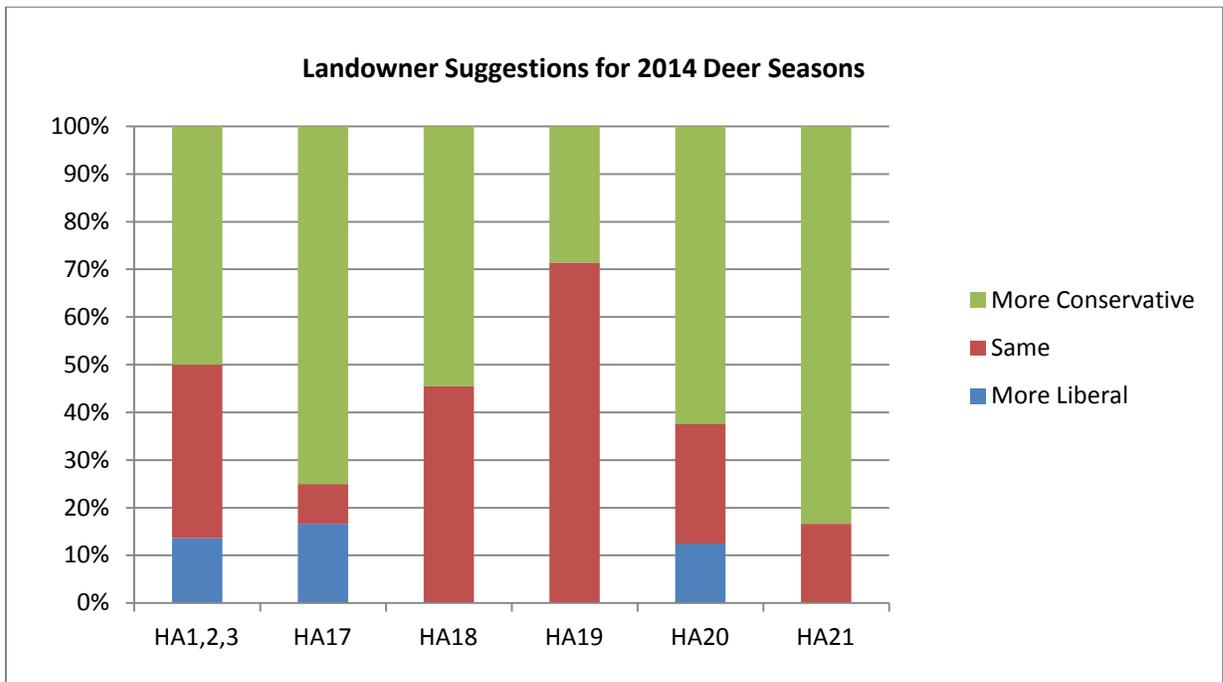


Figure 4. 2013 landowner survey results by herd unit regarding desired 2014 deer hunting seasons.

Table 2. Summary of responses by landowners regarding deer population levels and opinions for deer hunting seasons 1997– 2013.

| Hunt Area | Population | | | Season | | |
|--------------|---------------------|------------------|---------------------|---------------------|-------------|---------------------|
| | Below Desired Level | At Desired Level | Above Desired Level | More Conserv Season | Same Season | More Liberal Season |
| 1 | 7 | 5 | 0 | 5 | 5 | 2 |
| 3 | 5 | 1 | 0 | 4 | 2 | 0 |
| 8 | 0 | 1 | 0 | 0 | 1 | 0 |
| 10 | 2 | 0 | 0 | 1 | 1 | 0 |
| 17 | 9 | 3 | 0 | 9 | 1 | 2 |
| 18 | 6 | 5 | 0 | 6 | 5 | 0 |
| 19 | 2 | 5 | 0 | 2 | 5 | 0 |
| 20 | 6 | 2 | 0 | 5 | 2 | 1 |
| 21 | 6 | 1 | 0 | 5 | 1 | 0 |
| YEAR | | | | | | |
| *2013 | 43(65%) | 23(35%) | 0 | 37(57%) | 23(35%) | 5(8%) |
| 2012 | 106(66%) | 46(29%) | 8(5%) | 80(52%) | 65(42%) | 8(5%) |
| 2011 | 52 (71%) | 20 (28%) | 1 (1%) | 41 (59%) | 27 (39%) | 1 (1%) |
| 2010 | 56 (57%) | 38 (39%) | 4 (4%) | 40 (51%) | 49 (41%) | 8 (8%) |
| 2009 | 64 (57%) | 43 (38%) | 5 (4%) | 50 (45%) | 58 (52%) | 6 (5%) |
| 2008 | 28 (26%) | 72 (67%) | 7 (7%) | 17 (16%) | 78 (72%) | 13 (12%) |
| 2007 | 22 (18%) | 83 (66%) | 20 (16%) | 13 (10%) | 88 (70%) | 24 (19%) |
| 2006 | 24 (18%) | 75 (57%) | 32 (24%) | 14 (11%) | 77 (58%) | 41 (31%) |
| 2005 | 18 (19%) | 54 (56%) | 25 (26%) | 14 (14%) | 60 (61%) | 25 (25%) |
| 2004 | 52 (29%) | 98 (55%) | 29 (16%) | 30 (17%) | 117 (67%) | 29 (16%) |
| 2003 | 57 (30%) | 110 (58%) | 23 (12%) | 34 (19%) | 108 (61%) | 35 (20%) |
| 2002 | 43 (32%) | 76 (56%) | 17 (13%) | 30 (22%) | 84 (62%) | 22 (16%) |
| 2001 | 44 (35%) | 65 (52%) | 17 (13%) | 34 (27%) | 74 (59%) | 18 (14%) |
| 2000 | 38 (29%) | 73 (57%) | 18 (14%) | 34 (26%) | 66 (51%) | 30 (23%) |
| 1999 | 30 (29%) | 56 (55%) | 16 (16 %) | 26 (25%) | 56 (55%) | 20 (20%) |
| 1998 | 60 (47%) | 63 (49%) | 6 (5%) | 51 (39%) | 65 (50%) | 15 (11%) |
| 1997 | 64 (47%) | 56 (41%) | 16 (12%) | 57 (42%) | 61 (45%) | 18 (13%) |

*Note-Totals of Hunt Area may not equal total for 2013. This is due to some landowners not reporting what area they are in or answering only portions of the survey. They're opinions were factored into the total, but not by Hunt Area.

APPENDIX C

2013 Buffalo/Kaycee Landowner Survey

May 20, 2014

Prepared by Dan Thiele

Buffalo Wildlife Biologist
Wyoming Game & Fish Department

The 15^h Buffalo/Kaycee landowner postseason survey was conducted following the 2013 hunting season. About 170 landowners were queried on their perceptions of antelope, mule deer, white-tailed deer and elk populations as well as what hunting season adjustments they recommend for the 2014 hunting seasons. The survey was mailed along with a landowner coupon form and information on submitting landowner coupons for reimbursement. Landowners were asked the following questions for each species that occupies their ranches (antelope, mule deer, white-tailed deer, and elk):

Overall for your area, is the (*species*) population:

- Below or less than desired levels
- At or about right at desired levels
- Above or higher than desired levels

For next year, would you like to see the (*species*) hunting seasons:

- More conservative with fewer licenses
- About the same as this year
- More liberal with more licenses

Beginning in 2005, landowners were also asked if they were willing to provide free access for doe/fawn antelope and/or deer hunting. General comments were also requested.

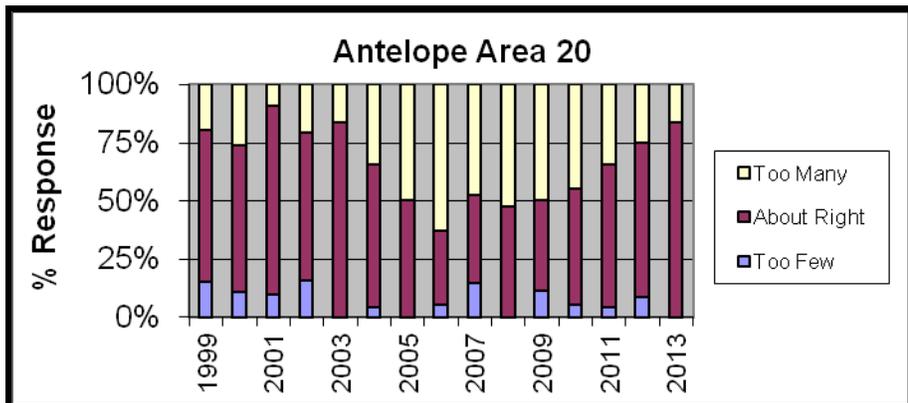
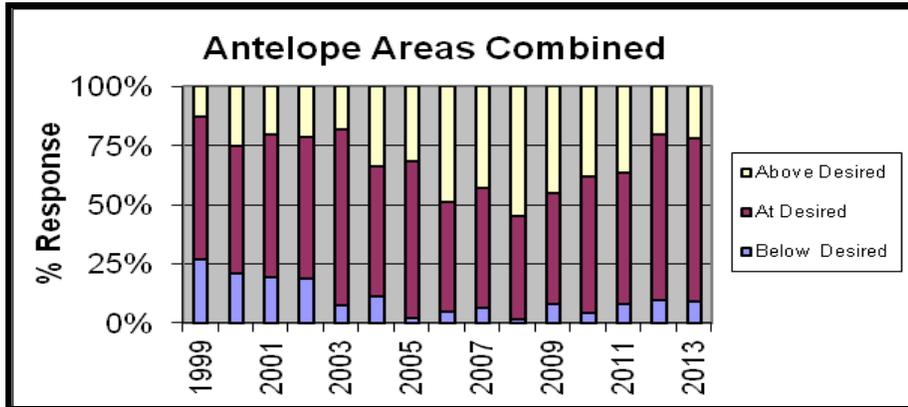
Sixty-seven responses were received for a response rate of 34%. This compares to 40% in 2012, 47% in 2011 and 46% in 2009 and 2010. Results of the 2013 survey and 15-year trends are provided below. Not all landowners responded to each question or for each species. Some landowners are credited with a response in more than one hunt area because of landownership patterns. Therefore, total responses may exceed the number of actual survey returns. The total (*n*) references the number of landowners who responded for the respective species followed by the totals for all hunt areas. Samples are generally low at the hunt area level limiting the confidence in the results.

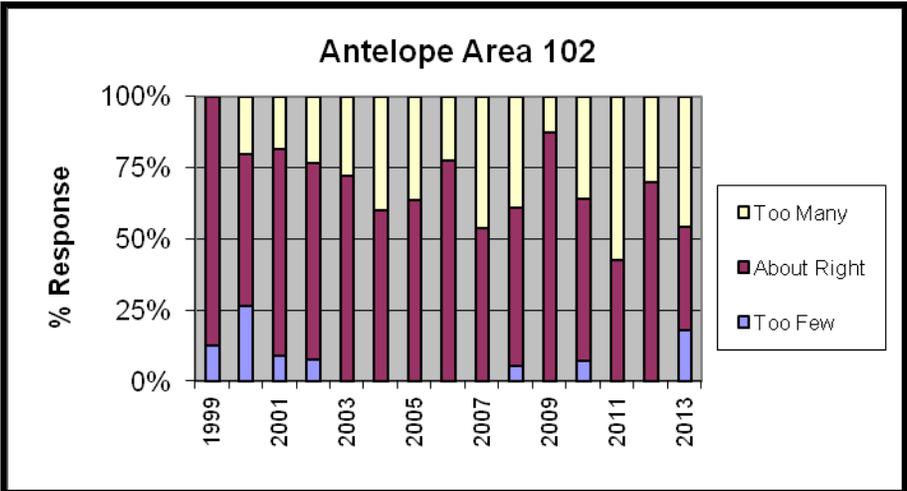
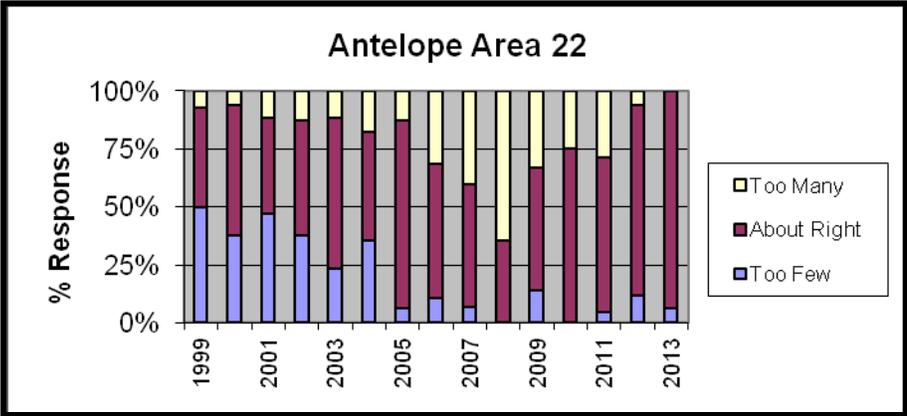
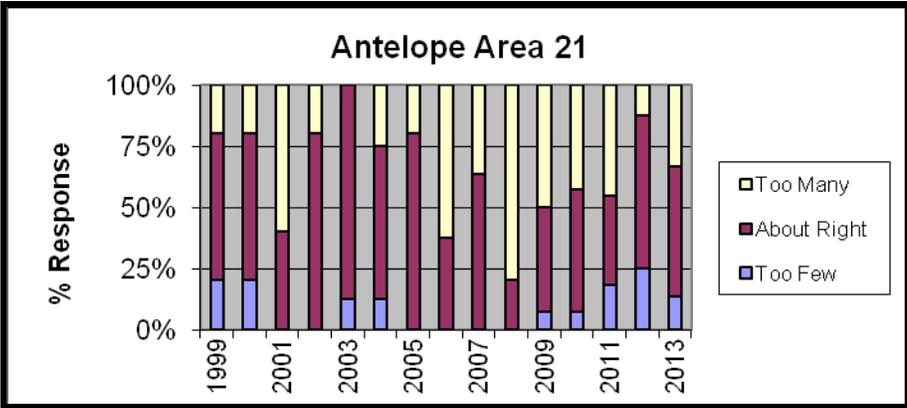
Some interpretation of survey responses was needed as some landowners responded for species they do not have, or, have limited numbers of. For example, a landowner who has low potential for antelope on a ranch and responded they are below desired numbers was not included in the final results.

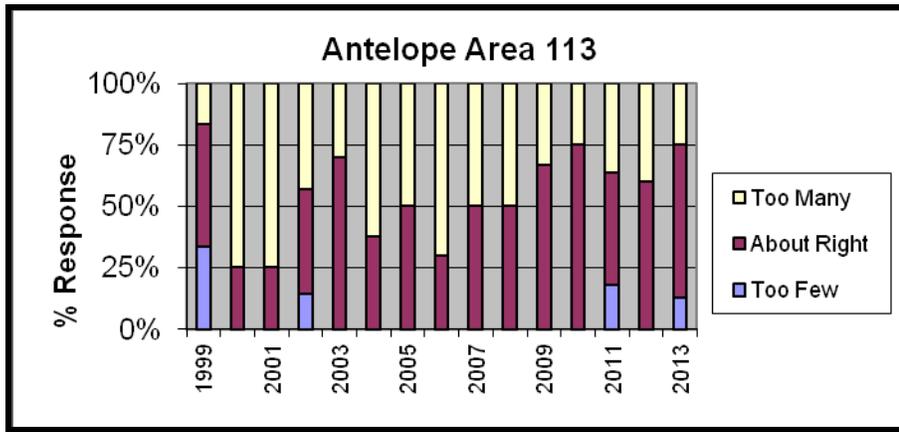
Combining all hunt area responses by species indicates that landowners believe antelope numbers have decreased over the last five years. Responses for mule deer suggest the decline in deer numbers may have moderated the last four years with numbers remaining well below desired levels. The 2011 results showed the lowest percentage of landowners reporting too many deer and the highest percentage reporting too few deer. Responses for white-tailed deer indicate numbers are down noticeably in several hunter areas due to a 2013 EHD outbreak and liberal hunting seasons. Combined responses show the percentage of landowners responding that white-tail deer numbers are too high dropped from 65% in 2012 to 43% in 2013. The most notable decrease was in Area 27 where 73% of responding landowners reported numbers at acceptable levels. The combined hunt areas response for elk indicates that numbers have remained relatively stable the last five years. The 2013 survey suggests 71% of landowners are satisfied with current elk numbers. A number of factors can influence landowner responses including population size, annual precipitation and depredation problems.

Seven landowners responded they would accept doe/fawn hunters free of charge for one or more species.

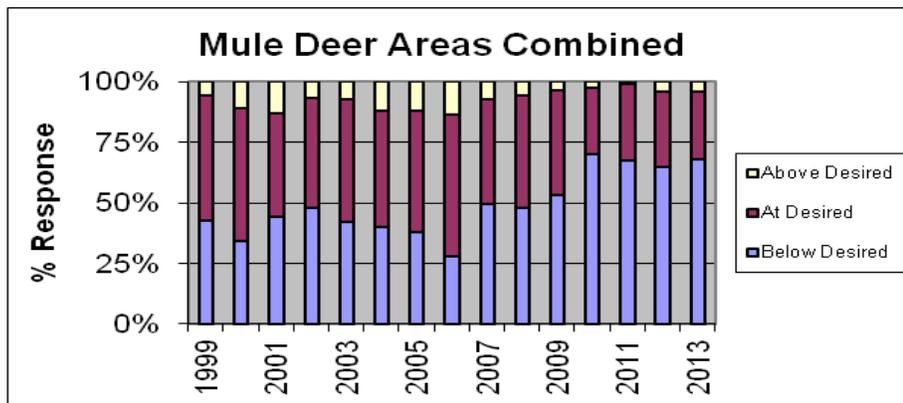
| Antelope | Population | | | Seasons | | |
|---------------------|----------------------|-------------------|----------------------|----------------------|--------------|----------------------|
| Hunt Area | Below Desired Levels | At Desired Levels | Above Desired Levels | More Conserv Seasons | Same Seasons | More Liberal Seasons |
| 20 | 0 | 15 | 3 | 1 | 15 | 2 |
| 21 | 2 | 8 | 5 | 2 | 9 | 4 |
| 22 | 1 | 15 | 0 | 2 | 14 | 0 |
| 102 | 2 | 4 | 5 | 0 | 4 | 6 |
| 113 | 1 | 5 | 2 | 1 | 3 | 2 |
| TOTAL (n=61) | 6 (9%) | 47 (69%) | 15 (22%) | 6 (9%) | 45 (69%) | 14 (22%) |
| 2012 (n=56) | 6 (10%) | 45 (71%) | 12 (19%) | 6 (10%) | 45 (71%) | 12 (19%) |
| 2011 (n=65) | 6 (8%) | 42 (55%) | 28 (37%) | 5 (7%) | 51 (67%) | 20 (26%) |
| 2010 (n=60) | 3 (4%) | 46 (61%) | 27 (35%) | 3 (4%) | 55 (74%) | 16 (22%) |
| 2009 (n=66) | 6 (8%) | 35 (47%) | 34 (45%) | 4 (5%) | 44 (59%) | 27 (36%) |
| 2008 (n=62) | 1 (1%) | 30 (44%) | 38 (55%) | 1 (2%) | 39 (58%) | 27 (40%) |
| 2007 (n=61) | 4 (6%) | 33 (51%) | 28 (43%) | 4 (6%) | 39 (60%) | 22 (34%) |
| 2006 (n=60) | 3 (4%) | 32 (47%) | 34 (49%) | 3 (4%) | 39 (57%) | 27 (39%) |
| 2005 (n=52) | 1 (2%) | 38 (67%) | 18 (32%) | 0 (0%) | 42 (75%) | 14 (25%) |
| 2004 (n=61) | 8 (11%) | 39 (55%) | 24 (34%) | 8 (11%) | 39 (56%) | 23 (33%) |
| 2003 (n=65) | 5 (7%) | 53 (75%) | 13 (18%) | 7 (10%) | 52 (74%) | 11 (16%) |
| 2002 (n=59) | 11 (18%) | 36 (60%) | 13 (22%) | 9 (15%) | 40 (68%) | 10 (17%) |
| 2001 (n=52) | 11 (19%) | 35 (60%) | 12 (21%) | 9 (16%) | 42 (75%) | 5 (9%) |
| 2000 (n=59) | 13 (21%) | 34 (54%) | 16 (25%) | 9 (14%) | 39 (62%) | 15 (24%) |
| 1999 (n=46) | 14 (27%) | 32 (60%) | 7 (13%) | 13 (25%) | 36 (69%) | 3 (6%) |

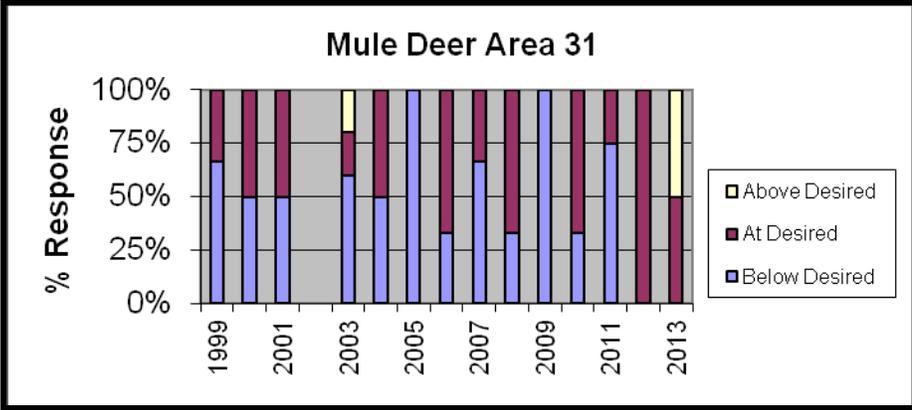
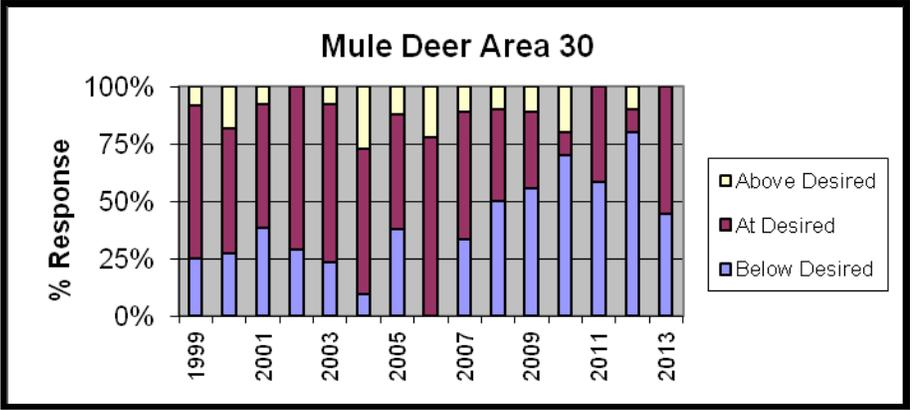
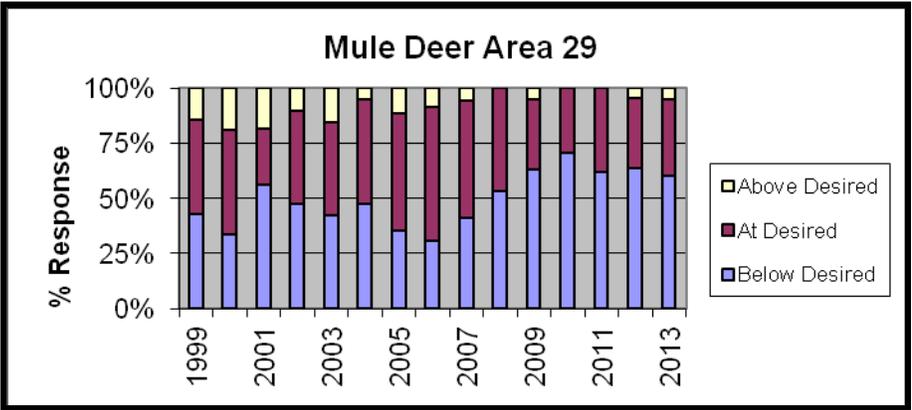
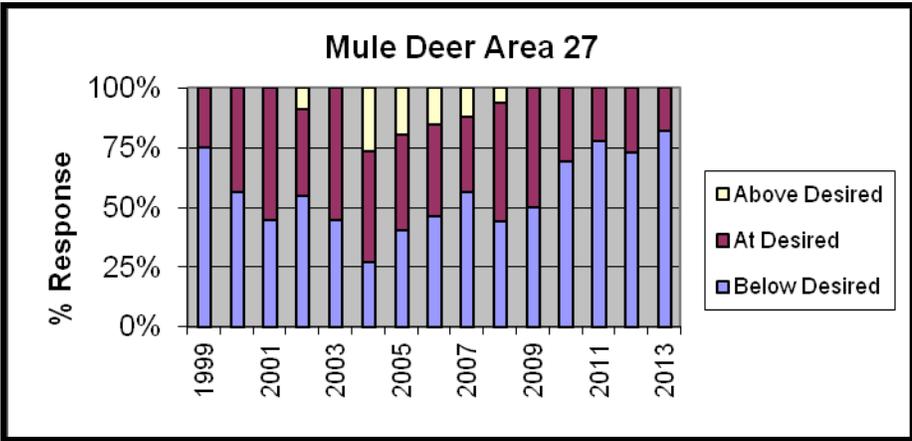


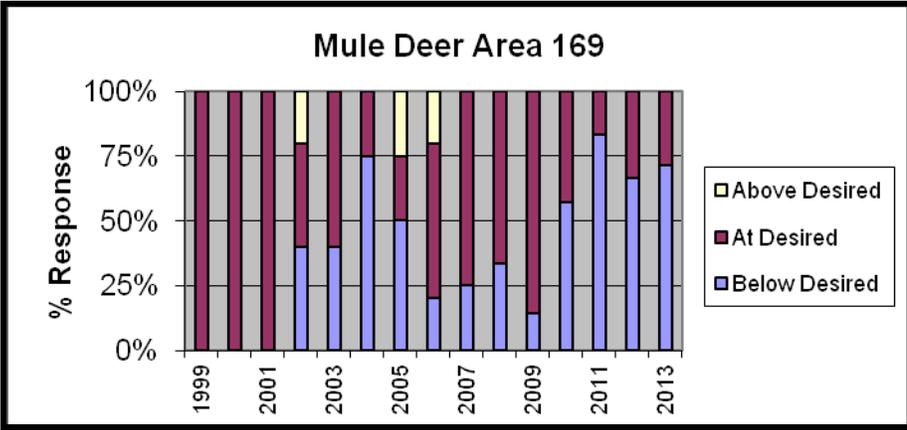
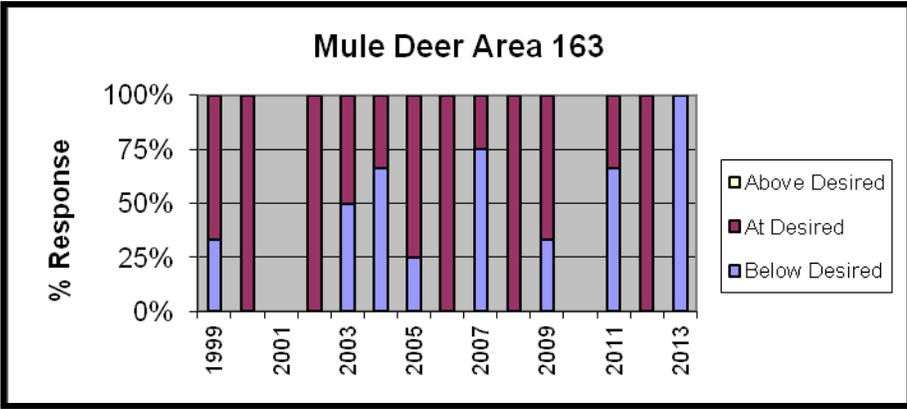
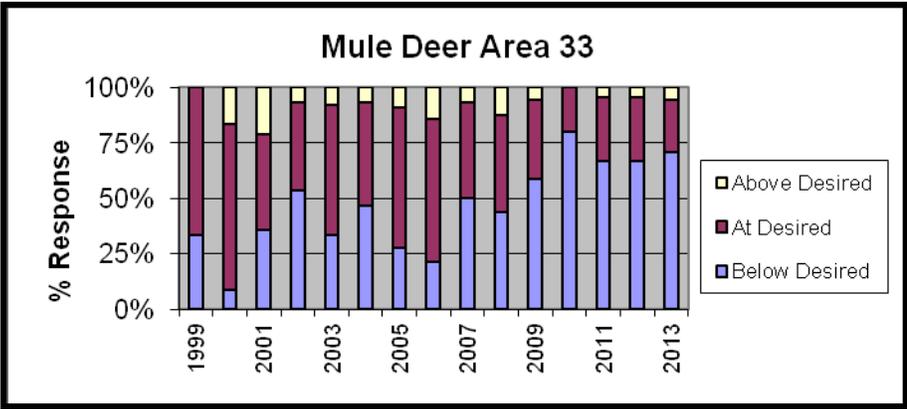
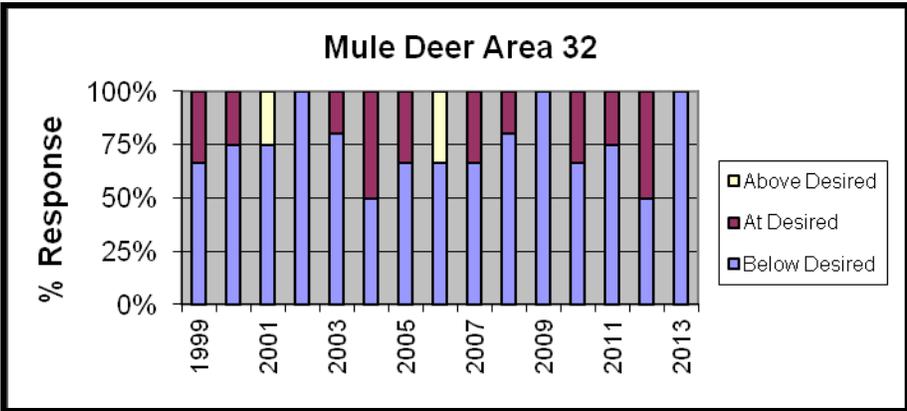




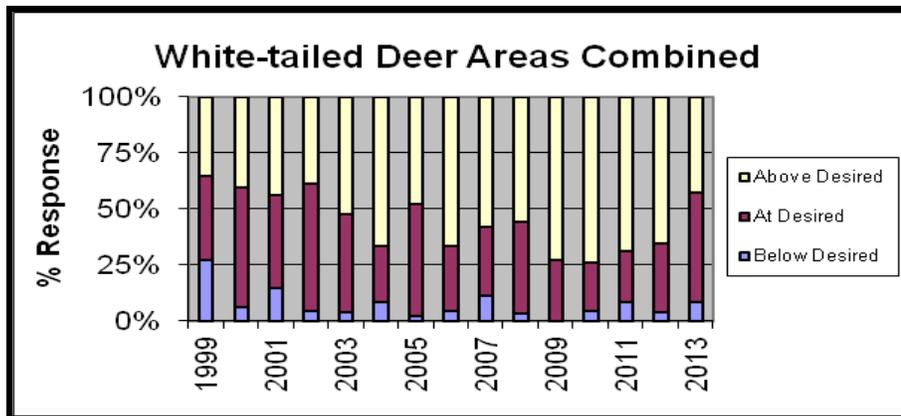
| Mule Deer Hunt Area | Population | | | Seasons | | |
|------------------------|----------------------------|-------------------------|----------------------------|----------------------------|-----------------|----------------------------|
| | Below Desired Levels | At Desired Levels | Above Desired Levels | More Conserv Seasons | Same Seasons | More Liberal Seasons |
| 27 | 9 | 2 | 0 | 7 | 3 | 0 |
| 29 | 12 | 7 | 1 | 10 | 8 | 1 |
| 30 | 4 | 5 | 0 | 5 | 4 | 0 |
| 31 | 0 | 1 | 1 | 1 | 0 | 1 |
| 32 | 3 | 0 | 0 | 2 | 1 | 0 |
| 33 | 12 | 4 | 1 | 12 | 4 | 1 |
| 163 | 5 | 0 | 0 | 4 | 1 | 0 |
| 169 | 5 | 2 | 0 | 5 | 2 | 0 |
| TOTAL (n=61) | 50 (68%) | 21 (28%) | 3 (4%) | 46 (64%) | 23 (32%) | 3 (4%) |
| 2012 (n=55) | 48 (65%) | 23 (31%) | 3 (4%) | 30 (45%) | 33 (49%) | 4 (6%) |
| 2011 (n=66) | 54 (68%) | 25 (31%) | 1 (1%) | 48 (64%) | 25 (33%) | 2 (3%) |
| 2010 (n=61) | 51 (70%) | 20 (27%) | 2 (3%) | 30 (44%) | 37 (54%) | 1 (2%) |
| 2009 (n=64) | 41 (53%) | 33 (43%) | 3 (4%) | 21 (30%) | 42 (61%) | 6 (9%) |
| 2008 (n=62) | 33 (48%) | 32 (46%) | 4 (6%) | 17 (25%) | 47 (69%) | 4 (6%) |
| 2007 (n=62) | 34 (49%) | 30 (44%) | 5 (7%) | 26 (39%) | 33 (50%) | 7 (11%) |
| 2006 (n=59) | 20 (28%) | 42 (58%) | 10 (14%) | 15 (22%) | 45 (64%) | 10 (14%) |
| 2005 (n=50) | 22 (38%) | 29 (50%) | 7 (12%) | 16 (32%) | 34 (68%) | 5 (10%) |
| 2004 (n=64) | 30 (40%) | 36 (48%) | 9 (12%) | 21 (31%) | 36 (52%) | 12 (17%) |
| 2003 (n=66) | 33 (42%) | 40 (51%) | 6 (7%) | 23 (29%) | 46 (59%) | 9 (12%) |
| 2002 (n=69) | 34 (48%) | 32 (45%) | 5 (7%) | 24 (34%) | 45 (63%) | 2 (3%) |
| 2001 (n=52) | 27 (44%) | 26 (43%) | 8 (13%) | 17 (29%) | 37 (63%) | 5 (8%) |
| 2000 (n=63) | 24 (34%) | 39 (55%) | 8 (11%) | 19 (27%) | 40 (56%) | 12 (17%) |
| 1999 (n=47) | 23 (43%) | 28 (52%) | 3 (5%) | 18 (32%) | 34 (61%) | 4 (7%) |

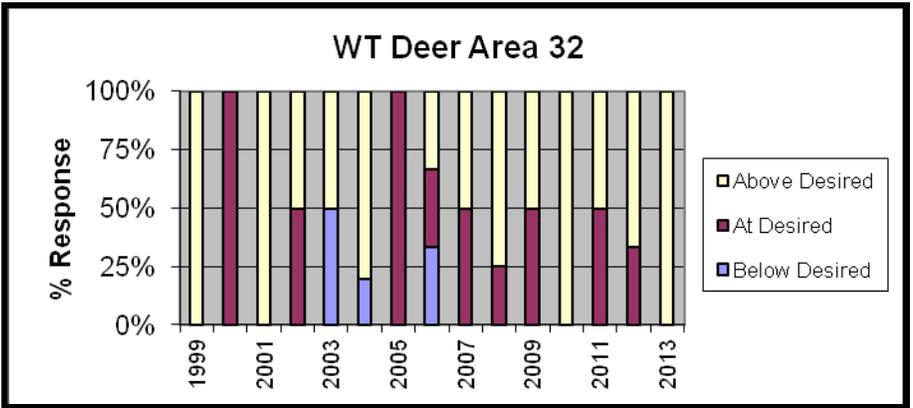
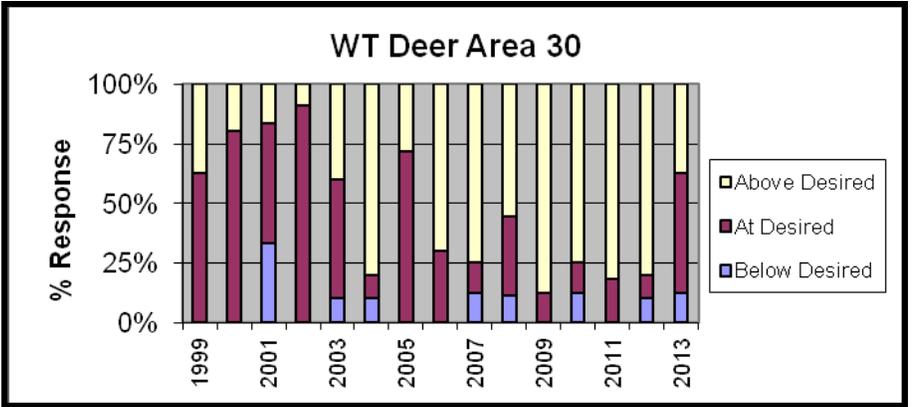
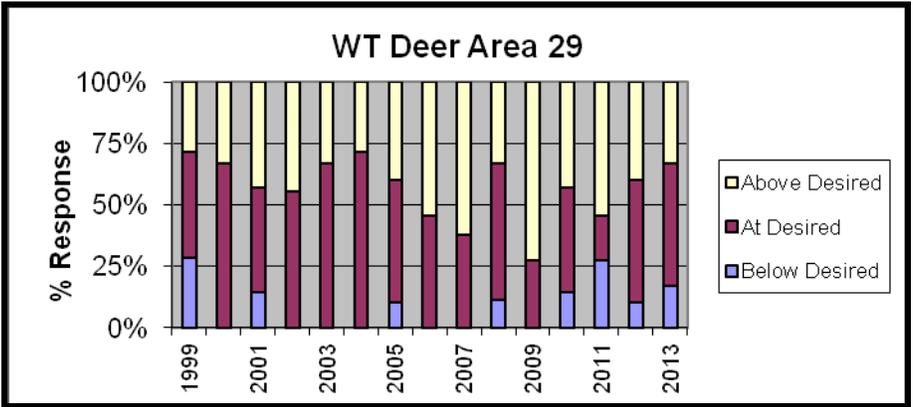
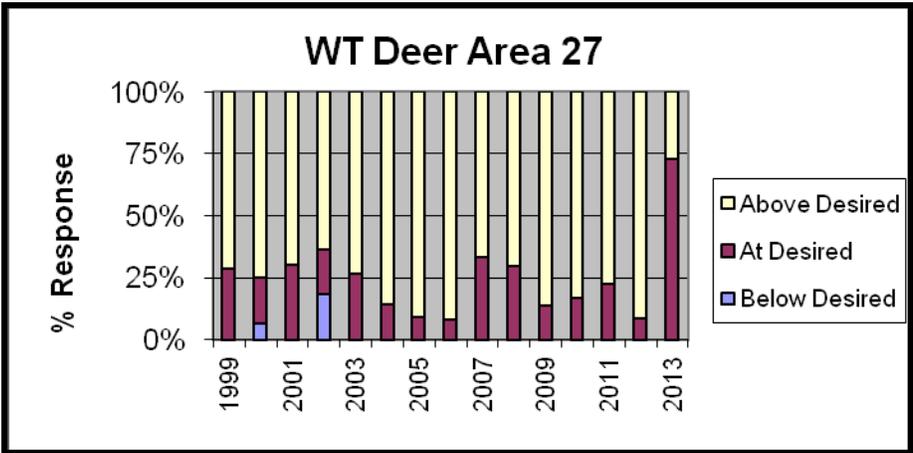


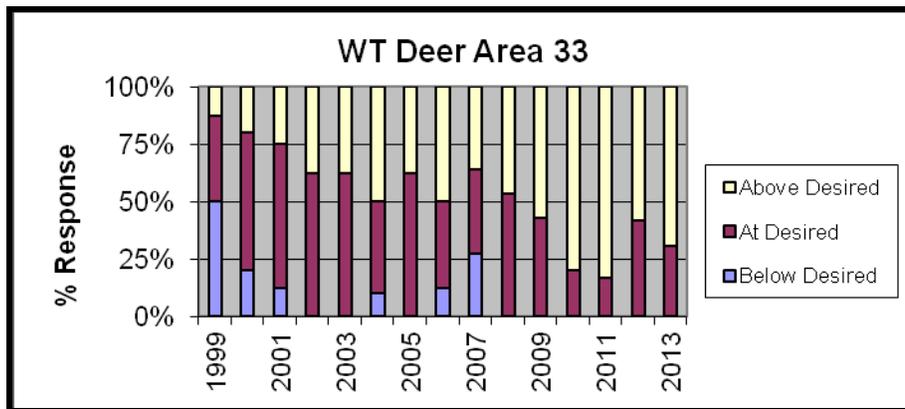




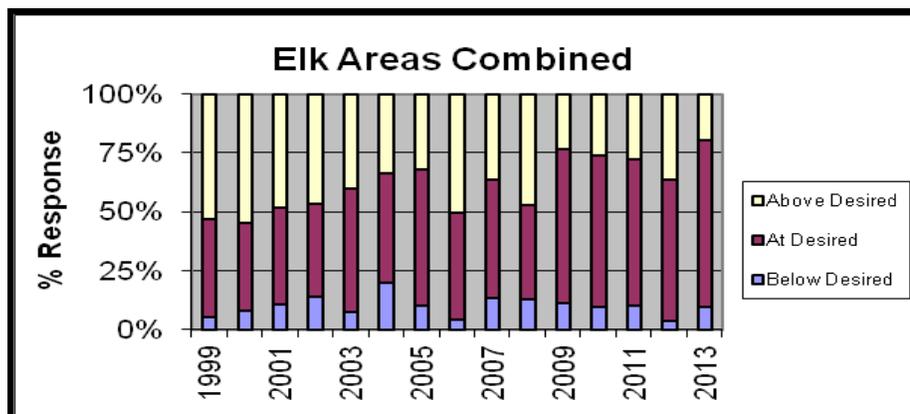
| WT Deer Hunt Area | Population | | | Seasons | | |
|----------------------|----------------------------|-------------------------|----------------------------|----------------------------|-----------------|----------------------------|
| | Below Desired Levels | At Desired Levels | Above Desired Levels | More Conserv Seasons | Same Seasons | More Liberal Seasons |
| 27 | 0 | 8 | 3 | 0 | 9 | 2 |
| 29 | 2 | 6 | 4 | 2 | 8 | 2 |
| 30 | 1 | 4 | 3 | 2 | 6 | 0 |
| 31 | 0 | 0 | 0 | 0 | 0 | 0 |
| 32 | 0 | 0 | 1 | 0 | 0 | 1 |
| 33 | 0 | 4 | 9 | 1 | 7 | 5 |
| 163 | 1 | 1 | 0 | 0 | 2 | 0 |
| 169 | 0 | 0 | 0 | 0 | 0 | 0 |
| TOTAL (n=43) | 4 (8%) | 23 (49%) | 20 (43%) | 5 (11%) | 32 (68%) | 10 (21%) |
| 2012 (n=45) | 2 (4%) | 15 (31%) | 32 (65%) | 2 (4%) | 26 (53%) | 21 (43%) |
| 2011 (n=47) | 4 (8%) | 11 (23%) | 33 (69%) | 4 (9%) | 18 (39%) | 24 (52%) |
| 2010 (n=43) | 2 (4%) | 10 (22%) | 34 (74%) | 1 (2%) | 20 (47%) | 22 (51%) |
| 2009 (n=49) | 0 (0%) | 14 (27%) | 37 (73%) | 0 (0%) | 16 (33%) | 32 (67%) |
| 2008 (n=49) | 2 (4%) | 22 (41%) | 30 (55%) | 1 (2%) | 27 (50%) | 26 (48%) |
| 2007 (n=50) | 5 (11%) | 14 (31%) | 26 (58%) | 2 (5%) | 18 (44%) | 21 (51%) |
| 2006 (n=48) | 2 (4%) | 13 (29%) | 30 (67%) | 2 (4%) | 17 (39%) | 25 (57%) |
| 2005 (n=37) | 1 (2%) | 20 (50%) | 19 (48%) | 1 (2%) | 20 (50%) | 19 (48%) |
| 2004 (n=46) | 4 (8%) | 12 (25%) | 32 (67%) | 4 (9%) | 13 (28%) | 30 (64%) |
| 2003 (n=47) | 2 (4%) | 21 (44%) | 25 (52%) | 3 (6%) | 19 (40%) | 26 (54%) |
| 2002 (n=43) | 2 (4%) | 25 (57%) | 17 (39%) | 4 (9%) | 26 (59%) | 14 (32%) |
| 2001 (n=41) | 6 (15%) | 17 (41%) | 18 (44%) | 5 (13%) | 17 (43%) | 18 (45%) |
| 2000 (n=45) | 3 (6%) | 25 (53%) | 19 (41%) | 2 (4%) | 28 (60%) | 17 (36%) |
| 1999 (n=41) | 10 (27%) | 14 (38%) | 13 (35%) | 4 (11%) | 22 (59%) | 11 (30%) |

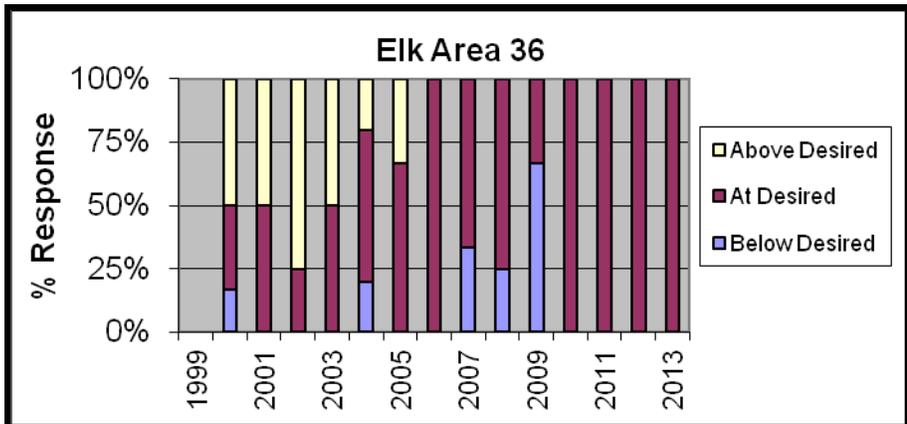
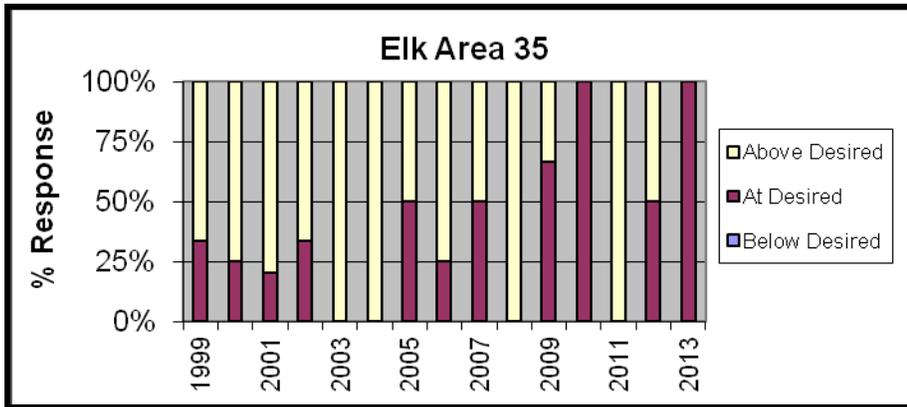
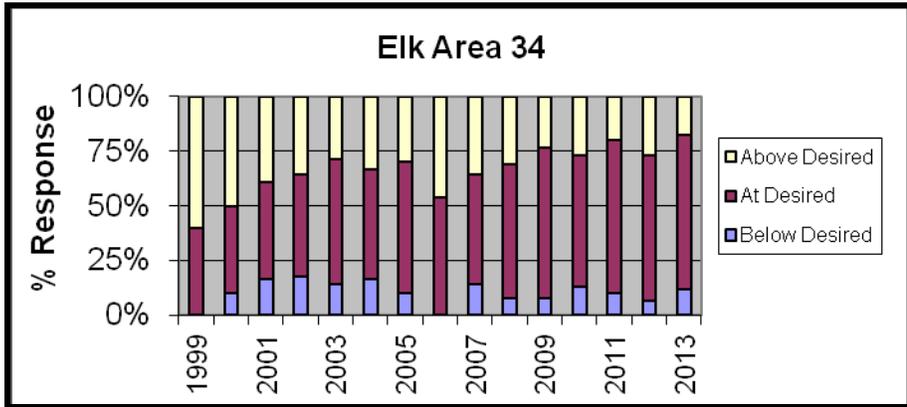
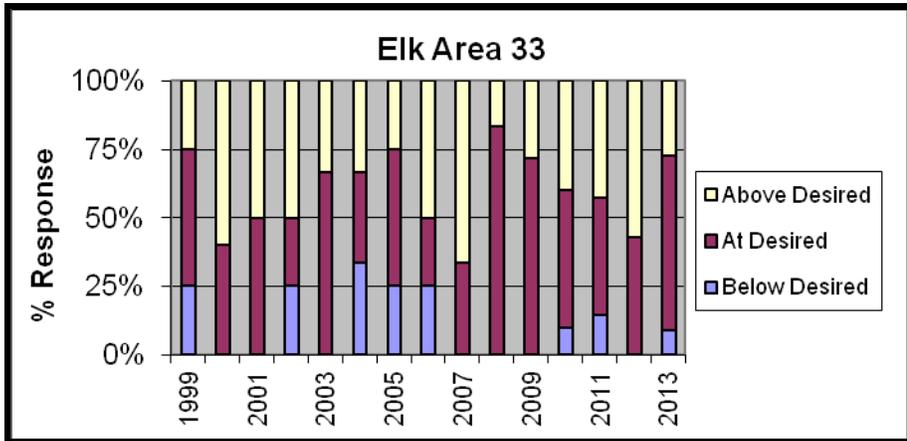






| Elk Hunt Area | Population | | | Seasons | | |
|---------------------|----------------------------|-------------------------|----------------------------|----------------------------|-----------------|----------------------------|
| | Below Desired Levels | At Desired Levels | Above Desired Levels | More Conserv Seasons | Same Seasons | More Liberal Seasons |
| 33 | 1 | 7 | 3 | 2 | 6 | 3 |
| 34 | 2 | 12 | 3 | 1 | 16 | 0 |
| 35 | 0 | 2 | 0 | 0 | 2 | 0 |
| 36 | 0 | 1 | 0 | 0 | 1 | 0 |
| TOTAL (n=34) | 3 (10%) | 22 (71%) | 6 (19%) | 3 (10%) | 25 (80%) | 3 (10%) |
| 2012 (n=23) | 1 (4%) | 15 (60%) | 9 (36%) | 1 (4%) | 18 (75%) | 5 (21%) |
| 2011 (n=31) | 3 (10%) | 18 (62%) | 8 (28%) | 2 (7%) | 21 (72%) | 6 (21%) |
| 2010 (n=30) | 3 (10%) | 20 (64%) | 8 (26%) | 3 (10%) | 22 (73%) | 5 (17%) |
| 2009 (n=30) | 3 (12%) | 17 (65%) | 6 (23%) | 1 (4%) | 19 (73%) | 6 (23%) |
| 2008 (n=25) | 2 (8%) | 16 (64%) | 7 (28%) | 0 (0%) | 19 (76%) | 6 (24%) |
| 2007 (n=22) | 3 (14%) | 11 (50%) | 8 (36%) | 5 (24%) | 8 (38%) | 8 (38%) |
| 2006 (n=22) | 1 (5%) | 10 (45%) | 11 (50%) | 2 (9%) | 13 (59%) | 7 (32%) |
| 2005 (n=19) | 2 (10%) | 11 (58%) | 6 (32%) | 1 (5%) | 15 (79%) | 3 (16%) |
| 2004 (n=30) | 6 (20%) | 14 (47%) | 10 (33%) | 3 (10%) | 20 (69%) | 6 (21%) |
| 2003 (n=25) | 2 (8%) | 13 (52%) | 10 (40%) | 0 (0%) | 14 (58%) | 10 (42%) |
| 2002 (n=28) | 4 (14%) | 11 (39%) | 13 (47%) | 6 (21%) | 16 (57%) | 6 (21%) |
| 2001 (n=25) | 3 (11%) | 11 (41%) | 13 (48%) | 3 (11%) | 16 (59%) | 8 (30%) |
| 2000 (n=33) | 3 (9%) | 13 (37%) | 19 (54%) | 3 (8%) | 22 (61%) | 11 (31%) |
| 1999 (n=17) | 1 (6%) | 7 (41%) | 9 (53%) | 3 (18%) | 11 (65%) | 3 (18%) |





Landowner Comments

Mitchell Esponda – Opposed to proposed early cow season Area 49 / Aug 15th too early.

Antelope Springs Ranch – MD Limited quota – have been requesting this for years. We have too many hunters This year fewer because it was too snowy and muddy.

Emerich Huber, Kaycee Land & Livestock – MD 4-pt or more

Lollie Plank – We do take hunters but with the repeat ones it fills us up.

Willow Cr Ranch – MD maybe point requirement. Elk Area 33 need more out of state licenses.

Kenneth Graves – Elk Area 34 end cow elk licenses Nov 20th. End WTD season Oct 31st.

Gary Godley – MD Area 29 I don't allow deer hunting. Numbers not high enough here on this ranch.

Dennis Hepp – make WTD season longer with extra buck tags for Area 32.

Ellis Sheep Co – 10 days of wonderful mud inhibited the hunt activities for antelope and deer. Elk Area 33 in the south end of the Bghorns wolf activity keeps the animals bunched and moving, and a major snow storm cut off access to the area.

Karen Kithis, Blue Cr Ranch – limit in state antelope and deer general licenses.

Talking Waters Ranch – WTD Area 30 shorter season.

2014 Free Doe Fawn

Joe Kalus – ANT 102

George Mathis – ANT 102 (call for dates)

Mitchell Esponda – WTD 29

Dave DeRuiter – ANT 22 / MD 29

Pat Garrett – WTD 29 (after Oct 15th - then will depend on drought, cows, etc)

Chris Brock – ANT 20 / WTD 33 / MD 33

Brad Neville – ANT 73

APPENDIX D

Shrub Monitoring Results for the Sheridan Region

Shrub monitoring was again conducted during fall 2013 and spring 2014 in the Sheridan Region to provide baseline habitat trend data to increase the awareness of habitat condition/trend among wildlife biologists and game wardens as they manage wildlife populations. These surveys were designed to:

- Monitor “key” or “indicator” areas that appear to reflect what is occurring within the larger area and where the vegetation community may show reactions or changes to population management.
- Use vegetation and habitat trend data to assist with justification of season recommendations and population objectives.
- Increase awareness of wildlife biologists, game wardens and the public of annual vegetation condition and long-term trends.
- Keep the process relatively simple for annual monitoring and assessment and include a minimum of one transect for each warden district and two transects for each wildlife biologist district. Each transect should be visited twice each year with data collected in the fall and in the spring. Historical transect locations and coordination with other land management agencies should be considered.
- Vegetation monitoring priority is in sagebrush and sagebrush steppe communities, however, other shrub communities and other vegetation type communities will be monitored as identified by Regional personnel.

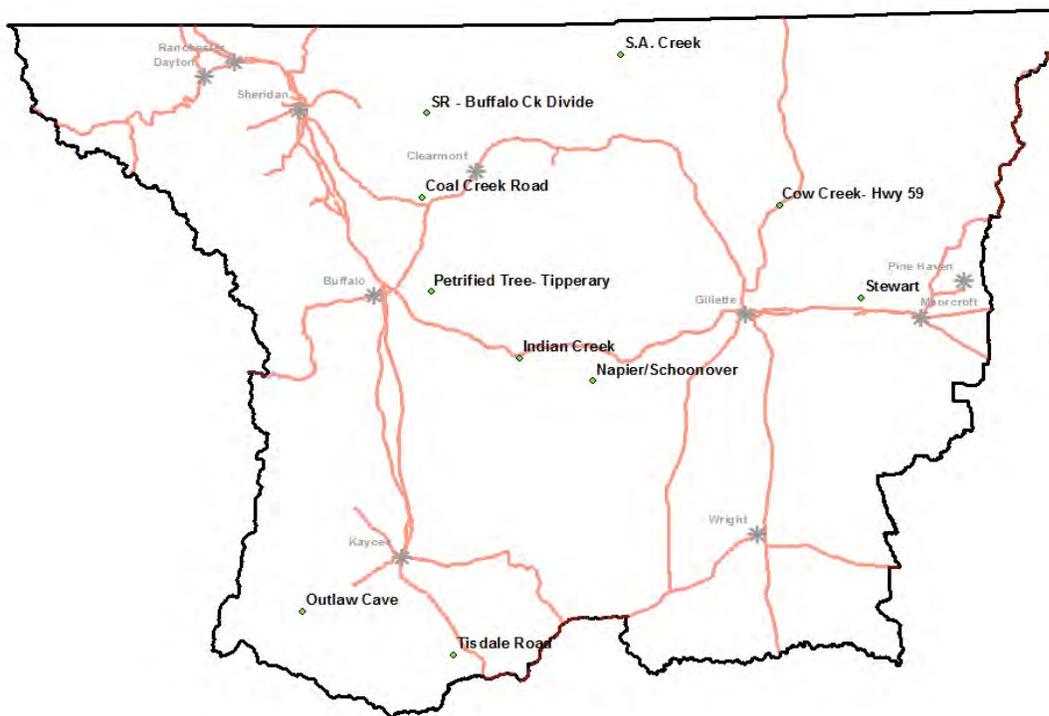
Basic data collection techniques are referenced in Appendix XII of the Handbook of Biological Techniques, WGFD 2007, pages 7-17. Minimum data collection requirements for the monitoring stations established regardless of vegetation community type or specific plant species include:

1. Measure annual production on a minimum of 5 leaders from at least 50 plants at paced intervals in late summer/fall after plant growth and prior to leaf drop or loss.
2. Measure annual utilization as number of leaders browsed from a minimum of 10 leaders from each of 50 plants at paced intervals collected in late winter or early spring prior to plant growth and after most animals have left the area.
3. Determine spring pellet group density from at least 10 circular 1/100 Ac plots.
4. Repeat photos (3 photos) collected in the spring and fall.
5. Nearby weather station summaries or on-site data if collected.
6. Permanent 4’x4’ hog wire cage to show large ungulate non-use as compared to use areas.
7. Shrub/tree age class categories for a minimum of 50 plants collected in the fall. Categories for describing shrub classes range from 1-4, with 1=young, 2=mature, 3=decadent, and 4=dead.

8. Shrub/tree hedging class categories for a minimum of 50 plants collected in the fall. Categories for describing shrub hedging range from 1-3, with 1=light, 2=moderate, and 3=severe.

Nine sagebrush transects and one curlleaf mountain mahogany transect were established at locations presented in Figure 1. Precipitation data is taken from four NOAA/NWS cooperative observer precipitation sites located at Leiter, Buffalo, Kaycee, and Gillette.

Figure 1. Locations of Sheridan Region Shrub Transects.



Leader Production

Sheridan Area

In the Sheridan area, leader production estimates were taken on two Wyoming big sagebrush transects, SA Creek and SR Buffalo Creek. Average leader production measured during the fall 2013 at SA Creek and SR Buffalo Creek was 15.9 and 4.6 cm, respectively. There were no leader growth measurements taken on the Coal Creek transect in 2013. Leader production was higher than the ten year average at SA Creek and SR Buffalo Creek for those respective sites. Precipitation in the Sheridan area for 2013 was 19.65 inches, which was higher than the ten year average. See graphs in Fig. 2.

Buffalo Area

In the Buffalo area, leader production estimates were taken on two Wyoming big sagebrush transects, Indian Creek, and Napier/Schoonover. Average leader production measured during fall 2013 for Indian Creek and Napier/Schoonover was 0.7 and 14.12 cm, respectively. There were no leader production estimates taken on Petrified Tree-Tipperary transect in 2013. Indian Creek leader production was lower than the ten year average, while Napier/Schoonover was higher than the ten year average for those respective sites. Precipitation in the Buffalo area for 2013 was 13.04 inches, which was slightly higher than the ten year average. See graphs in Fig. 2.

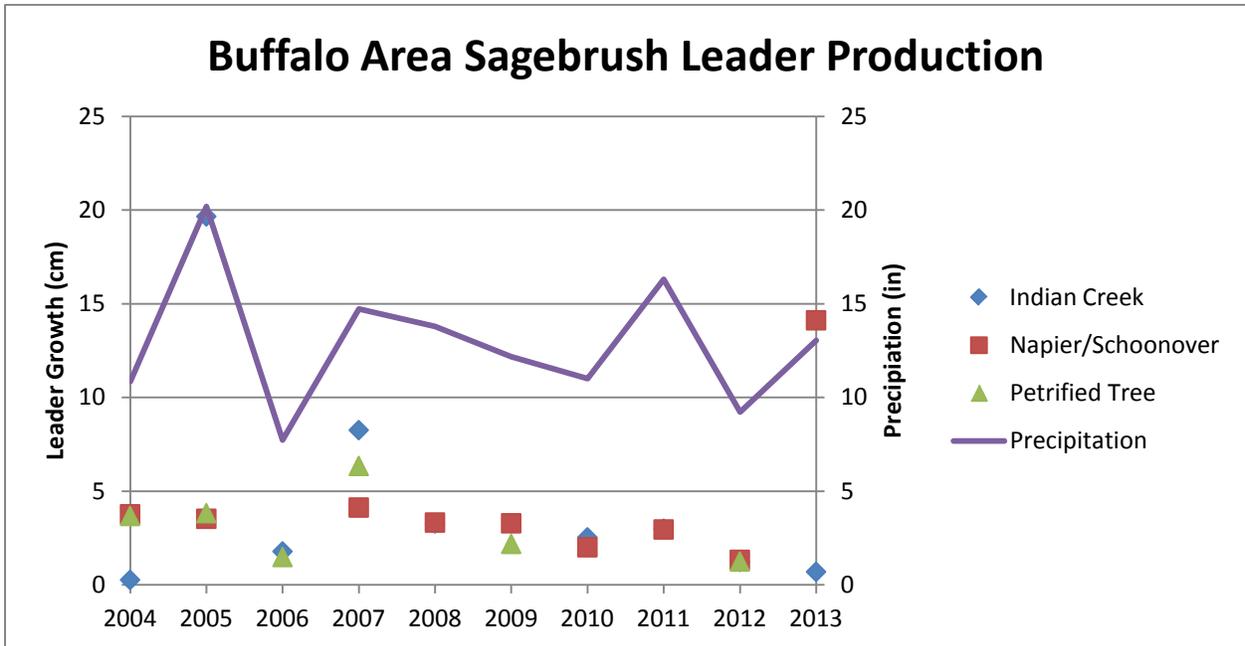
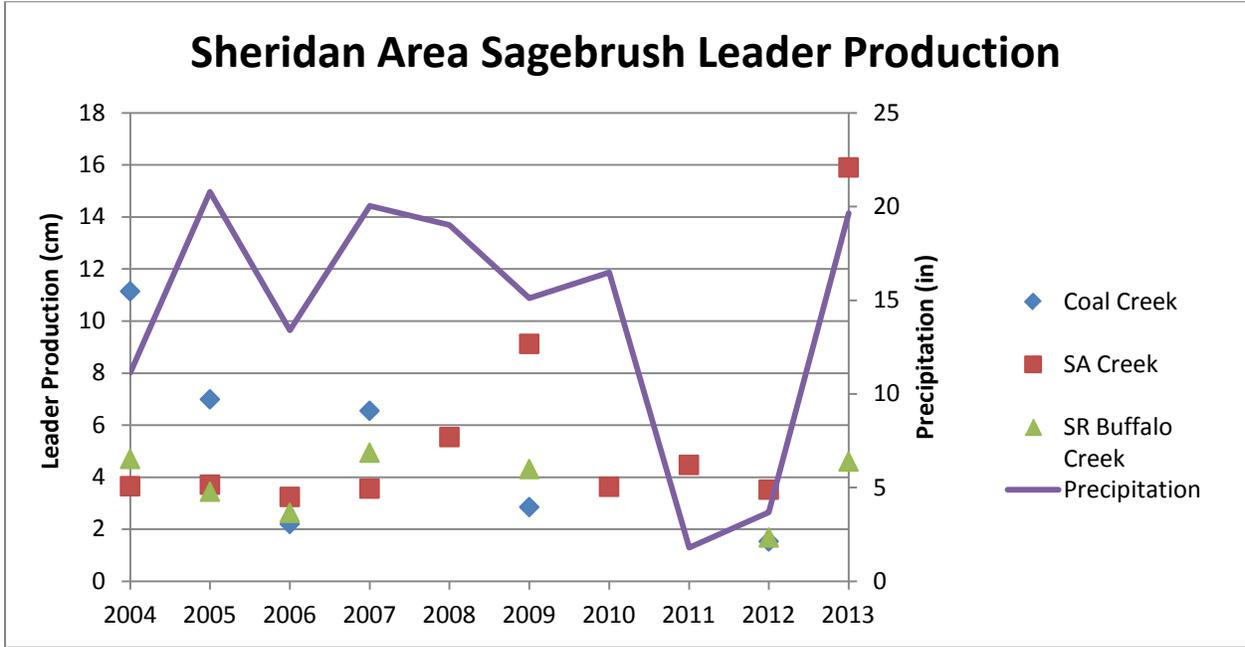
Kaycee Area

In the Kaycee area, leader production estimates were taken on one Wyoming big sagebrush transect, Tisdale Road, and a curl-leaf mountain mahogany transect, Outlaw Cave. Average leader production measured during fall 2013 was 3.6 and 0.4 cm, respectively. Tisdale Road leader production was slightly higher than the ten year average, while Outlaw Cave leader production was considerably lower than the ten year average for those respective sites. Precipitation in the Kaycee area for 2013 was 11 inches, which was higher than the ten year average. See graphs in Fig. 2.

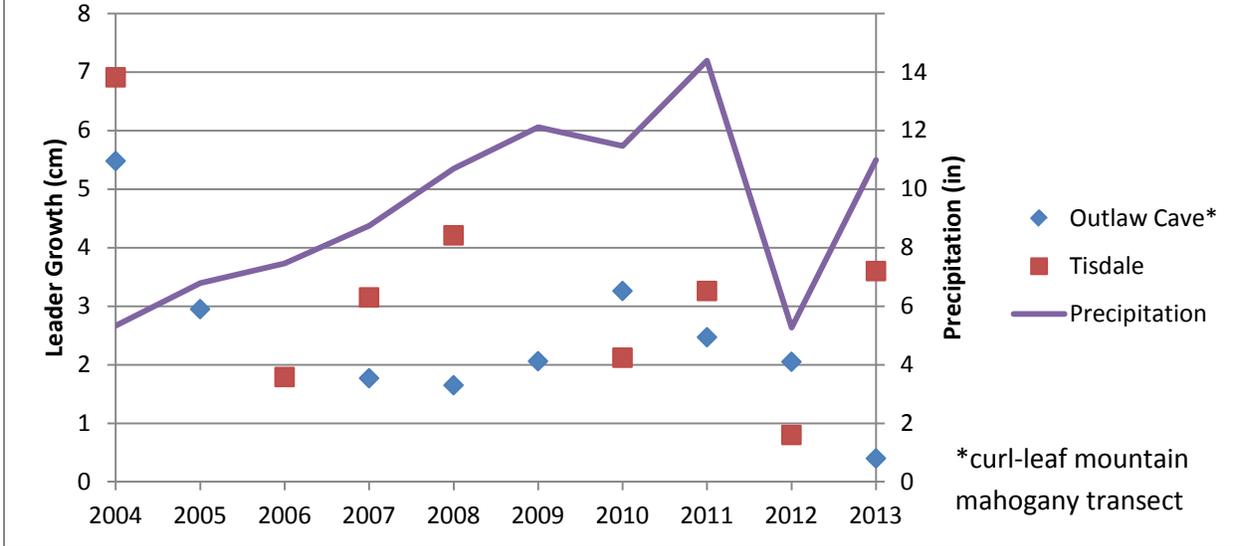
Gillette Area

In the Gillette area, leader production estimates were taken on two Wyoming big sagebrush transects, Cow Creek and Stewart. Average leader production measured during fall 2013 was 5.9 and 4.79 cm, respectively. Cow Creek and Stewart leader production was higher than the ten year average for those respective sites. Precipitation in the Gillette area was 21.5 inches, which considerably higher than the ten year average. See graphs in Fig. 2.

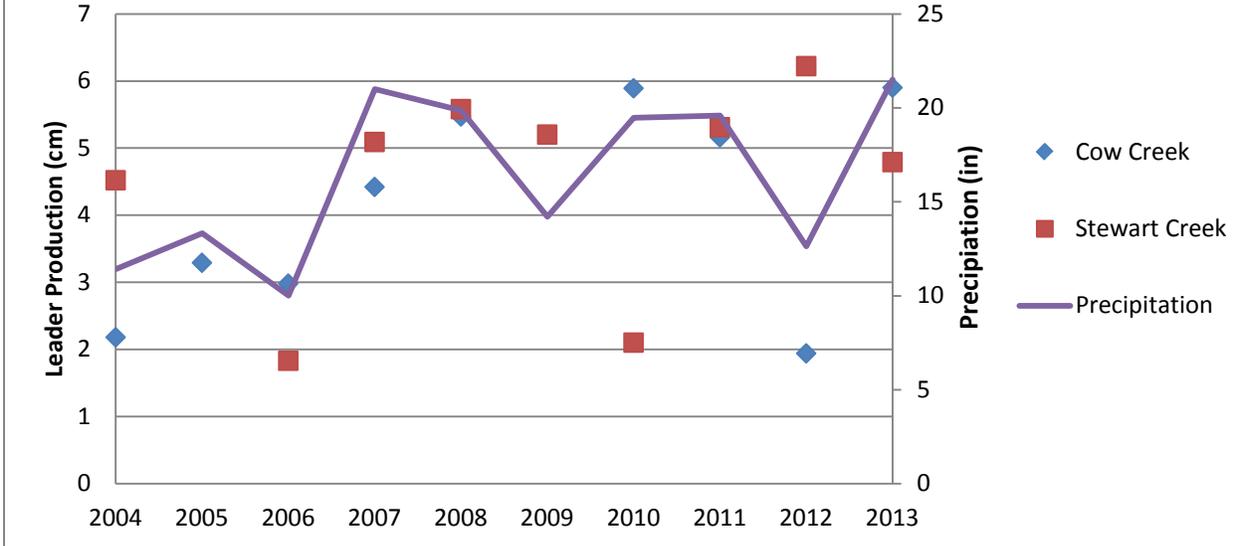
Figure 2. Sheridan Region Browse Leader Production.



Kaycee Area Browse Leader Production



Gillette Area Sagebrush Leader Production



Age Class

Sheridan Area

In the Sheridan area, age class estimates were taken on two Wyoming big sagebrush transects, SA Creek, and SR Buffalo Creek. Age class estimates were 2.14 and 2.29, respectively. There were no age class estimates taken on Coal Creek transect in 2013. Age class estimates were lower than the ten year average for SA Creek. SR Buffalo age class estimates for 2013 were equal to the value for the ten year average for that site. See table in Fig. 3.

Buffalo Area

In the Buffalo area, age class estimates were taken on two Wyoming big sagebrush transects, Indian Creek, and Napier/Schoonover. Age class estimates were 2.12 and, 2.08, respectively. There were no age class estimates taken on the Petrified Tree-Tipperary transect in 2013. Indian Creek age class estimates were slightly higher than the ten year average for that site, while Napier/Schoonover age class estimates were slightly lower than the ten year estimates for that site. See table in Fig. 3.

Kaycee Area

In the Kaycee area, age class estimates were taken on one Wyoming big sagebrush transect, Tisdale Road, and a curl-leaf mountain mahogany transect, Outlaw Cave. Age class estimates were 2.18 and 2.2, respectively. Tisdale Road age class estimates were slightly lower than the ten year average, while Outlaw Cave age class estimates were slightly higher than the ten year average for those respective sites. See table in Fig. 3.

Gillette Area

In the Gillette area, age class estimates were taken on one Wyoming big sagebrush transects, Stewart. The age class estimate for Stewart was 2.14, which was slightly higher than the ten year average for that site. No age class estimates were taken for Cow Creek in 2013. See table in Fig. 3.

Figure 3. Sheridan Region Shrub Age Class

| Year | 2004 | 2005 | | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 10 Year Average |
|----------------------|-------------|-------------|------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------|
| Sheridan Area | | | | | | | | | | | |
| Coal Creek | 2.92 | - | 2.48 | 2.41 | - | 2.54 | - | - | 2.52 | - | 2.57 |
| SA Creek | 2.77 | - | 2.42 | 2.44 | 2.40 | 2.28 | 2.26 | 2.25 | 2.06 | 2.14 | 2.34 |
| SR Buffalo Creek | 2.40 | 1.94 | 2.42 | 2.27 | - | 2.37 | - | - | 2.34 | 2.29 | 2.29 |
| Buffalo Area | | | | | | | | | | | |
| Indian Creek | 2.10 | - | 2.26 | 1.92 | 2.16 | - | 2.00 | 2.16 | 2.02 | 2.12 | 2.09 |
| Napier/Schoonover | 2.70 | 2.15 | - | 2.31 | 2.18 | 2.07 | 2.04 | 2.11 | 2.00 | 2.08 | 2.18 |
| Petrified Tree | 2.53 | - | - | 2.56 | - | 2.15 | - | - | 2.34 | - | 2.40 |
| Kaycee Area | | | | | | | | | | | |
| Outlaw Cave* | 2.11 | - | 2.25 | 2.34 | 2.28 | 2.12 | 2.12 | 2.00 | 2.20 | 2.20 | 2.18 |
| Tisdale | 2.77 | - | 2.62 | 2.26 | 2.22 | - | 2.12 | 2.22 | 2.32 | 2.18 | 2.34 |
| Gillette Area | | | | | | | | | | | |
| Cow Creek | 2.42 | - | 2.04 | 2.10 | 2.60 | - | 2.42 | 2.33 | 2.02 | - | 2.28 |
| Stewart Creek | 2.29 | - | 2.18 | 2.04 | 2.12 | 1.94 | 2.10 | 2.14 | 2.14 | 2.14 | 2.12 |

- No data

* Curl-leaf mountain mahogany transect

Hedging Class

Sheridan Area

In the Sheridan area, hedging scores were taken on two Wyoming big sagebrush transects, SA Creek and SR Buffalo Creek. Hedging scores were 2.14 and 2.29, respectively. There were no hedging scores taken on Coal Creek transect in 2013. Hedging scores were considerably higher than the ten year average of their respective sites for SA Creek and SR Buffalo Creek in 2013. See table in Fig. 4.

Buffalo Area

In the Buffalo area, hedging scores were taken on two Wyoming big sagebrush transects, Indian Creek and Napier/Schoonover. Hedging scores were 1.22 and 2, respectively. No hedging scores were taken on the Petrified Tree-Tipperary transect in 2013. Indian Creek and Napier/Schoonover hedging was lower than the ten year average for those respective sites. See table in Fig. 4.

Kaycee Area

In the Kaycee area, hedging scores were taken on one Wyoming big sagebrush transect, Tisdale Road, and a curl-leaf mountain mahogany transect, Outlaw Cave. Hedging scores were 1.26 and 1.18, respectively. Hedging on Tisdale and Outlaw Cave were both lower than the ten year average for those respective sites. See table in Fig. 4.

Gillette Area

In the Gillette area, hedging scores were taken on two Wyoming big sagebrush transects, Cow Creek and Stewart. Hedging scores were 1.04 and 1.08, respectively. Cow Creek and Stewart hedging scores were both lower than the ten year average for those respective sites. See table in Fig. 4.

Figure 4. Sheridan Region Hedging Scores

| Year | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 | 10 Year Average |
|----------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|----------------------------|
| Sheridan Area | | | | | | | | | | | |
| Coal Creek | 1.02 | 1.76 | 1.92 | 1.60 | - | 1.24 | - | - | 1.20 | - | 1.46 |
| SA Creek | 2.00 | 1.62 | - | 1.18 | 2.04 | 1.23 | 1.02 | 1.32 | 1.52 | 2.14 | 1.56 |
| SR Buffalo Creek | 1.00 | 1.59 | 1.74 | 1.56 | - | 1.52 | - | - | 1.62 | 1.90 | 1.56 |
| Buffalo Area | | | | | | | | | | | |
| Indian Creek | 1.00 | - | 1.76 | 1.12 | 1.85 | - | 1.22 | 1.71 | 1.22 | 1.80 | 1.46 |
| Napier/Schoonover | 2.00 | 1.76 | - | 2.34 | 1.82 | 1.95 | 2.00 | 1.08 | 2.00 | 1.26 | 1.80 |
| Petrified Tree | 1.10 | - | - | 1.52 | - | 2.09 | - | - | 1.30 | - | 1.50 |
| Kaycee Area | | | | | | | | | | | |
| Outlaw Cave* | 2.06 | 1.64 | 2.04 | 1.96 | 2.26 | 1.94 | 1.99 | 1.62 | 1.68 | 1.18 | 1.84 |
| Tisdale | 2.12 | - | 2.14 | 2.17 | 1.90 | - | 1.83 | 1.84 | 1.90 | 1.26 | 1.90 |
| Gillette Area | | | | | | | | | | | |
| Cow Creek | 2.00 | 1.51 | 1.24 | 1.82 | 1.76 | - | 1.36 | 1.47 | 1.44 | 1.04 | 1.52 |
| Stewart Creek | 2.4 | - | - | 2.27 | 1.96 | 2.41 | 1.04 | 1.63 | 1.24 | 1.08 | 1.75 |

- No data

* Curl-leaf mountain mahogany transect

Shrub Utilization

Sheridan Area

In the Sheridan area, shrub utilization estimates were taken on three Wyoming big sagebrush transects, Coal Creek, SA Creek, and SR Buffalo Creek. Average shrub utilization estimates during the spring of 2014 at Coal Creek, SA Creek and SR Buffalo Creek were 3.16%, 4.3% and 8%, respectively. Shrub utilization was lower than the ten year average at for those respective sites. See graphs in Fig. 5.

Buffalo Area

In the Buffalo area, shrub utilization estimates were taken on two Wyoming big sagebrush transects, Indian Creek, and Napier/Schoonover. Shrub utilization estimates were 2.4% and 3.6%, respectively. There was no shrub utilization estimates taken on the Petrified Tree-Tipperary transect during 2014. Indian Creek and Napier/Schoonover shrub utilization estimates were both lower than the ten year average for those respective sites. See graphs in Fig. 5.

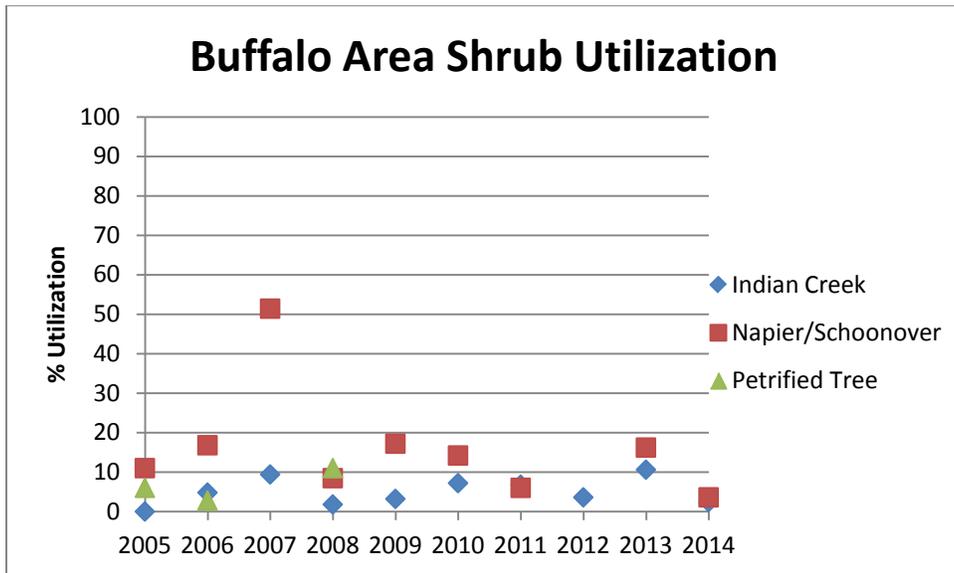
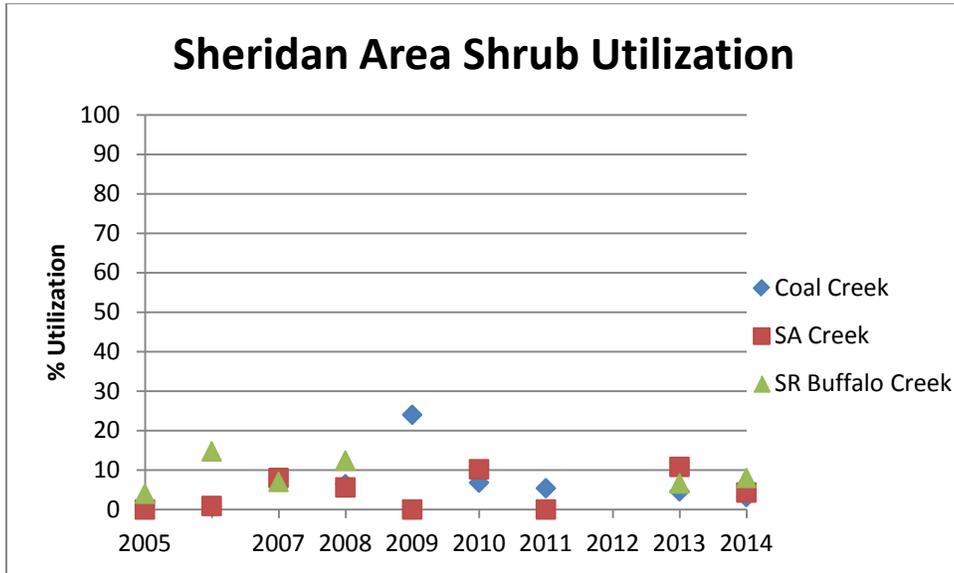
Kaycee Area

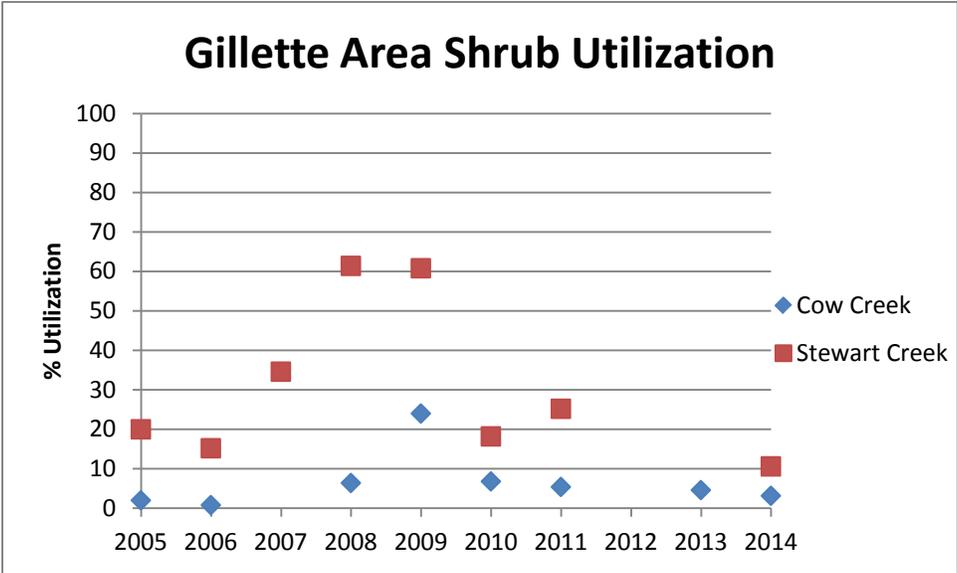
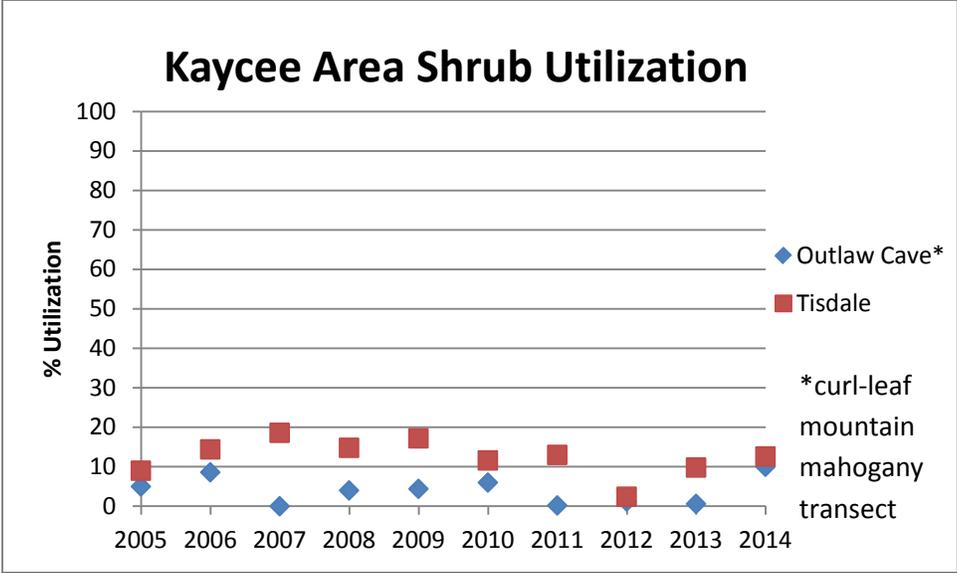
In the Kaycee area, shrub utilization estimates were taken on one Wyoming big sagebrush transect, Tisdale Road, and a curl-leaf mountain mahogany transect, Outlaw Cave. Shrub utilization estimates were 12.6% and 10%, respectively. Tisdale Road shrub utilization was only slightly higher than the ten year average for that site, while Outlaw Cave shrub utilization considerably higher than the ten year average for that site. See graphs in Fig. 5.

Gillette Area

In the Gillette area, shrub utilization estimates were taken for two Wyoming big sagebrush transects, Cow Creek and Stewart. Shrub utilization estimates were 3.16% and 10.6%, respectively. Both Cow Creek and Stewart utilization was considerably lower than the 10 year average for those respected sites. See graphs in Fig. 5

Figure 5. Sheridan Region Shrub Utilization





Conclusions

Leader Production

Overall in the Sheridan region, it appeared that leader production was higher in 2013 than the ten year average for each respective site. This most likely correlates with the higher than average precipitation that has occurred in the Sheridan Region during 2013. Overall trends suggest though, that leader production is on a downward trend. This is most likely the result of consecutive years of drought that occurred in the Sheridan region since these transects have been established.

Age Class

Age class estimates in the Sheridan region appear to be fairly stable, to slightly decreasing, which reflects that the majority of our browse species are mature plants, with the possibility of increased frequency of younger plants.

Hedging Scores

Hedging scores taken in 2013 in the Sheridan Region appear to reflect a decrease in use by ungulates compared to the ten year average. This appears to reflect the overall trend of decreased hedging seen in most shrub transects in the Sheridan Region. Deer and pronghorn populations have been low in the Sheridan Region for a couple of years, and this is most likely the explanation for the decrease in shrub hedging. It is noted though, that the trend in hedging scores in the Buffalo area, specifically Petrified Tree-Tipperary, Indian Creek, and SA Creek in the Sheridan Area, are showing a positive trend towards increasing hedging. Overall, hedging appears to be minimal across the region.

Shrub Utilization

Shrub utilization estimates taken in 2013 in the Sheridan Region appear to reflect a decrease in use by ungulates compared to the ten year average. Deer and pronghorn populations have been low in the Sheridan Region for a couple of years, and this is most likely the explanation for the decrease in shrub utilization. Overall, browse does not appear to be over utilized in the region.

APPENDIX E

CAMPBELL COUNTY HUNTER ASSISTANCE SERVICE 2013 SUMMARY OF ACTIVITIES

Operations

2013 was the 30th year for the Campbell County Hunter Assistance Service (here after “the Service”). The program was started in 1983 as an effort to better coordinate private land availability with prospective hunters. The Service has since evolved to include both private land hunting coordination as well as public land hunting information.

In 2013, the Hunter Assistance Service was operated from the Campbell County Visitor’s Center (here after “The Visitor’s Center”), located at Highway 59 and Interstate 90. Prior to 2000, the Service was conducted at both the Visitor’s Center and the Campbell County Chamber of Commerce in downtown Gillette. With a consolidated operation at one location, the Service is better able to maximize limited resources as well as provide better service to the hunting community, as all the information is located at one readily accessible and centrally located site.

During the past 14 years, the Service has also provided information for the Department’s Walk-in Access areas. In 2000, a temporary position was funded by the Department to work at the Visitor’s Center from late September through early November. A Game and Fish Department Access Yes grant was used from 2003-2009 to fund the position. The focus of this position was to promote Walk-in Access areas within Campbell County, distribute Walk-in Access guides, to contact landowners in the Gillette District to find those ranches seeking additional hunters, and to keep an active list of those ranches available at the Visitor’s Center for hunters seeking hunting opportunities. In previous years, the temporary employee had spent considerable time contacting landowners to inquire about big game hunting opportunities on private land. Those with open dates to take additional hunters were kept on a calling list to be distributed to hunters seeking such opportunity. The hired employee also worked at the Visitor’s Center during peak visitation periods, answering hunter questions and recommending appropriate departmental publications.

For the 2013 hunting season, coverage was provided by the Gillette Wildlife Biologist and Game Wardens, the Sheridan Information and Education Specialist, and by employees of the Visitor’s Center. It is hoped that this position will be refilled in future seasons when funding is available, as it is a valuable addition to the Hunter Assistance Service and provides the hunting public with additional information.

Various Department publications were made available for free distribution during service operations, including hunting regulations, fishing guides, and various specialty publications of the Department.

The Bureau of Land Management (BLM) land status maps (1:100,000) have been available at the Visitor's Center for the past seven years for resale to the hunting public. Sportsmen were assisted with understanding these maps by using a map display of Northeast Wyoming, which included marked public access roads. The display maps were updated to show changes in land ownership due to sales of state lands and exchanges of USFS and BLM lands. Display maps were located outside the building. Specific information on public lands hunting, map reading, and hunter ethics was also posted to the outside wall. The availability of critical hunting information along the outside wall of the Visitor's Center provided full-time support to the hunting community, even when the Visitor's Center was closed. The "big map" has become a popular stop for non-resident hunters. Hunters can update their own field maps and ask questions of WGFD and Visitor's Center staff before going into the field, and have mentioned that they appreciate and enjoy the service. Hunters also mention that they are very pleased with the "one-stop shopping" opportunity they have to purchase maps, reference the large map, and pick up regulations, and have their questions addressed at the Visitor's Center.

Results and Discussion

Personnel focused on fielding questions from the multitude of hunters that stopped in at the Visitor's Center and educating sportspersons about available public land and Walk-in hunting opportunities.

Visitor's Center personnel were very good in documenting hunter participation with the Hunter Assistance Service. During peak visitation periods when there were typically 10 to 20 hunters at the Visitor's Center at one time, it could be challenging to document detailed visitation information. Hunter information posted outside of the building meant that many hunters were never directly contacted by the Visitor's Center staff inside. Self-service information was very good for the customers, but the approach does not lend itself well to documenting actual total visitation and assistance provided. Additionally, some hunters were seen using the outside map and services during times when the Visitor's Center was closed. Overall, the Visitor's Center personnel did a commendable job in sampling the visiting hunter population; however the total numbers reported are recognized as being less than the actual total number of hunters using the Service in past years, due to the staffing limitations.

The recorded visitation in 2013 totaled approximately 593 hunters (Table 1). This total is likely lower than the actual total of visiting hunters, as some individuals that visited during September were not tallied by Visitor's Center staff and for reasons mentioned in the previous paragraph. It is conservatively estimated that at least 1,000 hunters actually used the Hunter Assistance Service in some fashion during the 2013 season.

Table 1. Gillette Hunter Assistance Service summary from 1984 to 2013.

| Year | Landowners | Total Hunters |
|------|------------|---------------|
| 1984 | 45 | 741 |
| 1985 | 36 | 554 |

| | | |
|------|----|-------|
| 1986 | 24 | 923 |
| 1987 | 24 | 1,131 |
| 1988 | 22 | 737 |
| 1989 | 28 | 501 |
| 1990 | 28 | 236 |
| 1991 | 43 | 442 |
| 1992 | 46 | 695 |
| 1993 | 31 | 727 |
| 1994 | 24 | 681 |
| 1995 | 33 | 701 |
| 1996 | 28 | 651 |
| 1997 | 19 | 626 |
| 1998 | 27 | 573 |
| 1999 | 19 | 620 |
| 2000 | 29 | 1,776 |
| 2001 | 22 | 1,316 |
| 2002 | 17 | 1,346 |
| 2003 | 29 | 1,237 |
| 2004 | 35 | 1,711 |
| 2005 | 18 | 845 |
| 2006 | 12 | 481 |
| 2007 | 17 | 1,034 |
| 2008 | 12 | 922 |
| 2009 | 10 | 600 |
| 2010 | 0 | 1,007 |
| 2011 | 0 | 903 |
| 2012 | 0 | 853 |
| 2013 | 0 | 593 |

Peak visitation tends to occur just prior to the start of the rifle season and remains high following the October 1st season opener for about 3 to 7 days. Many nonresident hunters feel that they must hunt the opening days of a season despite efforts to inform them that such a strategy is not necessary for a successful Wyoming hunt. The Gillette Wildlife Biologist and Gillette Wardens were present at the Visitor’s Center for two days prior to opening day and fielded the majority of hunting questions. The Sheridan Information and Education Specialist was also present on one day to assist. During the later parts of the season, the Gillette Wildlife Biologist would stop in as time permitted to help field questions. Both the North Gillette and South Gillette Game wardens stopped in when they were available. If staff members were unable to answer a question for a visiting hunter, they would either contact the Wildlife Biologist via cell phone or would contact the Sheridan Regional Office for assistance. The employees of the Visitor’s Center did a commendable job in answering hunting questions this past year.

On several occasions, the Visitor’s Center staff opened on weekend days following the opening of deer and antelope season in Campbell County, when typically the Visitor’s Center is closed. Many hunters expressed their appreciation that the Hunter Assistance Service was staffed and available on weekends in these instances. Later in October, an additional surge of hunter visits occurred, as inquiries about elk hunting opportunities within the area increased.

Sales of BLM Surface Management Maps were extremely popular. Many non-residents read about the Service via the Campbell County Hunting Guide – a mini magazine distributed by The Gillette News-Record in collaboration with Wyoming Game and Fish. The magazine is mailed annually to non-residents who draw an antelope license in Campbell County. It offers several news articles regarding the area’s hunting program and encourages use of the Hunter Assistance Service. Signs directing hunters to the Visitor’s Center were placed along Interstate 90 to help hunters find the Service.

Recommendations for the 2014 Hunter Assistance Service

Overall, the 2013 Hunter Assistance Service accomplished the goals set in 2012. Operations ran efficiently and effectively as many sportsmen were greatly benefited by the Service. However, without a temporary employee to assist with contacting landowners, hunters were at a disadvantage this year when trying to find last-minute private land hunting opportunities. The following recommendations are offered to further refine and improve operations:

1. Reinstate the Access Yes grant to allow funding of a temporary position to assist with the Service. Time should be spent by this employee prior to the season contacting landowners to generate the initial hunting lists and re-doing maps as needed. Following the opening of local hunting seasons, time should also be dedicated to data summaries and report preparation. Clearly this project has proven to be of great benefit to the Department since there is no Game and Fish public office in Campbell County. The Visitor’s Center may request some form of compensation from the Department in future years now that it is under new management, considering the time spent by permanent staff, use of the facilities, and the savings provided to Department personnel time.
2. Department staffing by local permanent personnel is still needed early in the season to help train temporary and Visitor’s Center personnel. The presence of personnel helps greatly with answering hunter questions, as the beginning of the hunting seasons is the most congested time for the Visitor’s Center. The addition of a Sheridan WGFD staff member the weekend prior to opening day and over the first week of October is a great benefit and provides faster service to hunters with questions that Visitor’s Center staff may not be capable of answering.
3. Continue the sale of BLM and USFS maps at the Visitor’s Center. The availability of maps is well-received by hunters, and they consistently comment that they appreciate it each year. Providing maps for sale at the Visitor’s Center should be a top priority, so that hunters do not need to leave and return again with their questions.
4. It is recommended that the Point-of-Sale (IPOS) license technology be included as a resource for hunters at the Visitor’s Center. Sale of leftover licenses was very popular when it was offered in 2005 at the Visitor’s Center, and hunters who used this opportunity in 2005 mentioned that they appreciated the service and would like to see it offered again. Other hunters who were visiting the Service for the first time in 2013 inquired about whether they could purchase leftover licenses at the Visitor’s Center, along with their maps and other WGFD hunting documents. Offering improved “one stop shopping” rather than having to redirect hunters to a local license agent would greatly improve the efficiency of Hunter Assistance Service as a whole and would likely be very popular with visiting hunters.

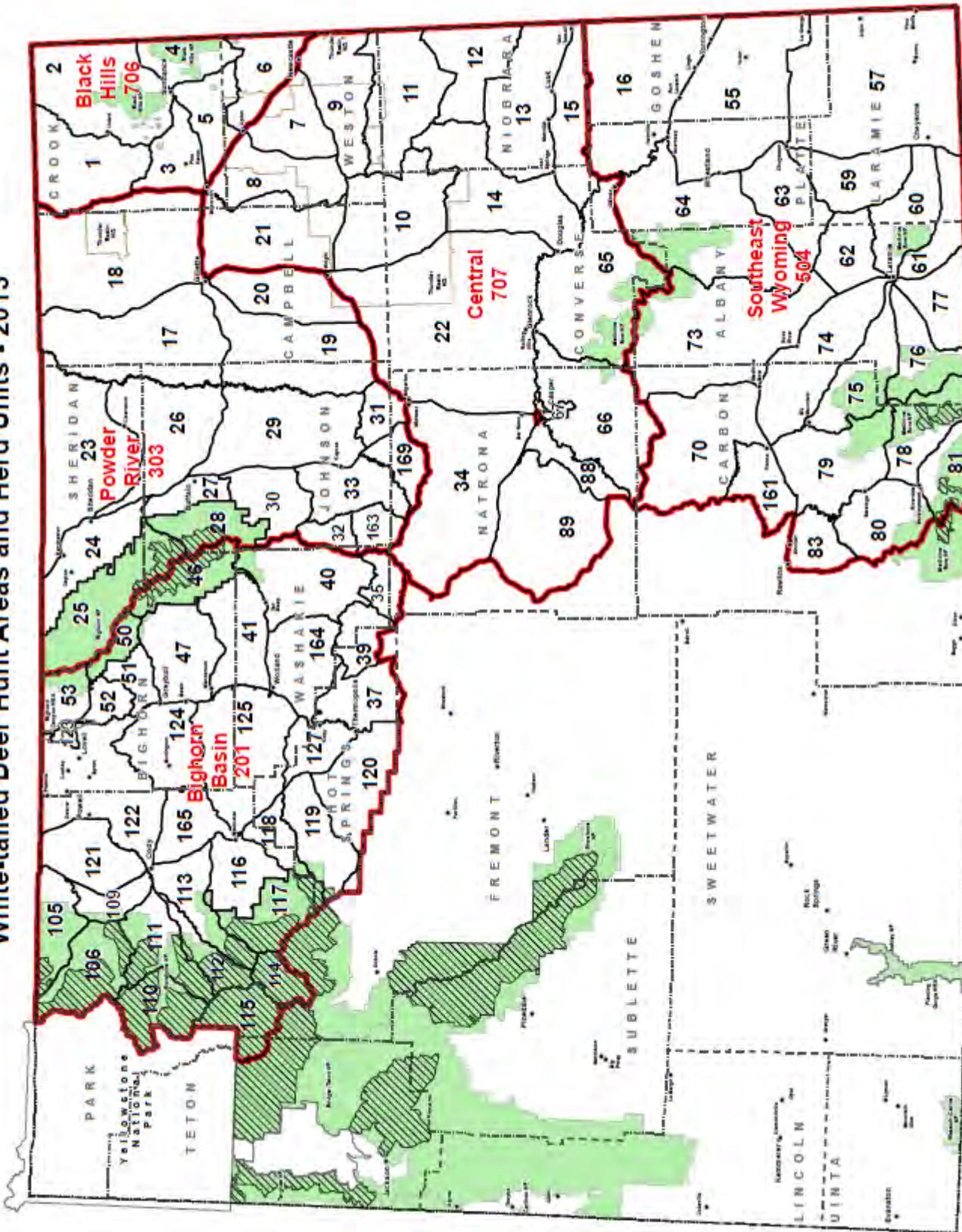
5. The Department should continue to assist the Gillette News-Record with publishing the hunter information newsletter in 2014. These efforts greatly contribute to the effectiveness of the program and give hunters a head start by answering many common questions within the publication.
6. Update the display maps with new BLM maps as the maps become available. New BLM maps for the Campbell County area are in the process of being published and new sets should be available. The new maps will include land ownership changes that are currently marked by hand on display maps. A new display map should be made at least every other year, as older maps become weathered and faded, and land exchanges need to be updated.
7. Disseminate information about the Hunter Assistance Center to landowners as much as possible prior to the 2014 hunting season. It has been noted that many local ranchers were unaware of the service, and it is not possible for the temporary staff of the Visitor's Center to contact all of the 500+ landowners in the region. Using direct letters or newsletters distributed to ranchers by the USDA and NRCS will facilitate communication and information between ranchers and the Department. The result will hopefully be an increase in participation by landowners in the Hunter Assistance Service program.
8. Expand the availability of similar services to the towns of Sundance and Buffalo. Work with PLPW staff to set up large maps and public displays at accessible points in both Sundance and Buffalo. Staffing may not be immediately possible at these locations, but many questions can be answered with public displays that hunters can visit on their own. Consider working with USFS - Thunder Basin National Grasslands personnel to revamp the kiosk at Weston. The kiosk could be redone prior to hunting seasons to provide additional hunting information to those that hunt public lands in the Weston/Spring Creek area.

MAPS

Pronghorn Herd Units and Hunt Areas
Mule Deer Herd Units and Hunt Areas
White-tailed Deer Herd Units and Hunt Areas
Elk Herd Units and Hunt Areas
Moose Herd Units and Hunt Areas

2013
Job Completion Report
Sheridan Region
Wyoming Game & Fish Department

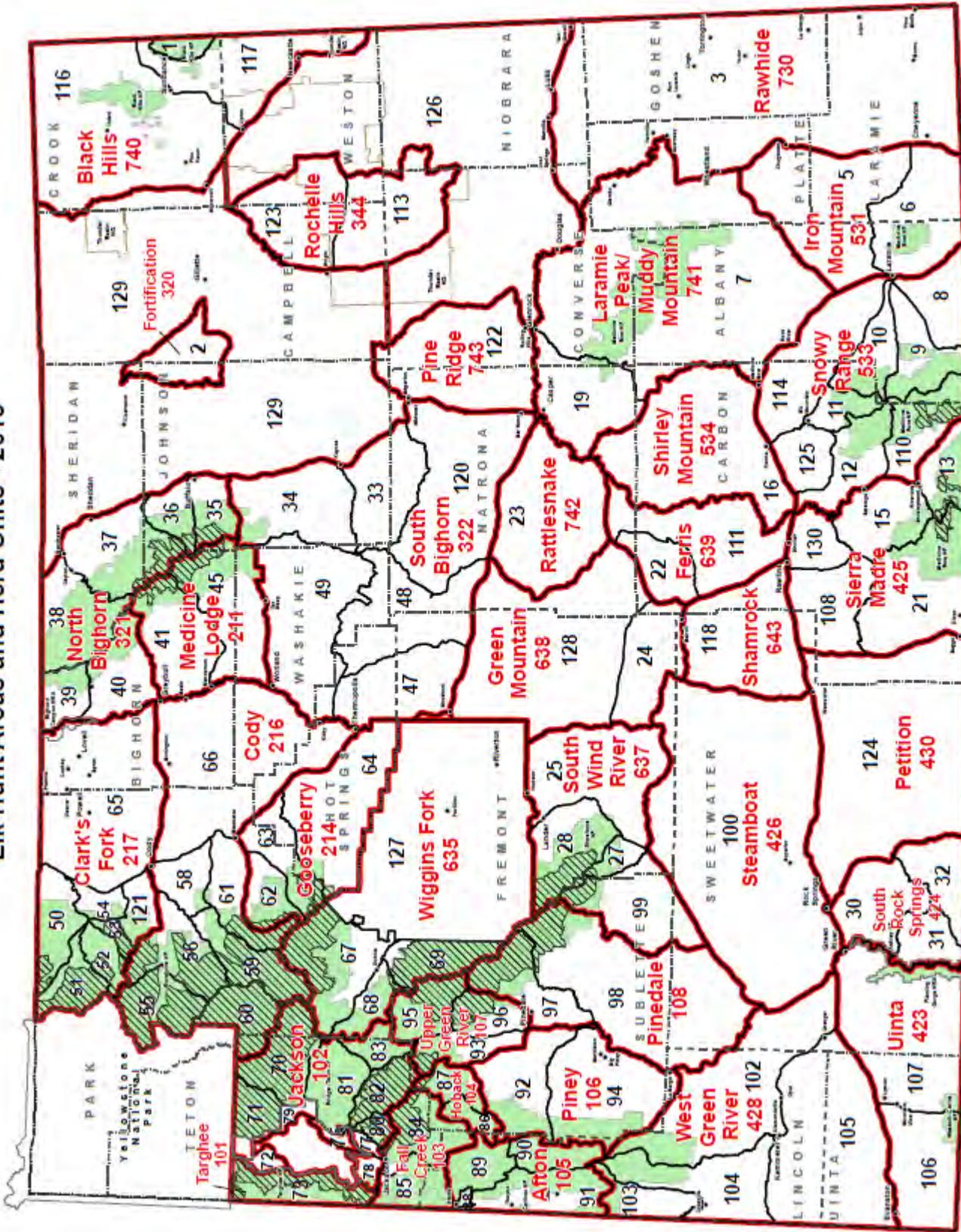
White-tailed Deer Hunt Areas and Herd Units - 2013



Note: Herd Units are represented by thicker red lines and red font

6/13/2013

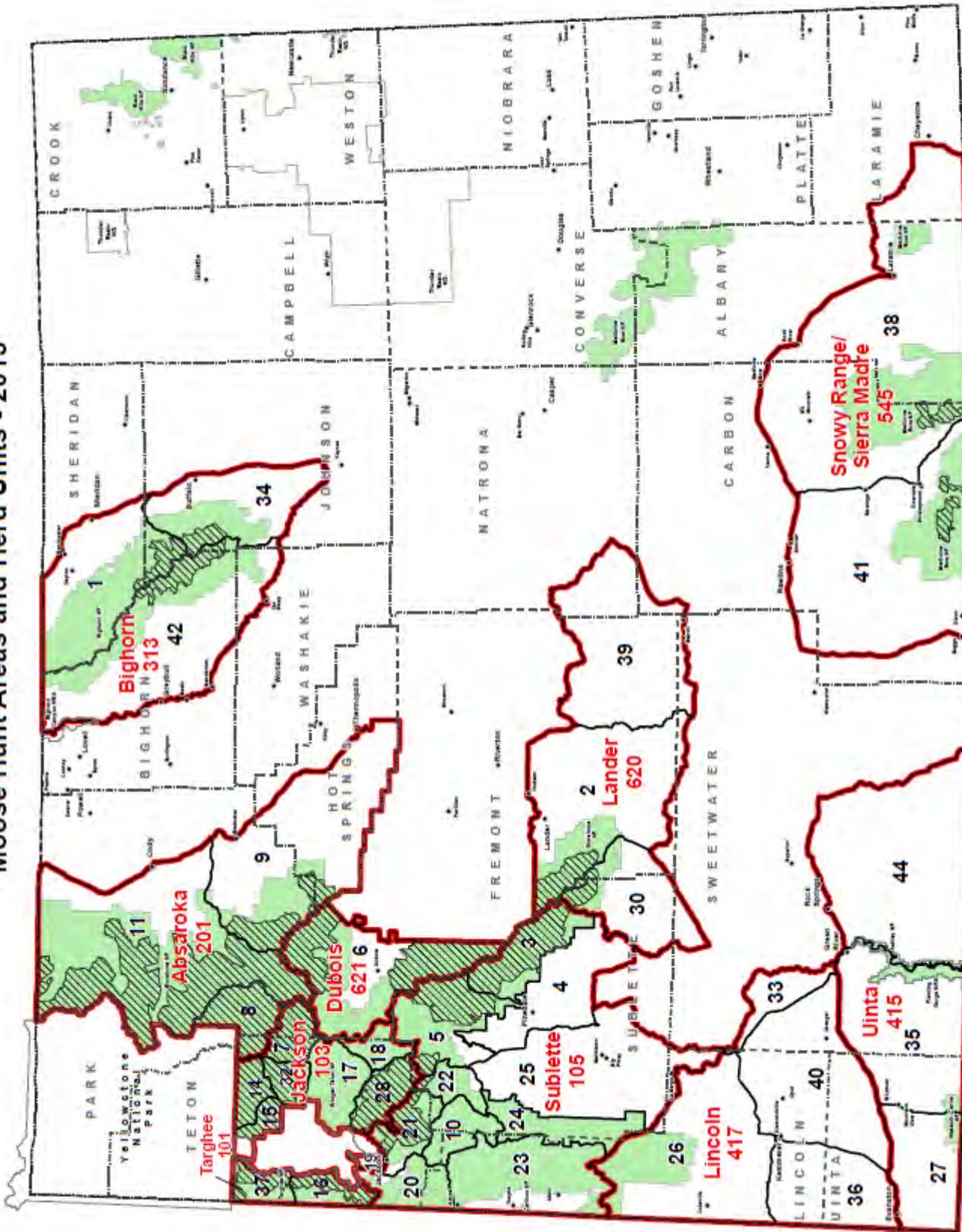
Elk Hunt Areas and Herd Units - 2013



Note: Herd Units are represented by a thicker red line and red font

7/2/2013

Moose Hunt Areas and Herd Units - 2013



Note: Herd Units are represented by thicker red lines and red font

6/13/2013