

WHITE-TAILED DEER

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2016 - JCR Evaluation Form

SPECIES: White tailed Deer

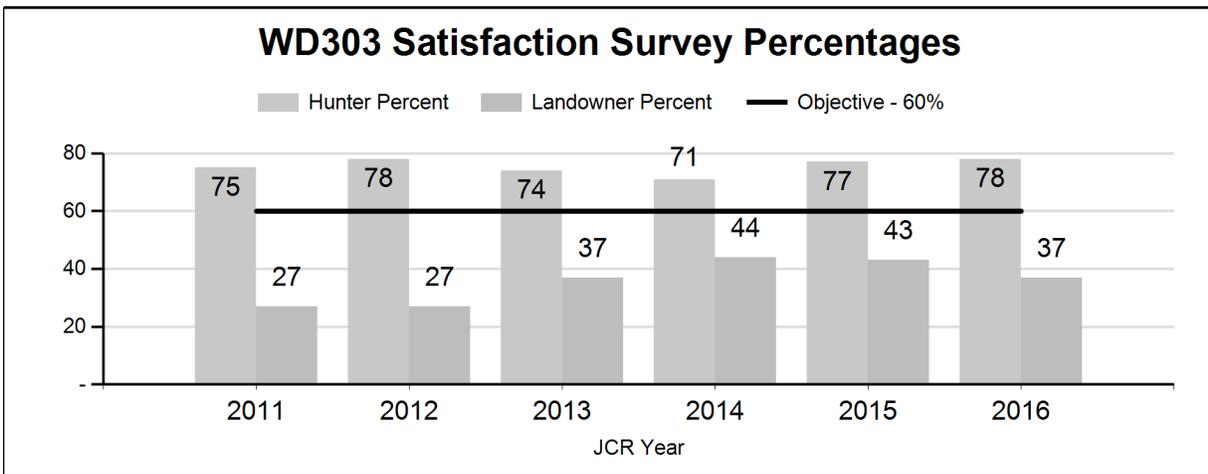
PERIOD: 6/1/2016 - 5/31/2017

HERD: WD303 - POWDER RIVER

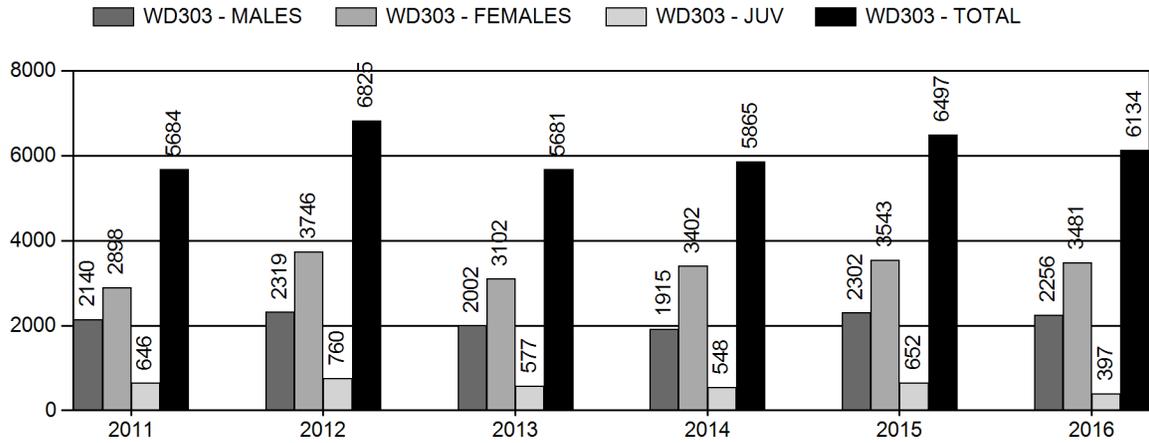
HUNT AREAS: 17-20, 23-33, 163, 169

PREPARED BY: TIM THOMAS

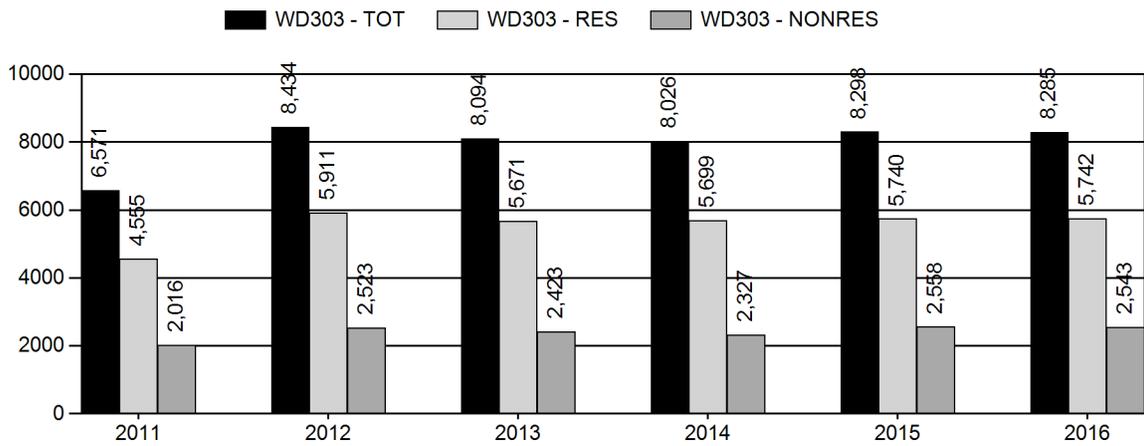
| | <u>2011 - 2015 Average</u> | <u>2016</u> | <u>2017 Proposed</u> |
|---|----------------------------|-------------|----------------------|
| Hunter Satisfaction Percent | 75% | 78% | 75% |
| Landowner Satisfaction Percent | 36% | 37% | 40% |
| Harvest: | 6,110 | 6,134 | 6,200 |
| Hunters: | 7,885 | 8,285 | 8,300 |
| Hunter Success: | 77% | 74% | 75% |
| Active Licenses: | 9,415 | 9,556 | 9,600 |
| Active License Success: | 65% | 64% | 65% |
| Recreation Days: | 39,773 | 37,361 | 38,250 |
| Days Per Animal: | 6.5 | 6.1 | 6.2 |
| Males per 100 Females: | 35 | 46 | |
| Juveniles per 100 Females | 69 | 65 | |
| Satisfaction Based Objective | | | 60% |
| Management Strategy: | | | Private Land |
| Percent population is above (+) or (-) objective: | | | -2% |
| Number of years population has been + or - objective in recent trend: | | | 15 |



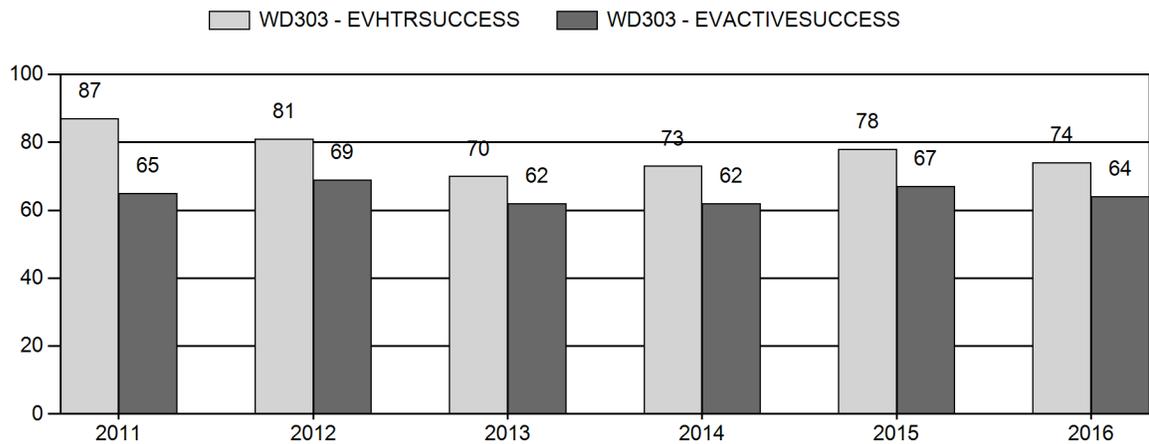
Harvest



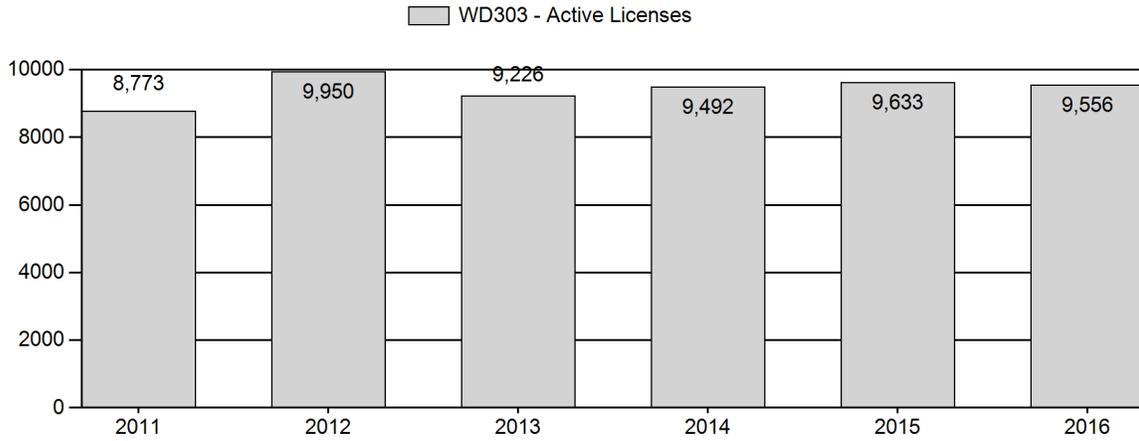
Number of Active Licenses



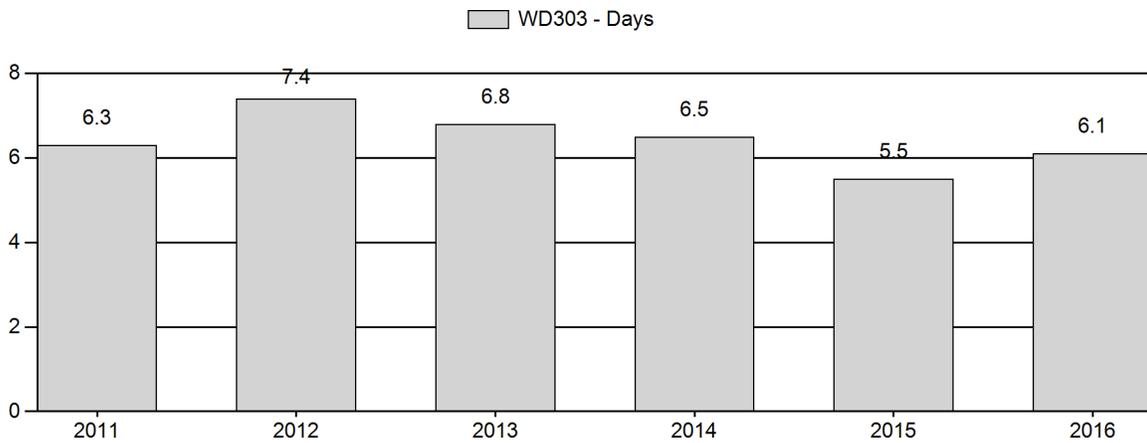
Harvest Success



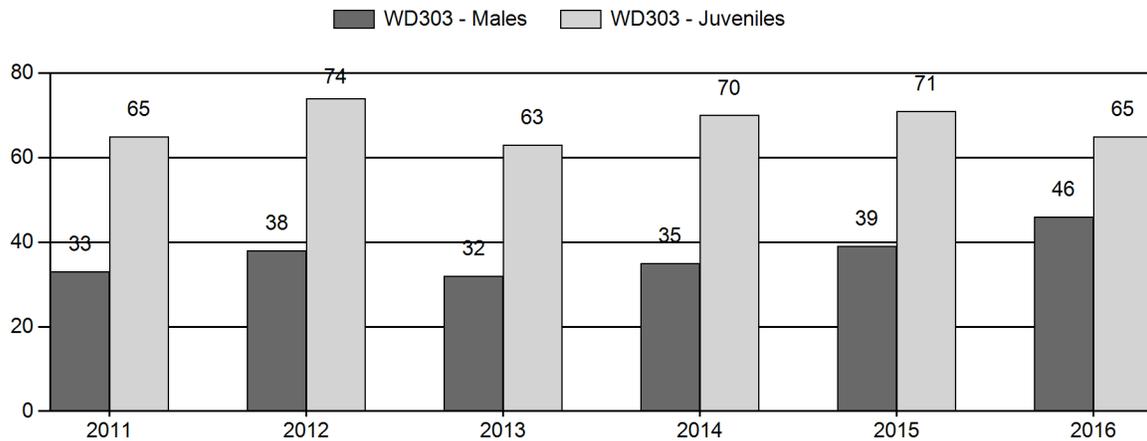
Active Licenses



Days per Animal Harvested



Postseason Animals per 100 Females



2011 - 2016 Postseason Classification Summary

for White tailed Deer Herd WD303 - POWDER RIVER

| Year | Post Pop | MALES | | | | FEMALES | | JUVENILES | | Tot CIs | Cls Obj | Males to 100 Females | | | | Young to | | |
|------|----------|-------|-------|-------|-----|---------|-----|-----------|-----|---------|---------|----------------------|-------|-------|----------|----------|----------|-----------|
| | | Ylg | Adult | Total | % | Total | % | Total | % | | | Ylng | Adult | Total | Conf Int | 100 Fem | Conf Int | 100 Adult |
| 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 | 18,000 | 150 | 303 | 453 | 16% | 1,437 | 51% | 907 | 32% | 2,797 | 1,211 | 10 | 21 | 32 | ± 2 | 63 | ± 3 | 48 |
| 2014 | 20,000 | 235 | 401 | 636 | 17% | 1,839 | 49% | 1,296 | 34% | 3,771 | 1,484 | 13 | 22 | 35 | ± 2 | 70 | ± 3 | 52 |
| 2015 | 0 | 206 | 375 | 581 | 19% | 1,483 | 48% | 1,058 | 34% | 3,122 | 1,554 | 14 | 25 | 39 | ± 0 | 71 | ± 0 | 51 |
| 2016 | 0 | 247 | 379 | 626 | 22% | 1,364 | 47% | 884 | 31% | 2,874 | 1,429 | 18 | 28 | 46 | ± 0 | 65 | ± 0 | 44 |

**2017 HUNTING SEASONS
POWDER RIVER WHITE-TAILED DEER HERD (WD303)**

| Hunt Area | Type | Season Dates | | Quota | License | Limitations |
|-----------|------|--------------|---------|-----------|---------------|--|
| | | Opens | Closes | | | |
| 17 | | Oct. 1 | Oct. 20 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |
| | 8 | Oct. 1 | Nov. 30 | 250 | Limited quota | Doe or fawn white-tailed deer |
| 18 | | Oct. 1 | Oct. 20 | | General | Antlered mule deer or any white-tailed deer |
| | 8 | Oct. 1 | Oct. 31 | 50 | Limited quota | Doe or fawn white-tailed deer valid on private land |
| 19 | | Oct. 1 | Oct. 20 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |
| | 6 | Oct. 1 | Oct. 20 | 50 | Limited quota | Doe or fawn valid on private land |
| | 8 | Nov. 1 | Nov.15 | 50 | Limited quota | Doe or fawn white-tailed deer |
| 23 | | Oct. 1 | Oct. 14 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |
| 23, 26 | 3 | Nov. 1 | Nov. 30 | 150 | Limited quota | Any white-tailed deer |
| | 6 | Oct. 1 | Dec. 15 | 2,000 | Limited quota | Doe or fawn valid on private land |
| 24 | | Oct. 15 | Oct. 31 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |
| | 3 | Nov. 1 | Nov. 30 | 300 | Limited quota | Any white-tailed deer |
| | 6 | Sep. 1 | Dec. 15 | 200 | Limited quota | Doe or fawn valid on private land |
| | 8 | Sep. 1 | Dec. 15 | Unlimited | Limited quota | Doe or fawn white-tailed deer |
| 25 | | Oct. 15 | Oct. 24 | | General | Antlered mule deer or any white-tailed deer |
| 26 | | Oct. 1 | Oct. 14 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |

| Hunt Area | Type | Season Dates | | Quota | License | Limitations |
|-----------|------|--------------|---------|-------|---------------|--|
| | | Opens | Closes | | | |
| 27 | | Oct. 15 | Oct. 31 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |
| | 8 | Sep. 1 | Sep. 30 | 1,200 | Limited quota | Doe or fawn white-tailed deer valid on private land |
| | 8 | Oct. 15 | Dec. 15 | | Limited quota | Doe or fawn white-tailed deer valid in the entire area |
| 28 | | Oct. 15 | Oct. 24 | | General | Antlered mule deer or any white-tailed deer |
| 29 | | Oct. 1 | Oct. 14 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |
| | | Nov. 16 | Dec. 15 | | General | Antlerless white-tailed deer |
| | 8 | Sep. 1 | Sep. 30 | 700 | Limited quota | Doe or fawn white-tailed deer valid on private land north of Crazy Woman Creek |
| | 8 | Oct. 1 | Dec. 15 | | Limited quota | Doe or fawn white-tailed deer valid in the entire area |
| 30 | | Oct. 15 | Oct. 31 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 30 | | General | Any white-tailed deer |
| | | Dec. 1 | Dec. 15 | | General | Antlerless white-tailed deer |
| | 8 | Sep. 1 | Sep. 30 | 500 | Limited quota | Doe or fawn white-tailed deer valid on private land |
| | 8 | Oct. 15 | Dec. 15 | | Limited quota | Doe or fawn white-tailed deer valid in the entire area |
| 31 | | Oct. 1 | Oct. 10 | | General | Antlered deer |
| 32 | | Oct. 15 | Oct. 31 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |
| 32, 163 | 8 | Oct. 15 | Nov. 15 | 50 | Limited quota | Doe or fawn white-tailed deer |

| Hunt Area | Type | Season Dates | | Quota | License | Limitations |
|-----------|------|--------------|---------|-------|---------------|--|
| | | Opens | Closes | | | |
| 33 | | Oct. 15 | Oct. 31 | | General | Antlered deer off private land; any deer on private land |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |
| | | Nov. 16 | Dec. 15 | | General | Antlerless white-tailed deer |
| | 6 | Oct. 15 | Oct. 31 | 25 | Limited quota | Doe or fawn valid on private land |
| | 8 | Sep. 1 | Sep. 30 | 500 | Limited quota | Doe or fawn white-tailed deer valid on private land |
| | 8 | Oct. 15 | Dec. 15 | | Limited quota | Doe or fawn white-tailed deer valid in the entire area |
| 163 | | Oct. 15 | Oct. 21 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |
| 169 | | Oct. 15 | Oct. 21 | | General | Antlered mule deer or any white-tailed deer |
| | | Nov. 1 | Nov. 15 | | General | Any white-tailed deer |

| Special Archery Season Hunt Areas | Season Dates | |
|--------------------------------------|--------------|---------|
| | Opens | Closes |
| 17-19, 23-33, 163, 169 | Sep. 1 | Sep. 30 |

| Region | Deer Hunt Areas | Quotas |
|--------|--------------------------------------|--------|
| C | 17-19, 23, 26, 29, 31 | 2,200 |
| Y | 24, 25, 27, 28, 30, 32, 33, 163, 169 | 1,800 |

| Hunt Area | Type | Quota change from 2014 |
|------------------------|----------|------------------------|
| 23, 26 | 3 | + 50 |
| 24 | 3 | + 100 |
| | 6 | - 100 |
| Herd Unit Total | 3 | + 150 |
| | 6 | - 100 |
| Region C | | No Change |
| Region Y | | No Change |

Management Evaluation

Current Hunter / Landowner Management Objective: 60% Landowner / Hunter Satisfaction

Secondary Management Objective: 20 bucks:100 does observed minimum

Management Strategy: Private Land

2016 Hunter Satisfaction Estimate: 78%

2016 Landowner Satisfaction Estimate: 37%

Most Recent 3-year Running Average Hunters Satisfaction Estimate: 75%

Most Recent 3-year Running Average Landowner Satisfaction Estimate: 41%

Herd Unit Issues

The Powder River White-tailed Deer Herd Unit is located in north central Wyoming. This herd unit contains 16 hunt areas – 17-19, 23-33, 163 and 169. Hunt areas 19 and 20 were combined into one (HA 19) in 2016. Area 20 still appears on the evaluation form so that historic data is incorporated at the herd unit level. The herd unit overlaps all biologist and warden districts in the Sheridan Region. The Sheridan biologist has herd unit reporting responsibilities while each biologist and warden retains management authority in their respective hunt areas.

The primary management objective for the Powder River White-tailed Deer Herd Unit is Hunter and Landowner Satisfaction at 60% or above, with a secondary objective of 20 or more bucks observed per 100 does. The management strategy is Private Land Management. The objective and management strategy were last revised in 2014.

We do not have a reliable population estimate at this time for this herd unit. The spreadsheet simulation model developed for white-tailed deer populations with postseason classification data does not function with the limited empirical data available 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 limited and localized due to limited access to private lands and refuges where harvest isn't allowed. Mortalities due to deer-vehicle collisions and disease (i.e. viral hemorrhagic diseases) help keep this population from being even higher than it is.

White-tailed deer depredation of standing and stored agricultural crops, especially alfalfa, is a significant problem in localized areas of this herd unit. Game wardens and damage technicians spend considerable amounts of time and effort to address these damage concerns. The WGFD pays damage payments to some landowners to compensate them for damage caused by high numbers of white-tailed deer.

Weather

Temperature and precipitation data referenced in this section were collected at the Sheridan Co Airport (#488155) weather station located within this herd unit. Data were reported by the Western Region Climate Center (www.wrcc.dri.edu).

The 2015-16 winter was generally mild and open. Animals should have come out of the winter in good shape. The 2016 spring was early, with warm temperatures in February-April and increased precipitation, especially in April. This allowed for an early start for grasses and forbes, providing

high quality forage just prior to and during parturition. Temperatures remained normal to above normal during the summer and fall. Conditions were dry during May-July, with increased precipitation during the fall. September saw almost 3 times the normal precipitation. Winter started in early November with increased snow fall and below average temperatures from mid-November through January. There were several periods of -20°F or more during this time. December monthly average temperature was $\sim 9^{\circ}\text{F}$ below normal and January monthly average temperature was $\sim 6^{\circ}\text{F}$ below normal. Conditions moderated in February, with warmer than normal temperatures, giving wintering wildlife a break. There were several wet, heavy snow falls during April. Deer, especially fawns, that just made it through the winter may have died during these snow events.

While adult wildlife entered the winter in good condition, they faced prolonged severe weather conditions during the early part of the winter. Fawns, being more susceptible to extremely cold temperatures, likely saw below average over-winter survival. We received several reports of winter killed white-tailed deer around the Sheridan area.

Habitat

We do not have established habitat transects 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 severely suppressed or eliminated in some woody draw communities along the Bighorn Mountains due to excessively high browsing pressure.

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 2,874 white-tailed deer, down from 2015 but still the third highest classification ever recorded in this herd unit. Deer may have been more visible during the survey due to snow cover, and cold temperatures may have caused deer to forage longer.

Fawn production, as measured by the observed fawn to doe ratio, was 65 fawns:100 does, a decrease from 2015 and well below the long-term ($n=35$ years) average of 76 fawns:100 does. Relatively low fawn production under favorable environmental conditions could be a density dependent response. Reduced fawn production could slow the growth of this herd, which has declined in recent years in response to increased harvest and mortalities due to viral hemorrhagic disease. We documented epizootic hemorrhagic disease (EHD) during 3 of the past 6 years, with the 2013 outbreak the most extensive and widespread.

Field personnel observed 46 bucks:100 does, an increase over 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 our secondary management objective of a minimum of 20 bucks:100 does.

During the 2016 season, 79% of hunters (n=1,630) who completed a harvest survey indicated they were satisfied (35%) or very satisfied (44%) with their hunting experience in this herd unit. At the hunt area level, excluding Hunt Areas 31, 33, 163 and 166 due to low samples sizes (range=2-6), satisfaction levels varied from 65% (Hunt Area 28; n=46) to 85% (Hunt Area 18; n=86). Hunt areas with higher densities of white-tailed deer tended to have higher satisfaction levels, even in predominately private land hunt areas.

Nonresident hunters were generally more satisfied (83%) than resident hunters (77%). Access to private lands through trespass fees or outfitted hunts, which is common in this herd unit, caters more to nonresident than resident hunters. Hunter satisfaction in both groups increased slightly in 2016 compared to 2015, possibly in response to recovering deer numbers, especially bucks, after the EHD disease outbreak in 2013.

We surveyed landowners to gauge their level of satisfaction with white-tailed deer numbers. One hundred fourteen landowners from HAs 17, 18, 19, 23, 24, 26, 27, 29, 30, 33, 163 and 169 completed the white-tailed deer portion of their survey. Of these landowners, 51% (n=58) indicated white-tailed deer numbers were higher than desired and 37% (n=42) believed numbers were at or near desired levels (Fig. 1). Most respondents (47%, n=54) suggested similar or more liberal (41%, n=47) season strategies for 2017. Based on these data, we appear to be moving in the desired direction with white-tailed deer numbers.

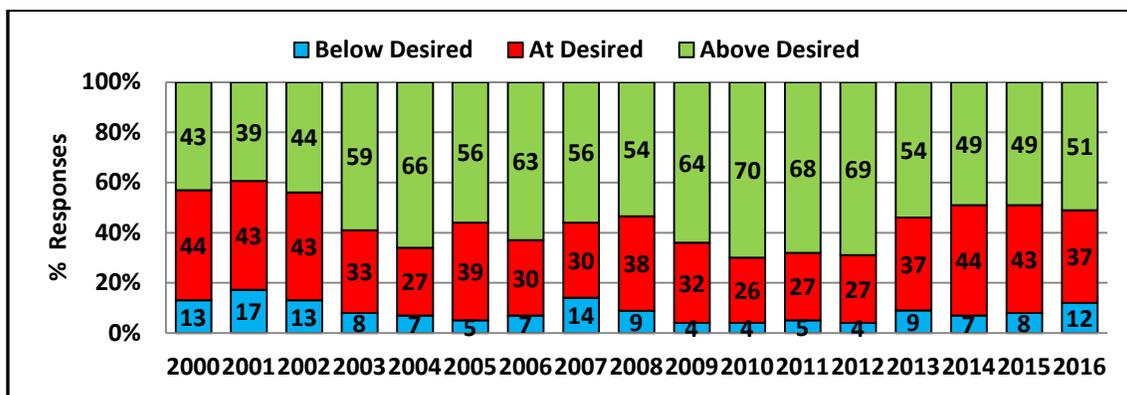


Figure 1. Relative landowner perceptions of white-tailed deer populations on their property in the Powder River White-tailed Deer Herd Unit, by percentage. Desired level is a subjective expression of individual landowner tolerance of white-tailed deer.

Harvest

An estimated 8,285 hunters (5,742 resident hunters; 2,543 nonresident hunters) harvested an estimated 6,134 white-tailed deer in 2016, a decrease of ~6% from 2015 and similar to the previous 5 year mean (2011-2015; n=6,110). This is the third highest harvest ever in this herd unit. Hunters harvested an estimated 2,256 bucks (37%), 3,481 does (57%) and 397 fawns (6%). Both buck and doe harvest decreased slightly in 2016 while fawn harvest decreased 39%.

Of total hunters, 69% were resident and 31% were nonresident hunters. Resident hunters harvested 73% of the total deer harvested and 82% of the bucks harvested in 2016. Nonresident hunters harvest 27% of the total harvest and only 18% of the buck harvest.

Hunter success rate was 74%, down slightly from 2015 (78%) and below the previous 5 year average of 78%. Hunter effort, as measured by days hunted per deer harvested, was 6.1 days/harvest, an increase from 2015. Effort was slightly below the previous 5 year average of 6.5 days/harvest. Hunter effort seems high for the amount of antlerless animals harvested in this herd unit as well as the relatively high success rate. This could be a function of each harvest being consider independent of other harvest. Our survey protocol may not account for multiple harvests per day per hunter which would result in a higher than actual estimated effort rate.

In summary, a similar number of hunters harvested slightly fewer white-tailed deer with slightly more effort than the year before. This suggests deer in general were relatively available for harvest during the 2016 season. Adverse weather conditions during the hunting season could have reduced harvest as hunters tend not to hunt during rain, snow or extreme cold.

White-tailed deer harvest in this herd unit is a significant source of high quality protein for hunters. Assuming an average yield of 45 lbs. of meat from a buck, 30 lbs. from a doe and 12 lbs. from a fawn, hunters were able to harvest over 200,000 lbs. of deer meat from this herd unit alone (Fig. 2).

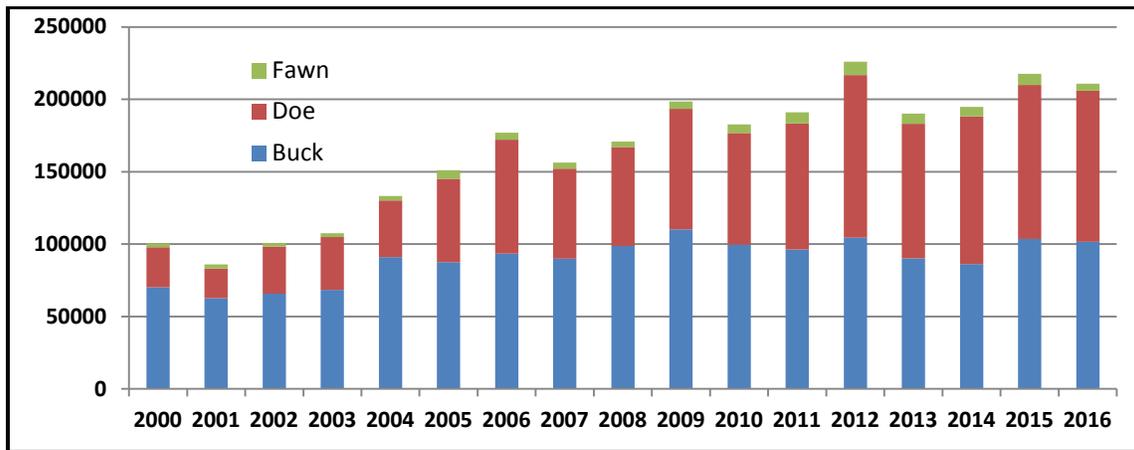


Figure 2. Estimated amount of deer meat harvested from this herd unit from 2000-2016. Assumes an average yield of 45 lbs. of meat per buck, 30 lbs. per doe and 12 lbs. fawn harvested.

Population

High white-tailed deer harvest in recent years (2012-2016; 5-year mean=6,200) suggests this population is robust. The spreadsheet model developed for white-tailed deer populations with postseason classification data does not work with the available data from this herd unit. Under all three possible model scenarios, it simulates a negative population. As such, we don't have a functioning population simulation model for this herd unit.

Assuming hunters harvest approximately 30% of the total population in recent years, this population would be near 20,500 deer postseason (Fig. 3). Assuming hunters harvested 10% of the available bucks, this population would be about 22,500 white-tailed deer postseason based on 2016 buck harvest (Fig. 3). These are relatively broad, generic estimates but demonstrate that this white-tailed deer population is doing very well and has recovered from the 2013 EHD outbreak.

We believe we have reduced this population through increased harvest over the past decade. We harvested an average of 5,684 white-tailed deer annually (average of: 2,179 bucks; 2,987 does; 519 fawns) during the 2007-2016 hunting seasons, compared to an average of 2,950 white-tailed deer harvested annually (average of: 1,539 bucks; 1,159 does; 251 fawns) during the 1997-2006 seasons.

Periodic outbreaks of viral hemorrhagic diseases have also contributed to reduced numbers. We documented a significant outbreak of epizootic hemorrhagic disease (EHD) in 2013, resulting in white-tailed deer mortality across the herd unit. Based on landowner and hunter reports, the level of mortality was localized, and likely varied from ~10% - 70% of local populations.

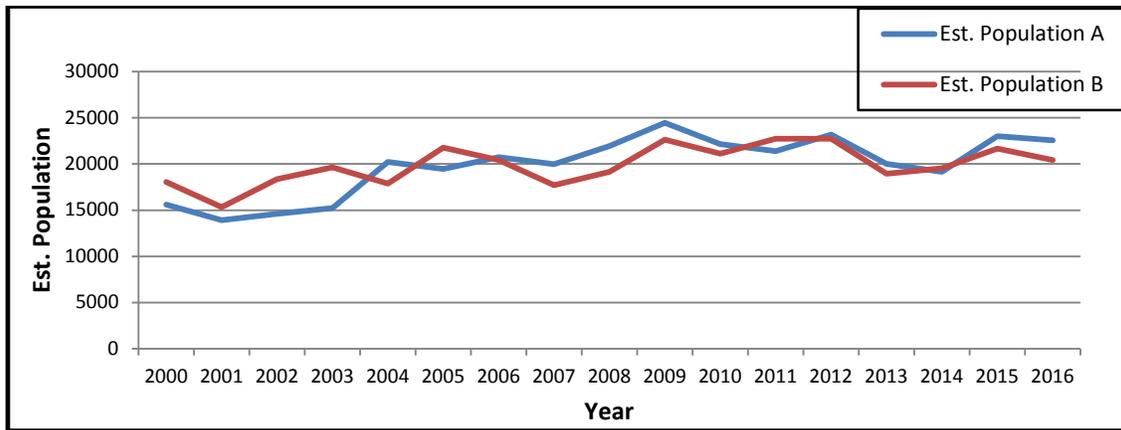


Figure 3. Estimated Powder River white-tailed deer population based on estimated harvest rates during the 2000-2016 hunting seasons. The estimated Population A (blue line) is based on harvesting 10% of available bucks. The estimated Population B (red line) is based on total harvest being 15-30% of total population.

Management Summary

The regular hunting season for white-tailed deer has generally been concurrent with mule deer seasons during October, as well as continuing for white-tailed deer through November. An archery pre-season runs the month of September in all hunt areas. Firearm 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.

We increased Type 3 (any white-tailed deer) licenses in Areas 23, 26 for 2017. We had reduced these licenses after the 2013 EHD outbreak to allow buck numbers to recover. Buck numbers appear to have rebounded and we have received numerous requests to increase this license to pre-2013 levels.

We increased Type 3 licenses in Area 24 to provide additional opportunity in response to improved buck numbers and requests from hunters and landowners. We reduced Type 6 licenses to limit mule deer harvest on these licenses. There are some landowners who take mule deer does to limit damage.

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 outfitted hunts, especially for

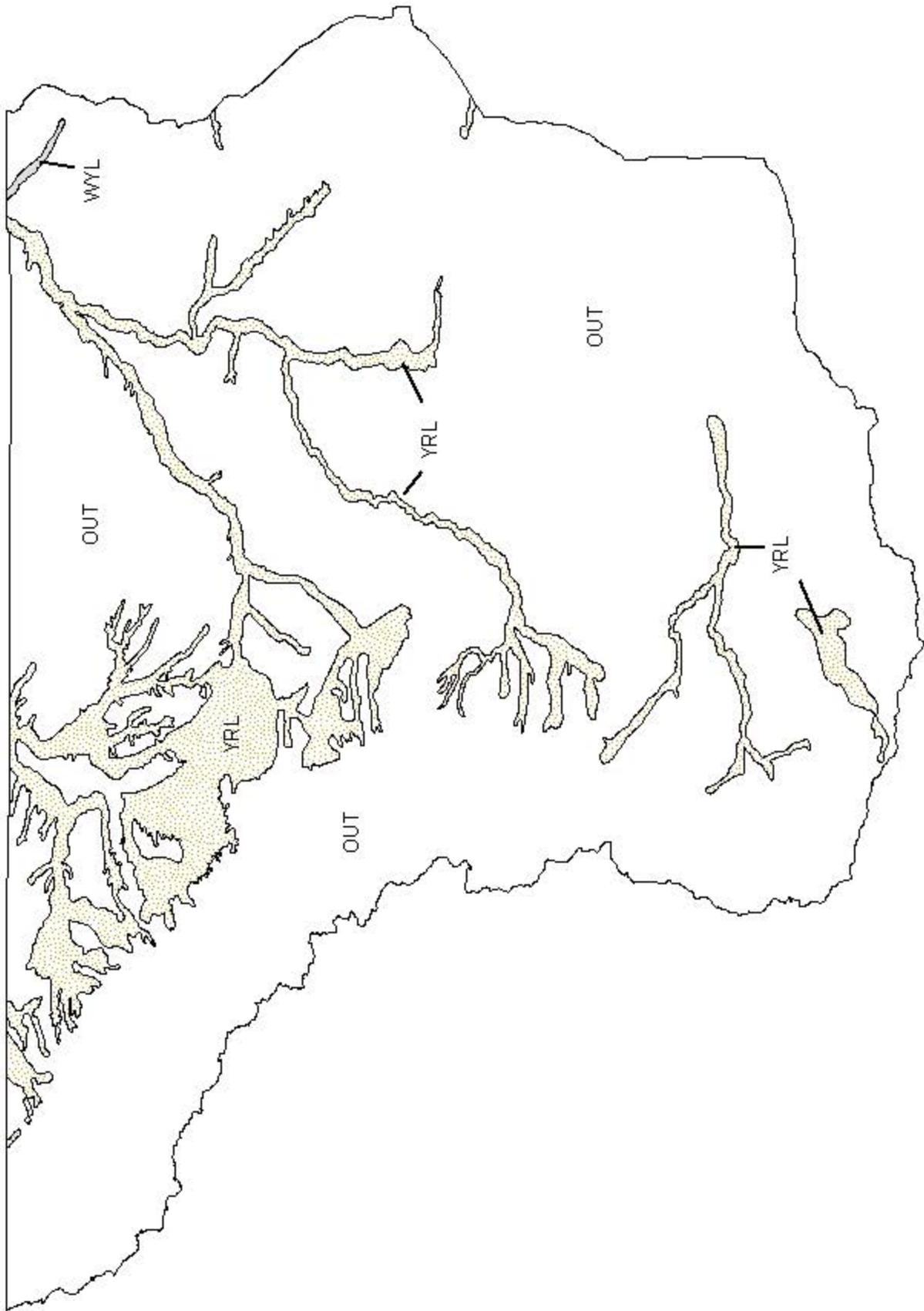
nonresident hunters. Access for antlerless harvest is generally easier, with several landowners on a publically available list allowing free access. Resident hunters seem to rely on various relationships (e.g., work, church, family) with landowners to gain access.

We estimate a harvest of about 6,500 white-tailed deer in 2017, a slight increase from 2016 but similar to 2014. Buck deer are recovering well following the 2013 EHD outbreak. Landowners and hunters report a lot of 3 year old bucks in the population. Antlerless harvest continues to be strong.

We are likely lowering this population in some areas through harvest, but with the numerous refuges available that do not allow hunting within this herd unit, it will be difficult to bring the overall population down to desired levels. Managers will continue to work with individuals and subdivisions to develop safe hunting opportunities.

We maintained the nonresident Region C deer quota at 2,200 licenses for the 2017 season. Region C contains Hunt Areas 17-19, 23, 26, 29 and 31. Nonresident deer hunters generally target mule deer as most can hunt white-tailed deer in their home state. White-tailed deer harvest in Region C hunt areas accounted for about 34% of total harvest in this herd unit in 2016.

We maintained the nonresident Region Y general license deer quota at 1,800 licenses for 2017. Region Y contains Hunt Areas 24, 25, 27, 28, 30, 32, 33, 163 and 169. These hunt areas accounted for 66% of the white-tailed deer harvest in this herd unit during 2016.



White-tailed Deer (WT303) - Powder River
HA 17, 19, 23-33, 163, 169
Revised 4/87