Table of Contents

ACKNOWLEDGEMENT

The field data contained in these reports are the result of the combined efforts of Sheridan Region Wildlife Division personnel, including the District Wildlife Biologists, District Game Wardens, Access Yes Game Warden, Habitat Biologist, Wildlife Technician, Wildlife Management Coordinator, Regional Supervisor, and other Department personnel. The authors appreciate all those who assisted with data collection.

2022 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2022 - 5/31/2023

HERD: PR309 - PUMPKIN BUTTES

HUNT AREAS: 23

PREPARED BY: ERIKA PECKHAM

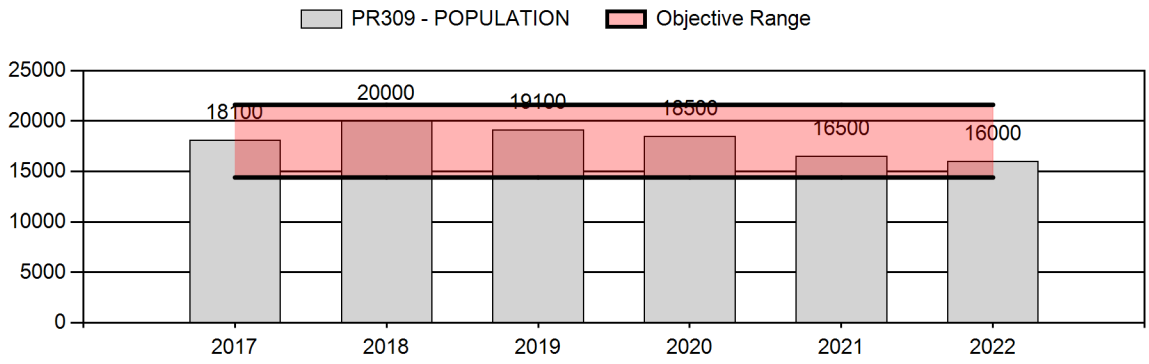
	2017 - 2021 Average	2022	2023 Proposed
Population:	18,440	16,000	16,300
Harvest:	2,534	1,671	1,556
Hunters:	2,663	1,990	1,950
Hunter Success:	95%	84%	80 %
Active Licenses:	2,833	2,156	2,000
Active License Success:	89%	78%	78 %
Recreation Days:	7,591	7,340	7,000
Days Per Animal:	3.0	4.4	4.5
Males per 100 Females	48	58	
Juveniles per 100 Females	75	86	

Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-11.1%
Number of years population has been + or - objective in recent trend:	2
Model Date:	2/8/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	15%	9%
Males ≥ 1 year old:	40%	26%
Proposed change in post-season population:	-12%	2%

Population Size - Postseason



2023 HUNTING SEASONS
PUMPKIN BUTTES PRONGHORN HERD (PR309)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
23	1	Aug. 15	Sept. 30	Oct. 1	Oct. 31	550	Any antelope
23	2	Aug. 15	Sept. 30	Oct. 1	Oct. 31	1,300	Any antelope valid on private land
23	6	Aug. 15	Sept. 30	Oct. 1	Oct. 31	200	Doe or fawn
23	7	Aug. 15	Sept. 30	Oct. 1	Oct. 31	500	Doe or fawn valid on private land

2022 Hunter Satisfaction: 78% Satisfied, 8% Neutral, 14% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The 2023 license issuance was designed to address a population that is still below objective. The model indicates that this herd has been in an increasing trend since 2021, although field observations conflict with this. Total number of animals classified has been decreasing since 2018 (n=3,573 in 2018, n=1,152 in 2022). This more recent decline can be explained by the relatively harsh winter of 2018-2019 and drought conditions that were experienced in 2020 and 2021. In addition to unfavorable rangeland conditions, the late summer and early fall of 2021 saw a severe outbreak of Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus (BTV). Although the severe weather and disease did not occur in the most recent years, the herd numbers are still impacted by these conditions. Doe/fawn licenses were reduced in 2022. Even with fewer licenses, success dropped on Type 6 licenses and days per harvest increased on both licenses types, suggesting pronghorn were difficult for hunters to find.

As this is a predominately private land herd, landowner desires are also considered. Around 2/3 of the respondents felt that antelope numbers were where they liked them, and the remainder felt that they were low.

The reduction of Type 6 and 7 licenses is an effort to further allow numbers to increase in this herd. Comments from public land hunters both in the field and on the harvest survey were generally negative. The comments were focused on seeing very few animals on both public and private lands, and overcrowding of the publicly accessible land, which is minimal in this herd unit. It is estimated that the percentage of buck harvest over the preceding three-year period is 29% of the total bucks. With this license issuance, the herd is predicted to be 8% below objective, with 26% of the mature bucks being harvested.

2.) Population Modeling: The 2022 postseason population estimate for this herd unit from the model was approximately 16,000 pronghorn. This varied quite a bit from the model projection in 2022. The IPM has little fluctuation in the abundance estimate over time, while ground observations over the years suggest otherwise. Success on the Type 2 licenses dropped from 89% to 79%. These tags are utilized on private lands and are predominantly an outfitted or trespass fee

hunt and typically experience harvest success in the 90% range. The harvest success of most licenses types has decreased slowly since 2019 even with a corresponding decrease in license issuance. This suggests that animals are more difficult to encounter, which corroborates with hunter comments and field observations. With a slight reduction in Type 6 and Type 7 licenses, the population is estimated to increase by 300 animals. The model is considered a fairly accurate model (convergence pretty likely and proportion of .91). This herd is scheduled for a line transect flight in May of 2023.

2022 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2022 - 5/31/2023

HERD: PR318 - CRAZY WOMAN

HUNT AREAS: 22, 113

PREPARED BY: ZACH TURNBULL

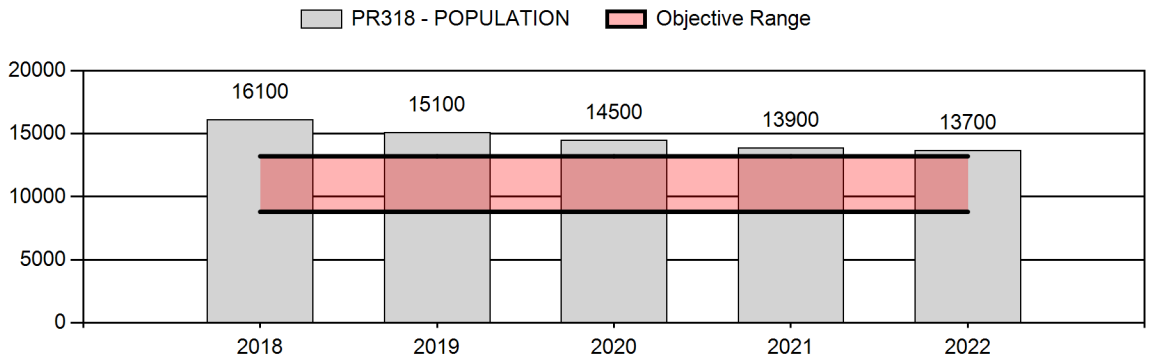
	2017 - 2021 Average	2022	2023 Proposed
Population:	15,300	13,700	13,800
Harvest:	1,557	946	950
Hunters:	1,774	1,179	1,180
Hunter Success:	88%	80%	81 %
Active Licenses:	1,925	1,262	1,260
Active License Success:	81%	75%	75 %
Recreation Days:	6,203	4,333	4,300
Days Per Animal:	4.0	4.6	4.5
Males per 100 Females	51	74	
Juveniles per 100 Females	70	74	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	25%
Number of years population has been + or - objective in recent trend:	19
Model Date:	01/31/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	13%	4%
Males ≥ 1 year old:	34%	16%
Proposed change in post-season population:	-11%	0%

Population Size - Postseason



2023 Hunting Seasons
Crazy Woman Pronghorn Herd Unit (PR318)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
22	1	Aug. 15	Sep. 30	Oct. 1	Oct. 31	700	Any antelope
22	6			Sep. 1	Sep. 30	300	Doe or fawn valid on private land north of Crazy Woman Creek
22	6	Aug. 15	Sep. 30	Oct. 1	Oct. 31		Doe or fawn valid in the entire area
113	1	Aug. 15	Sep. 30	Oct. 1	Oct. 31	150	Any antelope
113	2	Aug. 15	Sep. 30	Oct. 11	Oct. 31	150	Any antelope
113	6	Aug. 15	Sep. 30	Oct. 1	Oct. 31	100	Doe or fawn

2022 Hunter Satisfaction: 66% Satisfied, 16% Neutral, 18% Dissatisfied
2022 Landowner Satisfaction: 22% Satisfied, 43% Neutral, 35% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: Hunter satisfaction in 2022 was up to 66%, a small increase from prior years. The fawn ration in 2022 (74:100) remained similar to the past 5-year average (70:100). Some hunter crowding is to be expected on public lands. Severe drought conditions from 2020 and 2021 likely impacted recruitment and available forage in the unit. Epizootic hemorrhagic disease (EHD), and to a lesser extent bluetongue virus (BTV), affected antelope through the fall and summer months, likely having population level impacts for the second consecutive year.

Landowners generally indicated that numbers were at or below desired levels, and expressed concerns about drought and disease. Significant license reductions in 2022 appeared to alleviate some hunter crowding, and appeared to have a positive correlation on success. Days per harvest and active license success both improved over the previous year (Table 1). The estimated percentage of buck harvest over the preceding three-year period was 20% of the total bucks. With this license issuance, 17% of the mature bucks are predicted to be harvested in 2023. Private land access limits opportunity for harvest, including buck harvest.

Table 1. PR 318 Harvest Summary 2013-2022.

Year	Res Htrs	NRes Htrs	Tot Harv	Hunter Success	Act Lic	Hntr Days	Days to Harv
2013	362	1,672	1,790	88%	79%	7,415	4.1
2014	399	1,581	1,835	93%	84%	6,862	3.7
2015	298	1,687	1,801	91%	86%	6,834	3.8
2016	216	1,699	1,639	86%	80%	6,730	4.1
2017	245	1,521	1,677	95%	86%	5,876	3.5
2018	189	1,650	1,797	98%	89%	5,746	3.2
2019	162	1,640	1,551	86%	80%	6,055	3.9
2020	149	1,554	1,483	87%	81%	6,141	4.1
2021	203	1,557	1,275	72%	68%	7,196	5.6
2022	270	909	946	80%	75%	4,333	4.6

2.) Management Objective Review: The Crazy Woman herd is managed as a recreational herd with a post-season population objective of 11,000 pronghorn. After analyzing populations models, line transects, harvest statistics and consulting constituents, we feel that maintaining the current management framework and objective is appropriate, allowing adequate flexibility to balance hunter satisfaction, hunter success, landowner satisfaction and biologically suitable numbers on the landscape. Hunter comments and landowner surveys support the perception the population is under objective.

3.) Line Transect Survey: Line transects estimates for the herd have varied greatly. We conducted line transect (LT) surveys in 2020 and 2022. Surveys were completed using a Husky Aviat supplied by Flightline LFS, Inc and one observer. An LT survey was conducted in 2022, partly to assess the impacts of EHD and BTV, as field observation indicated significant loss. Using a new Pooled Hierarchical model to analyze results the survey produced an estimate of 9,120 pronghorn, far below previous estimates (Figure 2). Unlike many traditional models, the pooled model uses other similar line transect flights to inform the model. While this estimate is a stark contrast to previous models, it seems to reasonably represent the population and field observations. Traditional single herd analysis produced an estimate of 14,000.

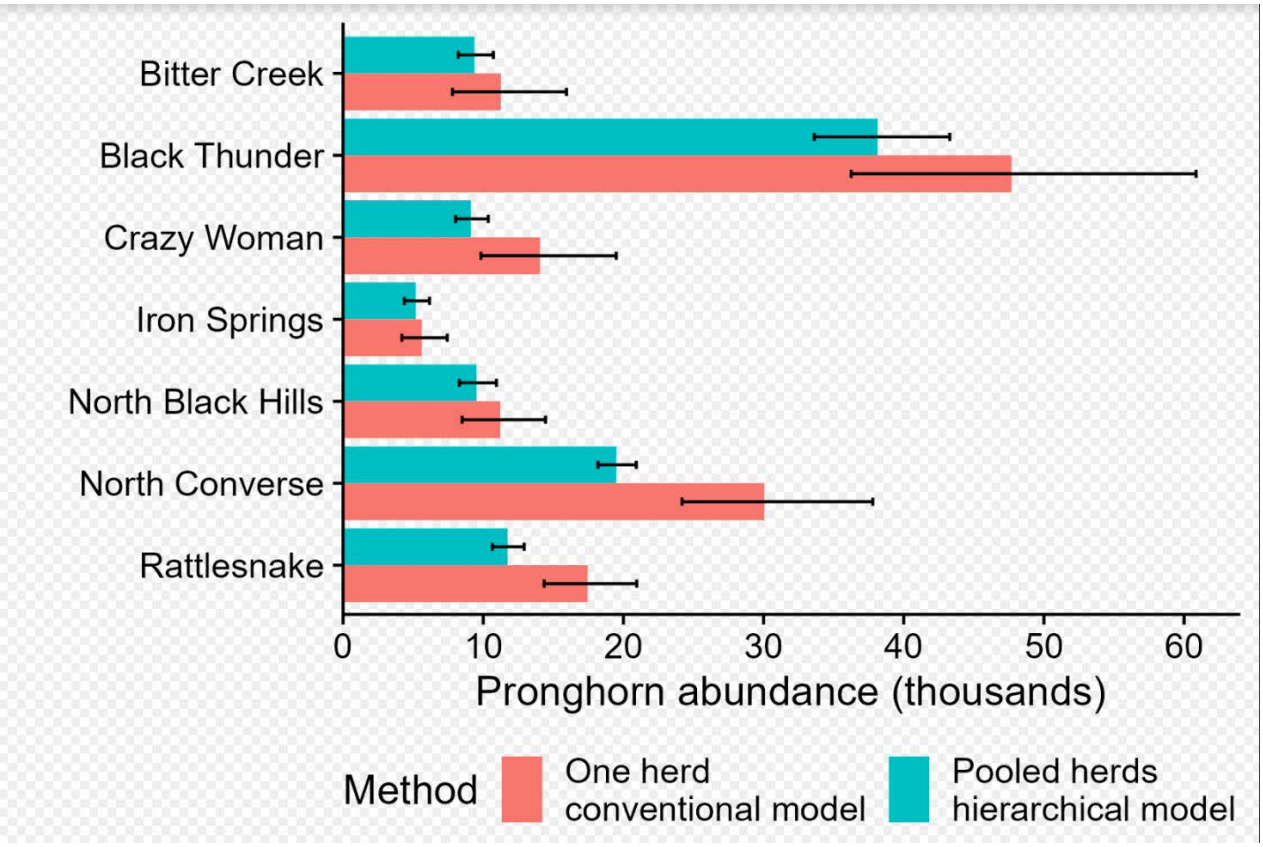


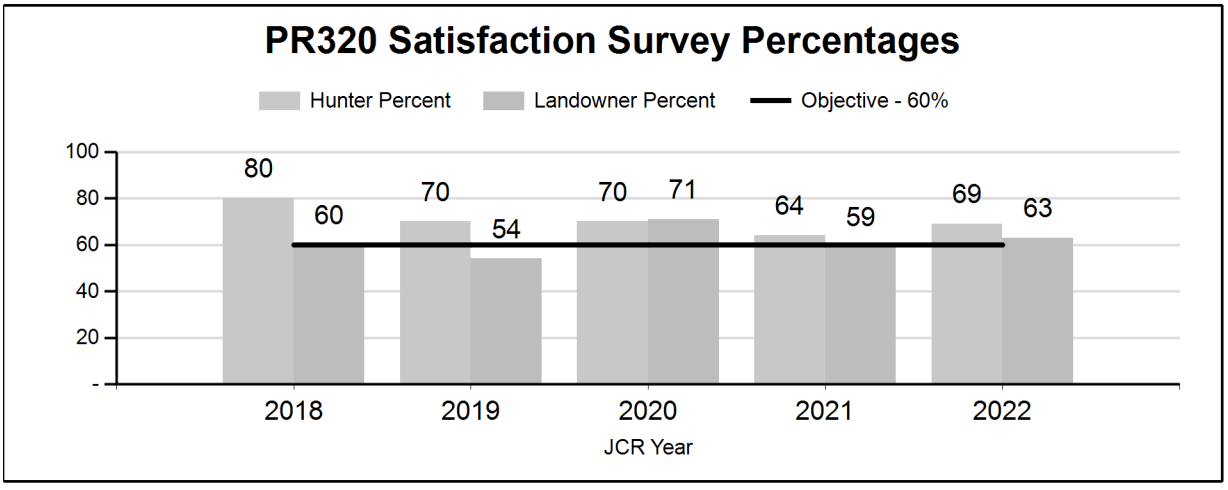
Figure 2. Comparison of single herd analysis and pooled hierarchical modeling 2022.

4.) Population Modeling: Using Integrated Population modeling, a bio-year 2022 postseason population estimate of 13,800 pronghorn was generated. This model used license numbers as the effort variable. The model had an Rhat value of 1.21 . This estimate is likely influenced by several recent line transect estimates that may have greatly overestimated the population.

2022 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2022 - 5/31/2023
HERD: PR320 - HAZELTON
HUNT AREAS: 20, 102
PREPARED BY: ZACH TURNBULL

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	74%	69%	60%
Landowner Satisfaction Percent	63%	63%	60%
Harvest:	1,104	744	750
Hunters:	1,364	1,046	1,050
Hunter Success:	81%	71%	71 %
Active Licenses:	1,503	1,158	1,160
Active License Success:	73%	64%	65 %
Recreation Days:	5,345	4,665	4,600
Days Per Animal:	4.8	6.3	6.1
Males per 100 Females:	72	68	
Juveniles per 100 Females	75	81	
Satisfaction Based Objective			60%
Management Strategy:			Private Land
Percent population is above (+) or (-) objective:			6%
Number of years population has been + or - objective in recent trend:			0



2023 Hunting Seasons
Hazelton Pronghorn Herd Unit (PR320)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
20	1	Aug. 15	Oct. 14	Oct. 15	Nov. 15	350	Any antelope
20	6	Aug. 15	Oct. 14	Oct. 15	Nov. 15	250	Doe or fawn
102	1	Aug. 15	Oct. 14	Oct. 15	Nov. 15	400	Any antelope
102	6			Sep. 1	Sep. 30	400	Doe or fawn valid on private land
102	6	Aug. 15	Oct. 14	Oct. 15	Nov. 15		Doe or fawn valid in the entire area

2022 Hunter Satisfaction: 69% Satisfied, 15% Neutral, 16% Dissatisfied
2022 Landowner Satisfaction: 5% Above, 50% At, 45% Below Desired Levels

2023 Management Summary

1.) Hunting Season Evaluation: Pronghorn harvest in 2022 largely mirrored that of the previous two years, with high days/harvest (6.3) and low harvest success (64% of active licenses) for the herd unit (Table 1). The impacts of the 2020-2021 drought combined with the appearance of bluetongue virus (BTV) and epizootic hemorrhagic disease (EHD) are likely contributing to these statistics. Fawn production increased slightly in 2022. The estimated percentage of buck harvest over the preceding three-year period was 13% of the total bucks. With this license issuance, 13% of the mature bucks are predicted to be harvested in 2022. Harvest, including buck harvest, is limited by access to private lands.

Harvest rates are very coarse as the herd is managed for landowner satisfaction, and not a numeric objective. As such, population estimates have large associated confidence intervals. Field observations in 2022 appeared to indicate significantly reduced crowding, likely due to reductions in pronghorn and deer license

Table 1. PR320 Harvest statistics 2018-2022.

Year	HUNTERS					Tot Harv	SUCCESS			
	Res Htrs	NRes Htrs	% NRes	Total Htrs	Act Lic		Hntrs	Act Lic	Hntr Days	Days to Harv
2018	211	1,153	85%	1,364	1,487	1,205	88%	81%	5,291	4.4
2019	174	1,171	87%	1,345	1,503	1,094	81%	73%	4,996	4.6
2020	172	1,186	87%	1,358	1,492	1,011	74%	68%	5,695	5.6
2021	192	1,200	86%	1,392	1,503	948	68%	63%	5,883	6.2
2022	192	854	82%	1,046	1,158	744	71%	64%	4,665	6.3

2.) Management Objective Review: The Hazelton herd is managed for hunter and landowner satisfaction (60% or above) and private land strategies. Landowner satisfaction was reported at 50% for the 2022 season. This recent dip in satisfaction likely stems from a significant decrease in pronghorn numbers primarily attributed to disease and drought. These impacts, and resulting satisfaction, were more evident in the southern HA 20. After analyzing harvest statistics and consulting constituents, we feel that maintaining the current management framework and objective is appropriate, allowing adequate flexibility to balance hunter satisfaction, landowner satisfaction and biologically suitable numbers on the landscape.

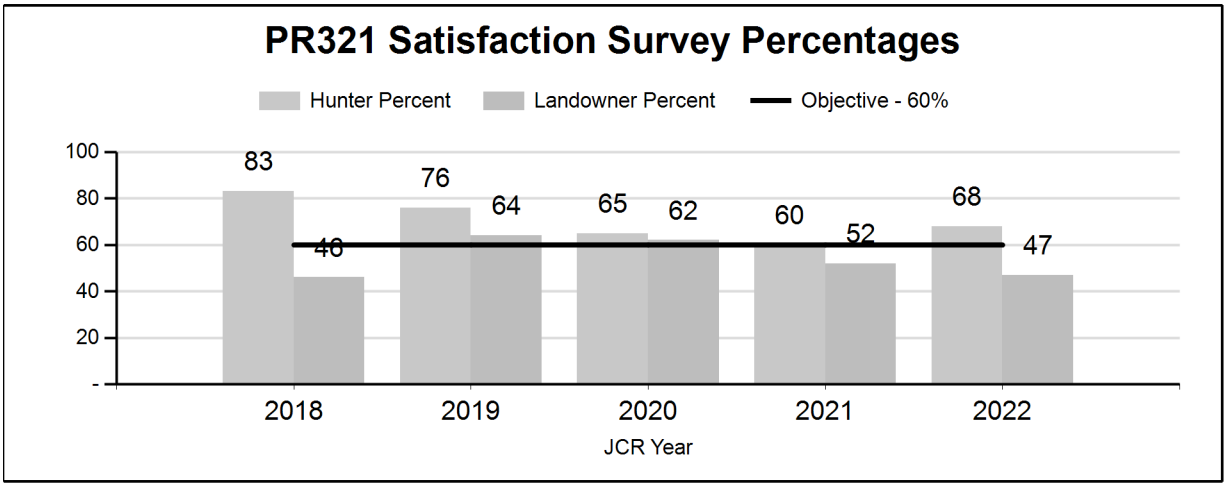
3.) Landowner Survey: The annual landowner survey was mailed out January 17th with a February 1 deadline for return. Forty (n=40) landowners responded. Landowner satisfaction was acceptable, with 50% reporting populations at desired levels and a preference for similar season structure (68%).

2022 - JCR Evaluation Form

SPECIES: Pronghorn
HERD: PR321 - LEITER
HUNT AREAS: 10, 15-16

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ERIC MAICHAK

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	71%	68%	70%
Landowner Satisfaction Percent	55%	47%	50%
Harvest:	1,695	781	800
Hunters:	2,261	1,171	1,000
Hunter Success:	75%	67%	80%
Active Licenses:	2,439	1,273	1,100
Active License Success:	69%	61%	73%
Recreation Days:	7,873	4,190	4,000
Days Per Animal:	4.6	5.4	5
Males per 100 Females:	47	50	
Juveniles per 100 Females	65	60	
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:			1



2023 HUNTING SEASONS
LEITER PRONGHORN HERD (PR321)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
10	1	Aug. 15	Sep. 30	Oct. 1	Oct. 14	200	Any antelope
	6	Aug. 15	Sep. 30	Oct. 1	Oct. 31	200	Doe or fawn
15	1	Aug. 15	Sep. 30	Oct. 1	Oct. 14	400	Any antelope
	6	Aug. 15	Sep. 30	Oct. 1	Oct. 31	200	Doe or fawn
16	1	Aug. 15	Sep. 30	Oct. 1	Oct. 14	250	Any antelope
	6	Aug. 15	Sep. 30	Oct. 1	Oct. 31	50	Doe or fawn

2022 Hunter Satisfaction Estimate: 68% (very satisfied + satisfied)
2022 Landowner Satisfaction Estimate: Population at desired level, 47%; Same seasons, 63%

2023 Management Summary

1.) Hunting Season Evaluation: This herd unit is predominantly private land, with very limited accessible public lands supporting pronghorn. Hunting season strategies are informed by survey responses and comments from land owners and hunters, classification ratios, and population model and adult buck harvest estimates. Weather, disease, and habitat data are considered as available.

The 2022-23 annual landowner survey results suggest landowners felt pronghorn numbers were at (n=17; 47%), below (n=13; 36%), or above (n=6; 17%) desired levels. Relative to 2022, landowners felt seasons should be set the same (n=22; 63%), more conservative (n=8; 23%), or liberal (n=5; 14%), with greater support for similar seasons in HA16 (73%) and HA10 (67%) than HA 15 (53%).

Hunter comments regarding populations (n=7) suggest fewer animals than prior years (n=6), as well as need to reduce Type 6 licenses (n=1), yet satisfaction (very satisfied + satisfied) was 68%, up from 60% and 65% in 2021 and 2020, respectively. Days hunted per animal harvested for Type 1 and 6 licenses combined was 5.4, consistent since 2020.

Production and recruitment, measured by observed classifications ratios, have lagged since 2012 yet improved. We observed 50 bucks:100 does, an improved ratio not seen since 2018. Fawn production the past five years has averaged 62 fawns:100 does, suggesting below desired production (66:100) to sustain the level of harvest during those same years.

Factors likely influencing landowner and hunter perception and the population was a shift in distribution due to extreme drought conditions 2018-2020 and mortalities due to epizootic hemorrhagic disease virus (EHDV) and blue tongue virus (BTV) in 2021. Although hunter success has trended down and effort has trended up since 2018, both metrics have stabilized since 2020.

Winter of 2022-23 was harsh. Wyoming SNOTEL sites suggest the Powder River Basin peaked at 127% of average snow-water-equivalent, with hard crusting of snow and limited melting until mid-April. Temperatures also fell at or below single-digit Fahrenheit several times.

In response to diminished population and fawn production, hard winter, and relative landowner and public support for similar to slightly more conservative seasons, particularly in HA 15, we reduced Type 1 licenses from 500 to 400, and Type 6 licenses from 400 to 200 in HA 15, with no changes in HA 10 or HA 16.

2.) Management Objective Review: This herd is scheduled for the next 5-year herd unit review in 2024.

3.) Population Modeling: In 2021, we started using a PopR based integrated population model (IPM). The 2022 IPM estimated a postseason population of 5,004 pronghorn (95% CI = 4858-7144). Estimated harvest of bucks >1 year old relative to total population based on the IPM was 0.37 in 2022, down from 2021 (0.55), with a 3-yr average of 0.54, and predicted at 0.50 in 2023. Model performed best (Rhat proportion = 0.99) with date range 2012-2023, Effort = Days/Harvest, Reproduction = Constant, Adult and Juvenile survival = Time Varying, Burnin = 50,000, Iterations = 30,500, Thinning Rate = 1.

2022 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2022 - 5/31/2023

HERD: PR339 - NORTH BLACK HILLS

HUNT AREAS: 1-3, 18-19

PREPARED BY: ERIKA PECKHAM

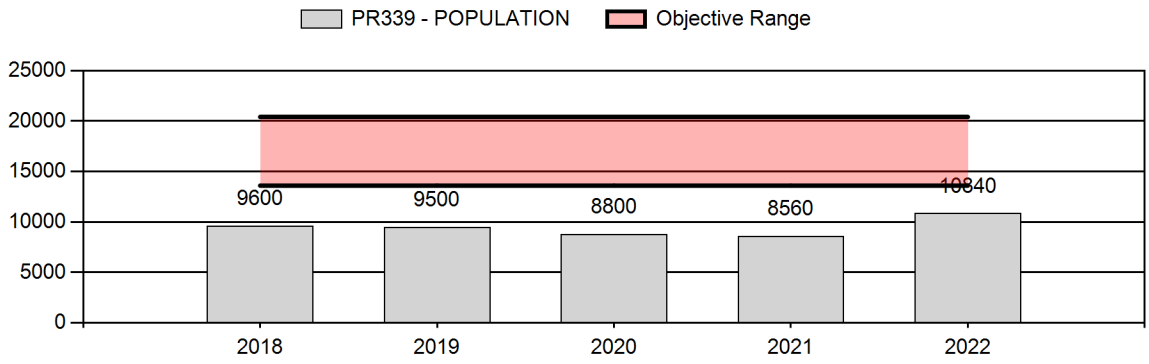
	2017 - 2021 Average	2022	2023 Proposed
Population:	9,392	10,840	10,940
Harvest:	1,286	980	900
Hunters:	1,450	1,135	1,050
Hunter Success:	89%	86%	86 %
Active Licenses:	1,641	1,257	1,100
Active License Success:	78%	78%	82 %
Recreation Days:	4,925	4,028	3,700
Days Per Animal:	3.8	4.1	4.1
Males per 100 Females	43	40	
Juveniles per 100 Females	70	71	

Population Objective (± 20%) :	17000 (13600 - 20400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-36.2%
Number of years population has been + or - objective in recent trend:	2
Model Date:	3/1/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	8%	5%
Males ≥ 1 year old:	61%	30%
Proposed change in post-season population:	-6%	1%

Population Size - Postseason



2023 HUNTING SEASONS
NORTH BLACK HILLS PRONGHORN HERD (PR339)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	1	Aug. 15	Sept. 30	Oct. 1	Nov. 20	250	Any antelope
1	6	Aug. 15	Sept. 30	Oct. 1	Nov. 20	75	Doe or fawn
2	1	Aug. 15	Sept. 30	Oct. 1	Nov. 20	150	Any antelope
3	1	Aug. 15	Sept. 30	Oct. 1	Nov. 20	175	Any antelope
3	6	Aug. 15	Sept. 30	Oct. 1	Nov. 20	25	Doe or fawn
18	1	Aug. 15	Sept. 30	Oct. 1	Oct. 20	175	Any antelope
18	6	Aug. 15	Sept. 30	Oct. 1	Oct. 20	25	Doe or fawn
18	7	Aug. 15	Sept. 30	Oct. 1	Oct. 20	25	Doe or fawn valid private land
19	1	Aug. 15	Sept. 30	Oct. 1	Oct. 20	200	Any antelope
19	7	Aug. 15	Sept. 30	Oct. 1	Oct. 20	25	Doe or fawn valid private land

2022 Hunter Satisfaction: 79% Satisfied, 12% Neutral, 9% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The North Black Hills Herd Unit is predominantly private land access with the exception of Hunt Area 18, and to some degree, Hunt Area 1. This herd has been trending overall downward for the last four years. The decline in recent years can be explained by the relatively harsh winter of 2018-2019 and drought conditions that were experienced in 2020 and 2021. In addition to unfavorable rangeland conditions, the late summer and early fall of 2021 experienced a severe outbreak of Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus (BTV). Although these events did not occur in the most recent bio-year, this herd is still suffering from the impacts.

License numbers were reduced in all but Hunt Areas 1. When looking at harvest success and fawn ratios, this area appears to be more stable than the others. Of particular concern is Hunt Area 18. This area has a fair amount of accessible public land. Both Type 6 and Type 7 licenses had low harvest success, 59% and 46% respectively. Additionally, days per harvest were high for pronghorn. The Type 6 and 7 harvest success in both Hunt Areas 2 and 19 were also low (51% and 69% respectively). Fawn ratios have been in the 60's the last three years for Hunt Area 2 and

19. As this herd is modeling significantly below objective, these doe/fawn licenses warranted a reduction.

As this is a private land herd, landowner surveys are also considered. Sixty percent of respondents felt there were the right amount of pronghorn, while 35% felt that they were below where they would like to see them. It is estimated that percentage of buck harvest over the preceding 3-year period is 30% of the total bucks. With this license issuance, the herd is predicted to be 45% below objective, with 30% of the mature bucks being harvested.

2.) Population Modeling: The 2022 postseason estimate from the IPM was approximately 10,800 (CL=9,688-12,191) pronghorn. Although field observations indicate that this herd has likely been trending downward the last few years, the model indicates that this herd has experienced a couple years of small growth. A line transect survey was flown in 2022 and resulted in a population estimate of around 11,000 pronghorn. All datasets point to a herd that is well below objective.

2022 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2022 - 5/31/2023

HERD: PR351 - GILLETTE

HUNT AREAS: 17

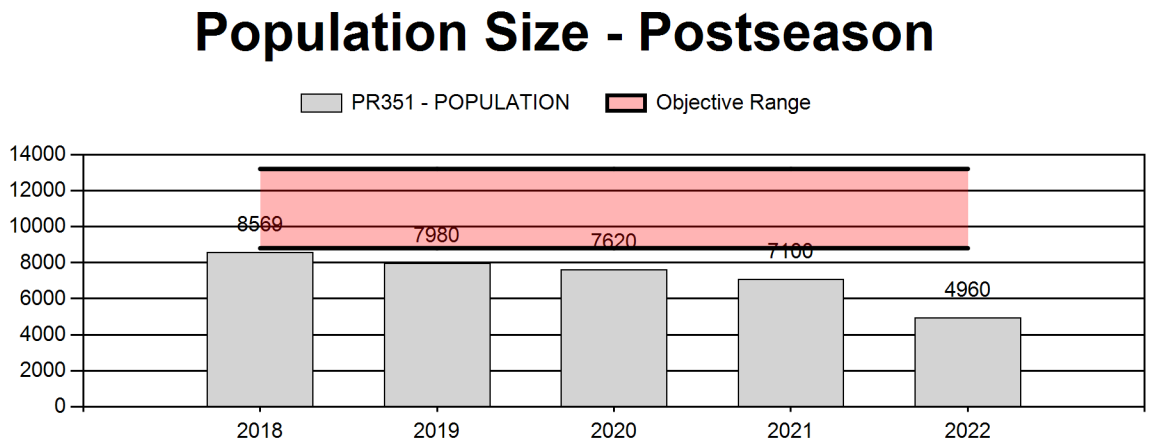
PREPARED BY: ERIKA PECKHAM

	2017 - 2021 Average	2022	2023 Proposed
Population:	8,060	4,960	5,170
Harvest:	974	568	414
Hunters:	1,152	797	600
Hunter Success:	85%	71%	69%
Active Licenses:	1,208	819	550
Active License Success:	81%	69%	75%
Recreation Days:	3,968	2,762	2,000
Days Per Animal:	4.1	4.9	4.8
Males per 100 Females	46	30	
Juveniles per 100 Females	49	52	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-54.9%
Number of years population has been + or - objective in recent trend:	7
Model Date:	3/2/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	8%	.05%
Males ≥ 1 year old:	51%	40%
Proposed change in post-season population:	-8%	4%



2023 HUNTING SEASONS
GILLETTE PRONGHORN HERD (PR351)

Hunt Area	Type	Archery Dates		Dates of Seasons		Quota	Limitations
		Opens	Closes	Opens	Closes		
17	1	Aug.15	Sep. 30	Oct. 1	Oct. 20	500	Any antelope
17	6	Aug.15	Sep. 30	Oct. 1	Oct. 20	25	Doe or fawn

2022 Hunter Satisfaction: 78% Satisfied, 15% Neutral, 7% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The 2023 license issuance was designed to address a declining population. This herd has been in a decline since 2016, according to the model, which aligns with field observations. This more recent decline can be explained by the relatively harsh winter of 2018-2019 and drought conditions that were experienced in 2020 and 2021. Consequently, observed fawn ratios in this herd have been exceptionally low in the preceding five-year period, averaging only 41:100.

In addition to unfavorable rangeland conditions, the late summer and early fall of 2021 experienced a severe outbreak of Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus. Although these diseases naturally cycle through populations every 8 to 10 years, 2021 was severe and had a negative, population-level effect. Although the severe weather and disease were not experienced in the most recent reporting year, this herd is still recovering from these issues.

The reduction of Type 1 and 6 licenses is an effort to curb the decline that this population is experiencing. Comments from both hunters and landowners expressed concern with the numbers of pronghorn. As this is a predominantly private land herd landowner desires are considered. Sixty percent of respondents (n=22) feel that the antelope are at levels below where they would like them to be. It is estimated the percentage of buck harvest over the preceding three-year period is 40% of the total bucks. With this license issuance, the herd is predicted to be 52% below objective, with 40% of the mature bucks being harvested.

2.) Population Modeling: The 2022 postseason population estimate for this herd unit was approximately 4,960 using the PopR IPM (CL= 4,430-5,515).

The model prediction decreased from last year's estimate of 6,600, and there is cause for concern when looking at different datasets individually, as well as the model as a whole.

Since 2017, the harvest success has decreased every year on the Type 1 licenses. The harvest success in 2022 was the lowest in many years, at 75% for Type 1 licenses. Also concerning is that beginning in 2020, licenses have been reduced every year to date. Even with these reductions,

harvest rates have continued to decline, suggesting that animals are getting harder to find.

Viewing the observed fawn ratios also illustrates why this herd is likely modeling in such a downward trajectory. A five-year average of 48:100 is a level of fawn production that will not allow this herd to increase.

2022 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2022 - 5/31/2023

HERD: PR352 - MIDDLE FORK

HUNT AREAS: 21

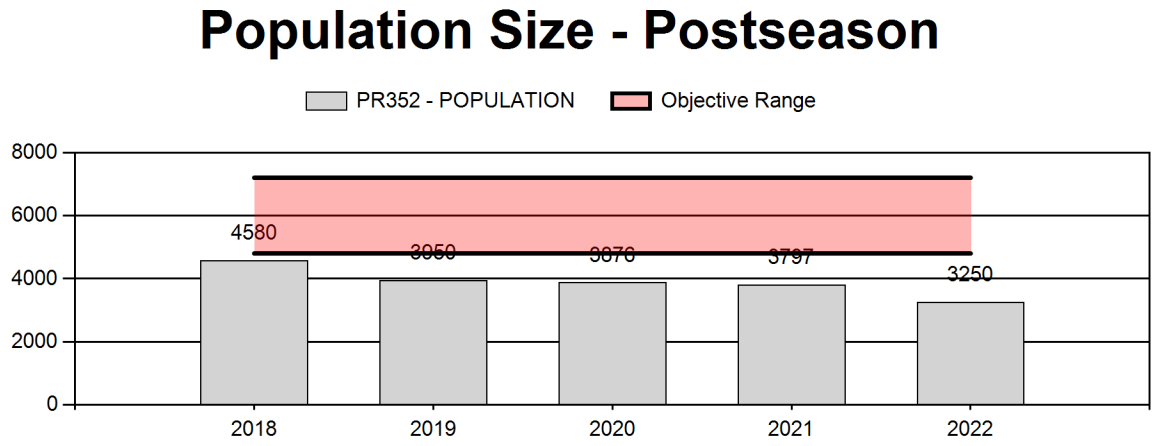
PREPARED BY: ZACH TURNBULL

	2017 - 2021 Average	2022	2023 Proposed
Population:	4,225	3,250	4,000
Harvest:	547	294	294
Hunters:	699	405	405
Hunter Success:	78%	73%	73%
Active Licenses:	769	429	429
Active License Success:	71%	69%	69%
Recreation Days:	2,473	1,359	1,300
Days Per Animal:	4.5	4.6	4.4
Males per 100 Females	44	41	
Juveniles per 100 Females	65	83	

Population Objective (± 20%) :	6000 (4800 - 7200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-45.8%
Number of years population has been + or - objective in recent trend:	2
Model Date:	1/27/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	14%	6%
Males ≥ 1 year old:	45%	20%
Proposed change in post-season population:	-2%	23%



2023 Hunting Seasons
Middle Fork Pronghorn Herd Unit (PR352)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
21	1	Aug. 15	Oct. 14	Oct. 15	Oct. 31	400	Any antelope
21	6	Aug. 15	Oct. 14	Oct. 15	Oct. 31	100	Doe or fawn

2022 Hunter Satisfaction: 74% Satisfied, 11% Neutral, 15% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The goal of the current season structure is to increase the population towards the objective and increase hunter satisfaction, while minimizing damage and reducing crowding on public lands. Some hunter crowding on public lands is expected, however a few concerning patterns are beginning to emerge following quota increases implemented in 2018. Starting in 2020, harvest statistics began to deteriorate with days per harvest increasing and hunter success decreasing. To address these concerns and a downward trending herd metrics, licenses were reduced in 2022. More favorable conditions, and fewer hunters appeared to increase both satisfaction and hunter success in 2023 (Figure 1). The estimated percentage of buck harvest over the preceding three-year period was 23% of the total bucks. With this license issuance, 20% of the mature bucks are predicted to be harvested in 2023. Private land access limits opportunity for harvest, including buck harvest.. It is likely that drought has impacted pronghorn numbers and forage production. With more favorable conditions last year fawn production increased to the highest levels observed since 2016 (83:100 does in 2022). Thirty-eight percent (38%) of landowner survey respondents (n=8) indicated that pronghorn numbers were below desired levels.

Table 1. PR 352 Harvest Summary 2013-2022.

Year	Res Htrs	NRes Htrs	Tot Harv	Hunter Success	Act Lic	Hntr Days	Days to Harv
2013	195	961	823	71%	67%	4,366	5.3
2014	145	765	776	85%	76%	5,061	6.5
2015	45	520	520	92%	81%	2,661	5.1
2016	62	532	504	85%	78%	1,988	3.9
2017	115	517	584	92%	83%	1,900	3.3
2018	97	649	705	95%	85%	2,600	3.7
2019	123	648	575	75%	68%	2,293	4
2020	117	614	493	67%	62%	2,763	5.6
2021	146	471	380	62%	56%	2,807	7.4
2022	155	250	294	73%	69%	1,359	4.6

2.) Management Objective Review: The herd is managed as a recreational herd with a post-season population objective of 6,000 pronghorn. Population models indicate that the herd remained near objective for over a decade. Similar to other herd units in the area, this herd has recently been affected by drought and disease, causing depressed numbers. Fawn production and recruitment appeared to increase in 2022. After analyzing harvest statistics, line transect estimates, population models and consulting constituents, we feel that maintaining the current management framework and objective is appropriate, allowing adequate flexibility to balance hunter satisfaction, hunter success, landowner satisfaction and biologically suitable numbers on the landscape.

3.) Line Transect Survey: No line transect survey was conducted in 2022.

4.) Population Modeling: The bio-year 2022 postseason population estimate for this herd unit from the PopR integrated population models (IPM) was approximately 4,600 (CL = 2,730 – 6,360) pronghorn which suggests the population is below objective (6,000). The IPM model had an Rhat Max of 1.38 and tracked population input well. Recreational days was used as the model variable as it produced the lowest Rhat and tracked field observations best.

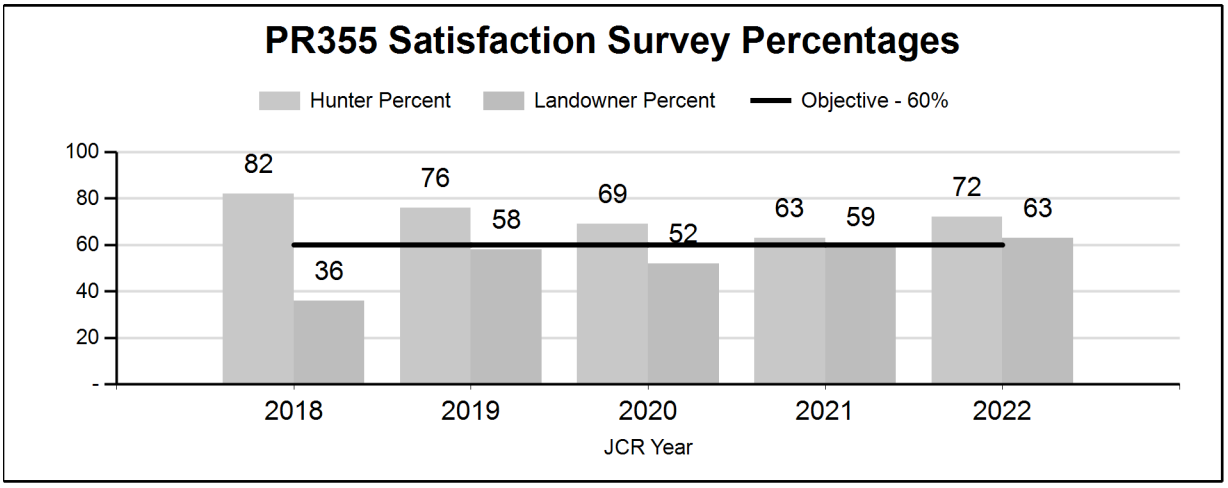
2022 - JCR Evaluation Form

SPECIES: Pronghorn
HERD: PR355 - BECKTON
HUNT AREAS: 109

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ERIC MAICHAK

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	74%	72%	73%
Landowner Satisfaction Percent	49%	63%	60%
Harvest:	388	234	230
Hunters:	523	320	320
Hunter Success:	74%	73%	72%
Active Licenses:	593	360	360
Active License Success:	65%	65%	64%
Recreation Days:	2,033	1,391	1,400
Days Per Animal:	5.2	5.9	6.1
Males per 100 Females:	29	44	
Juveniles per 100 Females	62	80	

Satisfaction Based Objective	60%
Management Strategy:	Private Land
Percent population is above (+) or (-) objective:	8%
Number of years population has been + or - objective in recent trend:	2



2023 HUNTING SEASONS
BECKTON PRONGHORN HERD (PR 355)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
109	1	Aug. 15	Sep. 14	Sep. 15	Nov. 30	300	Any antelope
	6	Aug. 15	Sep. 14	Sep. 15	Nov. 30	200	Doe or fawn

2022 Hunter Satisfaction Estimate: 72% (very satisfied + satisfied)
2022 Landowner Satisfaction Estimate: Population at desired level, 63%; Same season, 69%

2023 Management Summary

1.) Hunting Season Evaluation: This herd unit is predominantly private land, with very limited public land access to areas that support pronghorn. Hunting season strategies are informed by survey responses and comments from land owners and hunters, classification ratios, and modelled population and harvest estimates. Weather, disease, and habitat data are incorporated as available.

The 2022-23 annual landowner survey results suggest landowners felt pronghorn numbers were at (n=12; 63%), above (n=5; 26%), or below (n=2; 11%) desired levels. Landowners felt seasons should be set the same (n=11; 69%), more conservative (n=2; 13%), or more liberal (n=3; 19%). Relative to 2021, results were nearly identical for populations at desired levels and season strategies.

Hunter satisfaction (very satisfied + satisfied) was 72%, up from 63% and 69% in 2021 and 2020, respectively. Effort improved slightly comparing 2022 to 2021, as days hunted per animal harvested was 5.2 and 7.5 for Type 1 and 6 licenses respectively. Success for Type 1 improved slightly (78%), and remained unchanged for Type 6 licenses (50%).

We observed 44 bucks:100 does and 80 fawns:100 does during preseason August classification surveys, levels not seen since 2017.

Despite a harsh winter in 2022-23, we received no reports of large-scale deaths of pronghorn in this herd. Therefore, we made no changes for the 2023 season.

2.) Management Objective Review: This herd is scheduled for the next 5-year herd unit review in 2024.

3.) Population Modeling: In 2021, we started using a PopR based integrated population model (IPM). The 2022 postseason IPM estimated 1,232 pronghorn (95% CI = 911-1,703) compared to 1,194 in 2021. Estimated harvest of bucks >1 year old relative to total population based on the IPM was 0.56 in 2022, down from 2021 (0.69), with a 3-year average of 0.63, and predicted at 0.62 in 2023. Model performed best (Rhat proportion = 1) with date range 2013-2023, Effort = Days/Harvest, Reproduction = Constant, Adult and Juvenile survival = Time Varying, Burnin = 50,000, Iterations = 30,500, Thinning Rate = 1.

2022 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2022 - 5/31/2023

HERD: MD319 - POWDER RIVER

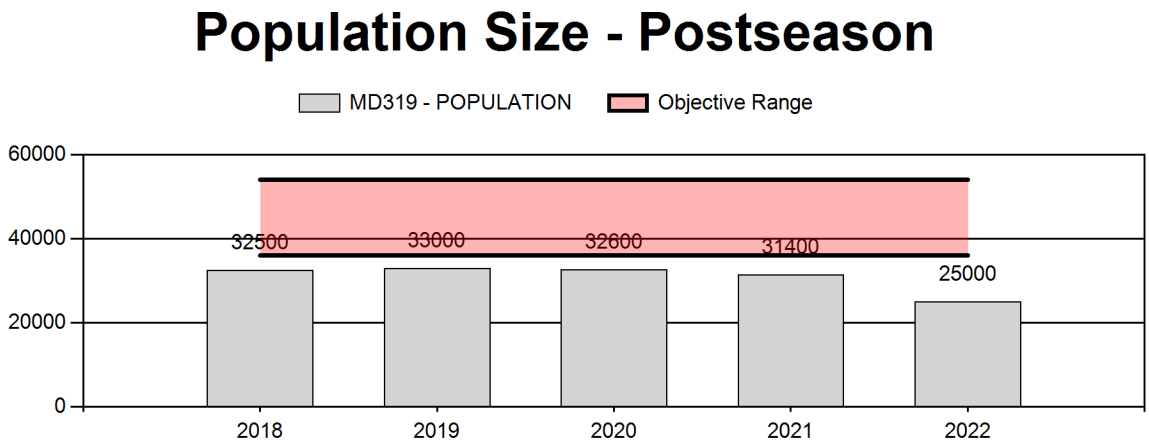
HUNT AREAS: 17-18, 23, 26
PREPARED BY: ERIKA PECKHAM

	2017 - 2021 Average	2022	2023 Proposed
Population:	32,650	25,000	25,600
Harvest:	2,787	1,836	1,666
Hunters:	4,222	3,622	3,400
Hunter Success:	66%	51%	49%
Active Licenses:	4,354	3,754	3,600
Active License Success:	64%	49%	46%
Recreation Days:	16,346	16,750	15,000
Days Per Animal:	5.9	9.1	9.0
Males per 100 Females	42	39	
Juveniles per 100 Females	59	69	

Population Objective (± 20%) :	45000 (36000 - 54000)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-44.4%
Number of years population has been + or - objective in recent trend:	5
Model Date:	2/12/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	4%	1%
Males ≥ 1 year old:	27%	21%
Proposed change in post-season population:	1.01%	1.02%



2023 HUNTING SEASONS
POWDER RIVER MULE DEER HERD (MD319)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
17	Gen	Sep.1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
18	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
23	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
23, 26	7			Sep.1	Dec. 15	300	Doe or fawn valid on private land
26	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer

2023 Region C nonresident quota: 2,000

2022 Hunter Satisfaction: 59% Satisfied, 18% Neutral, 23% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: All hunt areas within this herd unit are general season areas. License issuance changed regarding the Type 7 licenses. Although there were a minimal amount of Type 7 licenses in Hunt Areas 17 and 18, observed fawn ratios and the fact that this herd is well below objective warranted removing these license types. The Type 7 licenses valid in Hunt Areas 23 and 26 were decreased substantially, from 1,000 to 300 licenses, as this herd is modeling well below objective. However, in Hunt Areas 23 and 26, fawn ratios are consistently higher than Areas 17 and 18, and based on the harvest survey there were 302 mule deer harvested on these Type 7 licenses in 2022, while 254 were utilized on white-tailed deer. Of landowners surveyed in HA 23 and 26 (as of 2/9/23), 57% suggest populations below desired level and 54% maintaining seasons and licenses similar to 2022. Therefore, we issued 300 Type 7 licenses to maintain seasons and harvest at acceptable levels and address damage concerns in specific areas. Additionally, 1,000 Type 8 licenses were made available to further address damage concerns with white-tailed deer in Hunt Areas 23 and 26.

As this herd unit is a general area, the management tools are doe/fawn license issuance, non-resident regional quota and season length. As Type 7 licenses and regional quotas have been addressed, this leaves only the season length in Hunt Areas 17 and 18 to address a herd that is below objective. Shortening this season to October 14th puts these hunt areas in line with all other surrounding general October seasons. Leaving these as the only Region C hunt areas open for a third week likely increases pressure in two areas that do not need any further pressure. Hunt Areas 17 and 18 have much more suppressed numbers than Hunt Areas 23 and 26. This is pertaining to both harvest success and fawn production over the last several years. (Tables 1 and 2)

Table 1. Harvest Summary

2018 - 2022 Harvest Summary

for Mule Deer Herd MD319 - POWDER RIVER - Hunt Area ALL

		Hunter Data					Harvest Data									Success			
Year	Area	Res Hntrs	NR Hntrs	NR %	Total Hntrs	Act Lic	Ylg Male	Adult Male	Total Male	Male %	Fem	Fem %	Juv	Juv %	Total Harv	Huntr	Lic	Hntr Days	Avg Days
2018	17	599	565	49%	1,164	1,173	0	755	755	97%	20	3%	0	0%	775	67%	66%	4,594	5.9
	18	542	333	38%	875	889	0	464	464	90%	50	10%	3	1%	517	59%	58%	3,384	6.5
	23	755	863	53%	1,618	1,744	0	648	648	56%	481	42%	22	2%	1,151	71%	66%	5,917	5.1
	26	161	387	71%	548	574	0	336	336	87%	49	13%	0	0%	385	70%	67%	1,627	4.2
2019	17	663	719	52%	1,382	1,397	0	854	854	97%	24	3%	3	0%	881	64%	63%	5,826	6.6
	18	467	331	41%	798	823	0	386	386	87%	49	11%	10	2%	445	56%	54%	3,055	6.9
	23	802	881	52%	1,683	1,776	0	724	724	58%	450	36%	81	6%	1,255	75%	71%	5,854	4.7
	26	315	404	56%	719	733	0	341	341	78%	95	22%	0	0%	436	61%	59%	2,014	4.6
2020	17	683	625	48%	1,308	1,328	0	655	655	94%	40	6%	5	1%	700	54%	53%	5,266	7.5
	18	624	331	35%	955	1,002	0	443	443	89%	46	9%	6	1%	495	52%	49%	3,965	8.0
	23	823	819	50%	1,642	1,745	0	646	646	59%	407	37%	41	4%	1,094	67%	63%	5,445	5.0
	26	282	321	53%	603	677	0	284	284	86%	45	14%	0	0%	329	55%	49%	2,199	6.7
2021	17	564	657	54%	1,221	1,233	0	580	580	95%	31	5%	0	0%	611	50%	50%	5,119	8.4
	18	516	354	41%	870	889	0	307	307	86%	50	14%	2	1%	359	41%	40%	3,193	8.9
	23	679	879	56%	1,558	1,655	0	654	654	60%	427	39%	11	1%	1,092	70%	66%	7,248	6.6
	26	144	354	71%	498	498	0	269	269	96%	11	4%	0	0%	280	56%	56%	1,805	6.4
2022	17	602	539	47%	1,141	1,158	0	440	440	94%	28	6%	2	0%	470	41%	41%	4,954	10.5
	18	460	310	40%	770	801	0	238	238	83%	45	16%	5	2%	288	37%	36%	3,773	13.1
	23	640	740	54%	1,380	1,467	0	510	510	66%	252	33%	12	2%	774	56%	53%	6,181	8.0
	26	192	355	65%	547	556	0	258	258	85%	46	15%	0	0%	304	56%	55%	1,842	6.1

Table 2. Postseason Classification by Hunt Area

2018 - 2022 Postseason Classification by Hunt Area

for Mule Deer Herd MD319 - POWDER RIVER - Hunt Area ALL

			Males							Females		Juveniles				Males/100 Females			Young/100	
Year	Area	% Herd	# Ylg	# 2+ Cls 1	# 2+ Cls 2	# 2+ Cls 3	# 2+ Other	Total Male	% Male	#	% Fem	#	% Juv	Total	Class Obj	Ylg	Adult	Males	Female	Adult
2018	17	0%	146	292	97	6	0	541	24%	1,105	50%	564	26%	2,210	1,571	13	36	49	51	34
	18	0%	45	80	7	0	0	132	18%	387	53%	212	29%	731	1,571	12	22	34	55	41
	23	0%	83	35	40	22	156	336	27%	550	44%	362	29%	1,248	1,571	15	46	61	66	41
	26	0%	45	90	11	0	25	171	23%	367	48%	220	29%	758	1,571	12	34	47	60	41
2019	17	0%	75	118	73	7	0	273	18%	845	54%	435	28%	1,553	1,458	9	23	32	51	39
	18	0%	11	10	18	0	0	39	13%	150	49%	115	38%	304	1,458	7	19	26	77	61
	23	0%	57	128	69	3	0	257	20%	537	41%	508	39%	1,302	1,458	11	37	48	95	64
	26	0%	52	85	25	0	0	162	19%	409	48%	289	34%	860	1,458	13	27	40	71	51
2020	17	0%	82	190	72	0	0	344	20%	933	54%	461	27%	1,738	1,323	9	28	37	49	36
	18	0%	41	40	45	0	0	126	17%	403	53%	230	30%	759	1,323	10	21	31	57	43
	23	0%	81	115	28	1	0	225	22%	474	46%	327	32%	1,026	1,323	17	30	47	69	47
	26	0%	30	56	9	0	0	95	20%	234	50%	141	30%	470	1,323	13	28	41	60	43
2021	17	0%	39	275	148	5	0	467	25%	998	54%	372	20%	1,837	1,187	4	43	47	37	25
	18	0%	13	40	10	0	0	63	17%	202	56%	98	27%	363	1,187	6	25	31	49	37
	23	0%	68	237	84	1	0	390	23%	817	47%	526	30%	1,733	1,187	8	39	48	64	44
	26	0%	50	90	6	0	0	146	19%	388	51%	224	30%	758	1,187	13	25	38	58	42
2022	17	0%	50	145	62	1	0	258	17%	735	50%	483	33%	1,476	1,155	7	28	35	66	49
	18	0%	4	2	4	0	0	10	8%	80	67%	30	25%	120	1,155	5	8	12	38	33
	23	0%	47	67	43	4	0	161	23%	286	41%	254	36%	701	1,155	16	40	56	89	57
	26	0%	28	41	15	0	0	84	18%	222	49%	149	33%	455	1,155	13	25	38	67	49

Although Hunt Area 17 had an uptick in observed fawns during the classification surveys in 2022, the preceding four-year period experienced ratios below the levels required to maintain a population (65:100).

This herd has been well below objective for many years. This is likely due to various factors, including land use change, climatic conditions and disease. Observed fawn ratios have averaged 60:100 over the preceding 5-year period. Since 2020, harvest success has steadily dropped. In 2020, harvest success dropped 11% points, to 57%, from a preceding 5-year average of 68%. The 2021 harvest success remained comparatively low at 58% while the 2022 harvest success dropped even further to 49% success. As harvest success dropped, effort required to harvest also increased, with the 2022 season requiring 9 days to harvest a deer.

As this herd unit is comprised of primarily private land, a landowner survey is mailed out annually to gauge sentiments on the number of deer. Herd wide responses (n=68) indicate that 60% of respondents feel deer numbers are below where they would like to see them. In hunt areas 17 and 18, 64% of respondents felt that deer numbers were low and no respondents indicated that they felt there were too many deer. The population is predicted to remain 44% below objective with current license issuance.

2.) Herd Objective Review: The Powder River mule deer herd unit is located in north central Wyoming and is contained entirely within the Sheridan Region. The herd is managed as a private lands herd with an objective of 45,000 mule deer. Both Integrated Population Modeling and the previous Spreadsheet Modeling indicate the population is well below the current objective with a preceding 5-year average estimated to be around 31,000. Although there has been some variability with the IPM estimating slightly lower than the older spreadsheet model, this is not the key factor in being unable to attain 45,000 mule (±20%). Many elements likely contributed to this decline and are limiting its ability to increase towards objective. Recent research within this herd unit indicates high levels of adult female mortality attributed to disease, malnutrition and highway collisions. Although drought, harsh winters and resulting habitat conditions have, in recent years, affected deer numbers within this herd unit, it seems that this herd has been on long, slow downward trend.

While managers feel an adjustment in the population objective is warranted, they want to conduct a sightability survey to better gauge the current population prior to proposing a change. Managers will likely propose a reduction in the objective in the next 2-3 years.

3.) Population Modeling: The 2022 postseason population estimate for this herd unit from the PopR IPM was around 25,000 (CL=18,764-29843). This herd currently has no area specific survival data, but there will be adult female survival data forthcoming to help further inform the model. Additionally, the methodology used for classification surveys was changed in 2022 to include an aerial composition survey. This data both served to supply ratio information and also provided an independent abundance estimate (31,881, CL=11570-52192).

4.) CWD: This is a Tier 1 surveillance herd, last targeted in 2019. From 2020-2022, prevalence of CWD from hunter-harvested mule deer was 19% (n=297) in adult males and 9% (n=58) in adult females. This herd is scheduled to be targeted for CWD sampling in 2024, although efforts may begin in the 2023 hunting season.

We have not specifically structured hunting seasons to address CWD in this herd. However, Type 7 licenses in Areas 23 and 26 with liberalized white-tail deer seasons and licenses throughout the herd unit will likely help address CWD by reducing deer densities and environmental contamination with prions in hotspots.

2022 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2022 - 5/31/2023

HERD: MD320 - PUMPKIN BUTTES

HUNT AREAS: 19, 29, 31
PREPARED BY: TURNBULL

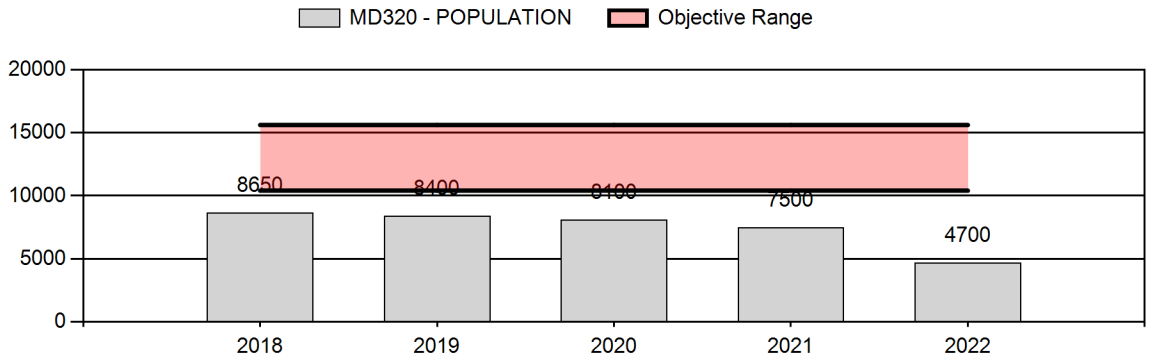
	2017 - 2021 Average	2022	2023 Proposed
Population:	8,370	4,700	4,200
Harvest:	605	331	330
Hunters:	1,011	820	820
Hunter Success:	60%	40%	40 %
Active Licenses:	1,029	828	820
Active License Success:	59%	40%	40 %
Recreation Days:	3,784	3,392	3,300
Days Per Animal:	6.3	10.2	10
Males per 100 Females	42	30	
Juveniles per 100 Females	58	58	

Population Objective (± 20%) :	13000 (10400 - 15600)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-63.8%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/8/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	1%	2%
Males ≥ 1 year old:	29%	27%
Proposed change in post-season population:	-4%	-11%

Population Size - Postseason



2023 Hunting Seasons
Pumpkin Buttes Mule Deer Herd Unit (MD320)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
19	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
29	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
31	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 10		Antlered mule deer or any white-tailed deer

2023 Region C nonresident quota: 2,000

2022 Hunter Satisfaction: 52% Satisfied, 20% Neutral, 28% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: Current models and population metrics show downward population trends. The 2022 season had lower total harvest (n=331) then the 10-year average (n=590; Figure 1). Low fawn ratios (58:100) were observed in 2022. While fawn ratios improved slightly from 2021, they still suffer, and are likely an artifact of drought, disease and ongoing habitat concerns. Epizootic hemorrhagic disease (EHD) was observed and verified for the third consecutive year in the unit. While impacts to pronghorn and white-tailed deer were likely more significant, there were likely impacts to mule deer as well.

The reduction in nonresident Region C licenses appeared to improve crowding slightly, but due to population trends and population performance, harvest success remained low. For the 2023 season, the general season in HA 19 was shortened to standardize dates and the Type 7 license was eliminated to address population concerns. The removal of 50 licenses is unlikely to have population impacts, but was removed out of caution.

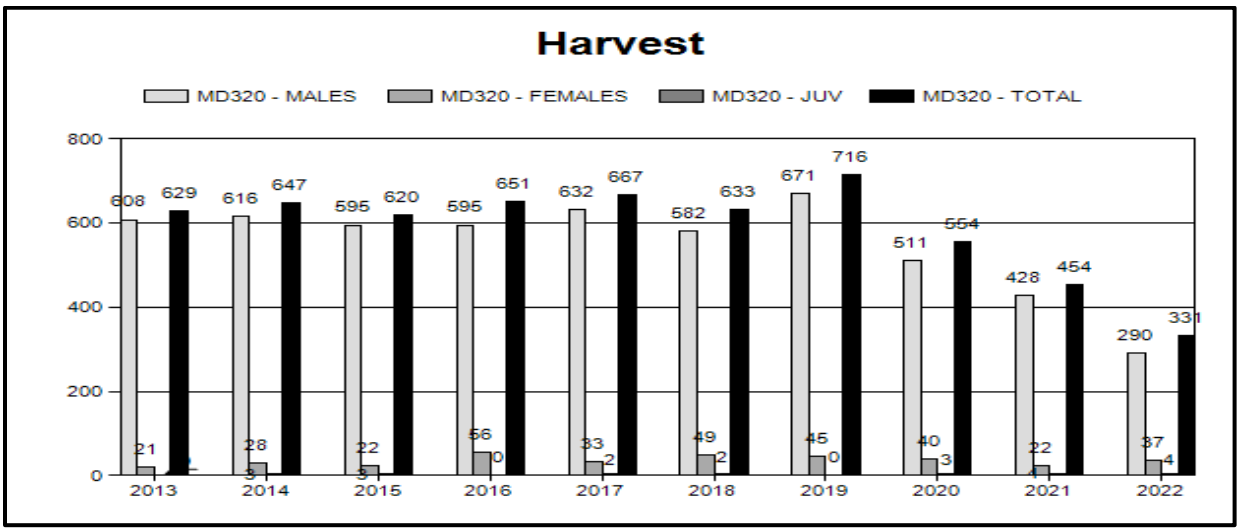


Figure 1. MD 322 harvest 2013-2022.

2.) Management Objective Review: See Appendix I.

3.) Chronic Wasting Disease Management: This is a Tier 2 surveillance herd and scheduled for CWD sampling in 2024. During the last focal period (2019-2021) we collected 136 samples, with prevalence reported at 14% (CI 7.5-21%) of samples. CWD prevalence remains a concern in the herd unit.

4.) Population Modeling: The 2022 post season population estimate using the PopR IPM was 4,700 deer (CL = 3,800-5,600). The IPM model suggests the population is below objective (13,000). An estimate based on a composition/abundance survey produced a 2022 post season point estimate of 8,000 animals. While this point estimate is primarily intended to inform the IPM model, it is useful and will likely improve in accuracy and confidence with each replication. This was the first year conducting aerial composition/abundance estimates in the herd area. PopR models and estimates were used in bio-year 2022 had an Rhat Max of 1.28 and a Proportion of 0.66.

5.) Research: Field research in the Pumpkin Buttes (PB) and Powder River (PR) herd units ended late in 2022. Data is still being analyzed, but early statistics are concerning. When analyzed as a whole (PB and PR) 57% of collared adult does died over the three year project (Figure 2). Of those mortalities, over half, were caused by disease or vehicle strikes. Annual survival of adult does ranged from a low of 66% to a high of 79%. Of note; 76% of documented vehicle collisions, and 100% of EHD mortality occurred along I-90 (Figure 3). Both mortality sources appear highly related to landscape and features. If these results are representative of the unit, as a whole, it may explain the sharp population declines observed in models.

Preliminary results also indicate an avoidance of disturbance and development in the study area. Delineated home ranges contain less disturbance than that present on the landscape. Deer in the project area are largely non-migratory, with only one deer out of 62 showing migratory behavior.

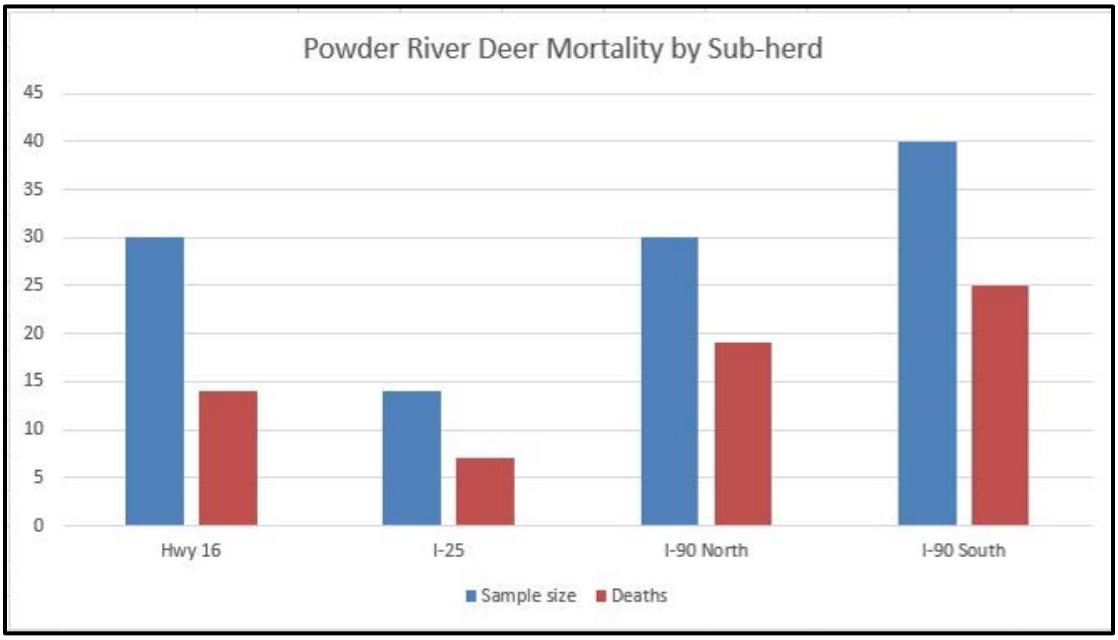


Figure 2. Mortality by Study Area 2020-2022.

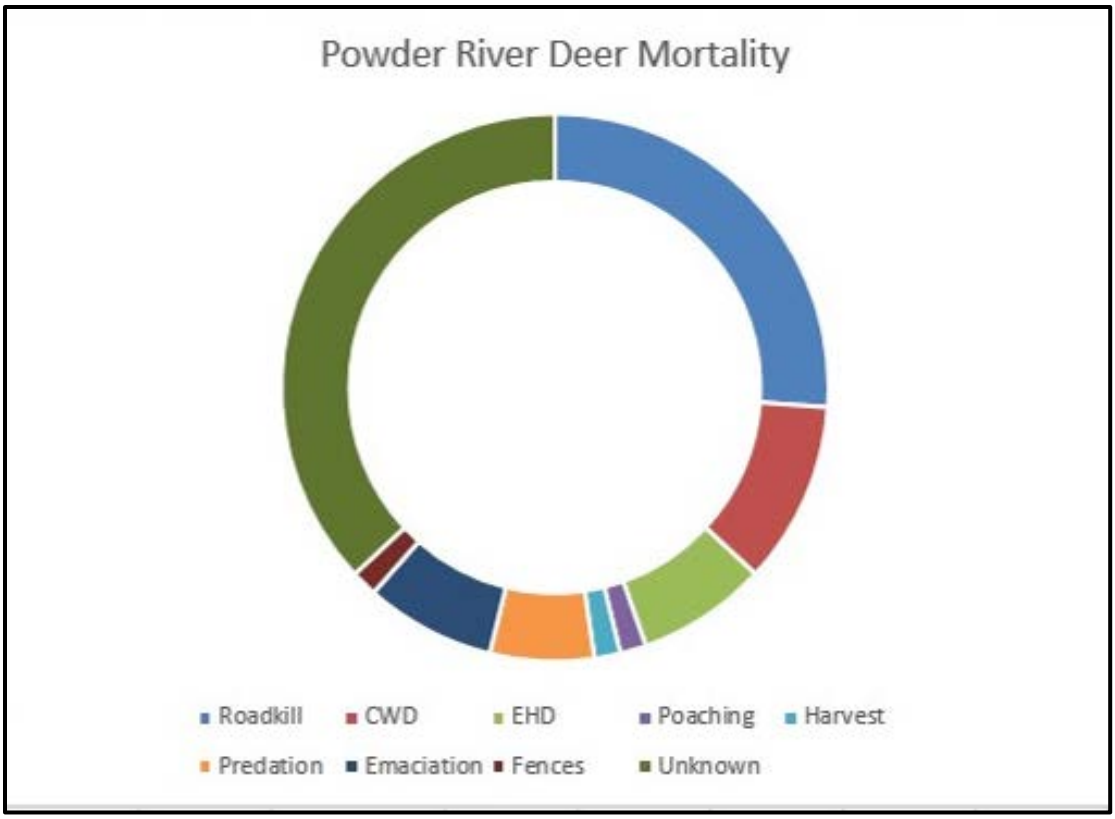


Figure 3. Cause Specific Mortality 2020-2022.

Appendix I. Pumpkin Buttes Mule Deer (MD320) Herd Unit Management Objective Review

Pumpkin Buttes Mule Deer (MD320)
Herd Unit Review
Zach Turnbull, Buffalo Wildlife Biologist
February, 2023

Current Management Objective:	Postseason population 13,000 mule deer
Management Strategy:	Private Land Management
2022 Population Estimate:	~8,500 Mule Deer
2023 Recommendation:	Reduce objective to 9,000 mule deer
	Maintain Private Land Management

The Pumpkin Buttes (MD320) mule deer herd unit is located in north central Wyoming and is contained entirely within the Sheridan Region. The herd is managed as a private lands herd with an objective of 13,000 mule deer. Both Integrated Population Modeling and the previous Spreadsheet Modeling indicate the population is well below objective with a five year average around 8,500 animals (Figure 1). Many factors are likely contributing to this decline including drought, poor range health, diseases, malnutrition, and vehicle collisions. While recent drought has undoubtedly affected short-term production, a long-term downward trend in habitat and range health have been noted. Fire and invasive grasses have severely impacted much of the habitat in this herd unit.

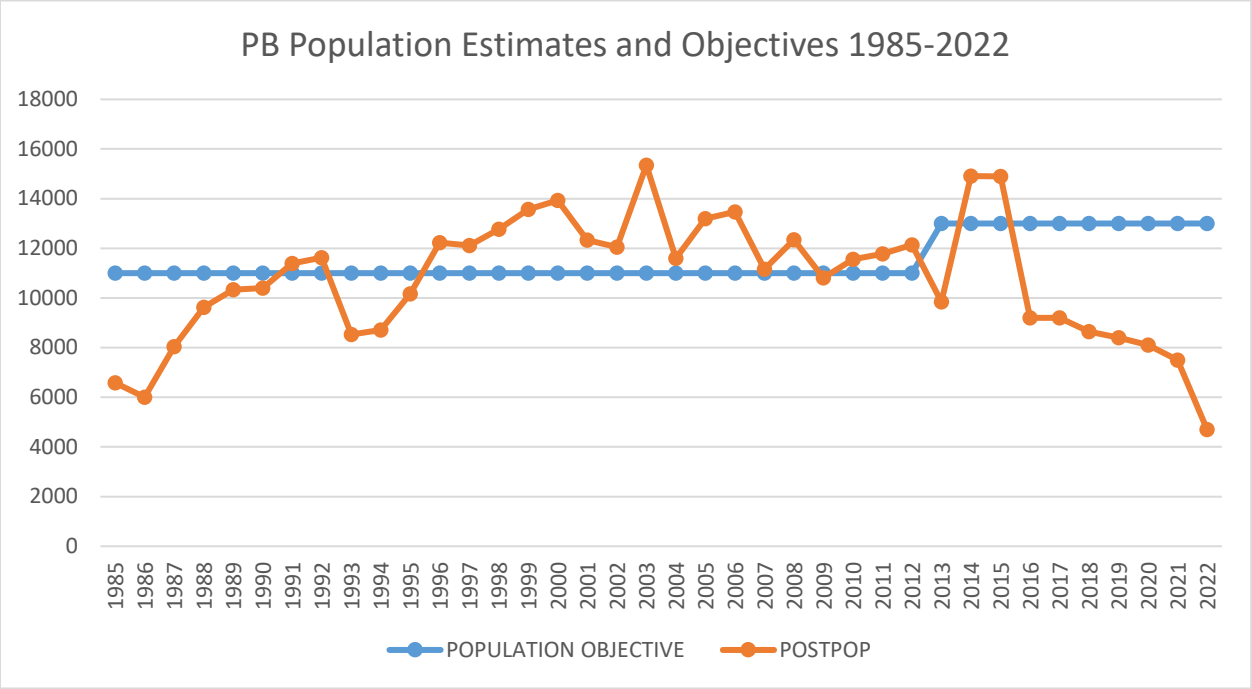


Figure 1. Pumpkin Buttes Population Estimates 1985-2022.

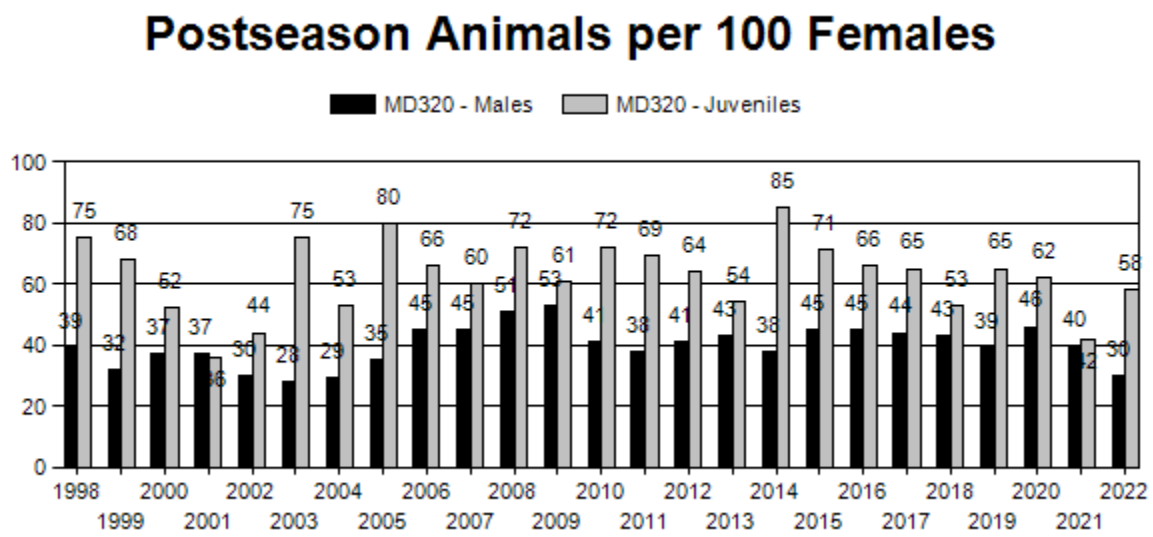


Figure 2. Pumpkin Buttes Fawn and Buck Ratios per 100 Females.

Mule deer body condition, health and recruitment no doubt, relate to habitat condition and range health. While recent drought, fires and a subsequent invasion of annual grasses has affected short-term production, long-term trends in habitat condition may be contributing to this decline as well. Range monitoring conducted by the Bureau of Land Management indicated that habitat in much of the hunt area fails to meet range standards. Many communities were dominated by annual warm season grasses, many of which are invasive. Sod bound soil states were found in many areas, further affecting forage production and altering range system functions and species diversity. While BLM range assessments may not be a perfect indicator of mule deer habitat conditions, they provide a more in-depth assessment of species composition, use and seral state.

Field research in the Pumpkin Buttes and Powder River herd units ended late in 2022. Data are still being analyzed, but early statistics are concerning. When analyzed as a whole (PB and PR), 57% of collared adult does died over the three year project (Figure 3). Of those mortalities, over half were caused by disease or vehicle strikes (Figure 4). Annual survival of adult does ranged from a low of 66% to a high of 79%. Of note, 76% of documented vehicle collisions, and 100% of EHD mortality occurred along I-90. Both mortality sources appear highly related to landscape and features. If these results are representative of the unit as a whole, it may explain the sharp population declines observed in models.

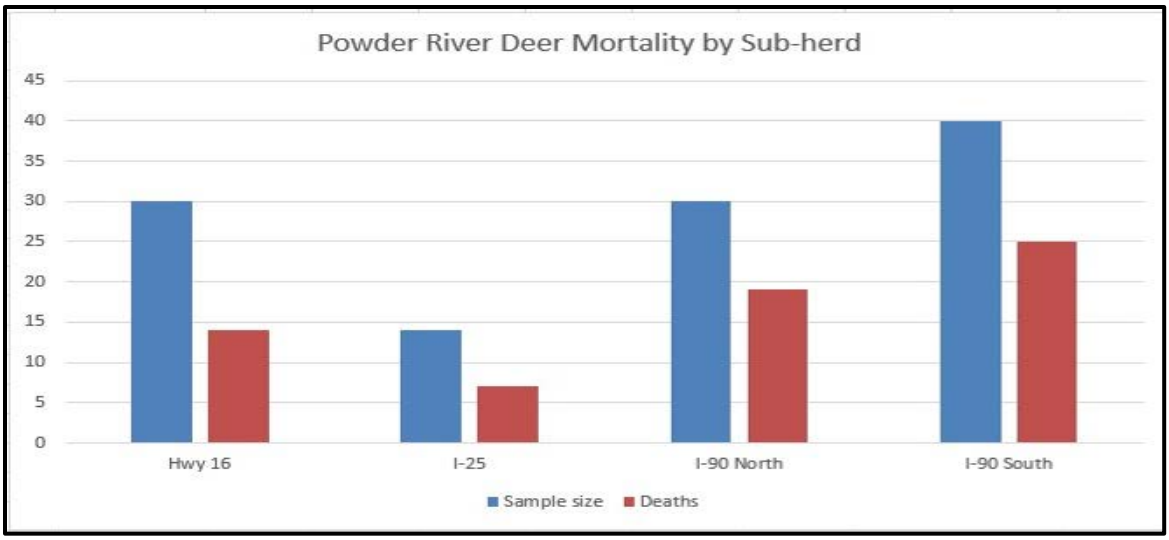


Figure 3. Powder River / Pumpkin Buttes mortality data 2020-2022.

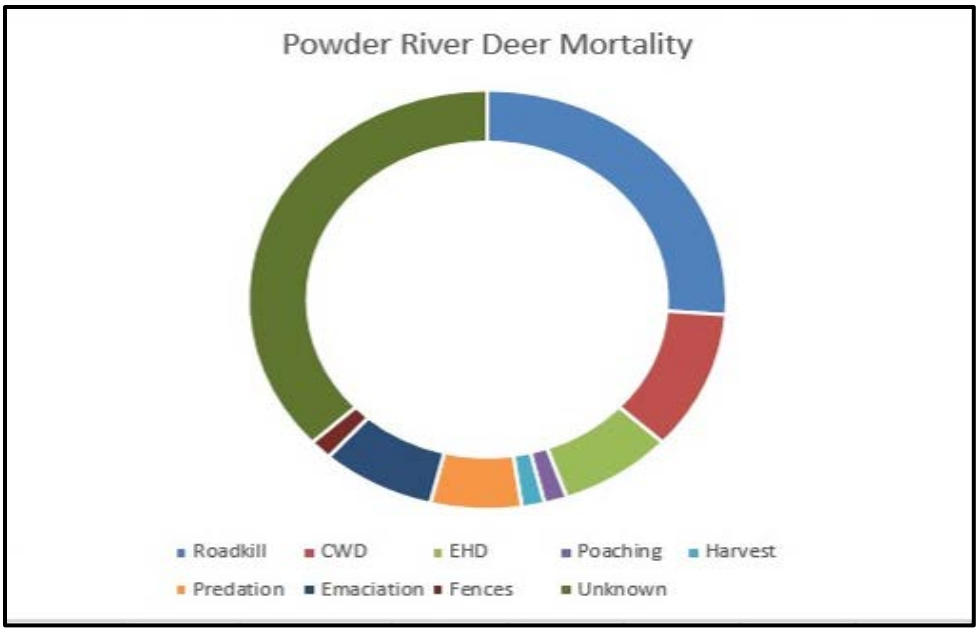


Figure 4. Powder River / Pumpkin Buttes mortality by type.

Preliminary research results also indicate an avoidance of disturbance and development in the study area. Delineated home ranges contain less disturbance than that present on the landscape. Deer in the project area are largely non-migratory, with only 1 deer out of 62 showing migratory behavior.

While there is significant public sentiment calling for increased deer numbers, the landscape and habitat likely cannot support populations observed in decades past. Adding additional deer to the landscape, while it is likely unattainable, may only worsen conditions and contribute to further habitat degradation and decreased herd fitness. For these reasons, we propose reducing the objective to 9,000 mule deer.

2022 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2022 - 5/31/2023

HERD: MD321 - NORTH BIGHORN

HUNT AREAS: 24-25, 27-28, 50-53
PREPARED BY: ERIC MAICHAK

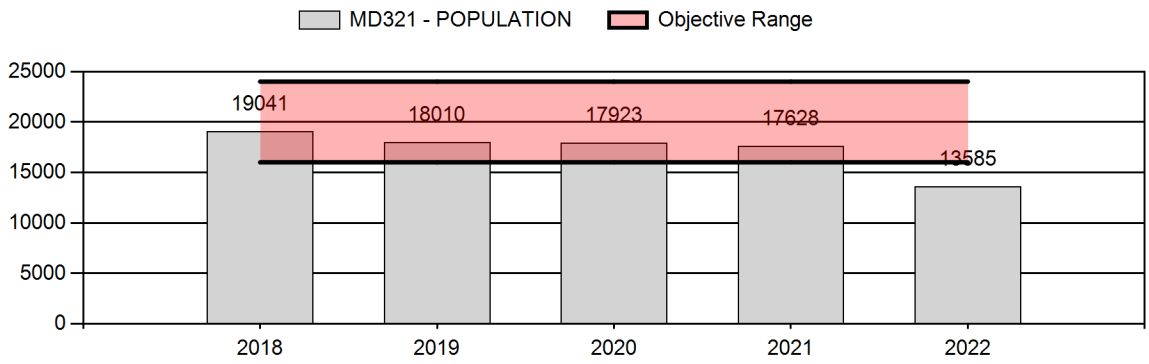
	2017 - 2021 Average	2022	2023 Proposed
Population:	18,417	13,585	13,399
Harvest:	1,084	990	1,100
Hunters:	2,904	2,724	2,900
Hunter Success:	37%	36%	38%
Active Licenses:	3,014	2,839	3,000
Active License Success:	36%	35%	37%
Recreation Days:	14,475	14,470	14,500
Days Per Animal:	13.4	14.6	13.2
Males per 100 Females	29	28	
Juveniles per 100 Females	64	65	

Population Objective (± 20%) :	20000 (16000 - 24000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-32.1%
Number of years population has been + or - objective in recent trend:	5
Model Date:	03/02/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	2%	2%
Males ≥ 1 year old:	31%	29%
Proposed change in post-season population:	1%	-1%

Population Size - Postseason



2023 HUNTING SEASONS
NORTH BIGHORN MULE DEER HERD (MD321)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
24	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
24	7			Sep. 1	Dec. 15	200	Doe or fawn valid on private land
25	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
27	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
28	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
50	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
51	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
51	Gen			Oct. 25	Oct. 31		Antlered mule deer or any white-tailed deer valid on or within one-half (1/2) mile of irrigated land
51	6	Sep. 1	Sep. 30	Oct. 15	Nov. 15	150	Doe or fawn valid on or within one-half (1/2) mile of irrigated land
52	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
52	Gen			Oct. 25	Oct. 31		Antlered mule deer or any white-tailed deer valid on or within one-half (1/2) mile of irrigated land

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
52	6	Sep.1	Sep. 30	Oct. 15	Nov. 30	25	Doe or fawn valid on or within one-half (1/2) mile of irrigated land
53	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer

Nonresident Region R Quota: 600
Nonresident Region Y Quota: 1,200

2022 Hunter Satisfaction: 55% Satisfied; 23% Neutral; 22% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: This herd unit includes public and private lands spanning two regions and the northern Bighorn Mountains. Hunting season strategies are informed by classification ratios, survey responses and comments from landowners and hunters, and modelled population estimates. Weather, disease, habitat, and cause-specific mortality data are considered as available. Hunting seasons have generally been conservative (10-15 days) and geared toward antlered mule deer, with limited doe harvest (youth general license hunters; private lands), and recent emphasis to address CWD.

In 2022, we observed 67 fawns:100 does during postseason classification surveys, up from 2021 (59:100) and slightly above desired 66:100 ratio needed to sustain or grow a population. We observed 28 bucks:100 does, up from 2021 primarily from increased yearling males classified.

Hunter satisfaction, determined by responses on harvest survey, increased slightly from 53% in 2021 (n=742) to 55% in 2022 (n=693) at the herd unit level. Satisfaction was highest in Hunt Areas 24 (66%), 51 (65%), and 27 (54%).

In Area 24, 2022-23 annual landowner survey responses (n=20) suggest 58% of landowners felt mule deer populations were below desired levels, whereas 55% felt seasons should be about the same. Hunter comments were similar. Long-term anecdotal observations suggest degradation of habitat conditions through overbrowsing, particularly in winter range areas. Furthermore, 2023 was a harsh winter with deep, persistent, crusted snow. Therefore we reduced Type 7 licenses from 250 to 200 to maintain targeted harvest of antlerless mule deer where desired.

In Hunt Area 25, due to perceived low quality and quantity of mule deer by various publics, we instituted a 3-point antler point restriction from 2020-2022. Prior to and through inception, adult buck harvest declined from a peak of 237 in 2016 to 101 animals in 2021, increasing slightly in 2022. However, In Hunt Area 24, immediately east of Hunt Area 25 and presumed winter range for animals from Area 25, we saw more adult males:100 females (24.7 vs. 16) and slightly fewer yearling males:100 females (11.6 vs. 10) during the three years prior to versus during three years during the 3-point restriction. For comparison, Hunt Areas 50 and 51 lie immediately west of Hunt

Area 25, with no 3-point restriction and similar seasonal (summer, winter) relationship as Hunt Areas 25 and 24. Hunt Areas 50 and 51 show similar patterns in adult males:100 females (14.6 vs. 11.3) and yearling males:100 females (10 vs. 10.6) over the same three-year span prior to and following the antler restriction. Seeing no biological benefit of the 3-point restriction, we reinstituted any antlered mule deer for the 2023 season in Hunt Area 25.

2.) Management Objective Review: This herd is scheduled for the next 5-year herd unit review in 2024.

3.) Population Modeling: In 2021, we started using a PopR based integrated population model (IPM). Our 2022 postseason IPM with no sightability correction estimated 6,664 mule deer (95% CI = 4,953-6,629). This model performed best (Rhat proportion = 1) with date range 2013-2023, Effort = Days/Harvest, Adult survival = Constant, Reproduction and Juvenile survival = Time Varying, Burnin = 50,000, Iterations = 30,500, Thinning Rate = 1.

To increase precision of our modelled population estimate, we flew about 20 hours over 206, 2-km^2 quadrats. We recorded number of deer, habitat type, and snow cover to generate a sightability correction factor to apply to our postseason population estimate.

Our 2022 postseason population estimate with sightability correction was estimated at 13,585 mule deer (95% CI = 12,061-15,287). This model performed best (Rhat proportion = 1) with date range 2003-2023, Effort = Licenses, Adult survival = Constant, Reproduction and Juvenile survival = Time Varying, Burnin = 50,000, Iterations = 30,500, Thinning Rate = 1.

4.) Chronic Wasting Disease Monitoring & Management: This is a Tier 1 surveillance herd last scheduled for priority CWD sampling in 2021. Hunter-harvested adult (≥ 2 years old) male mule deer from 2020-2022 suggest prevalence was 15.7% (n=223, Table 1.). During this time, we documented CWD positive mule deer in all hunt areas except Hunt Area 53. Samples from Hunt Areas 24 and 51 accounted for 55% (n=122) of total samples.

Table 1. CWD prevalence from hunter harvested male mule deer in the North Bighorn Herd Unit, 2019-2021.

		2020-2022			95% Confidence Interval	
Herd Unit	Species	# Tested	# Pos	Prev	Lower	Upper
North Bighorn	Ad M MD	223	35	15.7%	9.6%	21.1%

In Hunt Areas 51 and 52, we extended seasons in 2022 as part of a broader effort in non-resident Deer Region R to address CWD hotspots within the Bear, Beaver and Shell Creek drainages. These seasons were maintained for 2023. Maintaining Hunt Area 24 Type 7 licenses may help address CWD by controlling deer densities where overlap occurs with hotspots of white-tailed deer (Figure 1).

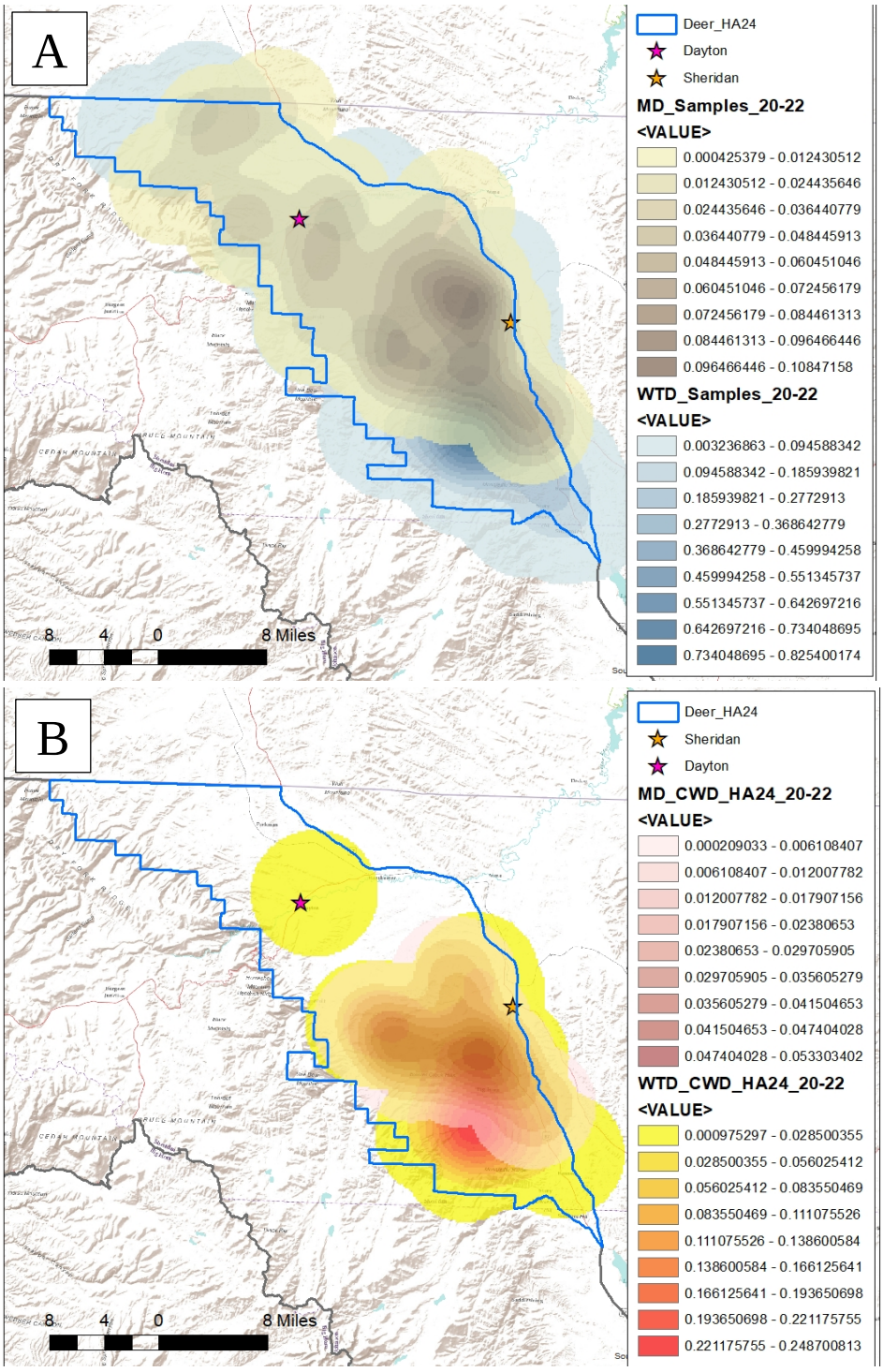


Figure 1. Density of CWD samples (A) and CWD-positive samples (B) from white-tailed deer and mule deer, Deer Hunt Area 24, 2020-2022. Darker colors represent higher density.

5.) Research: A three-year study through the University of Wyoming on mule deer seasonal movement and habitat use is ending in 2023. Preliminary results suggest mule deer migrate in response to snowfall more so than elk and moose, and female mule deer fawns may have greater fidelity to migration routes of their mothers than male fawns. A master's thesis on this study is

expected later this year.

A new five-year study was initiated through WGFD Science, Research, and Analytical Support unit in 2023. As part of the state-wide focal herd project, this is one of five herds targeted to better understand factors influencing mule deer populations, seasonal habitat use, and survival. Over 200 GPS collars were deployed among adult males, adult females, and juveniles. Preliminary results since collars were deployed in January 2023 suggest mortality of 10%, 15%, and 45% of adult females, adult males, and juveniles, respectively. Primary cause of mortality in collars recovered timely was winter kill, with loss also from predation (mountain lion) and vehicle collision.

2022 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2022 - 5/31/2023

HERD: MD322 - UPPER POWDER RIVER

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

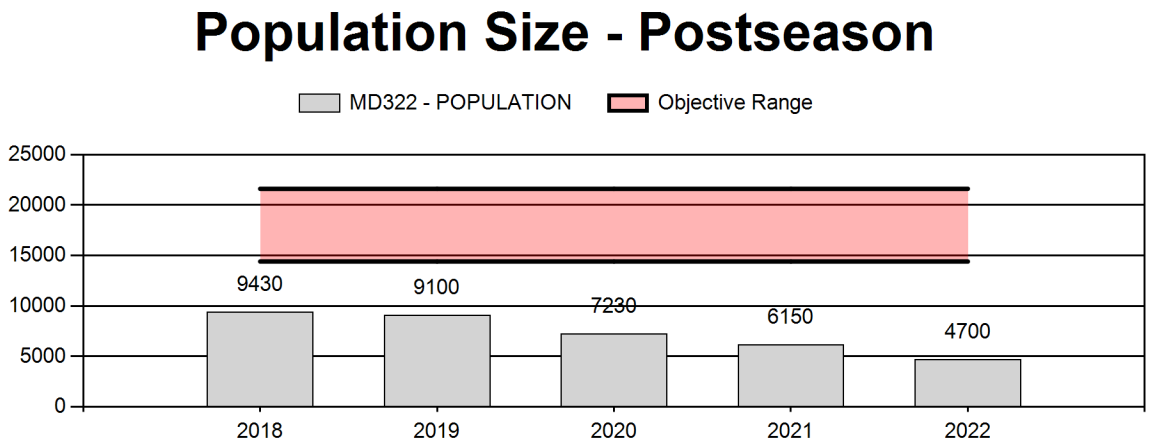
PREPARED BY: ZACH TURNBULL

	2017 - 2021 Average	2022	2023 Proposed
Population:	8,492	4,700	5,300
Harvest:	650	348	350
Hunters:	1,253	859	860
Hunter Success:	52%	41%	41 %
Active Licenses:	1,259	859	860
Active License Success:	52%	41%	41 %
Recreation Days:	5,285	4,261	4,200
Days Per Animal:	8.1	12.2	12
Males per 100 Females	33	22	
Juveniles per 100 Females	60	57	

Population Objective (± 20%) :	18000 (14400 - 21600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-73.9%
Number of years population has been + or - objective in recent trend:	20
Model Date:	2/8/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	1%	2%
Males ≥ 1 year old:	31%	25%
Proposed change in post-season population:	-6%	13%



2023 Hunting Seasons
Upper Powder River Mule Deer Herd Unit (MD322)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
30	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
32	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
33	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
163	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer
169	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer

2023 Region Y nonresident quota: 1,200 licenses

2022 Hunter Satisfaction: 49% Satisfied, 21% Neutral, 30% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: This herd has been below the population objective for more than a decade. The buck/doe ratio (23 bucks: 100 does) was well below the 30-45 bucks per 100 doe special management strategy target. The nonresident Region Y quota was reduced significantly in 2022 and all general license type bag limits were standardized (antlered mule deer, any white-tailed deer). Reported harvest numbers in 2022 were the lowest rates reported since 1985 (Figure 1). We attribute the negative population trend to low adult doe survival and fawn recruitment (see section 5) and not to harvest, however harvest success is dependent on the population dynamics. The license reduction appeared to address some hunter crowding, but did not appear to have immediate impacts on hunter success or satisfaction.

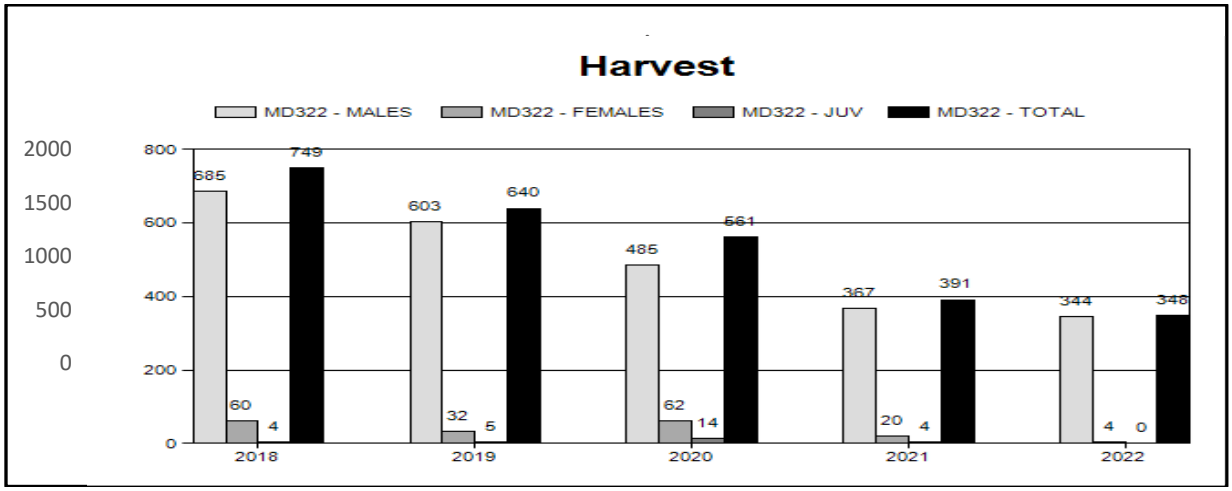


Figure 1. MD322 harvest 2018-2022

2.) Management Objective Review: See Appendix I.

3.) Chronic Wasting Disease Management: We collected 224 samples from 2020-2021 (Table 1). Prevalence during this period was reported at 18.8% (CI 11.6-24.5%). This level of CWD prevalence may be having population level impacts on survival.

Table 1. Upper Powder River CWD Statistics 2020-2021.

		2020-2021 Total			95% Confidence Interval	
Herd Unit	**Species**	**Tested**	**# Pos**	**Prev**	**Lower**	**Upper**
UPR	Ad M MD	224	42	18.8%	11.6%	24.5%

4.) Population Modeling:. The 2022 post-season population estimate using the PopR IPM was approximately 4,700 mule deer (CL = 4,100 – 5,800). All models and field data suggest the population is far below the 18,000 population objective. The models had an Rhat Max of 1.16 and a Proportion of .9.

5.) Weather: Precipitation (extrapolated from PRISM Climate Group, Oregon State University, http://prism.oregonstate.edu, created 4 Feb 2004) from October 2020 through September 2021 was above the 30 year average. Precipitation during the growing season (April through June) was also slightly above the 30 year average, but precipitation in the high elevation SSF seasonal ranges (May - July) was comparable to the 30 year average (Figure 2). Winter temperatures in 2022-2023 were below the 30 year average (28.4°F), with the temperatures averaging 22.39°F during the months of November through January as recorded in Kaycee. Moisture accumulation recorded in Kaycee during this time period was 1.66 inches of precipitation (30-year average is 2.09 inches) and 36.8 inches of snow accumulation (30-year average is 30.6 inches). The snow water equivalent measured at Powder River Pass, Beartrap Meadow, Middle Powder, and Grave Springs Snotel sites recorded February 9th, 2023 was 94%, 150%, 125%, and 145% of the official mean for those respective sites. The winter of 2022-2023 so far has seen colder temperatures and more snow than past winters. Spring/summer conditions during 2022 were favorable for vegetation production in the Upper Powder River mule deer herd unit, so assuming that mule deer went into winter in better condition than average, these cold and snowy conditions may not have an effect on winter survival unless conditions persist into late winter/early spring. Current snow water equivalent on mule deer Spring, Summer, Fall range suggest productive spring forage conditions could occur if winter breaks and favorable growing conditions are not delayed this spring. All winter precipitation, snowfall accumulation, and temperature data was acquired from the Kaycee NWS COOP Station 485055-5 Lat/Lon 43° 43’/106° 38’.

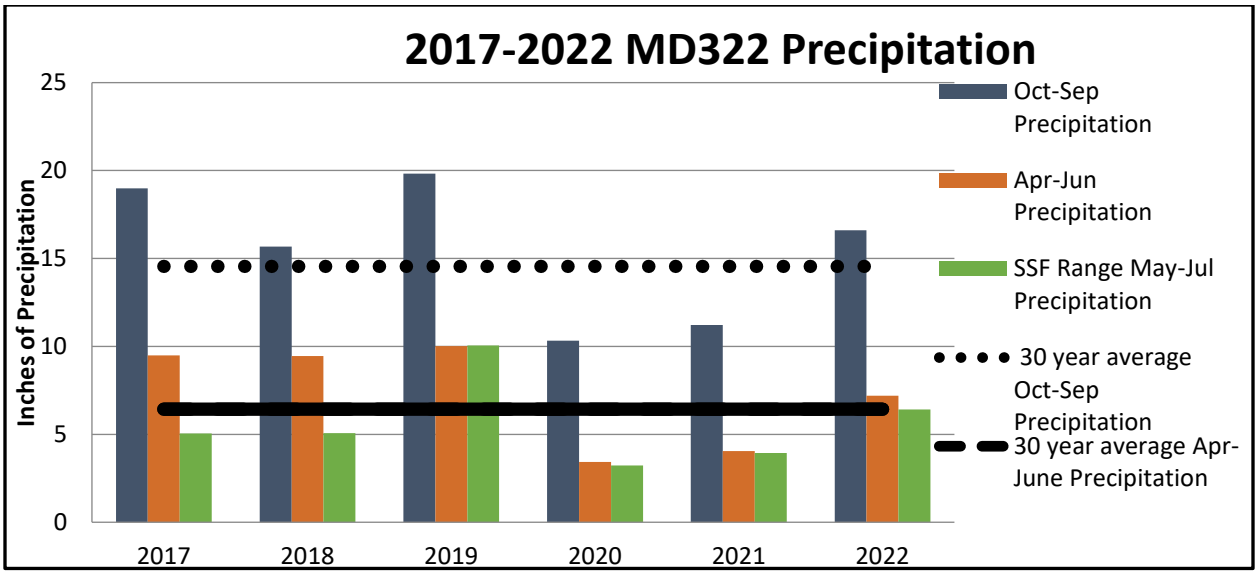


Figure 2. Upper Powder River Precipitation 2017-2022.

6.) Habitat: A number of mule deer habitat improvement projects have been completed with WGFD. Invasive annual grass treatments have occurred on high priority mule deer habitats in Outlaw Cave (702 acres, 2016) and lower Middle and North Fork of Crazy Woman Creek (4,133 acres, 2020). Also, 40 curl-leaf mountain mahogany plants were planted east of Outlaw Cave as part of a test to see if nursery grown plants can become successfully established in the Middle Fork Powder River area. An additional 30 curl-leaf mahogany plants were planted on the Buckingham Ranch in crucial mule deer winter range just north of the Middle Fork Powder River. Another project took place on the Schiermiester Ranch. Antelope Draw is a mesic draw that is being choked out by decadent silver sagebrush stands. During the winter of 2015, 14 acres of thick decadent silver sagebrush stands were Dixie harrowed. Following harrowing, the area was planted with a mixture of native grasses and forbs. The Schiermiester Ranch also planted a total of ten deciduous browse trees in mesic draws in different locations on the ranch.

Since 2016, a total of 2,743 acres of curl-leaf mountain mahogany have been treated for conifer encroachment to reduce fuel loading to protect crucial mule deer winter range in these important deer habitat stands in Poker Creek, Slip Road, Gardner Mountain, and EK Mountain. In 2021 conifer removal occurred on another 857 acres of curl-leaf mountain mahogany on EK Mountain. Since 2018, 218 acres of conifer removal took place in aspen stands in the upper Middle Fork Crazy Woman drainage. In 2021 an addition 4 acres of conifer removal took place in aspen stands in the upper Poison Creek drainage. In 2020, WGFD installed 10 Beaver Dam Analog (BDA) complexes on the upper portions of Middle Fork Crazy Woman Creek to improve riparian habitat and restore hydrological function. In 2021, 700 native deciduous woody riparian trees and shrubs were planted on the North Fork of Crazy Woman Creek and Beartrap Meadows to provide a seed source for future deciduous woody riparian plants in efforts to restore habitat diversity for mule deer. For more detailed information about these projects, please refer to the WGFD's Strategic Habitat Plan annual reports. Since 2020, a total of 7,335 acres of rangelands were treated with a cheatgrass herbicide treatment in the lower Middle Fork/North Fork Crazy Woman watershed.

In 2020, 2021, and 2022 three rapid habitat assessments were completed in the Upper Powder River mule deer herd unit. For details regarding results of the Rapid Habitat Assessments, see the Upper Powder River Mule Deer Herd Habitat Objective Review Rapid Habitat Assessments Report.

Appendix 1. Upper Powder River (MD322) Herd Unit Management Objective Review

Upper Powder River Mule Deer (MD322)
Herd Unit Review
Zach Turnbull, Buffalo Wildlife Biologist
February, 2023

Current Management Objective:	Postseason population 18,000 mule deer
Management Strategy:	Special Management
2022 Population Estimate:	~4,700 Mule Deer
2023 Recommendation:	Reduce objective to 9,000 mule deer Change to Recreational Management

The Upper Powder River MD322 mule deer herd unit is located in north central Wyoming and is contained entirely within the Sheridan Region. The herd is managed as a special herd with an objective of 18,000 mule deer. Both Integrated Population Modeling and the previous Spreadsheet Modeling indicate the population is well below objective. Modeling predicted a 2022 post season population of 4,700 (CL=4,100-5,800; Figure 1). The population has been below objective since 2000. Many factors including drought, poor range health, disease, malnutrition, and predation are likely contributing to this decline. Fawn recruitment and adult survival appear to be limiting some years. Field work investigating mule deer survival and habitat use recently came to a close. While assessment of data are ongoing, early indicators point to disease, malnutrition and predation as being a major detriment to annual survival (Figure 3).

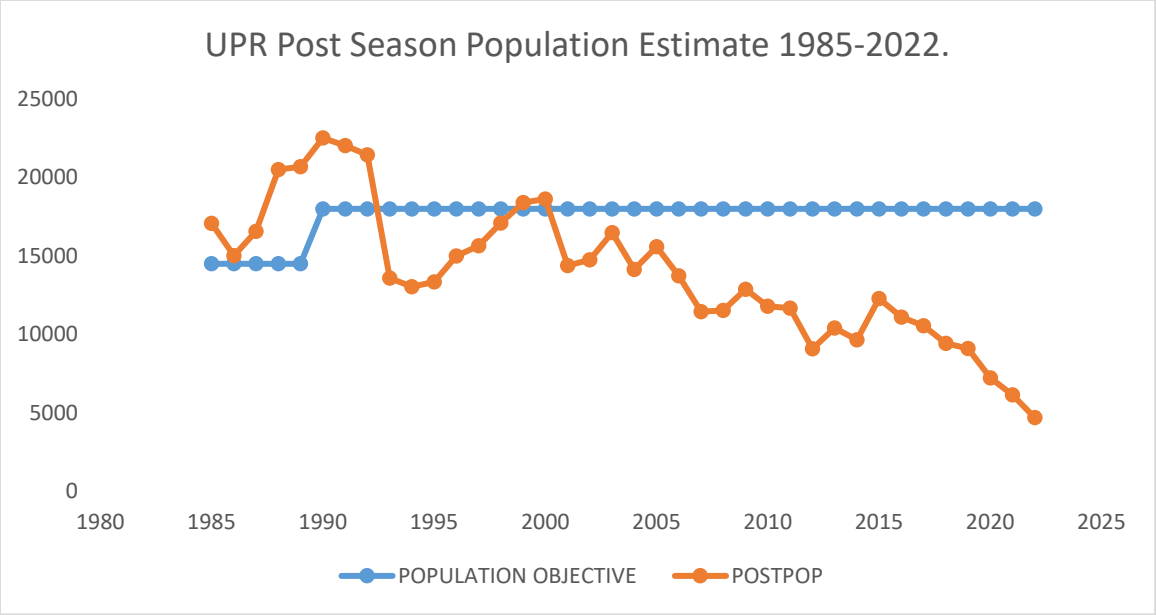


Figure 1. Upper Powder River Postseason population estimates 1985-2022.

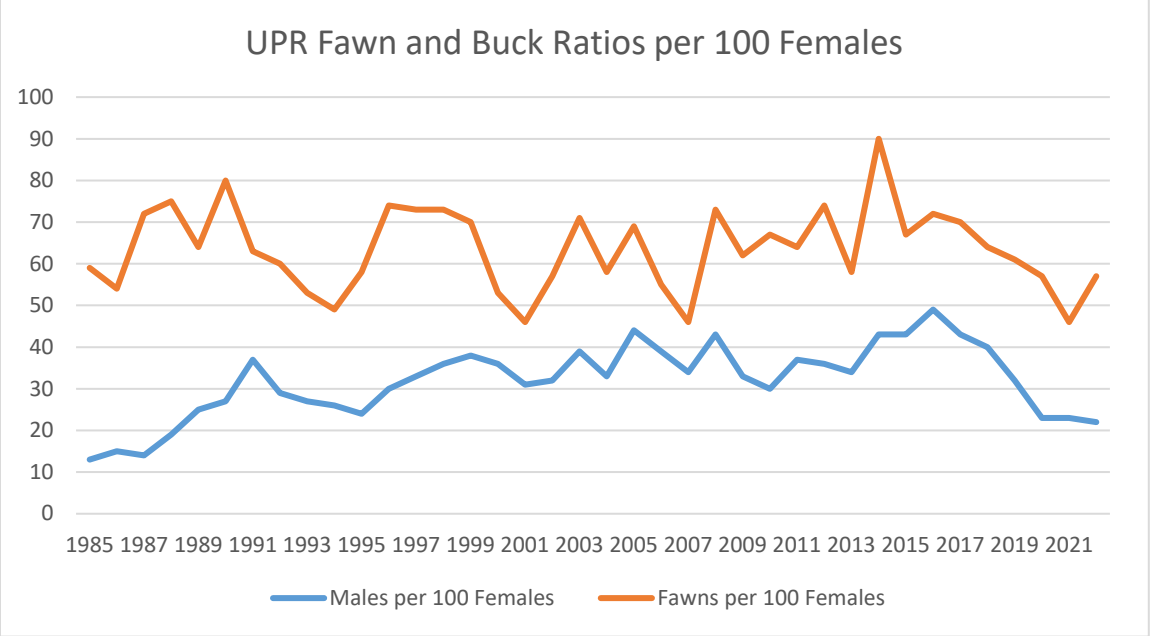


Figure 2. Upper Powder River Fawn and Buck Ratios per 100 Females 1985-2022.

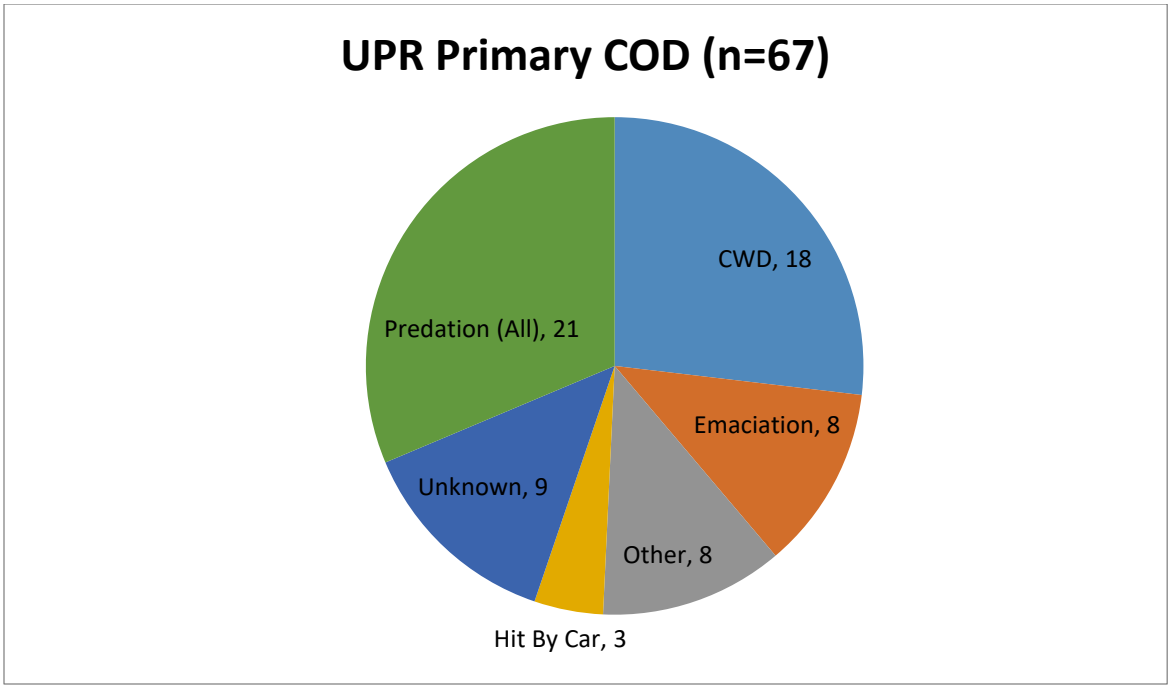


Figure 3. Upper Powder River Cause Specific Mortality 2018-2021.

Mule deer body condition, health and recruitment no doubt, relate to habitat condition and range health. While recent drought has affected short-term production, long-term trends in habitat condition may be contributing to this decline as well. A 2022 habitat report, summarizing rapid habitat assessments (RHA) conducted by the Department, indicated that some habitats only partially met the needs of mule deer, particularly on winter range or for low elevation non-migratory deer (Figure 4). In slight contrast to some of the RHAs, range monitoring conducted by the Bureau of Land Management indicated that habitat in much of the hunt area fails to meet range standards. Many communities were dominated by annual warm season grasses, many of which are invasive. Sod bound soil states were found in many areas, further affecting forage production and altering range system functions and species diversity. While BLM range assessments may not be a perfect indicator of mule deer habitat conditions, they provide a more in-depth assessment of species composition, use and seral state.

Riparian RHA					
Spring Summer Fall Range			Winter/Yearlong		
Acres		148	Acres		310
Riparian Herbaceous Community	Native	92%	Riparian Herbaceous Community	Native	7%
	Mix	8%		Mix	75%
	Introduced	0%		Introduced	18%
Herbivory	Light	53%	Herbivory	Light	14%
	Moderate	39%		Moderate	58%
	Severe	3%		Severe	28%
Species Diversity	Low	8%	Species Diversity	Low	63%
	Medium	11%		Medium	19%
	High	81%		High	18%
Invasives	None	56%	Invasives	None	0%
	Yes	44%		Yes	100%
	Mngt Limiting	0%		Mngt Limiting	0%
Meet Objectives	Yes	81%	Meet Objectives	Yes	0%
	Partial	11%		Partial	100%
	No	8%		No	0%

Aspen RHA		
Spring Summer Fall Range		
Acres		145
Seral State	Early	0%
	Middle	60%
	Late	0%
	PFC	40%
Herbivory	Light	0%
	Moderate	88%
	Severe	12%
Species Diversity	Low	0%
	Medium	100%
	High	0%
Invasives	None	12%
	Yes	88%
	Mngt Limiting	0%
Meet Objectives	Yes	40%
	Partial	60%
	No	0%

Figure 4. Upper Powder River Habitat Assessments

While there is significant public sentiment calling for increased deer numbers, the landscape and habitat likely cannot support historical numbers. Adding additional deer to the landscape may only worsen conditions and contribute to further habitat degradation and decreased herd fitness. With relatively conservative seasons, and liberal seasons on the primary predators of deer, this population has not increased. Managers are doubtful this population can reach the current objective under current conditions. For these reasons, we propose reducing the objective to 9,000 deer and moving the herd to recreational opportunity status. Ultimately, the goal is to improve habitat conditions to support a healthy and more robust population. If, and when, those conditions occur the objective and management status could be reviewed again.

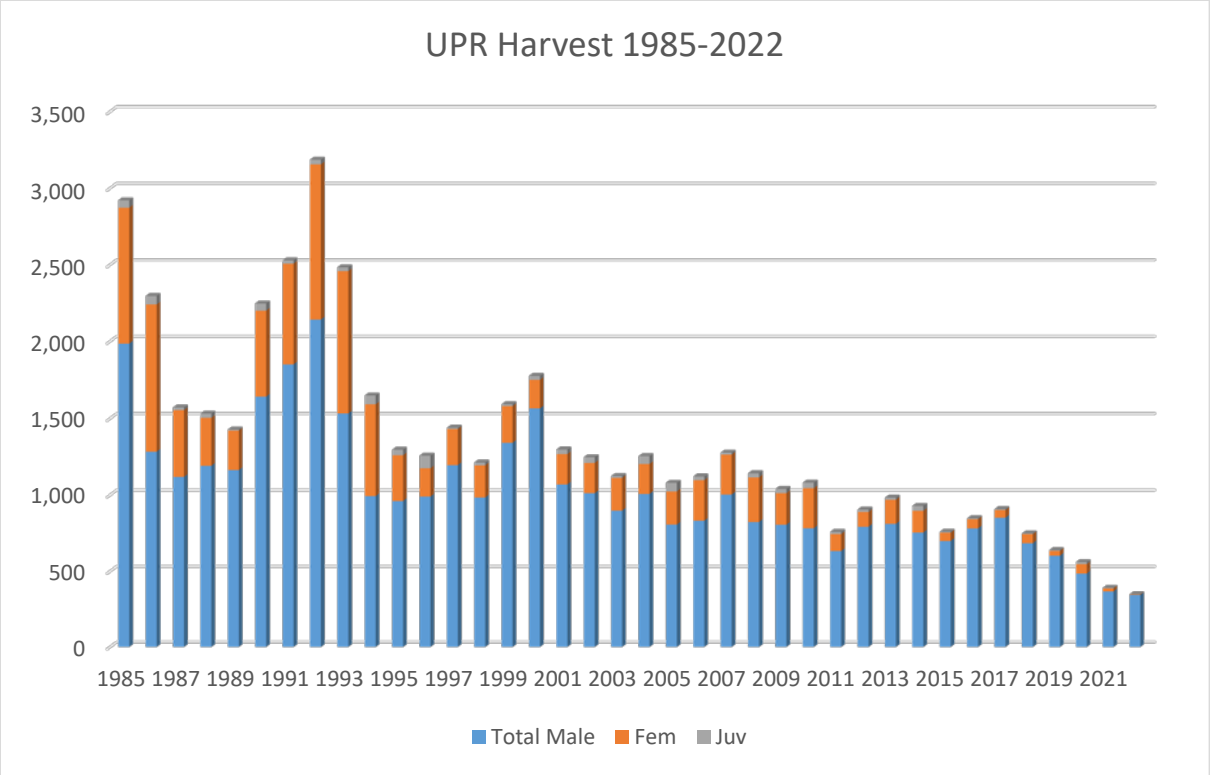


Figure 5. Upper Powder River Harvest 1985-2022.

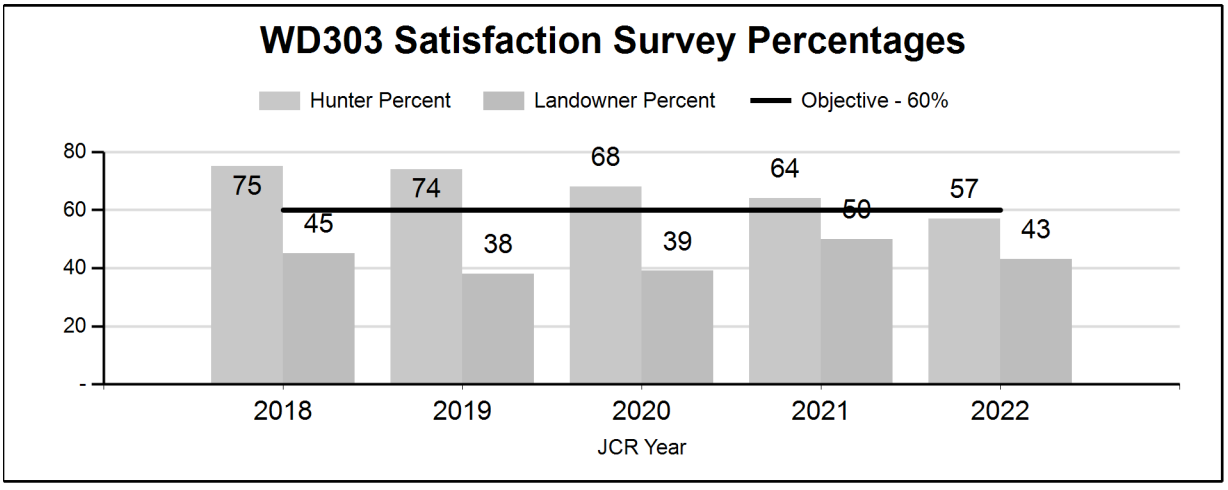
2022 - JCR Evaluation Form

SPECIES: White tailed Deer
HERD: WD303 - POWDER RIVER
HUNT AREAS: 17-19, 23-33, 163, 169

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ERIC MAICHAK

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	72%	57%	60%
Landowner Satisfaction Percent	43%	43%	50%
Harvest:	6,073	3,731	4,250
Hunters:	8,378	6,060	6,000
Hunter Success:	72%	62%	71%
Active Licenses:	9,614	6,840	7,000
Active License Success:	63%	55%	61%
Recreation Days:	38,751	24,430	25,000
Days Per Animal:	6.4	6.5	5.9
Males per 100 Females:	37	42	
Juveniles per 100 Females	69	63	

Satisfaction Based Objective	60%
Management Strategy:	Private Land
Percent population is above (+) or (-) objective:	-10%
Number of years population has been + or - objective in recent trend:	5



2023 HUNTING SEASONS
POWDER RIVER WHITE-TAILED DEER HERD (WD303)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
17	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
17	Gen			Nov. 1	Nov. 30		Any white-tailed deer
17	8	Sep. 1	Sep. 30	Oct. 1	Nov. 30	250	Doe or fawn white-tailed deer
18	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
18	8	Sep. 1	Sep. 30	Oct. 1	Nov. 15	200	Doe or fawn white-tailed deer valid on private land
19	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
19	Gen			Nov. 1	Nov. 15		Any white-tailed deer
19	8	Sep. 1	Sep. 30	Oct. 1	Nov. 15	75	Doe or fawn white-tailed deer
23	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
23	Gen			Nov. 1	Nov. 30		Any white-tailed deer
23, 26	3	Sep. 1	Sep. 30	Nov. 1	Nov. 30	500	Any white-tailed deer
23, 26	7			Sep. 1	Dec. 15	300	Doe or fawn valid on private land
23, 26	8			Sep. 1	Dec. 15	1000	Doe or fawn white-tailed deer valid on private land
24	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
24	Gen			Nov. 1	Nov. 30		Any white-tailed deer
24	3	Sep. 1	Sep. 30	Nov. 1	Nov. 30	500	Any white-tailed deer
24	7			Sep. 1	Dec. 15	200	Doe or fawn valid on private land
24	8			Sep. 1	Dec. 15	3000	Doe or fawn white-tailed deer valid on private land

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
25	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
26	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
26	Gen			Nov. 1	Nov. 30		Any white-tailed deer
27	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
27	Gen			Nov. 1	Nov. 30		Any white-tailed deer
27	8			Sep. 1	Sep. 30	1200	Doe or fawn white-tailed deer valid on private land
27	8	Sep. 1	Sep. 30	Oct. 15	Nov. 30		Doe or fawn white-tailed deer valid in the entire area; also valid in Area 28
27	8			Dec. 1	Dec. 31		Doe or fawn white-tailed deer
28	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer
28	Gen			Oct. 25	Nov. 30		Any white-tailed deer
29	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 14		Antlered mule deer or any white-tailed deer
29	Gen			Nov. 1	Nov. 30		Any white-tailed deer
29	Gen			Dec. 1	Dec. 31		Antlerless white-tailed deer
29, 31	8			Sep. 1	Sep. 30	700	Doe or fawn white-tailed deer valid on private land
29, 31	8	Sep. 1	Sep. 30	Oct. 1	Dec. 31		Doe or fawn white-tailed deer valid in entire area
30	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
30	Gen			Nov. 1	Nov. 30		Any white-tailed deer
30	Gen			Dec. 1	Dec. 31		Antlerless white-tailed deer

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
30, 32, 33, 163, 169	8			Sep. 1	Sep. 30	1000	Doe or fawn white-tailed deer valid on private land
30, 32, 33, 163, 169	8	Sep. 1	Sep. 30	Oct. 15	Dec. 31		Doe or fawn white-tailed deer valid in the entire area
31	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 10		Antlered mule deer or any white-tailed deer
32	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
32	Gen			Nov. 1	Nov. 15		Any white-tailed deer
33	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 31		Antlered mule deer or any white-tailed deer
33	Gen			Nov. 1	Nov. 15		Any white-tailed deer
33	Gen			Nov. 16	Dec. 31		Antlerless white-tailed deer
163	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer
163	Gen			Nov. 1	Nov. 15		Any white-tailed deer
169	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer
169	Gen			Nov. 1	Nov. 15		Any white-tailed deer

Nonresident Region C Quota: 2,000
Nonresident Region Y Quota: 1,200

2022 Hunter Satisfaction: 57% Satisfied; 22% Neutral; 20% Dissatisfied
2022 Landowner Satisfaction: 43% Satisfied; 25% Above Desired; 30% Below Desired

2023 Management Summary

1.) Hunting Season Evaluation: We manage this white-tailed deer herd based on hunter and landowner satisfaction. Hunting seasons are liberalized in most hunt areas in an effort to reduce complaints, deer-vehicle collisions, competition with mule deer, and more recently CWD. Hunter satisfaction has declined since 2018, as hunter satisfaction, success, total hunters, and harvest of bucks and does were at a 5-year low. Comments from hunters and landowners

(particularly east of Powder River) suggested reduced deer numbers and concern over recent EHD/Bluetongue outbreaks. However, landowner survey responses (n=125) indicated white-tailed deer populations were at (43%) to above (25%) desired levels, with similar (41%) to more liberalized (31%) hunting seasons suggested relative to 2022. Varying levels of access to private land where most white-tailed deer reside, and refuges provided by rural subdivisions, complicate white-tailed deer management.

General license season length was reduced in Hunt Areas 17-19 in response to decreased mule deer numbers; increased in Hunt Area 31 to standardize with Hunt Areas 23 and 26; and late-seasons expanded in Area 33 to address growing white-tailed deer numbers. We eliminated Type 7 licenses in Areas 17-19 to protect low mule deer numbers in these areas; reduced Type 8 licenses in Area 18 in response to white-tailed deer populations reduced by recent EHD outbreaks and diminished hunter demand; reduced the number of Type 7 licenses and created a Type 8 license in Hunt Areas 23 and 26; and maintained Type 7 and 8 licenses in Hunt Area 24, to maintain reduced levels of antlerless mule deer harvest and increased levels of antlerless white-tailed deer harvest where desired on private land. Type 8 licenses valid for Hunt Area 29 will be valid for Hunt Area 31, and Type 8 licenses valid for Hunt Area 30 will be valid in Hunt Areas 32, 33, 163, and 169 to increase opportunity and simplify regulations.

2.) Management Objective Review: This herd is scheduled for the next 5-year herd unit review in 2024.

3.) Chronic Wasting Disease Monitoring & Management: This herd overlaps several Tier 1 and 2 surveillance mule deer herds where sampling in white-tailed deer occurs opportunistically. From 2020-2022, region-wide prevalence was higher in white-tailed deer adult males (29.4%, n=561) than adult females (16.2%, n=469, Table 1), and higher than mule deer adult males (18.3%, n=770) and females (7.8%, n=127). This is a pattern similar to other non-migratory populations (e.g., Bighorn Basin).

Table 1. CWD prevalence of white-tailed deer within associated mule deer herds, 2020-2022.

Mule Deer Herd	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males	Yearling Males	Adult Females
Upper Powder River	39% (33)	0% (3)	31% (13)
Powder River	37% (110)	0% (7)	21% (67)
North Bighorn[a]	32% (339)	11% (27)	15% (367)
Pumpkin Buttes	16% (19)	25% (4)	9% (22)

[a] Data exclusive to Sheridan Region, excludes Bighorn Basin portion of herd unit

From 2020 to 2022, density of samples collected, as well as CWD-positive samples from white-tailed and mule deer, was higher in the western than eastern side of the herd unit, with hotspots distributed along the face of the Bighorn Mountains and riparian corridors (Figure 1). In Hunt

Areas 23, 24, and 26, hotspots of CWD-positive female mule deer and white-tailed deer occur around Sheridan and northeast of Buffalo along Clear Creek (Figure 2).

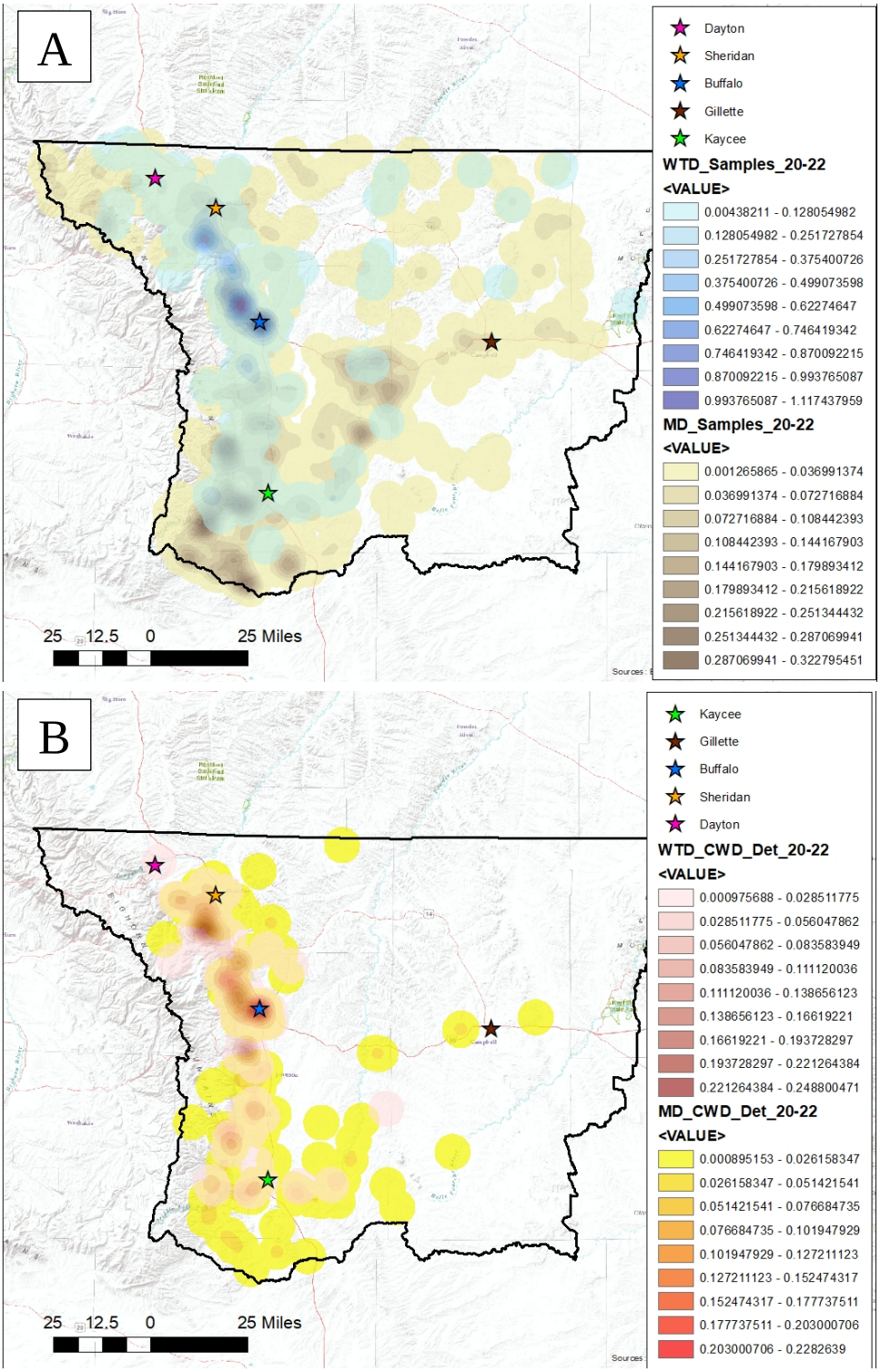


Figure 1. Density of CWD samples (A) and CWD-positive samples (B) from white-tailed deer and mule deer, Powder River Deer Herd Unit, 2020-2022. Darker colors represent higher density.

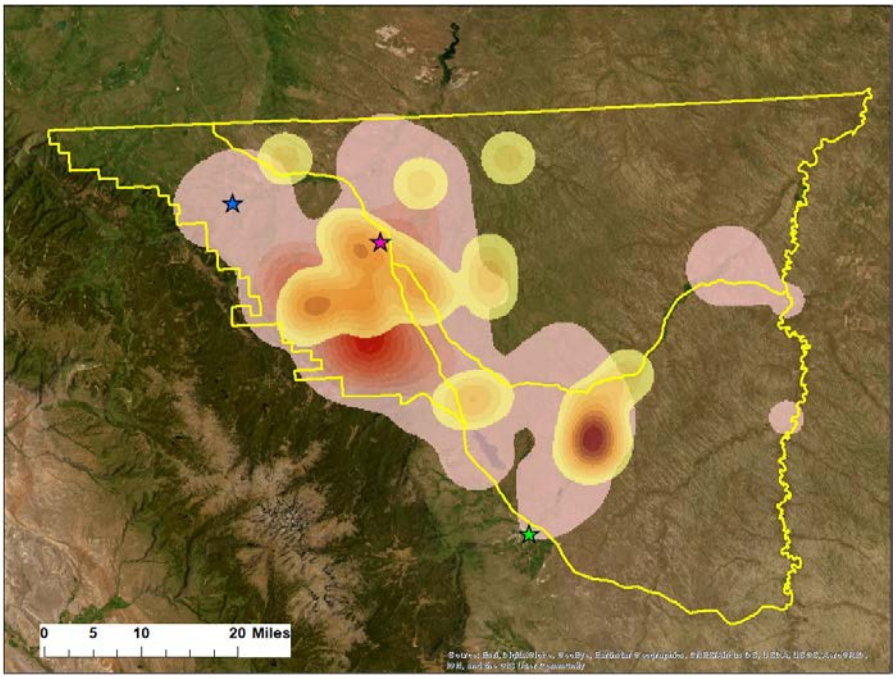


Figure 2. Density of CWD positive white-tailed deer (red) and adult mule deer females (yellow), 2020-22. Blue, red and green stars represent Dayton, Sheridan, and Buffalo, respectively. Hunt Areas 24, 23, 26 clockwise from top.

While we have not implemented specific management actions to address CWD, we continue to encourage landowners to reduce deer densities primarily through increased harvest. These recommendations have historically been to control deer numbers, address complaints and reduce browsing pressure on shrub communities. Reducing density of white-tailed deer and mule deer may also aid in limiting CWD prevalence and spread.

2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL320 - FORTIFICATION
HUNT AREAS: 2

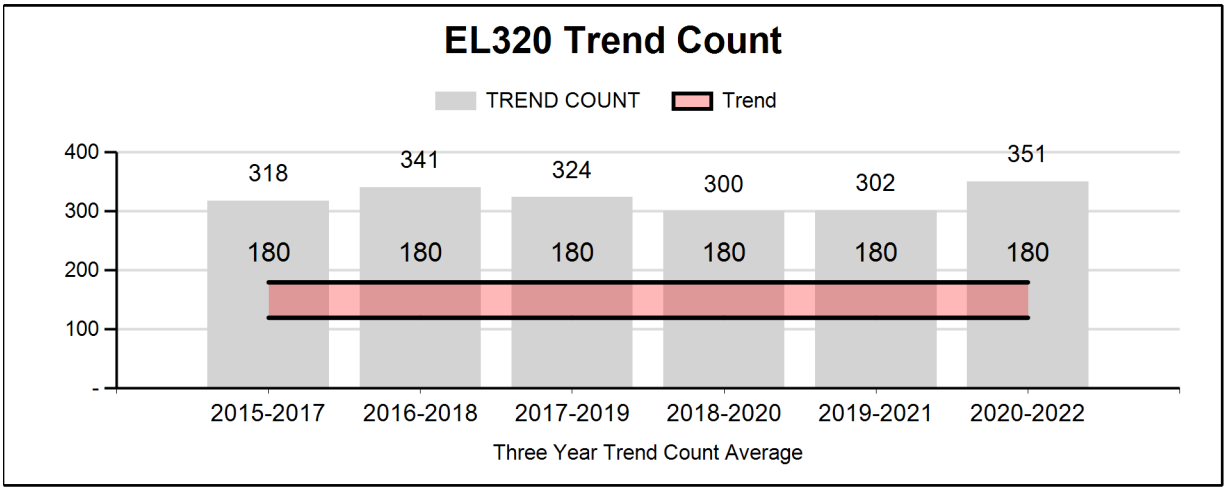
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ERIKA PECKHAM

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	323	407	350
Harvest:	88	197	190
Hunters:	126	405	400
Hunter Success:	70%	49%	48 %
Active Licenses:	130	438	425
Active License Success	68%	45%	45 %
Recreation Days:	438	1,965	2,000
Days Per Animal:	5.0	10.0	10.5
Males per 100 Females:	36	48	
Juveniles per 100 Females	55	59	

Trend Based Objective (± 20%)	150 (120 - 180)
Management Strategy:	Private Land
Percent population is above (+) or (-) objective:	171%
Number of years population has been + or - objective in recent trend:	8

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

	JCR Year	Proposed
Females ≥ 1 year old:	27%	31%
Males ≥ 1 year old:	11%	31%
Juveniles (< 1 year old):	1%	1%



2023 HUNTING SEASONS
FORTIFICATION ELK HERD (EL320)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
2	Gen	Sep. 20	Sep. 30	Oct. 1	Oct. 20		Any Elk
2	Gen			Oct. 21	Nov. 15		Antlerless elk
2	6			Oct. 1	Nov. 15	100	Cow or calf

2022 Hunter Satisfaction: 67% Satisfied, 13% Neutral, 20% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The 2022 season was the first year of a general season structure. In preceding years, this herd unit had alternated between some combination of Type 1, Type 4 and Type 6 limited quota licenses, and around 10 days in season length. All factors considered, it was the most logical option to transition to a general license harvest strategy.

This elk herd is over the objective and has been for several years. Elk are now frequently located south of I-90 and west of the Powder River, indicating that they are past carrying capacity within the boundary of Hunt Area 2, and expanding into the adjacent general hunt area 129. Complaints have been received from several landowners regarding there being too many elk and limited licenses available to address the situation via harvest.

The majority of the elk habitat is either on private land, or public land that is predominantly surrounded by private land. There is one legal access point to Bureau of Land Management land that allows hunters the opportunity to hunt elk on public land in this herd unit. We coordinate with landowners on an annual basis to discuss elk numbers and season dates. Prior to proposing a general season for 2022, a meeting was held in early December of 2021 with nine landowners attending. All of those present were satisfied with the season that was proposed. There was concern and discussion regarding Type 6 licenses and the need for ample licenses to accommodate hunters willing to harvest cows. This concern was addressed in the Hunt Area 129, Type 6 license issuance, with language making those licenses valid in that portion of Area 2 that falls within Johnson County. At the December 2021 meeting, it was made clear and agreed upon by those present that if a General Season were implemented it would need to be for a minimum of 3-5 years. Large changes to seasons on an annual basis are both confusing and do not allow the time required to assess if a new management strategy is successful.

The five-year average of hunter success was 68%. The 2022 season saw harvest success drop to 45%. This drop can be explained by various factors. When looking deeper at the breakdown of success, the non-resident hunters had an 81% rate of success, while the residents that reported hunting in this area had a 42% success rate. This indicates that non-residents who drew a general tag had a place lined up to hunt, likely via trespass fee or a guided hunt. It is estimated that around 340 resident hunters utilized their general elk tag in this herd unit, providing many more resident hunting opportunities than with the past limited quota season structure. Additionally, the distribution of elk seemed different from past years with not as many reported elk being present in the Access Yes Hunter Management Area at the end of the general, any elk season.

Both landowner observations the last couple of years and trend count flights indicate that there may be higher densities of elk in the northern portion of this herd unit than in years past. Although there is no way to know from the harvest results how many elk were harvested on the HA 129, Type 6 license, numerous landowner coupons have been returned in an area that was experiencing high densities of elk and corresponding degradation of rangeland habitat as a direct result.

This herd has a trend count objective of 150 elk. The 3-year average was 312 elk classified, well above the objective. The 2022 post-season flight resulted in 407 elk, which was the highest number of elk observed on these trend count flights.

2.) Public Access: Since 2019, portions of this hunt area have been enrolled in the Access Yes program. The program has been well received by hunters and landowners alike. Hunter Management Area (HMA) permits will be limited to hunters holding Type 6 licenses or hunting under a general tag, for antlerless elk only. Without access to private land via the HMA, it is difficult to access some of the remote portions of Hunt Area 2. This access provides an easier opportunity for those desiring to harvest an antlerless elk.

Although access to the Wilderness Study Area is difficult due to terrain and distance, it is not impossible. For any resident holding a general elk license, there is opportunity to walk into the large tract of contiguous public land that contains elk.

2022 - JCR Evaluation Form

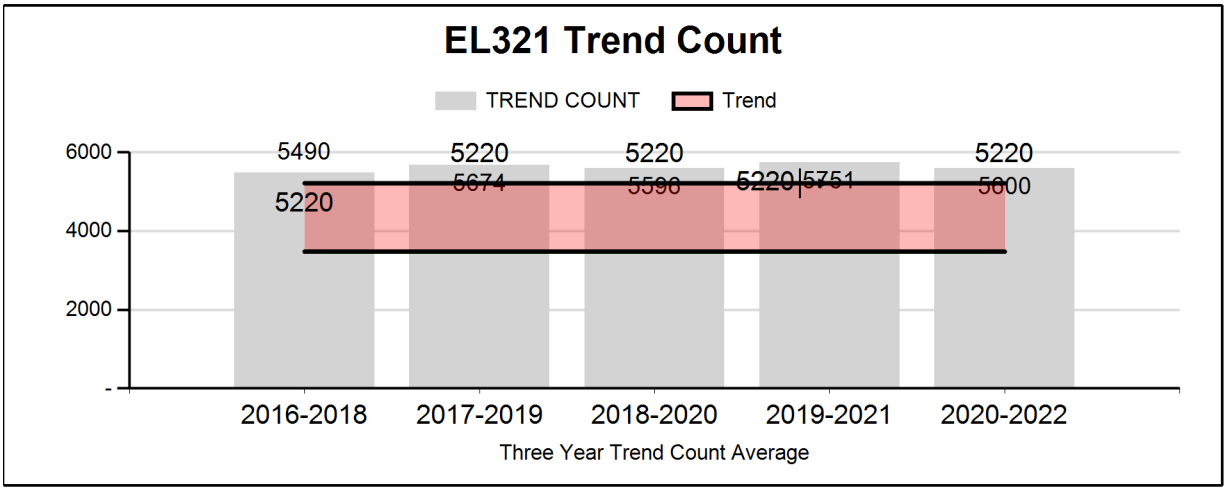
SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL321 - NORTH BIGHORN
HUNT AREAS: 35-40
PREPARED BY: ERIC MAICHAK

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	5,740	5,124	5,500
Harvest:	1,588	1,561	1,575
Hunters:	4,967	5,048	5,000
Hunter Success:	32%	31%	32%
Active Licenses:	5,201	5,305	5,250
Active License Success	31%	29%	30%
Recreation Days:	36,600	37,226	37,000
Days Per Animal:	23.0	23.8	23.5
Males per 100 Females:	25	36	
Juveniles per 100 Females	30	19	

Trend Based Objective (± 20%)	4,350 (3480 - 5220)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	18%
Number of years population has been + or - objective in recent trend:	5

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

	JCR Year	Proposed
Females ≥ 1 year old:	22%	22%
Males ≥ 1 year old:	28%	28%
Juveniles (< 1 year old):	5%	5%



2023 HUNTING SEASONS
NORTH BIGHORN ELK HERD (EL321)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
35	1	Sep. 15	Sep. 30	Oct. 10	Nov. 5	150	Any elk
35	1			Nov. 15	Dec. 31		Antlerless elk
35	4	Sep. 15	Sep. 30	Oct. 10	Nov. 5	175	Antlerless elk
35	4			Nov. 15	Dec. 31		Antlerless elk
35	6			Aug. 15	Oct. 9	425	Cow or calf elk valid on private land
35	6	Sep. 15	Sep. 30	Oct. 10	Dec. 31		Cow or calf elk valid off national forest
35	9			Sep. 1	Sep. 30	75	Any elk, archery only
36	Gen	Sep. 15	Sep. 30	Oct. 10	Nov. 5		Antlered elk valid on national forest; any elk off national forest
36	4	Sep. 15	Sep. 30	Oct. 10	Nov. 5	300	Antlerless elk
36	4			Nov. 15	Dec. 31		Antlerless elk
36	6			Oct. 1	Oct. 9	250	Cow or calf valid off national forest north of Rock Creek
36	6	Sep. 15	Sep. 30	Oct. 10	Nov. 5		Cow or calf valid in the entire area
36	9			Sep. 1	Sep. 30	75	Any elk, archery only
37	Gen	Sep. 15	Sep. 30	Oct. 10	Oct. 31		Any elk
37	Gen			Nov. 1	Nov. 15		Antlerless elk
37	6	Sep. 15	Sep. 30	Oct. 1	Dec. 31	500	Cow or calf
37	9			Sep. 1	Sep. 30	150	Any elk, archery only
38	1			Oct. 10	Oct. 31	400	Any elk
38	1			Nov. 1	Nov. 15		Antlerless elk
38	4			Oct. 1	Nov. 15	550	Antlerless elk
38	9			Sep. 1	Sep. 30	250	Any elk, archery only
39	1			Oct. 10	Nov. 4	200	Any elk
39	1			Nov. 5	Nov. 30		Antlerless elk
39	4			Oct. 1	Nov. 30	150	Antlerless elk
39	6	Sep. 1	Sep. 30	Nov. 5	Nov. 30	75	Cow or calf
39	9			Sep. 1	Sep. 30	100	Any elk, archery only

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
40	1			Oct. 15	Nov. 4	225	Any elk
40	1			Nov. 5	Nov. 30		Antlerless elk
40	4			Oct. 15	Nov. 30	125	Antlerless elk
40	5			Oct. 1	Oct. 10	125	Antlerless elk
40	5			Oct. 15	Nov. 30		Antlerless elk
40	6			Sep. 1	Nov. 4	100	Cow or calf valid off national forest
40	6			Nov. 5	Nov. 30		Cow or calf valid in the entire area
40	9			Sep. 1	Sep. 30	100	Any elk, archery only

2022 Hunter Satisfaction: 59% Satisfied; 20% Neutral; 21% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The current management objective is a mid-winter trend count of 4,350 elk (± 20%) and an overall management strategy of trophy management, with recreational management in Hunt Areas 36 and 37. We have also established hunt area trend count sub-objectives: HA 35=400; HA 36=800; HA 37=800; HA 38=1,000; HA 39=500; and HA 40=850. Our 2022 mid-winter trend count was 5,124 elk, down from 2021 (n=6,062), with counts in Areas 39 and 40 much lower relative to 2021. Although counts across the herd unit were lowest since 2016, deep snow conditions likely resulted in movement of elk into Montana.

Managers have implemented a variety of season strategies designed to increase elk harvest over the past two decades. Managers continue to engage landowners in effort to secure access and develop strategies to increase elk harvest on private lands, especially on the eastern side of the Bighorn Mountains. Following record harvest in 2018, seasons throughout the herd unit changed little from 2018-2021. In 2022, earlier start dates (October 10) than prior years (October 15) in Areas 37, 38, and 39, coupled with moderate snowfall and adequate accessibility on public lands were met with slightly increased harvest (n=1,561) vs. 2021 (n=1,405). Hunter satisfaction for the herd unit was slightly higher in 2022 (59%) than 2021 (56%), and was highest in Hunt Areas 38 (79%) and 39 (80%). Landowner survey responses (n=41, HA 35-38) favored populations at (41%) or above (29%) desired levels, and season strategies similar (41%) to more liberal (41%) than 2022.

Hunt Area 35 and 36 opening dates were moved up to October 10 to increase opportunity, and in some years an opportunity to hunt areas that quickly become inaccessible and snowbound. This opener would share the same standard date with Hunt Areas 37-39. We also prescribed a “break” in cow hunting on forest in both units from November 6-14. This break is intended to let elk settle and redistribute, hopefully to areas with access and opportunity. An “any elk” limitation was added to the general license off forest in HA 36. This will allow general season hunters to harvest antlerless elk, primarily in the northern end of the unit. Hopefully, this change will increase harvest opportunity while not increasing crowding.

We reduced Hunt Area 35 Type 4 licenses (75) to address crowding on forest, but still maintain antlerless harvest. Type 6 licenses (75) were added to hopefully maintain or increase harvest and focus harvest where it is most needed.

In 2022, in Hunt Areas 37-39, we implemented an October 10 regular season start date to avoid mid-October winter storms that can limit access and reduce success. Although harvest of adult males in Areas 37-40 on General or Type 1 licenses was greater in 2022 than prior years, harvest on Type 9 licenses was also higher in these areas in 2022 than prior years, suggesting ideal weather conditions to promote harvest. Furthermore, there were few hunter comments suggesting return to October 15 regular season start. Therefore, we maintained the October 10 regular season start date in Hunt Areas 37-39 to continue to provide additional opportunity for recreation and harvest. With populations continuing to exceed trend objectives, and few hunter comments regarding hunter crowding, we maintained existing license allocations in Hunt Areas 37 and 38.

In Hunt Area 39, hunter success on the Type 4 license was 61% in 2022. The Hunt Area 39 Type 4 season overlaps with the Type 1 "any elk" season from October 10th to November 4th. Publicly accessible land that holds elk during this season is relatively limited, therefore the Type 4 quota was maintained at 150 to ensure adequate elk harvest and reduce overcrowding. For Hunt Area 39 Type 6 license we implemented a special archery season to provide a cow hunting opportunity earlier in the fall when elk are most available on public land, and removed the "off national forest" early season due to lack of harvest since the seasons' inception.

2.) Management Objective Review: Herd unit objective was reviewed and discussed in 2021 with no change.

3.) Chronic Wasting Disease Monitoring & Management: This is a Tier 2 surveillance herd. Passive sampling of hunter-harvested adult elk during 2020-2022 seasons suggest 7.7% prevalence (n=206), an increase from 2018-2020 (3.4%, n=206). From 2020-2022, nearly 50% of samples were derived from Hunt Area 37, with hotspots in Hunt Areas 35-37 (Figure 1). Next scheduled priority CWD sampling is 2027.

Although we have not implemented any CWD management actions specific for elk in this herd unit, efforts to liberalize harvest may be helping to keep CWD prevalence lower in elk than overlapping mule deer populations, and reduce environmental contamination and ingestion of prions by deer.

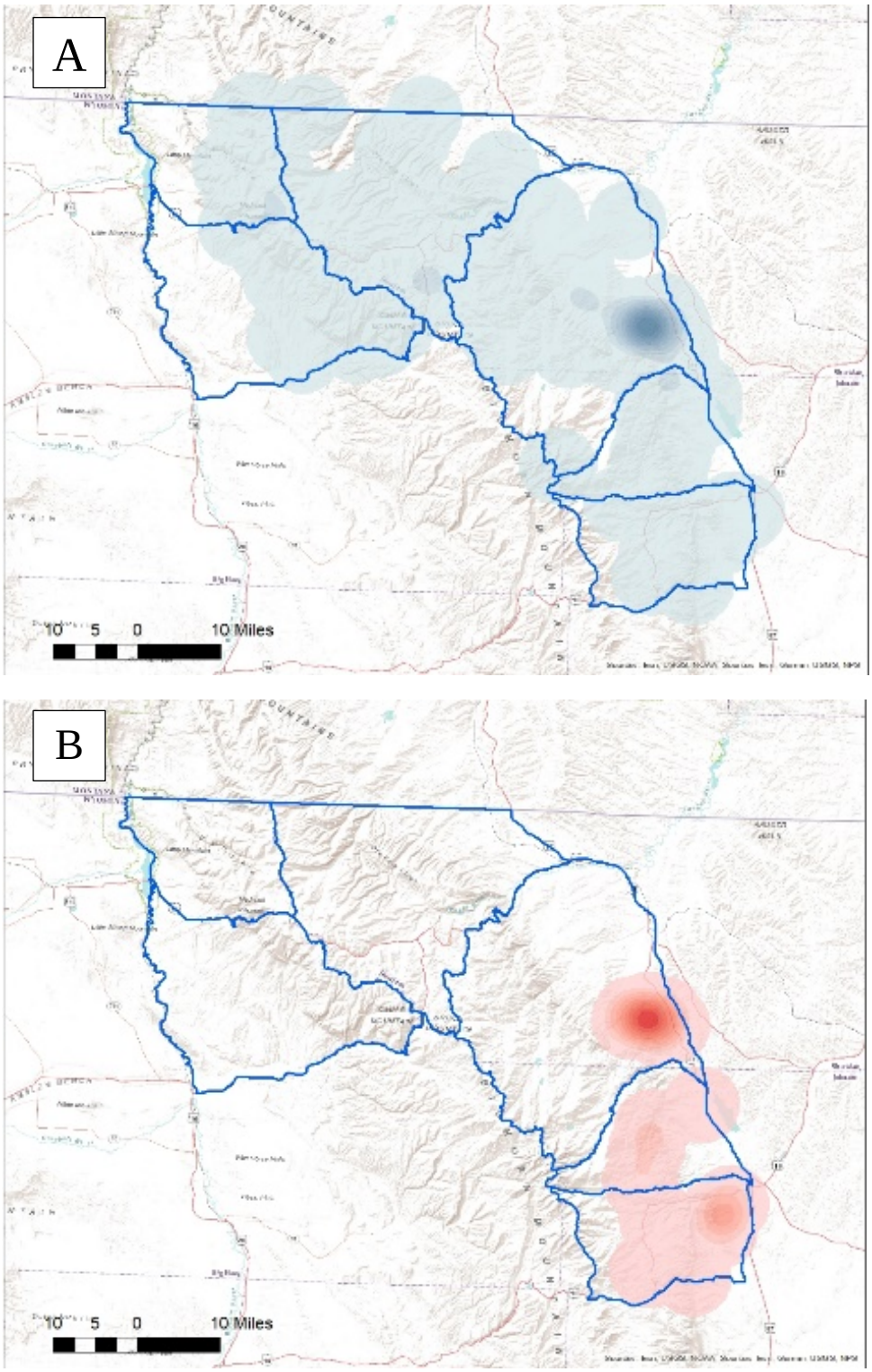


Figure 1. Density of CWD samples (A) and CWD-positive samples (B) from adult elk, North Bighorns Elk Herd Unit, 2020-2022. Darker colors indicate greater density.

2022 - JCR Evaluation Form

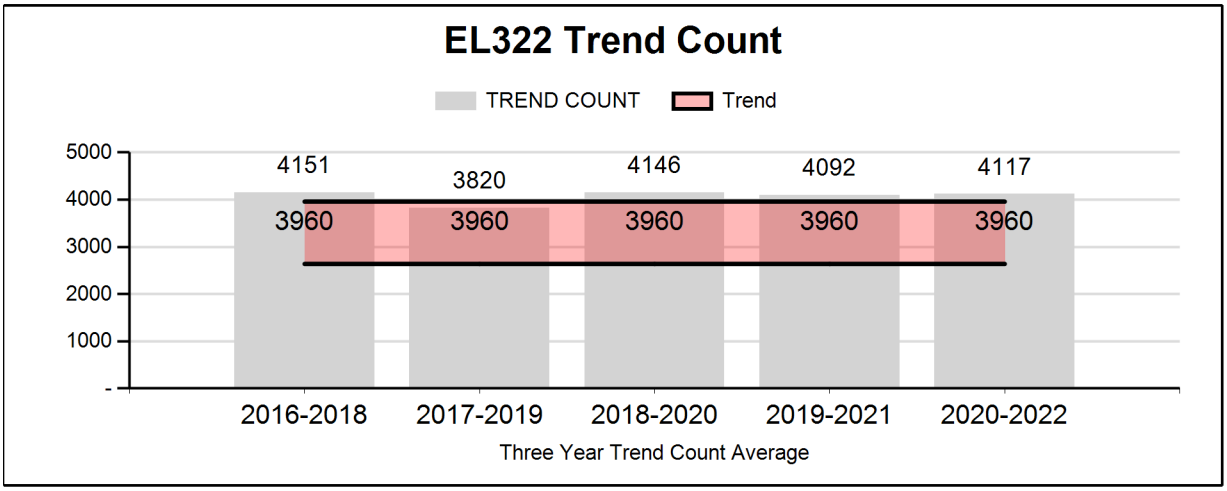
SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL322 - SOUTH BIGHORN
HUNT AREAS: 33-34, 47-49, 120
PREPARED BY: ZACH TURNBULL

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	4,021	3,709	4,000
Harvest:	1,749	1,385	1,500
Hunters:	3,887	3,859	3,900
Hunter Success:	45%	36%	38 %
Active Licenses:	4,011	3,977	4,000
Active License Success	44%	35%	38 %
Recreation Days:	27,002	29,435	29,500
Days Per Animal:	15.4	21.3	19.7
Males per 100 Females:	33	30	
Juveniles per 100 Females	29	23	

Trend Based Objective (± 20%)	3,300 (2640 - 3960)
Management Strategy:	Private Land
Percent population is above (+) or (-) objective:	12%
Number of years population has been + or - objective in recent trend:	5

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

	JCR Year	Proposed
Females ≥ 1 year old:	na%	na%
Males ≥ 1 year old:	na%	na%
Juveniles (< 1 year old):	na%	na%



2023 Hunting Seasons
South Bighorn Elk Herd Unit (EL322)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
33	1	Sep. 1	Sep. 30	Oct. 9	Oct. 31	200	Any elk
33	1			Nov. 7	Dec. 31		Antlerless elk
33	4			Aug. 15	Sep. 30	150	Antlerless elk valid on private land east of Buffalo Creek and the Bar C Road (B.L.M. Road 6214)
33	4	Sep. 1	Sep. 30	Oct. 9	Oct. 31		Antlerless elk valid in the entire area
33	4			Nov. 7	Dec. 31		Antlerless elk
33	6	Sep. 1	Sep. 30	Nov. 7	Dec. 31	300	Cow or calf
34	1	Sep. 1	Sep. 30	Oct. 9	Nov. 15	800	Any elk
34	1			Nov. 16	Dec. 31		Antlerless elk
34	6			Aug. 15	Oct. 8	700	Cow or calf valid on private land on or within one (1) mile of irrigated land.
34	6	Sep. 1	Sep. 30	Oct. 9	Dec. 31		Cow or calf valid off national forest
47	1	Sep. 1	Sep. 30	Oct. 9	Oct. 31	150	Any elk
47	1			Nov. 1	Nov. 30		Antlerless elk
47	6	Sep. 1	Sep. 30	Oct. 9	Nov. 30	50	Cow or calf
48	1	Sep. 1	Sep. 30	Oct. 9	Oct. 31	400	Any elk
48	1			Nov. 7	Dec. 15		Antlerless elk
48	4	Sep. 1	Sep. 30	Oct. 9	Oct. 31	125	Antlerless elk
48	4			Nov. 7	Dec. 15		Antlerless elk
48	6	Sep. 1	Sep. 30	Oct. 9	Oct. 31	600	Cow or calf
48	6			Nov. 7	Dec. 15		Cow or calf
48	7	Sep. 1	Sep. 30	Nov. 7	Dec. 15	300	Cow or calf
49	1	Sep. 1	Sep. 30	Oct. 9	Oct. 31	350	Any elk
49	1			Nov. 7	Dec. 21		Antlerless elk
49	4	Sep. 1	Sep. 14	Sep. 15	Oct. 31	100	Antlerless elk
49	4			Nov. 7	Dec. 21		Antlerless elk
49	6	Sep. 1	Sep. 30	Oct. 9	Oct. 31	350	Cow or calf
49	7	Sep. 1	Sep. 30	Nov. 7	Dec. 21	500	Cow or calf
120	1	Sep. 1	Sep. 30	Oct. 9	Oct. 31	175	Any elk
120	1			Nov. 1	Dec. 15		Antlerless elk
120	4	Sep. 1	Sep. 30	Oct. 9	Dec. 15	100	Antlerless elk
120	6	Sep. 1	Sep. 30	Oct. 9	Dec. 15	100	Cow or calf

2022 Hunter Satisfaction: 61% Satisfied, 18% Neutral, 21% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: This herd remained above trend count objectives (12% above) in spite of interchange between many hunt areas and some herd units. While low winter range fidelity complicates hunt area trend data, most hunt areas remain over objective: HA 33(1,079; 1,100 sub-objective); HA 34 (1,277; 1,000 sub-objective); HA 47 (99; 200 sub-objective); HA 48 (211; 400 sub-objective); HA 49 (428; 300 sub-objective); HA 120 (615; 300 sub-objective).

Harvest statistics, including hunter satisfaction (61%) and hunter success (36%) remained similar to previous years. Effort per harvest remains high (21.3 days per harvest). Harvest continues to be complicated by land access and ownership, with large numbers of elk residing on properties with restricted access.

Rest dates were incorporated into HA 33 seasons. This period is designed to let elk redistribute throughout the hunt area and ownership patterns. Often elk are shot or disturbed as soon as they cross onto public land or private lands that provide hunting opportunity. Often this immediately sends elk back to inaccessible areas. Hopefully, closing one week will allow elk to drift and distribute better, making more available for harvest once the seasons re-open.

In Hunt Areas 48 and 49, a Type 7 tag was added to distribute hunters better, with the intent to increase opportunity.

An earlier season opener was adopted in HA 49 Type 4 to increase opportunity and harvest. Only 100 licenses were offered so as to not increase pressure too much in the early season. Type 6 licenses were decreased for the same reasons and to address hunter comments.

Elk HA 120 Type 1 licenses were increased for 2023. Seasons may be increased next year if harvest metrics remain high.

2.) Management Objective Review: Next herd review in 2027.

3.) Chronic Wasting Disease Management: This was a Tier 2 surveillance herd in 2022 and will be targeted again in 2023. CWD was detected in all Southern Bighorn hunt areas in 2022 except for HA 120. Prevalence for the entire unit rose to 5.3% (Table 1). Some hunt areas saw a significant increase in prevalence and are cause for concern. A shift in herd behavior may be contributing to the rise in prevalence, with large sedentary herds occupying areas for extended periods.

Table 1. South Bighorn elk CWD sampling 2020-2022.

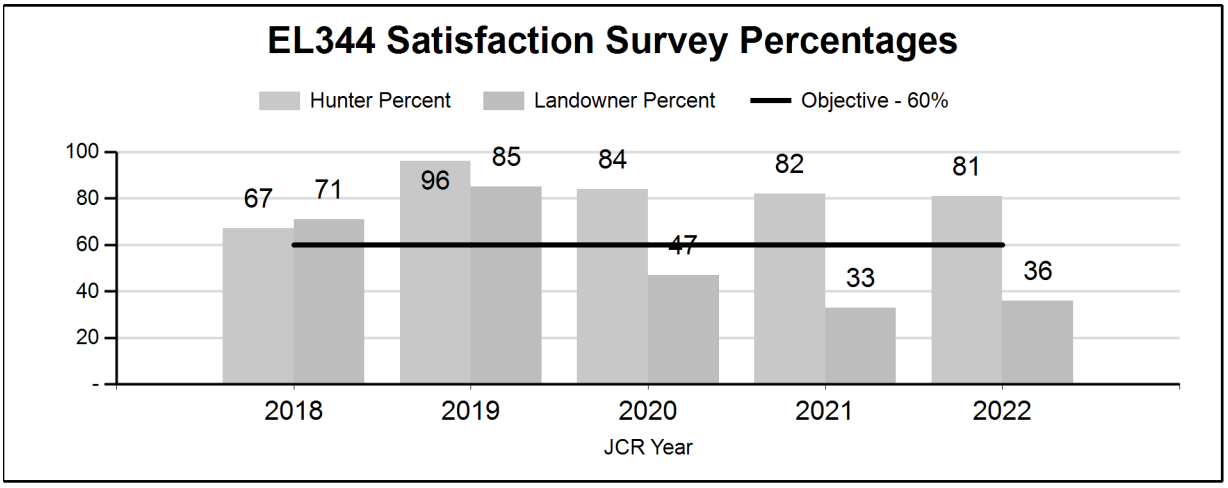
	2020-2022		
HA/HU	Tested	# Pos	Prev
33	26	1	3.8%
34	53	7	13.2%
47	8	1	12.5%
48	47	1	2.1%
49	47	1	2.1%
120	26	0	0.0%
South Bighorn 322 2022 Survey Tier 2	207	11	5.3%

2022 - JCR Evaluation Form

SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL344 - ROCHELLE HILLS
HUNT AREAS: 113, 123
PREPARED BY: ERIKA PECKHAM

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	84%	81%	60%
Landowner Satisfaction Percent	64%	36%	60%
Harvest:	139	254	350
Hunters:	172	345	450
Hunter Success:	81%	74%	78 %
Active Licenses:	181	366	400
Active License Success:	77%	69%	88 %
Recreation Days:	829	1,641	2,000
Days Per Animal:	6.0	6.5	5.7
Males per 100 Females:	31	0	
Juveniles per 100 Females	32	0	

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:	3



2023 HUNTING SEASONS
ROCHELLE HILLS ELK HERD (EL344)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
113	1	Sep. 1	Sep. 30	Nov. 5	Nov. 30	50	Any Elk
113	3	Sep. 1	Sep. 30	Nov. 5	Nov. 30	150	Spike or antlerless elk
123	1			Sept. 1	Oct. 10	100	Any elk
123	2			Sept. 1	Nov. 30	50	Antlered elk five (5) points or less on either antler or antlerless elk
123	4			Sep. 1	Nov. 30	75	Antlerless elk
123	6			Sep. 1	Nov. 30	75	Cow or calf

2022 Hunter Satisfaction: 81% Satisfied, 14% Neutral, 5% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: Hunt Area 123 is predominantly a private access hunt. The season structure is coordinated on an annual basis with participating landowners. Elk numbers in this hunt area remain high, and typically, landowner satisfaction is also high. Although landowners indicated that they were overall satisfied (71% satisfied, 29% neutral), there was still concern about the number of elk from a few people, and that the number of bulls was still too high. In 2022, a Type 2 license was added with an antler point restriction (APR). This APR was designed to harvest younger age class and smaller bulls and to bring the bull ratio down. The harvest survey indicated a 74% success on the Type 2 licenses, with an estimated 25 bulls being harvested. During the landowner meeting, it was decided to keep this license type for another year, to continue to target some of these bulls. In addition to the Type 2 license, there was a Type 1, any elk license added. This license type is available on a three-year rotation.

Although there is no numeric objective in this herd, a trend count is typically flown annually. The 2022 post-season flight resulted in spotting a large group of elk estimated at 500-600 animals in hunt area 123. This group is typically in the same location and was initially noted around 10 years ago. At that time, the group was around 75 elk. Each subsequent survey has resulted in seeing an increase in numbers in this gathering of elk. This information has been provided at the landowner meetings, with cautionary statements being made by personnel about the ability of elk to increase exponentially in this habitat type and area of the state.

The majority of dissatisfied landowners reside within Hunt Area 113 and there is overall concern that there are too many elk in this hunt area. This has been a concern that has grown gradually over the last few years. All seven attendees present at a landowner meeting in November 2022, expressed concern with the continued high number of elk.

The addition of a Type 2 license, aimed to harvest younger age class bulls, was implemented in 2022. This license was utilized with an estimated 78% success, resulting in 74 bulls and yearling bulls being harvested. The successful harvest achieved the goal of reducing the lower age class bulls, although there is still overarching concern at the overall number of elk. The Type 3 licenses were designed to allow harvest flexibility with the ability to target young males and females, in an effort to curb the continued growth that this herd is experiencing. The issuance of these licenses will allow private landowners to manage elk and will provide the hunting public opportunity on the public lands in this Hunt Area.

This herd has a satisfaction objective, with the goal of having at least 60% hunter and 60% landowner satisfaction. The 2022 harvest data illustrates an 81% hunter satisfaction, well above the requisite 60%. Conversely, this is the third year that the landowner satisfaction has not met the 60% threshold, coming in at 36%. As outlined above, the current season structure will address the concerns of each hunt area.

2022 - JCR Evaluation Form

SPECIES: Moose
HERD: MO313 - BIGHORN
HUNT AREAS: 1, 34, 42

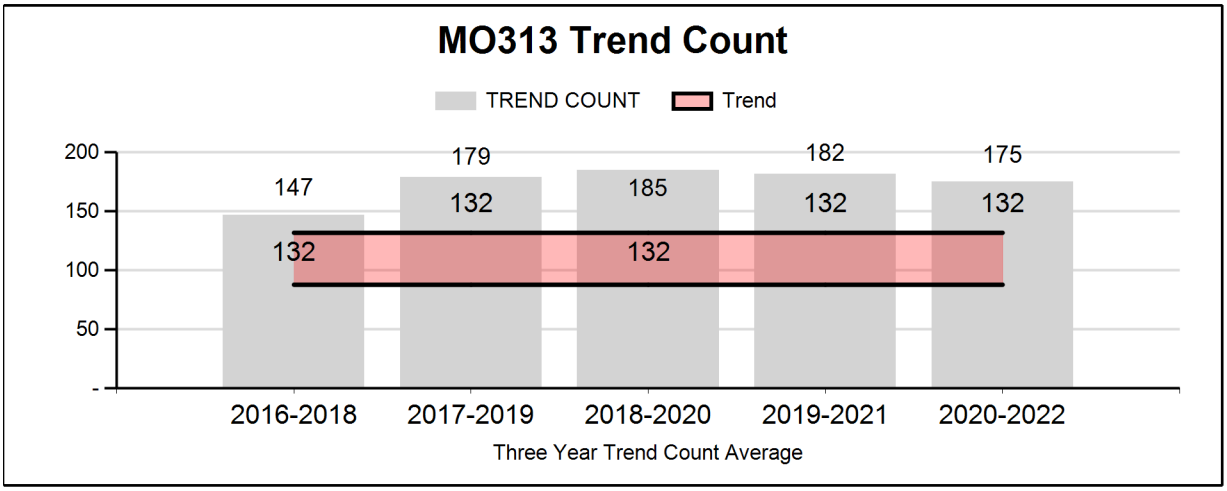
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ERIC MAICHAK

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	173	198	165
Harvest:	24	30	39
Hunters:	25	35	40
Hunter Success:	96%	86%	98%
Active Licenses:	25	35	40
Active License Success	96%	86%	98%
Recreation Days:	253	315	400
Days Per Animal:	10.5	10.5	10.3
Males per 100 Females:	85	54	
Juveniles per 100 Females	56	46	

Trend Based Objective (± 20%)	110 (88 - 132)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	80%
Number of years population has been + or - objective in recent trend:	5

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

	JCR Year	Proposed
Females ≥ 1 year old:	5%	18%
Males ≥ 1 year old:	18%	35%
Juveniles (< 1 year old):	1%	0%



2023 HUNTING SEASONS
BIGHORN MOOSE HERD (MO313)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	7	Any moose, except cow moose with calf at side (6 resident, 1 non-resident)
1	4	Sep. 1	Sep. 30	Oct. 1	Oct. 31	8	Antlerless moose, except cow moose with calf at side (7 resident, 1 non-resident)
34	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	6	Any moose, except cow moose with calf at side (6 residents)
34	4	Sep. 1	Sep. 30	Oct. 1	Oct. 31	6	Antlerless moose, except cow moose with calf at side (5 residents, 1 nonresident)
42	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	7	Any moose, except cow moose with calf at side (6 residents, 1 non-resident)
42	4	Sep. 1	Sep. 30	Oct. 1	Oct. 31	6	Antlerless moose, except cow moose with calf at side (6 residents)

2023 Management Summary

1.) Hunting Season Evaluation: We manage this herd on a Trend Count objective of 110 moose (± 20%) based on a 3-year running average. We have also established sub-objectives for each hunt area to represent desired distribution of moose (Area 1 = 50, Area 34 = 30, Area 42 = 30). Habitat, weather, disease, and cause-specific mortality data are considered as available. In 2022, we observed 198 moose (Area 1 = 89; Area 34 = 26; Area 42 = 83), and a 3-year running average of 175 moose (Area 1 = 81; Area 34 = 38; Area 42 = 56). Over the past five years, we have observed more moose in each hunt area than desired. The 2022 postseason ratio of calves:100 cows (Area

34) was 33:100. The 2022 preseason ratios of calves:100 cows were 32:100 (Area 1) and 34:100 (Area 42).

Willow habitat conditions and availability in this herd unit are generally considered modest. Use of willows, based on browsing of marked leaders and Live:Dead index, is considered high (>80%), and contributing to degradation of existing willow communities. Ongoing projects to rehabilitate willow communities include installation of beaver dam analogs and translocation of beavers throughout the herd unit.

All Wyoming moose herds are managed for a high bull to cow ratio (i.e. 50-70 bulls:100 cows), preferably with a diverse age structure. Ratios of bulls:100 cows are relatively stable among all hunt areas, including 108:100 (Area 42), 81:100 (Area 34), and 37:100 (Area 1). To maintain adequate age structure and hunt quality, this herd also has established harvest thresholds of males, including 40% of harvested males greater than 5 years old, and median age ≥ 4 years old. From 2020-2022, 56% of hunter-harvested bulls (n=61) were greater than 5 years old, and median age was 5 years old. Three-year averages of age were 6.3 (Area 42, n=24), 5.3 (Area 1, n=20), and 3.9 (Area 34, n=18) suggesting an adequate age structure in this population.

In response to trend count exceeding objective, suitable calf:cow ratios, and modest conditions, availability, and high use of willow habitat, we increased the number of Type 4 licenses to help control population growth. Managers are confident this limited female harvest is appropriate, desired and sustainable to keep moose populations at acceptable levels. Given current levels of bull:cow ratios and harvested bull ages among hunt areas, we adjusted Type 1 licenses among hunt areas. We maintained archery dates at September 1 to maximize opportunity for archery hunters, and standardize dates among other areas in the state. Licenses allocated to residents and non-residents were made based on the recent adoption of a 90:10 allocation of moose licenses to residents:non-residents hunters.

2.) Management Objective Review: This herd is scheduled for its next 5-year herd unit review in 2025.

3) Research: We initiated a research project in 2017 investigating moose movements and seasonal habitat use. Most collars have been retrieved and GPS data downloaded, with a master's thesis awaiting completion. These GPS data, in conjunction with WOS data, will be used to update moose seasonal ranges in 2023.

The University of Wyoming initiated a research project in January 2020 looking at the use of fecal DNA for a modified mark/recapture density abundance technique. Fecal samples have been collected over the past two winters. Analysis to identify individual animals is currently occurring. Results of this study, expected this fall, may inform managers how current survey techniques and management objectives relate to an independent population estimate.