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2023 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2023 - 5/31/2024

HERD: PR745 - RATTLESNAKE

HUNT AREAS: 70-72

PREPARED BY: BRANDON WERNER

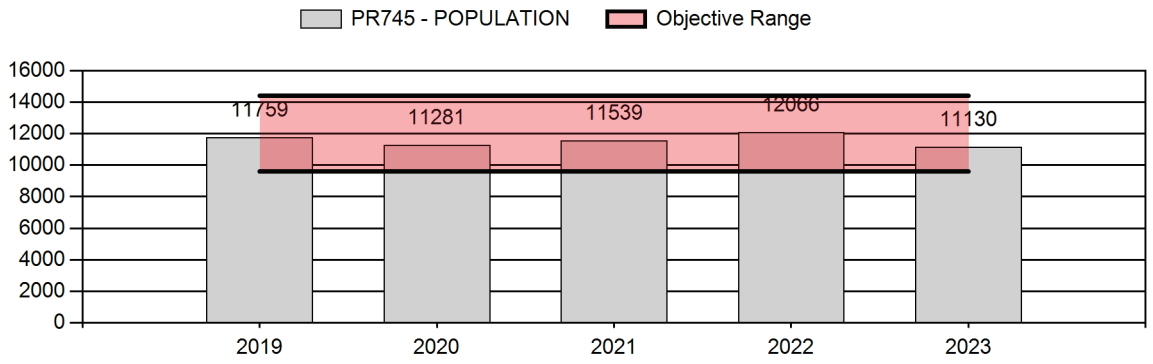
	2018 - 2022 Average	2023	2024 Proposed
Population:	11,719	11,130	12,088
Harvest:	1,041	684	1,100
Hunters:	1,116	800	1,200
Hunter Success:	93%	86%	92%
Active Licenses:	1,243	799	1,296
Active License Success:	84%	86%	85%
Recreation Days:	3,420	2,310	3,400
Days Per Animal:	3.3	3.4	3.1
Males per 100 Females	63	52	
Juveniles per 100 Females	61	43	

Population Objective (± 20%) :	12000 (9600 - 14400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-7.2%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/15/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	.03%	.09%
Males ≥ 1 year old:	15%	19%
Proposed change in post-season population:	.95%	1.09%

Population Size - Postseason



2024 HUNTING SEASONS
RATTLESNAKE PRONGHORN HERD (PR745)

Hunt Area	Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
70	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	100	Any antelope
	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	25	Doe or fawn
71	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	75	Any antelope
	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	25	Doe or fawn
72	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	800	Any antelope
	6	Aug. 15	Sep. 14	Sep. 15	Oct. 31	300	Doe or fawn

2023 Hunter Satisfaction 80% Satisfied, 12% Neutral, 8% Dissatisfied

2024 Management Summary

1) **Hunting Season Evaluation**: The severe winter of 2011 caused a drastic decline in this herd, which has since grown back to objective. Despite difficult conditions from 2018-2023, including drought and harsh winters, the Rattlesnake Herd continues to maintain itself around objective. The winter of 2022-2023 was extremely harsh, but pronghorn went into this winter in good body condition and winter mortality was near normal as indicated by managers' observations, good yearling buck ratios, and high harvest success in 2023. However, there was some impact on fawn production in 2023, suggesting these pronghorn were stressed during the harsh winter and produced fewer fawns or fawns born in poor body condition leading to lower survival. The growing season in 2023 was exceptional with great spring and summer precipitation with mild temperatures. With extremely mild winter conditions in 2023-2024, pronghorn survival in this herd will likely be extremely high.

   A three-year (2021-2023) analysis indicated the mean percentage of harvested males ≥ 1 year old was 18% of the preseason buck population. While this is below the management goal of 25% male harvest for recreational herds, this herd was under special management until 2020. The projected preseason harvest of males should be around 19% in the 2024 season. Due to lower fawn production from the harsh winter of 2022-2023 managers are hesitant to drastically increase buck harvest to the 25% goal. However, based on good harvest success, current buck ratios, hunter satisfaction, and observations, managers added some Type 1 and 6 license opportunities in 2024.

Due to high success and an over-objective antelope herd in 2022, managers wanted to increase license issuance in Areas 71 and 72 in 2023. However, to be conservative given the extreme winter weather conditions, managers maintained Type 1 quotas but removed all Type 6 licenses. After having a year to assess winter mortality from the 2022-2023 harsh winter, it is apparent these pronghorn had minimal losses. Area 72 saw an increase in Type 1 licenses due to high hunter success and densities of antelope. Area 70 remained the same because of high harvest success and an attempt to keep antelope densities low in this agriculturally dominated hunt area. Type 1 license issuance in Area 71 was slightly reduced due to below average harvest success and poor hunter satisfaction. Type 6 licenses are added back in all of these hunt areas, with 300 issued in Area 72 and 25 each in Areas 70 and 71. This was done to manage this herd around objective and provide increased hunter opportunity. Management goals are to continue to provide good buck harvest opportunity based on the recreational management strategy while maintaining this herd near the population objective.

2) **Objective Review:** No objective review is scheduled for 2024.

3) **Population Modeling:** The model for this herd represents a fair depiction of recent population trends. There have been five independent line-transect surveys completed in this herd. The most recent line-transect survey for the herd was conducted in 2022, resulting in an end-of-bioyear abundance estimate of 17,449 (CI=14,142-20,756) pronghorn. The 2023 postseason population estimate for this herd unit from the Integrated Population Model (IPM) was approximately 11,130 (CI=9,130-12,561) pronghorn. There is a sharp divergence between the most recent line-transect estimate and the IPM model. Managers believe the 2022 line-transect estimate may be over estimating abundance, which is likely why the IPM is unable to simulate through the 2022 line transect estimate. Finally, the model shows a modest population increase beginning in 2020, then slightly dropping in 2023. However, the pace of growth simulated by the model may be slightly higher than what is actually occurring.

2019 - 2023 Preseason Classification Summary

for Pronghorn Herd PR745 - RATTLESNAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	0	172	490	662	31%	988	46%	511	24%	2,161	2,263	17	50	67	± 5	52	± 4	31
2020	0	103	325	428	31%	622	45%	336	24%	1,386	1,995	17	52	69	± 7	54	± 6	32
2021	0	99	284	383	28%	561	42%	407	30%	1,351	2,355	18	51	68	± 7	73	± 7	43
2022	13,919	98	244	342	25%	614	45%	396	29%	1,352	2,398	16	40	56	± 6	64	± 6	41
2023	12,244	119	267	386	27%	740	51%	316	22%	1,442	0	16	36	52	± 5	43	± 4	28

2023 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2023 - 5/31/2024

HERD: PR746 - NORTH NATRONA

HUNT AREAS: 73

PREPARED BY: BRANDON WERNER

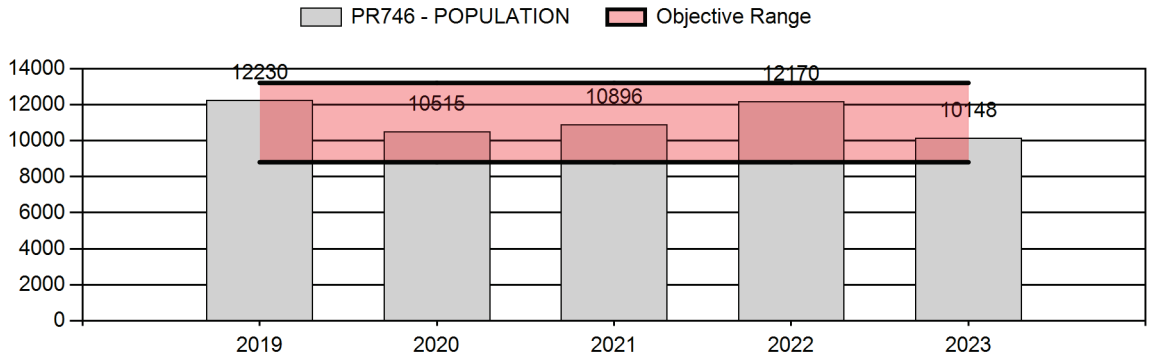
	2018 - 2022 Average	2023	2024 Proposed
Population:	11,563	10,148	10,986
Harvest:	1,559	358	359
Hunters:	1,736	494	385
Hunter Success:	90%	72%	93%
Active Licenses:	1,797	506	385
Active License Success:	87%	71%	93%
Recreation Days:	5,522	1,367	1,000
Days Per Animal:	3.5	3.8	2.8
Males per 100 Females	61	38	
Juveniles per 100 Females	64	57	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-7.7%
Number of years population has been + or - objective in recent trend:	1
Model Date:	02/08/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	.03%	.04%
Males ≥ 1 year old:	16%	16%
Proposed change in post-season population:	.97%	1.08%

Population Size - Postseason



2024 HUNTING SEASONS
NORTH NATRONA PRONGHORN HERD (PR746)

Hunt Area	Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
73	1	Aug. 15	Sep. 14	Sep. 15	Oct. 31	400	Any antelope
	7			Aug.15	Oct. 31	25	Doe or fawn valid east of the Bucknum Road (Natrona County Road 125) and south of the Burlington Northern Santa Fe railroad right-of-way

2023 Hunter Satisfaction: 70% Satisfied, 18% Neutral, 12% Dissatisfied

2024 Management Summary:

1) **Hunting Season Evaluation:** The model for this herd depicts substantial growth from 2014-2018, when harvest pressure was low and fawn production/survival were exceptional. Harvest pressure had since increased significantly, reducing this population incrementally each year. Both trends and population estimates seem to be well represented by the model for this herd. Severe winters in both 2018-2019 and 2019-2020 resulted in higher mortality rates. In addition, drought was present in this herd during 2020 and 2021, resulting in poor habitat conditions. Classification survey totals have subsequently yielded lower numbers of pronghorn, with significantly lower observed fawn ratios. Low rates of production combined with higher rates of harvest have caused population decline in the last six years. In response, license issuance has been reduced dramatically. The winter of 2022-2023 was very harsh, which led managers to be even more conservative for the 2023 season by eliminating all Type 6 licenses. This herd dipped below the population objective in 2023 while buck ratios dropped to the bottom end of the recreational management threshold. As a result, buck harvest opportunity was reduced to increase buck ratios. However, climatic conditions throughout 2023 were optimal for pronghorn survival with excellent precipitation coupled with mild temperatures.

   A three-year (2021-2023) analysis indicated the mean percentage for harvested males ≥ 1 year old was 16% of the preseason buck population. While this is below the management goal of 25%, hunter success has been steadily dropping. From 2014–2020 Type 1 license success averaged 90%. From 2021 – 2023 average success was 73% with success being 69% in 2023, an all-time low. This is a public land dominated herd unit and success should be much higher. The projected preseason harvest of males should be around 16% in the 2024 season.

The 2024 hunting season conservatively manages the North Natrona Pronghorn Herd to allow growth toward objective. Even though this herd is only 8% under objective, hunter satisfaction is low and managers are receiving many comments from concerned hunters about undesirable pronghorn numbers. Type 1 licenses were decreased by 200 to temper harvest while still managing within recreational standards. The extremely conservative license structure for 2024 should allow for population growth. The Type 7 license quota remained at 25 to control pronghorn densities on agricultural properties in the southeast portion of the herd unit. A total of 425 licenses were offered in 2024, a net reduction of 200.

2) **Management Objective Review:** An objective review is planned for 2024. This population is currently 9% under objective. When this herd is at objective, hunter satisfaction and success are still under desired levels. Managers believe the habitat can support more pronghorn. Sagebrush browse transects were completed in 2022 and 2024, which indicated light browsing by pronghorn is occurring. Field personnel are in the process of raising this population objective.

3) **Population Modeling:** Six line-transect surveys provide independent abundance estimates which help align trends and improve population estimates in the model. A line-transect was conducted in 2021, resulting in an end-of-bioyear abundance estimate of 9,543 pronghorn with a standard error of 1,284. Another line-transect was flown in 2023 with an end-of-bioyear population estimate of 13,368 (CI=11,135-16,161) (Appendix A). Managers believe this number is either an overestimate, or some pronghorn being counted in May/June migrate into other hunt areas in the southern Bighorn Mountains to summer range and are thus unavailable during fall hunting seasons. The bio-year 2023 postseason population estimate for this herd unit was 10,148 (CI=8,932-11,363) pronghorn using the PopR Integrated Population Model. The model shows a substantial population decline from 2018-2021, then stabilizing to 2023. Managers believe this to be accurate based on low fawn production/survival, harvest success, and an obvious continued decline in pronghorn densities. The model did well with incorporating the harsh winter of 2022-2023. While managers predict this population will begin to grow as simulated by the model, actual growth may not be realized for a year or more.

4) **Additional Surveys:** In 2019, this herd became part of a harvest study conducted by WGFD and the University of Wyoming Cooperative Fish and Wildlife Research Unit. Goals of the project were to quantify average pronghorn horn size relative to changes in buck ratios, buck age structure, population size, and environmental variables. This statewide research project was completed in 2023. Multiple publications from this research are pending or in press.

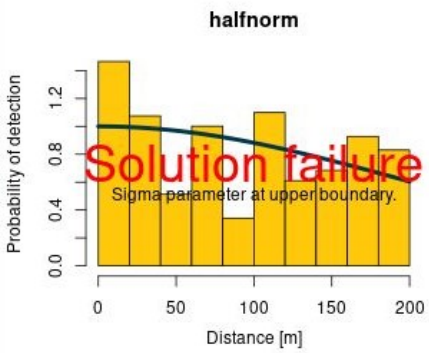
2019 - 2023 Preseason Classification Summary

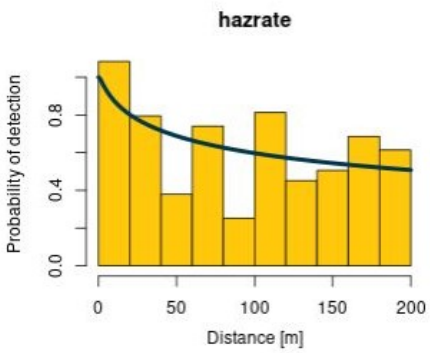
for Pronghorn Herd PR746 - NORTH NATRONA

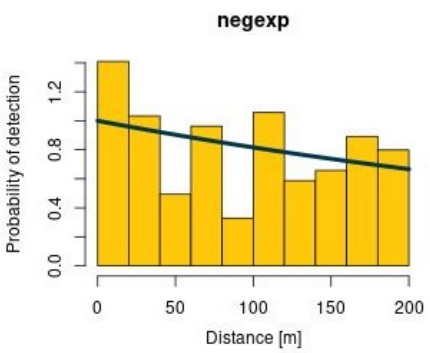
		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	0	118	418	536	27%	887	45%	553	28%	1,976	3,068	13	47	60	± 5	62	± 5	39
2020	0	120	341	461	33%	590	43%	335	24%	1,386	2,017	20	58	78	± 8	57	± 6	32
2021	0	55	178	233	25%	429	47%	256	28%	918	1,961	13	41	54	± 7	60	± 7	39
2022	13,341	47	120	167	25%	266	40%	224	34%	657	2,640	18	45	63	± 10	84	± 12	52
2023	10,911	38	96	134	19%	355	51%	201	29%	690	0	11	27	38	± 6	57	± 8	41

Appendix A. Line Transect Results

Detection Function Comparison







	Function	AICc
1	hazrate	3704.99
2	negexp	3706.05
3	halfnorm	3710.69

Results

Detection Function	Abundance	Abundance 95% CI	Abundance SE	Density (mi^2)	Density 95% CI	Prob. of Detection	Prob. of Detection 95% CI
hazrate	13,648	11,362 - 16,371	1,282	9.62	8.63 - 12.56	0.63	0.57 - 0.73

2023 PR746 - NORTH NATRONA Pronghorn Line-Transect Summary

Survey Dates:	5/19/2024 - 5/20/2024
Survey Cost:	$ 5,117.00
Flight Service:	LAIRD FLYING SERVICE
Aircraft:	HUSKY
Observers:	Werner, Carlisle

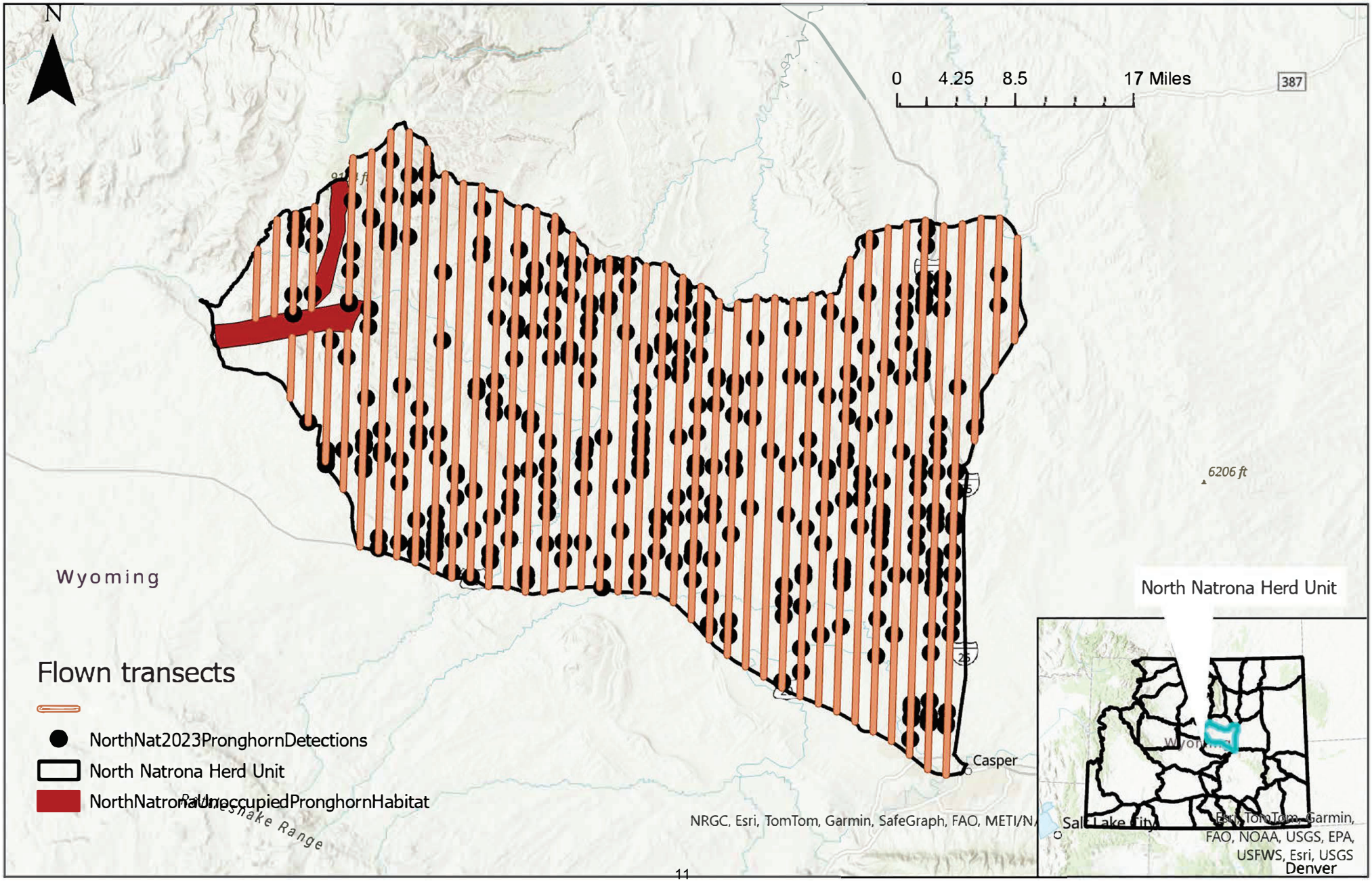
Weather Conditions:

Temperature (Degrees Fahrenheit):	60
Cloud Cover (%):	15
Wind Speed (MPH):	0 - 10

Transect Limits:	0 to 0
Transect Direction:	North/South
Transect Interval (Minutes of Longitude):	0
Transect Length: (Mi.):	1
Transect Altitude (AGL):	305 ft.

Occupied Habitat (mi^2):	1,418
Density Estimate (Animals/mi^2 with Confidence Intervals):	9.62 (8.63 - 12.56)
Population Estimate (with Confidence Intervals):	13,648 (11,362 - 16,371)

2023 North Natrona Line Transect



2023 - JCR Evaluation Form

SPECIES: Pronghorn

PERIOD: 6/1/2023 - 5/31/2024

HERD: PR748 - NORTH CONVERSE

HUNT AREAS: 25-26

PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Population:	23,382	21,571	22,099
Harvest:	2,151	1,290	1,290
Hunters:	2,352	1,430	1,425
Hunter Success:	91%	90%	91%
Active Licenses:	2,450	1,547	1,500
Active License Success:	88%	83%	86%
Recreation Days:	6,652	4,064	4,000
Days Per Animal:	3.1	3.2	3.1
Males per 100 Females	61	63	
Juveniles per 100 Females	70	75	

Population Objective (± 20%) : 28000 (22400 - 33600)

Management Strategy: Recreational

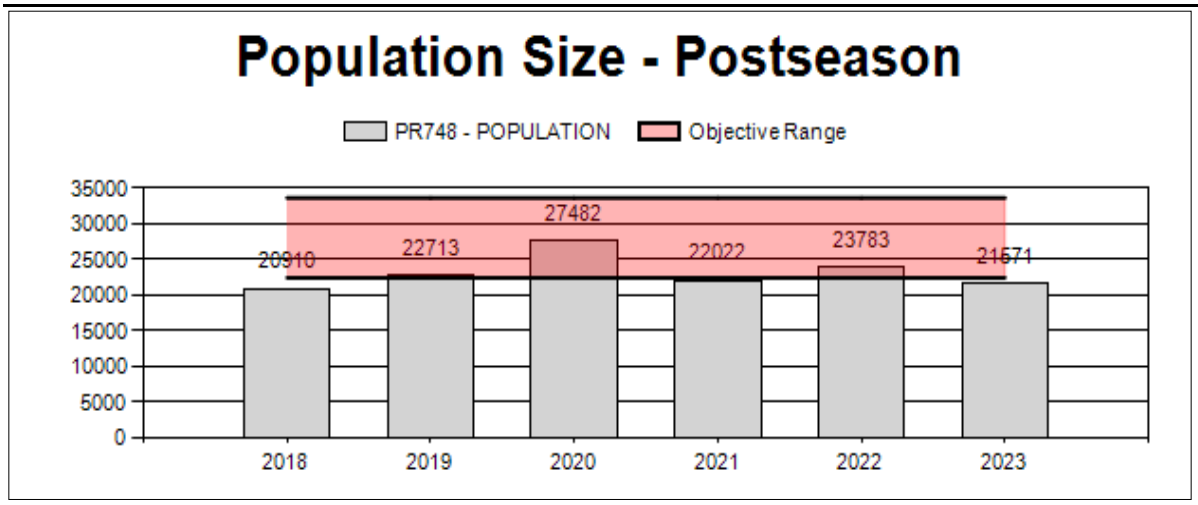
Percent population is above (+) or below (-) objective: -23.0%

Number of years population has been + or - objective in recent trend: 13

Model Date: 02/23/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	3.0%	3.0%
Males ≥ 1 year old:	18.0%	19.0%
Proposed change in post-season population:	5.0%	2.0%



2024 Hunting Seasons
North Converse Pronghorn Herd Unit (PR748)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
25	1	Aug. 15	Sep. 30	Oct. 1	Oct. 14	550	Any antelope
26	1	Aug. 15	Sep. 23	Sep. 24	Oct. 14	1000	Any antelope
26	6	Aug. 15	Sep. 23	Sep. 24	Oct. 14	50	Doe or fawn

2023 Hunter Satisfaction: 82% Satisfied, 13% Neutral, 5% Dissatisfied

2024 Management Summary

1) Hunting Season Evaluation: Pronghorn numbers have fluctuated over the past few years but remain well below objective. Extreme amounts of 2022-2023 winter, spring, and summer moisture alleviated the previous year's drought conditions. However, 2022-2023 winter mortality was higher than normal. This herd unit has a large amount of private land with limited access to public land. There are some small parcels of public land available, although they quickly become saturated with hunters. This population trended upward from 2013-2018, however drought conditions, lower fawn ratios, a widespread EHD outbreak in 2021, and above normal winter mortality in 2022/23 caused this population to decrease over the last few years. In addition, the increase in energy development, disturbance, and declining habitat throughout the herd unit in recent years may decrease the overall carrying capacity of this population over the long term. Preseason classification surveys showed increased fawn and yearling survival in 2023.

Area 25 – Type 1 licenses were increased by 50 for 2024. Although the population has not fully rebounded, hunter success has stayed consistent and buck ratios are still high. Area 26 – Type 6 licenses were decreased by 100 as license success rates were poor, and hunters generally had a harder time harvesting doe/fawn antelope. Area 26 – Type 1 licenses were also reduced by 100. The 3-year average buck harvest for this herd unit is 19% of the model-based preseason population of >1 yr. old males. Type 1 license issuance was not increased in 2024 to meet the goal of 25% harvest of preseason bucks. While hunter success, satisfaction, and preseason buck ratios were high, managers felt the lower antelope population numbers relative to the limited public access would cause a significant decrease in success and satisfaction if license issuance was increased. Based on landowner concerns with antelope numbers, personnel observations in the field during the season, and a population estimate falling further below objective, managers felt a decrease in Type 1 licenses was warranted.

In 2023, horn length measurements (N=119) were collected from harvested adult male pronghorn, with average horn length being 10.7 inches. A total of 8.4% of bucks were $\geq$ 13 inches. Managers can use these measurements to evaluate horn growth trends over time as this dataset grows.

2) Population Modeling: In 2021, WGFD managers began using PopR Integrated Population Models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2023 postseason population estimate for this herd unit from the PopR IPM was approximately 21,600 (CL = 19721-23894) pronghorn.

A line transect survey was flown for this herd unit in June 2022. This provided an abundance estimate of approximately 30,000 pronghorn (CL = 22,983-37,131). As with past LT's flown in this herd unit, the estimated abundance exceeded modeled population estimates. Managers feel the modeled population estimate is more in line with reality and that the LT is likely over-estimating this population.

Finally, the IPM may not have yet detected the decline in antelope the past couple of years. Rather, it is simulating a population increase beginning in 2024 and projected to continue throughout 2025. This is likely due to reduced doe harvest coupled with improved observed fawn ratios during 2022 and 2023 preseason classifications (Table 1). Despite model projections going forward, the recent short term decrease not detected by the model is real, hence the reduced harvest opportunity and conservative season being prescribed for the 2024 hunting season. This should start this population moving back toward objective.

Table 1.

2018 - 2023 Preseason Classification Summary

for Pronghorn Herd PR748 - NORTH CONVERSE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	23,662	189	336	525	23%	968	43%	748	33%	2,241	2,980	20	35	54	± 5	77	± 6	50
2019	25,619	147	448	595	27%	967	44%	619	28%	2,181	3,152	15	46	62	± 5	64	± 5	40
2020	30,086	144	348	492	29%	725	43%	477	28%	1,694	2,954	20	48	68	± 6	66	± 6	39
2021	20,247	140	300	440	27%	726	44%	475	29%	1,641	2,406	19	41	61	± 6	65	± 6	41
2022	27,079	182	318	500	26%	785	41%	612	32%	1,897	2,344	23	41	64	± 6	78	± 7	48
2023	25,480	155	236	391	27%	616	42%	462	31%	1,469	2,716	25	38	63	± 7	75	± 7	46

2023 - JCR Evaluation Form

SPECIES: Pronghorn
PERIOD: 6/1/2023 - 5/31/2024

HERD: PR750 - BLACK THUNDER

HUNT AREAS: 4-9, 24, 27, 29
PREPARED BY: JOE SANDRINI

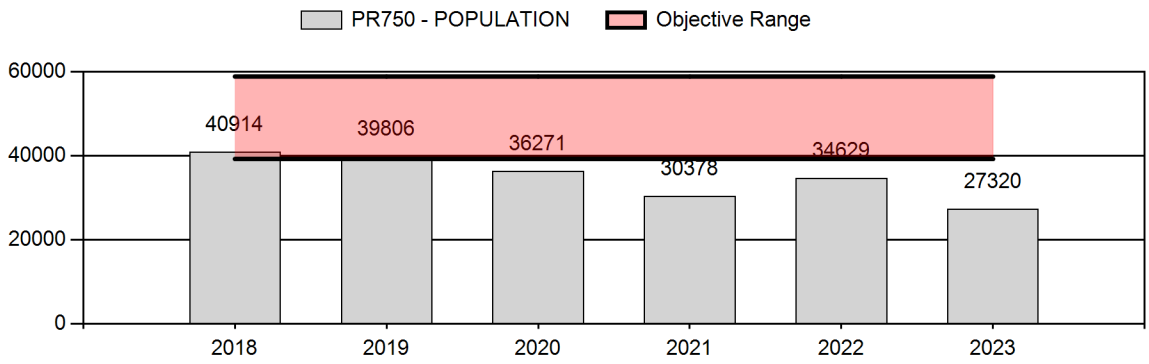
	2018 - 2022 Average	2023	2024 Proposed
Population:	36,400	27,320	26,155
Harvest:	3,415	1,647	1,956
Hunters:	3,774	1,755	2,175
Hunter Success:	90%	94%	90%
Active Licenses:	4,110	1,837	2,275
Active License Success:	83%	90%	86%
Recreation Days:	11,850	5,004	6,000
Days Per Animal:	3.5	3.0	3.1
Males per 100 Females	44	43	
Juveniles per 100 Females	62	69	

Population Objective (± 20%) :	49000 (39200 - 58800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-44.2%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/09/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	2.0%	3.0%
Males ≥ 1 year old:	24%	23%
Proposed change in post-season population:	1.0%	-0.04%

Population Size - Postseason[1]



1. *Population estimates are historic through 2022 and do not reflect currently modeled population. Modeling methodology was changed in 2021.*

2024 Hunting Seasons
Black Thunder Pronghorn (PR750)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
4	1	Aug. 15	Sep. 30	Oct. 1	Nov. 20	100	Any antelope
5	1	Aug. 15	Sep. 30	Oct. 1	Nov. 20	25	Any antelope
6	1	Aug. 15	Sep. 30	Oct. 1	Oct. 15	150	Any antelope; also valid on private land in that portion of Area 8 in Weston County
7	1	Aug. 15	Sep. 30	Oct. 1	Oct. 15	325	Any antelope
8	1	Aug. 15	Sep. 30	Oct. 1	Oct. 15	225	Any antelope
9	1	Aug. 15	Sep. 30	Oct. 1	Oct. 31	300	Any antelope; also valid in that portion of Area 11 in Converse or Niobrara counties
24	1	Aug. 15	Sep. 30	Oct. 1	Oct. 20	200	Any antelope
24	2	Aug. 15	Sep. 30	Oct. 1	Oct. 20	375	Any antelope valid on private land
24	6	Aug. 15	Sep. 30	Oct. 1	Oct. 20	25	Doe or fawn
24	7	Aug. 15	Sep. 30	Oct. 1	Oct. 20	25	Doe or fawn valid on private land
27	1	Aug. 15	Sep. 30	Oct. 1	Oct. 15	125	Any antelope
29	1	Aug. 15	Sep. 30	Oct. 1	Oct. 15	75	Any antelope
29	2	Aug. 15	Sep. 30	Oct. 1	Oct. 31	300	Any antelope valid on private land
29	7	Aug. 15	Sep. 30	Oct. 1	Oct. 31	50	Doe or fawn valid on private land

2023 Hunter Satisfaction: 86.8% Satisfied 8.2% Neutral 5.0% Dissatisfied

2024 Management Summary

1) **Hunting Season Evaluation:** After a low point in 2012, this herd grew steadily through 2018, and then declined substantially into 2022, before beginning to recover in 2023. The recent decline was due to persistent, low recruitment; increased mortality of all age classes during the 2018-19 winter; increased spring mortality in 2019 and 2020; continued drought since the spring of 2020; and losses to Blue Tongue Virus (BTV) and Epizootic Hemorrhagic Disease

Virus (EHDV) in 2021 and 2022. To address the decline, harvest was reduced 20% in 2020, another 33% in 2021, and 20% more in both 2022 and 2023. Harvest reductions resulted in active license success and effort remaining stable during the population decline, with success averaging 83% (std. dev. 0.7%) and effort 3.5 days per harvest (std. dev. 0.2 days). Hunting improved in 2023, with average success increasing to 93.9% and effort falling to 3.0 days/harvest. Consequently, hunter satisfaction increased and dissatisfaction dropped significantly in 2023.

To encourage continued population growth towards objective and provide hunter opportunity without compromising buck:doe ratios, 375 more any-antelope license have been issued for 2024. However, with or without this change, the population model projects the post-season population will decline slightly. Although, due to the wide confidence intervals of the 2023 post-season population estimate (19,800 – 32,500) and mild winter to date, local managers believe the population will actually increase 5% to 10% in 2024. With regard to buck numbers, the model cannot account for the observed 2022 preseason buck:doe ratio of 34:100 (see Appendix 1 and discussion below), but instead simulates a value of 43:100. A model run through 2024 slightly inflates the 2023 observed buck:doe ratio, but running it through 2025 inflates the 2023 ratio even more. This is a result of using predicted future data rather than observed data, and suggests the take of bucks in 2024 will be higher than the 23% estimated by the model. The current model indicates 23% of the adult male population has been harvested annually each of the past three years. However, for the reasons stated above, the actual harvest has likely exceeded this.

2) **Management Objective Review:** The management objective of this herd is a post-season population of 49,000 pronghorn hunted under the recreational management strategy. The population objective and its management strategy were adopted in 2014 when this herd was created by combining the Cheyenne River (PR740) and Highlight (PR316) pronghorn herd units. The management objective and strategy were then reviewed and renewed in 2019. After an internal review, the Department has decided to continue with the current objective and management strategy because the herd is now 44% below objective, but has the potential to increase to objective. It is anticipated, given favorable environmental conditions, that this herd will reach objective before 2028, and the objective can be more critically reviewed at that time in light of the revised estimates produced by the Integrated Population Model.

3) **Population Modeling:** In 2021, WGFD managers began using Integrated Population Models (IPM) to estimate pronghorn populations. In 2022, the (RTV-ASC-JSTV) IPM postseason population estimate for this herd was approximately 34,600 pronghorn (95% CI ~ 31,000 – 37,800). The best performing model this year, which is of similar construct, revised the 2022 post-season estimate downward to approximately 26,600 (CL ~ 24,500 - 28,400) and yielded a 2023 post-season estimate of about 27,300 (CL ~ 24,900 – 29,700). As such, the IPM is now modeling this herd more closely to the former spreadsheet model. However, there are several data points that make modeling this population difficult. First, reconciling the relatively high 2014 & 2016 Line Transect (LT) estimates given the low 2019 and 2021 LT results is problematic. In addition, the model does not align well with the fluctuations in observed buck:doe ratios since 2020 given reported harvest. Despite these concerns, the population trend produced by the current model comports well with observed herd performance and harvest statistics since 2016. Although, local managers feel the population peak the model indicates in 2018 was probably neither that high, nor the 2022 nadir that low.

4) **Concerns with this population:** There has been a general decline in observed fawn:doe ratios over the past 30^{+} years in this herd, which will likely continue with reductions in habitat quality and quantity due to aging sagebrush stands, increased invasive grass cover, and conversion of pronghorn habitat by energy development. We also suspect recruitment and survival of adults may continue to decline due to increased losses to disease if drier and warmer weather patterns persist.

Appendix 1

2018 - 2023 Preseason Classification Summary

Pronghorn Herd PR750 - BLACK THUNDER

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	45,886	413	908	1,321	23%	2,766	49%	1,613	28%	5,700	1,957	15	33	48	± 2	58	± 3	39
2019	44,809	262	817	1,079	23%	2,191	47%	1,374	30%	4,644	2,238	12	37	49	± 3	63	± 3	42
2020	40,266	204	657	861	21%	2,025	49%	1,235	30%	4,121	2,781	10	32	43	± 3	61	± 3	43
2021	34,181	239	633	872	22%	1,944	48%	1,233	30%	4,049	2,165	12	33	45	± 3	63	± 4	44
2022	42,177	174	490	664	17%	1,936	49%	1,325	34%	3,925	2,358	9	25	34	± 2	68	± 4	51
2023	30,590	312	755	1,067	20%	2,459	47%	1,703	33%	5,229	2,087	13	31	43	± 2	69	± 3	48

2023 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2023 - 5/31/2024

HERD: MD740 - CHEYENNE RIVER

HUNT AREAS: 7-14, 21
PREPARED BY: JOE SANDRINI

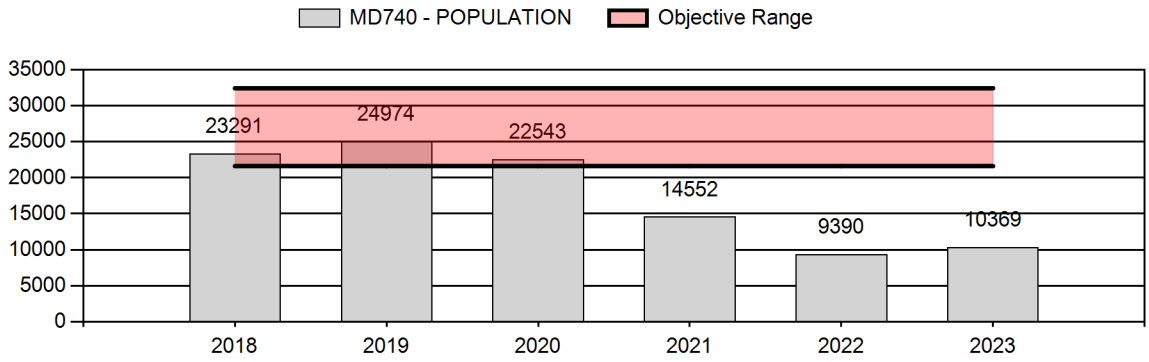
	2018 - 2022 Average	2023	2024 Proposed
Population:	18,950	10,369	10,360
Harvest:	1,188	711	620
Hunters:	2,154	1,604	1,400
Hunter Success:	55%	44%	44 %
Active Licenses:	2,189	1,604	1,400
Active License Success:	54%	44%	44 %
Recreation Days:	8,889	7,054	6,250
Days Per Animal:	7.5	9.9	10.1
Males per 100 Females	35	31	
Juveniles per 100 Females	57	65	

Population Objective (± 20%) :	27000 (21600 - 32400)
Management Strategy:	Private Land
Percent population is above (+) or below (-) objective:	-61.6%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/16/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	1.0%	1.0%
Males ≥ 1 year old:	32%	32%
Proposed change in post-season population:	-1.6%	+3.7%

Population Size - Postseason[1]



1. Population estimates are historic through 2022 and do not reflect currently modeled population estimates for those years. Modeling technique was changed in 2021

2024 Hunting Seasons
Cheyenne River Mule Deer (MD740)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
7	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
8	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
9	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
10	1	Sep. 1	Sep. 30	Oct. 1	Oct. 21	75	Antlered mule deer or any white-tailed deer
11	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
12	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
13	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
14	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
21	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer

2024 Region B Nonresident Quota: 800 licenses

2023 Hunter Satisfaction: 53% Satisfied 26% Neutral 21% Dissatisfied

2024 Management Summary

1) **Hunting Season Evaluation:** With excellent productivity and survival in 2014 and 2015, this herd experienced noteworthy growth following a low point in 2012. However, between 2016 and 2022 productivity and survival generally declined, and Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus (BTV) outbreaks increased adult mortality in 2021 and 2022. The 2022-23 winter was fairly severe in the southern half of the herd unit as well. Consequently, this mule deer population has dropped since 2019. Buck:doe ratios also waned during the first years of the current population decline as harvest remained fairly consistent. Hunting seasons then became more conservative each year beginning in 2021. With reductions in harvest, the buck:doe ratio has begun to increase, and it was anticipated the herd would grow slightly in 2023. However, due to the relatively severe 2022-23 winter in the southern half of the herd unit and a 2023 post-season fawn:doe ratio of 65 per 100 does, it is projected the post-season population actually dropped 2% in 2023. Therefore, Region B and HA 10, Type 1 license quotas were cut 20% and 25%, respectively. This was done to continue to foster herd growth and move the post-season buck:doe ratio towards its historical mean (Appendix 1). See Appendix 2 for

Hunt Area 10 specific data. With this season structure in place, the Integrated Population Model (IPM) indicates 32% of the adult bucks will be harvested in 2024, which is identical to the estimated figure for the past 3-years.

2) **Management Objective Review:** The management objective of this herd is for a post-season population of 27,000 mule deer managed under the private land management strategy. The population objective and its management strategy were adopted in 2014 and then reviewed and renewed in 2019. After an internal review, the Department decided to continue with the current objective and management strategy. This due to the fact that the change from spreadsheet modeling to Integrated Population Modeling significantly lowered population estimates for this herd, but this also occurred during a time of what appears to have been a substantial population decline of unknown magnitude. As such, the population is now estimated to be about 40% below objective, but it has the potential to increase with more favorable environmental conditions. Therefore, the objective will be reviewed again in 2028 relative to herd performance data and estimates produced by the IPM in the interim.

3) **Chronic Wasting Disease (CWD) Management:** This is a Tier 1 surveillance herd, and was last prioritized for CWD sampling in 2020. Details concerning the most current prevalence data were reported in the 2021 JCR. To date, no CWD management actions have occurred in this herd unit. Over the past three years, just 50 adult buck mule deer have been tested for CWD, with about 8% testing positive. However, valid prevalence values cannot be calculated due to the small sample size.

4) **Population Modeling:** In 2021, WGFD managers began using Integrated Population Models (IPM) to estimate this mule deer population in addition to the spreadsheet system. That year, both models produced fairly similar post-season population estimates. In 2022, the (RTV-ASC-JSTV) IPM relied on license numbers as the effort variable, and produced a postseason population estimate of about 9,400 mule deer (CL ~ 8,300 – 10,400). The same IPM structure was used again in 2023. The 2023 model revised the 2022 post-season population estimate upwards 12% to ~10,500 (CL ~ 9,300 – 11,800), and yielded a 2023 post-season population estimate of ~10,400 mule deer (CL ~ 8,900 – 11,850). This comports well with field personnel's perceptions that mule deer numbers dropped in the southern half of the herd unit, but remained steady or improved some in the northern half over the past year. Given these perceptions, harvest statistics and input from landowners, the 2023 IPM's post-season population estimate and trend are deemed reasonable.

Appendix 1

2018 - 2023 Postseason Classification Summary

for Mule Deer Herd MD740 - CHEYENNE RIVER

		MALES							FEMALES		JUV.				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	23,291	132	399	114	8	0	653	20%	1,669	51%	970	29%	3,292	1,133	8	31	39	± 2	58	± 3	42
2019	24,974	110	172	75	6	5	368	18%	991	47%	731	35%	2,090	1,400	11	26	37	± 3	74	± 4	54
2020	22,543	121	219	92	9	0	441	22%	1,127	55%	465	23%	2,033	1,416	11	28	39	± 3	41	± 3	30
2021	14,552	80	114	31	1	0	226	15%	838	55%	453	30%	1,517	926	10	17	27	± 2	54	± 4	43
2022	9,390	120	182	73	4	0	379	15%	1,359	53%	807	32%	2,545	1,046	9	19	28	± 2	59	± 3	46
2023	10,369	136	143	52	12	0	343	16%	1,122	51%	730	33%	2,195	1,219	12	18	31	± 2	65	± 4	50

Appendix 2

Mule Deer Hunt Area 10

Post-Season Buck:Doe Ratios and Antler Classification Data
&
Tooth Age and Antler Data from Harvested Mule Deer

Year	Post Season Buck : Doe Ratio	Post-Season Buck Classification Percentages				Harvested Bucks			
		Ylg.	CLS 1	CLS 2	CLS 3	Median Age	Mean Antler Spread	Median Pts. Left	Median Pts. Right
2017	41 : 100	32%	54%	13%	1%	4.5	20.0	4	4
2018	134 : 100	7%	69%	22%	2%	4.5	19.9	4	4
2019	44 : 100	9%	43%	47%	0%	4.5	19.8	4	4
2020	59 : 100	15%	44%	30%	11%	5.5	19.1	4	4
2021	31 : 100	22%	56%	22%	0%	5.5	19.1	4	4
2022	34 : 100	20%	53%	28%	0%	6.5	18.4	5	4
2023	37 : 100	31%	42%	23%	4%	5.5	21.0	4	4

2023 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2023 - 5/31/2024

HERD: MD751 - BLACK HILLS

HUNT AREAS: 1-6
PREPARED BY: JOE SANDRINI

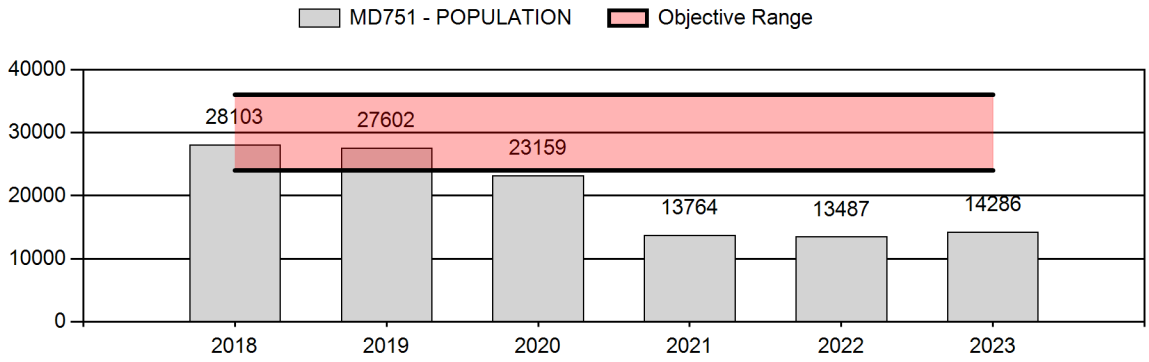
	2018 - 2022 Average	2023	2024 Proposed
Population:	21,223	14,286	14,360
Harvest:	1,908	995	1,050
Hunters:	5,009	2,955	3,000
Hunter Success:	38%	34%	35%
Active Licenses:	5,187	2,955	3,000
Active License Success:	37%	34%	35%
Recreation Days:	15,920	8,489	9,125
Days Per Animal:	8.3	8.5	8.7
Males per 100 Females	21	20	
Juveniles per 100 Females	60	72	

Population Objective (± 20%) :	30000 (24000 - 36000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-52.4%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/13/2024

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:	43%	44%
Proposed change in post-season population:	8.3%	+0.5%

Population Size - Postseason[1]



1. Population estimates are historic through 2022 and do not reflect currently modeled population. Modeling methodology changed in 2021.

2024 Hunting Seasons
Black Hills Mule Deer (MD751)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
2	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
3	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
4	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer; the lands of the State of Wyoming's Ranch A property shall be closed
5	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
6	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer

2024 Region A Nonresident Quota: 2,000 licenses

2023 Hunter Satisfaction: 51% Satisfied 25% Neutral 24% Dissatisfied

2024 Management Summary

1) **Hunting Season Evaluation:** This herd exhibits regular population cycles. Following a low in 2012, it rebounded due to excellent productivity and survival, most notably in 2014 and 2015. It then peaked in 2016. Over same period, post-season buck:doe ratios climbed above historic values. Between 2016 and 2022, the population declined substantially due to low recruitment, increased over-winter mortality in bio-year 2018, low fawn numbers between 2020 and 2022 (mean of 53 fawns:100 does post-season), and losses to Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus (BTV) in 2021 and 2022. Because hunting seasons remained fairly consistent as the population initially dropped, post-season buck:doe ratios returned to long-term values (23 bucks per 100 does) between 2018 and 2020. In response to the declining population and buck:doe ratio, more conservative hunting seasons were implemented each year between 2020 and 2023. Even with a conservative hunting season in place, the post-season buck:doe ratio dropped to 16:100 in 2022, a level not seen in 10 years. In 2023, the most restrictive hunting season in many years was implemented, with no doe mule deer hunting, and a 17-day General License season that allowed only buck deer to be taken. In 2023, the post-season fawn:doe ratio increased to 72 fawns per 100 does, the post-season the buck:doe ratio climbed to 20 bucks per 100 does (Appendix 1), the estimated, post-season population increased 8%, and the preseason trend count was up 20%. Consequently, area managers believe leaving license issuance and limitations unchanged will sustain the November 1-20 hunting season set for 2024, which is something a recent survey of landowners, outfitters, and hunters revealed is most widely supported. The 2024 hunting season should harvest 44% of the adult male deer,

which is identical to the previous 3-year average.

2) **Chronic Wasting Disease (CWD):** Prior to the 2021 hunting season, about 1,100 mule deer from the Black Hills had been tested for CWD. The vast majority of those were hunter-harvested, of which less than 1% were found to have the disease. However, the relative number of deer testing positive each year generally increased. In 2021, this herd was prioritized as a Tier 1 surveillance herd. Over the past three-years, 160 mature buck mule deer (along with 25 yearling bucks and 40 adult does) have been sampled and tested. These totals represent sample sizes too low to yield reliable prevalence rates and associated confidence intervals for any of the age and sex classes. However, prevalence estimates and sample sizes for CWD sampling since 2021 are presented below (Table1). In 2023, only 44 mature bucks were tested, which represented 4.5% of the reported buck mule deer harvest from the herd unit. To date, no CWD management actions have occurred in this herd unit. Although, managers should continue to monitor the "hot spots" in Hunt Area 3 and within the municipalities in the Black Hills as future management actions are considered.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males (CI = 95%, n)	Yearling Males	Adult Females
2021-2023	**6.9% (**unk**, n= 160)**	4.0% (25)	0.0% (40)

Table 1. 2021-2023 CWD prevalence in hunter-harvested mule deer from the Black Hills Mule Deer Herd.

In addition to hunter harvested deer tested for CWD, the City of Newcastle implemented for the first time a deer culling operation under a Chapter 56 permit, and harvested 28 mule deer within the City limits (7 juv. males, 3 juv. fem., 5 adult males, & 13 adult fem.). All of the deer taken were tested for CWD, and one of the 27 usable samples tested positive.

3) **Population Modeling:** In 2021, WGFD managers began using Integrated Population Models (IPM) to estimate mule deer populations. The 2023 (RTV-ASC-JSTV) IPM postseason population estimate for this herd unit was approximately 14,400 mule deer (95% CI ~ 13,000 – 15,900) using license number as the effort variable. The model's post-season population estimate is 23% above the abundance estimate garnered in late November, but well within its 95% confidence interval (11,589, CI = 7,613 – 15,564) (Appendix 2). However, that abundance estimate was thought to be low, due to poor sightability of deer in timbered habitat and relatively warm weather. Post-season population estimates produced by the model are 89% correlated with preseason trend counts. Consequently, local managers are quite comfortable with the estimates produced by the model.

Appendix 1

2018 - 2023 Postseason Classification Summary

Mule Deer Herd MD751 - BLACK HILLS

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	28,103	71	109	15	2	0	197	12%	884	53%	582	35%	1,663	1,297	8	14	22	± 2	66	± 4	54
2019	27,602	67	98	21	1	0	187	12%	822	51%	597	37%	1,606	1,508	8	15	23	± 2	73	± 5	59
2020	23,159	65	99	38	7	0	209	14%	884	58%	425	28%	1,518	1,462	7	16	24	± 2	48	± 4	39
2021	13,764	52	38	8	0	0	98	11%	497	57%	276	32%	871	942	10	9	20	± 3	56	± 5	46
2022	13,487	67	66	12	0	0	145	10%	869	58%	478	32%	1,492	905	8	9	17	± 2	55	± 4	47
2023	14,286	37	35	6	0	0	78	10%	392	52%	283	38%	753	1,409	9	10	20	± 3	72	± 7	60

Appendix 2

2023 MD 751 Black Hills Mule Deer
Aerial Classification Results

Dates: November 27 – 29, 2023

Surveyors: Joe Sandrini (all flights and HA's); Eric Newkirk (11/27 & 11/28, HA's 2,4,5,6); Nate Holst (11/28 & 11/29, HA's 1,3); Erika Peckham (11/29, HA 1)

Time: Surveys initiated about 0715 ea. morning, with mid-day break (1-2 hrs). Resumed about 1400 hrs. and ending approx. 1600 hrs.

Vendor / Helicopter: Helicopter Solutions, MT (Kent Potter) / Bell Jet Ranger

Cost: $27,778.75 (*See Appendix A for itemization of costs)*

Polygons Surveyed: 93 of 1,567 available (Appendix B): 30 of 151 high density (20%) and 63 of 1,266 low density (5%). No "unoccupied" (150 total) surveyed.

Survey Time: 23.3 Flight hours averaging 15 min per polygon (includes ferry between polygons, to fuel truck, and to and from hangar to observer pickup locations).

Weather: The weather all three days of the survey was relatively similar. Temp. 15 to 35 degrees F with clear to mostly sunny skies each day. Winds were predominately NNW 3 to 9 mph on 11/27 and 14-24 mph on 11/28 & 29. Snow cover varied from about 85% early on 11/27/23 in HA 6, to 50% or less in HA 5, and 25% or less in HA 4. Snow cover 11/28/23 was zero to 85% in HA 2 and zero to 25% in HA 3. On 11/29/23 virtually no snow cover was encountered in HA's 1 & 3.

Results: Of the 94 polygons flown, mule deer were observed in 52. *Note polygons - 2 were mostly over the water of Keyhole Reservoir.* Raw flight data available in Appendix C.
A total of 753 mule deer were observed as follow:

HA	N	Fawn : Doe	Ylg : Doe	Ad : Doe	Buck:Doe
1	245	74	11	14	25
2	116	76	7	14	20
3	138	97	9	3	12
4	103	59	8	7	15
5	61	53	6	11	17
6	90	59	12	12	24
DAU	**753**	**72**	**9**	**10**	**20**

Anecdotally, coyote numbers were significantly greater in HA's 4, 5, & 6 with about three to four times as many coyotes observed per hour of flight time.

Composition & Abundance Estimate Results (DAU):

Blacks Hill Mule Deer MD751

Bio-Year 2023-2024

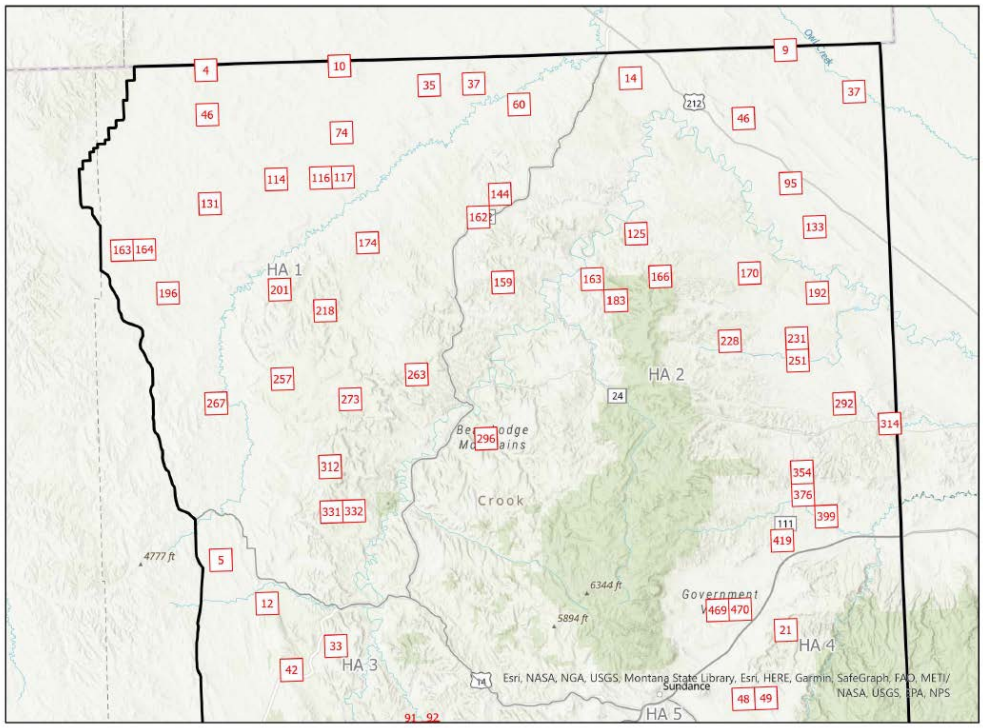
Demographic	Raw Count	Estimate	LCL	UCL
Total Deer	753	11,575	7,589	15,562
Does	392	6,045	3,966	8,124
Fawns	283	4,222	2,735	5,709
Ylg. Bucks	37	629	348	910
Class 1 Buck	35	555	273	838
Class 2 Buck	6	121	17	225
Class 3 Buck	0	0		
Total Bucks	78	1,310	735	1,884
Buck:Doe	0.199	0.217	0.206	0.227
Fawn:Doe	0.722	0.698	0.687	0.710

Appendix A: Aerial Survey Costs

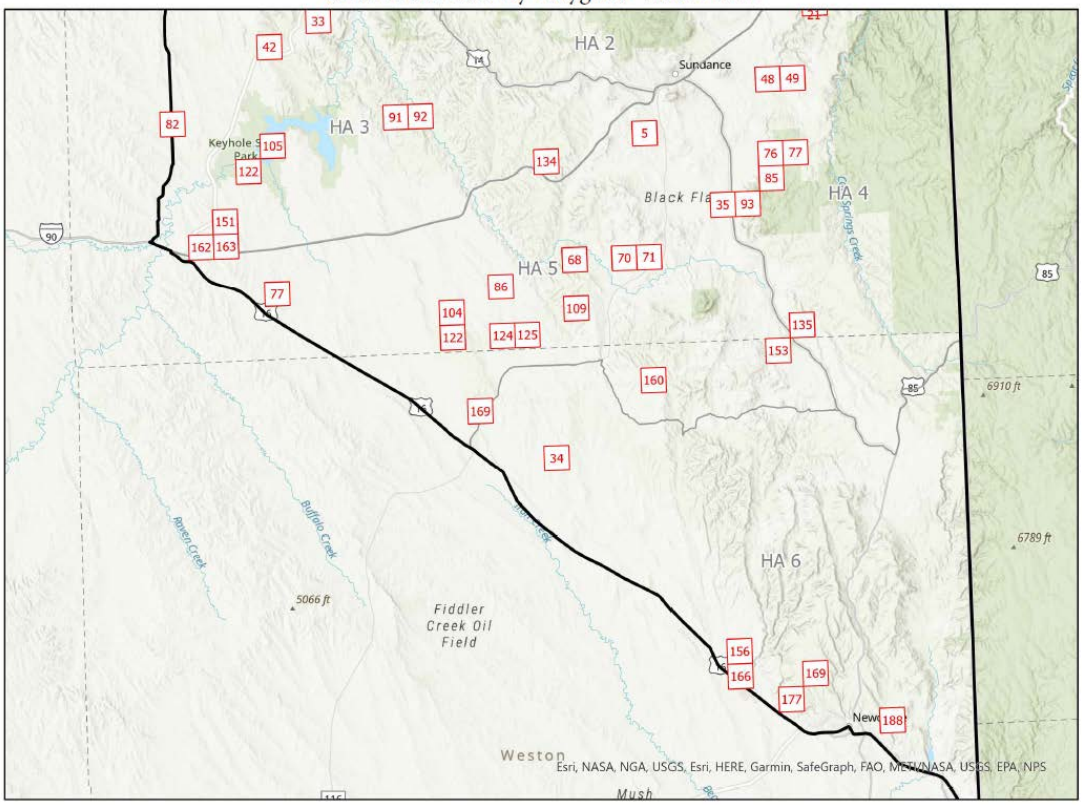
Item	Description	Quantity	Rate	Amount
Ferry Time	11/26/2023 Ferry Flight Newcastle	2.3	1,050.00	2,415.00
Per Diem	Pilot & Driver	2	225.00	450.00
Hanger Nightly Exp	Hangar for Helicopter	1	50.00	50.00
Fuel Truck	Fuel Truck Miles	337	2.25	758.25
Helicopter Survey	11/27/2023 Survey Flight	6.63	1,050.00	6,961.50
Per Diem	Pilot & Driver	2	225.00	450.00
Hanger Nightly Exp	Hangar for Helicopter	1	50.00	50.00
Fuel Truck	Fuel Truck Miles	134	2.25	301.50
Helicopter Services	11/28/2023 Survey Flight	7.3	1,050.00	7,665.00
Per Diem	Pilot & Driver	2	225.00	450.00
Fuel Truck	Fuel Truck Miles	255	2.25	573.75
Hanger Nightly Exp	None	0		0.00
Helicopter Survey	11/29/2023 Survey Flight	6.4	1,050.00	6,720.00
Hanger Nightly Exp	None	0	0.00	0.00
Per Diem	Pilot & Driver	2	225.00	450.00
Fuel Truck	Fuel Truck Miles	215	2.25	483.75

Appendix B: Surveyed Polygons

MD751 2023 Survey Polygons - North Half



MD751 2023 Survey Polygons - South Half



2023 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2023 - 5/31/2024

HERD: MD755 - NORTH CONVERSE

HUNT AREAS: 22

PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Population:	6,554	3,934	3,934
Harvest:	281	235	275
Hunters:	392	353	375
Hunter Success:	72%	67%	73%
Active Licenses:	392	353	375
Active License Success:	72%	67%	73%
Recreation Days:	1,596	1,611	1,600
Days Per Animal:	5.7	6.9	5.8
Males per 100 Females	47	38	
Juveniles per 100 Females	59	52	

Population Objective (± 20%) : 9000 (7200 - 10800)

Management Strategy: Special

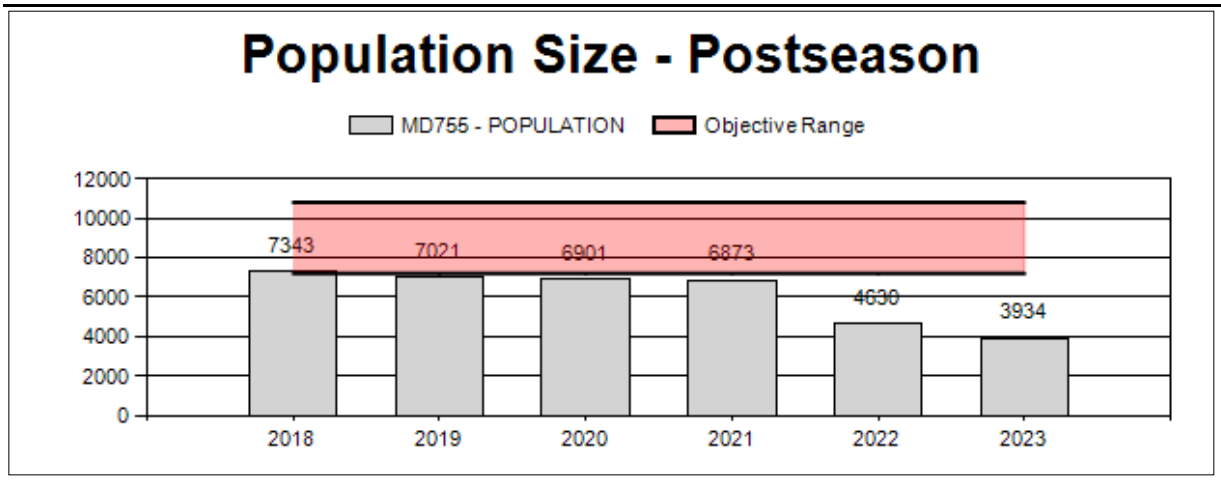
Percent population is above (+) or below (-) objective: -56.3%

Number of years population has been + or - objective in recent trend: 15

Model Date: 02/25/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	20%	22%
Proposed change in post-season population:	-3.0%	-4.0%



2024 Hunting Seasons
North Converse Mule Deer Herd Unit (MD755)

Hunt Area	License Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
22	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	150	Antlered mule deer or any white-tailed deer
22	2	Sep. 1	Sep. 30	Oct. 1	Oct. 14	250	Antlered mule deer or any white-tailed deer valid south and east of Wyoming Highway 95, 55 Ranch Road (Converse County Road 23), Sage Creek Divide/Blizzard Heights Road, and Ross Road (Converse County Road 31)

2023 Hunter Satisfaction: 58% Satisfied, 18% Neutral, 25% Dissatisfied

2024 Management Summary

1) Hunting Season Evaluation: The 2024 season structure will be conservative in an effort to promote population growth and maintain buck ratios within special management parameters. This hunt area is predominantly private land with much of the public land inaccessible to hunters or difficult to access. Public land mule deer hunting is very limited in this area. Many of the large landowners have concerns over mule deer populations and have limited the number of hunters they allow. License issuance is largely based on access to private lands and limited to prevent saturation of available public lands. In 2024, managers created a Type 2 license valid only in the eastern portion of Hunt Area 22 to better focus hunting pressure in areas of higher deer density and alleviate crowding on public lands.

The North Converse Mule Deer Herd experienced a dramatic reduction through 2011 likely caused by years of drought culminating in a harsh winter. The population showed a slight upward trend through 2018, but has remained below objective and declined from 2019 to present. Fawn production/survival has generally been poor over the past 5 years contributing to population decline and stagnation. Buck ratios have been consistently high in this herd and have averaged 39 bucks:100 does over the past three years which follows the Special Management strategy criteria (Table 1). This herd unit has been subjected to a very high level of energy development disturbance over the past decade. Impacts from this development on the long-term carrying capacity of mule deer habitats are unknown, but potentially significant.

Additional Management Data Collected In the North Converse Herd Unit Includes:

- In 2023, we collected antler spread measurements (n=46) from harvested adult male mule deer. Class II bucks represented only 11% of all bucks sampled, while Class I bucks represented the other 89%. Managers realize this is a small sample size and not statistically

relevant, however these data are valuable for tracking trends over time and help managers asses trophy quality.

Stratified random composition and abundance surveys have been used in this herd unit since 2021 (Appendix 1). This is a new survey method for this herd and is being improved each year with survey design and adjusting flight budgets. Buck ratios have varied and have been lower than previous years. This could be an artifact of random sampling and smaller sample sizes obtained compared to prior directed surveys.

2) Chronic Wasting Disease Management: The North Converse Herd Unit was selected as a Tier 3 priority surveillance area in 2023. A total of 39 hunter harvested adult buck mule deer were tested with 4 testing positive for CWD (Table 2). Managers sent letters to all license holders requesting CWD samples prior to the season. Because of the low number of samples received, this area will remain a priority surveillance area, and managers are implementing mandatory sampling for mule deer in Hunt Area 22 in 2024 (Appendix 2).

3) Population Modeling: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2023 postseason population estimate for this herd unit was 3,930 (CL = 2,943-5,015) mule deer. The post-season population estimate in 2021 was derived from the Spreadsheet model while the estimates for 2022 and 2023 were provided by the IPM. The IPM estimates are quite lower than the previous estimates. Abundance estimates derived from low precision comp/abundance surveys from 2021-2023 estimated higher numbers of deer than modeled, however they had very large confidence intervals. The modeled population does fall within those confidence intervals, albeit at the very low end. While the population estimate is lower than that of the previous Spreadsheet model, the IPM is showing a similar decreasing population trend. Based off field observations and landowner comments, managers believe the IPM estimate may be a better representation of actual numbers than the Spreadsheet model, but have concerns with it not matching abundance estimates. Managers plan to incorporate a sightability estimate in future years to better anchor the IPM.

Table 1.

2018 - 2023 Postseason Classification Summary

for Mule Deer Herd MD755 - NORTH CONVERSE

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	7,343	36	75	16	0	0	127	31%	159	39%	123	30%	409	1,825	23	57	80	± 12	77	± 12	43
2019	7,021	51	93	41	1	0	186	20%	460	51%	262	29%	908	1,644	11	29	40	± 4	57	± 5	41
2020	6,901	25	82	41	2	0	150	23%	326	50%	173	27%	649	1,240	8	38	46	± 6	53	± 6	36
2021	6,873	7	22	14	0	0	43	17%	138	55%	72	28%	253	964	5	26	31	± 7	52	± 10	40
2022	4,630	14	45	13	1	0	73	23%	148	46%	99	31%	320	0	9	40	49	± 9	67	± 11	45
2023	3,934	9	22	7	0	0	38	20%	100	53%	52	27%	190	0	9	29	38	± 9	52	± 11	38

Table 2.

		2021			2022			2023			3 Year Prevalence			95% Confidence				
HA	Species	Tested	# Pos	Prev	Tested	# Pos	Prev	Tested	# Pos	Prev	Tested	# Pos	Prev	Ratio	Lower	Upper	F-low	F-high
Surveillance Tier 3	Ad M MD	7	1	14.3%	4	0	0.0%	39	4	10.3%	50	5	10.0%	0.1	3.0%	21.8%	3.2	2.1
North	Yrlg M MD	0	0	#DIV/0!	0	0	#DIV/0!	7	0	0.0%	7	0	0.0%	0.0	0.0%	41.0%	0.0	4.9
Converse	Ad F MD	1	0	0.0%	0	0	#DIV/0!	1	0	0.0%	2	0	0.0%	0.0	0.0%	84.2%	0.0	10.6
755	Ad M WTD	0	0	#DIV/0!	5	1	20.0%	9	2	22.2%	14	3	21.4%	0.2	3.8%	50.8%	5.1	2.8
HA 22	Ad F WTD	0	0	#DIV/0!	0	0	#DIV/0!	0	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	0.0%	100.0%	0.0	0.0
Casper	Yrlg M WTD	0	0	#DIV/0!	0	0	#DIV/0!	0	0	#DIV/0!	0	0	#DIV/0!	#DIV/0!	0.0%	100.0%	0.0	0.0

Appendix 1.

Mule Deer Composition Stratified Random Sampling Summary
2023-2024 Survey Year
MD755 North Converse

- Average time to fly 2-square mile polygon
    - 6.04 Minutes
- Average time to fly high vs. low density polygon
    - 17 Lows – 5.82 Minutes/Low
    - 9 Highs – 6.44 Minutes/High
- Total survey time (including all ferry time between polygons), excluding ferry time to get chopper prior to survey
    - 4.67 Hours
- Weather conditions
    - Visibility – Clear, cloudy in the afternoon.
    - Wind – 0-10 MPH
    - Temp – 38 Degrees
- What percentage of actual polygons flown were high's vs. low's?
    - 35% Highs
    - 65% Lows
- How many total deer were classified?
    - 190 Total Deer
- Assessment of polygons that were flown (should high's be changed to low's, or vice versa?)
    - Polygons 241, 840, & 879 could be changed to High's
    - Polygons 49 & 178 should be changed to High
    - Polygon 1077 could be changed to Low or Excluded. Lots of houses.
- Should any polygons that were flown be completely excluded?
    - No
- Save screenshot of polygons flown
    - In Folder
- Save Google Earth image of polygons flown
    - In Folder
- What were total survey costs for this survey?
    - Survey Time – 6.6 hrs. @ $1,050/hr. = $6,930.00
    - Ferry Time – 0.9 hrs. @ $1,050/hr. = $945.00
    - Fuel Truck – 198 miles @ $2.25/mi. = $445.50
    - Pilot/Driver Per Diem – 2 people @ $225/day x 1 day = $450.00
    - Hangar Charge – 1 night @ $50/day = $50.00
    - Total Survey Cost = $8,820.50
- Classification Ratios
    - Fawns:100 Does – 52
    - Yearling bucks:100 Does – 9
    - Class 1: 100 Does – 22

    - Class 2 : 100 Does – 7
    - Class 3 : 100 Does – 0
    - Adult Bucks : 100 Does – 29
    - All Bucks : 100 Does - 38
- Date they were entered into the WOS
    - 12/14/2023

Appendix 2.

CWD Mandatory Sample Submission Plan for North Converse Mule Deer Herd Unit Deer Hunt Area 22

Submitted by: Casper Region's Wildlife Division

Wyoming Game and Fish Department has the statutory authority to mandate hunters to submit samples for CWD testing under Chapter 2, General Hunting Regulations, Section 17:

Section 17. Mandatory CWD Sample Submission. *The Department may mandate hunters submit CWD samples from harvested deer, elk and moose from designated hunt areas within Wyoming.*

(a) Mandatory submission of CWD samples from harvested deer, elk and moose may be established annually by the Department when necessary to meet its CWD testing and monitoring requirements or to implement and evaluate management actions related to CWD. Mandatory CWD sample submission of deer, elk and moose shall end when the Department achieves sampling goals for designated hunt areas, as stipulated by Department personnel prior to enacting any mandatory CWD sample submission. The Department shall determine the type, time frame and method of CWD sampling required for submission.

(b) When the Department mandates hunters submit CWD samples, public notice shall be given through posting of mandatory submission requirements in Department offices and designated license selling agents, electronic or traditional mailings to known license holders (and other sportspersons) and through the Department website, publications and news releases.

(c) It shall be a violation of Commission regulation for a hunter to fail to submit mandated CWD samples in accordance with this section.

For the 2024 hunting season the Casper Region requests to have mandatory CWD sample submission for mule deer in Hunt Area 22. The North Converse Mule Deer Herd Unit was requested by local biologists for priority sampling in 2023. Letters were sent to all Hunt Area 22 deer license holders in 2023, additional personnel assisted with sampling at offices and in the field, sample drop boxes were established in both Douglas and Casper, and check stations were manned through parts of the season. With all of that effort, only 39 samples from adult male mule deer were collected in this herd unit in 2023.

Mandatory sampling is not necessary for white-tailed deer since we are focusing on management recommendations for mule deer. However, we will still opportunistically take samples throughout the white-tailed deer season. This should reduce the workload for employees and reduce requirements of our constituents.

Based on the 2023 harvest survey, there were 235 adult male mule deer harvested from the herd unit. The past number of voluntary submissions have been low, and based on the number of samples taken in 2023 during the last priority surveillance effort, it would take more than 3 years to obtain an adequate number of samples to meet our statistical goal.

There will be a sample collection box at the Casper Regional Office. The processor in Douglas will be contacted to see if we can set up head boxes throughout the regular season. We will contact taxidermists and outfitters in Douglas, Glenrock, and Casper to see if they will take samples or set aside heads during the archery (Sept 1-30) and regular season (Oct 1-14). Personnel will also be out conducting routine compliance checks and collecting samples in the hunt area throughout the regular rifle season. Other surveillance plan details will be confirmed at a later date.

We will have signs and other information at the Casper regional office and provide signs/posters to license selling agents in the Casper region and possibly the Sheridan region. The information will include the location of the regular season check stations, regional office information, and personnel contact information for harvests during the archery and regular mule deer seasons. We will also include a link or QR code directing individuals to our webpage to provide information on how to collect their own samples and where to drop them off.

Letters will be mailed in August to all Area 22 – Type 1 license holders informing them of the mandatory submission requirement and sampling locations and instructions. Additionally, we will work to include pertinent information on the Hunting in Wyoming Home Page of the Department's website and Regional web pages, and we plan to highlight Hunt Area 22 in the brochure as a Mandatory CWD Sampling Area.

2023 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2023 - 5/31/2024

HERD: MD756 - SOUTH CONVERSE

HUNT AREAS: 65

PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Population:	5,134	3,883	3,585
Harvest:	273	221	225
Hunters:	777	647	650
Hunter Success:	35%	34%	35%
Active Licenses:	777	647	650
Active License Success:	35%	34%	35%
Recreation Days:	3,242	2,402	2,400
Days Per Animal:	11.9	10.9	10.7
Males per 100 Females	40	30	
Juveniles per 100 Females	57	53	

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

Management Strategy: Private Land

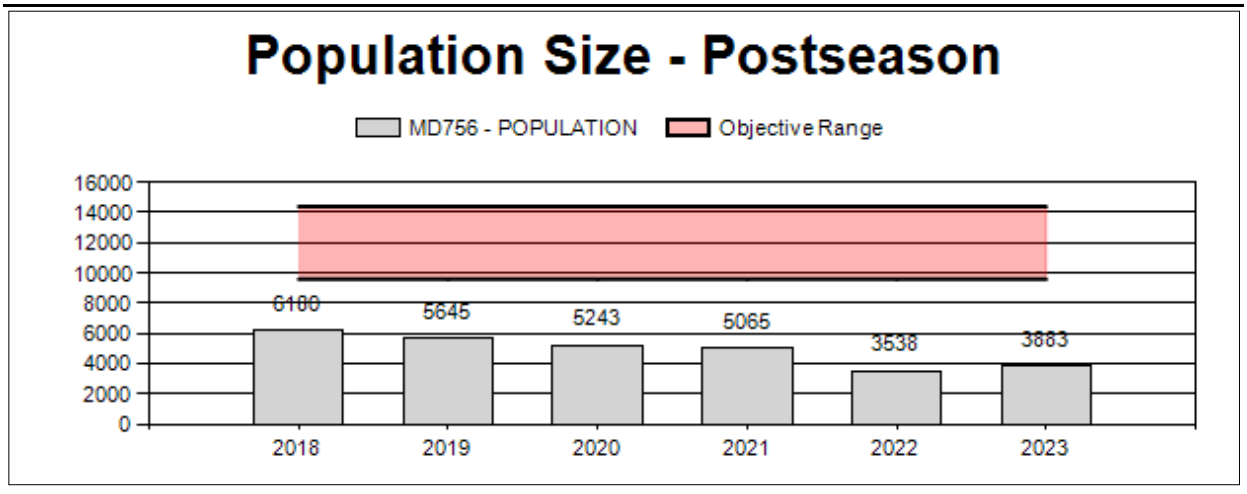
Percent population is above (+) or below (-) objective: -67.6%

Number of years population has been + or - objective in recent trend: 16

Model Date: 03/06/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	28.0%	23.0%
Proposed change in post-season population:	0%	-3.0%



2024 Hunting Seasons

South Converse Mule Deer Herd Unit (MD756)

Hunt Area	License Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
65	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 24		Antlered mule deer or any white-tailed deer

2024 Region J nonresident quota: 750 licenses

2023 Hunter Satisfaction: 47% Satisfied, 23% Neutral, 30% Dissatisfied

2024 Management Summary

1) Hunting Season Evaluation: The 2024 season structure continues with a 10-day season with no antler point restriction. This area historically has maintained high buck ratios and high CWD prevalence. After hitting a low point in 2012, mule deer numbers grew through 2017 due to favorable environmental conditions, and have since started to show a downward trend. Therefore seasons are more conservative due to low population numbers and significant landowner concerns with longer seasons.

After a generally dry, mild 2020/2021 winter, the herd unit was hit with a significant spring storm in March of 2021 which caused higher winter mortality. Above average snowfall and periods of frigid temperatures throughout the 2022/2023 winter possibly caused higher winter mortality as well. However, the adjacent Bates Hole herd with collared mule deer did not show higher than normal levels of winter mortality. Both of these herds historically have had lower than average annual survival rates, likely due to degraded habitat, drought, predation, and disease.

A stratified random mule deer composition/abundance survey was conducted in November 2023 by helicopter (Appendix 1). Managers classified 190 mule deer with ratios of 53 fawns:100 does and 21 bucks:100 does. The observed buck ratio is suspected to be far lower than actual ratios, likely a byproduct of a small sample size due to an inability to classify an adequate number of mule deer given aerial survey budget constraints. Buck ratios over the past 10 years have averaged approximately 40 bucks:100 does (Table 1). However, the past 3 years have been variable with the new survey design, and only ground classifications were completed in 2021 due to extreme wind. Since this technique has been implemented, the only year with good observation conditions and an adequate classification sample size (2022) yielded a buck ratio of 41:100 does. Given the private land nature of this herd unit coupled with conservative hunting seasons, actual buck ratios simply do not fluctuate as much as observed ratios derived from composition / abundance surveys flown over the past three years. Stratification and survey effort will continue to be refined in the future to ensure classifications are more representative.

Harvest in 2023 was the second lowest observed in the past 33 years in Hunt Area 65. However it did not differ significantly from the previous 10-year average. Lower harvest in 2023 was likely a result of a significant snowstorm immediately prior to the season opener. In recent years, harvest has not changed significantly with changes in season structure (i.e., utilizing APRs with longer season length). In 2023, we collected antler spread measurements (n=20) from adult male mule

deer harvested in the South Converse Herd Unit. Of all bucks sampled, 60% were Class I, 35% were Class II, and 5% were Class III bucks. As expected, the percentage of Class I bucks remained higher in 2023 with the absence of an antler point restriction.

2) Chronic Wasting Disease Management: This is a Tier 2 surveillance herd that was prioritized for CWD sampling beginning in 2022 and will continue through 2024. Mandatory CWD testing was required in the South Converse Herd Unit in 2022. Sampling continued in 2023, but was not mandatory. To date, we have collected 163 samples during this focal period. Prevalence data will be reported in the 2024 JCR when this focal surveillance period is complete.

3) Population Modeling: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2023 postseason population estimate for this herd unit was 3,883 (CL = 3,037-4,895) mule deer.

The post-season population estimate in 2021 was derived from the Spreadsheet model while the estimates for 2022 and 2023 were provided by the IPM. The IPM estimate in 2022 was significantly lower than the previous estimates as well as the Feb. 2023 abundance estimate (from sightability survey) of 4,682. Managers were concerned the 2022 estimate was artificially low. Model performance has improved for 2023 with the incorporation of the abundance estimate.

Managers flew a composition/abundance survey in November 2023 which produced an abundance estimate of 3,040 (CL = 0 – 7,061) deer. The survey resulted in a very low sample size which produced the large Confidence Interval. Managers are planning to increase flight time to improve abundance estimates in the future. While estimates are variable between composition/abundance surveys, sightability surveys, and modeled populations, the overall downward trend is believed to be accurate.

Table 1.

2018 - 2023 Postseason Classification Summary

for Mule Deer Herd MD756 - SOUTH CONVERSE

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	6,180	41	79	23	8	0	151	22%	299	44%	237	34%	687	1,571	14	37	51	± 6	79	± 8	53
2019	5,645	78	133	31	0	0	242	21%	608	52%	321	27%	1,171	1,281	13	27	40	± 3	53	± 4	38
2020	5,243	52	70	25	2	0	149	21%	388	55%	167	24%	704	1,030	13	25	38	± 4	43	± 5	31
2021	5,065	17	16	4	0	0	37	13%	167	59%	79	28%	283	794	10	12	22	± 5	47	± 8	39
2022	3,538	33	15	23	1	0	72	19%	175	46%	130	34%	377	0	19	22	41	± 7	74	± 10	53
2023	3,883	9	15	7	0	0	31	16%	104	55%	55	29%	190	0	9	21	30	± 8	53	± 11	41

Appendix 1.

Mule Deer Composition Stratified Random Sampling Summary
2023-2024 Survey Year
MD756 South Converse

- Average time to fly 2-square mile polygon
    - 8.30 Minutes
- Average time to fly high vs. low density polygon
    - 6 Lows – 8.33 Minutes/Low
    - 17 Highs – 8.29 Minutes/High
- Total survey time (including all ferry time between polygons), excluding ferry time to get chopper prior to survey
    - 4.63 Hours
- Weather conditions
    - Visibility – Partly cloudy
    - Wind – 0-10 MPH
    - Temp – 38 Degrees
- What percentage of actual polygons flown were high's vs. low's?
    - 74% Highs
    - 26% Lows
- How many total deer were classified?
    - 190 Total Deer
- Assessment of polygons that were flown (should high's be changed to low's, or vice versa?)
    - Change Polygon 111 from Low to High
    - Could change polygons 5, 41, & 42 from Highs to Lows
- Should any polygons that were flown be completely excluded?
    - No
- Save screenshot of polygons flown
    - In Folder
- Save Google Earth image of polygons flown
    - In Folder
- What were total survey costs for this survey?
    - Survey Time – 4.6 hrs. @ $1,050/hr. = $4,830.00
    - Ferry Time – 0 hrs. @ $1,050/hr. = $0.00
    - Fuel Truck – 152 miles @ $2.25/mi. = $342.00
    - Pilot/Driver Per Diem – 2 people @ $225/day x 1 day = $450.00
    - Total Survey Cost = $5,622.00
- Classification Ratios
    - Fawns:100 Does – 53
    - Yearling bucks:100 Does – 9
    - Class 1: 100 Does – 14
    - Class 2 : 100 Does – 7
    - Class 3 : 100 Does – 0

    - Adult Bucks : 100 Does – 21
    - All Bucks : 100 Does - 30
- Date they were entered into the WOS
    - 12/14/2023

2023 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2023 - 5/31/2024

HERD: MD757 - BATES HOLE/HAT SIX

HUNT AREAS: 66-67

PREPARED BY: BRANDON WERNER

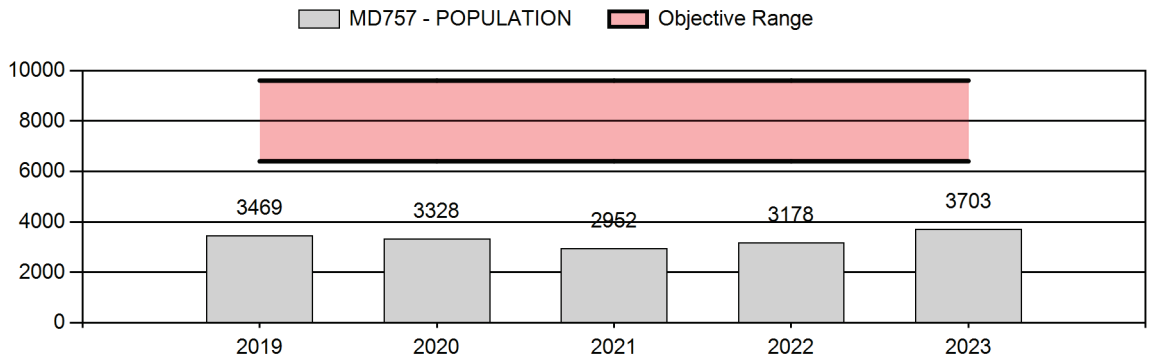
	2018 - 2022 Average	2023	2024 Proposed
Population:	3,269	3,703	3,763
Harvest:	241	394	243
Hunters:	786	850	773
Hunter Success:	31%	46%	31%
Active Licenses:	786	850	773
Active License Success:	31%	46%	31%
Recreation Days:	2,837	2,723	2,750
Days Per Animal:	11.8	6.9	11.3
Males per 100 Females	29	28	
Juveniles per 100 Females	66	64	

Population Objective (± 20%) :	8000 (6400 - 9600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-53.7%
Number of years population has been + or - objective in recent trend:	23
Model Date:	02/08/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.01%	0%
Males ≥ 1 year old:	.35%	.34%
Proposed change in post-season population:	1.06%	1.02%

Population Size - Postseason



2024 HUNTING SEASONS
BATES HOLE / HAT SIX MULE DEER HERD (MD757)

Hunt Area	Type	Archery Opens	Archery Closes	Season Opens	Season Closes	Quota	Limitations
66	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer

2024 Region D Nonresident Quota: 300

2023 Hunter Satisfaction: 52% Satisfied, 22% Neutral, 26% Dissatisfied

Management Summary:

1) **Hunting Season Evaluation:** After declining from 2009 through 2013, this population grew through 2016 but then declined until 2020. Since 2020 the population has remained stagnant. Postseason classifications have yielded mediocre fawn ratios in the 60s per 100 does for the last eight years. Antler-point restrictions (APRs) of three (3) points or more on either antler are used in some years, with the goal of conserving younger age-class bucks and reducing harvest pressure in years when the buck ratio is low. Managers applied an APR to the hunting season from 20192022. The APR was removed for the 2023 season as buck ratios remained strong, and managers wanted to distribute harvest across all male age classes. The winter of 2022-2023 was harsh in most of this herd unit although core winter ranges were not as severely affected. Collar data indicated over-winter survival in adult females was near normal. In 2023, difficult survey conditions due to patchy snow and cloud cover lead to only 243 deer being classified, which is under the 300-500 sample goal (Appendix A). More survey time is recommended in the future. With the low number of deer classified, the confidence in ratio data is low. Great spring and summer moisture with mild temperatures occurred in 2023 (Appendix B), but fawn ratios were relatively similar to the five-year average of 64:100 does. Overall hunter success increased in 2023 to 46%, which was well above the five-year average of 31%. Nonresident harvest success increased to 63%, far higher than the five-year average of 34%. An estimated 389 mule deer bucks were harvested in 2023, the highest since 2017. Improved success rates likely stem from mild weather conditions during the 2023 season, which allowed hunters to easily access all of the hunt area. In addition, the removal of the APR led to more yearling bucks being harvested resulting in increased overall harvest. Tooth samples and antler measurements were collected from 33 harvested mule deer bucks in 2023 (Table 1). The average cementum annuli tooth age of those sampled was 3.7 years old, with a median age of 3.5, and average antler spread of 17 inches.

Bio-Year	Total Class N for HA	# Bucks Classified					Buck Ratios per 100 Females					
		Ylng	Class I	Class II	Class III	Total	Ylng	Class I	Class II	Class III	All Adult	Total
2008	1,254	75	57 (50%)	41 (36%)	16 (14%)	189	12	9	6	2	18	29
2009	1,320	59	61 (54%)	41 (37%)	10 (9%)	171	8	8	6	1	15	23
2010	1,479	82	49 (49%)	42 (42%)	9 (9%)	182	9	5	5	1	11	20
2011	1,248	47	52 (56%)	33 (36%)	7 (8%)	139	7	8	5	1	14	21
2012	1,272	28	55 (59%)	30 (32%)	9 (9%)	122	4	8	4	1	13	17
2013	1,483	86	50 (61%)	25 (30%)	7 (9%)	168	10	6	3	1	10	20
2014	1,403	83	79 (71%)	26 (23%)	7 (6%)	195	12	12	4	1	17	29
2015	2,061	164	97 (70%)	29 (21%)	13 (9%)	303	16	9	3	1	13	29
2016	1,836	132	198 (85%)	31 (13%)	4 (2%)	365	15	22	3	1	26	41
2017	1,165	54	108 (80%)	23 (17%)	4 (3%)	189	9	18	4	1	22	31
2018	734	32	59 (89%)	7 (11%)	0 (0%)	98	8	15	2	0	17	26
2019	1,050	55	89 (86%)	10 (10%)	4 (4%)	158	10	17	2	1	19	29
2020	555	43	41 (87%)	6 (13%)	0 (0%)	90	15	15	2	0	17	32
2021	0	0	0	0	0	0	0	0	0	0	0	0
2022	509	34	30 (66%)	15 (33%)	0 (0%)	79	13	11	5	0	17	30
2023	243	15	17 (85%)	3 (15%)	0 (0%)	35	12	13	2	0	16	28

Table 1. Antler classification analysis for **Area 66** within the Bates Hole/Hat Six Mule Deer Herd Unit, 2008 – 2023.

For the 2024 hunting season, managers prescribed a seven-day general license season, which is typical for the herd. The APR limitation will not be reinstated to continue to reduce pressure on mature bucks, better distribute harvest across all age classes of bucks, and provide more opportunity for sportsmen. Buck ratios have been steady, averaging 29:100 does over the last five years (excluding no data in 2021). Managers recommend removal of the APR for at least two consecutive years, assuming buck ratios remain adequate. This will provide more consistency and less confusion for hunters.

2) **Management Objective Review:** No objective review was scheduled for 2024.

3) **Mule Deer Initiative Habitat Information:** As part of the Mule Deer Initiative, managers collect Rapid Habitat Assessment (RHA) data throughout the herd unit in some years. Limited RHA data was collected within the Bates Hole – Hat Six Mule Deer Herd during the 2023 reporting period due to some data being lost due to technical issues. Numerous habitat treatments are ongoing and being planned including sagebrush treatments, noxious weed control, juniper removal, riparian restoration and wildlife friendly fence conversions.

4) **Chronic Wasting Disease Management:** Elevated Chronic Wasting Disease (CWD) surveillance efforts have occurred in this herd in recent years due to ongoing CWD research. From 2020-2022, a total of 162 adult male mule deer were sampled, which is below the sample goal of 200. This herd is exhibiting a high prevalence of CWD (28%) in adult bucks, which has been sustained over the past five-years of intensive CWD surveillance. Managers believe this high prevalence is contributing to poor adult survival in this herd. To date, no meaningful CWD management actions have occurred in this herd unit. In 2019 a multi-year research project was initiated in this herd by WGFD in collaboration with the University of Wyoming. This study will focus on interactions between mountain lion predation, mule deer, and CWD. Results from this study will not be reported for several years.

5) **Population Modeling:** The model for this herd depicts a population that has been consistently under objective and remained relatively stable over the past four years. A sightability survey conducted in 2022 provided an abundance estimate of 3,686 (CI=2,575-4,797), which slightly increased the overall trend and population estimate in the model. In addition a composition/abundance survey was conducted in 2023 resulting in an estimate of 3,238 (CI=257-6,218). Four annual survival estimates for adult female mule deer stemming from research were plotted into the PopR Integrated Population Model (IPM), along with three abundance estimates. Chronic low survival (73% in 2017, 66% in 2021, 72% in 2022, and 65% in 2023) of adult does is largely responsible for this population remaining stagnant. These independent estimates will improve model performance over time. The 2023 postseason population estimate for this herd from the IPM was approximately 3,703 (CI=3,301-4,106) mule deer, which is well below objective. Based on the composition/abundance and sightability survey estimates, the 2023 population estimate produced by the IPM is reasonably accurate.

2019 - 2023 Postseason Classification Summary

for Mule Deer Herd MD757 - BATES HOLE/HAT SIX

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	3,469	55	89	10	4	0	158	15%	536	51%	356	34%	1,050	1,058	10	19	29	± 3	66	± 5	51
2020	3,328	43	41	6	0	0	90	16%	278	50%	187	34%	555	1,070	15	17	32	± 5	67	± 7	51
2021	2,952	0	0	0	0	0	0	0%	0	0%	0	0%	0	0	0	0	0	± 0	0	± 0	0
2022	3,178	34	30	15	0	0	79	16%	260	51%	170	33%	509	906	13	17	30	± 5	65	± 8	50
2023	3,703	15	17	3	0	0	35	14%	127	52%	81	33%	243	0	12	16	28	± 7	64	± 11	50

Appendix A. 2023 MD 757 Bates Hole-Hat Six Aerial Classification Results

Surveyors: Brandon Werner, Simon Martinez, Ty Masco

Date: 12/1, 12/2

Total Polygons Surveyed: Twenty three polygons were flown, 18 of high density and five of low density (79%, 21%)

Total Survey Time: 5 Flight hours averaging about 11 minutes a polygon

Weather: The weather on December 1 was less than ideal to detect deer, heavy cloud cover made it difficult to locate deer on the ground. The wind and temperature were at acceptable ranges about 30 degrees with a 12 mph wind. Most of the Hat Six, Cow Camp, and Stock Trail country was under patchy snow and it was extremely difficult to detect deer. December 2 was better: Bolton Creek, Marton, and Alcova country was free of snow and it was sunny. The probability of seeing every deer in a polygon was high. There was light wind and it was warm on this day.

Results: Of the 23 polygons surveyed, mule deer were observed in 16 of them. The polygons in which no deer were observed were 130, 200, 276, 286, 301, 313, 335. Of these polygons 57% were low density and 43% high. A total of 243 deer were observed which is under the 300-500 sample goal. With this low sample size the classifications will have a low confidence interval. The results include; 127 does, 81 fawns, 15 yearling bucks, 17 Class I bucks, and 3 Class II bucks. These results based on ratios of 100 does equate to 64 fawns, 12 yearling bucks, and 16 adult bucks. The total buck to doe ratio is 28 bucks per 100 does. These results are about average for the last five years excluding 2021 in which classifications were not completed due to extreme weather conditions.

Recommendations: The low sample size was likely due to poor visibility conditions between clouds and patchy snow. Also, Bates Hole has not experienced much of a winter yet in late 2023, polygons usually full of deer this time of year had many less than usual. I speculate that the deer were much more spread out this year and were not all on winter range during the survey. I also recommend that seven hours be budgeted again, similar to 2022 to get an adequate sample size.

Costs: Flight costs were $1050 per hour, in $450 per diem per day, and $2.25 per mile for the fuel truck.

Flight time

5.7 x $1050 = $5,985

Per Diem

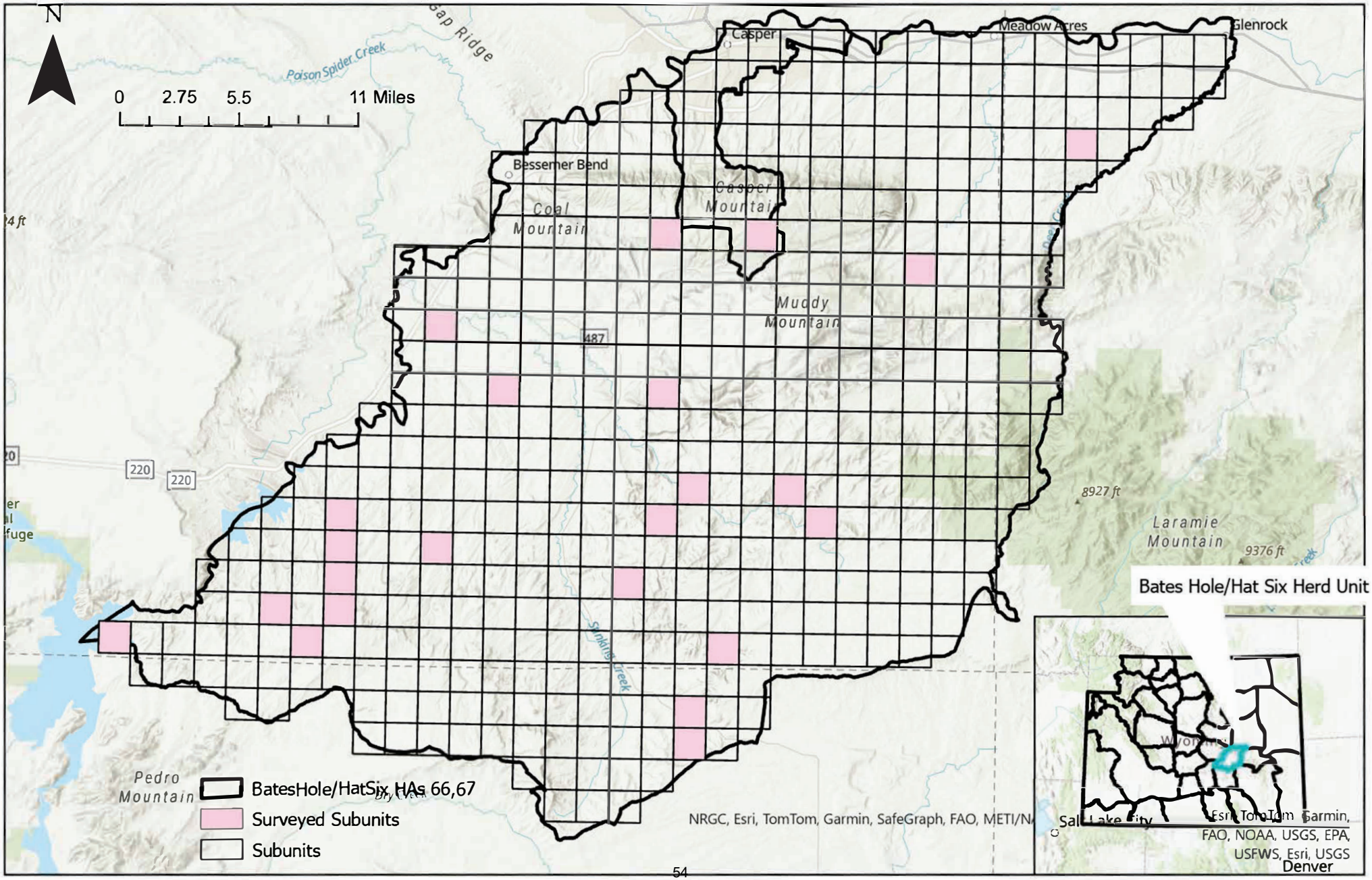
$450 x 1 day

Fuel truck

152 x $2.25 = $342

Total = $6,777

2023 Bates Hole/Hat Six Composition Abundance Survey



Appendix B
Weather Data for the Bates Hole / Hat Six Mule Deer Herd Unit

Precipitation

From October 2022 through September 2023 (Water Year 2023), precipitation in the Bates Hole / Hat Six Mule Deer Herd Unit was 3.1 inches higher than the 30-year average for the same water year timeframe (Figure 1). The growing season (April-June) precipitation in 2023 (6.7 inches) was also about 0.6 inches higher than the 30-year growing season average. Precipitation during this time of year is extremely important for shrubs because this is when the majority of annual growth occurs. During July and August of 2023, typically the driest months during the summer, the Bates Hole / Hat Six Mule Deer Herd Unit received 3.0 inches of precipitation which is 1.1 inches above the 30-year average for July and August. The herd unit received 3.3 inches of precipitation during September and October 2023, which is above of the 30-year average by 1.1 inches. Precipitation received during this timeframe is beneficial to help jumpstart plant growth the following growing season. The overall precipitation for water year 2023 was above normal, the above average fall precipitation was ideal for creating adequate fall green up conditions to assist with mule deer body condition going into winter. The 2024 water year precipitation thus far has been about average.

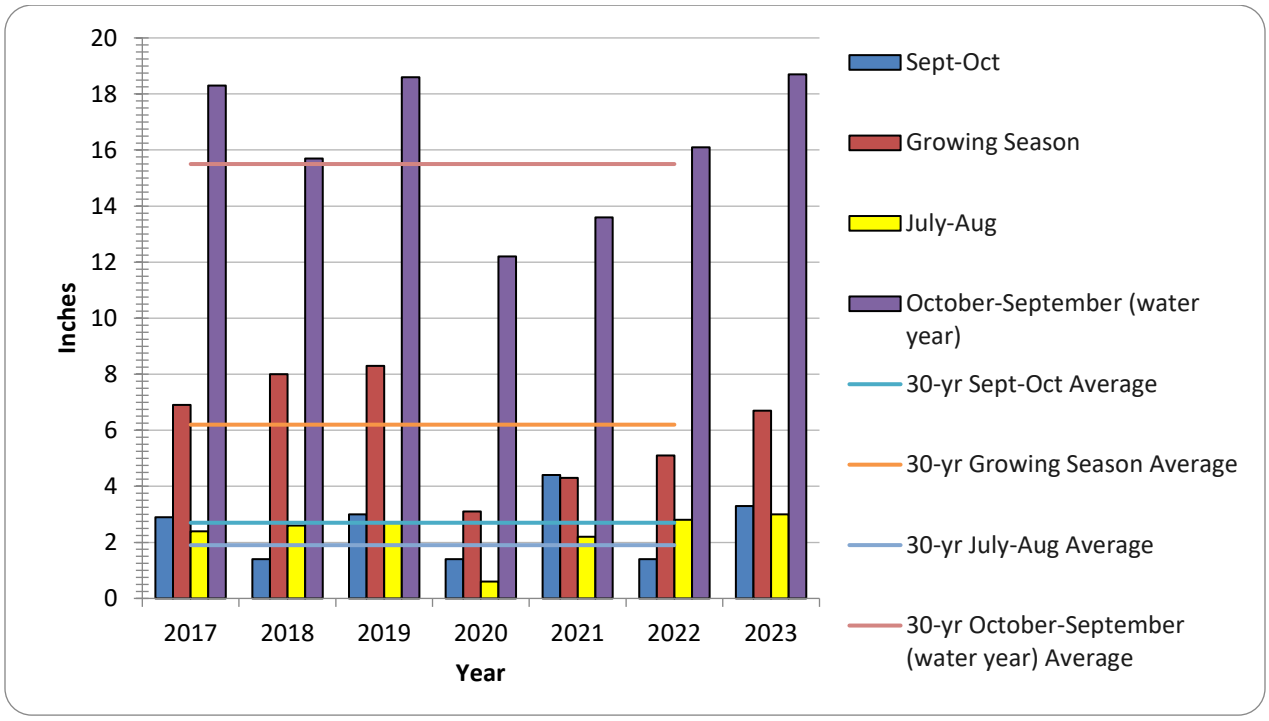


Figure 1. Seasonal precipitation received compared to 30-year averages within the Bates Hole / Hat Six Mule Deer Herd Unit.

2023 - JCR Evaluation Form

SPECIES: Mule Deer
PERIOD: 6/1/2023 - 5/31/2024

HERD: MD758 - RATTLESNAKE

HUNT AREAS: 88-89
PREPARED BY: BRANDON WERNER

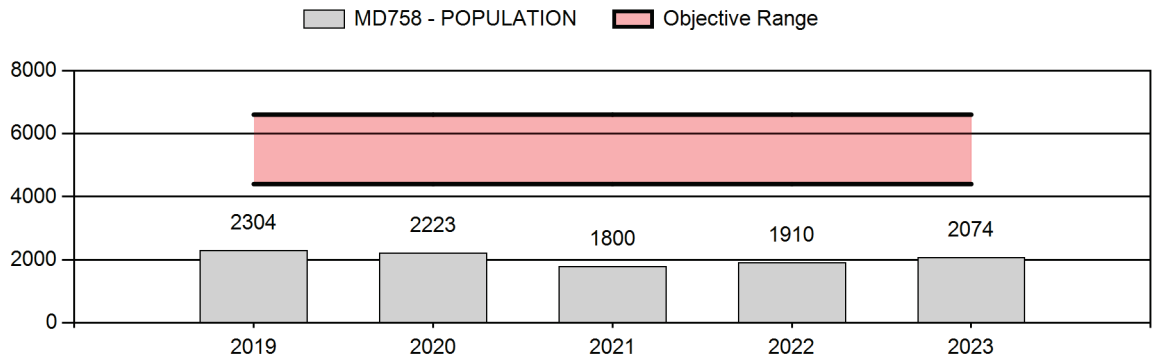
	2018 - 2022 Average	2023	2024 Proposed
Population:	2,135	2,074	1,959
Harvest:	220	176	229
Hunters:	437	343	350
Hunter Success:	50%	51%	65%
Active Licenses:	437	347	350
Active License Success:	50%	51%	65%
Recreation Days:	1,569	1,114	1,200
Days Per Animal:	7.1	6.3	5.2
Males per 100 Females	42	31	
Juveniles per 100 Females	59	66	

Population Objective (± 20%) :	5500 (4400 - 6600)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-62.3%
Number of years population has been + or - objective in recent trend:	18
Model Date:	02/08/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	.01%	.02%
Males ≥ 1 year old:	27%	40%
Proposed change in post-season population:	1.01%	.94%

Population Size - Postseason



2024 HUNTING SEASONS
RATTLESNAKE MULE DEER HERD (MD758)

Hunt Area	Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
88	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 21		Antlered mule deer or any white-tailed deer
88	7	Sep. 1	Sep. 30	Oct. 15	Nov. 30	75	Doe or fawn valid on private land
89	1	Sep. 1	Sep. 30	Oct. 15	Oct. 31	125	Antlered mule deer or any white-tailed deer

2024 Region D Nonresident Quota: 300

2023 Hunter Satisfaction: Herd Unit: 67% Satisfied, 19% Neutral, 15 % Dissatisfied

HA 88: 66% Satisfied, 20% Neutral, 14% Dissatisfied
HA 89: 69% Satisfied, 16% Neutral, 15% Dissatisfied

Management Summary:

1) **Hunting Season Evaluation:** The model for this herd depicts a population that declined until 2013, then grew from 2013 to 2018 during years of improved fawn production and overwinter survival, and then gradually declined from 2018-2021 as fawn production decreased. Fawn production for the whole herd unit increased in 2022 and 2023 but is still under desired levels. Postseason classification data was collected using a stratified random-sample survey design via helicopter in 2023 (Appendix A). The resulting sample size (N=303) was at the bottom end of the sample goal of 300-500 deer, meaning more flight time may be required to bolster sample size given low deer densities in this herd. The proportion of larger mature (Class II & Class III) bucks has been decreasing, even though overall population has remained stagnant in recent years (Table 1). Despite the harsh winter of 2022-2023, fawn ratios in Area 89 were excellent in 2023 at 79 fawns per 100 does compared to just 48 fawns in Area 88, a record low. Harvest success on Area 89-1 licenses decreased to 65% in 2023, from an average of 71%. General license success in Area 88 increased to 38%, which is still below the five-year average of 44%. The lower harvest success is attributed to warm October temperatures in 2023, which led to deer being less active during the hunting season.

Bio-Year	Total Class N for HA	# Bucks Classified					Buck Ratios per 100 Females					
		Ylng	Class I	Class II	Class III	Total	Ylng	Class I	Class II	Class III	All Adult	Total
2008	1,220	71	126 (74%)	40 (23%)	5 (3%)	242	11	20	6	1	27	38
2009	848	31	74 (53%)	54 (39%)	12 (9%)	171	7	17	13	3	33	40
2010	778	38	59 (54%)	45 (41%)	6 (5%)	148	9	14	11	1	26	35
2011	1,009	48	114 (62%)	61 (33%)	9 (5%)	232	9	21	11	2	34	43
2012	503	17	61 (84%)	10 (14%)	2 (3%)	90	6	22	4	1	26	32
2013	548	11	53 (74%)	18 (25%)	1 (1%)	83	4	17	6	0	24	27
2014	684	37	66 (65%)	30 (29%)	6 (6%)	139	12	22	10	2	34	46
2015	896	80	90 (69%)	38 (29%)	3 (2%)	211	20	22	9	1	28	48
2016	717	45	78 (74%)	25 (24%)	3 (2%)	151	13	22	7	1	30	42
2017	762	31	53 (39%)	78 (58%)	4 (3%)	166	10	16	24	1	42	51
2018	620	46	64 (73%)	22 (25%)	2 (2%)	134	21	29	10	1	40	61
2019	281	13	37 (79%)	9 (19%)	1 (2%)	60	9	26	6	1	34	43
2020	485	24	45 (61%)	25 (34%)	4 (5%)	98	10	18	10	2	30	40
2021	190	3	23 (64%)	9 (25%)	1 (3%)	36	3	20	9	1	29	32
2022	262	14	14 (45%)	16 (52%)	1 (3%)	45	11	11	12	1	24	34
2023	200	20	15 (71%)	6 (29%)	0 (0%)	41	22	16	7	0	24	54

Table 1. Antler classification analysis for Area 89 within the Rattlesnake Mule Deer Herd Unit, 2008-2021.

Tooth samples and antler measurements were also collected from 55 harvested adult male mule deer from Area 89 in 2023 (Table 2). The average cementum annuli age of those sampled was 5.6 years, near the long term mean for the hunt area, with the median age being 5.5. The average antler spread was 20 inches, which is under the five-year hunter reported average of 21inches. In Area 89, even with the lower harvest success in 2023, the average age of deer harvested is consistent with previous years buck ratios remained high in Area 89 so no change in the amount of Type 1 license issuance was warranted

	2012	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Average Tooth Age	5.07	5.83	5.88	5.67	5.4	5.09	5.18	5.05	5.41	6.1	5.6
Median Tooth Age	4.5	6.5	5.5	5.5	5.5	4.5	5.5	5.5	5.5	5.5	5.5
Average Antler Spread	20	23	23	23	23	20	21	20	21.25	22.9	20
Total Sample Size (N)	37	13	8	12	20	54	20	28	24	18	55

Table 2. Hunter-submitted tooth age and antler measurement data from Area 89 deer, 2012-2023.

The 2024 season continues to provide quality hunting opportunities in Area 89. For Area 89, 125 Type 1 licenses are available for antlered deer, which is no change from 2023. For Area 88, managers continue to prescribe a 7-day general license season with licenses valid for antlered mule deer or any white-tailed deer. In 2023, managers prescribed a Chronic Wasting Disease (CWD) management hunt in Area 88 with 50 Type 7 licenses valid for doe or fawn on private land from October 15 - December 15 (see Section 3). Harvest success on the Type 7 was 100%. However, only 21 of the 50 available licenses were active. Given lower deer densities are recommended due to high prevalence and more CWD samples from does are needed to assess female prevalence, a modest increase in Type 7 licenses was warranted. The season dates are shortened on the Type 7 license to be concurrent with the close of white-tailed deer season.

2) **Management Objective Review:** No review is scheduled in 2024.

3) **Chronic Wasting Disease Management (CWD):** This herd is a priority area for CWD surveillance in 2024. This herd was under mandatory surveillance in 2023 on the General, 89-1, and 88-7 licenses. Due to low sample sizes this herd will remain under mandatory sampling in 2024. Mandatory sampling will allow managers to better understand CWD distribution in this herd unit and prevalence across sex and age classes of deer. There was good hunter compliance for mandatory sampling in 2023 with a total of 143 hunter-harvested deer sampled. CWD prevalence from harvested mule deer in 2023 continued to be considerably higher in Area 88 (25%) compared to Area 89 (3%). According to the Wyoming Game and Fish Department CWD Management Plan, a potential way to reduce CWD on the landscape is to identify "hot spots" or areas where CWD is concentrated and reduce deer densities. An analysis of harvest locations from CWD-positive deer in Area 88 indicated many agricultural fields are CWD hot spots (Appendix B). Managers therefore prescribe continued doe mule deer harvest in Area 88, which contains both irrigated landscapes and riparian habitats. This may provide a focused and meaningful way to reduce CWD prevalence while limiting the spread to adjacent Area 89. Increased buck harvest is not warranted in Area 88 due to low buck ratios of resident deer. Yearling buck prevalence may be high in HA 88 at 25% (N=4 positive out of 16 samples) as is the harvest on these yearling bucks. Low buck ratios and high yearling buck harvest in Area 88 may be reducing transmission of CWD to adjacent Area 89. Final CWD prevalence data will be reported in 2025 when this round of intensive surveillance concludes.

4) **Population Modeling:** The trends depicted by the model are reasonable, and results from an independent abundance estimate were added to the 2019 bio-year which helps align the model for more accurate population estimates. The low precision abundance estimate from the composition abundance survey was 2,618 in 2023. The postseason population estimate for this herd unit from the Integrated Population Model was approximately 2,074 (CI=1,785-2,385) mule deer, which is well below objective.

2019 - 2023 Postseason Classification Summary

for Mule Deer Herd MD758 - RATTLESNAKE

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	2,304	34	65	21	1	0	121	19%	345	53%	184	28%	650	1,410	10	25	35	± 4	53	± 5	39
2020	2,223	24	45	25	4	0	98	20%	248	51%	139	29%	485	881	10	30	40	± 5	56	± 7	40
2021	1,800	3	23	9	1	6	48	22%	124	56%	48	22%	220	786	2	31	39	± 8	39	± 8	28
2022	1,910	14	14	16	1	0	45	17%	133	51%	84	32%	262	803	11	23	34	± 7	63	± 10	47
2023	2,074	24	17	7	0	0	48	16%	154	51%	101	33%	303	0	16	16	31	± 6	66	± 10	50

Appendix A. 2023 MD 758 Rattlesnake Aerial Classification Results

Surveyors: Brandon Werner, Austin Swingholm, Ty Masco

Date: 12/2, 12/3

Total Polygons Surveyed: 27, 22 of high density and 5 of low density (81% high 19% low)

Total Survey Time: 7 Flight hours averaging 11:00 a polygon

Weather: The weather on December 1 and 2 was relatively similar. Snow covered the ground in almost all of HA 89 but none in HA88. The temperature range during flight time was between 20-30 degrees with winds ranging from 6-20 mph. Both days were partly cloudy in the morning becoming mostly sunny in the afternoons with visibility of about 3-8 miles.

Results: Of the 33 polygons flown, mule deer were observed in 16 of them. The polygons in which no deer were observed were HA 88 41, 48 in HA 89 14, 33, 48, 95, 96, 267, 320, 321, 324, 327, 302, 273, 271, 491, and 426. Of the polygons with no observations 77% were of high deer density. A total of 303 deer were observed. This includes 154 does, 101 fawns, 24 yearling bucks, 17 class I bucks, and 7 class II bucks. The ratios are based on 100 does for the whole herd unit. The ratios come back to 31 males (16 yearling and 16 adult) and 66 fawns. The ratios differ greatly from HA 88 to HA 89.

Recommendations: Many of the polygons with no deer in them were located on top of the Rattlesnake Mountains this was due to heavy snow conditions in that area. I recommend building a survey that focuses on areas outside of the mountains on years of heavy snow loads. The amount of hours flown was perfect.

Costs: Flight costs were $1050 per hour, $450 in per diem per day, and $2.25 per mile for the fuel truck.

Flight time

$1050 x 7.8 = 8,190

Per Diem

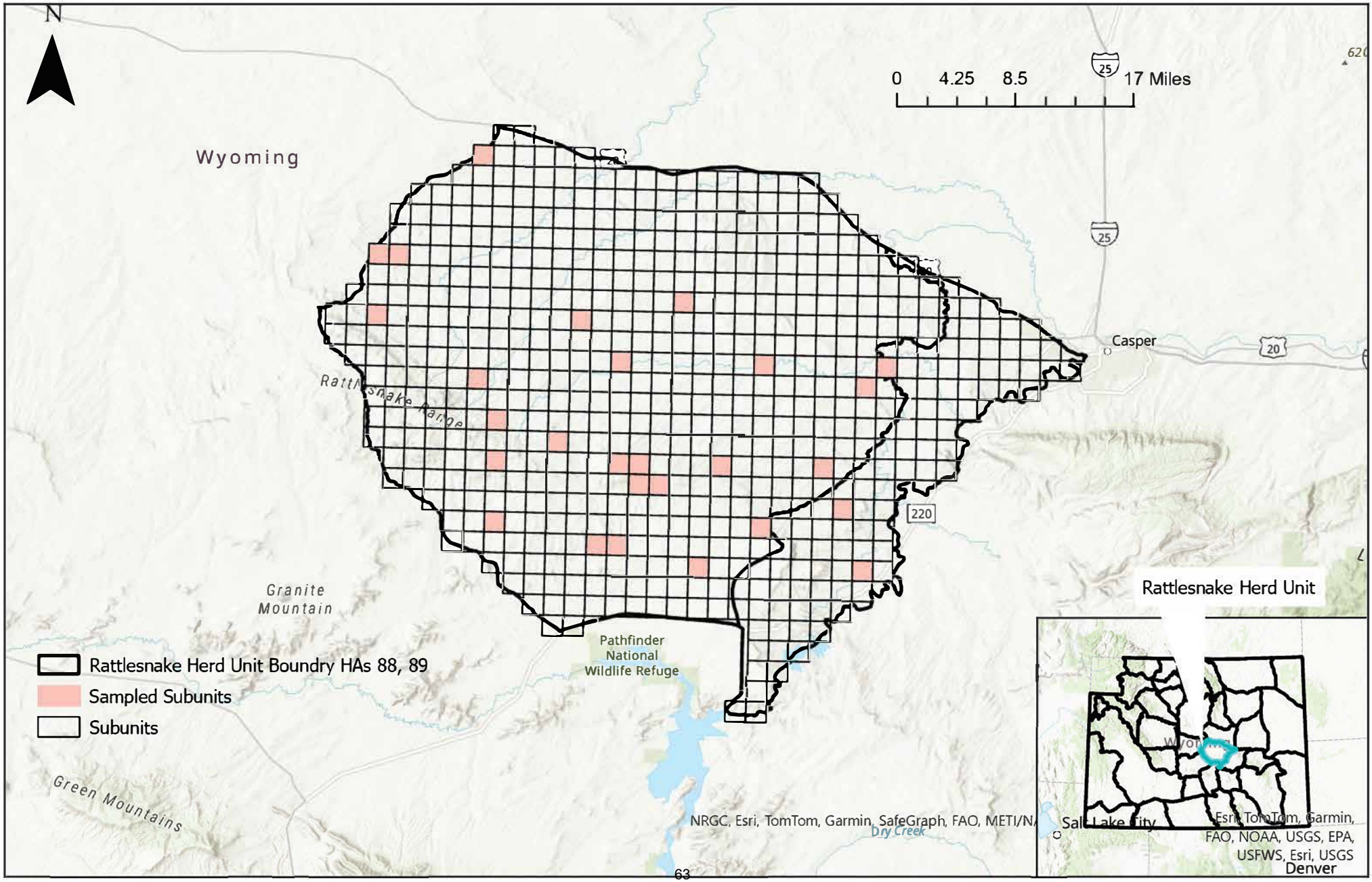
$450 x 2 = $900

Fuel truck

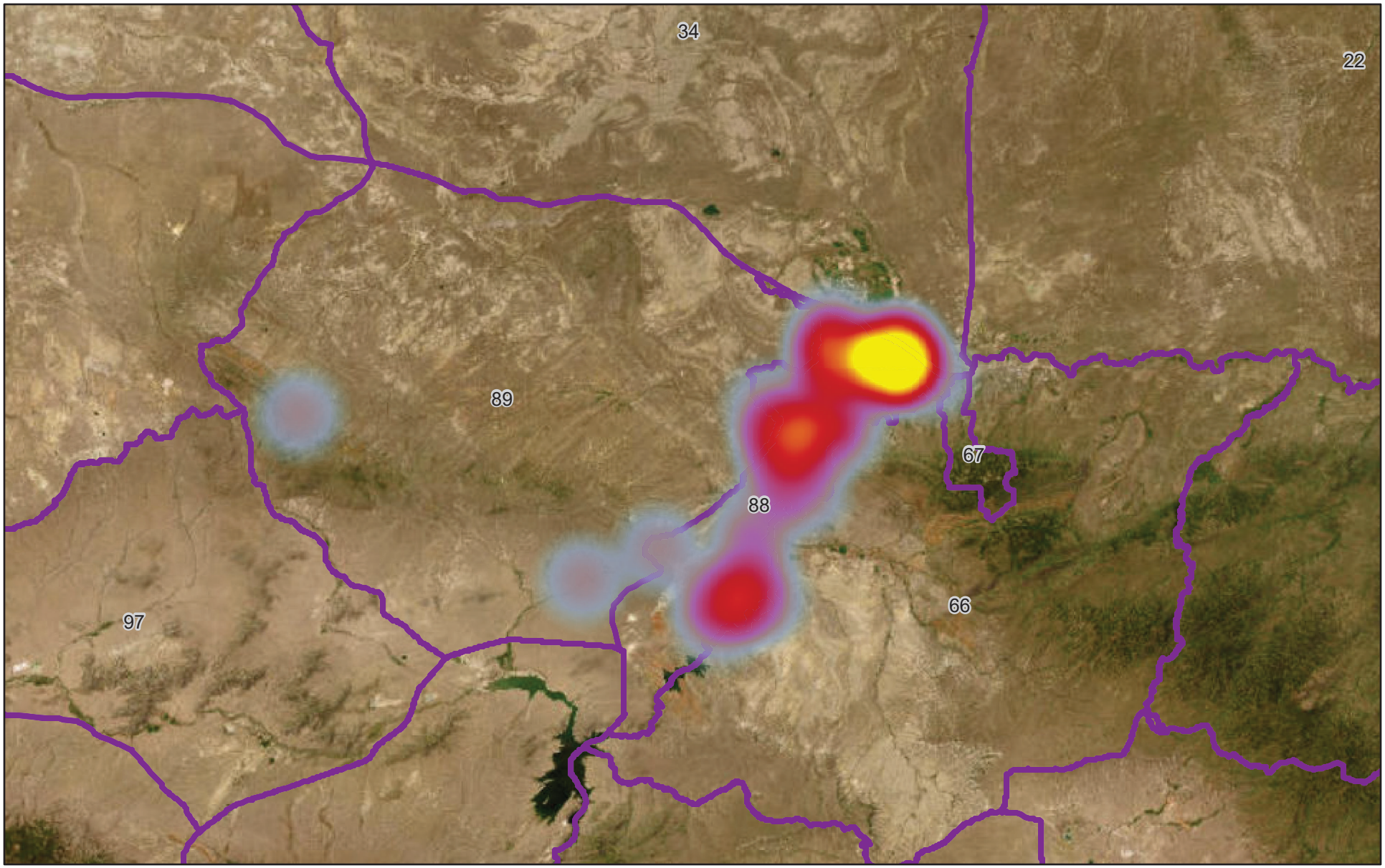
$ 2.25 x 106 =$238.5

Total = $9,328.50

2023 Rattlesnake Composition Abundance Survey



Appendix B. CWD Data 2021 - 2023 - WGFD HA 88-89 CWD Positives



5/16/2024

1:868,614

0 5 10 20 mi

0 5 10 20 km

Earthstar Geographics

2023 - JCR Evaluation Form

SPECIES: Mule Deer

PERIOD: 6/1/2023 - 5/31/2024

HERD: MD759 - NORTH NATRONA

HUNT AREAS: 34

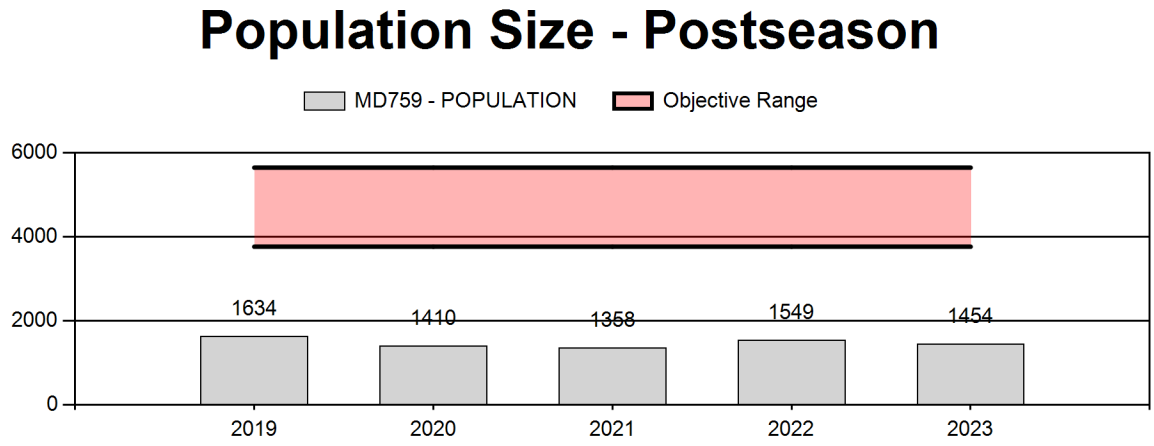
PREPARED BY: BRANDON WERNER

	2018 - 2022 Average	2023	2024 Proposed
Population:	1,512	1,454	1,438
Harvest:	198	111	111
Hunters:	264	154	140
Hunter Success:	75%	72%	79%
Active Licenses:	279	165	140
Active License Success:	71%	67%	79%
Recreation Days:	1,212	881	900
Days Per Animal:	6.1	7.9	8.1
Males per 100 Females	39	53	
Juveniles per 100 Females	50	66	

Population Objective (± 20%) :	4700 (3760 - 5640)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-69.1%
Number of years population has been + or - objective in recent trend:	9
Model Date:	02/13/2024

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:	27%	27%
Proposed change in post-season population:	1%	.99%



2024 HUNTING SEASONS
NORTH NATRONA MULE DEER HERD (MD759)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
34	1	Sep. 1	Sep. 30	Oct. 15	Oct. 31	125	Antlered mule deer or any white-tailed deer
	7			Aug 15	Dec. 15	25	Doe or fawn valid east of Bucknum Road (Natrona County Road 125) and south of the Burlington Northern Santa Fe railroad right-of-way

2023 Hunter Satisfaction: 59% Satisfied, 14% Neutral, 27% Dissatisfied

2024 Management Summary:

1) **Hunting Season Evaluation:** Following significant losses during the harsh winter of 2011, this herd recovered and increased gradually until 2017. Moderate fawn production/survival from 2017-2019 resulted in a slowly declining herd, with the decline accelerating from 2019-2021. Improved fawn production in 2022 and 2023 resulted in a population that is now stable but well below objective. Despite a harsh winter in 2022-2023, over-winter survival was likely near average. There were excellent yearling buck ratios in 2023 at 23:100 (Table 1). High yearling buck ratios are a great indicator of good fawn survival during the previous year's winter. The amount of deer observed and harvested during the season, even with the warm fall weather, was about average.

Bio-Year	Total Class N for HA	# Bucks Classified					Buck Ratios per 100 Females					
		Ylng	Class I	Class II	Class III	Total	Ylng	Class I	Class II	Class III	All Adult	Total
2008	1,023	59	111 (73%)	36 (24%)	5 (3%)	211	11	20	7	1	28	39
2009	1,009	51	87 (60%)	44 (31%)	13 (9%)	195	9	16	8	2	26	35
2010	905	47	55 (46%)	44 (37%)	21 (18%)	167	10	12	9	4	25	35
2011	760	52	64 (63%)	34 (33%)	4 (4%)	154	13	16	8	1	25	38
2012	868	36	91 (78%)	20 (17%)	6 (5%)	153	7	18	4	1	23	30
2013	637	28	60 (75%)	19 (24%)	1 (1%)	108	8	18	6	0	23	32
2014	1,033	51	84 (72%)	30 (26%)	2 (2%)	167	12	19	7	1	26	38
2015	1,065	78	93 (80%)	22 (19%)	1 (1%)	194	17	21	5	0	26	43
2016	1,208	68	105 (73%)	36 (25%)	3 (2%)	144	12	18	6	1	26	37
2017	924	57	124 (78%)	34 (21%)	2 (1%)	217	14	31	8	1	40	54
2018	745	56	116 (86%)	17 (13%)	2 (1%)	191	16	32	4	1	38	53
2019	234	11	27 (90%)	3 (10%)	0 (0%)	41	10	23	3	0	26	36
2020	622	21	81 (76%)	24 (23%)	1 (1%)	127	6	22	6	0	29	34
2021	207	8 (25%)	18 (72%)	5 (3%)	0	31	6	10	4	0	18	25
2022	391	23	27 (69%)	11 (28%)	1 (3%)	62	12	14	6	1	20	32
2023	386	41	32 (79%)	19 (19%)	1 (2%)	93	23	14	8	1	29	53

Table 1. Antler classification analysis for the North Natrona Mule Deer Herd Unit, 2008-2023.

Due to flight budget constraints, this herd was ground classified in 2023 with a sample size of 386 mule deer. Buck ratios improved significantly in 2023, although relatively few Class II and III bucks were observed. The fawn ratio was 66:100 does, a level high enough for herd maintenance but too low to bolster population growth. Harvest success on Type 1 licenses was above the five-year average (71%) at 76% in 2023. Tooth samples and antler measurements were collected from 26 harvested mule deer in 2023 (Table 2). The average cementum annuli tooth age of those sampled was 5.38 years old, the oldest average age since 2013. The median age was 5.0 and average antler spread was 20”, both of which are near the five-year average.

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Average Age	5.4	5.27	5.27	4.85	4.6	4.7	4.8	5.1	5.25	5.34	5.38
Median Age	5.5	4.5	4.5	5.5	4.5	4.5	4.5	5.5	5.5	5.5	5.0
Average Antler Spread	21.2	20	20.9	21.5	20.7	19.9	18.1	18.1	18.5	19.8	20.2
Sample Size (N) =	52	44	32	40	51	49	58	72	33	29	26

Table 2. Hunter-submitted tooth age and antler measurement data from Area 34 deer, 2012-2023.

A total of 125 Type 1 licenses are available for the 2024 season. Due to ongoing damage issues and Chronic Wasting Disease (CWD) concerns, 25 Type 7 licenses will be available in 2024 and will be valid within the agricultural region in the southeastern part of the herd unit. A total reduction of 25 Type 7 deer licenses was made due to low harvest success and less damage concern. Hunting seasons will remain extremely conservative for the foreseeable future until this herd rebounds.

2) **Management Objective Review:** This herd is up for an objective review in 2024. We are maintaining this herd at the current objective and management strategy based on internal discussions and conversations with our constituents. We evaluated and considered population status data included in this document and a change is not warranted at this time. We will review this herd objective again in 2029; however, if the situation arises that a change is needed, we will review and submit a proposal as needed.

3) **Chronic Wasting Disease Management:** This herd was not a priority for CWD surveillance in 2024. This herd was a priority for CWD surveillance in 2019 and 2020. The most current prevalence data was reported in the 2020 JCR. Data suggests management of high deer densities on irrigated landscapes may provide a focused and meaningful way to reduce CWD prevalence. Compiled CWD data shows the highest prevalence of CWD in the agricultural portion of this hunt area. Continued issuance of Type 7 licenses that focus harvest pressure on agricultural lands may help reduce CWD transmission in the herd.

4) **Population Modeling:** The 2023 postseason population estimate for this herd from the PopR Integrated Population Model (IPM) is approximately 1,454 (CI=1,205-1,732) mule deer, which is well below objective. Based on fawn ratios and observed population trends, the IPM seems to be tracking the population well.

2019 - 2023 Postseason Classification Summary

for Mule Deer Herd MD759 - NORTH NATRONA

		MALES							FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	2+ Cls 1	2+ Cls 2	2+ Cls 3	2+ UnCls	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	1,634	11	27	3	0	0	41	18%	114	49%	79	34%	234	1,134	10	26	36	± 8	69	± 12	51
2020	1,410	21	81	24	1	0	127	20%	370	59%	125	20%	622	1,096	6	29	34	± 3	34	± 3	25
2021	1,358	8	18	5	0	0	31	15%	125	60%	51	25%	207	479	6	18	25	± 6	41	± 8	33
2022	1,549	23	27	11	1	0	62	16%	192	49%	137	35%	391	743	12	20	32	± 5	71	± 9	54
2023	1,454	41	32	19	1	0	93	24%	177	46%	116	30%	386	0	23	29	53	± 7	66	± 9	43

2023 - JCR Evaluation Form

SPECIES: White tailed Deer
PERIOD: 6/1/2023 - 5/31/2024

HERD: WD706 - BLACK HILLS

HUNT AREAS: 1-6
PREPARED BY: JOE SANDRINI

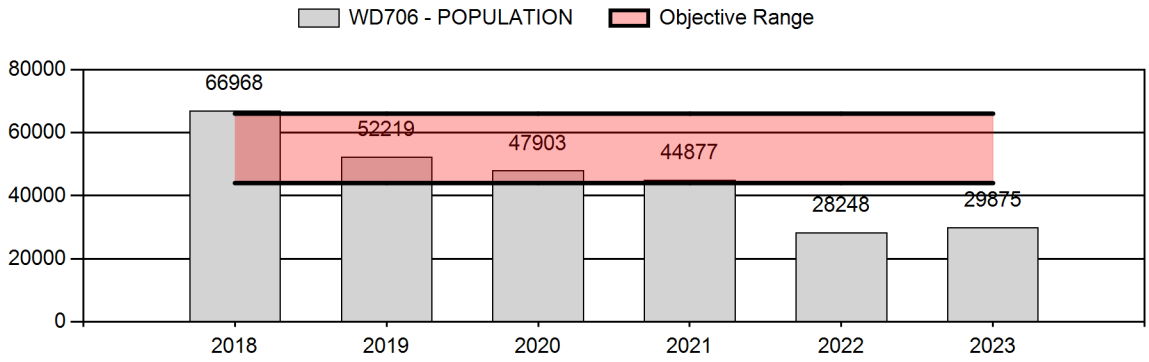
	2018 - 2022 Average	2023	2024 Proposed
Population:	48,043	29,875	34,983
Harvest:	5,143	2,023	2,450
Hunters:	8,765	4,666	4,950
Hunter Success:	59%	43%	49 %
Active Licenses:	9,169	4,793	5,100
Active License Success:	56%	42%	48 %
Recreation Days:	34,890	17,660	20,800
Days Per Animal:	6.8	8.7	8.5
Males per 100 Females	31	28	
Juveniles per 100 Females	60	52	

Population Objective (± 20%) :	55000 (44000 - 66000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-45.7%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/13/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	1.2%	1.3%
Males ≥ 1 year old:	31.0%	30.0%
Proposed change in post-season population:	+8.5%	+17.1%

Population Size - Postseason[1]



1. Population estimates are historic through 2022 and do not reflect currently modeled population estimates for those years.

2024 Hunting Seasons
Black Hills White-Tailed Deer (WD706)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
1,2,3	8	Sep. 1	Sep. 30	Nov. 1	Nov. 20	350	Doe or fawn white-tailed deer valid on private land
2	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
3	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
4	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer; the lands of the State of Wyoming's Ranch A property shall be closed
4	8	Sep. 1	Sep. 30	Nov. 1	Nov. 20	25	Doe or fawn white-tailed deer valid on private land
5	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer
6	Gen	Sep. 1	Sep. 30	Nov. 1	Nov. 20		Antlered deer

2024 Region A Nonresident Quota: 2,000 licenses

2023 Hunter Satisfaction: 51% Satisfied 24% Neutral 25% Dissatisfied

2024 Management Summary

1) **Hunting Season Evaluation:** This herd experiences cyclic population fluctuations due to weather, changes in harvest, and periodic disease outbreaks. Following a population low in 2012, the population grew steadily, peaking about 25% above objective in 2017. It then began to decline due to increased harvest and reduced recruitment. This decline was exasperated by above average mortality during the 2018-19 winter and a truly significant die off from Epizootic Hemorrhagic Disease (EHD) and Blue Tongue Virus (BTV) in 2021, followed by further EHD and BTV mortalities in 2022. As a result of back to back years of EDH / BTV outbreaks, some ranches reported losing in excess of 75% of their resident white-tailed deer, most particularly in the northern half of the herd unit.

   As this population declined, hunting seasons became more conservative between 2020 and 2023. However, even with changes to hunting seasons, hunter success steadily dropped from an average of 65% between 2014 and 2020 to 53% in 2021, and then to 45% in 2022. Similarly, hunter effort, which averaged 6.2 days per harvest between 2014 and 2020, increased to 7.8 and

9.3 days per harvest in 2021 and 2022, respectively. These changes in harvest statistics were borne out in hunter satisfaction, which fell from about 80% in both 2017 and 2018, to around 70% in both 2019 and 2020, then to 55% in 2021, and to 49% in 2022. In 2023, with the most conservative hunting season in decades, hunter success and satisfaction increased a couple percentage points, and effort declined about 0.5 days per harvest.

Non-Resident General license (Region A) issuance dropped 27% in 2022, and the hunting season closed November 20 in all hunt areas. Type 7 license issuance was also cut substantially, and 864 unsold Type 7 licenses were pulled from sale prior to the start of the hunting season. In 2023, the Region A quota was reduced another 27% to 2,000 and the hunting season closed November 17. That year, doe-fawn license issuance was reduced an additional 88%, and all doe/fawn licenses converted to Type 8, which allowed only harvest of antlerless white-tailed deer on private land. In 2024, as this herd appears to have begun to rebound, the Region A quota remained unchanged, while the season closing date returned to November 20, and an additional 100 type 8 licenses were issued. It is anticipated the 2024 hunting season will remove 30% of the adult bucks, compared to the previous three-year average of 34%.

2) **Chronic Wasting Disease (CWD):** Prior to the 2021 hunting season, just over 2,300 white-tailed deer from the Black Hills Herd Unit had been tested for CWD. The vast majority of those were hunter-harvested deer, of which about 2% were found to have the disease. However, annual prevalence rates generally increased over time. In 2021, this herd was prioritized as a Tier 1 surveillance herd. Since then, 435 hunter-harvested white-tailed deer have been tested for CWD. Prevalence estimates and sample sizes for CWD testing conducted between 2021 and 2023 are presented below (Table1). Interestingly, of all the white-tailed deer tested to date that have been reportedly harvested on the Black Hills National Forest (BHNF), only three have tested positive (two since 2017). On the BHNF there is very high hunting pressure almost exclusively focused on bucks, and this hunting pressure results in lower buck:doe ratios and mostly younger age classes of buck deer compared to what is observed on surrounding private lands. To date, no CWD management actions have occurred in this herd unit. Although, managers should continue to monitor the "hot spots" in Hunt Area 3 and within the municipalities in the Black Hills as future management actions are considered.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males (CI = 95%, n)	Yearling Males	Adult Females
2021-2023	**7.5%** (4.4% - 11.1%, n=295)	8.7% (104)	8.3% (36)

Table 1. 2021-2023 CWD prevalence for hunter-harvested white-tailed deer in the Black Hills White-Tailed Deer Herd.

In addition to hunter-harvested deer tested for CWD, the City of Sundance continued their annual deer culling operation under a Chapter 56 permit, and harvested 26 white-tailed deer within the city limits (4 males and 22 females) in 2023. All of the deer taken were tested for CWD, and two of the 26 samples tested positive (Table 2).

YEAR	Total Tested	CWD Positive	CWD Negative	Unable to Test	Percent Positive
2019	25	1	24	0	4%
2020	11	2	9	0	18%
2021	20	3	15	2	17%
2022	50	7	43	0	14%
2023	26	2	24	0	8%

Table 2. Five-Year (2019-2023) CWD positivity rate from white-tailed deer taken under the City of Sundance's Chapter 56 permit.

3) **Population Modeling:** Population estimates for this herd continue to rely on the Department's spreadsheet system. This model purposely inflates the number of bucks observed during preseason classifications by 30%, as historically this seems to be about the number of bucks missed on average during classification efforts. The model also accounts for archery harvest that occurs prior to these classifications. However, estimates produced by the model are tenuous at best. This is because the herd does not represent a closed population; sightability of bucks during pre-season classifications can vary widely; and the estimated survival rates produced are not realistic in some years. However, pre-season population estimates are well correlated with pre-season trend counts (0.87) along with hunter effort (-0.86) and success (0.84). Therefore, the trends produced by the model seem realistic.

Appendix 1

2018 - 2023 Preseason Classification Summary
White tailed Deer Herd WD706 - BLACK HILLS

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Pre Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	74,769	246	429	675	19%	1,721	47%	1,228	34%	3,624	1,641	14	25	39	± 0	71	± 0	51
2019	58,425	95	226	321	14%	1,246	54%	733	32%	2,300	1,221	8	18	26	± 0	59	± 0	47
2020	53,763	137	286	423	18%	1,239	53%	680	29%	2,342	1,039	11	23	34	± 0	55	± 0	41
2021	49,541	80	210	290	14%	1,124	56%	601	30%	2,015	936	7	19	26	± 0	53	± 0	43
2022	30,560	62	110	172	14%	702	57%	368	30%	1,242	892	9	16	25	± 0	52	± 0	42
2023	32,100	49	134	183	16%	645	55%	336	29%	1,164	909	8	21	28	± 0	52	± 0	41

2023 - JCR Evaluation Form

SPECIES: White tailed Deer

PERIOD: 6/1/2023 - 5/31/2024

HERD: WD707 - CENTRAL

HUNT AREAS: 7-14, 21-22, 34, 65-67, 88-89

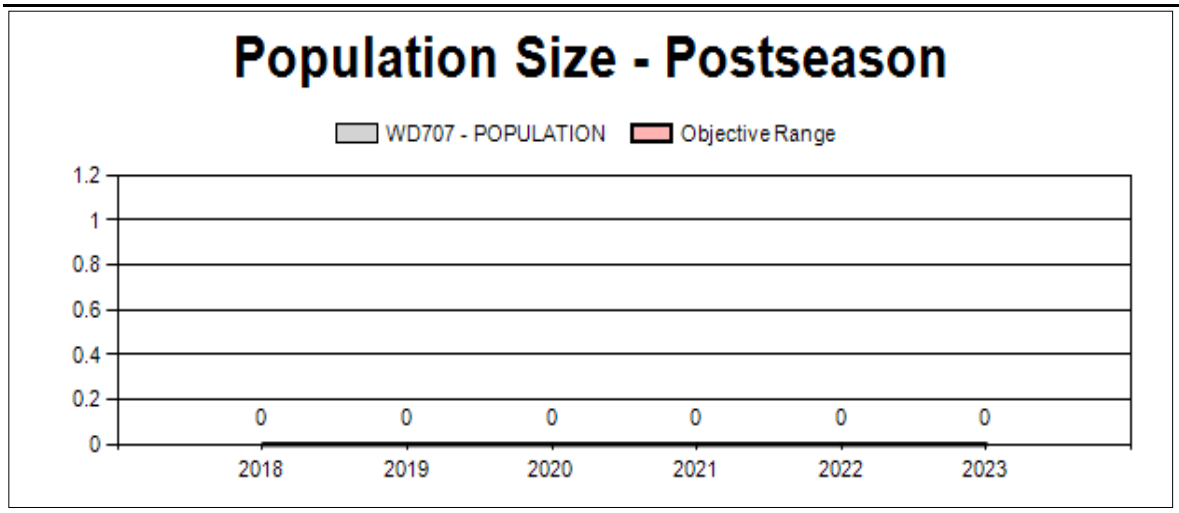
PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Population:	0	N/A	N/A
Harvest:	1,342	1,059	1,100
Hunters:	2,639	2,324	2,250
Hunter Success:	51%	46%	49 %
Active Licenses:	3,036	2,914	2,500
Active License Success:	44%	36%	44 %
Recreation Days:	11,192	11,988	10,000
Days Per Animal:	8.3	11.3	9.1
Males per 100 Females	37	0	
Juveniles per 100 Females	65	0	

Population Objective (± 20%) :	0 (0 - 0)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	0
Model Date:	None

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	0%	0%
Proposed change in post-season population:	0%	0%



2024 HUNTING SEASONS

Central White-Tailed Deer Herd Unit (WD707)

Hunt Area	License Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
8	3	Sep. 1	Sep. 30	Oct. 1	Nov. 30	50	Any white-tailed deer
8	8	Sep. 1	Sep. 30	Oct. 1	Nov. 30	50	Doe or fawn white-tailed deer
10	3	Sep. 1	Sep. 30	Oct. 1	Nov. 30	25	Any white-tailed deer
10	8	Sep. 1	Sep. 30	Oct. 1	Nov. 30	25	Doe or fawn white-tailed deer
11	Gen			Oct. 16	Nov. 30		Any white-tailed deer
11,12, 13,14	3	Sep. 1	Sep. 30	Oct. 1	Nov. 30	200	Any white-tailed deer
11,12, 13,14	8	Sep. 1	Sep. 30	Oct. 1	Nov. 30	200	Doe or fawn white-tailed deer
12	Gen			Oct. 16	Nov. 30		Any white-tailed deer
13	Gen			Oct. 16	Nov. 30		Any white-tailed deer
14	Gen			Oct. 16	Nov. 30		Any white-tailed deer
21	8	Sep. 1	Sep. 30	Oct. 1	Oct. 31	50	Doe or fawn white-tailed deer valid on private land.
22	3	Sep. 1	Sep. 30	Oct. 1	Nov. 30	75	Any white-tailed deer
22	8	Sep. 1	Sep. 30	Oct. 1	Nov. 30	100	Doe or fawn white-tailed deer
34	3	Sep. 1	Sep. 30	Oct. 15	Nov. 30	50	Any white-tailed deer
34	8			Aug. 15	Dec. 15	50	Doe or fawn white-tailed deer
65	3	Sep. 1	Sep. 30	Oct. 15	Nov. 30	350	Any white-tailed deer, also valid in that portion of Area 66 in Converse County
65	8	Sep. 1	Sep. 30	Oct. 15	Dec. 31	600	Doe or fawn white-tailed deer, also valid in that portion of Area 66 in Converse County
66,88,89	3	Sep. 1	Sep. 30	Oct. 15	Nov. 30	100	Any white-tailed deer
66,88,89	8			Aug. 15	Oct. 14	100	Doe or fawn white-tailed deer only valid in Area 88
66,88,89	8	Sep. 1	Sep. 30	Oct. 15	Nov. 30		Doe or fawn white-tailed deer

Note: The above season limitations are restricted to only those lines in the Chapter 6 Regulation that directly affect white-tailed deer hunting. Additional general and limited quota seasons occur in Hunt Areas 7-14, 21, 34, 65-66, 88, and 89 but are not captured here.

2023 Hunter Satisfaction: 53% Satisfied, 25% Neutral, 22% Dissatisfied

2024 Management Summary

1) Hunting Season Evaluation: The 2024 season structure was kept somewhat liberal to allow for high hunter opportunity within the recreational management strategy. White-tailed deer numbers had grown substantially from 2013 through 2020, and harvest also increased each year through 2020. Due to a massive EHD die-off in 2021, managers were forced to reduce licenses in 2022 given the sharp reduction of white-tailed deer. Continued documentation of EHD in 2022 prevented significant population recovery. Managers observed increased numbers of white-tailed deer and recognized improved access in Hunt Area 8 in 2023 and therefore increased license quotas in that area for 2024. Observed buck ratios of 26 bucks:100 does (n=777) were well over minimum objective ratios (>20 bucks:100 does postseason) (Table 1). The majority of white-tailed deer classifications come from Hunt Areas 7, 8, 9, 13, 14, and 65. Fawn ratios have shown a steady decrease over the past 6 years. Hunt Area 8 – Type 3 licenses were increased by 25 and a new Type 8 license was added with 50 licenses available. Managers observed a lower number of white-tailed deer in Hunt Area 22 during the hunting season and while conducting classifications. Because of the lower numbers and low harvest success rates, Type 3 licenses were reduced by 25 and Type 8 licenses were reduced by 50 in Hunt Area 22. The Hunt Area 65 – Type 8 license quota was decreased by 100 due to poor success rates and low deer densities following recent EHD outbreaks. Most limited quota white-tailed deer licenses for the Central White-tailed Deer Herd Unit sold out in 2023. Hunt Area 65 had 21 Type 8 licenses remaining at the end of the season.

2) Chronic Wasting Disease Management: CWD sample sizes within the Central White-Tailed Deer Herd Unit were not sufficient to report an accurate prevalence for most hunt areas. Increased sampling effort was put forth in Hunt Areas 22 & 65 in conjunction with priority mule deer surveillance in 2023. In Hunt Area 65, from 2021-2023, managers were able to obtain 86 CWD samples from adult white-tailed deer. Of those samples, 4 were positive for a prevalence of 4.6%. Managers are working on a small-scale CWD project in Hunt Area 65 tracking CWD status within an area known for high densities of white-tailed deer northwest of Douglas.

3) Population Modeling: There is no population model constructed for this herd unit.

Table 1.

2018 - 2023 Postseason Classification Summary

for White tailed Deer Herd WD707 - CENTRAL

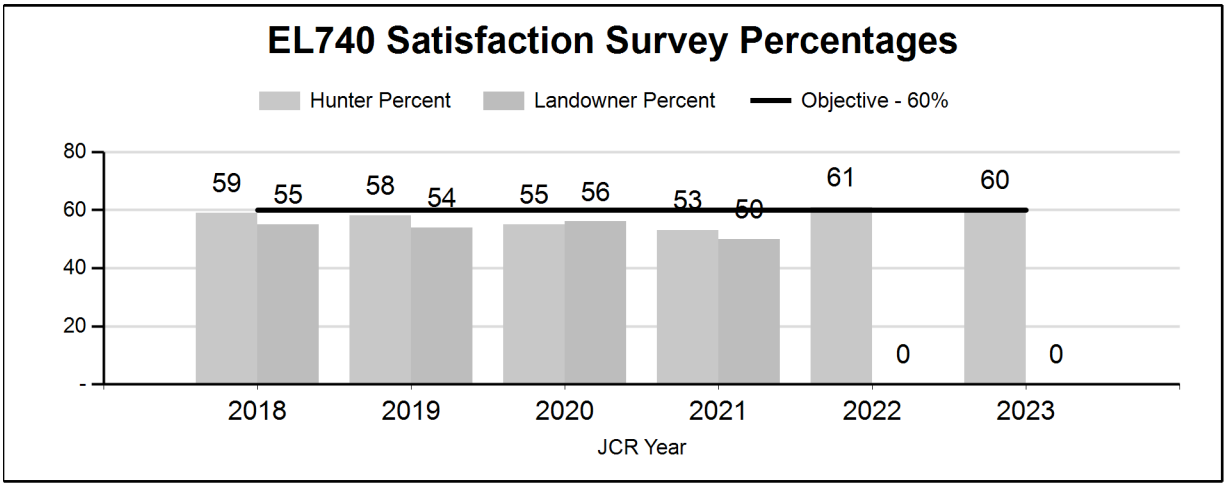
		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	0	90	161	251	19%	601	46%	456	35%	1,308	0	15	27	42	± 0	76	± 0	54
2019	0	41	65	106	13%	420	51%	299	36%	825	0	10	15	25	± 0	71	± 0	57
2020	0	84	244	328	21%	772	49%	466	30%	1,566	0	11	32	42	± 0	60	± 0	42
2021	0	19	36	55	19%	151	52%	87	30%	293	964	13	24	36	± 0	58	± 0	42
2022	0	44	98	142	18%	421	53%	228	29%	791	0	10	23	34	± 0	54	± 0	40
2023	0	40	73	113	15%	443	57%	221	28%	777	0	9	16	26	± 0	50	± 0	40

2023 - JCR Evaluation Form

SPECIES: Elk
HERD: EL740 - BLACK HILLS
HUNT AREAS: 1, 116-117

PERIOD: 6/1/2023 - 5/31/2024
PREPARED BY: JOE SANDRINI

	2018 - 2022 Average	2023 [a]	2024 Proposed
Hunter Satisfaction Percent	57%	60%	60%
Landowner Satisfaction Percent [b]	54%	N/A	N/A
Harvest:	751	1,168	1,500
Hunters:	1,986	2,273	2,900
Hunter Success:	38%	51%	52%
Active Licenses:	2,051	2,737	2,750
Active License Success:	37%	43%	55%
Recreation Days:	18,874	25,552	32,500
Days Per Animal:	25.1	21.9	21.7
Males per 100 Females:	N/A	N/A	
Juveniles per 100 Females	N/A	N/A	
Satisfaction Based Objective [c]			N/A
Management Strategy:			Reduce Elk Numbers
Percent population is above (+) or (-) objective:			N/A
Number of years population has been + or - objective in recent trend:			N/A



[a] Does not include harvest on auxillary licenses

[b] Landowner data not collected since 2021

[c] Objective under review since 2023. Current management direction is to reduce elk numbers on private land to address damage complaints.

2024 Hunting Seasons
Black Hills Elk (EL740)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
1	1	Sep. 1	Sep. 30	Oct. 15	Nov. 30	100	Any elk
1	4	Sep. 1	Sep. 30	Oct. 15	Nov. 30	75	Antlerless elk
116	Gen	Sep. 1	Sep. 30	Oct. 15	Nov. 10		Any elk
116	Gen			Nov. 11	Nov. 30		Antlerless elk
116	1	Sep. 1	Sep. 30	Nov. 11	Dec. 31	100	Any elk valid off national forest
	1			Jan. 1	Jan. 31		Antlerless elk valid off national forest
116	7			Aug. 15	Jan 31	400	Cow or calf valid off national forest
117	Gen			Sep. 1	Nov. 30		Antlerless elk valid south of U.S. Highway 16
117	1	Sep. 1	Sep. 30	Oct. 15	Nov. 30	500	Any elk
117				Dec. 1	Jan. 31		Antlerless elk
117	3	Sep. 1	Sep. 30	Oct. 15	Jan. 31	350	Spike or antlerless elk
117	6	Sep. 1	Sep. 30	Oct. 15	Jan. 31	150	Cow or calf
117	8			Aug. 1	Jan. 31	Unlimited	Cow or calf valid on private land

2024 Region E Nonresident Quota: 600

2023 Hunter Satisfaction: 60% Satisfied 22% Neutral 18% Dissatisfied

2023 Landowner Satisfaction: N/A[1]

2024 Management Summary:

1) **Hunting Season Evaluation:** The harvest strategy for this herd continues to be harvesting as many elk as possible on private land given the limited access afforded to hunters. To facilitate harvest, a Hunt Management Coordinator has been hired each year since 2017 to assist hunters with access to private land. In 2023, an auxiliary hunting season was also implemented in Hunt Area (HA) 117, and a minimum of 121 elk (104 cows and 17 calves) and an estimated 144 elk (124 cows and 20 calves) were harvested under the Chapter 34 authorization. Auxiliary license

[1] Bio-Year 2021 was the last year these data were collected.

harvest details are as follows:

- **Auxiliary Elk Hunt Area 117**
  - Crook County – 5 participating landowners
  - Weston County – 25 participating landowners
  - Season Dates: August 1, 2023 – January 31, 2024
  - 241 Auxiliary licenses issued
  - Minimum harvest = 121 elk (104 cows and 17 calves)
  - Estimated harvest = 144 elk (124 cows and 20 calves)

Summarized harvest data for all hunter take in HA 117 (harvest survey and auxiliary harvest data combined) are presented in Appendix 2. Together, it is estimated the HMAP program and auxiliary season increased elk harvest in HA 117 about 175 head over the traditional season structure. In addition to these programs, regular license issuance in Hunt Area (117) was increased 25% in 2023. Increases in license issuance and the auxiliary season resulted in a 41% increase in the total number of licenses issued for this particular hunt area compared to the previous year. This yielded an estimated harvest of 999 elk from HA 117,[2] and a total estimated harvest of 1,312 elk from the herd unit as a whole.

Changes to the 2024 hunting season were structured to give landowners more flexibility to reduce elk numbers, while maintaining bull quality and attempting to diminish hunter crowding on accessible public land. To these ends, 2024 changes included: Increasing HA 116 Type 7 license issuance 33%; decreasing HA 117 Type 1 license issuance 17%; eliminating HA 117 Type 2 and Type 4 licenses and replacing those license types with a Type 3 license valid for spike or antlerless elk; dropping the lowest success license, HA 117 Type 6, issuance by 50 tags; eliminating HA 117 Type 7 licenses; and issuing unlimited HA 117 Type 8 licenses valid on private land, with the ability for hunters to have an unlimited number of these tags. The reduction in HA 117 Type 1 licenses (despite 2023 reported harvest success being 63%) was enacted because local managers believe the harvest estimate is biased high (see footnote 3), especially given that issuance of this license type was increased 50% in 2023. Something that resulted in significant crowding on accessible public land and complaints from Type 1 license holders regarding crowding and the lack of access to private land. It is speculated that the 2024 season structure changes will result in a harvest of about 1,500 elk from the herd unit.

2) **Management Objective Review:** See Appendix 1

3) **Chronic Wasting Disease (CWD):** To date, about 350 elk from the Black Hills have been tested for CWD. Since 2021, 83 hunter harvested elk having been tested, with 74 of those having been taken in HA 117. In total, three hunter-harvested elk from HA 117 have tested positive for the disease, but only one since 2021. The only other CWD-positive elk found in the Black Hills have been four targeted surveillance elk, three from HA 117, and one from HA 1. However, very few elk from HA 116 have been tested. To date, no CWD management

[2] The estimated harvest is likely biased high, especially on HA 117 Type 1 and General Licenses. This is due to successful hunter response bias not being accounted for, and the fact that HA 117 Type 1 harvest projections were based upon just 40 resident and 17 nonresident 117 Type 1 licenses holders (10% of the license holders) reporting they harvested 34 elk; and only 2 General License holders responding that they hunted that portion of HA 117 open to General License hunting.

strategies have been implemented in this herd unit.

4) **Population Data:** In late February of 2016 and 2020, The Department partially funded South Dakota Game Fish & Parks (SDGF&P) helicopter-based, late winter elk sightability surveys. This funding was used to survey a significant portion of occupied elk habitat in HAs 1 & 117. In 2016, 31 subunits were surveyed and 923 elk observed. This yielded a sightability estimate of 1,091 elk (CL = 988 - 1,521) within the survey area. In 2020, 42 subunits were flown and 1,519 elk found. This effort produced a sightability estimate of 1,687 (CL = 1,584 - 2,118). Directly comparing the 31 subunits flown in both 2016 and 2020 revealed a 36% increase in the estimated number of elk present. However, changes in elk distribution may have influenced the magnitude of the relative change. In both years, most groups of elk observed were not classified due to their large size.

   In late February of 2024, a trend count in HA 117 was conducted. The survey was done from a Bell Jet Ranger helicopter flown at an average altitude above ground level (AGL) of 350 feet, along eighteen, north-south transects spaced about 2 miles apart (Appendix 3), at an average ground speed of 45 knots. Some deviation from the established AGL, ground speed, and set lines (up to about ½ mile) was allowed to augment sightability of elk and increase efficiency. Just over eight hours of total survey time were expended, and about 450 miles of survey flight were flown. The weather varied from overcast to clear, with temperatures ranging from 27 to 47 degrees F and winds 5- 15 MPH. Snow cover was fairly nonexistent, except for some north facing slopes and on USFS lands, where it ranged from 15% to 90%. A total of 1,702 elk were counted, with larger groups being videotaped and then counted and classified after the survey. Observers were familiar with elk distribution, and conjectured that sightability of cow and calf groups was about 90%, that of spike elk 85%, and mature bulls only 25%. Consequently, we estimate about 2,100 elk were wintering in the hunt area. At a meeting of Hunt Area 117 landowners following the trend count, no suggestions were proffered from the landowners when asked by the Department as to percentage change they would like to see in elk numbers. Instead, a general direction was received to reduce elk numbers and collect future trend count data.

APPENDIX 1

BLACK HILLS ELK HERD UNIT (E740)
MANAGEMENT OBJECTIVE REVIEW - 2024

Herd Unit: E740 *(Black Hills Elk)*

Region: Casper

Biologist: Joe Sandrini, Sr. Wildlife Biologist – Newcastle

Last Herd Objective Review: 2018

Current Objectives:

1. 60% Landowner Satisfaction
2. 60% Hunter Satisfaction

Current Sub-Objective: Age Distribution of Harvested Bulls *(± 5% in all categories)*:

- 20% aged ≤ 2 years old
- 60% aged 3 to 5 years old
- 20% aged 6 years old, or older

Management Strategy: Private Land

Proposed Objective: Winter Trend Count (3-yr avg.), with number to be finalized in February, 2025 after 2-yrs. of flight data collection and landowner meetings. At that time, a revised management objective proposal will be submitted for approval. In the interim, the management direction will be to reduce elk numbers in HA 116 & HA 117, while maintaining high hunter success in HA 1. We will also work towards harvesting bulls at a rate that leads to about 40% harvest mortality, with 20% of that harvest being older aged bulls (6^+ yrs. old).[1]

Proposed Sub-objective: Structured bull harvest, based upon a three year average.

- Annual, bull harvest mortality rate of 40% *(± 5%)*
- 20% *(± 5%)* of bulls harvested aged 6^+ years old

Proposed Management Strategy: Private Land

[1] See attached management plan.

HERD UNIT DESCRIPTION

The Black Hills Elk Herd Unit is comprised of Hunt Areas (HA's) 1, 116, & 117. It is located in the northeast corner of Wyoming and encompasses approximately 3,270 mi^2, of which 1,920 mi^2 are considered occupied habitat. Elk are not ubiquitous across occupied habitat. Rather, they tend to move about depending upon range conditions, snow depth and human activity, with some areas seeing regular elk use and others very infrequent use. Approximately 73% of the occupied habitat is private land, with the single largest block of public land being found on the Black Hills National Forest (BHNF), which contributes 14% of the occupied habitat. HA 1 is 97% public land, and represents the largest contiguous block of public land extensively inhabited by elk. Elk do occur in other areas of the Black Hills National Forest and dispersed sections of other federally owned and State of Wyoming lands. However, elk use and hunter harvest in those areas are not consistent.

The herd unit boundary has been revised several times over the past 30^+ years following alterations in hunt area boundaries. The herd's seasonal range map was last updated in 2003 using field observations and contacts with landowners to make delineations. Changes to crucial winter range were not made at the time due to the lack of protracted, severe winter weather. That same year, a small portion of the Black Hills formerly outside the Herd Unit (Elk Mountain) was included to better reflect elk distribution and habitat. In 2008, that area was incorporated into HA 117, while the northwest third of HA 117 and a large portion of HA 116 were placed into HA 129. However, the herd unit boundary and seasonal range map were not adjusted to reflect these changes because existing maps adequately captured elk habitat and use in the Black Hills. In 2013, the HA 116 boundary was again redefined such that the three hunt areas comprising the herd unit again aligned with the herd unit boundary, encapsulating Wyoming's Black Hills ecosystem. Beginning in 2022, due to increasing elk numbers in HA 126, allowance was made to allow General License holders and HA 126 Type 6 license holders the ability to hunt that portion of HA 117 south of U.S. Highway 16. This has resulted in fewer elk straying into Wyoming from South Dakota in this portion of the herd unit. Consequently, it is proposed for 2025 that this portion of the Black Hills herd unit be removed, returning the HA 117 and herd unit boundary to what it was just prior to 2008.

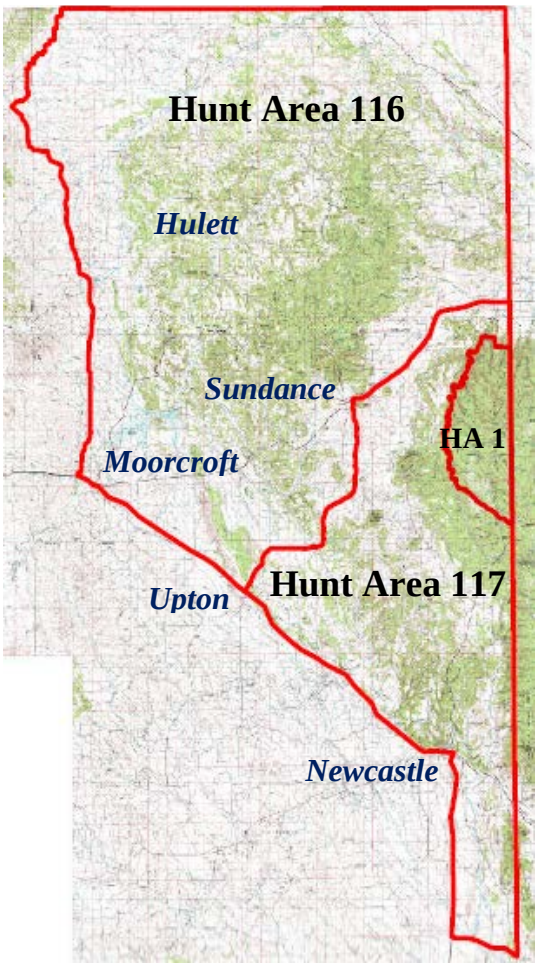


Figure 1. Black Hills Elk Herd Unit and Hunt Area Boundaries.

Is the herd at or trending toward the current and/or proposed objective, current and/or proposed sub-objectives, and current and/or proposed management strategy?

- Current objectives
  - Hunter satisfaction – Yes
  - Landowner satisfaction – Unknown

- Current Sub-objectives – No (Figure 5)

- Current Management Strategy – N/A (private land)

- Proposed objectives – To be determined.

- Proposed sub-objectives – To be determined.

- Proposed Management Strategy – N/A (private land)

Bio-Year 2023 Hunter Satisfaction: 60% Satisfied, 22% Neutral, 18% Dissatisfied

Bio-Year 2021 Landowner Satisfaction (see footnotes):

Landowner Satisfaction JCR [2]	*18% Below*	*49% At*	*34% Above*
Landowner Satisfaction Surveyed [3]	*43% Satisfied*	*14% Neutral*	*43% Dissatisfied*

Most Recent 3-year Running Average Hunter Satisfaction: 58%

Most Recent 3-year Running Average Landowner Satisfaction: N/A

Secondary management objective, relative distribution of ages of harvested bulls: [4]

Bull Harvest	***Objective***	**2020**[5]	**2022**	**2023**
Bulls 0-2 yrs. old	*20%*	22%	11%	12%
			3 yr. mean	**15%**
Bulls 3-5 yrs. old	*60%*	62%	61%	44%
		3 yr. mean		**56%**
Bulls 6+ yrs. old	***20%***	16%	28%	44%
			3 yr. mean	**29%**

[2] Data from Bio-Year 2021. This was the last year these data were collected, and represent landowner responses when asked if elk numbers are below, at, or above desired level.
[3] Data from Bio-Year 2021. This was the last year these data were collected, and represent landowner responses when asked specifically about satisfaction in the same manner as the harvest survey of hunters.
[4] The majority of age structure data are from HA's 1 & 117.
[5] Insufficient tooth age data collected in 2021. Therefore, 2020 data used for 3-yr avg.

Current Objective Review and Discussion:

Management of the Black Hills Elk Herd Unit (E740) has significantly challenged Department personnel for over three decades, as elk numbers and occupied habitat have increased dramatically, along with depredation complaints. Consequently, hunting seasons have been consistently liberalized. However, limited access to private land for hunters allowed continued herd growth. Recognizing the impracticality of managing elk numbers towards a numerical objective, the herd was managed under the Department's criteria for landowner and hunter satisfaction between 2013 and 2023. Despite numerous alterations to hunting season structure, damage complaints persisted and satisfaction levels remained essentially unchanged. As a result, during the management objective review process for this herd in 2023, it was decided to manage more formally towards what had been the per se management direction - to reduce and prevent elk damage. Therefore, local game managers proposed a depredation-based management objective that retained reasonable hunter success and satisfaction, without requiring herd composition surveys. After an internal review, this objective was not adopted. Instead, the process was begun to develop a winter trend count objective that maintains bull quality and helps address depredation concerns. This process is currently underway and, based upon the results of a pilot trend count in HA 117 and a recent landowner meeting, seasons will be structured to reduce elk numbers over the next three-years as trend count data become available.

The current management objectives for this herd were adopted in 2013. That objective framework stated all landowners receiving landowner elk licenses and other landowners whose property see regular elk use, or have expressed an interest in elk management, would receive a mail survey with prepaid response envelopes every three years; and annual one on one visits would be conducted during non-survey years.[6] However, between 2015 and 2022, the Department annually conducted the former in lieu of the latter based upon administration direction.

When landowner satisfaction was first quantified for bio-year 2012, 167 Black Hills landowners were mailed a short survey to gauge their satisfaction with elk numbers and determine support for a non-numerical objective. A total of 71 landowners responded, and slightly more than 60% of these noted they were satisfied, very satisfied, or neutral with respect to elk numbers. The criteria used to gauge landowner satisfaction were formalized in bio-year 2014 when it was deemed landowners reporting elk numbers to be "at, or about at" desired levels were to be considered satisfied, while those reporting numbers to be "above" or "below" desired levels categorized as dissatisfied. As such, survey results for bio-years 2012 and 2013 were reanalyzed using these criteria where they could be teased from the responses collected. Consequently, the recorded satisfaction values were changed to 59% and 43% for bio-years 2012 and 2013, respectively. Unfortunately, due to the timing of survey efforts and administrative direction regarding satisfaction measurement criteria, no landowner satisfaction survey data meeting the revised standards were collected for bio-year 2014.

Then, each January between 2016 and 2022 (representing bio-years 2015-2021), a pre-paid return mail survey was sent to about 160 Black Hills landowners. Subtracting for undelivered surveys, the response rate averaged close to 50% annually. Overall, despite changes in hunting season structure and harvest, little changed with respect to landowner satisfaction. Although, there was a slight shift towards more respondents being dissatisfied because elk numbers were too high, and/or

[6] See "Final Black Hills Herd Unit and Population Review" adopted by the Dept. and Commission in 2013.

elk were causing damage – notably in HA 117. Responses to landowner satisfactions surveys for bio-years 2015 through 2021 are presented in Figures 2, 3, & 4.

It should be noted, when attempting to quantify landowner satisfaction, reasons for satisfaction are not strictly tied to perceptions of elk numbers. Therefore, using reports of "at, or about at" "above," and "below" desired levels as satisfaction measures is questionable. These criteria are not measures of satisfaction per se, and while they are likely associated to some degree with satisfaction, they are simply subjective indications of perceived elk numbers relative to personal desire. Therefore, to better tease out true satisfaction, another set of questions was asked each year specifically enquiring about landowner's satisfaction level with elk numbers and their reason(s) for dissatisfaction. Between bio-years 2015 and 2021, on average 12% more respondents stated elk numbers were "at, or about at" desired than stated they were satisfied or very satisfied with elk numbers.

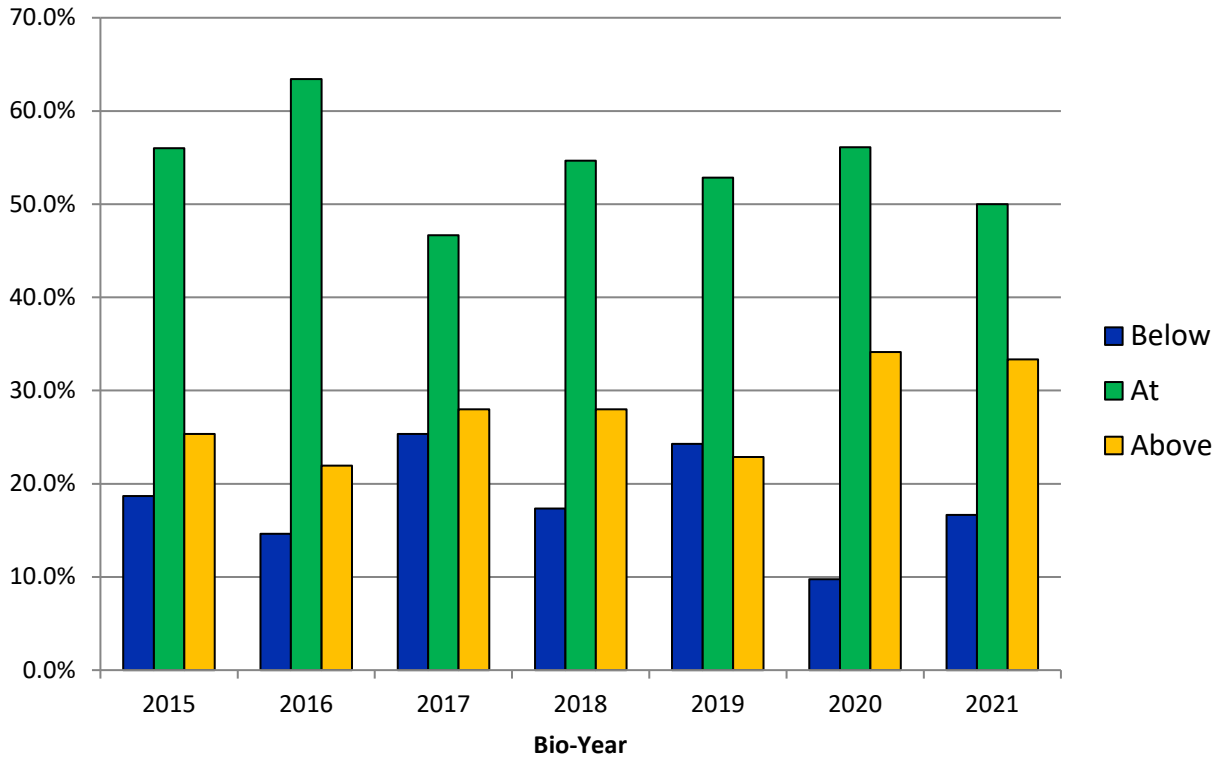


Figure 2. Percentages of Black Hills landowners reporting perceptions of elk numbers compared to "desired level."

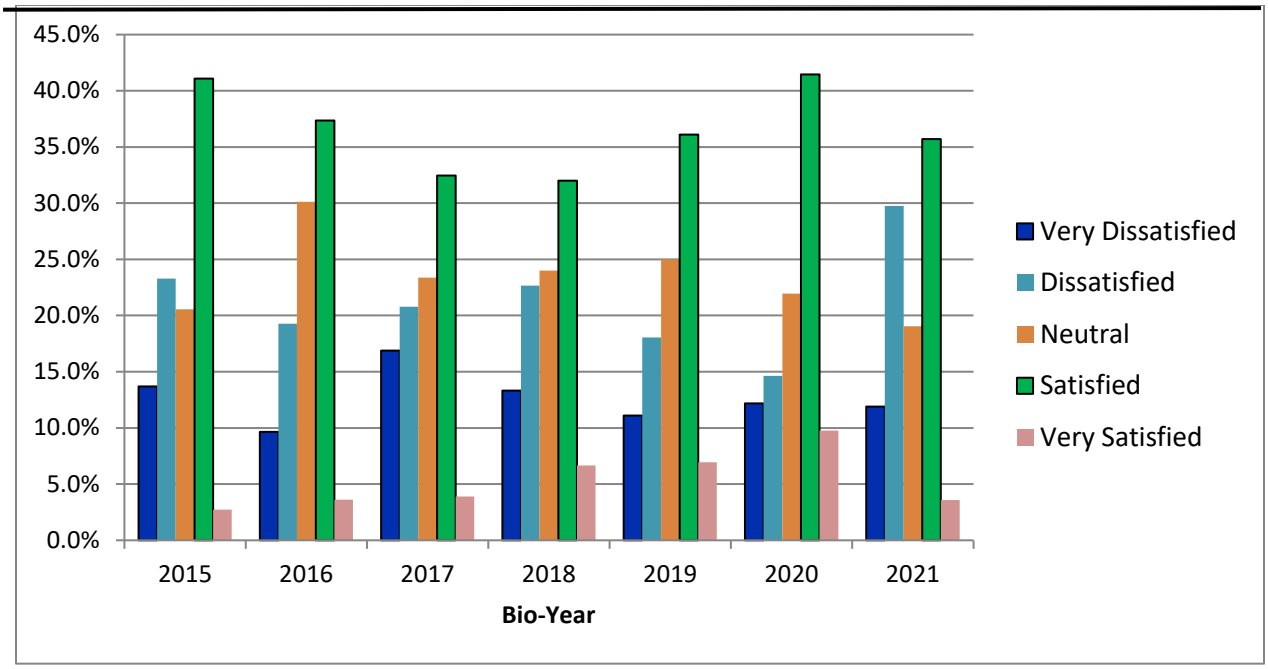


Figure 3. Percentages of landowners reporting various satisfaction levels with elk numbers in the Black Hills.

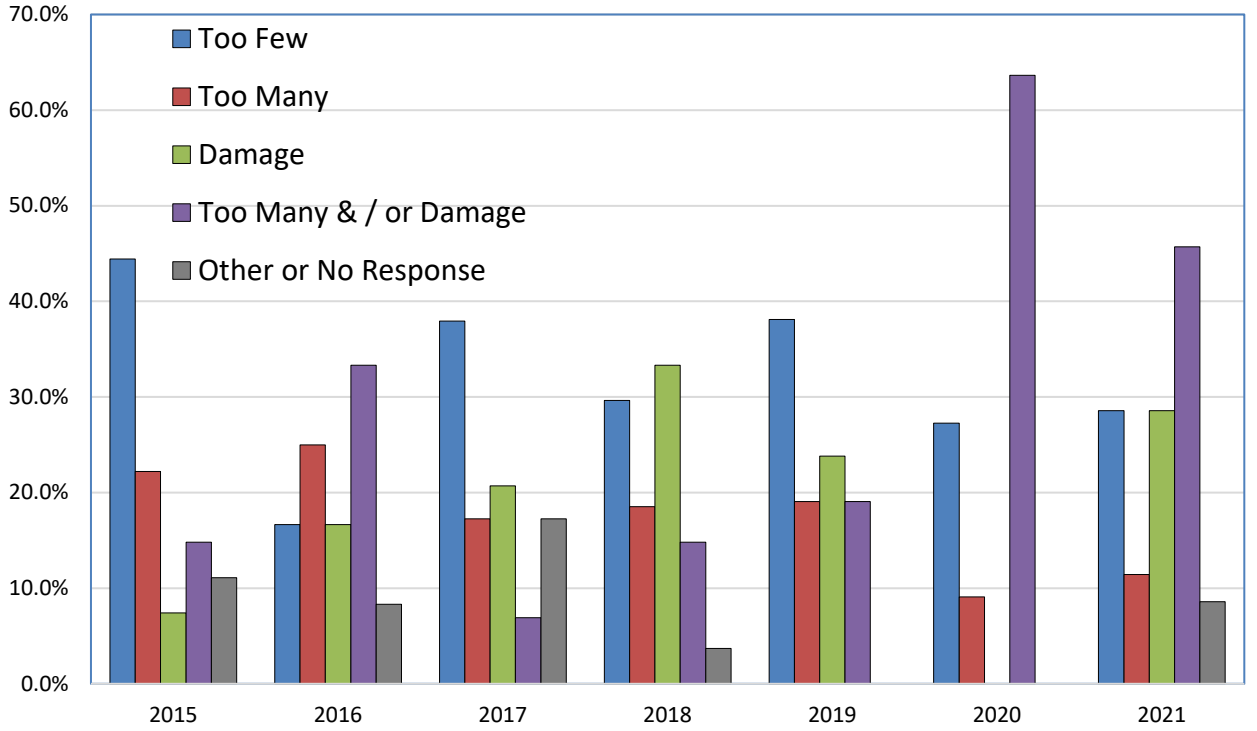


Figure 4. Reason(s) for dissatisfaction with elk numbers in the Black Hills.

Overall, these survey data demonstrate how difficult it is to broadly quantify landowner satisfaction in the Black Hills. In general, properties here are relatively small by typical Wyoming ranch standards, and many are not dependent on agriculture for profit. A significant portion of landowners in the Black Hills enjoy having elk around and would like to see more, as would other non-traditional landowners who have purchased property for hunting. On the other hand, there are traditional ranching landowners negatively impacted by elk who are frustrated with the damage they cause and the lack of hunting on adjoining or nearby properties. As such, these two contingents are diametrically opposed in what they desire in the way of elk numbers. The result of these disparate positions is an increase in overall dissatisfaction.

Due to differing reasons for landowner dissatisfaction and the fact changes in elk management have not resulted in significant alterations to satisfaction, local game managers are proposing to move to a three-year, average winter trend count objective. The proposed change is also being put forth to better quantify and reduce the number of elk causing damage and depredation complaints. With adoption of this objective, the Department will conduct trend counts the next two years and meet with landowners following these counts to establish a winter trend count objective number during the 2025 season setting process. Until then, hunting seasons will be structured to aggressively reduce elk numbers in HA 116 and HA 117, while maintaining limited entry for hunters and relatively high success rates in HA 1.

Have private landowners, Federal land managers, hunters or others expressed concerns about the ability of the habitat to support the current objective?

- Not with regard to the current satisfaction objective.

Have private landowners, Federal land managers, hunters or others expressed concerns about population levels? Provide details, including trends in hunter satisfaction statistics, for each below.

Landowners:

Landowner surveys conducted between 2016 and 2022 indicated fairly steady satisfaction, with the majority of landowners stating elk numbers were at their desired level, together with a slight trend towards more considering numbers to be above their desired number. The 2018 survey asked an additional question: “Do you support the current management objectives?” 58% indicated support, while 21% did not, and 21% had no opinion. In addition, while most of the 2018 survey respondents voiced an opinion about the management objectives, it is important to consider only 41% of the total landowners receiving a survey responded to the question. This suggests most landowners were not too interested in our management objectives. Further, only one of the respondents who stated they did not support the objectives offered a reasonable answer to the follow up question, “If you do not support the current objective, what would you like to see changed?” That single response requested decreasing harvest mortality on older bulls. Instead, the remainder of the respondents expressed complaints about license issuance, damage or some other issue.

Regardless of the satisfaction survey results over the past decade, this timeframe witnessed a steady increase in the number of traditional landowners frustrated with damage and depredation

caused by elk, especially in HA 117. Consequently, the harvest strategy implemented for this herd was to take as many elk as possible on private land given the limited access afforded to hunters. To facilitate harvest, a Hunt Management Coordinator was hired each beginning in 2017 to help hunters access private land, and an auxiliary hunting season was conducted in Hunt Area (HA 117) in 2023. It is estimated in 2023 the HMAP program and auxiliary season increased elk harvest in HA 117 about 175 head over the traditional season structure. In addition to these programs, regular license issuance in Hunt Area (117) has steadily increased. The 2023 regular and auxiliary license issuance resulted in a 41% increase in the total number of licenses issued for HA 117 compared to the previous year. This resulted in an estimated 2023 harvest of 999 elk[7] from HA 117, and an estimated harvest of 1,312 elk from the herd unit as a whole.

Hunters: In Wyoming, elk hunter success is highly correlated with hunter satisfaction. Since 2013, hunter success on all license types in the Black hills has averaged 34%, while hunter satisfaction has averaged 55%. That noted, in 2013, HA 116 moved from limited quota license hunting to a General License season combined with a significant number of cow/calf licenses. Due to very limited access to elk hunting on private land, this resulted in a large number of General License holders hunting the National Forest where few elk reside. As such, hunter success on General Licenses has been very low, averaging 17% since 2013. This poor success rate is reflected in low hunter satisfaction in HA 116, where satisfaction has averaged 46% during the same timeframe. Low satisfaction in HA 116 biases the herd unit hunter satisfaction numbers low, since a large number of hunters at the herd unit level are sampled annually from HA 116. In contrast, since 2013, hunter satisfaction in HA 1 and HA 117 have averaged 68% and 64%, respectively. Aside from the concerns regarding hunter satisfaction in HA 116 there have not been any concerns expressed with hunter satisfaction, except for complaints about limited access to hunt private land, and, more recently, complaints about hunter crowding on accessible public lands.

Federal or State Land Managers:

South Dakota Game Fish and Parks (SDGF&P): We have collaborated with SDGF&P annually regarding elk management, and they are provided with Wyoming's harvest report for consideration when setting harvest strategies for South Dakota. SDGF&P is currently managing the South Dakota portion of the Black Hills (excluding Custer State Park and Wind Cave National Park) for 7,000 wintering elk, within a range of 6,000 to 8,000 depending on habitat conditions.[8] To date, SDGF&P's forage estimates indicate elk numbers in South Dakota are well within habitat carrying capacity.

Black Hills National Forest (BHNF): The following is from SDGF&P's elk management plan[9]:

> *The Black Hills National Forest encompasses western South Dakota and northeastern Wyoming, covering an area approximately 110 miles north to south and 70 miles east to west… Elk were evaluated in the Forest Planning process because of public*

[7] The estimated harvest is likely biased high, especially on HA 117 Type 1 and General Licenses. This is due to successful hunter response bias not being accounted for, and the fact that HA 117 Type 1 harvest projections were based upon just 40 resident and 17 nonresident 117 Type 1 licenses holders (10% of the license holders) reporting they harvested 34 elk; and only 2 General License holders responding that they hunted that portion of HA 117 open to General License hunting.

[8] South Dakota Department of Game, Fish and Parks. 2015. South Dakota Elk Management Plan 2015-2019. Completion Report 2015-01. South Dakota Department of Game, Fish and Parks, Pierre, South Dakota, USA.

[9] IBID

demand and interest in the species, and were labeled as a demand species along with five other game animals and fish… (The) BHNF can implement site-specific considerations for elk if abundance, availability and condition of elk habitat have been proposed by the public… and identified by BHNF as important and substantial land management issues, but BHNF is not required to do so.

The 1997 Revised Forest Plan allocated forage to livestock, deer and elk across the entire BHNF… There are 135 grazing allotments on BHNF with approximately 262 permittees in both South Dakota and Wyoming. (Forage) allocation across BHNF in Wyoming and South Dakota has remained the same for the Phase II Forest Plan used today with the following caveats:

- *Wildlife spend 85% of their foraging time on BHNF and 15% off BHNF.*
- *50% of the forage produced is available for use by livestock and wildlife.*
- *Livestock generally graze BHNF five months from June 1 – October 31.*
- *Estimation of wildlife forage needs is calculated on a 100% (year-round basis)*

Livestock are considered cattle with age classes of yearlings, bulls, dry-cows and cows with calves. There are no sheep, goat, horse or buffalo allotments on BHNF.

- *Forage utilization and condition depend on variables such as weather, use patterns and different species' diet overlap for forage.*
- *AUM (animal unit month) is the tenure of one animal-unit for one month. For 1 livestock AUM, it is considered one mature 1,000-pound cow and her calf with the average daily forage consumption of 33-lbs. of dry matter/day.*
- *An elk AUM is 0.462 and a deer is 0.1.*

The BHNF 1997 Revised Forest Plan calculated forage needs for wildlife and livestock. The Forest Plan estimated that 70,000 deer and 4,500 elk would utilize approximately 87% of the USFS forage allocation for wildlife. The estimates for deer and elk used in the Forest plan were compiled after consultation with SDGFP and WGFD, and represented state agency goals at that time. These population estimates were not based on data from research or aerial surveys; rather they were based on limited survey data and qualitative assessments of elk densities by agency staff. During the winter of 2013 SDGFP conducted an aerial survey of all elk management units in the Black Hills and calculated elk densities based on a logistic regression sightability model. The aerial survey methodology and sightability model are based on current research findings from studies conducted by South Dakota State University. The aerial survey yielded an estimate of 5,077 (95% CI 4,807-6,116; excludes WICA and CSP) elk which is the first scientific and quantitative estimate of elk in the Black Hills of South Dakota. This estimate cannot be compared with previous population estimates or goals because 2013 was the first time the entire Black Hills in South Dakota had been surveyed. It is the goal of SDGFP to base future population estimates and objectives for elk on aerial survey data and the best scientific data available. Due to substantial changes to forest habitats caused by fires and the mountain pine beetle epidemic, forage estimates from the 1997 Forest Plan underestimate current forage availability. South Dakota Game, Fish, and Parks staff has estimated current available forage based on the 1997 Forest Plan and a

conservative estimate of additional forage available due to fire and the mountain pine beetle epidemic.

Since Wyoming's management objectives for this herd were revised in 2013, BHNF staff have not expressed any concerns or dissatisfaction with elk numbers or management direction in the Wyoming portion of the Black Hills. However, personal contacts with grazing permittees by WGFD personnel indicate some feel elk numbers are too high on the BHNF and would like to see them reduced. Overall, there seems to be more concern with elk numbers on private land.

Wyoming State Agencies: To date, no Wyoming State agency has expressed any concern or dissatisfaction with elk numbers or management direction in the Wyoming portion of the Black Hills.

Where applicable, do Rapid Habitat Assessment and other habitat data indicate the current objective is sustainable? While quantitative data for the Wyoming portion of the Black Hills are not available, we have no concerns about the habitat sustaining the current number of elk. This is supported anecdotally from field observations and data collected by SDGF&P.

Have there been any major environmental (wildfire, invasive species, drought, etc.), development (subdivision, industrial, etc.) or other changes in the herd unit that keep it from being managed toward objective? There have been no major changes that are preventing the herd unit from being managed towards the current and proposed objectives. The greatest environmental change over the past decade have been wildfires that have burned a significant amount of occupied habitat, increasing its carrying capacity for elk.

In your professional opinion, are the current objective, sub-objectives and management strategy attainable? What is your recommendation for each? Provide details for each below:

OBJECTIVES: The current satisfaction-based management objectives are, in all probability, not sustainably attainable. As noted above, it is unlikely 60% landowner satisfaction (based upon the "at," "above," or "below" desired level criteria) will be achieved due to the makeup of landowners in the Black Hills. Further, because elk hunter satisfaction is so closely tied to harvest success (requiring about 45% overall success to yield to 60% hunter satisfaction), as long as elk numbers on public land in HA 116 remain low and access to private land limited, low harvest success will translate into lower satisfaction. Finally, due to the need to better address traditional landowner concerns about depredating elk and the damage they cause, a numerically based objective is recommended. To this end, a three-year, average winter trend count objective would be the most cost effective and efficient method to gauge and manage elk numbers. Such an objective would quantify changes in elk numbers and demographics allowing managers to better analyze and adjust harvest strategies to direct the trajectory of elk numbers, and hence the amount of damage they cause.

SUB-OBJECTIVES: Long-term harvest statistics, tooth age data, and public input suggest the current sub-objectives of this herd are reasonable, and can be attained. However, betweem 2011

and 2018, as the herd grew at what was probably a much higher rate than the past five years, there was a trend towards harvesting more middle aged bulls and fewer young and old bulls. Since 2018, as Type 1 license harvest increased substantially and Type 2 and Type 3 licenses were introduced to encourage harvest of younger bulls, this trend has been reversed, with greater numbers of old and young bulls now being taken (Figures 5).[10]

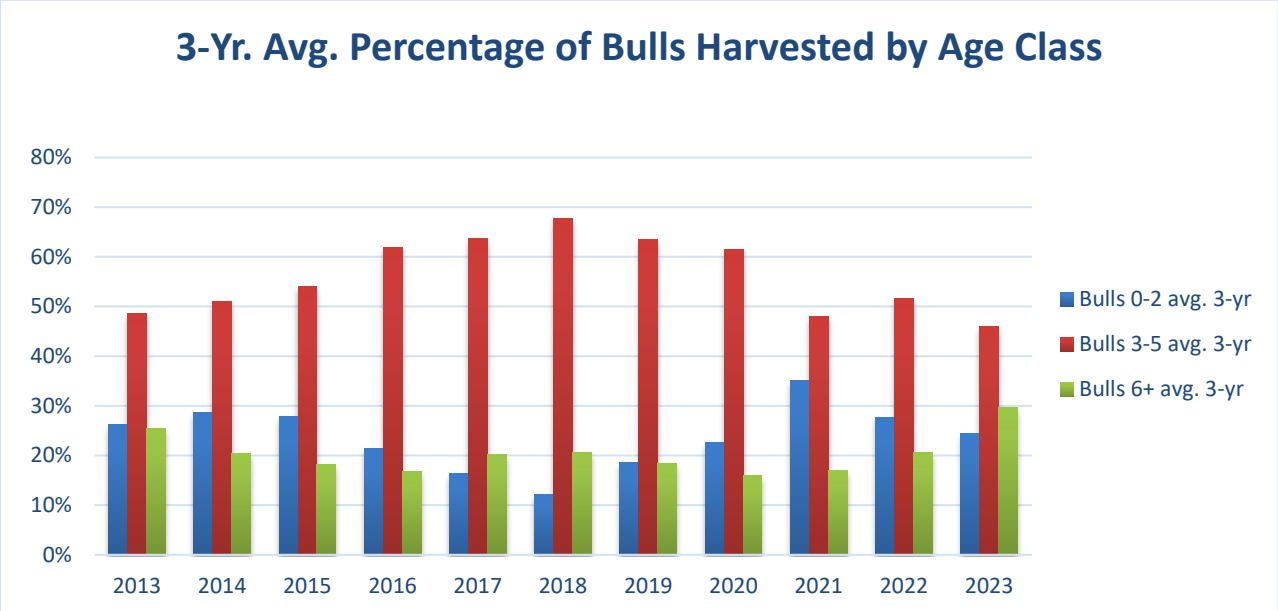


Figure 5. Three-year average percentage of bulls harvested by age class.

It was noted in the 2018 objective review for this herd that larger relative increases in antlerless versus any elk license issuance was resulting in an increasing percentage of female elk in the harvest. Further, it was proffered that if this population was to stabilize or decline we would expect to see an increase in the percentage of younger-aged bulls harvested, as availability of older bulls declined with decreased recruitment into older age classes. It does appear we are now harvesting relatively more younger-aged bulls (less than 5 years old), but this has likely been augmented more by Type 2 and 3 license issuance rather than reduced recruitment. Of note, however, is the substantial increase in older "trophy aged" bulls harvested the past two years as Type 1 license issuance dramatically increased. Between 2011 and 2021, 6^{+} year old bulls comprised on averaged 19% of the annual bull harvest. That figure jumped to 28% and 44% in 2022 and 2023, respectively. Consequently, in order to maintain a number of older, trophy class bulls in the population, there is a need to reduce harvest of older age class bulls, while still maintaining adequate bull harvest to ensure reasonable bull:cow ratios. Therefore, we are proposing a sub-objective change to manage for 40% harvest mortality on bulls, but that 20% or less of the harvest be comprised of bulls aged 6 years or older.

MANAGEMENT STRATEGY: The private land management strategy works well for this herd because the vast majority of occupied habitat is private land; and sex and age composition data

[10] The vast majority of the age structure data of bull harvest is from HA117.

cannot be reliably collected without a significant expenditure of money and personnel time. Further, landowners and hunters do not seem to be as concerned about managing for a given bull:cow ratio as they do being able to meet their expectation of having a reasonable chance to harvest an older aged bull when they draw a Type 1 licenses. To that end, limiting take of older-age class bulls while harvesting a substantial proportion of the youngest bulls makes sense.

Date Submitted by Regional Wildlife Supervisor –

Date Approved by Deputy Chief Wildlife Division –

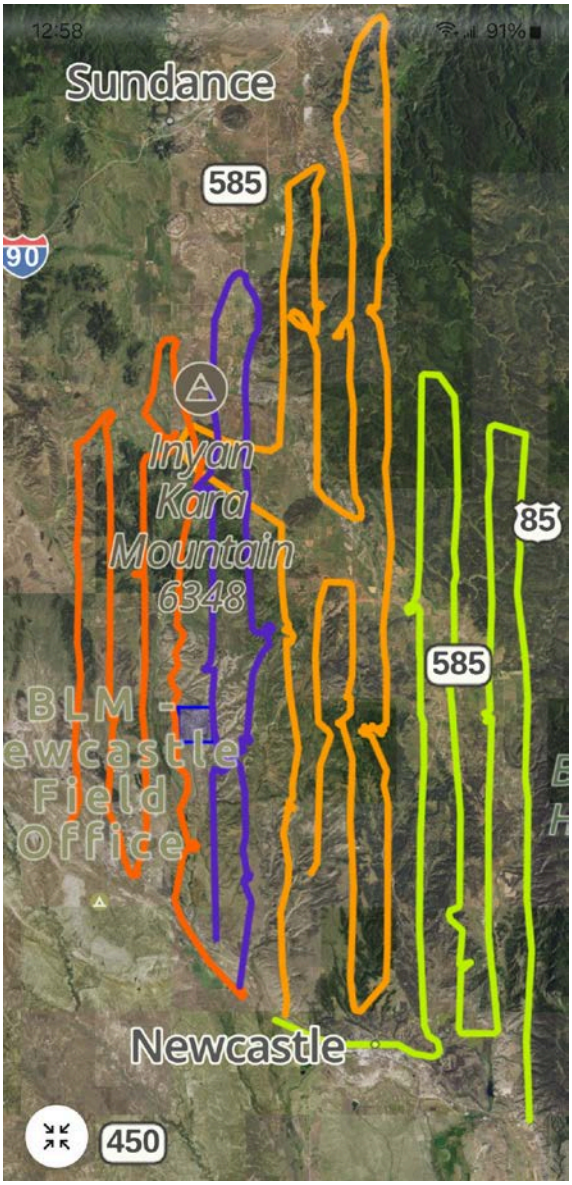
Appendix 2

Elk Area 117 Summarized Harvest Data

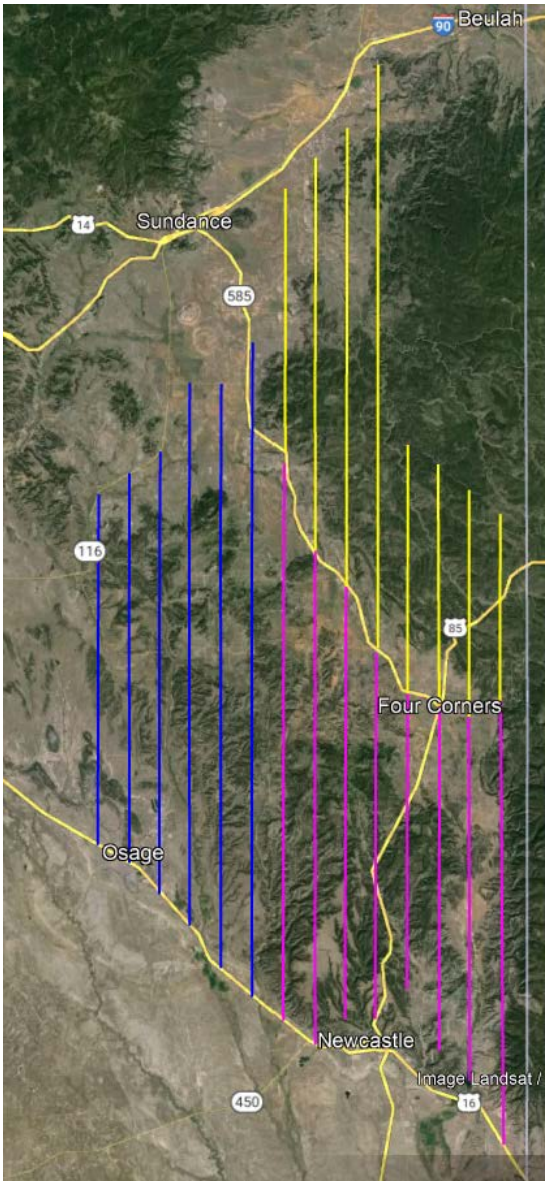
Hunt Area	License Type	ACTIVE	HARVEST					HUNTER SUCCESS	DAYS / HARVEST	HUNTER DAYS	Lic. SOLD
		LICS/HTRS	**BULL**	**SPIKE**	**COW**	**CALF**	**TOTAL**				
117 South Black Hills	Full 1	564	**272**	**19**	**56**	**6**	**353**	62.6%	19.7	6,960	600
	Full 2	216	**59**	**7**	**25**	**7**	**98**	45.4%	25.3	2,481	252
	Full 4	81	**0**	**0**	**30**	**0**	**30**	37.0%	28.6	859	98
	Reduced 6	156	**0**	**0**	**35**	**11**	**46**	29.5%	30.4	1,398	174
	Reduced 7	589	**0**	**0**	**253**	**63**	**316**	53.7%	17.6	5,558	744
	General	*16*	***12***	***0***	***0***	***0***	***12***	*75.0%*	*4.3*	*51*	*n/a*
	AUX-8	**211**	**0**	**0**	**119**	**25**	**144**	**68.2%**	**5.5**	**1,161**	**241**
	Pooled Total	**1,833**	**343**	**26**	**518**	**112**	**999**	**54.5%**	**18.5**	**18,468**	**2109**

Appendix 3

Hunt Area 117 Trend Count Lines – 2023
(color coded by flight and observers)



Actual Flight Pattern



Delineated Trend Count Lines

2023 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2023 - 5/31/2024

HERD: EL741 - LARAMIE PEAK/MUDDY MOUNTAIN

HUNT AREAS: 7, 19

PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Population:	13,102	12,071	9,919
Harvest:	2,114	2,295	2,500
Hunters:	4,786	4,193	5,250
Hunter Success:	44%	55%	48 %
Active Licenses:	4,869	4,713	5,500
Active License Success:	43%	49%	45 %
Recreation Days:	36,273	33,548	40,000
Days Per Animal:	17.2	14.6	16
Males per 100 Females	39*	17*	* Not accurate ratios
Juveniles per 100 Females	42	31	

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

Management Strategy: Special

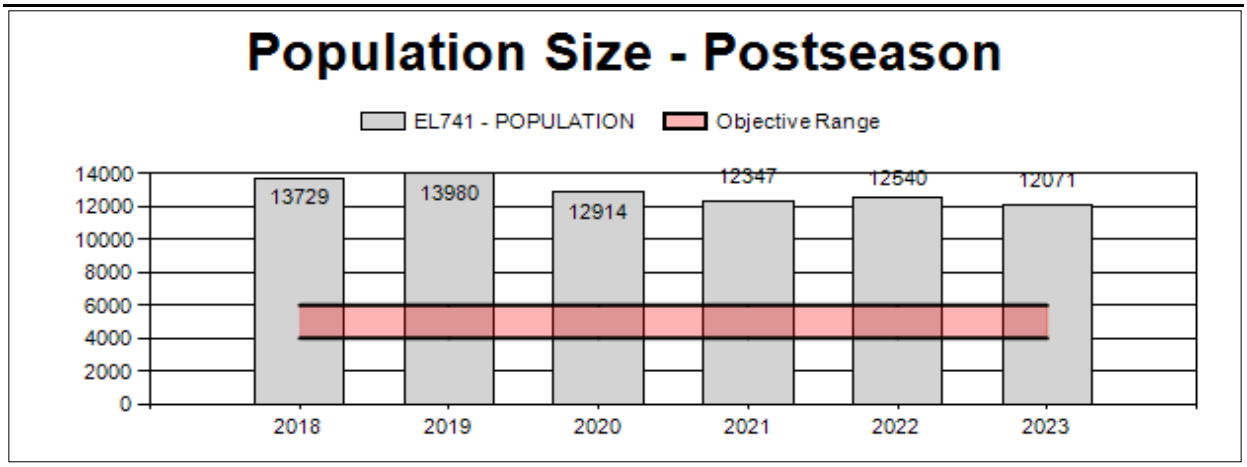
Percent population is above (+) or below (-) objective: 141%

Number of years population has been + or - objective in recent trend: 23

Model Date: 02/27/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	16.4%	24.9%
Males ≥ 1 year old:	20.8%	23.5%
Proposed change in post-season population:	-16.2%	-17.8%



2024 Hunting Seasons

Laramie Peak/Muddy Mountain Elk Herd Unit (EL741)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
7	1	Sep. 1	Sep. 30	Oct. 15	Nov. 20	1500	Any elk
7	1			Nov. 21	Dec. 31		Antlerless elk
7	2			Nov. 21	Dec. 31	350	Antlered elk five (5) points or less on either antler; valid in Converse County
7	4	Sep. 1	Sep. 30	Oct. 15	Dec. 31	800	Antlerless elk
7	6	Sep. 1	Sep. 30	Oct. 15	Dec. 31	1000	Cow or calf
7	8			Aug. 15	Oct. 14	Unlimited	Cow or calf valid on private land in Albany and Carbon Counties; also valid in all of Platte County; not valid in Converse or Natrona Counties
7	8			Oct. 15	Dec. 31		Cow or calf valid off national forest
19	1	Sep. 1	Sep. 30	Oct. 1	Oct. 14	150	Any elk
19	1			Dec. 1	Dec. 14		Any elk
19	1			Dec. 15	Jan. 31		Antlerless elk
19	2	Sep. 1	Sep. 30	Nov. 1	Nov. 20	175	Any elk
19	2			Dec. 1	Dec. 14		Any elk
19	2			Dec. 15	Jan. 31		Antlerless elk
19	4	Sep. 1	Sep. 30	Oct. 1	Oct. 14	125	Antlerless elk
19	4			Nov. 21	Jan. 31		Antlerless elk
19	5	Sep. 1	Sep. 30	Nov. 1	Jan. 31	125	Antlerless elk
19	6	Sep. 1	Sep. 30	Oct. 1	Oct. 14	225	Cow or calf
19	6			Nov. 1	Jan. 31		Cow or calf

2023 Hunter Satisfaction: 65% Satisfied, 19% Neutral, 16% Dissatisfied

2024 Management Summary

1) Hunting Season Evaluation: The 2024 season structure continued to be liberal in an effort to maximize harvest to reduce this population toward objective. Elk numbers in this herd unit continue to remain far above objective despite very liberal license issuance and long season length. For the 2024 season, the existing season structure for bull harvest was unchanged due to concerns of public land saturation, especially during the archery season. The Hunt Area 7 – Type 4 quota was reduced by 400 licenses and the Type 6 quota was reduced by 1,250 licenses. The August 15-October 14 rifle seasons for Type 4 & 6 licenses were also removed. Type 4 licenses were maintained to accommodate applicant demand in 2024 and are proposed to be removed entirely in 2025. To address damage concerns, a Type 8 license was added to Hunt Area 7. This license will be valid mainly on private lands during the early season and open area-wide off National Forest

starting October 15. The Type 8 license will have an unlimited quota and will not be subject to the 3 license maximum per license holder. Managers will continue to address chronic elk damage issues with Chapter 34 Auxiliary Management Seasons outside of normal season dates. Hunt Area 19 license issuance remained the same due to hunter saturation during any-elk seasons and low harvest success on antlerless and cow/calf licenses.

A significant mid-October snowstorm during fall 2023 caused earlier elk movements to lower elevations in Hunt Area 7. It melted out quickly with mild conditions ensuing, providing good access throughout the remainder of the hunting seasons. This likely attributed to higher than average hunter success and decreased days to harvest in Hunt Area 7.

The weather in Hunt Area 19 in 2023 was extremely mild, which lead to many elk taking refuge on one large private ranch with limited hunting access. Due to an overall lack of snow and cold weather, many of these elk remained on this ranch throughout the season. Despite the mild weather, Hunt Area 19 saw the largest bull harvest since 2017 at 185. The previous 5-year average annual bull harvest is 154. The harvest success on the Type 1 (62%) was the highest since 2017, with Type 2 success being about average for recent years. This high success can be attributed to both of those licenses being valid for any elk in December, an extended season length that has only recently been in place. Harvest success on the Type 1 license in October is usually good as bulls are more dispersed at the end of the breeding season. During the November and December seasons bachelor groups of bulls often leave the safety of a private land refuge and move onto public lands, which can also lead to good harvest success. Cow harvest was about average at 107. The harvest success on full price antlerless licenses (Type 4 and 5) was good, but poor on the Type 6.

No flight time was allocated to the Laramie Peak/Muddy Mountain Herd Unit for classifications in 2023. However, managers were able to classify a large number of elk in conjunction with aerial mule deer surveys. All classifications were done by helicopter, with 2,336 elk being classified (Table 1). As noted in the evaluation form, reported male classification ratios are not representative of actual ratios. The lack of elk-specific aerial surveys and limited ground access in recent years allows managers to obtain a good sample size of cows and calves for a juvenile ratio, but limited mature bull classifications which skews male:female ratios in years we do not fly intensive surveys.

In 2023, managers collected antler class data (n=101) from hunter-harvested bull elk. Class II (>=6 points, heavy 5x5) bulls made up 73% of the sample. Antler classification data has also been collected since 2008 during postseason classification surveys. In Hunt Area 7, the percentage of Class II bulls being classified is showing a downward trend while the percentage of Class I bulls is increasing (Table 2). This contradicts tooth age data which shows the average age of harvested bulls is increasing. This is also likely an artifact of not conducting aerial surveys designed to garner accurate elk sex ratios.

Beginning in February 2024, managers deployed GPS tracking collars on 40 cow elk in the southern portion of Area 7. The main objective of this study is to observe interactions with sympatric collared mule deer. These collars will be also used to document elk survival and movements.

This herd has been over objective for many years. Managers continue to make efforts to maximize female harvest and work to preserve public land hunting quality with license quotas and limitations. The addition of Type 8 licenses will assist in that effort by allowing more flexibility and options to maximize harvest and minimize damage on private lands.

During the 2024 hunting season, there were two authorizations for auxiliary elk harvest in this herd unit under the Chapter 34 Regulation. In total a minimum of 198 elk and an estimated 206 elk (193 cows and 13 calves) were harvested under these authorizations in addition to totals reported in the harvest survey. Details are as follows:

- Auxiliary Hunts 5 & 7 – Elk Hunt Area 7
    - Converse County – 15 participating landowners
    - Season Dates: July 24, 2023 – March 15, 2024
    - 195 Auxiliary licenses issued
    - Minimum harvest = 101 cow or calf elk
    - Estimated harvest = 96 cows and 13 calf elk

- Auxiliary Hunt 9 – Elk Hunt Area 7
    - Converse County – 1 participating landowner
    - Season Dates: August 9, 2023 – March 15, 2024
    - 100 Auxiliary licenses issued
    - Total harvest = 97 cow elk

Tooth age data was requested from all elk harvested with auxiliary management licenses. Ages were obtained for 146 elk total. Ages ranged from 0.5-17.5 years old with an average age of 6.3 years.

2) Chronic Wasting Disease Management: This is a Tier 1 surveillance herd that was prioritized for CWD sampling in 2022. Although not prioritized, 103 samples were received in 2023 from hunter harvested elk. Of those, only 2 tested positive. The 3 year prevalence for this herd unit with 417 samples is 3.8%. To date, no meaningful CWD management actions have occurred in this herd unit.

3) Population Modeling: The TSJ,CA Spreadsheet model was used to estimate the post-hunt population of 12,100 in 2023. The last abundance estimate was completed in February 2019 for this herd unit, which estimated a total of 11,182 elk. This gave managers a much more accurate population estimate which increased confidence in model estimates going forward. A sightability survey was conducted in May 2024, although the analysis will be reported in the Bioyear 2024 JCR. This will further help anchor the population model and help us better understand the effects of harvest on the population over the past 5 years. This herd will remain well above objective for the foreseeable future. Access for female harvest will need to significantly increase throughout the entire herd unit before harvest will effectively reduce the population.

Table 1.

2018 - 2023 Postseason Classification Summary

for Elk Herd EL741 - LARAMIE PEAK/MUDDY MOUNTAIN

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Ylng	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2018	13,729	853	1,630	2,483	27%	4,855	52%	2,021	22%	9,359	602	18	34	51	± 1	42	± 1	28
2019	13,980	120	188	308	16%	1,125	60%	454	24%	1,887	888	11	17	27	± 2	40	± 3	32
2020	12,914	132	130	262	14%	1,153	60%	518	27%	1,933	898	11	11	23	± 2	45	± 3	37
2021	12,347	120	202	322	25%	638	51%	303	24%	1,263	745	19	32	50	± 4	47	± 4	32
2022	12,540	212	368	580	15%	2,331	61%	923	24%	3,834	630	9	16	25	± 1	40	± 2	32
2023	12,071	170	101	271	12%	1,572	67%	493	21%	2,336	0	11	6	17	± 1	31	± 2	27

Table 2. Hunt Area 7 Post-Season Classifications and Tooth Age Data

Calendar Year	Spike Bull: 100 Cows	Adult Bull: 100 Cows	Total Bull: 100 Cows	% Class I	% Class II	Average Age Harvested Bull
2008	11	15	26	24	76	
2009	12	25	37	47	53	
2010	18	26	44	48	51	4.6
2011	10	19	29	68	32	3.5
2012	10	19	29	55	45	5.2
2013	12	18	30	58	42	6
2014	9	10	19	64	36	5.6
2015	15	15	30	74	26	4.8
2016	14	19	33	70	30	6.3
2017	12	20	32	71	29	6.4
2018	18	34	52	59	41	6.1
2019	12	20	32	56	44	6
2020	10	13	24	73	27	6.1
2021	19	32	50	66	34	7.0
2022	9	15	23	56	44	6.7
2023	10	7	17	68	32	6.3

2023 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2023 - 5/31/2024

HERD: EL742 - RATTLESNAKE

HUNT AREAS: 23

PREPARED BY: BRANDON WERNER

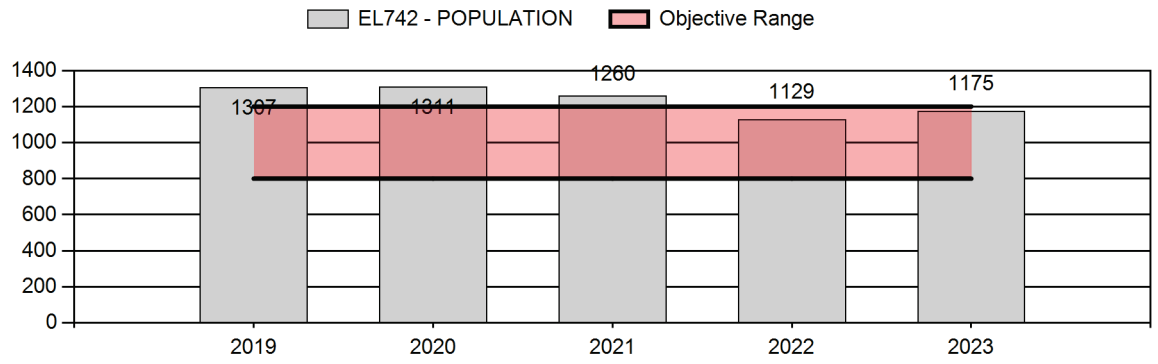
	2018 - 2022 Average	2023	2024 Proposed
Population:	1,273	1,175	1,088
Harvest:	170	218	185
Hunters:	402	404	420
Hunter Success:	42%	54%	44%
Active Licenses:	444	483	500
Active License Success:	38%	45%	37%
Recreation Days:	3,949	4,868	4,900
Days Per Animal:	23.2	22.3	26.5
Males per 100 Females	30	15	
Juveniles per 100 Females	38	29	

Population Objective (± 20%) :	1000 (800 - 1200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	18%
Number of years population has been + or - objective in recent trend:	32
Model Date:	02/21/2024

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

	JCR Year	Proposed
Females ≥ 1 year old:	16%	12.2%
Males ≥ 1 year old:	21%	25%
Proposed change in post-season population:	-17.43%	-8%

Population Size - Postseason



2024 HUNTING SEASONS
RATTLESNAKE ELK HERD (EL742)

Hunt Area	Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
23	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	175	Any elk
				Nov. 15	Dec. 15		Any elk; Also valid in area 128 east of Castle Gardens Road (Fremont County Road 507), east of Wyoming Highway 136, east of Ore Road (Fremont County Road 5), and north of Beaver Rim Road (B.L.M. Road 2401)
	4	Sep. 1	Sep. 30	Oct. 1	Oct. 31	200	Antlerless elk
				Nov. 15	Dec. 15		Antlerless elk; Also valid in area 128 east of Castle Gardens Road (Fremont County Road 507), east of Wyoming Highway 136, east of Ore Road (Fremont County Road 5), and north of Beaver Rim Road (B.L.M. Road 2401)
	6	Sep. 1	Sep. 30	Oct. 1	Oct. 31	200	Cow or calf
				Nov. 15	Dec. 15		Cow or calf; Also valid in area 128 east of Castle Gardens Road (Fremont County Road 507), east of Wyoming Highway 136, east of Ore Road (Fremont County Road 5), and north of Beaver Rim

							Road (B.L.M. Road 2401)

2023 Hunter Satisfaction: 60% Satisfied, 21% Neutral, 19% Dissatisfied

2024 Management Summary:

1) **Hunting Season Evaluation:** The 2024 season structure was maintained as it has been for the last several years, with the goal of maximizing cow harvest in an over-objective herd with constrained public access. Harvest success on Type 1 licenses tends to be good from year to year, in the 50-60th percentile, but was low in 2023 at just 43%. Harvest on females is consistently poor due to large numbers of cows and calves taking refuge on one property that does not allow hunting access. In 2023, elk rarely left the private land sanctuary, despite this the hunter harvest survey stated there was near record cow harvest. Hunter satisfaction declined dramatically in 2023. Based on extensive hunter field checks as well as low satisfaction, and prolonged observations of elk in the private land sanctuary, managers feel the harvest survey may be overestimating antlerless harvest in 2023. A total of 1,117 elk were classified from a helicopter in 2023 when conducting annual mule deer surveys.

   Additional Type 1 and 4 licenses were added due to elk population expansion further east in the herd unit, as well as being able to hunt in Area 128 in the November and December season. Later in the fall elk consistently move from Area 23 into Area 128. In 2023, there were at least 16 elk harvested in HA 128 in the late season on Type 4 and 6 licenses. For 2024, Type 1 licenses will also be valid for any elk in Area 128 from November 15 - December 15. All Area 23 licenses will be restricted in Area 128 to east of Castle Gardens Road (Fremont County Road 507), east of Wyoming Highway 136, and east of Ore Road (Fremont County Road 5) and north of Beaver Rim Road (B.L.M. Road 2401). This will concentrate hunters in the northeast part of Area 128 where elk cross the Dry Creek Road and Gas Hills Road. Managers are also exploring adding license types and splitting hunting seasons to reduce hunting pressure in 2025. Field managers will continue working with landowners to improve access and increase harvest to the extent possible.

2) **Management Objective Review:** No objective review is scheduled for 2024.

3) **Population Modeling:** Small herd size, disparate harvest of males versus females, skewed classification data, and an open population make accurate modeling of this herd difficult. The addition of an abundance estimate for the 2019 bio-year helped to better align the model. The spreadsheet model selected for the 2024 was the Time Specific Juvenile, Constant Adult Survival, Male Survival Coefficient. This model was selected because of a lower AIC value while providing a reasonable estimate. The post hunt population estimate is 1,175 for 2023 and 1,088 in 2024. However, this model is likely under estimating the population given 1,117 elk being classified in 2023. The population is indeed greater than 1,175 elk. The model also

predicts this population is trending toward objective. However, calculations of female harvest percentages indicate cow harvest would have to increase one and a half times just to maintain the herd. Managers feel like the herd is reaching carrying capacity and elk are dispersing into adjacent herd units.

2019 - 2023 Postseason Classification Summary

for Elk Herd EL742 - RATTLESNAKE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2019	1,307	66	216	282	27%	603	58%	155	15%	1,040	428	11	36	47	± 2	26	± 1	18
2020	1,311	27	59	86	20%	275	63%	76	17%	437	481	10	21	31	± 4	28	± 4	21
2021	1,260	52	2	54	7%	476	60%	267	34%	797	512	11	0	11	± 1	56	± 3	50
2022	1,129	47	64	111	14%	476	59%	215	27%	802	483	10	13	23	± 2	45	± 3	37
2023	1,175	51	67	118	11%	775	69%	224	20%	1,117	0	7	9	15	± 0	29	± 1	25

2023 - JCR Evaluation Form

SPECIES: Elk

PERIOD: 6/1/2023 - 5/31/2024

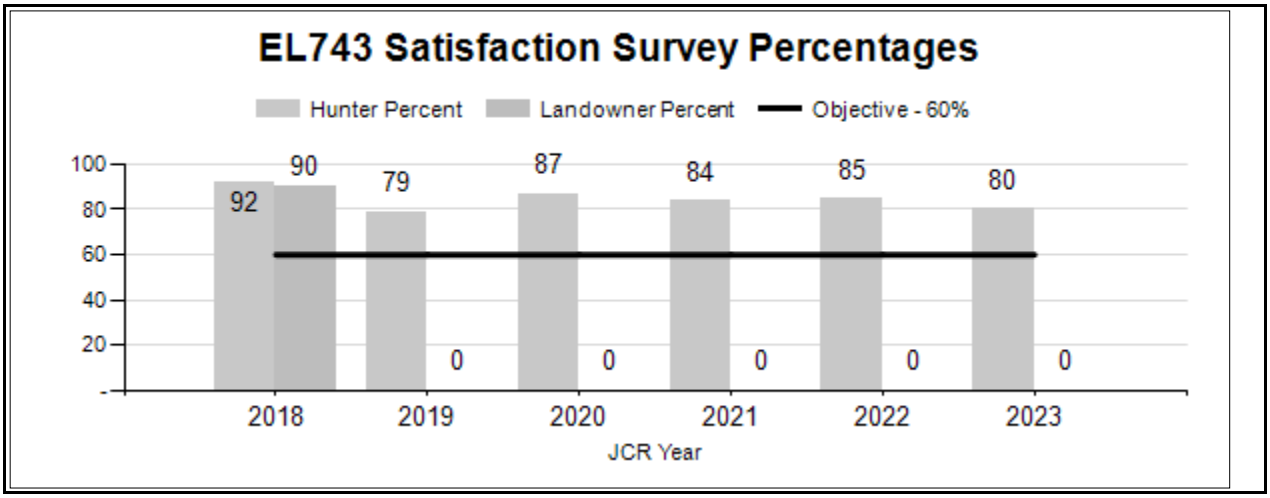
HERD: EL743 - PINE RIDGE

HUNT AREAS: 122

PREPARED BY: MATT HUIZENGA

	2018 - 2022 Average	2023	2024 Proposed
Hunter Satisfaction Percent	85%	80%	90%
Landowner Satisfaction Percent	18%	0%	50%
Harvest:	152	187	225
Hunters:	198	327	350
Hunter Success:	77%	57%	64 %
Active Licenses:	208	360	325
Active License Success:	73%	52%	69 %
Recreation Days:	656	1,528	1,000
Days Per Animal:	4.3	8.2	4.4
Males per 100 Females:	39	44	
Juveniles per 100 Females	35	59	

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



2024 Hunting Seasons
Pine Ridge Elk Herd Unit (EL743)

Hunt Area	License Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
122	1	Sep. 1	Sep. 30	Oct. 1	Nov. 30	150	Any elk
122	1			Dec. 1	Dec. 31		Antlerless elk
122	2			Oct. 15	Nov. 30	100	Antlered elk five (5) points or less on either antler
122	6	Sep. 1	Sep. 30	Oct. 1	Dec. 31	150	Cow or calf
122	8			Aug. 1	Jan. 31	Unlimited	Cow or calf valid on private land

2023 Hunter Satisfaction: 80% Satisfied, 11% Neutral, 9% Dissatisfied

2023 Landowner Satisfaction: 0% Below desired levels, 0% At or about at desired levels, 100% Above desired levels

2024 Management Summary

1) Hunting Season Evaluation: The majority of elk are located on private land or inaccessible (or difficult to access) public land in this area. Licenses are therefore issued based primarily on the amount of private land access allowed by landowners. The 2024 season structure was set to address a landowner-perceived growing population, high bull ratios, and minimize over-crowding of the minimal public land access points. As a result of the lack of public access, Type 6 licenses generally do not sell out for this area. Managers adjust the Type 6 license quota to address demand and access. To increase flexibility on private lands and decrease hunter pressure on public lands, Type 6 licenses were reduced by 200 and a new unlimited Type 8 license valid on private land only was added. To address high bull ratios along with a desire to maintain bull quality, 100 Type 2 licenses were added for antlered elk, 5 points or less on either antler (Table 1). This season was implemented later to spread out pressure during the Type 1 season as well as limit elk hunters during the deer and antelope seasons.

There is no population model for this herd. Minimum population size and trend is based off aerial winter trend counts and landowner input, resulting in a minimum estimate of approximately 1,000 elk. As this herd unit has not been a priority for aerial composition or abundance surveys, managers have not estimated herd size. However, both managers and landowners agree the current population size likely exceeds 1,000 and could possibly be closer to 2,000. Field personnel have been directed to revise the objective for this herd from a satisfaction-based objective to either a postseason numeric or mid-winter trend count objective. Given the pending objective revision coupled with the need to better understand current elk abundance, this herd unit will be prioritized for an abundance survey during the 2024-2025 winter. Regardless, current harvest levels have

likely been insufficient to curtail population growth, and managers believe elk may be emigrating from this herd.

Success in this area over the prior five years is quite high, averaging 81% hunter success with an average of 4.4 days to harvest. In 2023, hunter success dropped to 57% with an average of 8.2 days to harvest. This is likely a result of increased license availability with no increase in access. While managers always prefer to manage this population through increased harvest, license issuance is almost entirely dependent upon how many hunters landowners are willing to take. With the new license types and more flexibility in seasons, landowners indicated a willingness to allow more access for 2024, which will hopefully increase elk harvest in this herd unit.

2) Chronic Wasting Disease Management: To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred. This herd has not been prioritized for CWD surveillance because historically harvest has been too low to obtain an adequate sample size for a statistically valid prevalence.

Table 1.

2022 - 2023 Postseason Classification Summary

for Elk Herd EL743 - PINE RIDGE

		MALES				FEMALES		JUVENILES				Males to 100 Females				Young to		
Year	Post Pop	Ylg	Adult	Total	%	Total	%	Total	%	Tot Cls	Cls Obj	Yling	Adult	Total	Conf Int	100 Fem	Conf Int	100 Adult
2022	0	56	143	199	22%	508	57%	180	20%	887	0	11	28	39	± 0	35	± 0	25
2023	0	20	67	87	22%	199	49%	118	29%	404	0	10	34	44	± 0	59	± 0	41

2023 - JCR Evaluation Form

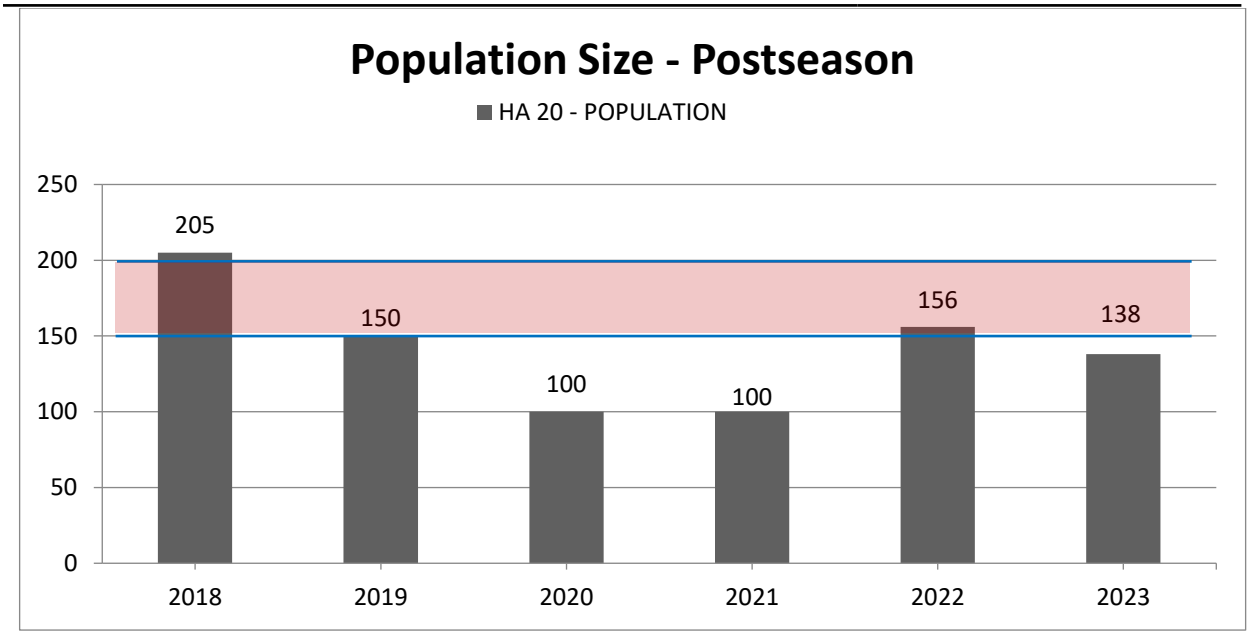
PERIOD: 6/1/2023 - 5/31/2024

HERD: BH720 (Non-Herd Unit)

HUNT AREAS: 20 (Kouba Canyon) PREPARED BY: JOE SANDRINI

	2018 - 2023 Average	2023	2024 Proposed
Population:	148	138	145
Harvest:	2.5	2	1
Hunters:	2.5	2	1
Hunter Success:	100%	100%	100%
Active Licenses:	2.5	1	1
Active License Success:	100%	100%	100%
Recreation Days:	10.0	5	5
Days Per Animal:	4.1	5.0	5.0
Males per 100 Females[1]	106	92	
Juveniles per 100 Females[2]	41	58	

Population Objective (± 20%):	150-200
Management Strategy:	Joint Management with South Dakota
Percent population is above (+) or below (-) objective:	At Objective
Number of years population has been + or - objective in recent trend:	1
Model Date:	No Model (population est. from ground survey)



[1] Based on mean of observed values

[2] Based on mean of observed values

2024 HUNTING SEASONS

BIGHORN SHEEP HUNT AREA 20 (KOUBA CANYON)

NON-HERD UNIT

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
20	1	Aug. 15	Aug. 31	Sep. 1	Nov. 30	1	Any ram (1 resident)

2023 Hunter Satisfaction: *Bighorn Sheep (BHS) Hunters Not Surveyed*

2024 Management Summary

1) **Hunting Season Evaluation:** At the start of the 2021 bio-year, there were 21 ewes and 17 rams with active VHF radio collars in this herd. In addition, there were at least three active VHF collars on ewes collared as part of a previous project. Over the next 12 months, five of the collared ewes and eight of the collared rams died, yielding an annual mortality rate 21% for collared ewes and 47% for collared rams, with two of the collared rams being harvested by hunters. Bighorn sheep observations during the 2021-22 winter indicated a large proportion of radio-collared sheep in the herd and virtually no lambs. Poor lamb survival and lower numbers of observed sheep suggested this herd had declined, perhaps as a result of an Epizootic Hemorrhagic Disease (EHD) die-off that had affected area deer and antelope herds significantly. A sightability flight flown in February, 2022 detected 75 total sheep, including 22 of the 23 collared sheep known to be in the survey area. However, it did not produce a useable population estimate. In November, 2022 South Dakota Game Fish and Parks (SDGF&P) ran multiple ground-based sightability surveys in this herd. The fifth and final survey produced the best results. A total of 76 bighorn sheep were observed producing a population estimate of 156 sheep (95% CI= 96 – 254). Age and sex classifications made during this final ground-based survey yielded a ratio of 47 lambs:100 ewes:58 rams, while the mean of all the classifications made during the surveys yielded 60 lambs:100 ewes: 98 rams. In November of 2023, SDGF&P again conducted their ground-based survey using radio-collared sheep. This effort yielded an estimated population of 138 sheep (95% CI = 56-340). The minimum count produced during the 2023 effort was 25 rams, 21 ewes, and 14 lambs, for a total minimum count of 60 sheep residing in both states. The average, observed sex/age ratio of all five surveys was 58 lambs:100 ewes:92 rams, with about 45% of the rams being classified as Class IV (trophy class), compared to about 60% in 2022. A helicopter classification flight flown in Wyoming in February, 2024 detected 56 sheep, with an observed lamb:ewe:ram ratio of 15:100:93.

   Following the perceived population decline in bio-year 2021, this hunt area went from three Wyoming licenses available to one for the 2022 season, while SDGF&P continued to issue three licenses. After discussions with SDGF&P, it was decided to issue two Wyoming licenses for the 2023 hunting season, and both hunters harvested mature rams. There were possibly up to 8 radio-collared rams available to hunters at the beginning of the 2023 hunting season, but 2 of these collars had not been detected since 2021. Of the five rams hunters harvested in 2023 (2 WY, 3 SD), four were collared. This high proportion of collared rams in the harvest, coupled

with the fact that days to harvest a ram increased from an average of 2.8 between 2015 and 2020 to an average of 5.1 days since 2021, has local managers concerned about the availability of trophy class rams. Because of this, and what seems to be a declining herd, Wyoming is issuing one any-ram license in 2024. This should provide success for a single resident hunter. In addition, three rams will likely be harvested in South Dakota due to the number of tags they are required to issue. Using average classification counts and the 2023 population estimate produced by South Dakota's fall survey, the data suggest there may be about 50 mature rams in the population, of which perhaps 20 are Class IV rams. If the combined interstate harvest objective of four rams is met in 2024, it likely will not exceed the management objective of harvesting no more than 10% of the rams, or 50% of the class IV rams. Instead, it would be a conservative harvest, which is something the local Wyoming managers desire to foster in 2024 before revisiting license issuance with South Dakota for 2025. It is expected, barring a disease outbreak, this herd will grow slightly in 2024, to perhaps 145 individuals.

2) **Management Objective:** In 2012, joint management criteria for this herd were agreed upon with SDGF&P. This management framework includes an interstate population objective of 150 to 200 sheep. Additionally, hunting seasons are to be implemented when there is a combined Wyoming and South Dakota population of at least 75 to 100 sheep. These seasons are intended to provide trophy ram hunting, such that harvest of rams in relation to population demographics allows for replacement of Class IV (¾ curl) rams taken. To this end, harvest should not normally exceed 50% of known number of Class IV rams, and annual harvest should not exceed 10% of the total rams.

3) **Population Estimation and Research Projects:** Garnering an accurate population estimate of this herd is vital to its management, and three methods have been tried, all with limited success:

   A ground-based mark-resight survey relying on radio-collared BHS was developed as part of a graduate student project in 2013. Most years, this method has produced estimates with very wide confidence intervals due to the limited number of radio-collared sheep available. Mark-resight data have been analyzed using a modified Lincoln-Peterson estimate, and one based upon a Poisson distribution, along with a detection rate function. Completing these surveys as designed in recent years has become difficult due to more restricted access to private land.

   A forward-looking infrared (FLIR) survey was attempted in June, 2018. However, the FLIR system was not able to effectively detect BHS.

   Between December 2019 and February 2022, a project was conducted to develop a helicopter-based sightability model for this herd in conjunction with radio-collared sheep. This study was conducted in tandem with SDGF&P. In mid-February of 2022, a sightability flight was flown. However, detection of sheep on set transects not relying on radio collar signals was extremely low, resulting in an estimate with exceedingly wide confidence intervals. It appeared that the bighorn sheep were very sensitive to the presence of a helicopter and sought hiding cover to avoid detection. As such, this method was deemed untenable for producing a reliable population estimate.