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ACKNOWLEDGEMENTS

The field data contained in these reports is the result of the combined efforts of Jackson Region Wildlife Division personnel including District Wildlife Biologists, District Game Wardens, the Disease Biologist, Feedground Manager, Wildlife Management Coordinator, and Region Supervisor, as well as other Department personnel working check stations and in the field. The authors wish to express their appreciation to all those who assisted in data collection.

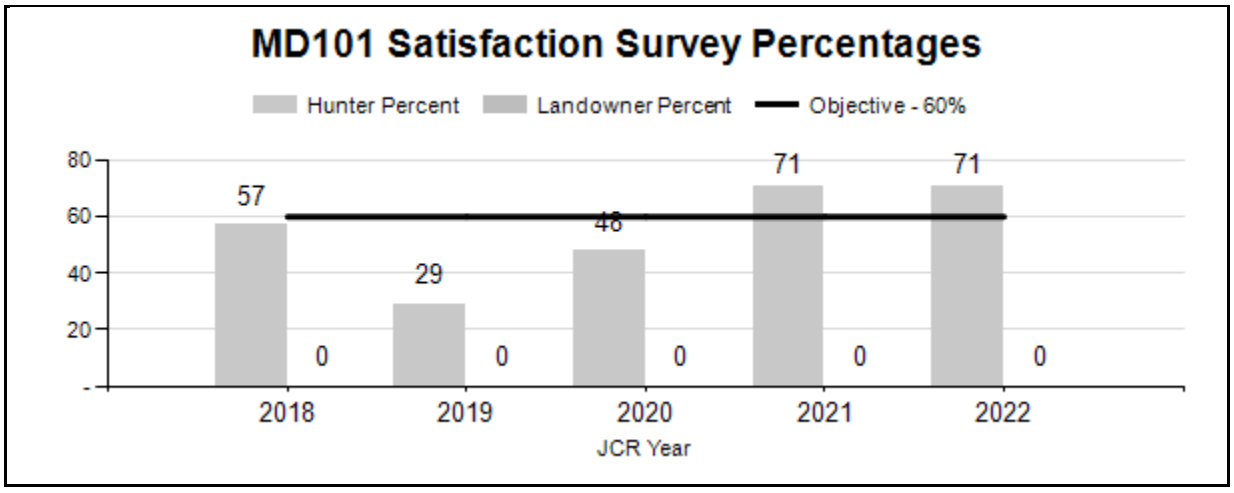
2022 - JCR Evaluation Form

SPECIES: Mule Deer
HERD: MD101 - TARGHEE
HUNT AREAS: 149

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	56%	71%	70%
Landowner Satisfaction Percent	N/A	N/A	N/A
Harvest:	18	38	30
Hunters:	77	106	80
Hunter Success:	23%	36%	38%
Active Licenses:	77	106	80
Active License Success:	23%	36%	38 %
Recreation Days:	387	457	400
Days Per Animal:	21.5	12.0	13.3
Males per 100 Females:			
Juveniles per 100 Females			

Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	2



2023 HUNTING SEASONS
TARGHEE MULE DEER HERD (MD101)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
149	Gen	Sep. 1	Sep. 14	Sep. 15	Sep. 30		Antlered mule deer or any white-tailed deer
149	3	Sep. 1	Sep. 14	Sep. 15	Nov. 30	25	Any white-tailed deer
149	8	Sep. 1	Sep. 14	Sep. 15	Nov. 30	25	Doe or fawn white-tailed deer

2023 Regional H Non-Resident Quota: 400 licenses

2022 Hunter Satisfaction: 71.0% Satisfied, 19.4% Neutral, 9.7% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: This herd is managed with a hunter satisfaction objective (60%) instead of a trend count or population model because the majority of deer migrate to winter ranges in Idaho. Hunter satisfaction was 71% in 2022. Hunting opportunity in this herd unit is limited due to few access points to public lands, steep terrain, and fall migration of mule deer to Idaho. A total of 106 hunters harvested 38 mule deer in the herd unit in 2022. Eight white-tailed deer were harvested in 2022 (one with a Type 3 license, zero with a Type 8 license, and seven with a general license). Keeping white-tailed deer numbers low in this area is a priority for managers. In 2021, the Type 3 and Type 8 white-tailed deer licenses for Hunt Area 149 were combined with other hunt areas in the Jackson Region in the Sublette Herd in to provide hunters more flexibility with where they could use these licenses and address areas where white-tailed deer numbers have been increasing. However, hunters who normally hunt Area 149 have had more difficulty drawing these licenses since they were combined, so the Type 3 and Type 8 licenses were split out for Area 149 again for the 2023 hunting season.

Due to the severe winter in western Wyoming and eastern Idaho in 2022/2023, managers reduced the general license season length by one week from a closing date of October 6 to September 30. The non-resident quota from Region was also reduced to 400 licenses.

2.) Management Objective Review: The next objective review is scheduled for 2024.

3.) Chronic Wasting Disease Management: This is a Tier 3 surveillance herd that is not a priority for CWD sampling at this time due to its very low deer harvest and difficulty in encountering hunters with harvested animals in the field. Collecting an adequate sample size in this herd is not feasible at this time. CWD management in this herd focuses on opportunistic hunter-harvest, roadkill sampling, and sampling any animals that are displaying signs of sickness. A total of two hunter-harvested mule deer were sampled in 2022 (Table 1). No hunter-harvested white-tailed deer were sampled. CWD has not been detected in this herd, however confidence intervals are large due to very low sample size.

Table 1. CWD prevalence for hunter-harvested mule deer in the Targhee Mule Deer Herd, 2020-2022.

Year(s)	Percent CWD-Positive and (*n*) – *Hunter Harvest Only*		
	Adult Males (CI = 95%)	Yearling Males	Adult Females
2022	**0% (n=2)**	None sampled	None sampled
2020-2022	**0% (CI 0%-70.8%, n=3)**	None sampled	None sampled

2022 - JCR Evaluation Form

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

HERD: MD131 - WYOMING RANGE

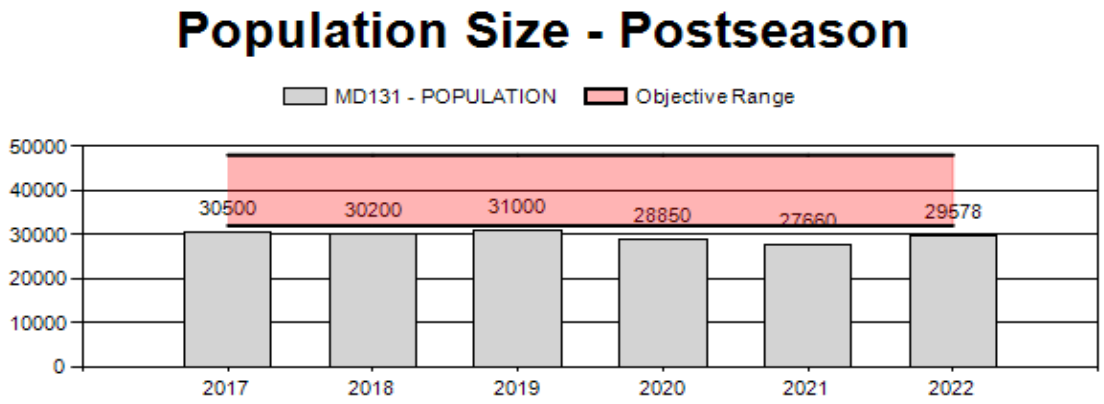
HUNT AREAS: 134-135, 143-145
PREPARED BY: GARY FRALICK

	2017 - 2021 Average	2022	2023 Proposed
Population:	29,642	29,394	28,501
Harvest:	1,578	1,769	1,762
Hunters:	4,984	4,901	4,915
Hunter Success:	32%	36%	36%
Active Licenses:	4,984	4,901	4,915
Active License Success:	32%	36%	36%
Recreation Days:	27,721	28,193	28,432
Days Per Animal:	17.6	15.9	16.1
Males per 100 Females	30	37	
Juveniles per 100 Females	60	67	

Population Objective (± 20%) :	40000 (32000 - 48000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-26.1%
Number of years population has been + or - objective in recent trend:	7
Model Date:	02/27/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	<1%	<1%
Males ≥ 1 year old:	27%	23%
Proposed change in post-season population:	+5%	<1%



2023 HUNTING SEASONS
WYOMING RANGE MULE DEER HERD (MD131)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
134	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 6		Antlered mule deer three (3) points or more on either antler or any white-tailed deer
135	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 6		Antlered mule deer three (3) points or more on either antler or any white-tailed deer
143	Gen	Sep. 1	Sep. 14	Sep. 15	Sep. 30		Antlered mule deer three (3) points or more on either antler or any white-tailed deer
144	Gen	Sep. 1	Sep. 14	Sep. 15	Sep. 30		Antlered mule deer three (3) points or more on either antler or any white-tailed deer
145	Gen	Sep. 1	Sep. 14	Sep. 15	Sep. 30		Antlered mule deer three (3) points or more on either antler or any white-tailed deer
145	3	Sep. 1	Sep. 14	Sep. 15	Nov. 15	25	Any white-tailed deer
145	3			Nov. 16	Jan. 31		Antlerless white-tailed deer
145	8			Nov. 1	Jan. 31	25	Doe or fawn white-tailed deer

2023 Region G nonresident quota: 350 licenses

2022 Hunter Satisfaction: 51% Satisfied, 25% Neutral, 24% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation:

Herd Unit Summary:
Severe winter conditions during the 2022-2023 winter resulted in significant deer mortalities and elevated public concern. High winter mortality was observed during the 2017, 2019, and 2023 winters throughout the herd unit. Moreover, the effects of winter mortality have suppressed population growth. For comparison, it is useful to note the period of sustained population growth during the period from 2012-2016. It was during this 5-year period (2012-2016) the population approached the objective of 40,000.

Antlered only hunting and the insignificant antlerless harvest, typically < 100 does (<1% of does given herd unit ratios and a population estimate of 29,000 deer) which are harvested by youth hunters, should allow the population to begin recovery following the 2023 winter losses. However, the 2023 hunting season will allow youth hunters to harvest only antlered deer which is a departure from recent youth hunting seasons where any deer could be taken.

The number of Nonresident Region G licenses decreased from 400 to 350 licenses as a result of Commission action in response to public comment. This is the first decrease in Nonresident Region G licenses since 2017.

Jackson/Pinedale Region Summary: Hunt Areas 143-145

Deer seasons in the northern areas will be adjusted in 2023 to reflect growing public concern over the extreme winter deer losses observed throughout the herd unit. That adjustment will entail the additional restriction of the 3-points or more antler point restriction (APR) for antlered mule deer in Areas 143 – 145. In addition, the season dates limitation will change to open September 15 and close September 30 in Hunt Areas 143, 144, and 145. The September 30 closing date makes this year the shortest deer season in the northern hunt areas in at least 25 years.

These hunting seasons run concurrently with 14 additional mule deer hunt areas in the Jackson and Pinedale Regions. The standardized open and close dates reduce hunter crowding and the effect of hunters moving between areas with different opening and closing dates. The effect results in population growth and buck retention into the postseason population by focusing on antlered only hunting, closing deer seasons prior to the onset of the fall migration and the October 15 general elk hunting seasons. Season closure prior to the fall migration will ensure that overharvest of bucks does not occur, and thereby result in a substantial decrease in the buck:doe ratio. Hunt seasons that close in early October in the northern areas are in response to public concerns regarding deer numbers following the 2023 winter. In addition, a season date ending on September 30 in the northern areas offers an assurance that bucks are not harvested during the migration. The hunting public supports this management strategy.

Green River Region Summary: Hunt Areas 134 and 135

In Hunt Areas 134 and 135 we try to offer a season that includes 2 weekends with 14 days of general deer hunting opportunity. These seasons have been largely buck only hunting over the last 20+ years. This season structure is very conservative and the population is not limited by this level of hunting. We continuing to offer this type of hunting opportunity in light of having lower deer survival during tough winters is still biologically appropriate. Changes in hunting seasons will not resurrect deer that died in past winters. This type of season will also not limit future growth of the herd. However, due to low deer numbers from recent harsh winters there is a push from a segment of the public for us to have a season length shorter than 14 days. This a social issue rather than a biological one, and we recognize that both issues are inextricably intertwined. In response to extreme winter mortality in 2017 and 2019 and the resultant public demand for shorter seasons, we reduced the season from 14 days to 11 days starting in 2020. The 2023 deer season will offer 6 days of antlered only with an additional Antler Point Restriction in response to never-before-documented winter mortality. Deer numbers are going to be low due to the current tough winter conditions. This season will offer only 6 days of hunting

opportunity with Sunday, October 1, as the only weekend day of hunting opportunity. This is an overly restrictive hunting opportunity and will not improve the deer herd. Analysis of past data in these areas shows no correlation between season length and harvest, hunter days or average days hunted per hunter. We are currently meeting buck:doe ratio objectives and also see mature bucks dying on winter ranges. We will change the antler point restriction from four point to three point to standardize and simplify the regulations in western Wyoming.

2.) **Management Objective Review:** The Wyoming Range mule deer population objective was reviewed by the public and federal agency personnel in 2016. The population objective was reduced from 50,000 to 40,000 (± 20%) deer based on public review, and approval by the Commission. An objective review was conducted in 2021; no change was recommended and consequently the population objective remained at 40,000 deer.

3.) **Herd Unit Evaluation**: Management strategies have emphasized population growth since 1993 by promoting antlered deer only hunting opportunity. A concerted management effort has emphasized retaining trophy class bucks in the post hunt population by not extending the deer hunt into the October 15 general license elk season. Antlered deer hunts open in mid-September and typically close in early October throughout the herd unit. Hunt seasons close in the northern hunt areas prior to the onset of the annual fall migration in order to minimize vulnerability of bucks that migrate from subalpine summer ranges to sagebrush winter ranges in the Upper Green River Basin and Bear River Basin. This early October, typically October 6 or earlier, closing date regime has enabled mangers to maintain the management objective of 30-45 bucks:100 does in the postseason herd composition surveys.

Over the last 28 years the population has remained stable at an annual average of approximately 32,000 deer. The only recent sustained, population growth occurred during the period from 2012 – 2016, which followed the winter of 2011 and prior to the 2017 winter. During this period the population grew to its highest level since 2003 which was 40,000 deer. The population estimate following the 2016 hunting season was approximately 38,000 deer.

Sustained population growth has been largely tempered because of the frequency of high to extreme overwinter mortality approximately every 3 years since 1993. The most recent period of extreme winter mortality occurred in 2017, 2019, 2020, and the highest annual winter morality ever reported was during the current 2023 winter. Prior to 2017, most of this mortality occurred exclusively on the southern winter ranges where an estimated 60% of the Wyoming Range herd spends the winter. However, in 2017 and 2023, unprecedented winter losses were universally observed on all low elevation sagebrush-dominated winter ranges in western Wyoming.

In 2021, WGFD managers began using PopR integrated population model (IPM) to estimate population indices for mule deer. The bio-year 2022 postseason population estimate for this herd unit was 29,394 (CL =28,158 – 30,654) mule deer. It is important to note that the IPM, dated February 27, 2023, is designed to incorporate annual survival metrics. Given the winter severity conditions that occurred after the model was run and the limitations for incorporating winter mortality specifically into the model, the 2023 postseason population estimate should not be relied on. We anticipate having a better 2023 postseason population estimate following the 2023 hunting season, postseason classification survey, and subsequent population modeling efforts.

During the period from 2014-2022, buck:doe ratios have met or exceeded the special management objective of 30-45 bucks:100 does in the posthunt population in all years except 2017, 2018, 2020 because of moderate to severe winter mortality on the southern winter ranges. However, since 2017, moderate to high overwinter survival has ensured recruitment of 1.5+ year old bucks on the LaBarge winter ranges.

The LaBarge winter ranges support approximately 40% of the Wyoming Range herd, and a substantial percentage of the Greys River deer population. It is here that buck:doe ratios exceeded 40 bucks:100 in years 2013, 2014, 2015, 2019, 2021, and 2022 (Figure 1, Appendix A) The highest buck ratios achieved in at least 20 years were observed in 2013 (46:100), 2021 (45:100), and 2022 (40:100) (Figure 1). The effects of winter mortality observed during the 2017, 2019, and 2020 winters had a deleterious impact on buck:doe ratios herd unit-wide, but most notably on the southern ranges, following those winters. The 29 bucks:100 does observed in 2017 was only the second time since 1993 that the buck:doe ratio dropped below the management minimum of 30 buck:100 does (Appendix A).

High winter survival was observed on the LaBarge winter ranges from 2018 - 2022, and mitigated the high losses observed in Areas 134 and 135 in 2019 and 2020. As a result of the higher survival on the northern winter ranges near LaBarge, observed buck:doe ratios climbed to 41 bucks:100 does, 45:100, and 40:100 after the 2019, 2021, and 2022 hunting seasons, respectively (Figure 1, Appendix A).

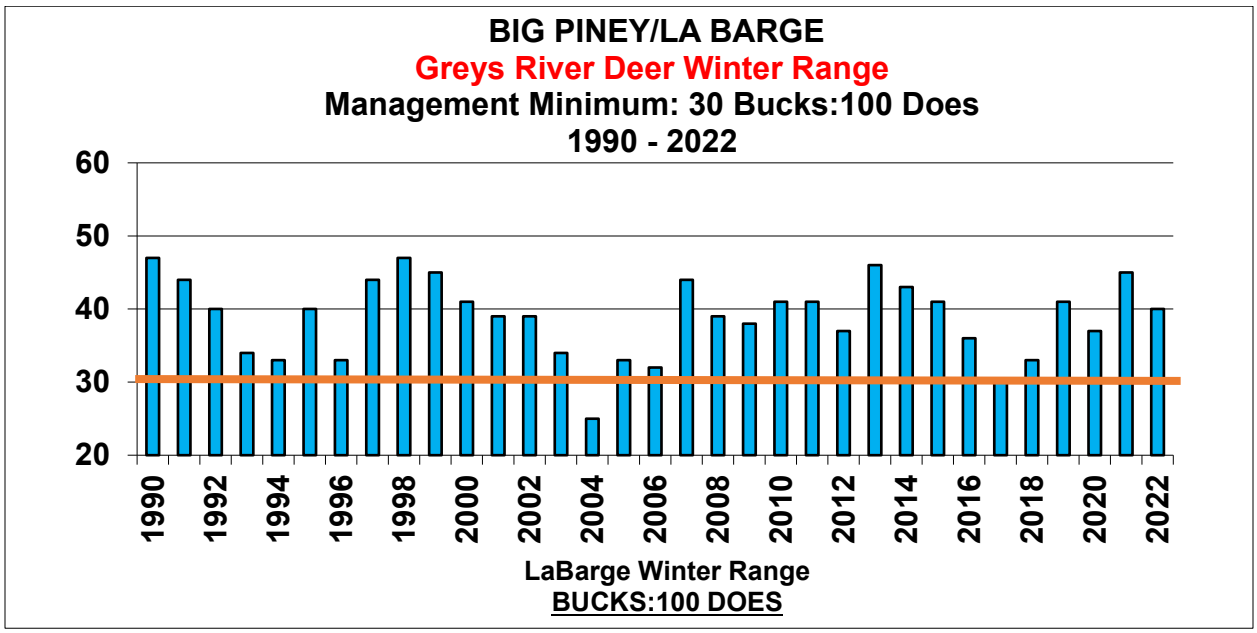


Figure 1. A summary of posthunt observed buck:doe ratios, LaBarge winter ranges, Hunt Area 143, 1990-2022.

4.) **Weather**:

Precipitation

The Parameter-Elevation Relationships on Independent Slopes Model (PRISM) was utilized to estimate precipitation by calculating a climate-elevation regressions for each Digital Elevation Model grid cell (4km resolution) for the Wyoming Range Mule Deer Herd Unit during the period from October 2021 through September 2022 (water year). Annual precipitation was below the 30 year (Sept-Oct) average. Precipitation during the growing season (April-June) was below the 30 year average, and precipitation during the spring-summer period (May-July) was well below the 30 year average. Generally, 2021-2022 monthly winter precipitation varied from below average during February and March to above average during December and January. 2022 spring monthly precipitation was below average across the herd unit, except for April which was above average. Summer 2022 precipitation was below average across the herd unit, however August experienced above average precipitation. Herd unit precipitation during fall 2022 was below average during October and November, and above average in September (Figure 2).

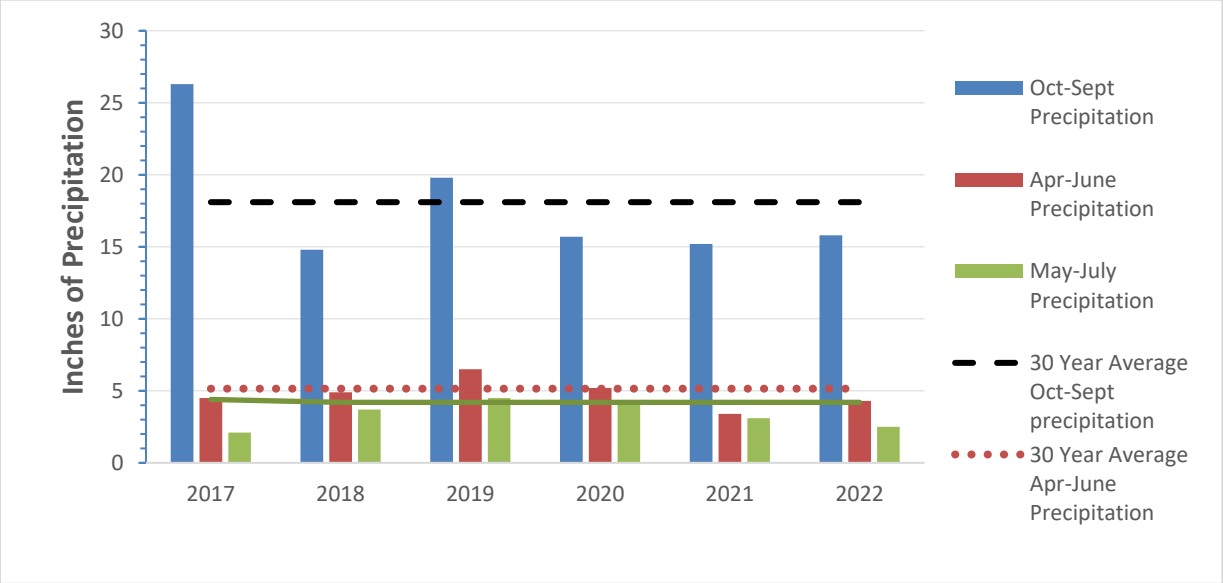


Figure 2. Wyoming Range precipitation summary, 2017-2022

Winter Severity

Most low elevation winter ranges experienced above average monthly snow accumulation between November 2022 and February 2023, and reporting locations in the Randolph Utah, Fossil Butte, and Afton areas each recorded over twice their monthly average snowfall during January 2023. SNOWTEL sites at higher elevations showed the snow water equivalent ranging from 91-129% of the median as of February 24, 2023, suggesting excellent soil moisture for early 2023 growing season conditions. Average monthly temperatures recorded from locations near winter ranges were consistently colder than the long term monthly averages between November 2022 and February 2023, with the January Afton area temperatures being the only exception, which were slightly above the monthly average. The cumulative effects of consistent winter storms, above average snow accumulation, colder than average temperatures and associated wind chill temperatures on winter ranges across the herd unit during the 2022-2023 winter are expected to result in significant deer mortalities.

5.) Habitat:

Significant Events

Several habitat improvement efforts occurred within the herd unit during 2022. In the Big Piney to Fontenelle Creek area, approximately 5,000 acres of sagebrush--grassland habitat were treated with herbicide to control cheatgrass, spot treatments were completed to control thistles in prescribed burn areas, 225 acres were treated to control spotted knapweed, 305 acres surveyed and treated to control Dyer's woad, 5-miles of electric fence was maintained to defer livestock grazing on 19,000 acres of treatment area, 83 acres of conifer thinning to restore healthy aspen habitat, and deployment of 276 virtual fencing collars to begin a pilot project in deferring grazing use on vegetation treatment areas and reduce grazing use/improve grazing rotations in riparian areas. Habitat enhancement efforts for the southern Wyoming Range area included: 3,488 acres of sagebrush mowing treatments, 5 miles of fence replaced with wildlife friendly specifications, 192 acres of conifer thinning to restore aspen habitat, and 24,540 acres of aerial herbicide treatment to control cheatgrass in sagebrush-grassland and mixed mountain shrub habitats. More details about these projects can be found in the Pinedale and Green River Region sections of the 2022 Statewide Habitat Plan (SHP) report.

Habitat Monitoring

Winter range shrub transects were monitored at five locations through the Calpet/Little Colorado winter range during 2022 to evaluate trends in annual leader growth of true mountain mahogany. The average annual mahogany leader growth of all five sites during 2022 was 2.70 inches, essentially equaling the 25 year average of 2.66 inches across these sites.
Department personnel also conducted monitoring associated with past and future treatments throughout the herd unit during 2022.

Rapid Habitat Assessments

Rapid Habitat Assessments (RHA) were first implemented by the Department in 2015 to generally characterize conditions of important habitat types on the landscape within Mule Deer Initiative Herd Units. Summarized RHA data are used as a habitat component during herd population objective reviews to evaluate whether or not deer numbers are in balance with sustaining habitat at an acceptable level or higher quality condition.
Department personnel completed 2,956 acres of rangeland RHAs and 19 acres of riparian RHAs within the Wyoming Range Herd Unit during 2022. Surveys were conducted in transitional, summer, and crucial winter range mule deer habitats.

6.) Chronic Wasting Disease Management: The Wyoming Range mule deer herd is a Tier 1 surveillance herd that was prioritized in 2022, and specific efforts were directed at gathering CWD samples. The sample goal of 200 adult males was not obtained in 2022, but the desired sample goal was collected during the period from 2020-2022; a total of 396 samples were gathered during this period (Table 1). During the 2022 sampling period there were two positive hunter-harvested adult male deer that tested positive. Samples in 2022 were collected without the assistance of CWD technicians, so it is believed a similar level of effort and corresponding CWD samples should be expected into the foreseeable future. This level of effort is appropriate with the high profile and importance of this deer herd.

Table 1. CWD prevalence for hunter-harvested mule deer in the Wyoming Range Herd, 2022.

Year	Percent CWD-Positive and sample size (n) *Hunter Harvest Only*		
	All Adult Male Deer (CI = 95%)	Yearling Males	Adult Females
2020-2022	0.8% (0.2% - 2.2%, 3, n=396)	0.0% (63)	0.0% (30)
2022	1.4% (2, n=140)	0.0% (20)	0.0% (7)

7.) Wyoming Range Sightability Survey: During the period from February 17 – 28, a comprehensive animal abundance survey was completed in the Wyoming Range mule deer herd (Table 2, Appendix B). Two Bell 47 helicopters were utilized to conduct the survey over five (5) major winter range complexes near LaBarge (HA143), Evanston (HA134), Kemmerer/Cokeville (HA135) and Star Valley (HA145). A total of 15,465 deer were counted on Wyoming Range winter ranges (North Ranges: Big Piney/LaBarge and Salt River – 8,125 deer, 52% of sample; South Ranges: Kemmerer, Cokeville, Evanston – 7,340, 48% of sample; Table 2). The resulting population estimate is 30,213 deer. At 85% Confidence the range is 24,956 – 35,470 deer.

Table 2. A summary describing the metrics and total deer counted by hunt area during a mule deer sightablity survey, Wyoming Range mule deer herd, 2023.

Hunt Area	**No. Deer Counted in 2023**	**No. Deer Counted in 2018**
138	2323	1616
143	5359	7053
145	463	1405
JN-PE Total	8125	10,074
134	3493	8923
135	2467	4508
168	106	566
UT	1274	1246
Green River Total	7340	15244
Herd Unit Total	**15,465**	**25,317**
Sightability Corrected Estimate	30,213	29,074
85% & 90% CI	24,956 - 35,470	28,606 - 29,542
Sightability Correction	+/- 5,257	3,757
Probablity of Detection/Observability	74%	87%
Posthunt Pop Estimate	29,578	30,500
No. Strata/Count Blocks	Strata: 317 High; 173 Low	Count Blocks: 90 (22N, 68S)
Total Area (Sq. Mi)	490	1,657
No. of Observers	~12	~20
Number of Hours	112	133
Cost	$122,177	$135,000

8.) Focal Herd Research: The Wyoming Game and Fish Commission approved $3.5 million in 2022 to initiate an unprecedented effort to assess survival and factors that may influence mule deer survival across 5 Focal Deer herds in Wyoming (Appendix C). One of those herds chosen was the Wyoming Range.

The Focal Herd Research will provide deer managers with a better understanding of survival across the Wyoming Range. It will focus on a wide variety of profiles that include, but are not limited to, the influence of disease, habitat factors on summer and winter ranges, and the influence of predation. Perhaps the most notable aspects of the focal herd work will result in the delineation and understanding of mule deer movement patterns, seasonal range use, and effectiveness of habitat treatments.

Perhaps more importantly, it will provide much-needed metrics for the Department to better understand and quantify the effects of harvest and different management strategies on the Wyoming Range deer herd. To that end, on December 19, 2022 the Department initiated a radio-collaring effort on LaBarge, Star Valley and Cokeville, Evanston, and Kemmerer winter ranges to initiate the Focal Herd program.

A total of l31 mule deer were captured and radio-collared on Wyoming Range deer winter ranges. Collars were deployed by age and sex on the winter ranges identified in Appendices D and E.

Annual survival is a key component of the Wyoming Range season setting cycle. It is inherently critical to the development and allocation of hunting season resources in terms of nonresident hunting license allocation, season length, and other limitations that may pertain to Antler Point Restrictions, and age/sex specific harvest recommendations. The 2023 winter had by all accounts the most adverse effect on the annual population dynamic and over-winter mortality since the Wyoming Range herd was conceptualized in 1982.

Annual mule deer survival was greatly reduced during the 2023 winter. As of May 22, 2023 only 57 mule deer of the 262 deer that entered the winter in December 2022 were alive (Appendix F). Mortality among all age and sex classes was extreme, with fawns being subjected, as expected, to the highest mortality. By May 25, zero (0) of 92 fawns collared was still alive. Survival for bucks and does were only slightly higher. The percentage of does and bucks that survived until May 25 was reported at 31% and 39%, respectively (Appendix F).

9.) An Estimation of Winter Fawn Loss Based on the December – April Change-In-Ratio Metric: A systematic survey has been conducted since 1986 in the Wyoming Range herd to determine minimum winter fawn mortality. The objective has been to determine the percent change in the proportion of fawns to adults from December to April as a relative index of winter fawn mortality on the largest and most expansive sagebrush-dominated winter ranges near LaBarge and Kemmerer and Evanston.

The comparative change in the proportion of fawns:100 adults between the late fall and spring provides a relative minimum estimate of the proportion of fawns lost over the winter. Since

1993 the highest years of minimum winter fawn mortality have occurred, on average, approximately every four years (Figure 3, Appendix G). The highest estimated fawn mortality occurred in 2011 and 2017, respectively. The years of greater than 40% estimated fawn mortality were recorded subsequent to the 1993, 1997, 2002, 2004, 2011, 2017, and 2023 winters. The highest estimated fawn mortality occurred in 2017 and 2023. The estimated losses observed in 2023 are remarkable in the history of the Wyoming Range mule deer herd. The Wyoming Range herd was conceptualized in 1982.

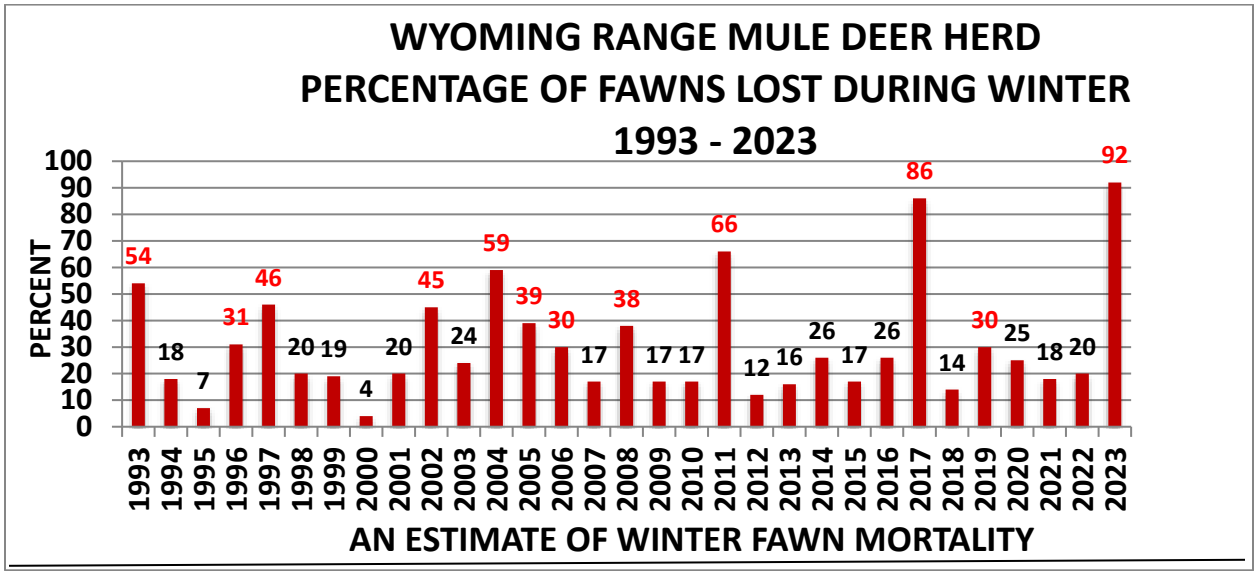


Figure 3. A depiction of estimated minimum winter fawn mortality from December to April, 1992 – 2023.

Appendix A. Wyoming Range Mule Deer Herd, posthunt herd composition data, 2015-2023.

							Ratio:100 Females			
2015	Yrlng Males	Adult Males	Total Males	Does	Fawns	Total	Yrlng Males	Adult Males	Total Males	Fawns
HA134	81	173	254	737	406	1397	11	23	34	55
HA135	176	302	478	1188	828	2494	15	25	40	70
HA143	415	399	814	2005	1147	3966	21	20	41	57
144/145	Survey conducted in February 2016					440				
TOTAL	672	874	1546	3930	2381	8297	17	22	39	60
2016										
HA134	95	190	285	774	489	1549	12	24	36	63
HA135	182	380	562	1605	1008	3175	11	24	35	63
HA143	256	260	516	1430	723	2669	18	18	36	50
144/145	Survey conducted in February 2017					517				
TOTAL	533	830	1363	3809	2220	7910	14	22	36	58
2017*	Herd Unit Wide Antlered Deer, 3 points APR Hunt Season									
HA134	14	153	167	672	389	1228	2	23	25	58
HA135	47	282	329	1105	701	2135	4	25	30	63
HA143	111	348	459	1547	701	2707	7	22	30	45
144/145	Sightability Survey Conducted in February 2018					1405				
TOTAL	172	783	955	3324	1791	7475	5	23	29	54
2018*	Herd Unit Wide Antlered Deer, 3 points APR Hunt Season									
HA134	134	135	269	1223	721	2213	11	11	22	59
HA135	197	375	572	1752	1070	3394	11	21	33	61
HA143	178	239	417	1277	742	2436	14	19	33	58
144/145	Survey conducted in February 2019					823				
TOTAL	509	749	1258	4252	2533	8,866	12	18	29	59
2019*	Herd Unit Wide Antlered Deer, 3 points APR Hunt Season									
HA134	14	86	100	520	287	907	3	16	19	55
HA135	111	318	429	1346	730	2505	8	24	32	54
HA143	338	365	703	1706	1088	3497	20	21	41	64
144/145	Survey conducted in February 2020					142				
TOTAL	463	769	1232	3572	2105	7051	13	21	34	59
2020										
HA134	14	82	96	635	395	1126	2	13	15	62
HA135	50	260	310	1302	835	2447	4	20	24	64
HA143	120	225	345	937	672	1954	13	24	37	72
144/145	Survey conducted in February 2021					632				
TOTAL	184	577	751	2874	1902	6159	6	20	26	66
2021										
HA134	39	29	68	210	99	377	18	14	32	47
HA135	101	131	232	909	520	1661	11	14	25	57
HA143	141	140	281	620	491	1392	23	22	45	79
144/145	Survey conducted in February 2022					493				
TOTAL	281	300	581	1739	1110	3923	16	17	33	64
2022										
HA134	55	70	125	386	225	736	14	18	32	58
HA135	159	260	419	1283	901	2603	12	20	33	70
HA143	380	411	791	1983	1324	4098	19	21	40	67
144/145	Sightability Survey Conducted in February 2023					463				
TOTAL	594	741	1335	3652	2450	7900	16	20	36	67

1

APPENDIX B

N

0 3 6 9 12 Miles

Focal herd program

Kickoff meeting

July, 2022

Goals

- Better understand survival across the state, including the influence of different disease, habitat and predator profiles
- Quantify the effects of harvest management strategies
- Learn about movement patterns, seasonal range use, drivers of herd performance, effectiveness of habitat treatments and more

State-of-the-art monitoring

6 areas critical to management

Cutting-edge information on harvest and public values

Robust data on herd composition

Disease + nutrition assessments

More reliable information on herd size

Access to data that's accurate + immediately available

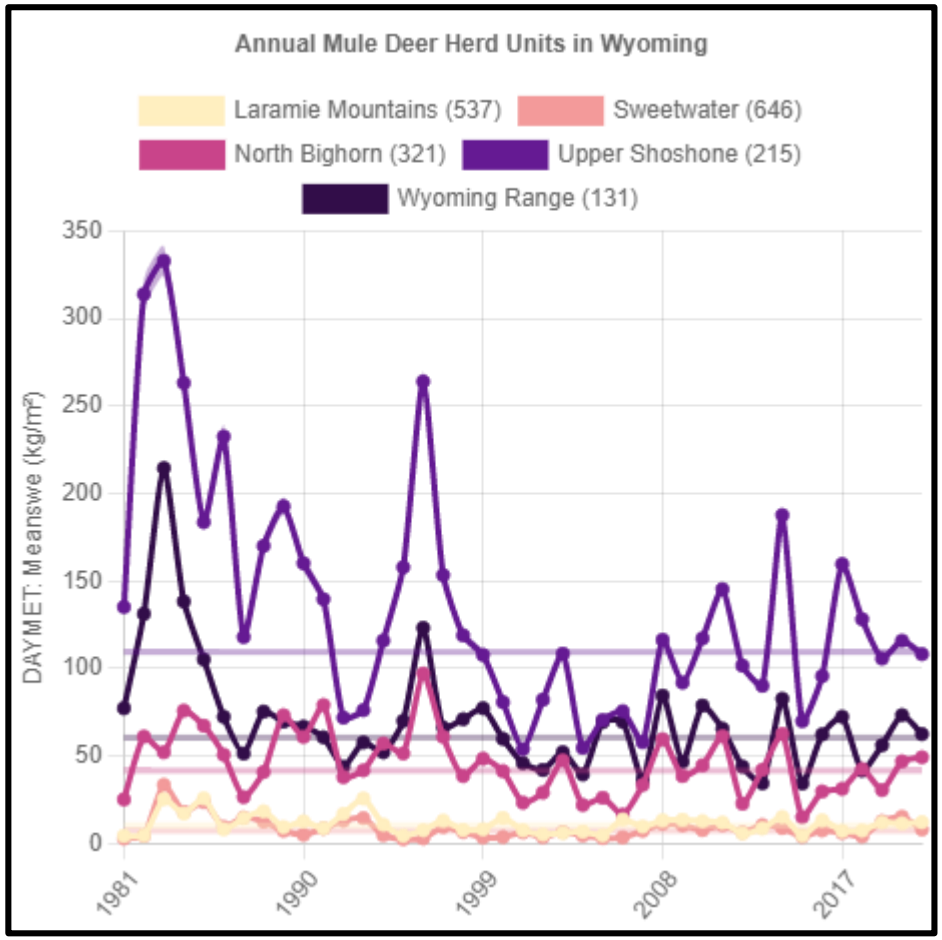
Meaningful assessments of survival, movement + habitat use

Herd selection process

Mule deer working group

- Gathered input from Coordinators
- Considered habitat, herd objectives, harvest strategies, disease prevalence, existing data, public interest, landownership and more
- Recommended 7 herds to Wildlife Administration

Final selection: **5 herds**



Focal herds

Laramie Mountains

North Bighorn

Sweetwater

Upper Shoshone

Wyoming Range

Sample design

- Maintain **80** does, **30** bucks, **100** juveniles (6 month olds) marked in each herd
- GPS technology
- Replace mortalities annually to maintain sample size
  - Project duration = 5 years
  - Mark new batch of juveniles each year for 3 years
- Large scale redeployment half-way through the project

Collar specifications

Most herds

- Telonics
- Does – standard collar
- Bucks – expandable collar
- Juveniles – expandable collar

Wyoming Range

- Vectronics
- Does – standard collar
- Bucks – expandable collar
- Juveniles – padded standard collar

Programming TBD – likely 1 location every 2 hours, most points stored on-board, subset uplinked

Capture logistics

Native Range – Nov 20 – Feb 15

- Laramie Mountains 1st
- TBD thereafter – **looking for input!**

Capture crews will deploy collars and collect samples, unless you want something different

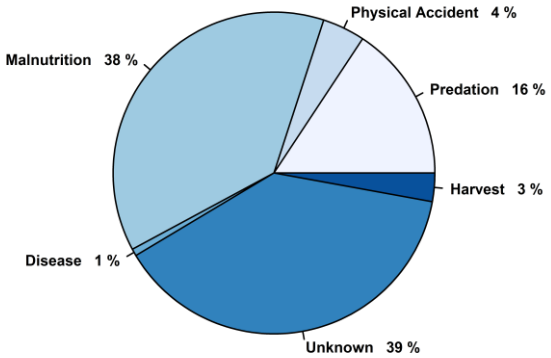
Samples – **looking for input!**

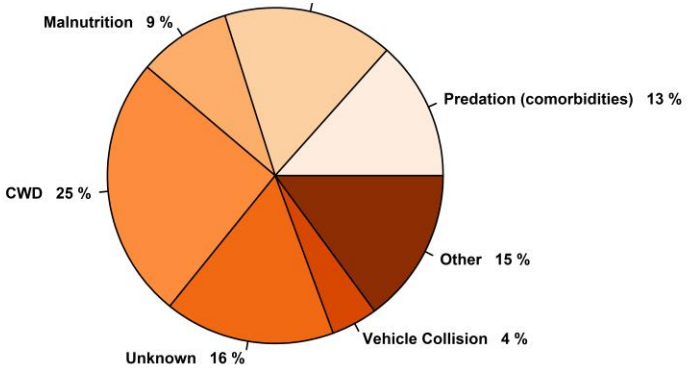
Landing zones, capture polygons, information needs – determined by regions

Predator component

Cause-specific mortality – 2 herds

- Herd selection TBD – Recommend Laramie Mountains and Sweetwater. Wyoming Range will continue to have data collected **Input needed!**
- Full-time field technician (hired thru Monteith lab)
- Additional field help – Malmberg lab, SRA Unit
- Standardized field necropsy protocols (Malmberg)
- Cutting edge pathology (Malmberg)

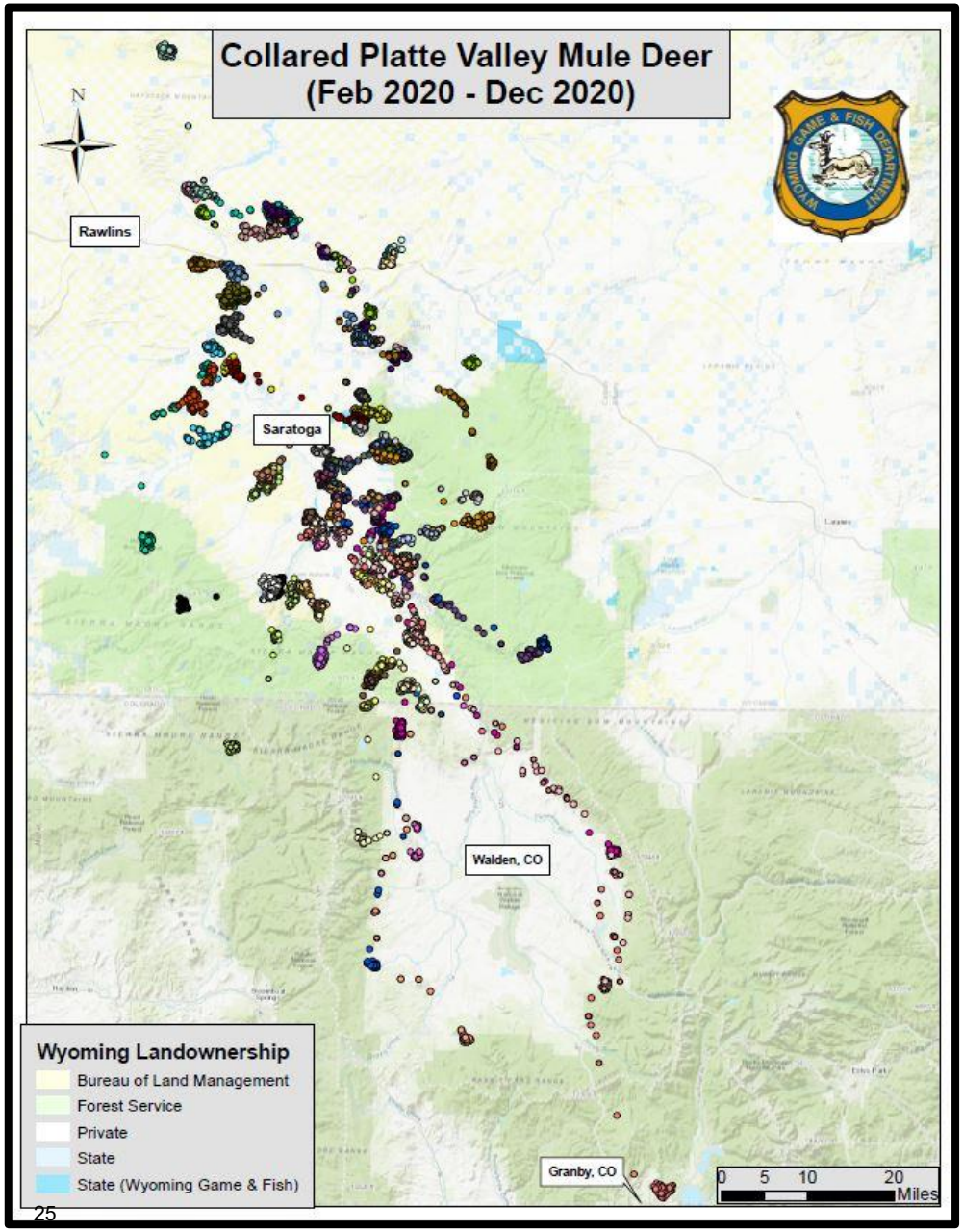




Data delivery

UW Partnership (Merkle)

- Hired a person responsible for data management and delivery (starts Oct 1)
- Weekly updates about your animals (email)
- Data dashboard
- Data uploads to Movebank
- System that manages GPS data for you, including cleaning, some “on-the-fly” maps and other deliverables



Roles & responsibilities

These are your herds!

Regions

- Define additional information needs
- Be the face of the program for your herd
- Coordinate capture specifics (landing zones, local outreach)
- Retrieve collars
- Use the data and provide feedback

SRA Unit

- Coordinate and oversee program
- Study design
- Reserve capture crews
- Order and setup collars
- Secure Chapter 33 permit and IACUC review
- Arrange for satellite uplinks and fees
- Work with fiscal for all things budgets and contracts
- Partner with UW on data management and access

U. of Wyoming partners

- Dr. Jerod Merkle – UW, Zoology & Physiology
- Dr. Jenn Malmberg – UW, WSVL
- Dr. Kevin Monteith – UW, Haub School
- WY Cooperative Fish & Wildlife Research Unit

Next steps

Point-of-contact for each herd (**today**)

Decide on cause-specific mortality herds (**ASAP**)

Finalize collar programming (**July 25**)

Finalize sample collection (**Aug 15**)

Set dates for individual herd meetings (**Aug?**)




APPENDIX C

APPENDIX D

WYOMING RANGE MULE DEER HERD

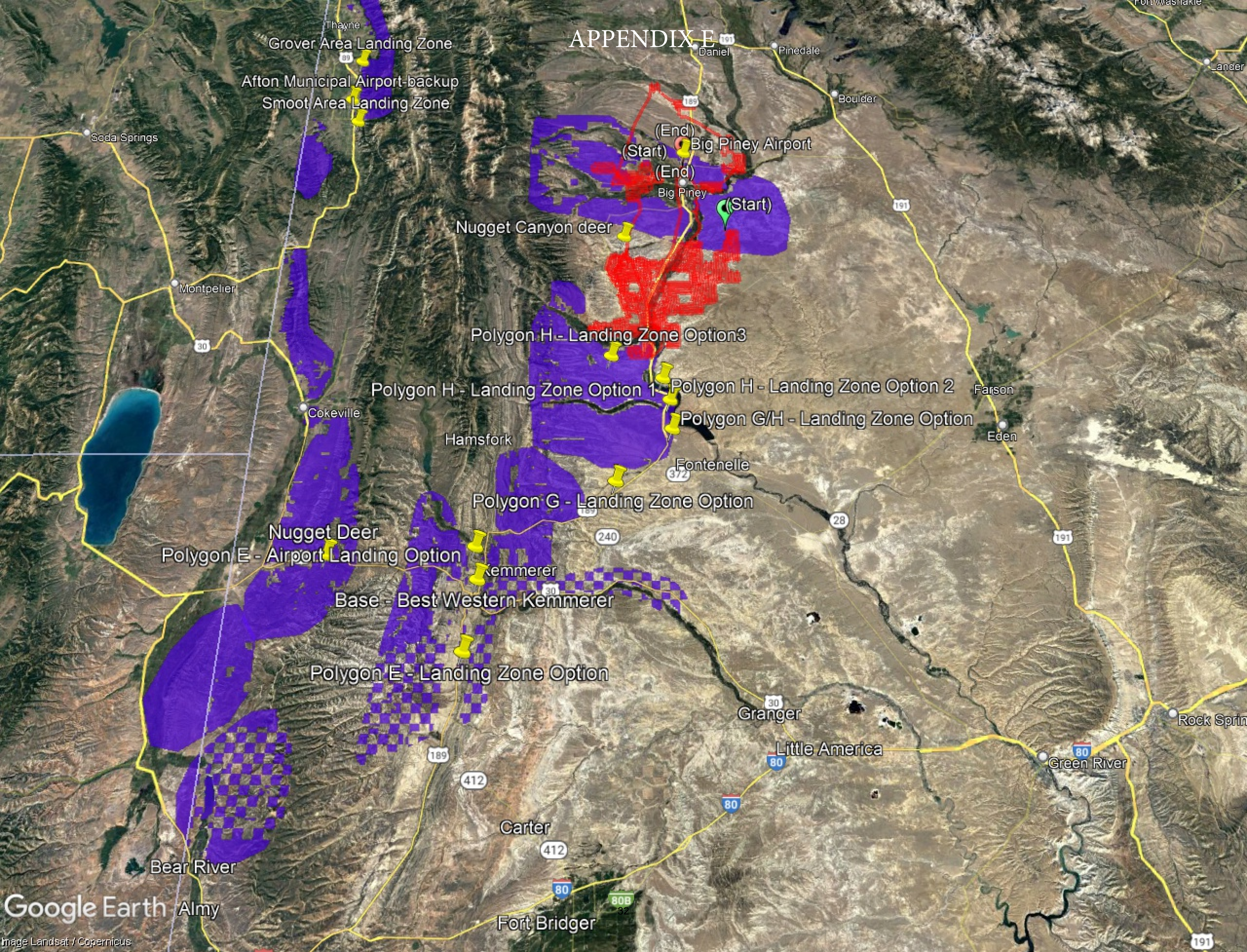
A SUMMARY OF FOCAL HERD COLLAR DEPLOYMENT BY WINTER RANGE COMPLEX

Polygon ID	Buck Collars	Doe Collars	Juvenile Collars	Total	Hall Notes
Star Valley (5 sub polygons)	5	15	7	27	
Big Piney Polygon	3	15	20	38	Changed to 3 bucks; notes indicate < = 5
Polygon H	4	8	7	19	
Polygon G	2	4	4	10	Corrected transposed doe / fawn numbers
Polygon F	1	4	2	7	
Polygon E	1	2	1	4	
Polygon A	0	0	2	2	Deleted 1 male originially listed; counting them in Kevin's sample; will top up next year if this approach doesn't work
Polygon B	1	0	10	11	Deleted 4 males originially listed; counting them in Kevin's sample; will top up next year if this approach doesn't work
Polygon C	0	0	1	1	Deleted 2 males originially listed; counting them in Kevin's sample; will top up next year if this approach doesn't work
Polygon D	1	0	11	12	Deleted 3 males originially listed; counting them in Kevin's sample; will top up next year if this approach doesn't work
SUM	**18**	**48**	**65**	**131**	

Big Piney Polygon					
Suggested Radio-collar Deployment Areas subsequent to comp flight Dec.6-7,2022					
	Buck Collars	**Doe Collars**	**Juvenile Collars**	**Total**	
Big Piney Polygon	**3**	**15**	**20**	**38**	
1. Deer Hills	**0**	**3**	**2**	**5**	**13%**
2. Graphite & Pine Hollows	**0**	**5**	**5**	**10**	**26%**
3. E of GR: Reardon, Chapelle,	**3**	**7**	**13**	**23**	**61%**

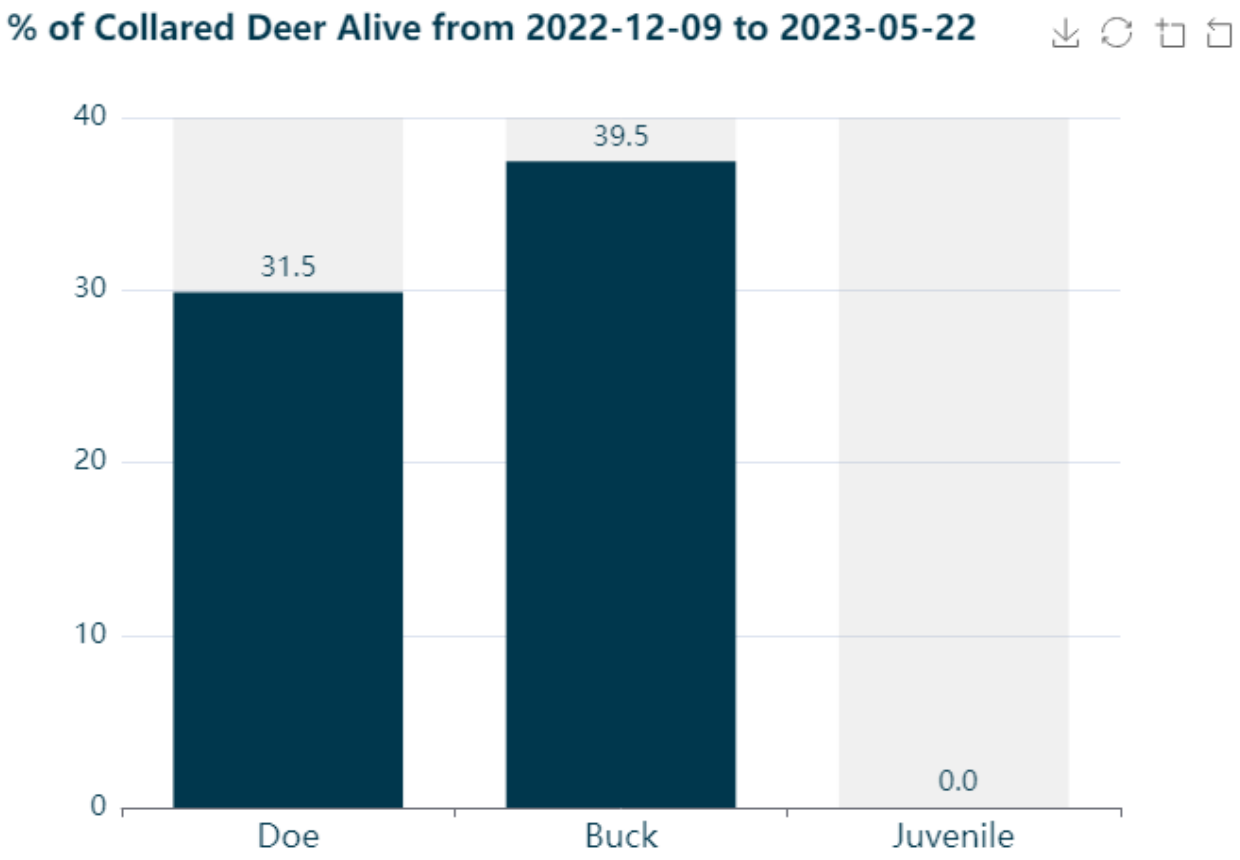
Figure 4, Bird Canyon				
Totals: 1 - 3 Big Piney Polygon	**3**	**15**	**20**	**38**

APPENDIX E


Grover Area Landing Zone
Afton Municipal Airport-backup
Smoot Area Landing Zone
Thayne
Soda Springs
Daniel
Pinedale
Boulder
Lander
(End)
(Start)
Big Piney Airport
(End)
Big Piney
(Start)
Nugget Canyon deer
Montpelier
Polygon H - Landing Zone Option3
Polygon H - Landing Zone Option 1
Polygon H - Landing Zone Option 2
Polygon G/H - Landing Zone Option
Farson
Eden
Cokeville
Hamsfork
Fontenelle
Polygon G - Landing Zone Option
Nugget Deer
Polygon E - Airport Landing Option
Kemmerer
Base - Best Western Kemmerer
Polygon E - Landing Zone Option
Granger
Little America
Rock Sprin
Green River
Carter
Bear River
Almy
Fort Bridger
Google Earth
Image Landsat / Copernicus

APPENDIX F

WYOMING RANGE MULE DEER HERD
A SUMMARY OF FOCAL HERD MULE DEER SURVIVAL
DECEMBER 9, 2022 – MAY 22, 2023



Attached are the last two weeks of locations and movements, along with survival information for the project, and a mortality summary from the last 7 days.
To interact with the location map you must download the attached .html then open it.

There are currently **57** mule deer on air including 17 bucks, 40 does, and 0 juveniles.
There have been **205** total mortalities since 2022-12-09 including 26 bucks, 87 does, and 92 juveniles.
In the last week there was 1 mortality.

Appendix G. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2023.

	No. Deer Classified				Change in Ratio		
	December		April		December	April	%
2022-23	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	Change
HA134	511	225	NDR	NDR	44.0	No Data Reported	No Data Reported
HA135	1702	901	NDR	NDR	52.9	No Data Reported	No Data Reported
HA143	2774	1324	1182	46	47.7	3.89	-92.0
TOTAL	2774	1324	1182	46	47.7	3.89	-92.0
2021-22	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	
HA134	278	99	152*	77*	35.6	50.6*	Small Sample Size
HA135	1141	520	NDR	NDR	45.6	No Data Reported	No Data Reported
HA143	901	491	2045	895	54.5	43.7	-19.8
TOTAL	901	491	2045	895	54.5	43.7	-19.8
2020-21							
HA134	731	395	125*	84*	54.0	67.2*	Small Sample Size
HA135	1612	835	459	185	51.7	40.3	-22.0
HA143	1282	672	757	336	52.4	44.4	-15.3
TOTAL	3625	1902	1341	605	52.0	42.8	-17.6
2019-20							
HA134	620	287	184*	46*	46.3	Small Sample Size	Small Sample Size
HA135	1775	730	419	108	41.1	25.8	-37.2
HA143	2409	1088	1511	517	45.2	34.2	-24.1
TOTAL	4804	2105	2114	671	43.4	32.4	-25.3
2018-19							
HA134	1492	721	387*	59*	48.3	15.2	-68.5
HA135	2324	1070	506	113	46.0	22.7	-49.3
HA143	1694	742	2006	765	43.8	38.1	-13.0
TOTAL	5510	2533	2899	937	46.0	32.3	-29.7
2017-18							
HA134	839	389	341	141	46.3	41.3	-10.7
HA135	1434	701	414	158	48.8	38.1	-21.9
HA143	2006	701	1261	430	34.9	34.0	-0.03
TOTAL	4279	1791	2016	729	41.8	36.1	-13.6
2016-17							
HA134	1059	489	344	27	46.1	7.8	-83.1
HA135	2167	1008	531	45	46.5	8.4	-82.0
HA143	1946	723	2142	113	37.1	5.3	-86.0
TOTAL	5172	2220	3017	185	42.9	6.1	-86.0
2015-16							
HA134	991	406	300	119	40.9	39.6	-3.2
HA135	1666	828	482	167	49.6	34.6	-30.2
HA143	2819	1147	1903	615	40.6	32.3	-20.4
TOTAL	5476	2381	2685	901	43.5	33.5	-25.7
2014-15							
HA134	803	466	103	76	58.0	73.7*	Small Sample Size
HA135	1899	1128	461	319	59.4	69.1*	Small Sample Size
HA143	1850	884	798	317	47.8	39.7	-16.9
TOTAL	1850	884	798	317	47.8	39.7	-16.9

Appendix G. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2023.

	No. Deer Classified				Change in Ratio		
	December		April		December	April	%
2013-14	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	Change
HA134	934	496	121*	53*	53.1	Small Sample Size	Small Sample Size
HA135	1261	672	526	208	53.3	39.5	-25.8
HA143	1999	897	1431	486	44.8	33.9	-24.3
TOTAL	3260	1569	1957	694	48.1	35.5	-26.2
2012-13							
HA134	793	404	199*	71*	50.9	Small Sample Size	Small Sample Size
HA135	1061	647	254	95	60.9	37.4	-38.6
HA143	1092	505	1498	585	46.2	39.0	-15.6
TOTAL	2153	1152	1752	680	53.5	38.8	-27.4
2011-12							
HA134	844	415	NDR	NDR	49.2	No Data Reported	No Data Reported
HA135	1387	675	133*	52*	48.7	Small Sample Size	Small Sample Size
HA143	2670	1083	1046	375	40.6	35.8	-11.8
TOTAL	2670	1083	1046	375	40.6	35.8	-11.8
2010-11							
HA134	870	379	722	77	43.5	10.6	-75.6
HA135	1449	622	611	73	42.9	11.9	-72.2
HA143	1987	959	1069	227	48.2	21.2	-56.0
TOTAL	4306	1960	2402	377	45.5	15.6	-65.7
2009-10							
HA134	954	430	772	289	45.0	37.4	-16.8
HA135	1409	642	428	166	45.5	38.7	-14.9
HA143	2480	1177	1278	503	47.4	39.3	-17.0
TOTAL	4843	2249	2478	958	46.4	38.6	-16.8
2008-09							
HA134	856	403	622	238	47.0	38.3	-18.5
HA135	1561	731	207	76	46.8	36.7	-21.6
HA143	2140	870	1415	522	40.6	36.9	-9.1
TOTAL	4557	2004	2244	836	44.8	37.3	-16.7
2007-08							
HA134	1225	736	787	171	60.0	21.7	-63.8
HA135	1198	657	565	137	54.8	24.2	-55.8
HA143	3122	1404	1315	525	44.9	39.9	-11.1
TOTAL	5545	2797	2667	833	50.4	31.2	-38.1
2006-07							
HA134	680	344	249	104	50.6	41.7	-17.6
HA135	844	462	444	191	54.7	43.0	-21.4
HA143	2253	1136	520	223	50.4	42.8	-15.1
TOTAL	3777	1942	1213	518	51.4	42.7	-16.9

Appendix G. A comparison between December and April herd composition data, Wyoming Range Mule Deer Herd, 1992-2023.

	No. Deer Classified				Change in Ratio		
	December		April		December	April	% Change
2005-06	Adults	Fawns			Juv:100 Adults	Juv:100 Adults	
HA134	732	442	391	174	60.4	44.5	-26.3
HA135	1075	644	435	157	59.9	36.1	-39.7
HA143	2279	1085	1177	413	47.6	35.1	-26.2
TOTAL	4086	2171	2003	744	53.1	37.1	-30.1
2004-05							
HA134	942	537	515	135	57.0	26.2	-54.0
HA135	854	534	790	232	62.5	29.4	-52.9
HA143	1750	893	1156	461	51.0	39.8	-21.9
TOTAL	3546	1964	2461	828	55.3	33.6	-39.2
2003-04							
HA134	760	457	146	21	60.1	14.4	-76.0
HA135	1148	625	587	149	54.4	25.3	-53.5
HA143	1490	788	880	195	52.8	22.1	-58.1
TOTAL	3398	1870	1613	365	55.0	22.6	-58.9
2002-03							
HA134	511	235	426	129	45.9	30.3	-33.9
HA135	1141	546	986	366	47.8	37.1	-22.4
HA143	1556	7767	1542	585	49.3	37.9	-23.1
TOTAL	3208	1548	2954	1080	48.2	36.6	-24.1
2001-02							
HA134	1051	478	468	59	45.5	12.6	-72.3
HA135	1535	704	902	174	45.8	19.3	-57.9
HA143	2453	1122	1456	474	45.7	32.5	-28.9
TOTAL	5039	2304	2826	707	45.7	25.0	-45.3
2000-01							
HA134	572	305	256	76	53.3	29.6	-44.4
HA135	821	490	873	375	59.7	42.9	-28.1
HA143	2244	1358	1529	811	60.5	53.0	-12.4
144/45	215	137	83	42	63.0	50.6	-20.0
TOTAL	3852	2290	2741	1304	59.4	47.5	-20.0
1999-00							
HA134	744	422	88	52	56.7	Small Sample Size	Small Sample Size
HA135	936	460	559	242	49.1	43.3	-11.8
HA143	1570	934	1225	715	59.5	58.4	-00.1
TOTAL	3250	1816	1872	1009	55.6	53.6	-3.6

	No. Deer Classified				Change in Ratio		
1998-99	December		April		December	April	% Change
	Adults	Fawns	Adults	Fawns	Juv:100 Adults	Juv:100 Adults	
HA134	591	321	280	121	54.3	43.2	-20.4
HA135	908	513	416	178	56.5	42.7	-24.4
HA143	1921	1017	1224	540	52.9	44.1	-16.6
TOTAL	3420	1851	1920	839	54.1	43.7	-19.2
1997-98							
HA134	821	386	90	29	47.0	32.2	-31.5
HA135	1081	621	415	160	57.4	38.6	-32.8
HA143	1769	896	1528	648	50.7	32.4	-16.4
TOTAL	3671	1903	2033	837	51.8	41.2	-20.5
1996-97							
HA134	1092	570	217	25	72.6	11.5	-84.2
HA135	1601	867	231	82	75.7	35.5	-53.1
HA143	1221	791	1202	401	64.8	33.4	-48.5
TOTAL	3914	2228	1650	508	56.9	30.7	-46.0
1995-96							
HA134	431	228	334	106	54.2	31.7	-41.5
HA135	735	407	416	180	55.4	43.0	-22.4
HA143	1925	942	1369	483	48.9	35.3	-27.8
144/45	551	254	206	39	46.1	18.9	-59.0
TOTAL	3642	1831	2325	808	50.3	34.8	-30.8
1994-95							
HA134	1331	574	596	221	43.1	37.1	-13.9
HA135	434	245	489	219	56.5	44.8	-20.7
HA137	361	172	217	85	47.6	39.2	-17.6
HA143	1965	759	1189	514	38.6	43.2*	Small Sample Size
TOTAL	4742	2133	2491	1039	45.0	41.7	-7.3
1993-94							
HA134	564	202	318	88	35.8	27.7	-22.6
HA135	360	148	357	108	41.1	30.3	-26.3
HA137	229	64	254	79	27.9	31.1*	Small Sample Size
HA143	1165	395	957	301	33.9	31.5	-7.1
144/45	298	170	108	41	57.0	38.0	-33.3
TOTAL	2667	1002	1994	617	37.6	30.9	-17.8
1992-93							
HA134	1089	530	190	21	48.7	11.1	-77.2
HA135	470	253	92	16	53.8	17.4	-67.7
HA143	1924	548	1281	251	28.5	19.6	-31.2
144/45	515	174	193	24	33.8	12.4	-63.3
TOTAL	4586	1782	1756	312	38.9	17.8	-54.2

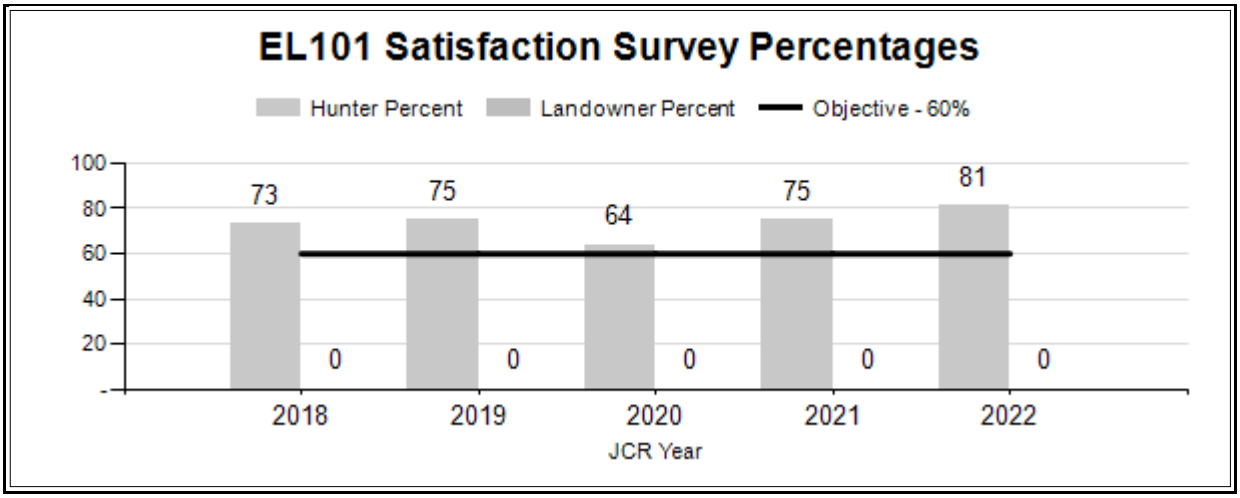
2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL101 - TARGHEE
HUNT AREAS: 73

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	74%	81%	80%
Landowner Satisfaction Percent	N/A	N/A	N/A
Harvest:	48	60	50
Hunters:	117	134	120
Hunter Success:	41%	45%	42 %
Active Licenses:	126	143	120
Active License Success:	38%	42%	42 %
Recreation Days:	813	1,117	800
Days Per Animal:	16.9	18.6	16
Males per 100 Females:			
Juveniles per 100 Females			

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



2023 HUNTING SEASONS
TARGHEE ELK HERD (EL101)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
73	Gen	Sep. 1	Sep. 19				Any elk
73	Gen			Sep. 20	Oct. 25		Antlered elk, spikes excluded
73	6			Aug. 15	Jan. 31	35	Cow or calf valid on private land
73	6	Sep. 1	Sep. 19				Cow or calf valid in the entire area

2022 Hunter Satisfaction: 81.0% Satisfied, 16.7% Neutral, 2.4% Dissatisfied

2023 Management Summary

1.) Hunting Season Explanation: This herd is managed with a hunter satisfaction objective (60%) instead of a mid-winter trend count because the majority of elk migrate to winter ranges in Idaho. Hunter satisfaction in 2022 was 81%. Hunting opportunity in this herd unit is limited due to limited access points to public lands, steep terrain, and fall migration of elk to Idaho. Despite relatively low overall harvest numbers (60 elk were harvested in 2022 by 133 active hunters), hunter satisfaction in this herd unit is high and the herd is meeting its hunter satisfaction objective.

2.) Management Objective Review: The next objective review is scheduled for 2024.

3.) Chronic Wasting Disease Management: This is a Tier 3 surveillance herd that is not a priority for CWD sampling at this time due to its very low elk harvest. Collecting an adequate sample size in this herd is extremely difficult due to low elk harvest over a very large area. CWD management in this herd focuses on opportunistic hunter-harvest and roadkill sampling and sampling any animals that are displaying signs of sickness. Three CWD samples were collected from elk in 2022 (Table 1). CWD has not been detected in this elk herd, although confidence intervals are large due to very low sample size.

Table 1. Chronic wasting disease prevalence for elk in the Targhee Elk Herd Unit in 2022 and for 3-year period of 2020-2022.

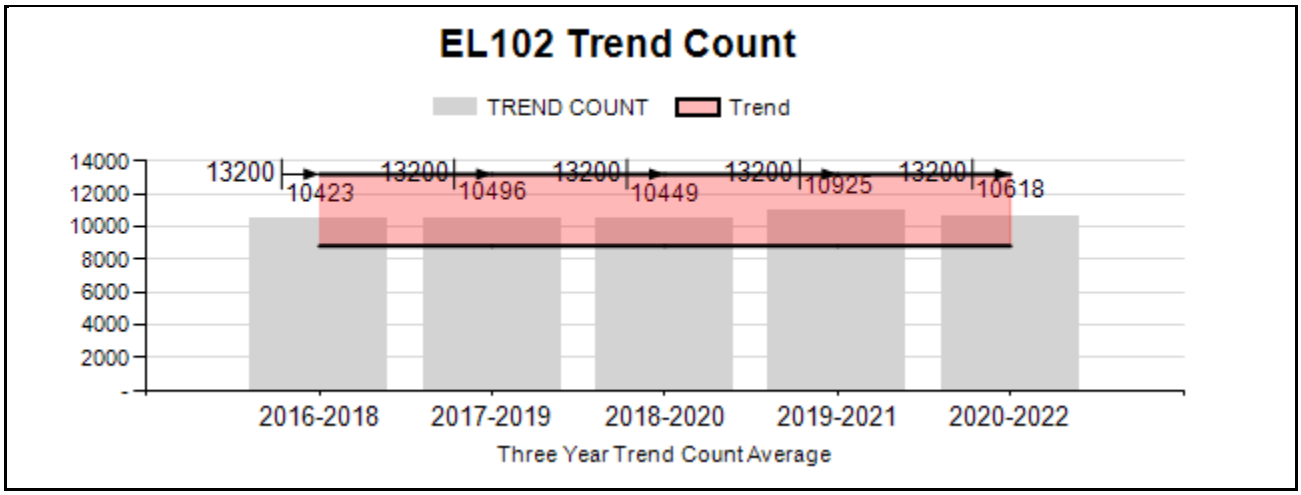
Year	Percent CWD-Positive and sample size (n) *Hunter Harvest Only*
	All Adult Elk (CI = 95%)
2022	0.0% (n=3)
2020 - 2022	0.0% (CI 0.0% - 45.9%, n=6)

2022 - JCR Evaluation Form

SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL102 - JACKSON
HUNT AREAS: 70-72, 75, 77-83
PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	10,656	10,064	11,000
Harvest:	1,096	1,332	1,100
Hunters:	2,696	2,546	2,700
Hunter Success:	41%	52%	41%
Active Licenses:	2,834	2,676	2,800
Active License Success	39%	50%	39 %
Recreation Days:	17,316	16,005	17,000
Days Per Animal:	15.8	12.0	15.5
Males per 100 Females:	34	34	
Juveniles per 100 Females	21	22	

Trend Based Objective (± 20%)	11,000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	-8.5%
Number of years population has been + or - objective in recent trend:	1



2023 HUNTING SEASONS
JACKSON ELK HERD (EL102)

Area	Type	Archery Dates		General Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
70	Gen	Sep. 1	Sep. 19				Any elk
70	Gen			Sep. 20	Oct. 31		Antlered elk, spikes excluded
71	Gen	Sep. 1	Sep. 19				Any elk
71	Gen			Sep. 20	Oct. 31		Antlered elk, spikes excluded
72							Closed
75	4			Nov. 18	Dec. 10	20	Antlerless elk; the Snake River Bottom and Antelope Flats portions shall be closed
75	6			Nov. 18	Dec. 10	20	Cow or calf; the Snake River Bottom and Antelope Flats portions shall be closed
77	Gen			Oct. 10	Oct. 24		General license and unused limited quota licenses, excluding limited quota cow or calf licenses, valid for any elk
77				Oct. 25	Nov. 22		General license and unused limited quota licenses; antlerless elk
77	Youth only			Nov. 23	Nov. 26		National Elk Refuge permits shall be issued only for those in possession of a full price youth elk license, any elk; youth only
77				Nov. 27	Dec. 15		General license and unused limited quota licenses, antlerless elk
78	Gen			Aug. 15	Oct. 31		Antlerless elk valid on private land
78	Gen	Sep. 1	Sep. 25				Any elk valid in the entire area
78	1			Aug. 15	Sep. 25	75	Any elk valid off national forest

78	1			Sep. 26	Jan. 31		Any elk valid in the entire area
78	2			Aug. 15	Oct. 31	50	Any elk valid on private land
78	6			Aug. 15	Sep. 25	175	Cow or calf valid off national forest
78	6			Sep. 26	Jan. 31		Cow or calf valid in the entire area
79							Closed
80	Gen	Sep. 1	Sep. 25	Sep. 26	Oct. 31		Any elk
80	6	Sep. 1	Sep. 25	Oct. 15	Nov. 20	300	Cow or calf
80	6			Nov. 21	Nov. 30		Cow or calf valid south of the Curtis Canyon and Sheep Creek Roads (U.S.F.S. Road 30440 and 30445)
81	Gen	Sep. 1	Sep. 25				Any elk
81	Gen			Sep. 26	Oct. 25		Antlered elk, spikes excluded
82	Gen	Sep. 1	Sep. 25				Any elk
82	Gen			Sep. 26	Oct. 25		Antlered elk, spikes excluded
82	4	Sep. 1	Sep. 9	Sep. 10	Nov. 5	45	Antlerless elk
82	4			Nov. 6	Jan. 31		Antlerless elk on private land, also valid on private land in Areas 81 and 70
83	Gen	Sep. 1	Sep. 30				Any elk
83	Gen			Oct. 1	Oct. 25		Antlered elk, spikes excluded

2022 Hunter Satisfaction: 76.8% Satisfied, 14.8% Neutral, 8.4% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The 2023 season structure was maintained similar to recent years and continues to focus antlerless harvest on short and medium-distance migratory herd segments and more conservative, mostly antlered harvest on long-distance migratory and Gros Ventre herd segments. The current hunting season structure has succeeded in stabilizing the herd around the 11,000 mid-winter trend count objective. The 2022 mid-winter trend count was 10,064 elk and the 3-year average was 10,618 (3.5% below objective). The calf:cow ratio was 22 and the bull:cow ratio was 34. The calf:cow ratio is slightly higher than the 5-year average of 20.

The lower trend count this year was likely driven by relatively high elk harvest during fall 2022. Total harvest was 1,332 elk for the herd unit, including 781 antlerless elk (634 cows, 147 calves). The early season harvest was low due to very warm fall temperatures, but the later season harvest that mainly focuses on antlerless elk was high in the southern hunt areas (mainly 77 and 80). This was due to snowfall in November that caused elk to migrate earlier than in recent years.

Changes to the 2023 seasons included substantially decreasing the quota in Hunt Area 75 in Grand Teton National Park from 475 licenses to 40 and shortening the season. This change was due to the lower mid-winter trend count and decreased number of adult females in the herd. The Youth Hunt portion of the Hunt Area 77 season was lengthened from three days to four days. The Hunt Area 78 Type 1 license was increased from 50 to 75 licenses due to the high success on this license in recent years (>90% success). The Hunt Area 82 Type 4 season was shortened by approximately 10 days on public lands but lengthened on private lands until January 31. Additionally, this license will be valid on private lands in Hunt Areas 81 and 70 later in the season. These changes were mainly to help address elk damage later in the winter on private lands in the Gros Ventre drainage and Buffalo Valley.

Overall harvest success in the Jackson Elk Herd in 2022 was 52%. There were three full price licenses that had over 60% success: Hunt Area 78 Type 1 license (90%), Hunt Area 78 Type 2 license (81%), and Hunt Area 82 Type 4 license (83%). Quotas were increased for the Hunt Area 78 Type 1 and Hunt Area 82 Type 4 licenses in 2023. The Hunt Area 78 Type 2 license is valid on private land only and therefore access is limited. Managers will continue to monitor hunter success on this license and access options, but feel that there is currently not enough access to offer additional licenses.

2.) Management Objective Review: The Jackson Elk Herd objective review was scheduled for 2021. However, herd unit managers decided to postpone the objective review until the current Elk Feedgrounds Public Collaborative Process is completed. The results of this process may have direct implications to the evaluation of the herd unit objective. This process is expected to be completed in 2023 or 2024.

3.) Chronic Wasting Disease Management: This is a Tier 1 surveillance herd. The first CWD-positive elk in this herd unit was detected in 2020 in Hunt Area 75. No additional positive elk have been detected. Prevalence estimates and sample sizes are presented below (Table 1). Sample size is high in this herd due to mandatory sampling in Hunt Areas 75 (Grand Teton National Park) and 77 (National Elk Refuge) and efforts by Department personnel in the Jackson Region to collect samples from meat processors, head barrels, and from hunter contacts in the field. However, sample distribution is skewed to the southern hunt areas that are primarily antlerless harvest where access is easier. Samples are limited from backcountry hunt areas, however Department personnel are working to improve this by prioritizing time spent contacting backcountry camps and trailheads as well as training hunters and outfitters to collect their own samples. The Department initiated the Elk Feedgrounds Public Collaborative Process in 2020, with the goal of developing a long-term management plan for feedgrounds. Currently, CWD management activities are focused on proper carcass disposal and surveillance through hunter-harvested elk, road-kills, and any elk that is exhibiting signs of sickness. In addition, the Department is employing general disease management principles on feedgrounds such as low-

density feeding and reducing the length of the feeding season when feasible to reduce animal-to-animal contact and density.

Table 1. Chronic wasting disease prevalence for hunter-harvested elk in the Jackson Elk Herd Unit in 2022 and for 3-year period of 2020-2022.

Year	Percent CWD-Positive and sample size (n) *Hunter Harvest Only*
	All Adult Elk (CI = 95%)
2022	0.0% (n=542)
2020 - 2022	0.1% (CI 0.0% - 0.5%, n=1209)

4.) Disease Surveillance and Feedgrounds: Conditions this winter were severe and resulted in the initiation of feeding earlier than average region wide. Above average snowfall and below average temperatures this winter influenced an extended supplemental feeding season in the Jackson Region. Due to these extreme winter conditions, most feedgrounds operated for the maximum duration with peak elk numbers in attendance, and none of the feedgrounds were terminated during the February/March time frame, as is typical. Brucellosis surveillance efforts in this herd were associated with collar and ear tag deployments both on feedgrounds and via helicopter captures.

Table 1. 2023 Jackson Elk Herd Brucellosis Surveillance and long-term prevalence.

Feedground	Capture Method	GPS collars deployed	# Captured	# Tested	% Prevalence	Long Term Sero % (total tested)
National Elk Refuge	Dart	0	28	26	19%	34% (1841)
Fish Creek	Trap	1	99	19	5%	29% (150)
Gros Ventre NWR	Helicopter	13	13	13	38%	39% (97)
Totals		14	140	58	19%	

The National Elk Refuge experienced above average calf mortality during the 2022-2023 feeding season. Significant efforts were put into documenting and necropsying mortalities throughout the spring in an effort to identify with causative agent of this mortality. NER staff documented 187 calf mortalities during spring surveys (approximately 19% of the classified calves on supplemental feed) and are currently awaiting laboratory results from necropsies conducted. This level of mortality is above average and can be attributed primarily to winter severity, feeding duration and feedground elk densities.

5.) Mid-Winter Trend Count: The 2022 mid-winter trend count for the Jackson Elk Herd was 10,064 elk. The number of elk on supplemental feed on the National Elk Refuge (NER) was 7,406 and the calf:cow ratio was 20. The calf ratio on the NER was higher this year compared to 18 in 2019 and 16 in 2021 (there was no calf ratio obtained in 2020 due to survey limitations from COVID). This could have partly been caused by relatively high cow harvest this fall. There were a total of 1,933 elk counted in the Gros Ventre drainage, which is about 100 elk fewer than the 3-year average of 2,050 elk. A total of 1,545 elk were on the Patrol Cabin Feedground and

388 on native winter range in this year's survey. Elk attended the Fish Creek Feedground briefly earlier in the winter but were not there during the trend count. Feeding did not occur at Alkali Feedground this year. The calf:cow ratio in the Gros Ventre 26.6 calves per 100 cows. The adult bull ratio was 16.0 and the yearling bull ratio was 15.0. There were 572 elk on other native winter ranges, primarily in areas east of the NER near Flat Creek and Curtis Canyon, Spread Creek, Elk Ranch, and Buffalo Valley. This is 723 elk fewer than last year, which is likely due to the above average winter conditions this year that pushed more elk onto feedgrounds. Snowfall started relatively early (November) and continued through March, coupled with several prolonged stretches of very cold temperatures (< 0º F) Significant snow depth persisted on low elevation winter ranges into mid-April.

6.) Research: Managers are continuing to focus collaring efforts in the Gros Ventre herd segment in order to better understand elk winter distribution, movements in and out of the drainage, and cow elk survival. These efforts began in fall 2018 and collaring efforts continued in 2019, 2021, and 2022 in order to maintain a sample size of approximately 20-30 cow elk. In total, 75 Gros Ventre cow elk have been collared over four years. Overall, 19 elk have died during the study. Five (26%) have died from hunter harvest or wounding loss, mostly outside of the Jackson Herd Unit in adjacent hunt areas. Four (21%) died from predation (three from wolves and one from a mountain lion), one (6%) died from necrotic stomatitis, one (6%) died from a systemic infection from unknown cause, one (6%) died from birth complications, and 7 (37%) died of unknown causes. Annual survival has been between 84% - 90% although it dropped to 71% in 2022. The collars have increased our knowledge of Gros Ventre elk winter distribution and movements in and out of the Gros Ventre drainage. On average, 30% of the collared elk migrate out of the Gros Ventre drainage and spend the winter on the NER, however during some winters it is as high as 50%. Individual elk also exhibit a significant amount of winter range switching from year to year. These shifts in winter distribution help explain why mid-winter trend count numbers can fluctuate dramatically year to year in the Gros Ventre drainage. Despite where elk spend the winter, the collared elk are very faithful to their summer and fall ranges and return to the same areas every year. A current research collaboration with a PhD student at the University of California at Berkeley will help shed light on the factors that are driving the winter range shifts, including wolf density, weather, and snowpack.

7.) National Elk Refuge Step-Down Plan: In 2020, the U.S. Fish and Wildlife Service began implementation of its Bison and Elk Management Step-Down Plan: a Structured Framework for Reducing Reliance on Supplemental Winter Feeding (2019) on the NER. Following the direction in this plan, supplemental feeding was ceased one week earlier in 2020 and two weeks earlier in 2021 compared to what would have traditionally occurred based on snow melt trends. In 2022, the NER delayed the initiation of feeding by one week and ceased feeding 2 weeks early. Biologists from the WGFD and NER jointly monitor forage and snow conditions prior to the initiation of feeding and in the past, have recommended that feeding start when available forage has declined to an average of 300 lbs/acre on the NER. This threshold was reached on January 8, 2023. The NER attempted to delayed feeding initiation by 2 weeks according to the Step-Down Plan, however crusty snow conditions and decreased forage availability caused a large group of elk to begin to stage to leave the NER to the northwest after a delay of 2 days, which triggered initiation of feeding to prevent elk from leaving the NER. The NER planned to cease feeding approximately 3 weeks early in spring 2023, however after discussion with WGFD regarding

significant snow depths remaining on native range, this was scaled back to approximately 11 days early based on conditions. Even with the delay and early cessation, this was one of the longest feeding seasons on the NER due to severe and prolonged winter conditions in 2023. Feeding started on January 11 and ended on April 8.

2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL103 - FALL CREEK
HUNT AREAS: 84-85

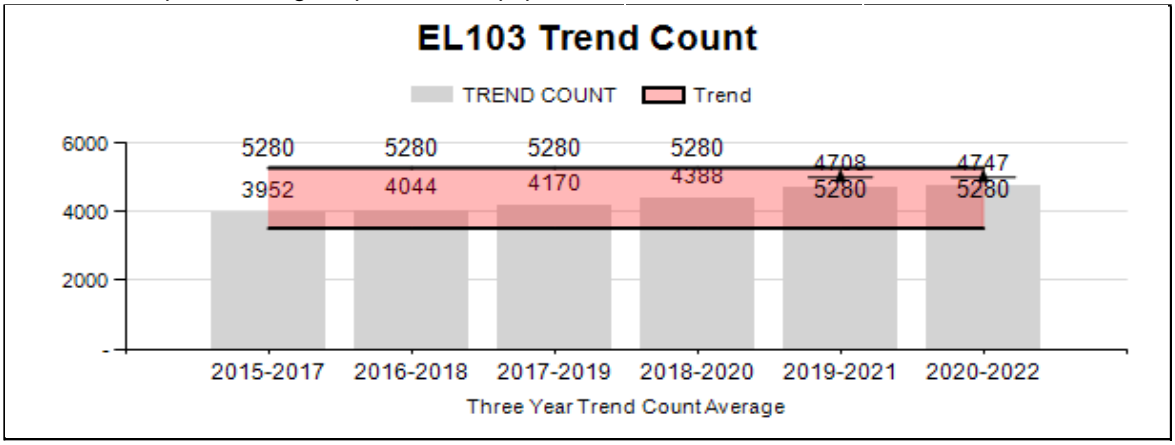
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GARY FRALICK

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	4,394	4,781	4,500
Harvest:	514	580	650
Hunters:	1,529	1,547	1,625
Hunter Success:	34%	37%	40 %
Active Licenses:	1,595	1,652	1,625
Active License Success	32%	35%	40 %
Recreation Days:	9,905	10,360	11,781
Days Per Animal:	19.3	17.9	18.1
Males per 100 Females:	18	23	
Juveniles per 100 Females	27	33	

Trend Based Objective (± 20%)	4,400 (3520 - 5280)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	9%
Number of years population has been + or - objective in recent trend:	4

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

	JCR Year	Proposed
Females ≥ 1 year old:	NA%	NA%
Males ≥ 1 year old:	NA%	NA%
Juveniles (< 1 year old):	NA%	NA%
Total:	NA%	NA%
Proposed change in post-season population:	NA%	NA%



2023 HUNTING SEASONS
FALL CREEK ELK HERD (EL103)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
84	Gen	Sep. 1	Sep.25				Any elk
84	Gen			Sep.26	Oct.31		Any elk , spikes excluded
84	Gen			Nov. 1	Nov. 15		Antlerless elk
84	1			Nov. 1	Jan.31	35	Any elk valid on private land west of U.S. Highway 191 and north and east of the Snake River starting at the South Park Bridge
84	6	Sep. 1	Sep. 25	Sep.26	Nov.20	300	Cow or calf
84,85	7			Aug. 15	Jan. 31	250	Cow or calf valid on private land in Area 84; also valid in the portion of Area 85 on or within 200 yards of irrigated land north of Fall Creek
85	Gen	Sep. 1	Sep. 25				Any elk
85	Gen			Sep. 26	Oct. 31		Any elk, spikes excluded
85	Gen			Nov. 1	Nov.15		Antlerless elk
85	6	Sep. 1	Sep. 25	Sep.26	Nov. 15	100	Cow or calf

2022 Hunter Satisfaction: 76% Satisfied, 15% Neutral, 8% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The proposed hunting season structure will promote any elk hunting, spikes excluded opportunity from September 26 - October 31 because of a sustain number of elk counted in the postseason trend count that is within the population trend objective range. Public sentiment, primarily from resident hunters, supports more opportunity to harvest antlerless elk in this herd. Any elk hunting opportunities, in which hunters may select antlerless elk, can mitigate, or decease hunting pressure on the antlered segment of the population and thereby potentially increase the number of antlered elk observed in the postseason population.

A November general license season in Area 84 will provide additional opportunity because of the increased number of elk counted during the current postseason trend count, This portion of the hunt will increase the number of days by closing on November 15 instead of November 7. In addition, the number of Type 6 licenses valid for cow or calf only in Area 84 will remain at 300 licenses and the closing date will remain at November 20. A later closing date in November for Type 6 license holders offers up to potentially 81 days of recreation.

A modest increase in opportunity will occur in Area 85 by allowing a general license antlerless elk hunt November 1 – November 15. The number of Type 6 cow calf licenses will remain at 100 but offer an extension in the closing date of the hunting season from October 31 to November 15. This adjustment is due to the relatively high number of elk counted on the Dog Creek and South Park feedgrounds, which are close to the feedground quotas of 800 and 1000 elk, respectively.

The management strategy associated with the issuance of Type 7 licenses has proven to be popular with the hunting public and as a result, these limited quota licenses will be maintained at 250 licenses in 2023. These late season hunts provide an opportunity to harvest elk in areas where depredation to privately stored crops or co-mingling with livestock occurs.

2.) **Management Objective Review**: The Fall Creek elk herd postseason trend objective is 4400 elk. The postseason trend count objective was last reviewed by the public in 2017. The Wyoming Game and Fish Commission approved the objective in 2017. The next objective review is scheduled for 2023.

3.) **Herd Unit Evaluation**: The number of elk counted during postseason surveys decreased from 5052 elk in 2021 to 4781 elk in 2022 (Appendix A). The decrease in the number of elk counted was largely observed on the Camp Creek and Horse Creek feedgrounds. The number of elk decreased from 2889 elk in 2021 to 2681 elk in 2022 on these feedgrounds, which is still above the combined Commission quota of 2150 elk. The observed elk numbers, especially in Area 84, warrant a continuation of a more liberal approach to elk management in 2023. Consequently, a November, general season for antlerless elk will be maintained in both hunt areas that will allow the take of antlerless elk from November 1 – 15.

The spikes excluded restriction will likely persist into the future as popularity with segments of the hunting public will successfully petition the Department to continue with this management program. Moreover, the Department's elk management program appears to be supported by the hunting public as evidenced by a rating of 76% hunter satisfaction in 2022.

4) Chronic Wasting Disease Management: The Fall Creek elk herd is a Tier 2 surveillance herd that prioritized in 2022, and specific efforts were directed at gathering CWD samples. Prevalence estimates and sample sizes are presented below (Table 1). During the 2022 sampling period there no positive hunter-harvested elk that tested positive. Samples in 2022 were collected without the assistance of CWD technicians, so it is believed a similar level of effort and corresponding CWD samples should be expected into the foreseeable future. This level of effort is appropriate with the high profile and importance of this elk herd. Since 2020, a total of 250 samples have been collected and tested with zero testing positive.

Table 1. CWD prevalence for hunter-harvested elk in the Fall Creek Elk Herd, 2020 – 2022.

Years	Percent CWD-Positive and sample size (n) *Hunter Harvest Only*
	All Adult Elk (CI = 95%)
2020	0.0% (0.0%, n=87)
2021	0.0% (0.0%, n=63)
2022	0.0% (0.0%, n=100)
2020 - 2022	0.0% (0.0%, n=250)

5.) Disease Surveillance and Feedgrounds: Conditions this winter were severe and resulted in the initiation of feeding earlier than average region wide. Above average snowfall and below average temperatures this winter influenced an extended supplemental feeding season in the Jackson Region. Due to these extreme winter conditions, most feedgrounds operated for the maximum duration with peak elk numbers in attendance, and none of the feedgrounds were terminated during the February/March time frame, as is typical. Brucellosis surveillance in the Fall Creek Elk herd was limited in 2023 to animals captured for collar deployment and a more comprehensive, statistically significant effort will be undertaken in 2024.

Table 1. 2023 Fall Creek Elk Herd Brucellosis Surveillance.

Feedground	Capture Method	GPS collars deployed	# Captured	# Tested	% Prevalence	Long Term Sero % (total tested)
Horse Creek	Dart	2	2	2	0%	47% (176)
Camp Creek	Dart	2	2	2	0%	43% (90)
South Park	Dart	3	5	5	40%	29% (313)
Dog Creek	Dart	2	2	2	0%	53% (75)
Totals		9	11	11	18%	

During the 2022-2023 feeding season, a mortality event was documented at the Horse Creek/Camp Creek Feedground complex south of Jackson. Based on visual and necropsy observations this prolonged morbidity/mortality event was determined to be from a buildup of *Fusobacterium necrophorum,* an anaerobic bacteria commonly found in the mammalian digestive tract. Between February 25th and May 13, 2023 a total of 155 calf elk mortalities were documented, with 91 occurring either on or directly adjacent to the feeding areas and most being euthanized due to inability to move at time of discovery. An additional 64 elk were documented on national forests and private lands adjacent to Horse Creek and Camp Creek Feedgrounds and based on scavenging patterns, locations, age and timing of mortality it is assumed that these individuals are highly likely to have been infected as well. This level of mortality accounts for a loss of more than 30% of the calves that were documented between Horse Creek and Camp Creek Feedgrounds (45% of classified calves on Horse Creek Feedground) in 2023.

Appendix A. Fall Creek Elk Herd, posthunt herd composition data, 2017-2022.										
							Ratio:100 Females			
2017	Adult Males	Yrlng Males	Total Males	Cows	Calves	Total	Adult Males	Yrlng Males	Total Males	Calves
84 HCFG	115	52	167	787	148	1102				
84 CCGF	5	12	17	446	47	510				
84 SPFG	73	42	115	609	218	942				
84 NR	24	7	31	64	25(59)	179				
85 DCFG	23	30	53	551	85	689				
85 NR	11	15	26	44	24(240)	334				
TOTAL	251	158	409	2501	547(299)	3756	10	6	16	22
2018										
84 HCFG	78	50	128	927	203	1258				
84 CCGF	11	28	39	512	157	708				
84 SPFG	74	42	116	513	167(50)	846				
84 NR	22	9	31	61	36(110)	238				
85 DCFG	48	29	77	595	201	873				
85 NR	8	8	16	111	25(15)	167				
TOTAL	241	166	407	2719	789(175)	4090	9	6	15	29
2019										
84 HCFG	181	89	270	1194	314	1778				
84 CCGF	10	27	37	563	201	801				
84 SPFG	88	45	133	553	185	871				
84 NR	18	13	31	46	29(56)	162				
85 DCFG	54	39	93	705	177	975				
85 NR	2	5	7	12	14(45)	78				
TOTAL	353	218	571	3073	920(101)	4665	11	7	18	30
2020										
84 HCFG	124	43	167	671	205	1043				
84 CCGF	19	39	58	990	201	1249				
84 SPFG	63	48	111	541	134	786				
84 NR	44	11	55	139	26(175)	395				
85 DCFG	28	14	42	398	78	518				
85 NR	15	2	17	30	1(369)	417				
TOTAL	293	157	450	2769	645(544)	4408	10	6	16	23
2021										
84 HCFG	175	125	300	1314	320	1934				
84 CCGF	14	50	64	688	203	955				
84 SPFG	72	60	132	539	193	864				
84 NR	1	0	1	0	0(174)	174				
85 DCFG	47	42	89	660	265	1014				
85 NR	6	1	7	0	0(111)	111				
TOTAL	315	278	593	3201	981(277)	5052	10	8	18	31
2022										
84 HCFG	175	91	266	1126	341	1733				
84 CCGF	39	31	70	710	168	948				
84 SPFG	94	67	161	555	233	949				
84 NR	48	18	66	34	7(29)	136				
85 DCFG	34	45	79	563	235	877				
85 NR	36	3	39	35	9(55)	138				
TOTAL	426	255	681	3023	993(84)	4781	14	8	22	33

2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL105 - AFTON
HUNT AREAS: 88-91

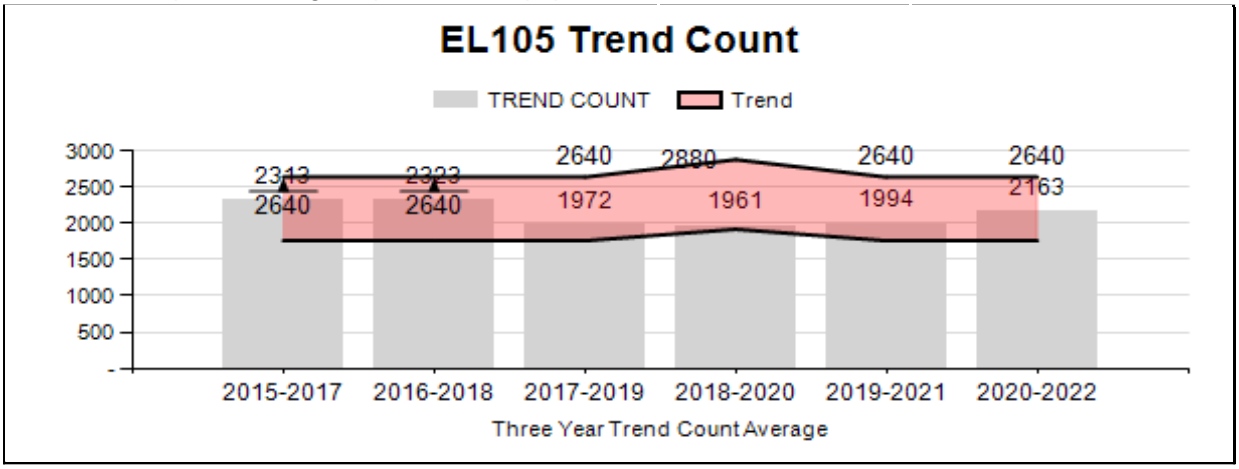
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GARY FRALICK

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	2,053	2,142	2,050
Harvest:	831	809	905
Hunters:	2,487	2,239	2,315
Hunter Success:	33%	36%	39 %
Active Licenses:	2,598	2,316	2,315
Active License Success	32%	35%	39 %
Recreation Days:	16,125	14,091	15,100
Days Per Animal:	19.4	17.4	16.7
Males per 100 Females:	21	20	
Juveniles per 100 Females	35	32	

Trend Based Objective (± 20%)	2,200 (1760 - 2640)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	-2.6%
Number of years population has been + or - objective in recent trend:	3

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

	JCR Year	Proposed
Females ≥ 1 year old:	NA%	NA%
Males ≥ 1 year old:	NA%	NA%
Juveniles (< 1 year old):	NA%	NA%
Total:	NA%	NA%
Proposed change in post-season population:	NA%	NA%



2023 HUNTING SEASONS
AFTON ELK HERD (EL105)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
88	1	Sep.1	Sep. 30	Oct. 1	Oct. 31	40	Any elk
88	1			Nov. 1	Nov. 30		Antlerless elk valid south of Peterson Lane and south and west of the Greys River Wildlife Habitat Management Area Elk Fence
89	Gen	Sep. 1	Sep. 30	Oct.15	Oct. 25		Any elk
90	Gen	Sep. 1	Sep.30	Oct. 15	Oct. 25		Any elk
90	6	Sep. 1	Sep.30	Oct. 15	Oct. 25	50	Cow or calf
91	Gen	Sep. 1	Sep. 30	Oct.15	Oct. 31		Any elk
91	1	Sep. 1	Sep.30	Oct. 1	Oct.31	100	Any elk
91	1			Nov. 1	Dec.31		Antlerless elk
91	1			Jan.1	Jan. 31		Antlerless elk valid off national forest
91	6	Sept. 1	Sept. 30	Oct. 1	Dec.31	300	Cow or calf
91	6			Jan. 1	Jan. 31		Cow or calf valid off national forest
91	7	Sept.1	Sept. 30	Oct. 1	Jan. 31	150	Cow or calf valid off national forest west of U.S. Highway 89 and south of Wyoming Highway 239

2022 Hunter Satisfaction: 71% Satisfied, 19% Neutral, 10% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The 2023 hunting season is designed to promote population stability, while minimizing harvest of antlered elk, especially in the Greys River segment of the population - Hunt Areas 89 and 90.

In Area 89, a shortened season will be implemented to end prior to October 31 for the third consecutive year. A shorter season is designed to promote an increase in total bull numbers and ratios observed on native winter ranges and the Greys River feedground. However, an additional effort to minimize the harvest of antlered elk will allow the harvest of any elk from October 15 – October 25. The transition to an any elk season for the entire hunt is a substantial departure from the previous two years when the general, any elk season closed after 5 days, October 15-October 19, which was then followed by antlered elk only until October 25.

In the upper Greys River, Hunt Area 90, an effort was initiated in 2021 to the increase total elk and bulls numbers on the Forest Park feedground after one of the lowest number (N=399) of elk documented on this feedground since its inception in 1979. The more restrictive hunting seasons in 2021 and 2022, which generally reduced antlerless elk harvest resulted in substantial increases in the number of elk counted on this feedground. In 2022 and 2023 a total of 650 and 703 elk have been counted, respectively. As a result of a positive response in elk numbers on this feedground, hunting seasons in 2023 will reflect additional hunter opportunity. Consequently, the 2023 hunting season will allow the harvest of any elk October 15-October 25. The longer any elk season will allow antlerless elk harvest in order to maintain elk numbers on the Forest Park feedground near the Commission-established quota of 750 elk.

In Area 91, the current proposal continues a management strategy initiated in 2022 that emphasizes elk harvest along the Idaho-Wyoming Stateline. In an attempt to address long-term, chronic damage issues and potential elk-livestock co-mingling concerns, the Region will continue with a Type 7 license that will focus on antlerless elk along the Idaho-Wyoming Stateline from October 1 – January 31. Managers believe this continued management response to increasing elk numbers, largely from elk moving into Wyoming from Idaho, will alleviate damage and co-mingling concerns along a portion of Area 91 that historically has proven difficult to manage. In order to accommodate access to private property the number of licenses that will be commensurate with access opportunity, the number of Type 7 licenses will increase from 100 licenses to 150 licenses. Because of wide-spread elk moment onto private lands and associated damage to stored crops and co-mingling with livestock during the 2023 winter, the unused Type 1 and Type 6 license holders will be permitted to take antlerless elk on all lands off the national forest system in this hunt area.

A slight adjustment in the Area 88 season pertains to the late November hunt. The closing date will move up to a November 30 instead of closing January 31 as in previous years in order to minimize elk displacement away from the Greys River feedground to potential damage situations on private property in Areas 88 and 91.

2.) Management Objective Review: The Afton elk herd postseason trend objective is 2200 elk. The postseason trend count objective of 2200 elk was last reviewed by the public in 2017. The Wyoming Game and Fish Commission approved the objective in 2017.

3.) Herd Unit Evaluation: A total of 2142 elk were counted during the most recent trend count (Appendix A). Consequently, management strategies have focused on maintaining elk numbers and more recently attempting to promote population growth and increase the number of bulls in the Greys River – Hunt Areas 89 and 90. The 2023 season for these areas continues with an aggressive management approach to increase bull numbers by allowing the harvest of any elk, thereby potentially reducing the harvest of antlered elk, during the entire hunting season. This approach has proven to be have widespread public support, based on hunter satisfaction surveys, for increasing bull numbers in the Afton elk herd, and specifically in Greys River.

In Area 91, the management effort will continue to promote late season antlerless harvest in order to reduce damage to stored crops and the potential for elk to co-mingle with livestock on private lands.

4.) Chronic Wasting Disease Management: The Afton elk herd is a Tier 2 surveillance herd that prioritized in 2022, and specific efforts were directed at gathering CWD samples. Prevalence estimates and sample sizes are presented below (Table 1). During the 2022 sampling period there no positive hunter-harvested elk that tested positive. Samples in 2022 were collected without the assistance of CWD technicians, so it is believed a similar level of effort and corresponding CWD samples should be expected into the foreseeable future. This level of effort is appropriate with the high profile and importance of this elk herd. Since 2020, a total of 201 samples have been collected and tested with zero testing positive.

Table 1. CWD prevalence for hunter-harvested elk in the Afton Elk Herd, 2020 – 2022.

Years	Percent CWD-Positive and sample size (n) *Hunter Harvest Only*
	All Adult Elk (CI = 95%)
2020	0.0% (0.0%, n=59)
2021	0.0% (0.0%, n=86)
2022	0.0% (0.0%, n-56)
2020 - 2022	0.0% (0.0%, n=201)

5.) Disease Surveillance and Feedgrounds: Conditions this winter were severe and resulted in the initiation of feeding earlier than average region wide. Above average snowfall and below average temperatures this winter influenced an extended supplemental feeding season in the Jackson Region. Due to these extreme winter conditions, most feedgrounds operated for the maximum duration with peak elk numbers in attendance, and none of the feedgrounds were terminated during the February/March time frame, as is typical.

As part of a regional surveillance plan, the Afton Elk Herd was the priority surveillance herd for 2023. This effort included trapping elk at Greys River feedground (last statistically significant sample effort in 2021) and Forest Park feedground (last statistically significant sampling effort in 2021). Helicopter captures were utilized to deploy satellite collars on native winter ranges in the Greys River drainage in an effort to document movement, distribution and disease status of this population segment that appears to have limited interaction with adjacent feedground attending populations.

Table 1. 2023 Afton Elk Herd Brucellosis Surveillance.

Feedground	Capture Method	GPS collars deployed	# Captured	# Tested	% Prevalence	Long Term Sero % (total tested)
Greys River	Trap	2	112	32*	22%	33% (1467)
Forest Park	Trap	0	132	38*	21%	25% (413)
Greys River NWR	Helicopter	10	10	10	10%	10% (10)
Totals		12	254	80	20%	

*statistically significant *n* for estimated prevalence to be within +/- 15% of true prevalence

Appendix A. Afton Elk Herd, posthunt herd composition data, 2018-2022.										
							Ratio:100 Females			
Year	Adult Males	Yrlng Males	Total Males	Cows	Calves	Total	Adult Males	Yrlng Males	Total Males	Calves
2018										
88 GRFG	18	13	31	378	110	519				
88 NR	0	0	0	0	0	NS				
89 NR	1	12	13	111	85(108)	317				
90 FPFG	36	11	47	326	94	467				
90 NR	0	0	0	0	0	NS				
91 NR	49	21	70	227	90(177)	564				
TOTAL	104	57	161	1042	379(285)	1867	10	5	15	36
2019										
88 GRFG	22	13	35	343	110	488				
88 NR	0	1	1	3	1	5				
89 NR	15	10	25	187	82 (63)	357				
90 FPFG	36	25	61	318	108 (2)	489				
90 NR	3	0	3	6	4	13				
91 NR	20	7	27	18	9 (230)	284				
TOTAL	96	56	152	875	314(295)	1636	11	6	17	36
2020										
88 GRFG	33	16	49	400	95	544				
88 NR	0	0	0	2	3	5				
89 NR	19	7	26	59	21(156)	262				
90 FPFG	31	6	37	312	50	399				
90 NR	0	0	0	7	5	12				
91 NR	70	34	104	175	102(776)	1157				
TOTAL	153	63	216	955	276(932)	2379	16	7	23	29
2021										
88 GRFG	30	36	66	385	132	583				
88 NR	0	0	0	0	0	0				
89 NR	2	9	11	54	22(270)	357				
90 FPFG	50	24	74	407	169	650				
90 NR	0	0	0	1	2	3				
91 NR	19	9	28	95	51(201)	375				
TOTAL	101	78	179	942	376(471)	1968	11	8	19	40
2022										
88 GRFG	35	15	50	313	108	471				
88 NR	0	0	0	0	0	0				
89 NR	5	13	18	144	33	195				
90 FPFG	64	46	110	446	147	703				
90 NR	0	0	0	0	0	0				
91 NR	5	0	5	0	0(768)	783				
TOTAL	109	74	183	903	288 (768)	2142	12	8	20	32

2022 - JCR Evaluation Form

SPECIES: Moose

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

HERD: MO101 - TARGHEE

HUNT AREAS: 16, 37

PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Population:		N/A	N/A
Harvest:	4	3	5
Hunters:	5	3	5
Hunter Success:	80%	100%	100%
Active Licenses:	5	3	5
Active License Success:	80%	100%	100%
Recreation Days:	51	70	50
Days Per Animal:	12.8	23.3	10

Limited Opportunity Objective:

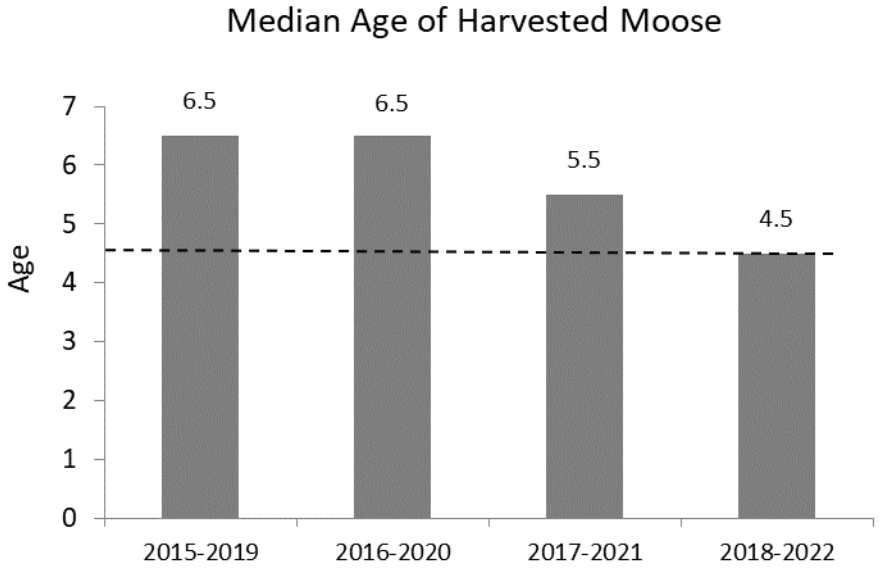
5-year median age of > 4.5 years for harvested moose

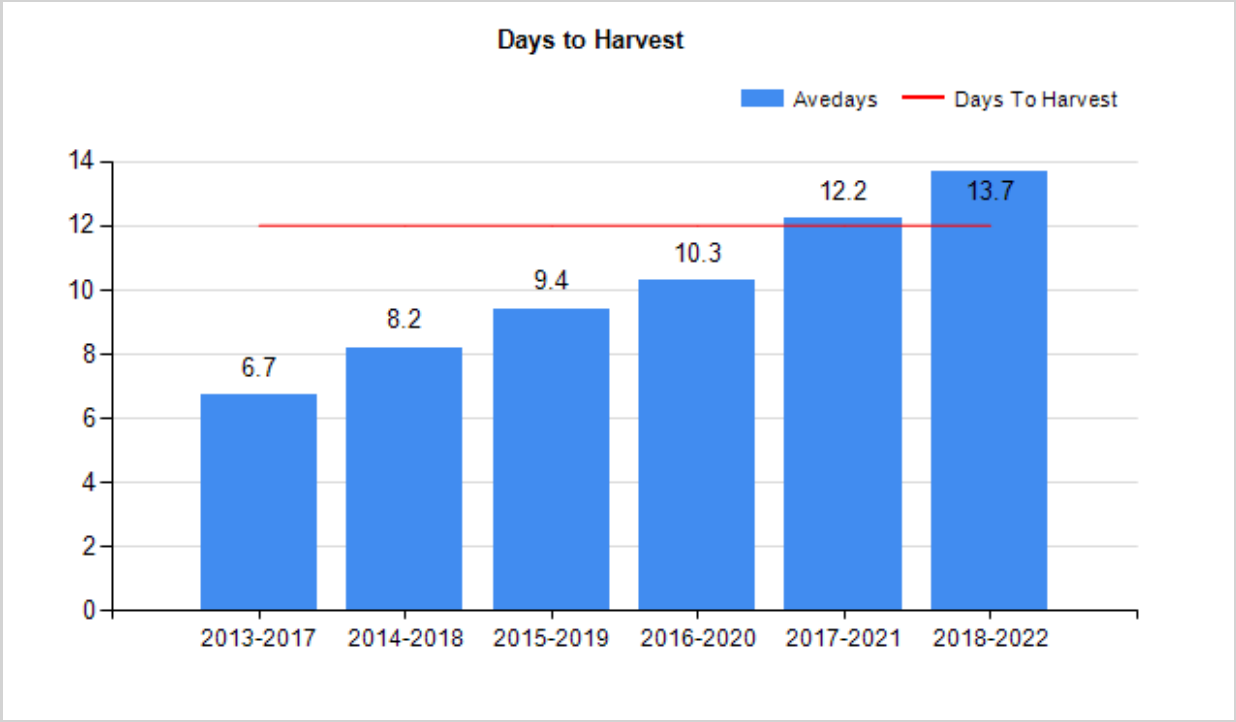
5-year average of <= 12 days/animal to harvest

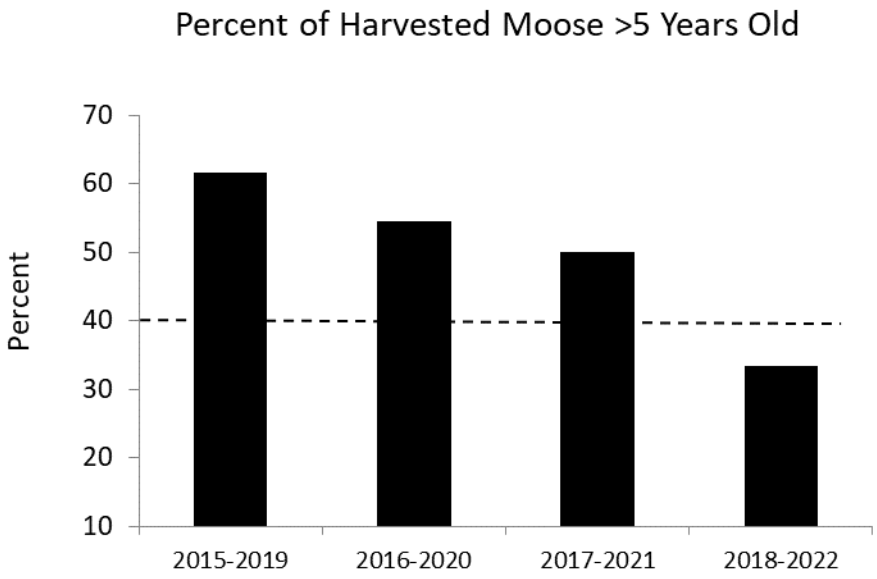
Secondary Objective:

5-year average of 40% of harvested moose are > 5 years of age

Management Strategy: Special




Days to Harvest
Avedays
Days To Harvest
14
12
10
8
6
4
2
0
6.7
8.2
9.4
10.3
12.2
13.7
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022


Percent of Harvested Moose >5 Years Old
Percent
70
60
50
40
30
20
10
2015-2019
2016-2020
2017-2021
2018-2022

2023 HUNTING SEASONS
TARGHEE MOOSE HERD (MO101)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
16, 37	1	Sep. 1	Sep. 14	Sep. 15	Nov. 15	5	Antlered moose (5 residents)

2023 Management Summary

1.) Hunting Season Evaluation: Management of this herd is not based on a mid-winter trend count because the majority of moose migrate to winter ranges in Idaho and winter ranges in Wyoming are difficult to survey due to conifer cover. Herd objectives are based on 1) median age of harvested moose ≥4.5 years, 2) at least 40% of harvested moose over 5 years old, and 3) average days to harvest less than 12. This herd met objective #1 this year but not objectives #2 or #3. Only 3 of 5 license-holders hunted in 2022 and harvest success was 100% (3 moose harvested). Average days to harvest was 23 (5-year average is 13.7). One hunter submitted teeth for aging in 2022 for a 2 year old moose. The median harvest age for the past 5 years is 4.5 years old, however, the trends in age have been steadily decreasing since 2015. Only 33% of harvested moose over the past 5 years have been over 5 years old.

The hunting seasons remained the same in 2023. Managers will need to improve tooth submissions from hunter-harvested moose to effectively monitor herd objectives in the future. Managers will monitor the declining trend in age of harvested moose and increasing days to harvest, which may indicate a declining population and a need to decrease licenses in the future.

2.) Management Objective Review: The next scheduled herd unit review is in 2024.

2022 - JCR Evaluation Form

SPECIES: Moose

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

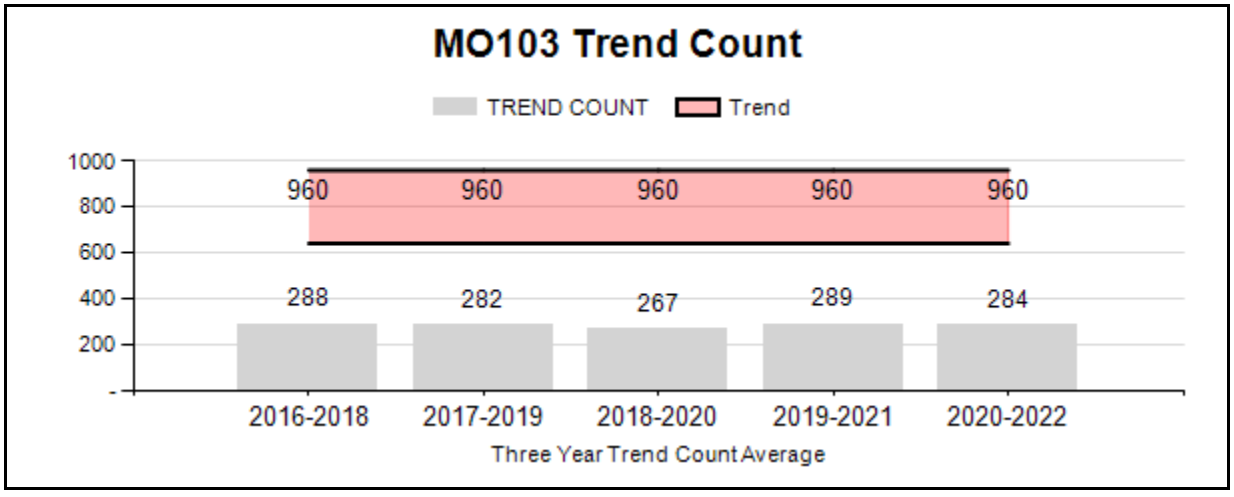
HERD: MO103 - JACKSON

HUNT AREAS: 7, 14-15, 17-19, 28, 32

PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	280	297	350
Harvest:	9	9	10
Hunters:	10	10	10
Hunter Success:	90%	90%	100%
Active Licenses:	10	10	10
Active License Success	90%	90%	100%
Recreation Days:	88	132	100
Days Per Animal:	9.8	14.7	10
Males per 100 Females:	85	97	
Juveniles per 100 Females	51	38	

Trend Based Objective (± 20%)	800 (640 - 960)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-62.9%
Number of years population has been + or - objective in recent trend:	20



2023 HUNTING SEASONS
JACKSON MOOSE HERD (MO103)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
7, 14, 15, 19, 32							CLOSED
17, 28	1	Sep. 1	Sep. 14	Sep. 15	Nov. 15	5	Antlered moose (4 residents, 1 nonresident)
18	1	Sep. 1	Sep. 30	Oct. 1	Nov. 15	5	Antlered moose (5 residents)

2023 Management Summary

1.) Hunting Season Evaluation: A total of 297 moose were counted during the 2022 mid-winter trend count. The 3-year average is 288 moose. Even though the herd continues to be well below the objective of 800 moose, managers feel that limited antlered moose hunting in some areas is still sustainable due to high bull ratios. The bull ratio during the mid-winter trend count was 97 bulls per 100 cows, which is the highest on record for this herd. Harvest success was 90% in 2022 with average days to harvest at 14.7. Even though the bull ratio during winter surveys is very high, feedback from hunters is that bulls are very difficult to find during the hunting season and that bull quality is low. Fall hunting seasons have been very warm and dry in recent years. For this reason, managers extended the season to November 15 to allow hunters more time to harvest. Managers will continue to monitor the bull ratio and consider increasing licenses in the future.

Even though overall moose numbers remain low, calf:cow ratios have been steadily increasing in recent years. In 2009, the calf:cow ratio was 15 calves per 100 cows. Since then, it has increased and the most recent 5-year average was 51. The ratio dipped slightly during February 2023 surveys to 38. Managers anticipate that this calf ratio will lead to a growing population in the future. Hunt areas 7, 14, 15, 19, and 32 remained closed in 2023. We have received clear feedback from the public that they do not support opening these areas at this time.

2.) Management Objective Review: The next scheduled objective review is in 2025.

2022 - JCR Evaluation Form

SPECIES: Bighorn Sheep

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

HERD: BS106 - TARGHEE

HUNT AREAS: 6

PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Population:		N/A	N/A
Harvest:	1	0	2
Hunters:	1	1	2
Hunter Success:	20%	0%	100%
Active Licenses:	1	1	2
Active License Success:	40%	0%	100%
Recreation Days:	19	24	19
Days Per Animal:	19	0	19

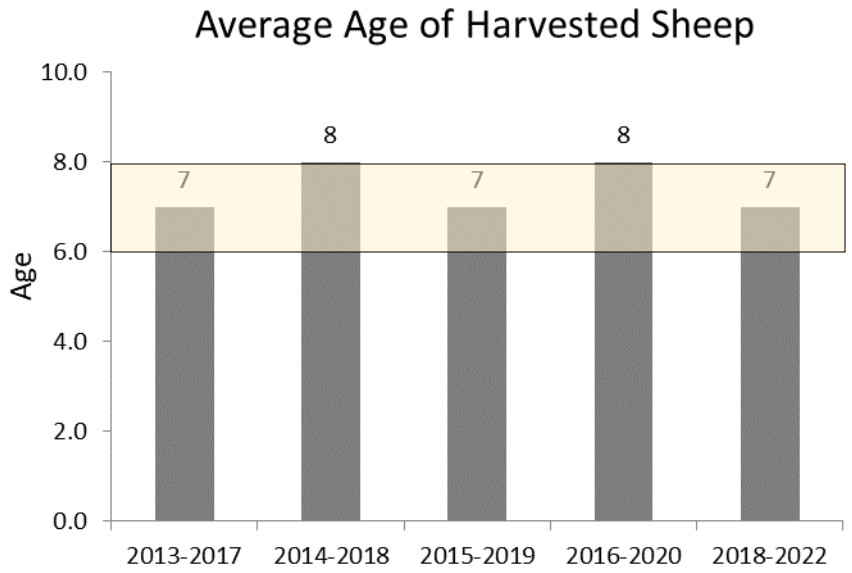
Limited Opportunity Objective:

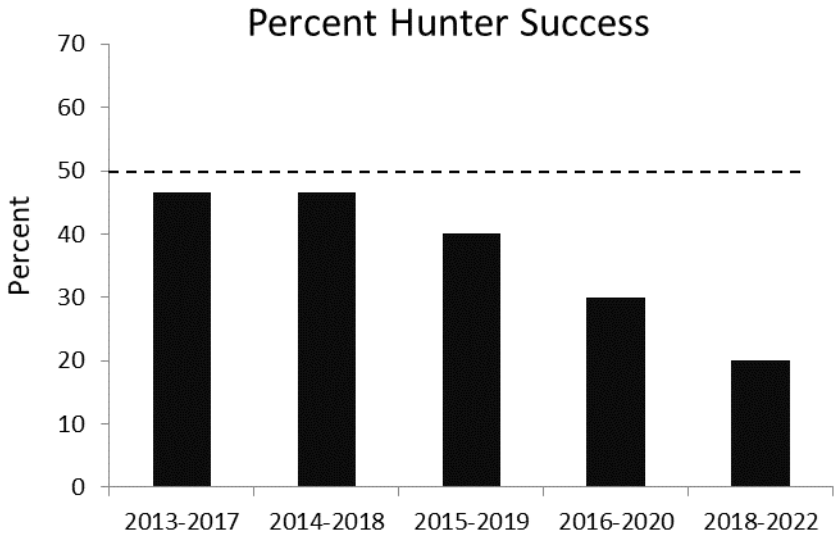
5-year average harvest age of 6-8 years

5-year average hunter success of >= 50%

Secondary Objective:

Management Strategy: Special





2023 HUNTING SEASONS
TARGHEE SHEEP HERD (BS106)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
6	1			Aug. 1	Aug. 31	2	Any ram valid north of South Badger Creek (1 resident, 1 nonresident)
6	1			Sep. 1	Oct. 31		Any ram valid in the entire area

2023 Management Summary

1.) Hunting Season Evaluation: This is a limited opportunity management herd with two objectives: 1) 5-year average harvest age of 6-8 years, and 2) 5-year average hunter success of at least 50%. The one hunter in 2022 was not successful, however, the hunter reported seeing mature rams and had opportunity. There has only been one sheep harvested in this herd unit during the last 5 years. This trend is reflected in the declining average hunter success metric. The average age of harvested sheep is 7 (because 1 hunter harvested a 7.5 year old sheep during the past 5 years). The average hunter success is 20%. Therefore, the herd is meeting the first objective but not the second.

Managers reduced the license quota from 2 to 1 beginning in 2018 because mature ram numbers were low, particularly in the southern herd segment where all harvest has occurred in the past 20 years. At that time, a total of 76 sheep were being counted in the herd with 22 rams of which

only 13 had at least ¾ curl. The February 2022 survey found a total of 104 sheep and an increase in rams with a total of 37, of which 26 were at least 3/4 curl (11 in the southern portion of the herd unit and 15 in the northern portion). This winter's survey was delayed due to consistently bad weather in the Tetons, but was accomplished in early April 2023. A total of 71 sheep were observed including 29 rams, of which 18 had at least ¾ curl (10 in the southern portion of the herd unit and 8 in the northern portion).

One of the challenges with managing this herd is that surveys are flown in the winter when most sheep are on winter ranges in Grand Teton National Park; therefore, it is difficult to know how many of the rams seen during the winter surveys are outside of the park and available to hunters in the open hunt area during the fall. The WGFD biologist conducted a 3-day ground survey in August 2022 in the North Darby Creek/Wedge/Mt. Bannon area and did not see any rams (one group of ewes and lambs was observed). Likewise, biologists from Caribou-Targhee National Forest conducted a 4-day ground survey for bighorn sheep in the Alaska Basin/Mt. Meek area and did not see any rams. The WGFD game warden observed a group of bighorn sheep of unknown age/sex in the Fox Creek drainage in fall 2022. However, managers received more reports from the public of seeing groups of rams in Hunt Area 6 in 2022. Managers received a report of two groups of rams of various ages totaling 16 in the southern portion of the hunt area in fall 2022 and a report of 12 rams in the northern portion of the hunt area in spring 2022. For these reasons, licenses were increased from 1 to 2 in 2023. The season was extended from August 1 – August 31 for the northern portion of the hunt area only in order to encourage harvest in the northern herd segment.

2.) Management Objective Review: The next scheduled objective review is 2024.

3.) Mid-Winter Trend Count: This herd has been increasing for the past five years from low trend counts of 40-60 sheep from 2015-2017 to trend counts of 90-100 from 2020-2022. However, the trend count dropped slightly this year to 71 sheep. Winter 2022/2023 was very prolonged and severe with low and mid elevation ranges covered in deep snow until mid May, which likely impacted sheep survival and may cause reduced lamb numbers for next year. Due to consistently poor weather conditions in February and March, this year's survey was not completed until early April, however, most sheep were still concentrated at high elevations with deep snow in lower elevation side canyons. This year's survey only found 5 lambs and a lamb ratio of 15 lambs per 100 ewes, which is concerning for future population trends. As in past years, the survey found almost an equal split of sheep between the northern portion of the herd unit (34 sheep) and southern portion (37 sheep).

4.) Teton Range Bighorn Sheep Working Group: The Teton Range Bighorn Sheep Working Group was very active during the past year. The working group includes representatives from WGFD, Grand Teton National Park (GTNP), Bridger-Teton National Forest (BTNF), Caribou-Targhee National Forest (CTNF), Wyoming Wild Sheep Foundation, and Northern Rockies Conservation Collaborative (retired biologist who studied the herd in the 1970s). The working group initiated the Teton Sheep and Winter Recreation Community Collaborative Process in winter 2019/2020 to address the impacts of backcountry skiing on this herd. Final results of this collaborative process were delayed due to COVID-19, however a final plan was released in October 2021. The various agencies are now working on moving forward with a combination of

an education and stewardship campaign, voluntary winter range closures, and possibly mandatory winter range closures in GTNP through a NEPA Environmental Analysis (decision expected in 2023). WGFD and BTNF have been actively engaged with Jackson Hole Mountain Resort and their backcountry guiding operation to avoid bighorn sheep wintering areas and document bighorn sheep sightings. The working group has been actively involved in commenting during the NEPA process for Grand Targhee Ski Resort's proposed expansion into Teton Canyon. Also, GTNP and WGFD have been working collaboratively on a fecal DNA project over the last four years to gain better information on the population size and genetic health of this herd. Final results from this project are expected in summer 2023.

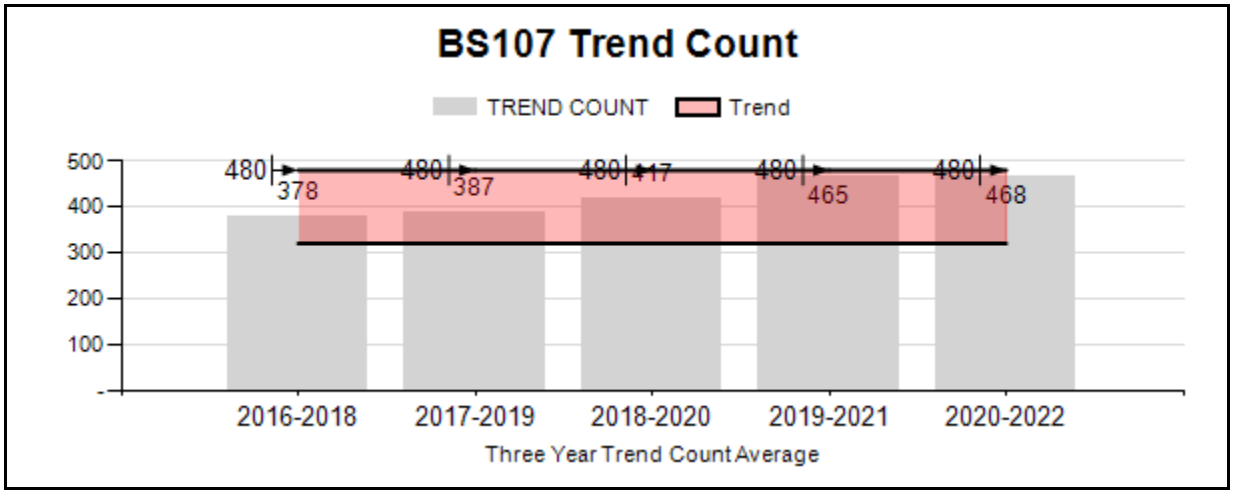
2022 - JCR Evaluation Form

SPECIES: Bighorn Sheep
HERD: BS107 - JACKSON
HUNT AREAS: 7

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	431	407	400
Harvest:	8	19	27
Hunters:	12	29	42
Hunter Success:	67%	66%	64 %
Active Licenses:	12	29	42
Active License Success	67%	66%	64 %
Recreation Days:	122	247	280
Days Per Animal:	15.2	13	10.4
Males per 100 Females:	39	49	
Juveniles per 100 Females	38	30	

Trend Based Objective (± 20%)	400 (320 - 480)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	2%
Number of years population has been + or - objective in recent trend:	3



2023 HUNTING SEASONS
JACKSON SHEEP HERD (BS107)

Hunt Area	Hunt Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
7	1	Aug. 1	Aug.14	Aug. 15	Oct. 31	12	Any bighorn sheep (11 residents, 1 nonresident)
7	6	Aug. 1	Aug. 31	Sep. 10	Oct. 15	30	Ewe or lamb valid within the Gros Ventre River drainage (27 residents, 3 nonresidents)

2023 Management Summary

1.) Hunting Season Evaluation: This herd is managed using a 3-year average mid-winter trend count objective of 400 sheep (+/-20%). The herd has been increasing since 2012 after its last pneumonia die-off. In recent years, the herd surpassed its objective of 400 sheep and it has been above its upper +20% buffer (480 sheep) for the past two of three years. This year, 407 sheep sheep were counted during the mid-winter trend count with a 3-year average of 468 sheep. The trend count was lower this year due to unknown reasons, but managers do not suspect a pneumonia die-off has occurred or other substantial reduction in the herd. Approximately 20 sheep are currently collared in this herd for research and there have been no pneumonia-related mortalities in collared adults this year. Due to above average winter conditions, sheep were distributed in different areas during the survey, therefore, managers suspect that several groups of sheep were missed during the survey.

The lamb:ewe ratio during the mid-winter trend count was 30:100 and the adult ram:ewe ratio was 49:100. Fifty-three rams with ¾ curl or larger horns were observed during the survey. Due to the increasing overall numbers in the population and number of mature rams, managers increased Type 1 licenses from 12 to 16 in 2022. After feedback from hunters and outfitters who spent significant time in the field last year, managers decided to reduce Type 1 licenses back to 12 in 2023 but open the season two weeks earlier for archery (August 1) and two weeks earlier for rifle (August 15) to give hunters a longer period of time. Managers have been concerned in recent years that hunter success and age of harvest sheep have been declining while average days to harvest has increased, which corroborates feedback from outfitters and hunters that quality rams have been difficult to find. Harvest success was 63% in 2022 however much of that success was driven by hunters harvesting younger sheep during the last few days of the season. Average age of harvested sheep was 6.5 years.

Since the herd has been above objective and trending upward, managers added a Type 6 ewe/lamb license beginning in 2022. In the past, this sheep herd has undergone pneumonia die-offs when the population reaches approximately 500 sheep. Ongoing research with the University of Wyoming has shown that the body fat of collared ewes on the Gros Ventre winter

ranges has declined in recent years, while ewes on the Curtis Canyon/Flat Creek winter ranges have remained relatively stable. Managers believe this decline in body fat may be a signal that bighorn sheep are competing for resources due to the growing population and may be a precursor to another pneumonia outbreak. Managers issued 16 ewe/lamb licenses valid for the Gros Ventre drainage in 2022 to reduce the population density in that herd segment. Harvest success was lower than expected at 38%. There were 182 ewes classified in the Gros Ventre drainage in February 2022, so this licenses only removed ~4% of the ewes. Interest in this license was high with a 4% draw rate for residents and 7% for non-residents in 2022. Due to the low harvest success, managers increased these licenses to 30 in 2023 to work toward population reduction goals of at least 10% reduction in ewes. Managers feel that this number of licenses will increase harvest but also prevent hunter overcrowding in the area. This season was also lengthened slightly to correspond with other species openers in the same area on September 10. Concurrent research will continue with the University of Wyoming to monitor how the ewe/lamb season affects body condition, population demographic rates, and disease in the Gros Ventre drainage, compared to the segment of the population that winters in Curtis Canyon and Flat Creek.

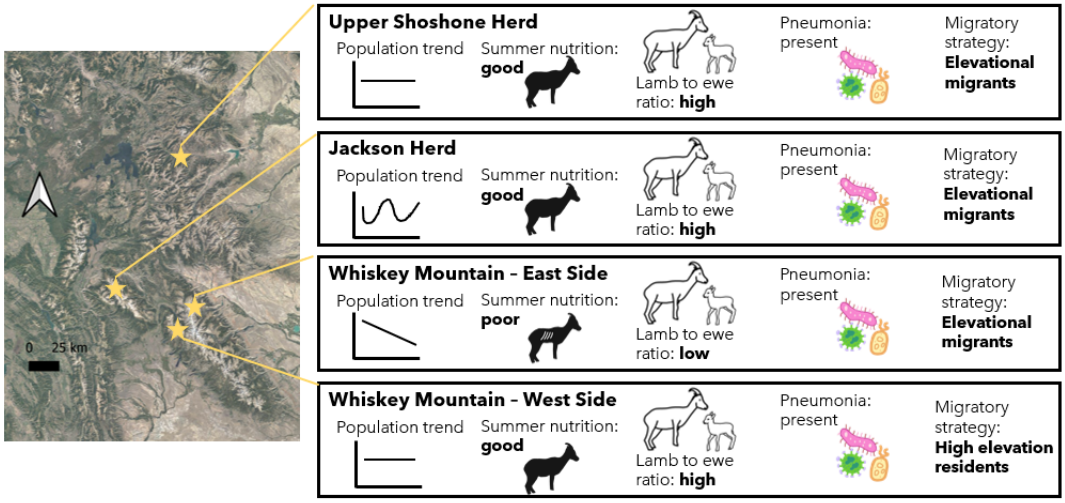
2.) Management Objective Review: The next scheduled objective review is 2025.

LaSharr

Bighorn Sheep Nutrition-Disease Project

Bighorn sheep populations across North America have been afflicted by pneumonia—a respiratory disease originally introduced by domestic sheep and goats. For decades it has remained unclear how to successfully manage populations in the presence of the disease. Herds infected with pneumonia can experience different fates—some slowly decline, some undergo crash-recovery cycles, and some tolerate it without substantial mortality. Once among the largest populations of Rocky Mountain bighorn sheep, the Whiskey Mountain herd experienced a pneumonia die-off in the early 1990s and has continued to decline ever since. Nearby herds have experienced similar die-offs, but they have not continued to decline like the Whiskey Mountain herd. Ecological factors such as population size, food availability, nutritional condition, immune function, and disease all could influence population trends and the ability for herds to recover after pneumonia die-offs. Untangling these complex interactions is critical to developing management plans to maintain healthy populations of bighorn sheep.

We are investigating how nutrition and disease interact to influence population dynamics. Our work focuses on the Whiskey Mountain, Jackson, and Upper Shoshone herds, which all hold the same suite of bacterial pathogens associated with pneumonia but have drastically different population trends. By monitoring the same animals through time, we are tracking pathogen presence, nutritional condition, reproduction, adult and lamb survival, mortality causes, and forage. We aim to better understand the ecological factors that influence pneumonia in bighorn sheep, with the ultimate goal of helping to conserve infected populations.



Notes from the field

The core of our work centers around late spring and summer when the sheep return to their summer ranges. As we have done since 2019, we spent May and June of 2022 catching and collaring the newborn lambs from our collared females. Spring dragged out in the mountains in 2022 which meant we became experts at snowshoeing and swimming through deep snow to access the areas where the sheep gave birth.

We monitor the collared lambs throughout their lives in hopes to better understand which moms can successfully raise lambs and which moms can't. One mom, AID 22 in Jackson, has successfully raised lambs for the last three summers while another Jackson mom, AID 147's lamb died of starvation before we arrived to collar it 24 hours after it was born. What makes AID 22 successful, and why couldn't AID 147 provide her lamb enough milk for it to survive the first day of life? These field observations are the motivations of why we are combining nutritional, immunological, pathogenic, and behavioral information about each of the moms and how it relates to her lamb's survival.

After all the lambs are born and most of the snow melts off their summer ranges, we embarked on vegetation surveys of each of the sheep summer ranges. Through the vegetation surveys, we can identify which plant species are available for sheep to eat, as well as how nutritious they are compared with other plants. With this information we aim to understand the role habitat quality plays in the relative performance of each of the herds we study.
On Jackson summer ranges we are often surveying alpine meadows with relatively tall and dense forb communities. On the Whiskey Mountain summer ranges, however, on the east side of the Wind River Range, we are navigating to small benches within rocky faces to measure the much smaller patches of vegetation that the sheep are using. We often struggle to find enough vegetation to collect our samples, likely a similar experience to the sheep that must make a living there.

AID 22's lamb that we collared summer 2022. This lamb is still alive and we hope to capture him this December to replace his collar and see how much he grew in his first 6 months.

Lambs can be quite feisty when captured, so we put single use blindfolds on them to calm them down while we process them.

Conducting a vegetation transect in the Wind River Range.

Gocke

Page 12

Lessons learned so far...

Our seasonal recaptures paired with boots-on-the-ground data collection during summer have brought us closer to understanding the relationship between nutrition and pathogens associated with pneumonia.

Despite similar pregnancy rates among the herds, the Whiskey Mountain females raise far fewer lambs over the summer. Through our lamb capture efforts, we've learned that a big proportion of the Whiskey Mountain lambs are dying of pneumonia throughout the summer.

The migratory portion of the Whiskey Mountain herd gains much less fat over the summer compared with the other herds we study—this was one of the first findings that led us to question the quality of their summer range. Moms in the migratory portion of the Whiskey Mountain herd that do raise lambs through the summer are losing fat on average.

Summer range of the Jackson herd has 2.5 times the biomass than that of the Whiskey Mountain herd. The Jackson summer ranges also have more digestible dry matter, crude protein, and micronutrients available, meaning that there is more high-quality food available in Jackson than in Whiskey Mountain. The difficulties of accessing high quality forage for Whiskey Mountain sheep may contribute to their inability to recruit lambs, gain fat over the summer, and to achieve population growth in the presence of pathogens.

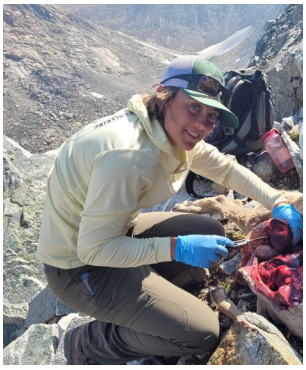
A high proportion of the Whiskey Mountain herd are considered 'chronic carriers' of Mycoplasma ovipneumoniae (M. ovi), a primary pathogen associated with pneumonia. While most sheep will become infected with M. ovi and subsequently clear it, chronic carriers will remain infected for years. Infection with M. ovi and other pathogens costs sheep some of their invaluable fat resources. In other words, the more pathogens a sheep is carrying, and the longer it carries them, the more energy it uses up and the less it has for other energetic requirements.

Future directions

We've begun to put some of the pieces together to understand how potential nutritional limitations are influencing the Whiskey Mountain herd—but there is still much to learn. The Wyoming Game and Fish Department is taking management actions, including a test and cull in the Red Creek portion of the Whiskey Mountain herd and a female harvest in the Jackson Herd. We are excited to continue monitoring these herds to understand how the management actions effect these populations.

Project leads

This project is led by PhD student Rachel Smiley (left) and master's student Brittany Wagler (right).



Collaborators, partners, and funders

The Northwest Wyoming Bighorn Sheep Project benefits from being highly collaborative in development, operations, and funding. We are fortunate to partner with the Wyoming Game and Fish Department and the Wyoming State Veterinary Laboratory, a collaboration through which we can pull expertise from managers, disease specialists, and ecologists. Funds have been provided by the Wyoming Game and Fish Department, Wyoming Game and Fish Commission, Wyoming Wildlife and Natural Resource Trust, National Wild Sheep Foundation, Wyoming Wild Sheep Foundation, Wyoming Governor's Big Game License Coalition, Bureau of Land Management, Wyoming Animal Damage Management Board, Wyoming Wildlife Livestock Disease Research Partnership, Teton Conservation District, and Bowhunters of Wyoming Inc. Special thanks to the Wyoming Game and Fish Department, United States Forest Service, Wyoming State Veterinary Lab, Bureau of Land Management, National Elk Refuge, Pinto Ranch, Steve Kilpatrick, Sara Bridge, and Des Brunette for assistance with logistics, lab analyses, field housing, and fieldwork.

2022 - JCR Evaluation Form

SPECIES: Mountain Goat
HERD: MG101 - PALISADES
HUNT AREAS: 2, 4

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

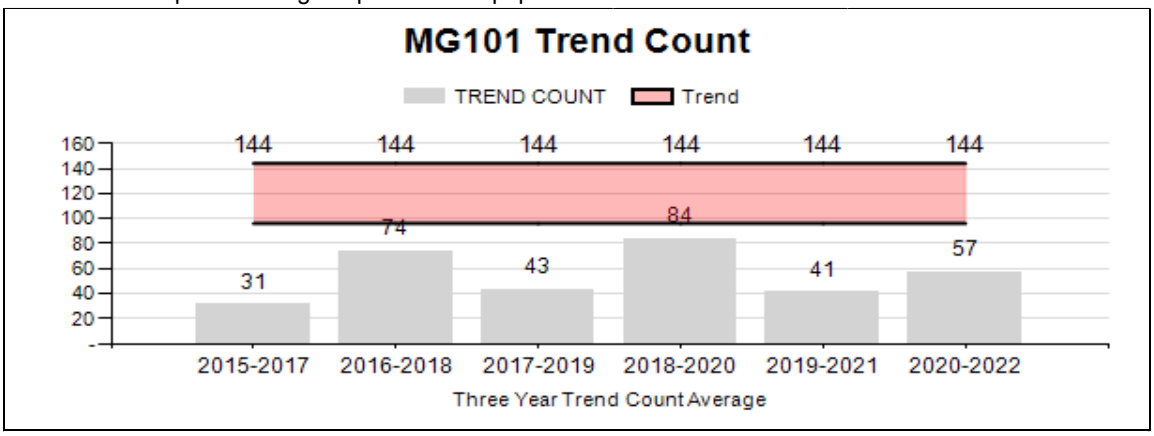
PREPARED BY: GARY FRALICK

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	126	48	75
Harvest:	15	7	5
Hunters:	32	11	5
Hunter Success:	47%	64%	100%
Active Licenses:	32	11	5
Active License Success	47%	64%	100%
Recreation Days:	215	70	120
Days Per Animal:	14.3	10	24
Males per 100 Females:	0	0	
Juveniles per 100 Females	34	41	

Trend Based Objective (± 20%)	120 (96 - 144)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	-60%
Number of years population has been + or - objective in recent trend:	1

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

	JCR Year	Proposed
Females ≥ 1 year old:	NA%	NA%
Males ≥ 1 year old:	NA%	NA%
Juveniles (< 1 year old):	NA%	NA%
Total:	NA%	NA%
Proposed change in post-season population:	NA%	NA%



2023 HUNTING SEASONS
PALISADES MOUNTAIN GOAT HERD (MG101)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
2	1	Aug. 15	Aug. 31	Sept. 1	Oct.31	5	Any mountain goat (4 residents, 1 nonresident)
4	A	Aug. 1	Aug. 14	Aug. 15	Nov.15	5	Any mountain goat (5 residents)

2022 Hunter Satisfaction: NA

2023 Management Summary

1.) Hunting Season Evaluation: In Area 2 a total of five (5) licenses, valid for any goat, will be issued in 2023. This season reflects a decrease from a total of eight (8) licenses that have been issued since 2017. The decrease in hunting opportunity reflects a decline in the number of goats counted during the 2022 mid-summer trend count.

The season will run September 1 – October 31. The number of licenses issued in 2023 will decrease and reflects a population dynamic that depicts the management trend count threshold below the 120 (+/- 20%) mountain goats for the first time since 1996.

2.) **Management Objective Review:** The Palisades mountain goat mid-summer trend count objective is 120 goats. The trend count objective was established in 2015.

3.) **Herd Unit Evaluation**: A most recent mid summery trend count was conducted in August 2022 (Appendix A). During this survey a total of 48 mountain goats were observed, which reflects the lowest mid-summer trend count since 1996. A total of 34 adults and 14 kids were observed. The kid:100 adult ratio was 41.

The current year's survey was conducted from a helicopter and is a collaborative and concurrent effort with Idaho Department of Fish and Game to survey the Snake River Range mountain goat population.

The Palisades herd offers hunters the opportunity to harvest trophy class billies that typically are at least 5 years old. Management goals of the Wyoming subpopulation have focused on maintaining a flexible management approach through the annual issuance of 4 – 12 licenses valid for any goat since 1999. This approach has resulted in a high degree of hunter satisfaction, exceptionally high hunter success, low days/animal harvest, and trophy class males being taken in most years since the hunt was initiated in 1999.

The 2022 hunting season was the 24th year that goats were hunted in Area 2. A total of eight (8) licenses were issued, and seven goats were harvested. A total of five billies and two nannies were harvested. Since 1999, a total of 164 mountain goats (137 billies, 27 nannies) have been

harvested in Hunt Area 2, and 83% and 17% of the total harvest during that period have been comprised of billies and nannies, respectively. In Area 4, a total of 6 hunters did not harvest any mountain goats.

The next mid-summer survey is scheduled for August 2024

Appendix A

SNAKE RIVER MOUNTAIN RANGE

MOUNTAIN GOAT POPULATION SURVEYS

IDAHO AND WYOMING

Idaho Summary of Mountain Goat Surveys in Unit 67 south of Palisades Creek

Year		Adults	Kids	Unknown	Total	Kids:100 adults
1982[a]		33	13	0	46	39
1985[a]		35	16	0	51	46
1986[b]		0	0	104	104	--
1986[a]		37	15	0	52	41
1988[b]		71	21	0	92	30
1990[b]		45	18	0	63	40
1993[b]		104	33	16	153	34
1994[a]		73	42	0	115	58
1996[a]		151	66	0	217	44
1998[a]		118	45	0	163	38
2000[a]		61	29	0	90	48
2002[a]		35	7	0	42	20
2004[a]		83	24	0	107	29
2006[a]		103	19	0	122	18
2008[a]		96	27	0	123	28
2010[a]		96	33	0	129	34
2012[a]		87	23	0	113	26
2014[a]		109	26	0	135	24
2016[a]		86	34	0	120	39

Wyoming Summary of Mountain Goat Surveys, Hunt Area 2, Palisades Goat Herd

Year		Adults	Kids	Unknown	Total	Kids:100 adults
1996[a]		16	8	0	24	50
1997[a]		34	20	0	54	59
1998[a]		47	15	0	62	32
2000[a]		58	18	0	76	31
2002[a]		37	17	0	54	46
2004[a]		90	31	0	121	34
2006[a]		98	32	0	130	33
2008[a]		52	13	0	65	33
2010[a]		97	30	0	127	31
2012[a]		83	25	0	108	30
2014[a]		144	21	0	165	14
2016[a]		71	22	0	93	31
2017[WH]		74	6	0	80	8
2018[WH]		65	5	0	70	8
2018[a]		96	33	0	129	34
2020[a]		91	31	0	122	34
2022[a]		34	14	0	48	41

[a] - Helicopter Survey (August)

[b] - Ground Count

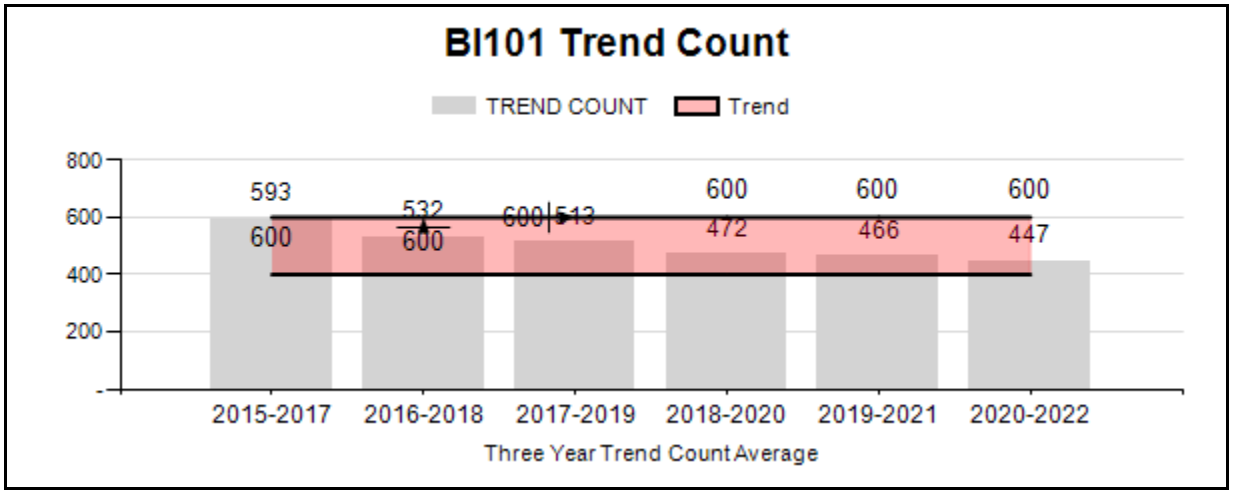
[WH]- Winter Helicopter Survey

2022 - JCR Evaluation Form

SPECIES: Bison
PERIOD: 6/1/2022 - 5/31/2023
HERD: BI101 - JACKSON
HUNT AREAS: 2
PREPARED BY: ALYSON COURTEMANCH

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	490	432	500
Harvest:	91	130	45
Hunters:	148	141	50
Hunter Success:	61%	92%	90%
Active Licenses:	148	141	50
Active License Success	61%	92%	90%
Recreation Days:	1,448	958	315
Days Per Animal:	15.9	7.4	7
Males per 100 Females:	93	51	
Juveniles per 100 Females	40	46	

Trend Based Objective (± 20%)	500 (400 - 600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	-13.6%
Number of years population has been + or - objective in recent trend:	5



2023 HUNTING SEASONS
JACKSON BISON HERD (BI101)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
2	1			Aug. 15	Jan. 31	50	Any wild bison; from Jan. 2 – Feb. 15 limited alternate permits for the National Elk Refuge may be available through the Department's Jackson Regional Office on a first-come first-served basis until the season closes or forage/weather conditions dictate that supplemental feeding is necessary. Also valid in Area 1 within the Clark's Fork River and Soda Butte Creek drainages from Aug. 15 – Dec. 31. Valid in other portions of Area 1 upon notification and authorization by the Department.

2023 Management Summary

1.) Hunting Season Evaluation: A total of 432 bison were counted during the 2022 mid-winter trend count. The majority of bison were on supplemental feed on the National Elk Refuge (360 bison) and the remainder were on native winter ranges in Grand Teton National Park (GTNP) (72 bison). The calf:cow ratio was 46 and the bull:cow ratio was 51. This herd has been trending below the population objective of 500 bison for the past 5 years. The relatively high harvest success in 2022 (92%; 130 bison harvested) contributed to pushing numbers down lower this year.

The 2022 hunting season was the first time since 2016 that groups of bison migrated to the National Elk Refuge (NER) before January. The first groups of bison migrated in early December 2022 due to earlier snowfall than in recent years. This allowed for more harvest opportunity than has been available in recent years. This is because much of the bison harvest (and nearly all of the cow/calf harvest) occurs on the NER. The timing of bison migration has been trending later into January, which often results in hunters (particularly Type 4 license-holders) only having a few days of harvest opportunity on the NER and overall lower hunter success (average 61% success from 2017-2021). For this reason, managers opted to remove the Type 4 license in 2023 and offer all Type 1 licenses to give hunters maximum opportunity. Although many hunters choose to harvest a bull on a Type 1 license, some hunters also opt to harvest cows and calves. This is likely due to the trend of increasing difficulty of bison hunting in the Jackson Herd. For example, in 2022, 35 cows and 10 calves were harvested on Type 1 licenses (40% of the Type 1 harvest). For this reason, managers feel that population management through cow harvest can still be achieved with Type 1 licenses. However, bull numbers in the herd have continued to decrease in recent years, particularly mature bulls. A total of 92 mature bulls were counted during the 2022 mid-winter trend count, which is approximately half of what was being counted 4-5 years ago. Managers will continue to monitor bull numbers and may

switch back to Type 4 licenses in the future if numbers continue to decline. Both the lower trend count and declining bull numbers prompted managers to reduce licenses in 2023 from 150 licenses to 50 licenses to allow this herd to grow closer to the 500 objective.

2.) Management Objective Review: The next objective review is scheduled for 2024.

2022-2023 Jackson Region Feedground Disease Management Report

Ben Wise

Regional Wildlife Disease Biologist, Jackson WY

Wildlife disease management and mitigation is an integral part of supplemental elk and bison feedground management in the Jackson Region of the Wyoming Game and Fish Department (WGFD). Numerous disease issues are exacerbated by supplemental feeding of wildlife and wildlife managers in western Wyoming attempt to make all efforts to limit disease transmission, morbidity and mortality.

Brucellosis Mitigation and Management

Brucella abortus, a gram negative bacterial infection is the causative agent for the disease Brucellosis. Brucellosis is a mammalian bacterial disease that has been endemic in the Greater Yellowstone Ecosystem (GYE) since the early 1900's. The main route of transmission of this disease is via physical contact with infected reproductive materials (aborted fetuses, placenta, amniotic fluids, live born fetuses, etc.) during the transmission period (February 15-June 1). Both the primary transmission route and transmission period were determined and validated through work that was partially undertaken by the WGFD's Brucellosis-Feedground-Habitat (BFH) section from the mid 1980's through 2018. Along with the information that was collected on what transmission in the environment looks like, several Best Management Practices (BMP) were developed in an effort to slow the rate of transmission of brucellosis in feedground settings. Due to the increased risk of disease proliferation in the feedground systems of western Wyoming, several of these practices have been adopted (referred to as the "Target Feedground Plan") at various levels of success in an effort to reduce and control communicable diseases both within wildlife and among livestock populations in the region. For the 2022-2023 feeding season, the following brucellosis (and overall wildlife disease) management efforts were implemented.

Brucellosis Surveillance

During the winter of 2022-2023, the Jackson Regional Disease Biologist captured elk using chemical immobilization, corral traps and contracted helicopter capture services at or adjacent to feedgrounds to deploy GPS collars on elk for brucellosis investigations, movement analysis and continue long term brucellosis seroprevalence trend data. Conditions this winter were severe and resulted in the initiation of feeding earlier than average region wide. Above average snowfall and below average temperatures this winter influenced an extended supplemental feeding season in the Jackson Region. Due to these extreme winter conditions, most feedgrounds operated for the maximum duration with peak elk numbers in attendance, and none of the feedgrounds were terminated during the February/March time frame, as is typical. Research has indicated that *Brucella*-induced abortions in elk peak in March, April, and May, so managers can expect a spike in brucellosis prevalence among most elk populations and should plan accordingly.

As part of a regional surveillance plan, the Afton Elk Herd was the priority surveillance herd for 2023. This effort included trapping elk at Greys River feedground (last statistically significant sample effort in 2021) and Forest Park feedground (last statistically significant sampling effort in 2021). An additional trapping efforts were also undertaken in the Jackson Elk Herd in order to deploy collars and ear tags for baseline movement monitoring of Gros Ventre wintering elk. A total of 408 elk were handled this winter at ten locations, including trapping 343 animals at Greys River, Forest Park and Fish Creek feedgrounds and darting 41 elk on feed lines. A total of 35 collars and were deployed on elk in the Jackson Region in 2023. In total, 152 yearling and adult cows were bled, feedground serology data available below (Figure 1).

Figure 1. 2023 Jackson Feedground Elk Capture Summary

Feedground	Capture Method	GPS collars deployed	# Captured	# Tested	% Prevalence	Long Term Sero % (total tested)
National Elk Refuge	Dart	0	28	26	19%	34% (1841)
Horse Creek	Dart	2	2	2	0%	47% (176)
Camp Creek	Dart	2	2	2	0%	43% (90)
South Park	Dart	3	5	5	40%	29% (313)
Dog Creek	Dart	2	2	2	0%	53% (75)
Greys River	Trap	2	112	32*	22%	33% (1467)
Fish Creek	Trap	1	99	19	5%	29% (150)
Forest Park	Trap	0	132	38*	21%	25% (413)
Greys River NWR	Helicopter	10	10	10	10%	10% (10)
Gros Ventre NWR	Helicopter	13	13	13	38%	39% (97)
Totals		35	408	152	19%	

*statistically significant *n* for estimated prevalence to be within +/- 15% of true prevalence

Target Feedground Plan

- Low Density Feeding: Low Density (LD) Feeding is a technique that was developed and validated by the WGFD BFH unit in the late 2000's in an effort to reduce contact (and subsequent transmission risk) between elk on supplemental feed. LD feeding has been shown to reduce contacts with aborted fetuses by 66-75% and is a cost effective method to directly reduce brucellosis prevalence among elk attending feedgrounds, and indirectly reduce risk of brucellosis spillover into livestock. The basic idea behind this technique is to distribute the hay

in a uniform pattern across the feeding area, which reduces the linear travel of elk on feedlines. When done correctly the feedground looks similar to a checkerboard, allowing an individual animal up to eight potential paths of travel to move between hay piles as opposed to a linear feeding (traditional) system where there are only two directions of travel on the feed lines. Where applicable, the Jackson Region has implemented LD feeding to varying degrees throughout the region and where this techniques is utilized effectively, brucellosis seroprevelance appears to be decreasing. In an effort to better implement LD feeding on feedground utilizing mechanized feeding, two (2) Square Spinner square bale feeders were used at South Park and Horse Creek Feedgrounds in 2021-2022. This new feeding equipment allows for LD feeding and a better overall ability to spread elk out and utilize more feeding area compared to other equipment used in the past. Due to an extensive wetland project at South Park WHMA in 2022, the Jackson Wildlife Disease Biologist spent an extensive amount of time breaking feed lines in the project area in an effort to implement LD feeding to the greatest extent possible.

- Early End Dates: In conjunction with LD feeding, early supplemental feeding end dates has been shown to also reduce brucellosis transmission on feedgrounds (and subsequently reduce brucellosis infection rates among attending elk). Research by the WGFD has found that the rate of elk abortion due to brucellosis on feedgrounds peaks in March, April and May, so the earlier in spring that managers can encourage elk to free range, the less the chance for elk to become exposed to the disease on a crowded feedground. However, to end feeding as early as possible there must be sufficient native forage available for the elk so they remain in good health, and the risk of elk causing damage to stored crops or co-mingling with cattle must be very low. Based on more than 35 years of WGFD feedground data, over 50% of the variation in brucellosis seroprevalence among elk attending feedgrounds can be explained by the end date of the feeding season (the later into spring a feedground operates, the higher brucellosis prevalence is), and truncating feeding seasons, where possible and if successful, should lead to long term decreases in brucellosis prevalence over time.

During the 2022-2023 feeding season, a mortality event was documented at the Horse Creek/Camp Creek Feedground complex south of Jackson. Based on visual and necropsy observations this prolonged morbidity/mortality event was determined to be from a buildup of *Fusobacterium necrophorum,* an anaerobic bacteria commonly found in the mammalian digestive tract. Based on past experience/documentation these outbreaks typically occur on a given feedground when animal densities are high and cannot adequately spread out and utilize clean feeding areas throughout the spring. Typically these mortality events occur later in the feeding season as temperatures moderate and daily freeze-thaw cycles allow the proliferation of the anaerobic bacteria in the feeding areas. Combined with high densities of elk, limited ability to spread animals out on clean feeding areas and the accumulation of feces throughout the feeding season results in an increased risk of this disease.

Feed type may also play a role in this disease and subsequent mortality. It is documented that rough, course feed increases risk of oral injury and allows a pathway for *Fusobacterium necrophorum* to invade

compromised tissues. It has also been documented that due to the nutritional content of alfalfa hay, *Fusobacterium necrophorum* production in the rumen is increased, further increasing the risk of disease outbreak in susceptible populations. Based on feedground movement research, feeding alfalfa hay on elk feedgrounds also results in increased time spent on feed lines daily and more difficulty in early termination of feeding in the spring. In areas predisposed to these disease outbreaks (excessively high elk numbers of the area available), it would be advised to only feed grass hay in an effort to reduce the time that elk spend in high density congregations, reduced risk of oral injury and better implementation of early end date management.

Typically this disease (Necrobacillosis) presents itself as either infectious necrotic pododermatitis (Hoof-rot) or Necrotic Stomatitis (mouth-rot) occur due to either inter-digital or inter-oral injury and subsequent infection from the environment of *F. necrophorum*. The majority of the mortality attributed to this disease occurs in calves attending feedgrounds. It is speculated this is due in part to their small size, limited resources and inability to adequately deal with the systemic infection that often accompanies a severe *F. necrophorum* infection. If infected individuals are able to survive a *F. necrophorum* infection often there will be lifelong morbidity (deformed hooves, necrosis of the jaw, etc.) in the afflicted areas due to the infection.

Based on a combination of feedground classification survey results and the overall size of the feeding area available at Horse Creek and Camp Creek Feedground during the 2022-2023 feeding season, we were able to predict with a significant level of certainty that there would be a *F. necrophorum* outbreak within the Horse Creek/Camp Creek Feedground complex. In late February WGFD began receiving reports from the feeder that calves were becoming lame and lethargic on Horse Creek Feedground resulting in an increased focus on monitoring for animal health at this feedground. This event coincided with a movement of elk from Camp Creek to Horse Creek (further increasing feedground density) presumably due to differences in quality and types of feed between the two feedgrounds. Between February 25th and May 13, 2023 a total of 155 calf elk mortalities were documented, with 91 occurring either on or directly adjacent to the feeding areas and most being euthanized due to inability to move at time of discovery. An additional 64 elk were documented on national forests and private lands adjacent to Horse Creek and Camp Creek Feedgrounds and based on scavenging patterns, locations, age and timing of mortality it is assumed that these individuals are highly likely to have been infected as well. This level of mortality accounts for a loss of more than 30% of the calves that were documented between Horse Creek and Camp Creek Feedgrounds (45% of classified calves on Horse Creek Feedground) in 2023.