ACKNOWLEDGEMENT

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

2022 - JCR Evaluation Form

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

HERD: PR615 - RED DESERT

HUNT AREAS: 60-61, 64
PREPARED BY: GREG HIATT

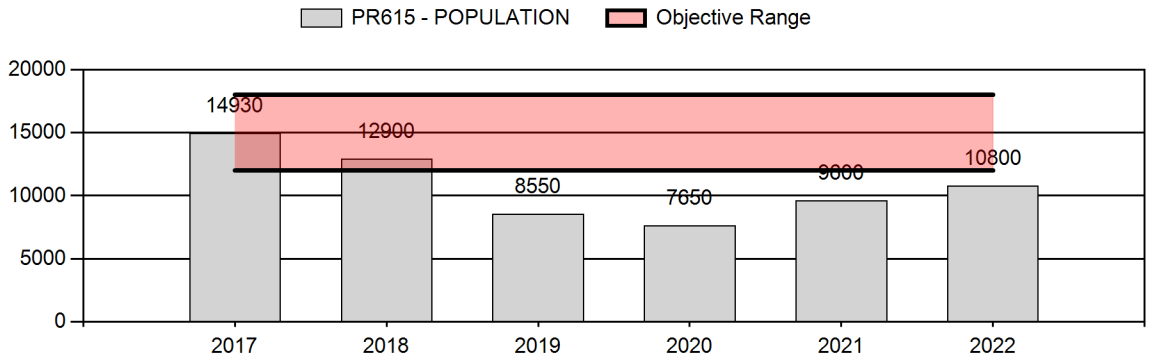
	2017 - 2021 Average	2022	2023 Proposed
Population:	10,726	10,800	4,300
Harvest:	283	368	180
Hunters:	321	449	200
Hunter Success:	88%	82%	90 %
Active Licenses:	338	449	200
Active License Success:	84%	82%	90 %
Recreation Days:	1,071	1,367	800
Days Per Animal:	3.8	3.7	4.4
Males per 100 Females	58	70	
Juveniles per 100 Females	50	70	

Population Objective (± 20%) :	15000 (12000 - 18000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-28%
Number of years population has been + or - objective in recent trend:	18
Model Date:	03/02/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	10%	13%
Proposed change in post-season population:	17%	-60%

Population Size - Postseason



2023 Hunting Seasons
Red Desert Pronghorn (PR615)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
60	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	50	Any antelope
61	1	Aug. 15	Sep. 8	Sep. 9	Oct. 31	50	Any antelope
64	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	100	Any antelope

2022 Hunter Satisfaction: 92% Satisfied, 6% Neutral, 2% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** This herd experienced two consecutive severe winters in 2018-19 and 2019-20, causing significant mortality. These losses, compounded with near-record low fawn crops in 2018 (41:100), 2019 (49:100) and 2020 (45:100) caused this population to decline well below objective. Fawn production improved in 2021 (56:100) and 2022 (70:100) allowing herd size to begin to recover.

Classification sample size in 2022 was nearly the same as in 2021, the smallest samples since 2005. The buck:doe ratio for this herd rose to 70, the highest in more than 10 years but only the second year in the past five that it has met the special management criterion. The majority of the increase came from improved recruitment of yearling bucks. Buck:doe ratios exceeded the minimum for special management in all three areas, the first time that has occurred since 2012, and was highest in area 64 at 76:100. Fawn production improved in 2022, the highest in more than 10 years. Fawn:doe ratios were similar between Areas 61 and 64, and again lowest in Area 60 at 59:100.

Beginning in 2019, Area 61 was included in a Department sponsored study to examine the effects of harvest on buck quality in pronghorn populations. Area 61 was designated a 'control' area for the study with the intent to maintain current management for the duration of the study through 2022. Despite this decision, the harvest quota for Area 61 was increased in 2020. Hunter satisfaction in Area 61 declined as increased harvest affected buck quality (Figure 1.). Hunter satisfaction for Area 61 was low in 2020 when bucks with horns longer than 14" made up only 24% of the buck harvest, but satisfaction reached 94% in 2022 when 59% of harvested bucks were at least 14" long. For the herd as a whole, hunter satisfaction was at a record low of 81% in 2020 when only 21% of harvested bucks met or exceeded 14" but rose to 92% in 2022 when 43% of the harvested bucks met that criterion (Figure 2.).

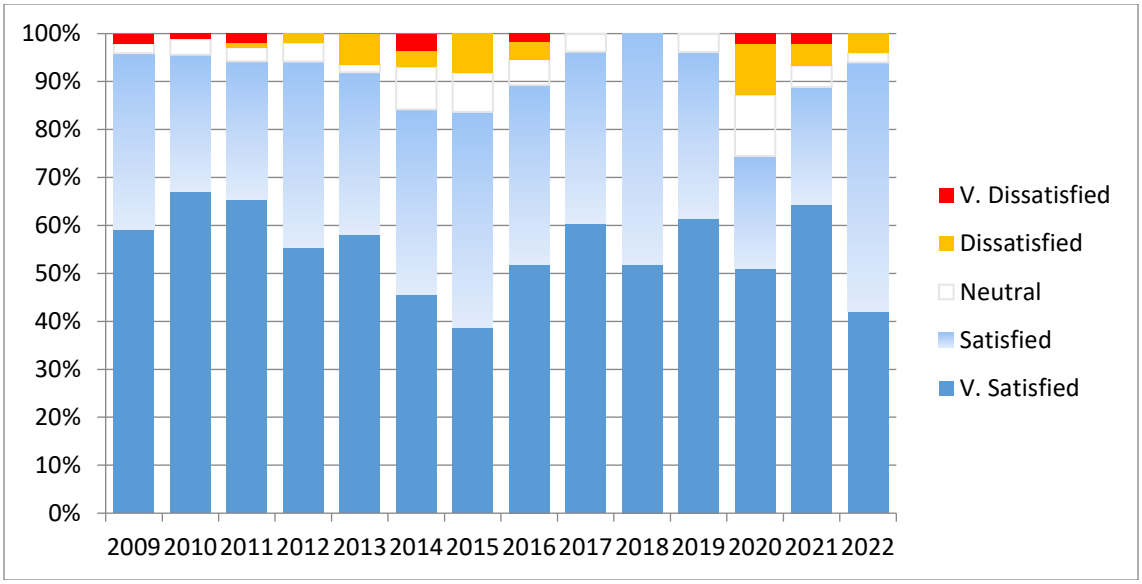


Figure 1. Hunter satisfaction and dissatisfaction in Antelope Area 61.

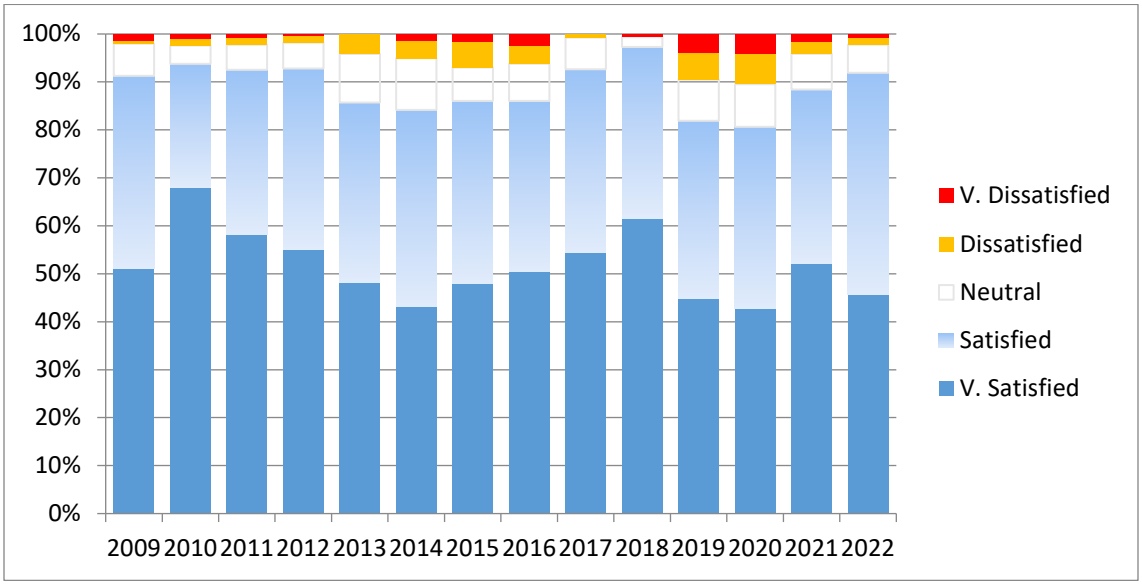


Figure 2. Hunter satisfaction and dissatisfaction in the Red Desert Pronghorn Herd.

Hunter success improved to 82% in 2022, but was still well below historic norms. All of the improvement was in Area 64, with areas 60 and 61 showing significant declines in hunter success. Despite the reduced hunter success for a large portion of the herd unit, hunter satisfaction increased to 92% and dissatisfaction decreased to 2%, similar to levels seen before the most recent harsh winters. Thirty-three percent of the buck harvest was checked and measured in 2022. Average length of buck horns increased slightly from 13.5” in 2021 to 13.6” in 2022 (Figure 3.). The longest horn measured in 2022 was 16.5” compared to 16.2” the year before. In both years the tallest buck came from Area 64. More importantly, the proportion of bucks 14” or longer increased from 21 percent of the harvest in 2020 to 36% in 2021 and 43% in 2022. Overall, hunters in these three hunt areas in 2022 enjoyed

better opportunities to harvest a tall buck than they did in 2021 (Figure 4.). As expected with 'special' management, their opportunity to harvest taller bucks was considerably better in this herd than what average hunters enjoyed statewide (Figure 5.). This herd has a reputation for exceptional bucks, and it would appear hunter satisfaction is tied more to buck quality than simple hunter success.

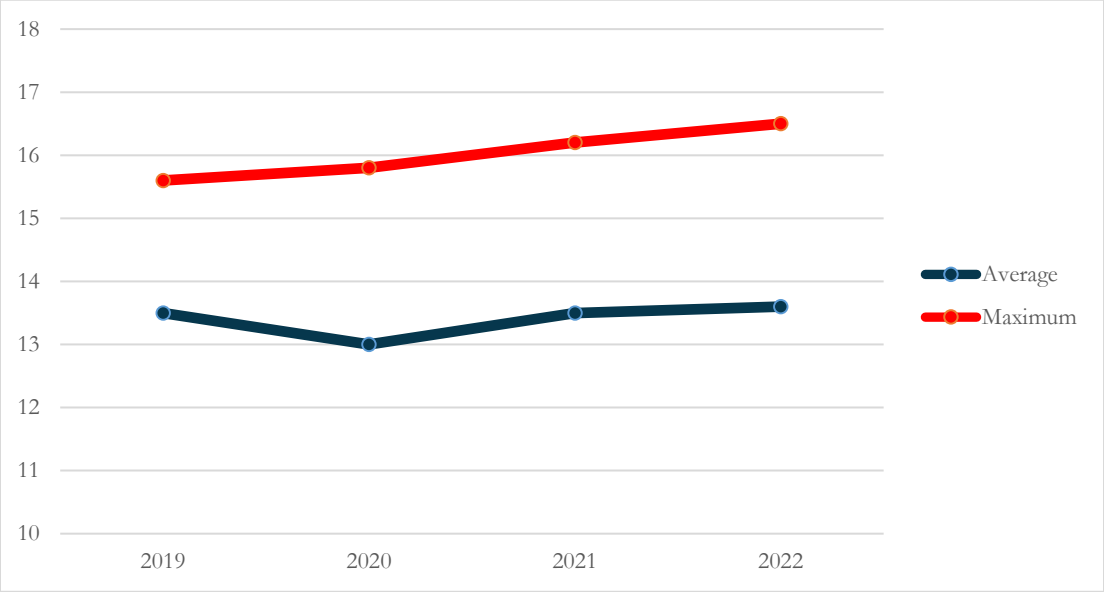


Figure 3. Average and maximum horn lengths of harvested bucks checked from the Red Desert Pronghorn Herd.

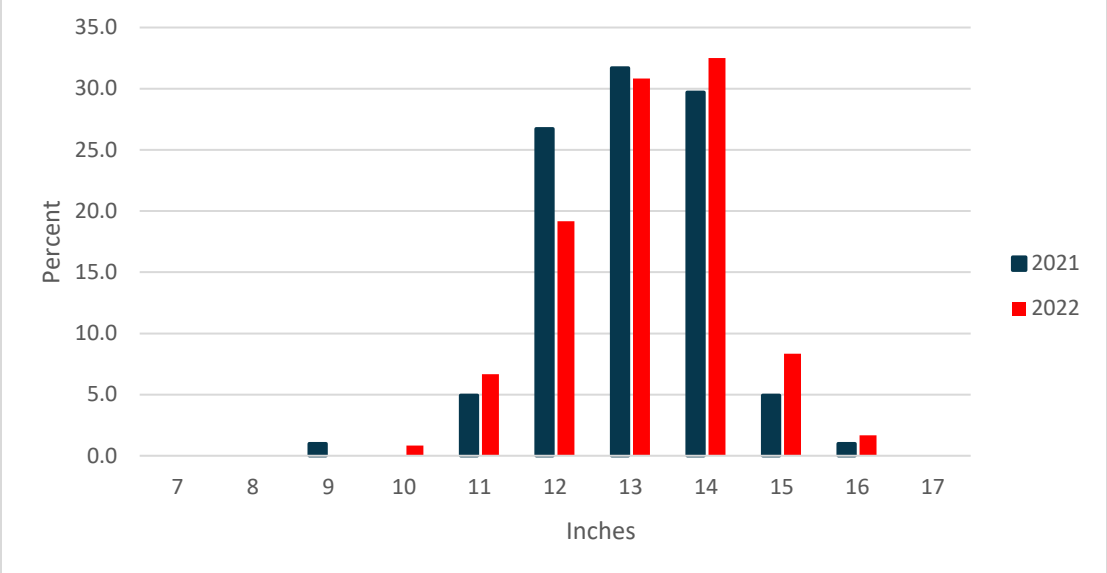


Figure 4. Horn length of harvested pronghorn bucks checked from the Red Desert Pronghorn Herd in 2022 compared to 2021.

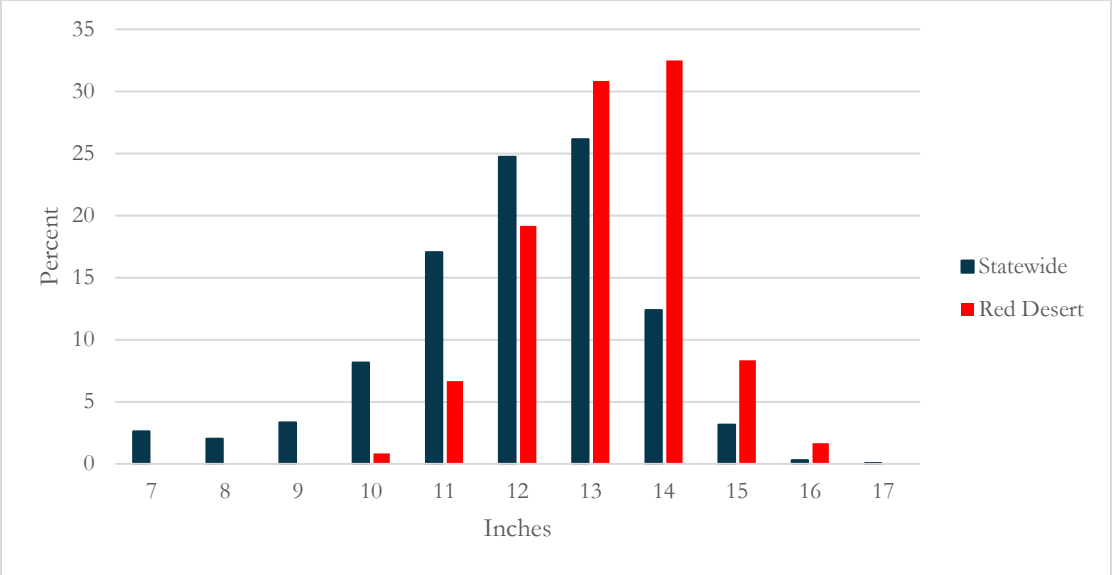


Figure 5. Horn length of harvested pronghorn bucks checked from the Red Desert Pronghorn Herd compared to statewide harvest checks in 2022.

Winter severity in 2022-23 was extreme, with sub-zero temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage. Thirty-three radio-collared adult doe pronghorn were still alive in this herd unit at the end of December 2022. Following the New Year's Day blizzard that deposited over 20" of snow over much of the herd unit, movements recorded from these animals show the same extreme migrations, often outside the herd unit, seen in the harsh 2018-19 and 2019-20 winters, as well as in 1983-84 and 1992-93. Severe weather and deep snow cover continued through mid-April and 17 of the 33 collared adult does died (52%) in those three and a half months. Three does moved east into the South Ferris herd unit, and all three died there. Six moved north into the Sweetwater portion of the Beaver Rim herd unit, and three of these died, late in the winter. Thirteen collared does moved west into the Baxter Basin portion of the Sublette herd unit, and only three of these perished during the winter. Of the 11 does that attempted to stay within the Red Desert herd unit, 8 died. Of the three survivors, one was in the extreme southeast corner of the herd unit by Rawlins and the other two were in the extreme southwest corner by Point of Rocks. Crusted snow cover following the New Year's blizzard was simply too deep across most of the herd unit and the winter too long and severe for most pronghorn to survive.

Losses during the 2022-23 winter are expected to be similar to other harsh winters experienced in the past half-century. One hundred and eighty-one pronghorn mortalities related to winter stress were examined and documented in this herd, excluding road kills, fence kills and telemetered animals (Table 1.).

			Age Class			
Sex	Number	fawn	1	2	3	4+
m	75	10	11	1	2	51
f	105	9	13	3	10	70
?	1	1				
Total	181	20	24	4	12	121
% of Adult	100		15	2	7	75
% of Total	100	11	13	2	7	67

Table 1. Age and sex of winter mortalities documented in the Red Desert Pronghorn herd during the 2022-23 winter.

Age and sex composition of mortalities can give an indication of winter severity. Typically the first animals to be lost in winter are those with the least fat reserves; the young of the year and older age classes. As winter severity increases, increasing numbers of the more vigorous 1-, 2- and 3-year olds will be lost. The number of fawns found in post-winter mortality surveys will depend on the number of fawns in the population prior to winter, but looking at the distribution of adult age classes allows for comparison of winter severity (Figure 6.).

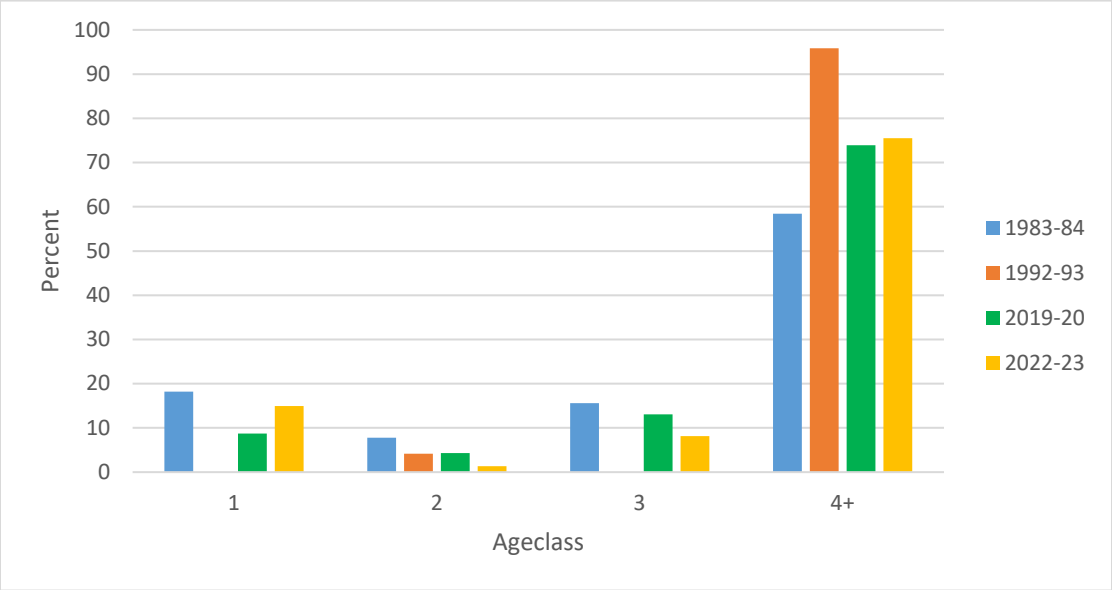


Figure 6. Age structure of adult pronghorn winter mortalities in the Red Desert herd in the 1983-84, 1992-93, 2019-20 and 2022-23 winters.

The winter of 1983-84 was the harshest in recent memory, and estimates of losses to pronghorn herds in the south-central portion of the state ranged from 50-80 percent. Mortality surveys found significant numbers in the 1-, 2- and 3-year age classes. The 1992-93 winter had a late October snowfall that crusted over and lasted well into March but losses were apparently less significant. Fewer mortalities were found, and most were

fawns or old, mature animals. Herd losses may have been less than half those of the 1983-84 winter. Age class distribution of winter losses in the Red Desert herd during the 2019-20 winter fall between the 1983-84 and 1992-93 winters, and severity would be expected to also be mid-range.

Documented losses from the 2022-23 winter within this herd unit were primarily found in Area 61 and may not precisely represent losses seen from the entire herd, nor animals that died after migrating outside the herd unit. And because of poor fawn production in 2018-2020, the proportions of younger adult animals in the population may not match the typical age structures seen in earlier harsh winters. But with these caveats in mind, composition of winter losses in 2022-23 appear similar to those of the 2019-20 winter, again less than those seen in 1983-84. The 2022-23 winter began, however, with the herd already 28% below objective.

Based upon the IPM postseason 2022 population estimate of 10,800 pronghorn, assuming 52% losses to does and similar losses to bucks in the population and near total losses to fawns, the end-of-year population of this herd was optimistically predicted to be about 4,300 pronghorn, well below the estimated 6,200 animals in this herd after the consecutive harsh winters of 2018-29 and 2019-20. Of these ~4,300 pronghorn, only about a third would be bucks. Based on high winter losses, public support for conservative seasons following this winter and expectation that many of the pronghorn that wintered outside this herd unit may not be able to return because of sheep-tight fences in the checkerboard, license quotas in 2023 were reduced by 60%.

With the herd so far below objective no doe/fawn harvest is warranted. From 2020 through 2022, reported harvests represented 9.3% of the bucks currently estimated to have been in this herd. With significant losses of bucks from winter mortality, total license quotas were originally cut by 50%, with an expected harvest of ~225 bucks, representing ~15% of the expected pre-hunt buck population. With continued winter losses, quotas were further reduced with the final quotas representing a 60% cut from 2022. Expected harvest would be about 180 bucks, representing ~13% of the expected pre-hunt buck population.

2.) **Population Modeling**: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 10,800 (9,750-11,800) pronghorn. Long term IPMs failed to achieve Rhat values adequate to place much confidence in their predictions and most greatly overestimated population size at the time of the most recent LT survey and were not used. While still failing to achieve desired Rhat values, and missing confidence intervals on two of six LT estimates, the selected IPM aligned well with the most recent LT estimate and showed growth in the population through 2022 due to light winters and improved fawn production. This model predicts a herd size 28% below objective prior to this severe winter. For comparison, an updated spreadsheet population model developed because IPMs were not yet available also indicates the population grew in 2022, but estimated a larger 2022 posthunt population of 12,569, roughly 15% below objective.

2022 - JCR Evaluation Form

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

HERD: PR630 - IRON SPRINGS

HUNT AREAS: 52, 56, 108
PREPARED BY: GREG HIATT

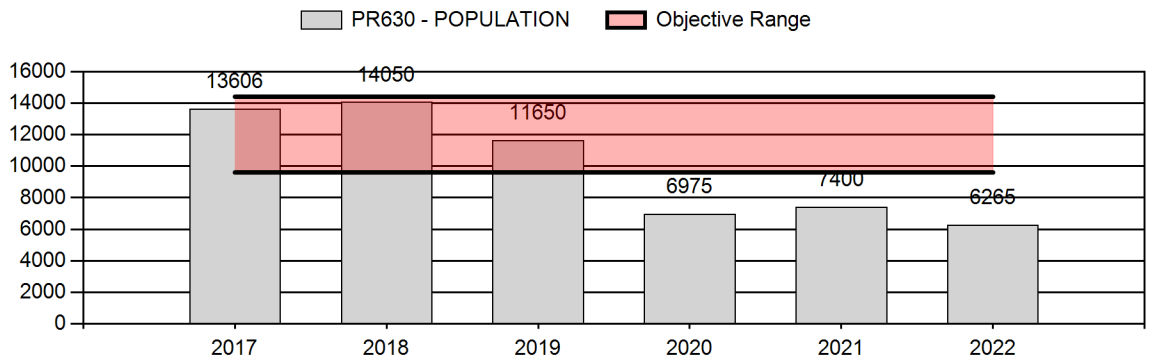
	2017 - 2021 Average	2022	2023 Proposed
Population:	10,736	6,265	4,000
Harvest:	742	441	255
Hunters:	759	492	290
Hunter Success:	98%	90%	88 %
Active Licenses:	886	563	290
Active License Success:	84%	78%	88 %
Recreation Days:	2,680	1,757	1,115
Days Per Animal:	3.6	4.0	4.4
Males per 100 Females	54	59	
Juveniles per 100 Females	45	60	

Population Objective (± 20%) :	12000 (9600 - 14400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-47.8%
Number of years population has been + or - objective in recent trend:	4
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:	4.2%	2%
Males ≥ 1 year old:	14.5%	16%
Proposed change in post-season population:	1.3%	-36%

Population Size - Postseason



2023 Hunting Seasons
Iron Springs Pronghorn (PR630)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
52	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	100	Any antelope
52	2	Aug. 15	Sep. 15	Sep. 16	Nov. 14	100	Any antelope valid south of North Spring Creek
56	1	Aug. 15	Sep. 19	Sep. 20	Oct. 31	25	Any antelope
108	1	Aug. 15	Sep. 19	Sep. 20	Oct. 31	25	Any antelope

2022 Hunter Satisfaction: 81% Satisfied, 10% Neutral, 9% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation:

A line transect survey of this herd was flown in June 2022, providing a sixth independent estimate of population size during the past 30 years (see Appendix A.). The survey estimated a density of 6.0 pronghorn per square mile, yielding an estimate of 5,338 pronghorn in the herd prior to fawn drop. This estimate was 60% less than the previous line transect estimate made 4 years earlier in spring of 2018. This latest line transect survey predicts the herd was roughly 43% below objective at the beginning of BY2022.

Classification and harvest data indicate this herd suffered heavy losses during the 2019-20 winter. The population has not recovered due to low fawn production in the northern portion (16:100 in 2020) and continued doe harvest in the south. Classification sample size declined again to another record low in 2022, and was almost two-thirds smaller than the sample classified in 2019 before the harsh winter. Most of the decline in sample size came from Area 108, yielding an all-time low for that area, with the sample from Area 52 actually improving by 16%. As usual, minimal sample was collected from Area 56 due to the lack of access to the majority of the hunt area. For the herd as a whole, the buck:doe ratio improved to 59:100, at the peak of the range for a recreational herd. Improvement in this ratio was due to increases in both yearling and adult bucks. Within the three hunt areas, the buck:doe ratio for Area 52 rose again to 66:100, while that for Area 108 remained low at 35:100. As expected, the improved fawn crops in Areas 52 and 108 seen in 2021 yielded near-normal yearling recruitment in 2022. Area 52 again had 18 yearling bucks:100 does, tying a record high. Just as the 2019-20 winter was most severe in the northern end, recovery has been slowest in that same portion of the herd.

Hunter success dropped to 78% in 2022, a 20-year record low and the 2nd poorest in 38 years. Of the seven license types, hunter success was lowest for the Type 7 licenses in southern Area 52 (64%) and highest for the Type 1 licenses in Area 108 (91%). Buck hunters in the southern portion of Area 52 had much higher success (88%) than those with Type 1 licenses in the more accessible northern portion (66%). Hunter satisfaction for the herd unit

did not change despite the poorer success, but dissatisfaction increased to the 2nd highest ever recorded (Figure 1.). This pattern was repeated in Areas 52 and 56. In Area 108, however, hunter satisfaction increased but was still the 4th lowest in 14 years of records. Hunter dissatisfaction reached 15% in Area 56 which is not surprising, given the greatly restricted access to that area. Three of 15 hunter comments received after the 2022 hunts complained about low antelope numbers, in both Area 52 and Area 108.

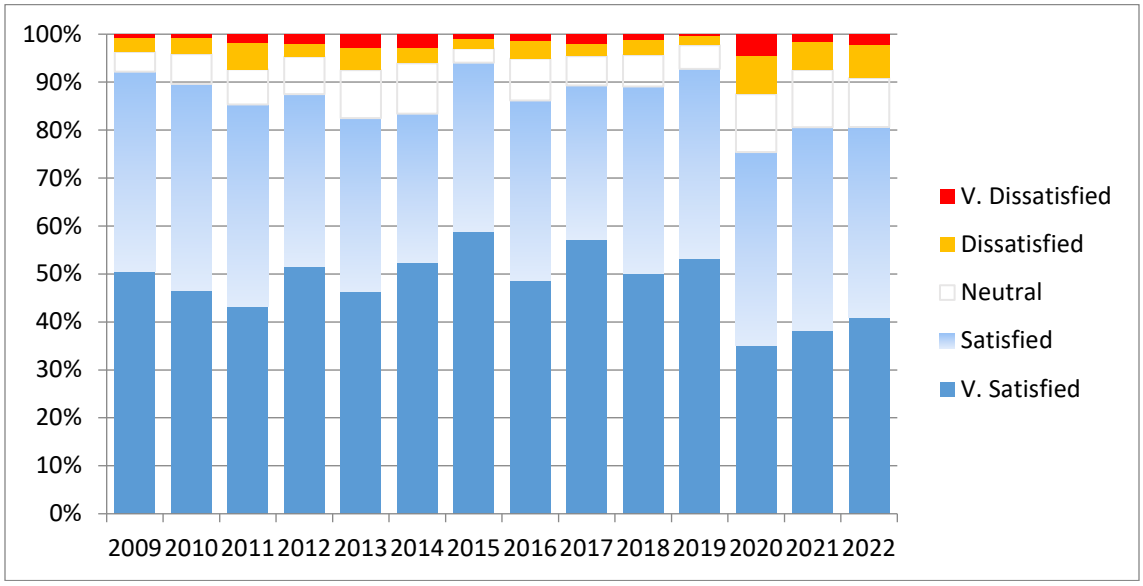


Figure 1. Hunter satisfaction and dissatisfaction in the Iron Springs Pronghorn Herd.

Buck quality showed slight improvement in this herd in 2022. Horn measurements were obtained from almost 10% of the reported harvest. Average horn length increased slightly from 11.8" to 12.2" (Figure 2.). Average horn length was greatest in Area 56 at 12.7" and poorest in Area 52 at 11.7". The maximum horn length checked in 2022 was 15", from Area 108, compared to only 14.3" last year. In 2021, bucks longer than 14" made up only 10% of the buck harvest, but in 2022 they were 15%. Overall, hunters in these three hunt areas in 2022 enjoyed better opportunities to harvest a tall buck than they did in 2021 (Figure 3.). Their opportunity to harvest taller bucks was slightly better in this herd than what average hunters enjoyed statewide (Figure 4.). Improved buck quality probably contributes to the stable hunter satisfaction in this herd despite declining success.

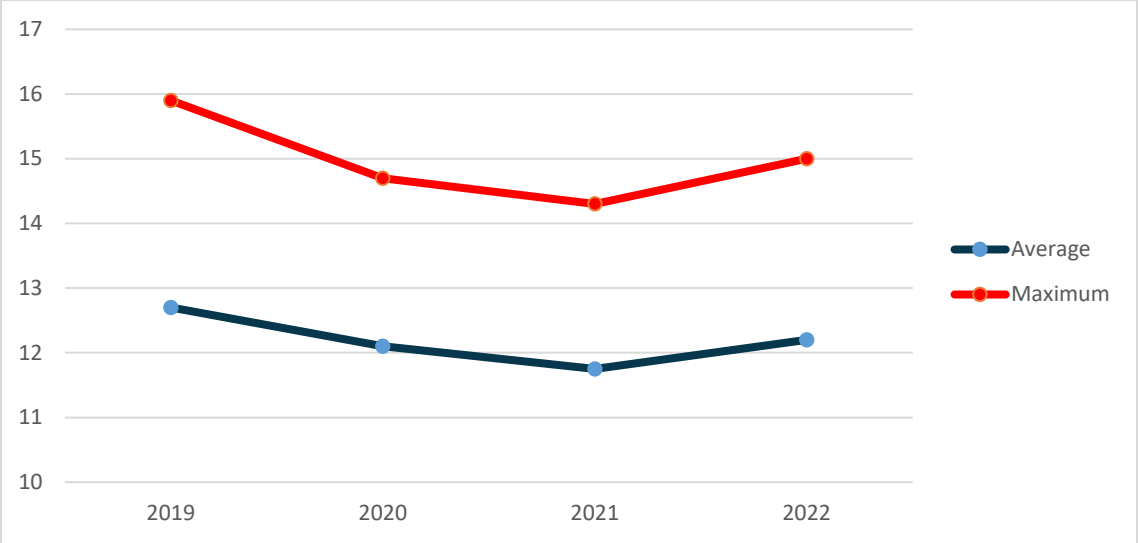


Figure 2. Average and maximum horn lengths of harvested bucks checked from the Iron Springs Pronghorn Herd.

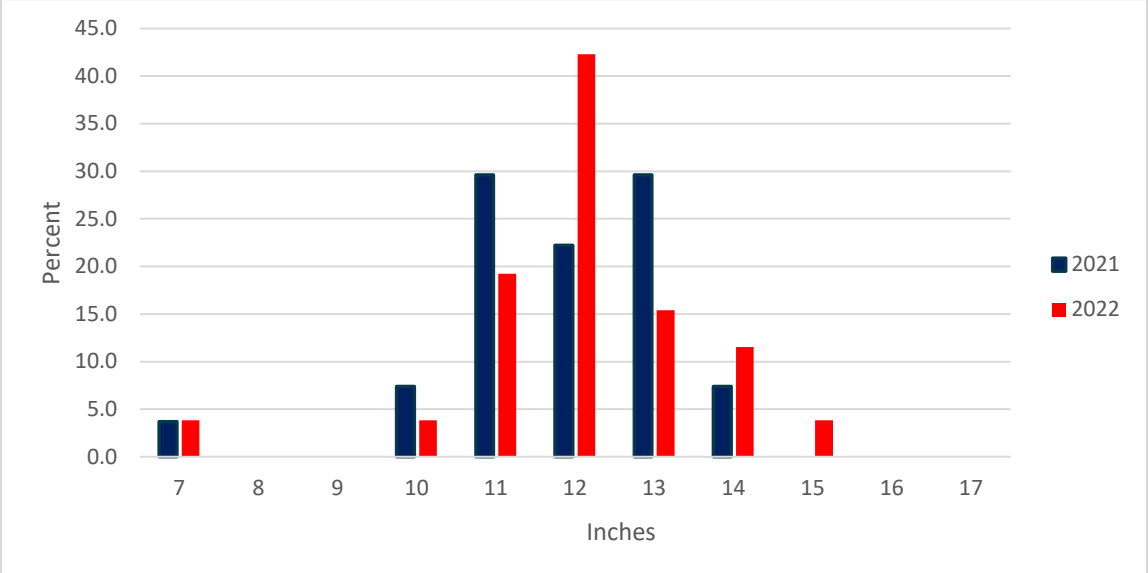


Figure 3. Horn length of harvested pronghorn bucks checked from the Iron Springs Pronghorn Herd in 2022 compared to 2021.

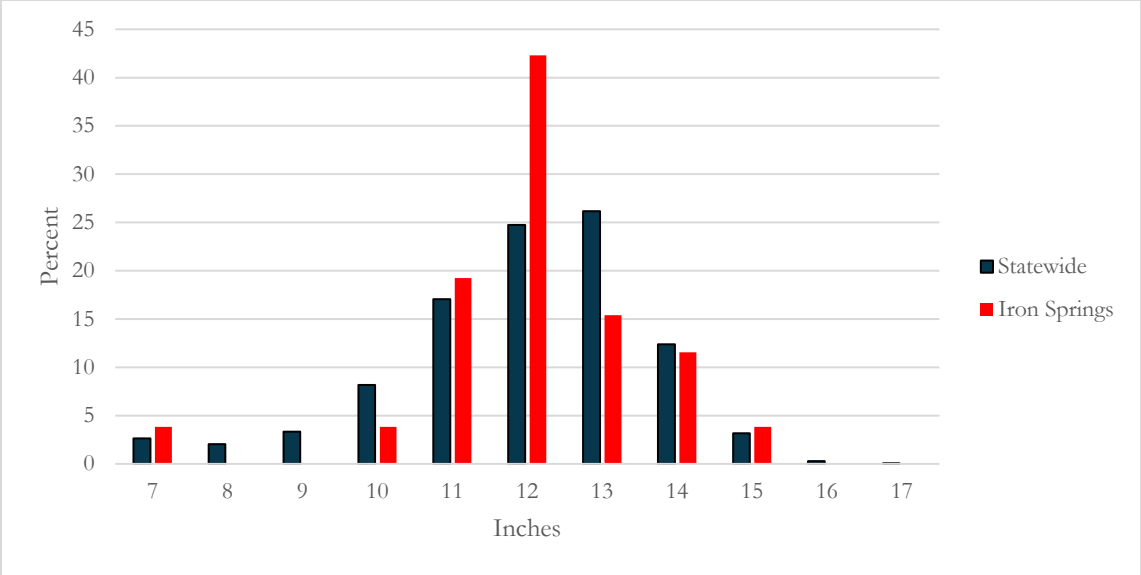


Figure 4. Horn length of harvested pronghorn bucks checked from the Iron Springs Pronghorn Herd compared to statewide harvest checks in 2022.

For the past 20 years buck harvests from Area 52 have been separated between the Type 1 and Type 2 licenses, with the Type 2s valid only in the southern portion of the hunt area. These licenses direct hunting pressure to a major portion of the area with large blocks of private land, often irrigated, which is difficult to access and typically has a greater supply of bucks. While this Type 2 license strategy has been successful, the southern portion still has the majority of the bucks in the area, at 72:100, compared to 60:100 in the more accessible northern portion. Nearly 60% of the bucks classified in Area 52 were in the southern, largely inaccessible portion and these represent 50% of the bucks classified in the entire herd.

Winter severity in 2022-23 was extreme, with sub-zero temperatures, high winds, and record snowfall producing deep crusted snow covering much of the herd unit from New Year's through mid-April. Thirty-three telemetered adult doe pronghorn were alive in the neighboring Red Desert herd at the end of December 2022. Movements recorded from these animals showed the same extreme migrations reported in other severe winters. In the following three and a half months of severe weather and deep snowfall, 17 of these 33 collared adult does died (52%), several within a few miles of this herd unit. Calculations based upon these telemetry losses estimate more than half the Red Desert herd was lost and similar losses are expected in at least the northern portion of the Iron Springs herd. Based upon current losses in the Red Desert, and assuming higher survival in the southern portion of this herd, the predicted end-of-year size of the Iron Springs herd is estimated to be only 4,000 pronghorn, depending upon winter severity across the herd unit. This is almost half the number of animals estimated to be in this herd unit following the two consecutive harsh winters of 2018-19 and 2019-20. Roughly a third of these would be expected to be bucks, around 1,350.

With the herd so far below objective, doe/fawn harvest is unnecessary and had been retained in Areas 52 and 108 solely to address damage concerns on irrigated private lands. To

accommodate for high winter losses and respond to public concerns over this additional mortality, the Type 6 and Type 7 doe/fawn licenses in Area 52 were eliminated in 2023, along with the Type 7 licenses in Area 108.

From 2020 through 2022, reported harvests averaged 16% of the bucks currently estimated to have been in this herd. With the herd nearly 50% below objective before the winter and expected high losses during the 2022-23 winter, quotas for Type 1 and Type 2 licenses were cut by nearly 40%. Expected buck harvest from these quotas would be about 16% of the 1,350 bucks that are projected to be this herd pre-hunt 2023, below the 25% target. However, roughly 90% of the pronghorn in Area 56, at least half those in Area 108 and a major portion of those in Area 52 are unavailable for harvest due to a lack of access. As in past years, a major portion of the bucks in the population will be unavailable to most hunters because of the checker-boarded land ownership and a lack of access. Overall, total quotas for 2023 are 250 licenses compared to 600 in 2022, of which 225 were doe/fawn.

2.) **Population Modeling:** In 2021 WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 6,300 (5,100-7,400) pronghorn. A long term IPM achieved adequate Rhat values but significantly overestimated herd size, exceeding the upper CI for the most recent LT estimate in June 2022 and was not used. The selected model is truncated to 11 years, still incorporates four LT estimates, gives comparable Rhat values of fit but also falls well within the confidence interval for the most recent LT. This model shows the drop in herd size due to the harsh 2018-19 and 2019-20 winters, but indicates herd size continued to decline due to low fawn production and continued doe harvests. It predicts the herd was nearly 50% below objective by posthunt 2022, prior to losses this past winter. For comparison, an updated spreadsheet population model developed because IPMs were not yet available indicated a slight increase in herd size in 2022 and predicted a larger 2022 postseason population of 7,824, but was still 35% below objective prior to the winter.

Appendix A
Line Transect Report

Bio Year: 2022
Species: Pronghorn
Aircraft: Cessna 182, Wyo. Aero Photo
Pilot: Jamie Burgess
Observers: Greg Hiatt
Conditions: Excellent green-up, mostly clear skies, light to no wind.

Herd Code: PR630
Herd Unit: Iron Springs
Hunt Areas: 52, 56, 108
Dates: 7, 8 June 2022
Flight Time: 6.8 hrs

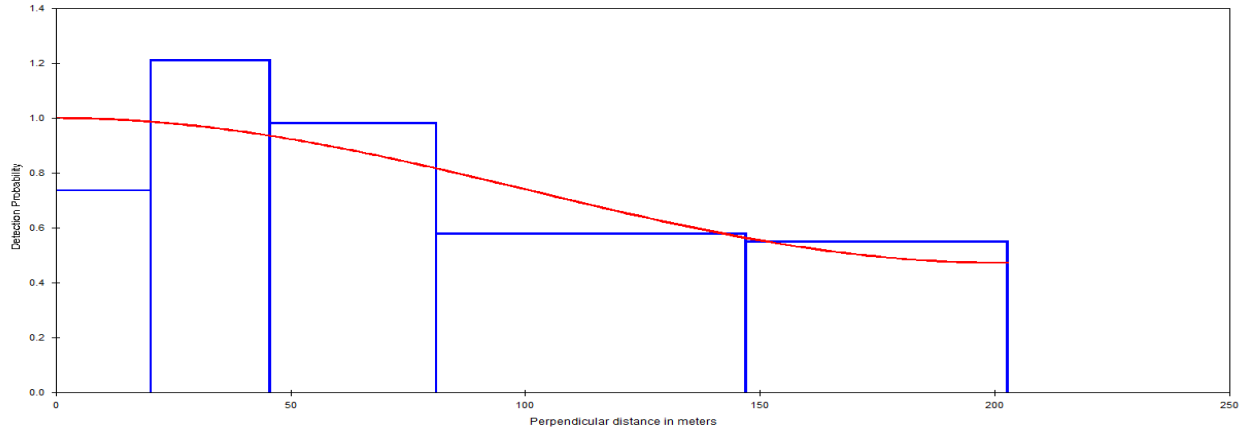
Survey Design:

Distance bands at 300':	20m, 45m, 80m, 145m, 200m
Average Above Ground Level (AGL):	304.0102 ft
Actual average distance bands:	20.28m, 45.60m, 81.07m, 146.94m, 202.67m
Number of transects:	24
Transect sampling scheme:	North-south transects (22) at 2' intervals, starting at 106° 44' and ending at 107° 24', plus a SW line through Bridger Pass and a SE line up Muddy Creek, both in area 108.
Length of transects:	740.453 km (462.205 miles)
Number of observers:	1

Notes:

7 June started SW through Bridger Pass on Line 1, then SE up Muddy Creek on Line 2. Then N on Line 3 on 107° 24' and worked east to N on Line 5 at 107° 20', staying on top of Miller Hill. Then dropped off Miller Hill and flew S on Line 6 at 107° 18' and worked east to S on Line 14 at 107° 02'. Accidently skipped Line 15 on N-bound leg and flew N on Line 16 at 106° 58'. Line 16 on 106° 58' was broken into two lines where the river cut the line for ~1/2-mile, technically making 24 lines. 8 June started S on Line 15 on 107° 00', jumped to N on Line 17 on 106° 56', then continued east to end N on Line 23 at 106° 44, which is entirely east of the highway. Radar altimeter failed on 73% of observations, therefore used survey average height for those gaps for analysis. No wind turbines yet erected, found several unmapped met-towers.

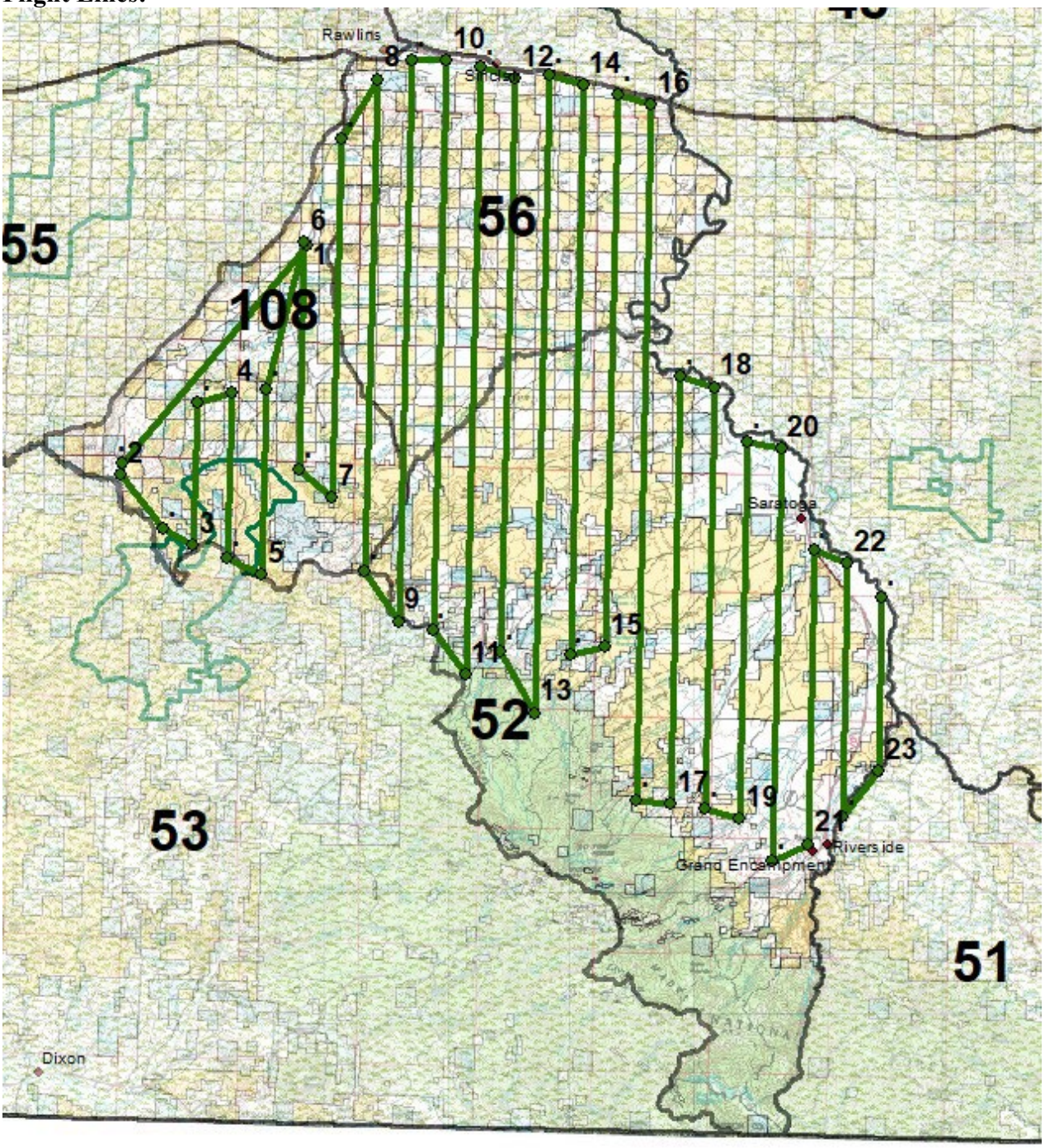
Survey Histogram:



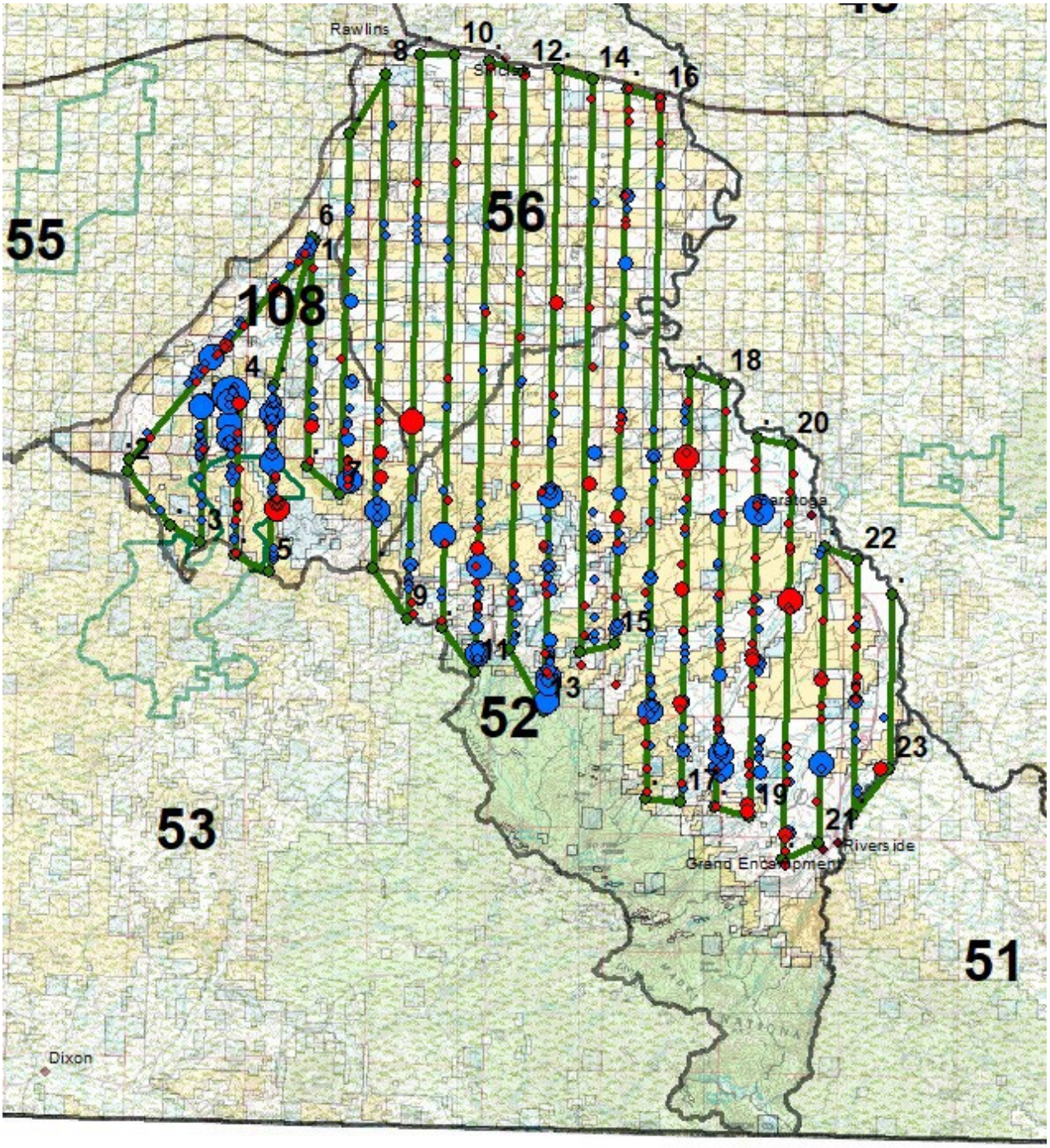
Distance Estimate:

Model used:	Uniform with Cosine adjustment
Density estimate (D):	5.9717 pronghorn/sq mi
% Coeff. Var. (CV)	15.78 %
Occupied habitat:	842.39 sq mi
Population estimate:	5,338 pronghorn (5.9717 Ph/sq mi * 842.39 sq mi)
95% CI:	3,892 – 7,323

Flight Lines:



Comparative Group Sizes and Distribution: 2022 (red) versus 2018 (blue).



2022 - JCR Evaluation Form

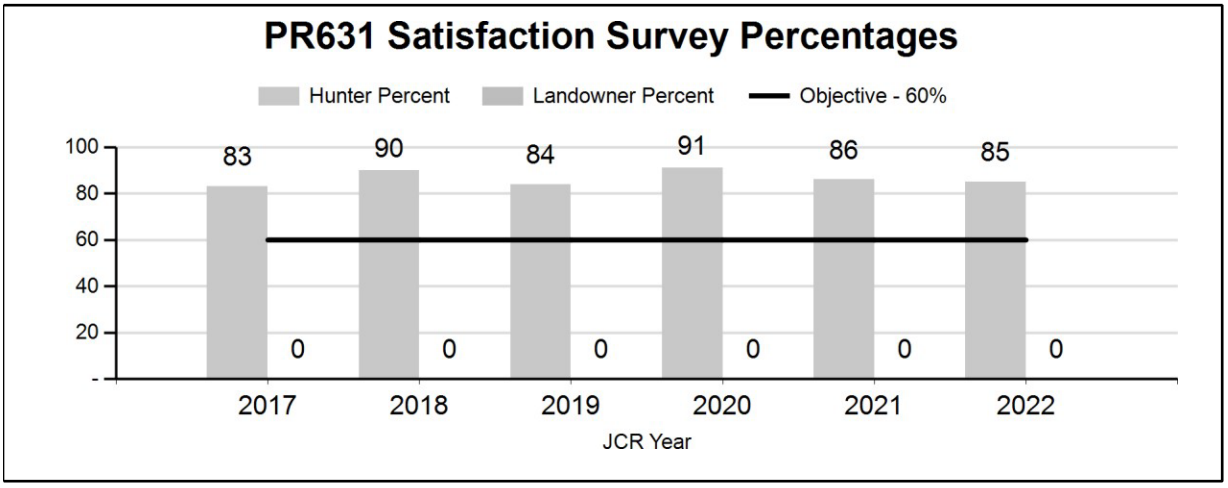
SPECIES: Pronghorn
HERD: PR631 - WIND RIVER
HUNT AREAS: 84

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

PREPARED BY: ZACH GREGORY

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	87%	85%	87%
Landowner Satisfaction Percent	0%	0%	0%
Harvest:	118	131	130
Hunters:	128	136	132
Hunter Success:	92%	96%	98 %
Active Licenses:	156	159	160
Active License Success:	76%	82%	81 %
Recreation Days:	656	808	675
Days Per Animal:	5.6	6.2	5.2
Males per 100 Females:	34	36	
Juveniles per 100 Females	51	39	

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:	0



2023 Hunting Seasons
Wind River Antelope (PR631)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
84	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	125	Any antelope
84	6	Aug. 15	Sep. 15	Sep. 16	Oct. 31	75	Doe or fawn

2022 Hunter Satisfaction: 85% Satisfied, 10% Neutral, 5% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The hunt season in area 84 has remained unchanged for the past several years, however this year there will be a slight increase in the Type 1 licenses. Anecdotal evidence indicates the population has fluctuated year to year based on environmental factors but it does not appear harvest pressure has had a great influence on the population. This herd inhabits mountain foothill areas throughout much of the summer and fall including isolated parks in conifer covered areas. Given the terrain inhabited by many of the antelope in the herd, classification sampling is difficult and sample sizes are typically small. In addition, there is believed to be a high rate of interchange with the Wind River Reservation. These factors preclude modeling the population. Instead the herd has a hunter satisfaction objective with the goal to have 60% of hunters satisfied. This goal has been met over the past five years with an average of 87%. Based on hunter and landowner comments, high success rates, along with persistent above objective hunter satisfaction a small increase of 25 Type 1 licenses is warranted to allow more hunting opportunity.

2022 - JCR Evaluation Form

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

HERD: PR632 - BEAVER RIM

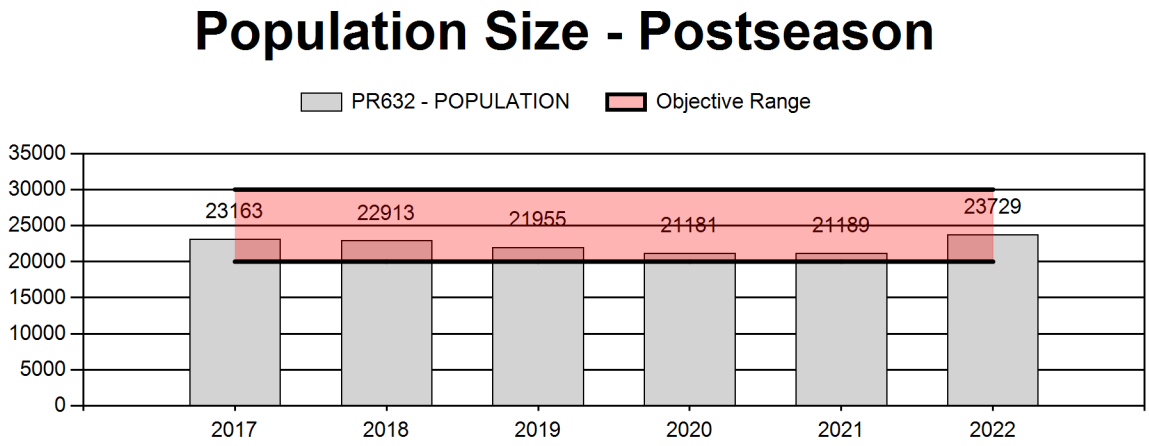
HUNT AREAS: 65-69, 74, 106
PREPARED BY: STAN HARTER

	2017 - 2021 Average	2022	2023 Proposed
Population:	22,080	23,729	25,936
Harvest:	1,787	1,193	835
Hunters:	1,869	1,298	925
Hunter Success:	96%	92%	90 %
Active Licenses:	2,056	1,349	925
Active License Success:	87%	88%	90 %
Recreation Days:	5,446	3,587	3,400
Days Per Animal:	3.0	3.0	4.1
Males per 100 Females	56	47	
Juveniles per 100 Females	52	60	

Population Objective (± 20%) :	25000 (20000 - 30000)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-5.1%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/23/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	2%	1%
Males ≥ 1 year old:	16%	17%
Proposed change in post-season population:	12%	9%



2023 Hunting Seasons

Beaver Rim Pronghorn (PR632)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
65	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	100	Any antelope
65	7	Aug. 15	Aug. 31	Sept. 1	Nov. 7	25	Doe or fawn valid north of the Little Popo Agie River, also valid in Area 66 west of the Little Popo Agie River
66	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	100	Any antelope
67	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	175	Any antelope
68	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	200	Any antelope
69	1	Aug. 15	Sept. 14	Sept. 15	Oct. 31	75	Any antelope
74	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	150	Any antelope
106	1	Aug. 15	Sept. 15	Sept. 16	Oct. 31	100	Any antelope

2022 Hunter Satisfaction: 90.0% Satisfied, 7.3% Neutral, 2.7% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: A total of 1,193 pronghorn were harvested in 2022, with minimal doe/fawn harvest in response to low fawn recruitment since 2019. The fawn/doe ratio rose to 60J/100 F, while the total buck/doe ratio dropped to 47M/100F in 2022. Winter 2022-23 has been quite harsh with Lander, Riverton, and Jeffrey City setting record January snow amounts, and February showed no improvement. These conditions likely had an impact on survival, especially of fawns. The 2023 hunting seasons are designed to provide appropriate, but reduced opportunity for bucks. The yearling buck/doe ratio of 11YM/100F was an improvement in 2022, but will likely decline in 2023. Thus, we are probably not fully replacing harvested bucks annually. Doe/fawn harvest will remain minimal and, where available. done to continue addressing localized damage concerns. Most hunt areas will not have doe/fawn licenses, in response to declining population trends and anticipated winter losses. According to the POP R model, this population is projected to increase by 9% to just below 26,000 in 2023, but winter mortality is likely to negate such an increase. Due to expected winter fawn mortality resulting in low yearling buck recruitment, buck/doe ratios are expected to remain below the low end of the special management criteria, with model projections showing a ratio of 52M/100F following reduced buck harvest in the 2023 hunting season.

Habitats received precipitation at or just above average in 2022, with some areas having very dry summer months, but others with well above average rain in August and September. Winter 2022-23 was severe, with colder than average temperatures and snow amounts beginning in January 2023 that remained through late-April. The extra precipitation will be beneficial to

habitat growth, but the amount of snow concentrated pronghorn in large groups where winds made at least some sagebrush available. Mortality was not heavily documented in the Beaver Rim herd unit, but mortality of collared adult females in the Red Desert herd unit to the south reached 50% by winter's end. Five collared does from the Red Desert wintering near the Sweetwater River northwest of Muddy Gap, with one from hunt area 60 spending most of the last year in hunt area 106 and then died in hunt area 67 in mid-March 2023 and 2 of 4 does that wintered north of Muddy Gap in area 68 died in April. Winter conditions did not improve much until late April 2023 across the Beaver Rim herd unit. Several groups of pronghorn were observed in the east end of hunt area 68 on March 29th, with few fawns being observed in those groups close to the highways near Muddy Gap Junction.

In 2023, reductions were made to Type 1 license quotas in all hunt areas in response to declines in buck/doe ratios, and expected low yearling buck recruitment. Overall reductions in Type 1 license quotas should result in buck harvest about 17% of the pre-season buck population in the Beaver Rim herd unit, above the minimum of 15% for special management herd units. Doe/ fawn license quotas remain only in 2 hunt areas to address localized damage concerns. Hunt Area 65 Type 7 licenses will remain, to address damage situations in restricted parts of Hunt Areas 65 and 66, but with 75 fewer licenses.

2.) POP R (IPM) Model Evaluation: In 2021, WGFD managers began using Pop R integrated population models (IPM) to estimate population indices for pronghorn. The POP R model for Beaver Rim pronghorn tracks well with end-of-bioyear abundance estimates falling within the confidence intervals for all seven line-transect (LT) estimates since 2001. The post-season population estimates also reflect observed trends through the years and trend fluctuations appear accurate based on field observations in classification and harvest data. The pre-season fawn/doe ratio of 60J/100F was a 30% increase above the ratio observed in 2021. The pre-season buck/doe ratio of 47M/100F was the lowest ratio since 2014, and has been declining since a high ratio of 63M/100F in 2017. The post-season abundance estimate of 23,729 pronghorn in 2022 (CL = 21,622 to 25,286) is a 12% increase over the post-season 2021 estimate in POP R, and is 5.1% below objective (25,000).

2022 - JCR Evaluation Form

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

HERD: PR634 - BADWATER

HUNT AREAS: 75
PREPARED BY: ZACH GREGORY

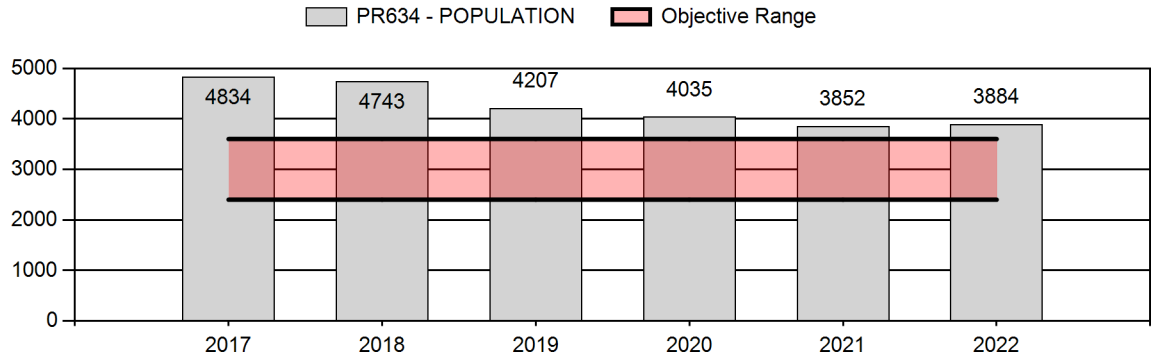
	2017 - 2021 Average	2022	2023 Proposed
Population:	4,334	3,884	4,108
Harvest:	691	333	318
Hunters:	717	342	325
Hunter Success:	96%	97%	98%
Active Licenses:	764	382	345
Active License Success:	90%	87%	92%
Recreation Days:	1,821	1,411	1,150
Days Per Animal:	2.6	4.2	3.6
Males per 100 Females	63	45	
Juveniles per 100 Females	59	65	

Population Objective (± 20%) :	3000 (2400 - 3600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	29%
Number of years population has been + or - objective in recent trend:	12
Model Date:	02/14/2023

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

	JCR Year	Proposed
Females ≥1 year old:	13%	4%
Males ≥ 1 year old:	43%	23%
Proposed change in post-season population:	-9%	1.06%

Population Size - Postseason



2023 Hunting Seasons
Badwater Antelope (PR634)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
75	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	250	Any antelope
75	6	Aug. 15	Sep. 15	Sep. 16	Oct. 31	75	Doe or fawn

2022 Hunter Satisfaction: 89% Satisfied, 8% Neutral, 3% Dissatisfied

2023Management Summary

1.) Hunting Season Evaluation: The Badwater Antelope herd has been above objective for over five years. However, in recent years the population has been declining mainly due to increased harvest and low recruitment. An extremely harsh winter in 2019-20 followed by extreme drought in 2020 and 2021 resulted in very poor survival for the 2019 and 2020 cohorts as evidenced by the historically low yearling buck:doe ratios of 5:100 and 10:100, respectively. This trend has continued with a yearling buck:doe ratio of 8:100 in 2022. Conversely, recruitment increased in 2022 with a fawn:doe ratio of 61:100 compared to 40:100 in 2021. While the population model indicates the population is stable or slightly increasing, harvest surveys indicate hunters are having a harder time harvesting an animal. Type 1 hunter success has decreased the last two years (86% & 85%, respectively) and both are significantly below the five year average of 98%. In addition, the number of days/harvest more than doubled in 2022 at 4.8 compared to 2.0 in 2021. Buck:doe ratios were also significantly lower in 2022 at 44 bucks:does compared to both 2021 and the five year average of 65 bucks:does. Given the lower success rate, increased days/harvest, and harsh winter conditions, we are decreasing the Type 1 license by 75 licenses and the Type 6 licenses by 25 licenses for the 2023 hunting season. With the potential for a slight decrease in harvest the model still shows our three year average harvest of preseason bucks will be at or near 25% and a proposed 23% for 2023.

2.) Population Modeling: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 3,884 (CL = 3,350 – 4,485) pronghorn. While the model shows a slight increase in population in 2023, that puts us over the 20% objective threshold, current winter conditions may have a bigger impact on this herd than anticipated in the model.

2022 - JCR Evaluation Form

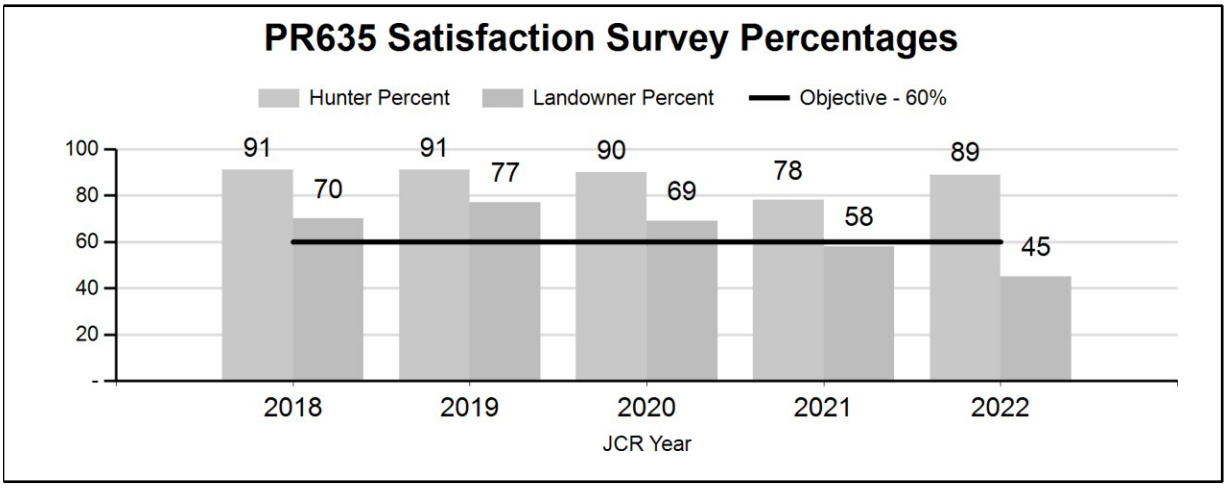
SPECIES: Pronghorn
HERD: PR635 - PROJECT
HUNT AREAS: 97, 117

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

PREPARED BY: ZACH GREGORY

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	89%	89%	94%
Landowner Satisfaction Percent	63%	45%	65%
Harvest:	453	239	185
Hunters:	443	247	200
Hunter Success:	102%	97%	92%
Active Licenses:	529	280	175
Active License Success:	86%	85%	106%
Recreation Days:	1,713	920	575
Days Per Animal:	3.8	3.8	3.1
Males per 100 Females:	43	14	
Juveniles per 100 Females	42	49	

Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	7%
Number of years population has been + or - objective in recent trend:	2



2023 Hunting Seasons
Project Antelope (PR635)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
97, 117	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	100	Any antelope
97, 117	2			Aug. 15	Oct. 31	25	Any antelope valid in Area 97 south of U.S. Highway 26 or Wyoming Highway 134 and east of Eight Mile Road, and in all of Area 117
97, 117	6	Aug. 15	Sep. 15	Sep. 16	Oct. 31	25	Doe or fawn
97, 117	7			Aug. 15	Oct. 31	25	Doe or fawn valid in Area 97 south of U.S. Highway 26 or Wyoming Highway 134 and east of Eight Mile Road, and in all of Area 117

2022 Hunter Satisfaction: 89% Satisfied, 5% Neutral, 6% Dissatisfied
2022 Landowner Satisfaction: 45% Good # of Ant, 40% Too many Ant, 15% Too few Ant

2023 Management Summary

1.) Hunting Season Evaluation: This herd unit is managed based on a hunter/landowner satisfaction objective. Mixed landownership within the Wind River Reservation (WRR) precludes the collection of good demographic data and population modeling. The total number of antelope classified in 2022 is the lowest it's been in over 10 years and resulted in a fawn:doe ratio of 49:100 and a buck:doe ratio of 14:100. The satisfaction objective was set in 2013 and personnel have been collecting landowner satisfaction data since 2014. Since then, hunter satisfaction has remained around 90% annually. Landowner satisfaction has increased dramatically since 2015 when the vast majority of landowners contacted felt there were too many antelope in the area. To address this concern, license issuance increased each year from 2016 through 2019 to increase harvest pressure on antelope. The strategy appeared to work very well as landowner satisfaction began increasing in 2017 and rose above 60% in 2018. However, landowner satisfaction declined below 60% in 2022. Given 60% of landowners either felt there were too few or a good number of antelope and current winter conditions will likely decrease the population, a reduction in Type 1, 6, and 7 licenses by half is warranted for 2023. The Type 2 and 7 licenses are maintained to address damage concerns.

2022 - JCR Evaluation Form

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

HERD: PR636 - NORTH FERRIS

HUNT AREAS: 63
PREPARED BY: GREG HIATT

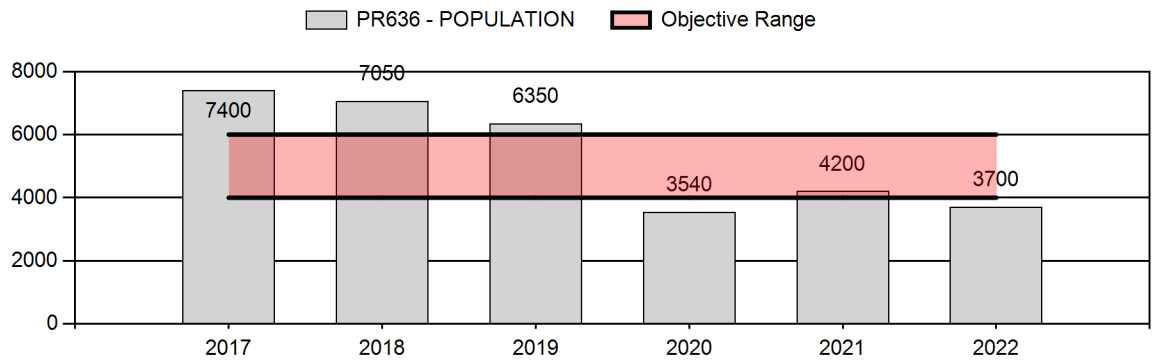
	2017 - 2021 Average	2022	2023 Proposed
Population:	5,708	3,700	2,400
Harvest:	570	285	150
Hunters:	636	349	190
Hunter Success:	90%	82%	79 %
Active Licenses:	700	349	190
Active License Success:	81%	82%	79 %
Recreation Days:	1,722	821	525
Days Per Animal:	3.0	2.9	3.5
Males per 100 Females	69	52	
Juveniles per 100 Females	64	68	

Population Objective (± 20%) :	5000 (4000 - 6000)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-26%
Number of years population has been + or - objective in recent trend:	3
Model Date:	02/17/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0.3%	0%
Males ≥ 1 year old:	22.8%	25%
Proposed change in post-season population:	5%	-25%

Population Size - Postseason



2023 Hunting Seasons
North Ferris Pronghorn (PR636)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
63	1	Aug. 15	Sep. 15	Sep. 16	Oct. 31	75	Any antelope
63	2	Aug. 15	Sep. 15	Sep. 16	Oct. 31	125	Any antelope valid east of the Buzzard Road (Natrona County Road 410-Carbon County Road 497)

2022 Hunter Satisfaction: 83% Satisfied, 12% Neutral, 5% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** This herd suffered heavy losses during the 2019-20 winter, but harvests were not reduced until 2021. Following heavy harvest in 2020, classification sample size declined significantly in 2021. Sample size declined again in 2022, yielding the 2nd smallest sample in over 40 years and less than half the sample collected in 2019. The 2021 harvest successfully reduced the buck:doe ratio to well within the recreational range, but at 52:100 was at its lowest level in 20 years. The adult buck:doe ratio was only 32:100, the poorest supply of adult bucks in this herd since 1988. Recruitment was good following the high fawn production in 2021, with the yearling buck:doe ratio increasing to 22:100. Fawn production remained at normal levels for this herd at 68:100.

Hunter success improved slightly in 2022, for both license types. Hunter effort declined to 2.9 days per animal, falling within the normal range for this herd. Sixteen percent of the buck harvest was checked in the field, and average horn length decreased slightly to 12.3 inches (Figure 1.). Only 11% of the bucks exceeded 14", compared to 8% in 2021 and 12% prior to the hard winter. The tallest buck checked was 14.9", the longest in three years but well below the 16.8" recorded from this area in 2019 before the hard winter. Overall, hunters in Area 63 in 2022 enjoyed slightly better opportunity to harvest a tall buck than they did in 2021 (Figure 2.) Their opportunity for taller bucks was comparable to what average hunters enjoyed statewide, except for a shortage of bucks 15 inches tall or taller (Figure 3.).

Hunter satisfaction increased, presumably a result of increased success and improved horn quality (Figure 4.). Hunter dissatisfaction declined to 5%, yet 6 of 7 hunter comments received complained about low numbers and poor quality of bucks.

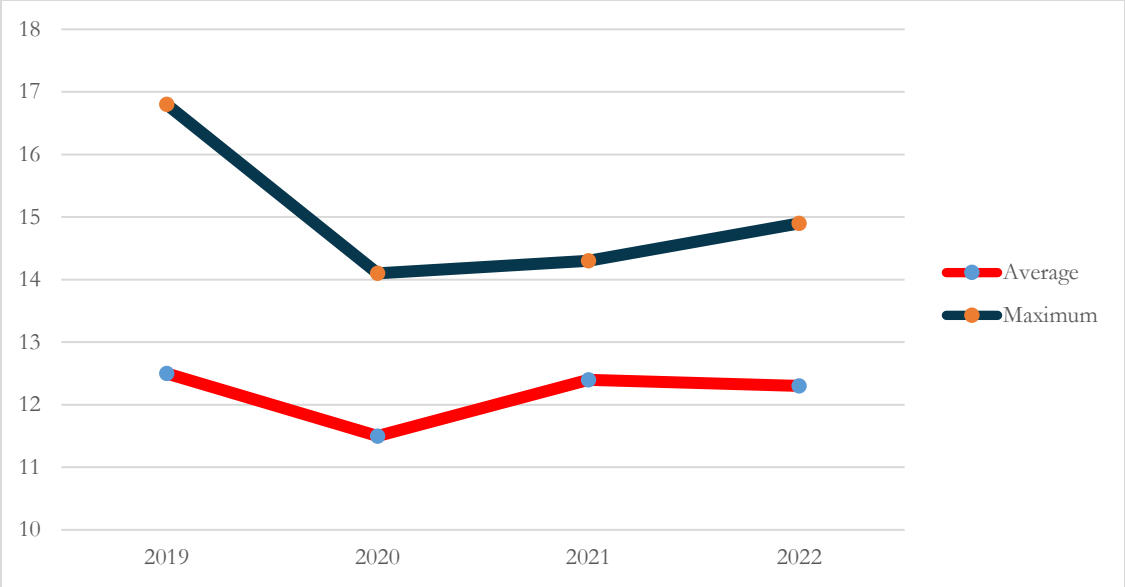


Figure 1. Average and maximum horn lengths of harvested bucks checked from the North Ferris Pronghorn Herd.

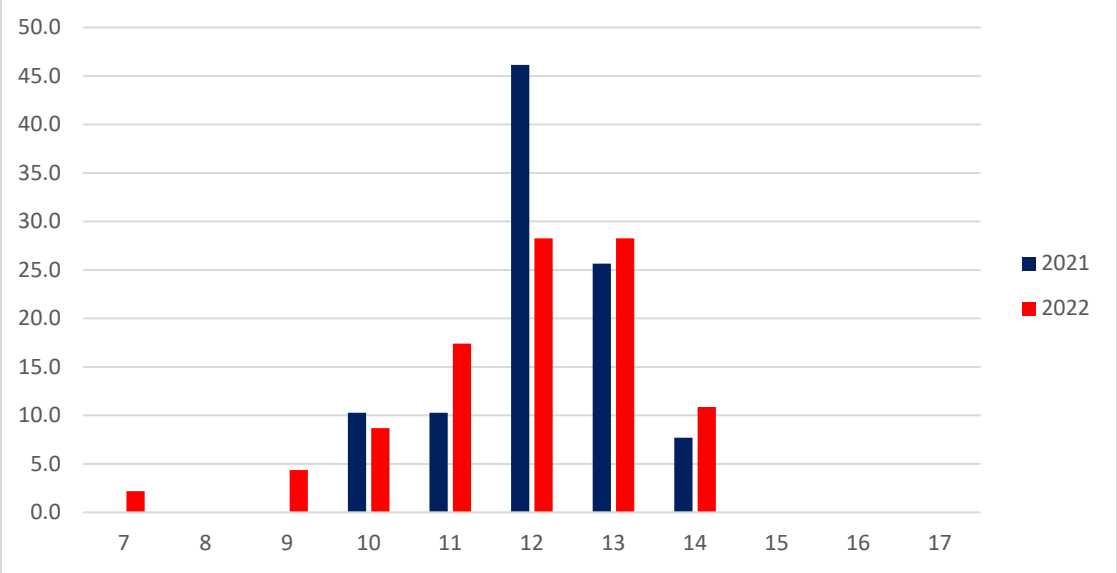


Figure 2. Horn lengths of harvested bucks checked from the North Ferris Pronghorn Herd in 2022 compared to 2021.

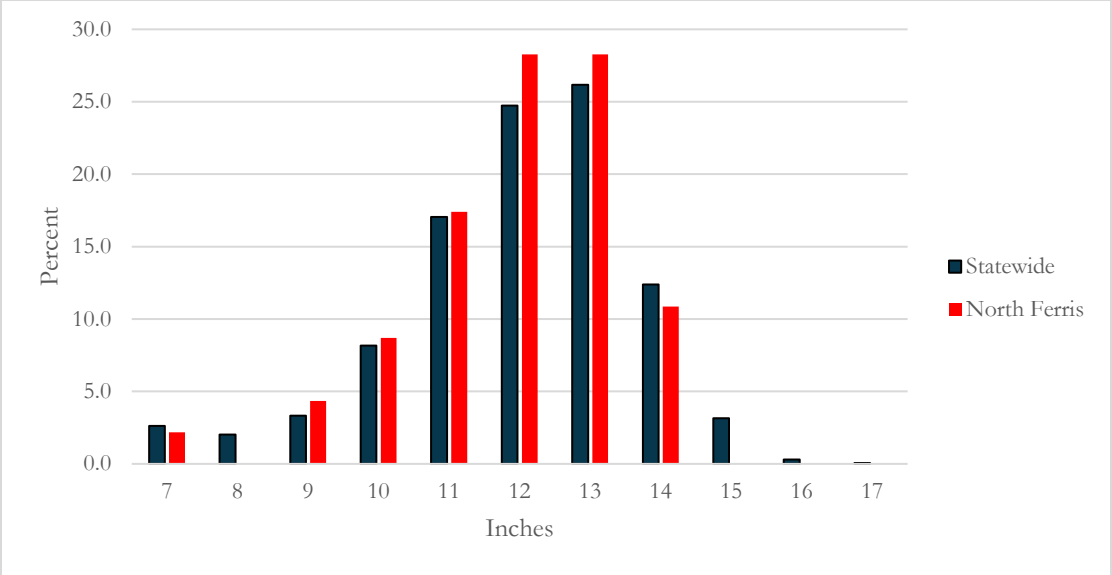


Figure 3. Horn length of harvested pronghorn bucks checked from the North Ferris Pronghorn Herd compared to statewide harvest checks in 2022.

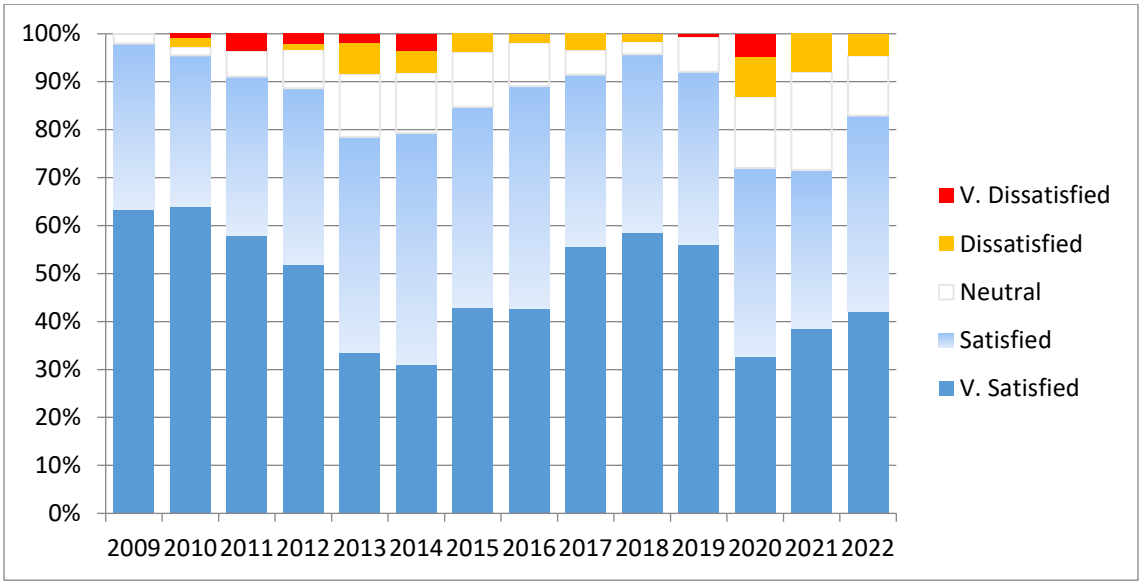


Figure 4. Hunter satisfaction and dissatisfaction in the North Ferris Pronghorn Herd.

Winter severity in 2022-23 was extreme, with sub-zero temperatures, high winds, and record snowfall producing deep crusted snow cover, yielding 100% coverage for major portions of the herd unit. Of 33 telemetered adult doe pronghorn alive in the neighboring Red Desert herd at the end of December 2022, 17 had died by mid-April. Five of these collared pronghorn migrated north into Area 68 immediately west of this herd and two of these were lost in early April. While severe winter conditions are presumed less harsh in the western and southeastern portions of Area 63, as in 2019-20 the central portion of the herd unit received the same deep, crusted, near-complete snow cover as herd units to the south.

Calculations based upon these telemetry losses estimate more than half the Red Desert herd was lost and similar losses are expected in the majority of the North Ferris herd. Based upon current losses in the Red Desert, the 2022 end-of-year size of the North Ferris herd is predicted to be ~1,850 pronghorn. The population would be less than half the number of animals estimated to be in this herd unit following the harsh winter of 2019-20. Roughly a third of these would be expected to be bucks by fall of 2023, around 600.

With the herd so far below objective, no doe harvest is warranted and no Type 6 or Type 7 licenses are issued. From 2020 through 2022, reported harvests averaged 17% of the bucks currently estimated to have been in this herd. With the herd roughly 25% below objective before the winter and expecting high losses during the 2022-23 winter, total license quotas are cut by almost 47%. Expected buck harvest from these quotas would be about 150 animals, 25% of the 600 bucks that are projected to be this herd pre-hunt 2023. A large proportion of the antelope in this area are on or behind private lands on Sand, Bear and Deweese Creeks and unavailable to most hunters. This harvest rate will increase harvest of bucks on publicly available lands above 25%, failing to satisfy hunter demands for higher quality bucks in this herd. Opening dates are shifted to retain a Saturday opener and align with neighboring areas in the Lander Region.

2.) **Population Modeling:** In 2021 WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 3,700 (3,000-4,300) pronghorn. A long term IPM failed to achieve adequate Rhat values and completely missed confidence intervals on two LT estimates and was not used. A similar truncated model with comparable Rhat values of fit and good alignment within the confidence interval for the most recent LT was selected. This model reliably predicts the drop in herd size due to the harsh 2018-19 and 2019-20 winters and subsequent recovery following two years of improved fawn production. The model predicts the herd was roughly 25% below objective at posthunt 2022, prior to losses this past winter. For comparison, an updated spreadsheet population model developed because IPMs were not yet available predicted a slightly larger 2022 postseason population of 4,300. A line transect survey scheduled for spring of 2023 should provide an updated estimate of herd size to evaluate losses this past winter and to help align modeling efforts.

2022 - JCR Evaluation Form

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

HERD: PR637 - SOUTH FERRIS

HUNT AREAS: 62
PREPARED BY: GREG HIATT

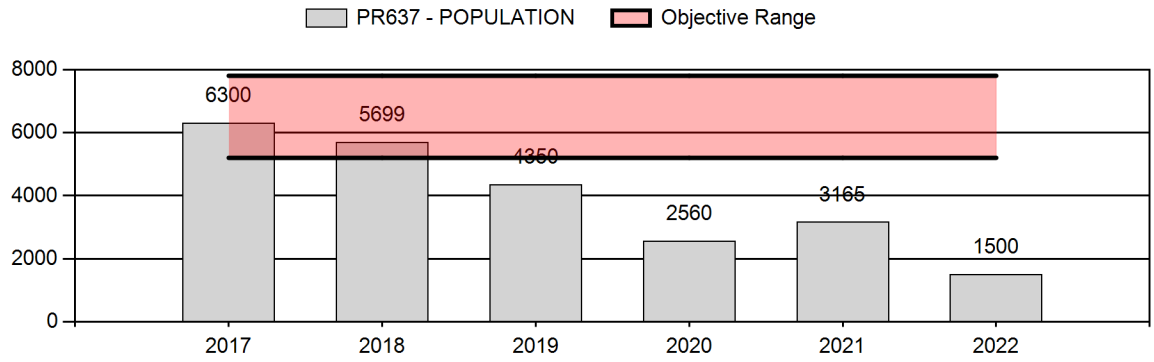
	2017 - 2021 Average	2022	2023 Proposed
Population:	4,415	1,500	950
Harvest:	145	89	20
Hunters:	159	100	25
Hunter Success:	91%	89%	80 %
Active Licenses:	174	100	25
Active License Success:	83%	89%	80 %
Recreation Days:	484	250	90
Days Per Animal:	3.3	2.8	4.5
Males per 100 Females	63	59	
Juveniles per 100 Females	32	57	

Population Objective (± 20%) :	6500 (5200 - 7800)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-76.9%
Number of years population has been + or - objective in recent trend:	4
Model Date:	02/17/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	7.5%	10%
Proposed change in post-season population:	1.7%	-37%

Population Size - Postseason



2023 Hunting Seasons
South Ferris Pronghorn (PR637)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
62	1	Aug. 15	Sep. 8	Sep. 9	Oct. 31	25	Any antelope

2021 Hunter Satisfaction: 89% Satisfied, 4% Neutral, 7% Dissatisfied

2022Management Summary

1.) Hunting Season Evaluation: The latest line transect survey flown in June 2019 and population modeling indicate this herd was still more than 75 percent below objective size at postseason 2022, a result of heavy losses during the 2018-19 and 2019-20 winters and several years of exceptionally poor fawn production (28:100 in 2019, 20:100 in 2020 and 27:100 in 2021). Fawn production improved in 2022, to 57:100, the highest in seven years. The buck:doe ratio declined in 2022 and returned to the recreational range at 59:100. Because of checker-boarded landownership, more than half of the hunt area is unavailable to almost all hunters and ratios collected from the herd as a whole do not represent what is available for harvest. In 2022, there were 51 adult bucks for every 100 does in the portion of the herd unit with greatly limited access while the publicly accessible portion had only 39:100. The yearling buck:doe ratio doubled in 2022 to 14:100, indicating high recruitment from the poor 2021 fawn crop.

Hunter success and effort improved in 2022, for both license types, suggesting pronghorn numbers in the herd had increased. With improved hunting conditions, hunter satisfaction rose to 89%, the highest in four years (Figure 1.). However, hunter dissatisfaction also increased slightly, to the 3rd highest level ever reported. Few hunters reported feeling "neutral" about their hunting experience, a response not seen since 2012. Two of five hunter comments received after the 2022 hunt complained of low numbers of antelope, and a third complained of poor buck quality.

Almost fifteen percent of the 2022 buck harvest was checked and measured in the field. Average horn length was 13.2", an inch longer than in 2021 (Figure 2.). Fifteen percent of the buck horns exceeded 14", whereas none did so in 2020, and 21% met or exceeded this length in 2019 before the 2nd hard winter. The longest horn checked was 15.2", the longest measured in four years. Overall, hunters in Area 62 in 2022 enjoyed better opportunity to harvest a tall buck than they did in 2021 (Figure 3.), or did average hunters statewide (Figure 4.).

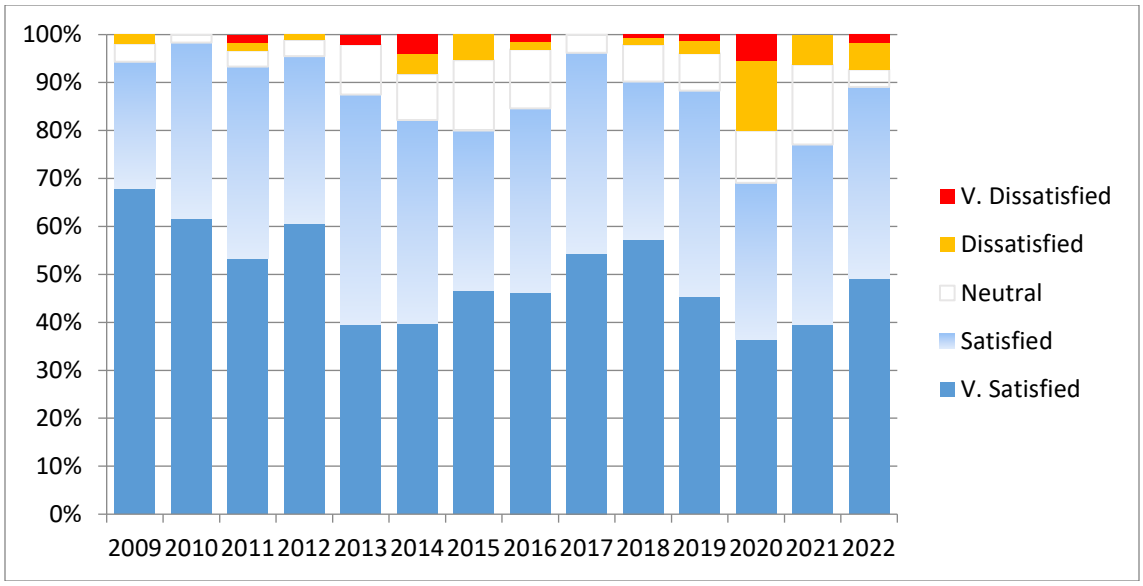


Figure 1. Hunter satisfaction and dissatisfaction in the South Ferris Pronghorn Herd.

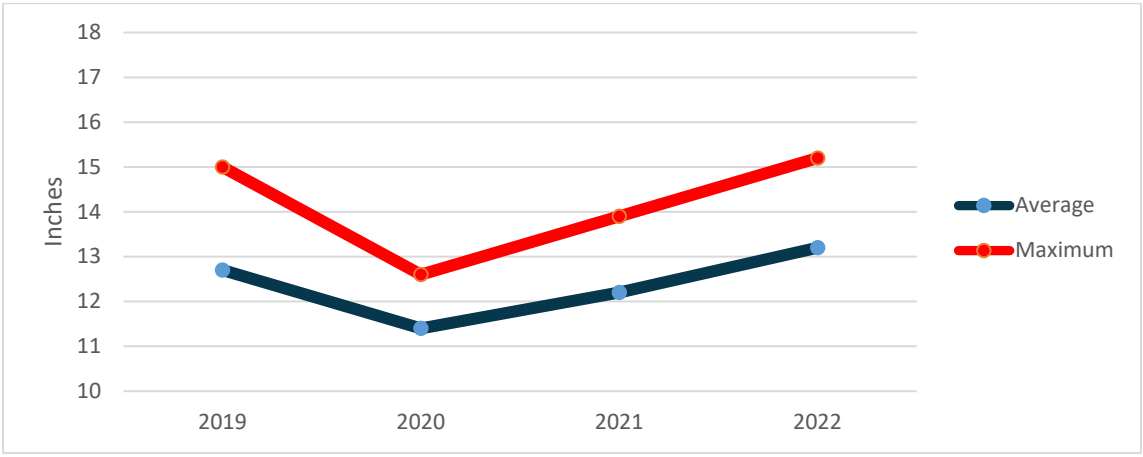


Figure 2. Average and maximum horn lengths of harvested bucks checked from the South Ferris Pronghorn Herd.

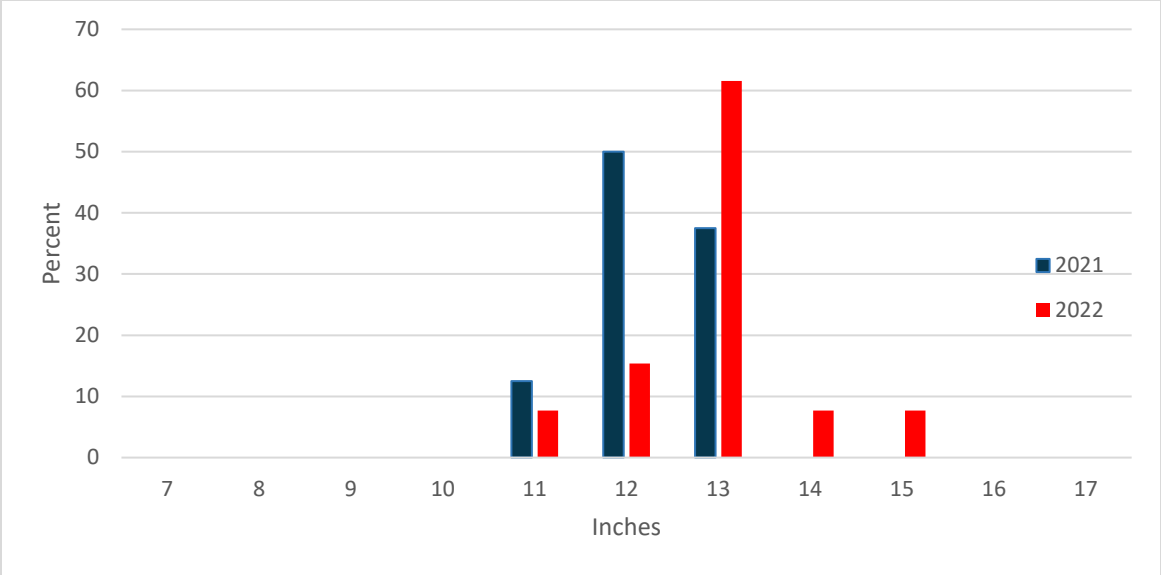


Figure 3. Horn length of harvested pronghorn bucks checked from the South Ferris Pronghorn Herd in 2022 compared to 2021.

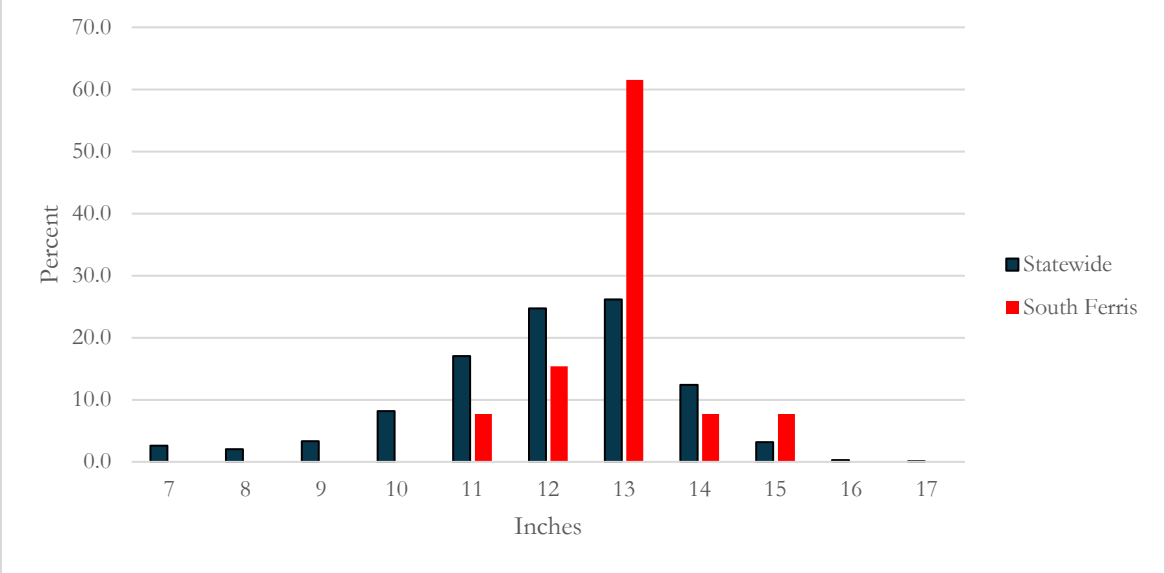


Figure 4. Horn length of harvested pronghorn bucks checked from the South Ferris Pronghorn Herd compared to statewide harvest checks in 2022.

Winter severity in 2022-23 was extreme, with sub-zero temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage. Thirty-three telemetered adult doe pronghorn were alive in the neighboring Red Desert herd at the end of December 2022. Movements recorded from these animals show the same extreme migrations reported in other severe winters, including three moving across US287 into this herd unit. During January through early April 2023, 17 of these 33 collared adult does died

(52%), including all three wintering in this herd unit. Calculations based upon the telemetry losses estimate more than half the Red Desert herd was lost and similar losses are expected in the South Ferris herd. Based upon these losses, the predicted end-of-year size of this herd would be only 700-800 pronghorn, less than half the size of the herd following two consecutive harsh winters in 2018-19 and 2019-20.

With the herd so far below objective, no doe harvest is warranted and no Type 6 licenses are proposed. From 2020 through 2022, reported harvests represented 12.7% of the bucks currently estimated to have been in this herd. With the herd already at least 75% below objective before the winter and projecting at least a 50% winter loss, total license quotas are cut by 75% to a minimum of 25, with an expected harvest of ~20 bucks. This would still represent almost 10% of the expected pre-hunt buck population. As usual, the majority of the bucks in the population will be unavailable to most hunters because of the checker-boarded land ownership and a lack of access. Within the portion of the area that has been available to hunters in past years, the large Stone Ranch has been enrolled in the Department's HMA program, providing access to some hunters but further curtailing the proportion of the buck population that most hunters can access.

For the past 11 years buck harvest has been separated between the Type 1 licenses and Type 2 licenses valid only in the eastern part of the hunt area, directing hunting pressure to a portion of the area which has difficult access and typically has a greater supply of bucks. With the significant reduction in license quota due to severe losses this winter and the herd being so far below objective prior to the winter, this Type 2 license is not needed in 2023. Extremely low yearling buck:doe and fawn:doe ratios observed in recent years indicate that it will be several years before recruitment can replace any bucks that are harvested, and the current supply of bucks needs to last longer than normal. Harvests need to remain extremely conservative until herd size and productivity reach more normal levels. A portion of this herd received supplemental predator control beginning in 2022 in an effort to improve fawn survival and this coyote control will continue in 2023.

2.) **Population Modeling:** In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 1,500 (500-2,500) pronghorn. Long term IPMs failed to achieve Rhat values adequate to place much confidence in their predictions, and greatly overestimated population size at the time of the most recent LT survey and were not used. While still failing to achieve desired Rhat values, a truncated short-term IPM aligned well with observed buck:doe ratios and the most recent LT estimate was selected. This model showed continued decline in herd size due to poor fawn production. According to this model, the 57:100 fawn production in 2022 stabilized the herd, but did not produce an increase in herd size. This model predicts a herd size more than 75% below objective at postseason 2022, prior to the severe winter. For comparison, an updated spreadsheet population model developed because IPMs were not yet available indicated a slight increase in herd size in 2022 and predicted a larger 2022 postseason population of 2,600, but was still 60% below objective.

2022 - JCR Evaluation Form

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

HERD: MD642 - DUBOIS

HUNT AREAS: 128, 148
PREPARED BY: ZACH GREGORY

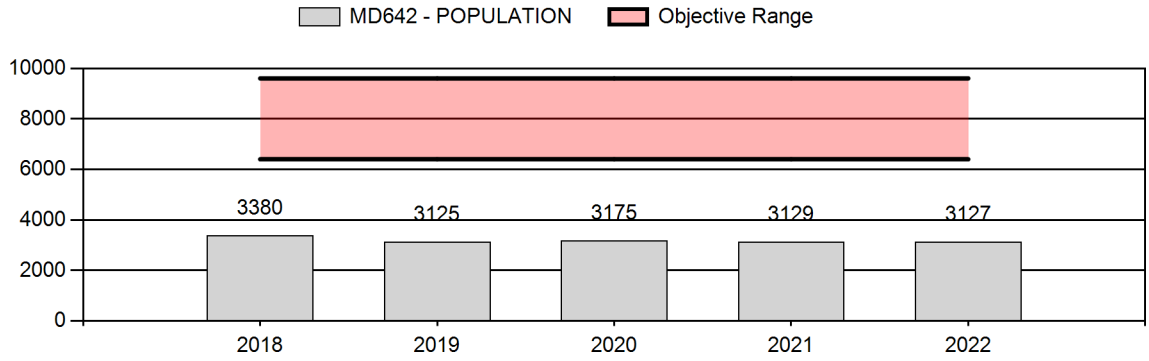
	2017 - 2021 Average	2022	2023 Proposed
Population:	3,260	3,127	3,350
Harvest:	362	248	325
Hunters:	1,082	977	1,015
Hunter Success:	33%	25%	32%
Active Licenses:	1,095	995	985
Active License Success:	33%	25%	33%
Recreation Days:	5,894	5,622	5,250
Days Per Animal:	16.3	22.7	16.2
Males per 100 Females	26	31	
Juveniles per 100 Females	54	51	

Population Objective (± 20%) :	8000 (6400 - 9600)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-60.9%
Number of years population has been + or - objective in recent trend:	12
Model Date:	02/23/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	2%	2%
Males ≥ 1 year old:	32%	45%
Proposed change in post-season population:	3%	3%

Population Size - Postseason



2023 Hunting Seasons
Dubois Mule Deer
(MD642)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
128	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 15		Antlered mule deer or any white-tailed deer
128	1	Sep. 1	Sep. 30	Nov. 1	Nov. 20	50	Any deer
128	3	Sep. 1	Sep. 30	Nov. 1	Nov. 30	50	Any white-tailed deer
128	7	Sep. 1	Sep. 30	Nov. 1	Nov. 20	50	Doe or fawn valid on private land
128	8	Sep. 1	Sep. 30	Oct. 1	Oct. 31	50	Doe or fawn white-tailed deer
	8			Nov. 1	Nov. 20		Unused Type 8 licenses valid on private land
148	Gen	Sep. 1	Sep. 14	Sep. 15	Oct. 25		Antlered mule deer or any white-tailed deer

2023 Region L nonresident quota: 225

2022 Hunter Satisfaction: 46% Satisfied, 25% Neutral, 28% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: This herd has been below objective and slowly declining for over a decade. However, it has been remarkably stable since 2018 with a five year average population of 3,260 and 3,127 in 2022. Herd demographics also indicate the population is relatively stable over the past five years with the exception of a decrease in fawn production in 2022 (51:100) compared to 2021 (71:100). That being said, the 2022 fawn ratio is well within the historic range and similar to the five year average of 54:100. The buck:doe ratio in the herd unit has been extraordinarily stable and is typically in the mid-20's:100. In 2022 the buck:doe ratio was 31:100 which is slightly higher than the five year average of 27:100 and well within the historical range of variation for this herd. The yearling buck:doe ratio was 10:100 and marginally higher than the five year average (8:100), indicating average to above average fawn survival. Harvest and hunter success decreased significantly in 2022 compared to 2021 and correspondingly the days/harvest almost doubled. Over the last decade hunter success and satisfaction has varied significantly and is most likely correlated with weather conditions, particularly snowfall during the hunting season. The 2022 hunting season was warm with little to no snowfall. The 2023 mule deer hunting seasons in both areas 128 and 148 will remain unchanged from the 2022 seasons with the exception of decreasing the Type 1 licenses by 25.

The structure of the general season is strictly intended to direct harvest towards the male segment of this herd as well as any white-tailed deer, both of which have no impact on recruitment, survival, nor the overall population. Furthermore, the management strategy is recreational and the postseason buck:doe ratio in 2022 (31:100) has exceeded the maximum recommendation of 29:100, while the five year average (27:100) is well within the recreational parameter limits (20-29:100). Other mule deer herds in non-resident region L are experiencing harsher than normal winter conditions which will affect the hunt areas in which nonresidents choose to hunt. To prevent an uneven distribution of nonresident hunters in the region, the Region L quota was decreased to 225 licenses.

In 2019 Type 8 licenses were included in hunt area 128 to allow increased harvest of white-tailed does. In 2021, the season dates for these licenses were extended on private land to encourage hunters to harvest white-tailed deer west of Dubois along the Wind River. Hunters with these licenses had a success rate of 28% in 2022, down from 43% in 2021 and 56% in 2020. The Type 3 licenses saw a slight increase in success at 63% compared to 58% in 2021. Overall, Type 3 hunter success has decreased since 2013.

In 2022, Type 1 licenses were increased to allow more opportunity for this highly sought after late- season mule deer hunt. Based on personnel observations and many hunter comments, this increase resulted in hunter crowding and complaints. As a result, Type 1 licenses were reduced by 25 for the 2023 hunting season.

2.) Chronic Wasting Disease Monitoring and Management: This is a Tier 2 surveillance herd that is scheduled for priority sampling in 2023. Past opportunistic sampling indicates CWD prevalence in the herd is extremely low.

3.) As part of a cooperative study with the University of Wyoming 48 adult, doe mule deer were outfitted with GPS collars between March, 2016 and March, 2017. The last of these collars were retrieved in April, 2019. The collar data has been used to document migration routes and timing for deer in the herd. Data from the collars was summarized in a report completed March, 2021.

4.) In 2019, funding was acquired to conduct an assessment of U.S. Highway 26 where it runs through the upper Wind River Valley to determine if modifications can be made to decrease the number of deer/vehicle collisions. Mule deer mortality along the highway has been a persistent problem for decades as the highway parallels the herd's spring/fall migration route and bisects the densely populated winter range. The highway assessment was completed in 2021 with the publication of a mitigation strategy document.

5.) Population Modeling: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 3,127 (CL = 2,789-3,506) mule deer. While this abundance estimate is much lower than previous years and models, this particular model shows a very good fit compared to other models with much tighter confidence intervals. Future abundance estimates, such as a sightability survey, would greatly improve the power of the model.

2022 - JCR Evaluation Form

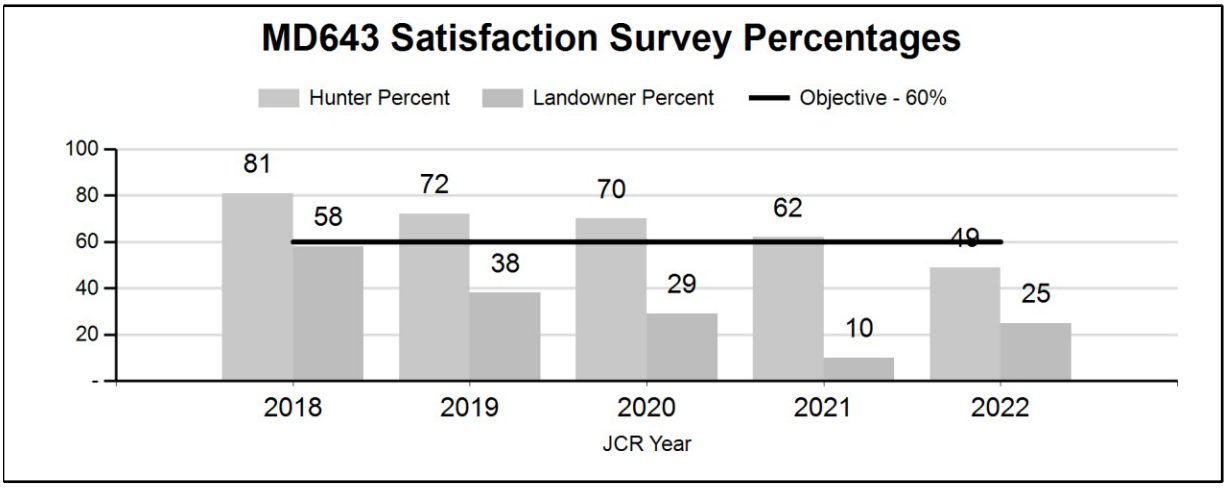
SPECIES: Mule Deer
HERD: MD643 - PROJECT
HUNT AREAS: 157, 170-171

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

PREPARED BY: ZACH GREGORY

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	74%	49%	60%
Landowner Satisfaction Percent	34%	25%	60%
Harvest:	365	149	125
Hunters:	577	438	275
Hunter Success:	63%	34%	45%
Active Licenses:	643	498	285
Active License Success:	57%	30%	44%
Recreation Days:	2,288	1,664	1,250
Days Per Animal:	6.3	11.2	10
Males per 100 Females:	24	18	
Juveniles per 100 Females	52	57	

Satisfaction Based Objective	60%
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	-23%
Number of years population has been + or - objective in recent trend:	4



2023 Hunting Seasons
Project Mule Deer (MD643)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
157	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	100	Any deer
157	3	Sep. 1	Sep. 30	Nov. 1	Nov. 30	100	Any white-tailed deer
157	6	Sep. 1	Sep. 30	Oct. 1	Nov. 10	25	Doe or fawn
157	8	Sep. 1	Sep. 30	Oct. 1	Oct. 31	250	Doe or fawn white-tailed deer
157	8			Nov. 1	Nov. 30		Doe or fawn white-tailed deer valid on private land
171	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 31		Any deer
171	3	Sep. 1	Sep. 30	Oct. 1	Nov. 30	100	Any white-tailed deer
171	6	Sep. 1	Sep. 30	Oct. 1	Nov. 30	250	Doe or fawn

2023 Region L nonresident quota: 225 licenses

2022 Hunter Satisfaction: 35% Satisfied, 14% Neutral, 51% Dissatisfied
2022 Landowner Satisfaction: 25% Good # of MD, 0% Too many MD, 75% Too few MD

2023 Management Summary

1.) Hunting Season Evaluation: This herd unit is managed based on a hunter/landowner satisfaction objective. Mixed landownership within the Wind River Reservation (WRR) precludes the collection of good demographic data and population modeling. The satisfaction objective was set in 2013 and personnel have been collecting landowner satisfaction data since 2014. Since 2014, hunter satisfaction has consistently been above the objective 60% threshold; however, it has decreased each of the last 4 years from 81% in 2018 to an understandably low of 35% in 2022. The decline in hunter satisfaction has coincided with a decline in deer numbers based on personnel observations, hunter/landowner comments, and harvest statistics. In 2020, 47% of landowners surveyed responded they thought mule deer numbers were too low. In contrast, 75% of landowners in 2022 that responded felt there were too few mule deer.

While recognizing the dissatisfaction from both hunters and landowners, there is also the need for continued harvest to maintain the current low density of deer in an attempt to address extraordinarily high CWD prevalence. Given, current low deer densities, and mortality due to CWD, reduced license issuance is warranted to maintain this herd at current levels. Area 157 Type 1 licenses will

be reduced by 200, 157 Type 3 licenses will be reduced by 100, 157 Type 6 licenses will be reduced by 175, and 157 Type 8 licenses will be reduced by 100. This level of harvest pressure, in concert with disease caused mortality, will likely limit population growth and maintain current low densities. Given the dramatic decline in deer numbers in this herd, managers believe it is prudent to attempt unprecedented season constructs to best attempt to decrease the high level of CWD present.

Other mule deer herds in the region are experiencing harsher than normal winter conditions which will affect the hunt areas in which nonresidents choose to hunt. To prevent an uneven distribution of nonresident hunters in the region the Region L quota was decreased to 225 licenses.

In 2019 the Department initiated focused CWD sampling in this herd unit, as well as mandatory CWD sampling in 2022. While prevalence data is still preliminary for the herd unit, sampling from 2020-2022 indicates CWD prevalence in hunt area 157 is 72% in adult male mule deer sampled. The impact of such a high rate of prevalence on the population is unknown but it is certainly likely CWD is a contributing factor in the population decline over the past 3 years.

While most landowners now believe mule deer numbers are too low, their opinion about white-tailed deer has also shifted. 79% of landowners surveyed, indicated white-tailed deer numbers are either at a good level or are too low. This is a significant increase compared to 42% in 2022. Given the declining trajectory of deer (both mule deer and white-tailed deer) in this herd unit in concert with hunter success, comments, and the landowner's shift in satisfaction, reductions in white-tailed deer licenses in area 157 for the 2023 hunting season are also warranted.

2.) Chronic Wasting Disease Management: This is a Tier 2 surveillance herd. The herd was prioritized for CWD sampling beginning in 2019 and continued through 2022 with mandatory sampling initiated in 2022. From 2020-2022, there have been 300 mule deer samples collected including 144 adult male, 20 yearling male, and 136 adult female with a prevalence rate of 67%, 30%, and 31% respectively (Fig.1). White-tailed deer were also sampled (Fig.2), indicating a lower prevalence rate than mule deer.

	2020				**2021**		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M MD	46	32	69.6%	Ad M MD	44	33	75.0%
Yrlg M MD	4	2	50.0%	Yrlg M MD	5	1	20.0%
Ad F MD	39	10	25.6%	Ad F MD	39	10	25.6%

	2022				3 Year Prevalence		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M MD	54	32	59.3%	Ad M MD	144	97	67.4%
Yrlg M MD	11	3	27.3%	Yrlg M MD	20	6	30.0%
Ad F MD	58	22	37.9%	Ad F MD	136	42	30.9%

Fig. 1 Results from CWD Tier 2 surveillance effort in the Project Mule Deer Herd 2020-2022.

	2020				2021		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M WTD	56	14	25.0%	Ad M WTD	46	12	26.1%
Ad F WTD	36	8	22.2%	Ad F WTD	40	7	17.5%
Yrlg M WTD	6	0	0.0%	Yrlg M WTD	8	0	0.0%

	2022				3 Year Prevalence		
Species	Tested	# Pos	Prevalence	Species	Tested	# Pos	Prevalence
Ad M WTD	108	37	34.3%	Ad MWTD	210	63	30.0%
Ad F WTD	97	23	23.7%	Ad F WTD	173	38	22.0%
Yrlg M WTD	12	1	8.3%	Yrlg M WTD	26	1	3.8%

Fig. 2 CWD test results from White-tailed deer in hunt areas 157 & 171.

In early 2023 WGFD, in collaboration with the University of Wyoming, U.S. Geological Survey, and the Eastern Shoshone & Northern Arapaho Tribal Fish and Game Department, implemented a two year CWD project in the Project Mule Deer herd. This project is multi-faceted and will help better understand CWD transmission and provide a more targeted management approach. Forty mule deer (30 does and 10 bucks) were collared in February, 2023 to gather data on movement, survival, and habitat selection. A sightability survey was conducted in March 2023. Personnel flew a total of 65 hours sampling 389 randomly selected subunits (30% of the herd unit) and observed a total of 1,559 mule deer. This is the first time a comprehensive survey of this magnitude has been conducted as well as the first significant survey for this herd unit. This resulted in a population estimate of 5,957 (CL = 4,387 - 7,526) and contributed more knowledge to mule deer winter distribution for this herd. This data will help identify possible CWD hot spots that may be artificially concentrating deer thus increasing transmission and prevalence rates and provide a basis for comparisons in population change through time. Identifying these hotspots will allow WGFD and Tribal managers to target harvest pressure, mitigate transmission, and potentially lower CWD prevalence rates.

2022 - JCR Evaluation Form

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

HERD: MD644 - SOUTH WIND RIVER

HUNT AREAS: 92, 94, 160 | PREPARED BY: STAN HARTER

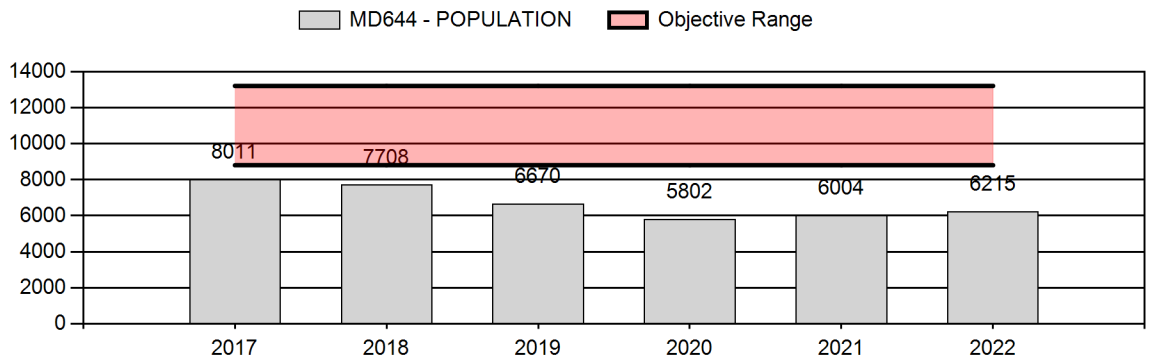
	2017 - 2021 Average	2022	2023 Proposed
Population:	6,839	6,215	5,726
Harvest:	391	301	300
Hunters:	1,176	868	850
Hunter Success:	33%	35%	35 %
Active Licenses:	1,181	868	850
Active License Success:	33%	35%	35 %
Recreation Days:	4,661	3,767	3,500
Days Per Animal:	11.9	12.5	11.7
Males per 100 Females	27	32	
Juveniles per 100 Females	71	73	

Population Objective (± 20%) :	11000 (8800 - 13200)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-43.5%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/26/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	1%
Males ≥ 1 year old:	22%	25%
Proposed change in post-season population:	+4%	-8%

Population Size - Postseason



2023 Hunting Seasons
South Wind River Mule Deer (MD644)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
92	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer
92, 94, 160	3	Sept. 1	Sept. 30	Oct. 1	Nov. 30	100	Any white-tailed deer
92, 94, 160	8	Sept. 1	Sept. 30	Oct. 1	Nov. 30	175	Doe or fawn white-tailed deer
94	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer
160	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer

2023 Region L Non-Resident Quota: 225

2022 Hunter Satisfaction: 42.1% Satisfied, 26.6% Neutral, 31.3% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: Declines have been noticed in each of the 3 hunt areas in the herd unit, with the most dramatic decrease being in hunt area 94. Due to an overall declining mule deer population and concerns about the overall number of hunters in the herd unit with respect to the number of available buck mule deer, the 2022 deer season again did not include a youth-only segment, and the "standard" general license season length remained at 6 days. These season length changes accompanied continued 3-point antler point restrictions (APR) for mule deer to reduce harvest. The Region L non-resident quota was 250 for the 2022 season. The 2022 season resulted in the lowest number of hunters since 1994. Total harvest increased slightly, but was the 3rd lowest since 1994.

With reduced harvest and increased fawn recruitment over the last 3 years, the desired increase in the total buck/doe ratio continued with a ratio of 32 total bucks/100 does, as the yearling buck/doe ratio increased slightly to 17YM/100F in 2022 and the adult buck/doe ratio remained at 15AM/100. The total of 518 bucks observed in classification surveys was the best since 2016. The total number of deer observed increased 27% over the 2021 sample, but the 2021 survey conducted with a 20% reduction of deer flight budgets compared with most surveys since 2004. The fawn/doe ratio was 73J/100F in 2022.

The 2020-2022 APR seasons reduced hunter numbers and mule deer buck harvest as desired. However, with the 2022 post-season and sightability survey abundance estimates and anticipated declines due to severe winter conditions leading to late-winter abundance being around 60% below objective, the 2023 season increases the number of antler points in the restriction from 3 to 4

(Antlered mule deer four (4) points or more on either antler or any white-tailed deer). This would place fewer bucks within the legal number of antler points and require extra hunter diligence to determine a legal buck, thus further limiting buck harvest. Although the buck/doe ratio in 2022 was above the "recreational" level for mule deer seasons, we are concerned that lifting the APR season structure would increase overall harvest that is unwarranted considering the population is 43.5% below objective and declining. In addition, the buck/doe ratio observed in Sweetwater mule deer was only 21M/100F and also facing dramatic fawn mortality this winter (and subsequently low yearling buck recruitment) indicating that APR seasons there remain warranted. We have maintained the same general license season structure in both herd units for over 20 years to avoid hunters moving from one herd unit to the other if one had more restricted seasons. If the population and concurrent number of available bucks remain well below objective, more restrictive hunting season options such as limited quota seasons need to be considered. The Region L non-resident quota is reduced to 225 for the 2023 season. No changes are being made to the Type 3 or Type 8 seasons for white-tailed deer.

Predation is one possible, if not probable, factor in low population growth and poor yearling buck recruitment in the face of good fawn/doe ratios through time. In an effort to help mule deer fawn survival over winter, the Department requested and received funds through the Animal Damage Management Board in July 2022 to pay for coyote removals. Although this project targeted winter ranges of the Sweetwater herd unit, Wildlife Services personnel planned to do extra work in the areas around Twin Creek, Beaver Creek, and Beaver Rim in hunt area 94 of the South Wind River mule deer herd unit. These control efforts are to be in addition to ongoing coyote control efforts paid for by area livestock producers. As of May 11, 2023, 107 coyotes had been removed in the Sweetwater project area, with about 75% of the allotted budget used.

2.) Mule Deer Initiative Habitat Information

Weather

Precipitation

Precipitation from October 2021 through September 2022 was above the 30-year average. Winter snows contributed the majority of the annual precipitation. Precipitation during the growing season (April-June 2022) was right at the 30-year average (Figure 1). Most of the growing season precipitation fell during May which was followed by a dry, hot summer with no measureable precipitation in June, less than average precipitation in July and August, and average precipitation in September. For the South Wind River Herd Unit, this information is based on 9 weather stations located throughout the herd unit and is generated from the PRISM (Parameter-elevation Relationships on Independent Slopes Model) dataset developed by Oregon State University.

Of particular note was the lack of precipitation received during the months of June-July when forbs and grasses need moisture for continued growth. Lack of summer precipitation led to early curing out of plants which are critical for lactating does when they need lush, nutritious forage available to raise their fawns.

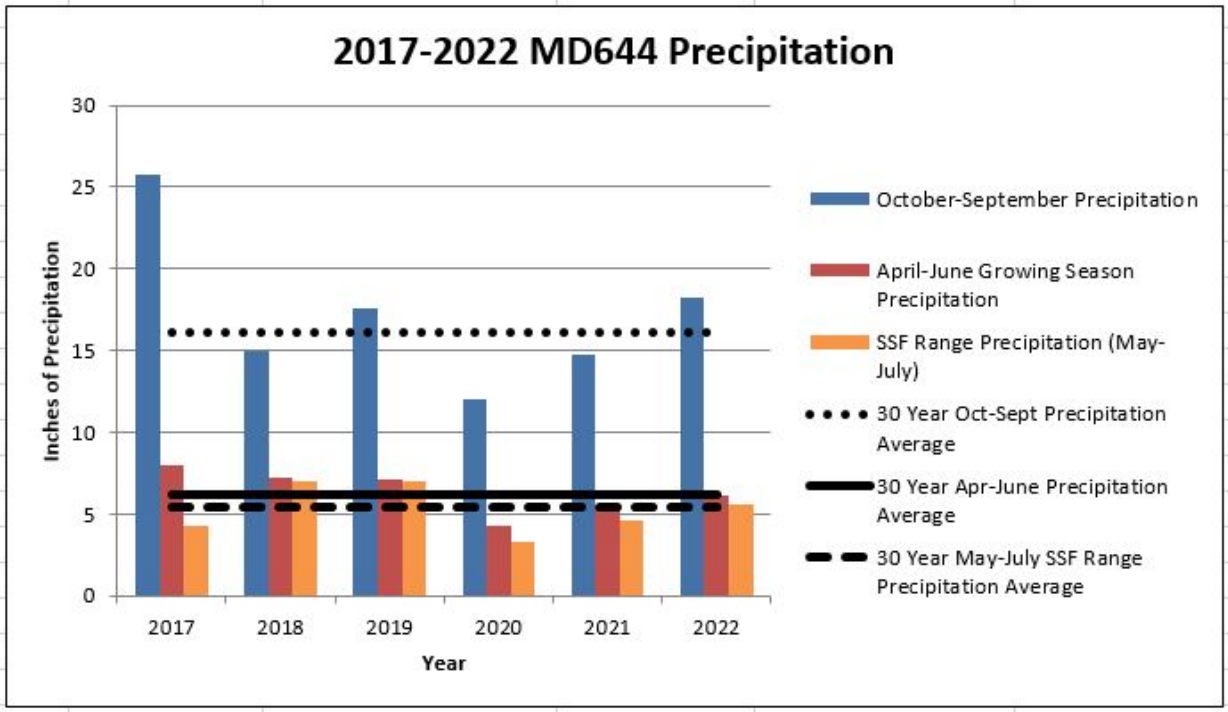


Figure 1. Annual precipitation levels compared to 30-year averages.

Winter Conditions

Winter 2022-2023 was among the harshest winters in recent memory for the Lander area with heavy snowfall and very cold temperatures. Temperature from November-February averaged 17.3 degrees Fahrenheit which was six degrees colder than the 30 year average for this time period in the Lander Area. A total of 107"of snowfall was recorded in Lander from November 1, 2022 through May 15, 2023, which included 36" in January, 2023 making it the snowiest January on record. The above average snowfall totals combined with below average temperatures for Lander and the surrounding foothills created nearly continuous snow conditions for most of the winter. This likely meant wildlife had to work harder to access forage to maintain body condition compared to the winters without continuous snow cover. Snowpack may benefit vegetation production during the coming growing season, depending on spring precipitation. Wildlife concentrated on south facing slopes where somewhat more open conditions were found.

Habitat

Precipitation across the herd unit was near the 30 year average, however timing of the precipitation was unusual compared to an average year. The June- September time period was characterized by markedly higher than normal temperatures and with almost no precipitation from June-August. Forbs and grasses capitalized on spring moisture and appeared to have normal growth, but shrubs may have suffered from the lack of summer moisture. Many springs, seeps, streams, and surface ponds have dried up in recent years, reducing riparian habitat vigor important to mule deer.

Significant Events

Habitat enhancements continued across the Herd Unit in 2022. It was the eighth year of aspen enhancement treatments (cut/ pile and lop/scatter) within the South Pass area. Sites treated were in Mill Creek, Twin Creek, and the Loop Road. A total of 243 acres of aspen were treated to remove encroaching conifers and improve aspen regeneration. This work was done and is ongoing as part of the WGFD's Mule Deer Initiative. The Shoshone NF, Rock Springs BLM, and WGFD collaborated to repair 4 miles of dilapidated USFS/BLM boundary fence that was allowing trespass cattle to access all of the treatment units in the Mill Creek-Pine Creek areas, causing significant damage to regenerating aspen and Beaver Dam Analogue structures. The repairs to this fence should help protect the investments made in the area the last few years. Since 2015, a total of 3,101 acres have been treated on South Pass in cooperation with USFS- Shoshone National Forest, BLM, and Wyoming State Forestry.

Beaver Dam Analogues (BDAs), and beaver relocation are becoming increasingly popular tools for use in habitat enhancement and restoration across Wyoming. The BDA's were maintained within the Mill Creek Watershed, and in concert with conifer removal should improve riparian condition and aspen vigor. Two nuisance beavers were live trapped in the Lander area and moved into a stream within the South Pass Aspen project vicinity.

The Popo Agie Weed Management Association initiated a Russian olive removal project in Squaw Creek, a tributary of the Popo Agie River, in an effort to improve riparian vegetation for mule deer. This project is on-going, and treatment occurred on approximately 5 acres in cooperation with 6 landowners along the length of Squaw Creek, positively benefitting approximated 292 acres of riparian habitat. This work will continue for the next 3-5 years, and may expand to include Baldwin Creek.

Rapid Habitat Assessments

In 2015, WGFD personnel initiated the Rapid Habitat Assessment (RHA) methodology to survey and assess important mule deer habitats. This method was developed to capture large-scale habitat quality metrics to better understand the condition of vegetation communities important to mule deer. RHAs provide a standardized habitat assessment conducted across the landscape. These assessments and resulting analyses are intended to provide a basis for mule deer population objective and other management decisions. They convey some insight into the habitat's long-term condition or carrying capacity.

From 2015-2022, 87 RHA's were conducted across the South Wind River Herd Unit. In 2022, 12 RHA's were conducted in the herd unit totaling 281 assessed acres. Of those acres, 85 acres were in aspen communities, 123 acres were in rangeland, 73 acres were in riparian corridors. While there were some areas of severe browse within both aspen and rangeland habitats, most of the aspen and shrub communities were in the moderate browse category. Due to plants curing out early in the summer due to hot dry temperatures, some species diversity was lower than expected, but most of the assessed acres had moderate to high species diversity. Riparian areas show impacts from erosion and bank trampling, but woody vegetation in the assessed riparian acres were in good condition and had moderate levels of recruitment.

Aspen communities across the herd unit, where habitat treatments or wildfires have not set back succession, exhibit mid to late seral stages with moderate age class diversity. High levels of browse on young aspen stems contributes to the lower recruitment. Browse within these stands is likely a combination of livestock and wildlife use. The species diversity within aspen communities is good across most of the herd unit, and is generally lowest in stands with higher levels of conifer encroachment which causes drying of the sites. Higher than normal summer temperatures likely contributes to livestock and wildlife sheltering longer in the cover of aspen stands, which increases browse on young aspen suckers, as well as on herbaceous understory plants.

Of the three rangeland RHA's conducted, two showed late seral shrub classification, which indicates older more decadent shrubs with decreased age-class diversity. This is often consistent with lack of disturbance such as fire. Many bitterbrush, sagebrush, serviceberry and other mixed mountain shrub species preferred by ungulates show a history of severe browse, contributing to clubbed and contorted growth forms. The last few years, tent caterpillars appeared to have serious impacts to bitterbrush and chokecherry communities. However in 2022, the number of caterpillars appeared to be much lower. Shrubs seemed to bounce back, and in areas where caterpillar numbers were very high previously, those shrubs had fewer caterpillars and very good leader growth. Herbaceous understory species diversity is generally good. In dry summers, like both 2021 and 2022, assessments conducted later in the season exhibit lower species diversity at least partially due to the senescence of cool season grasses and forbs.

Riparian habitats assessed in 2022 were generally in good condition. Assessments occurred in the vicinity of Dilabaugh Buttes, the Loop Road and the southern tip of the Wind River Mountains. A high level of species diversity was found in most of the assessed riparian areas, including many shrub and forb species beneficial to mule deer does during lactation. There were areas of increased erosion found where two-track roads cross riparian areas, or where heavily used livestock and wildlife crossings occur. Some areas showed severe herbaceous use, likely by livestock. Willow communities associated with the assessed streams were in good condition with recruitment occurring and browse levels generally low. Relict beaver activity is present along most of the stream corridors, and it would be good to see beavers return to these systems. The Lander Region recently acquired a beaver holding facility in order to increase the ability to trap and relocate beaver. Some of the streams assessed in 2022 may be good candidates for future releases.

3.) Chronic Wasting Disease Monitoring and Management. This is a Tier 1 surveillance herd and has been prioritized as a CWD focal herd beginning in 2023. From 2020-2022, 63 mule deer and 70 white-tailed deer were sampled, with CWD detected in 2 adult male mule deer, 5 adult male white-tailed deer, and 1 yearling male white-tailed deer. To date, no CWD management actions have occurred.

4.) POP R (IPM) Model Evaluation: In 2021, WGFD managers began using Pop R integrated population models (IPM) to estimate population indices for mule deer. The bio-year 2022 post-season abundance estimate was 6,215 mule deer (CL = 5,594 to 7,009). This is a 4% increase over the post-season 2021 estimate in POP R, and is 43.5% below objective (11,000). The post-season abundance estimates reflect observed trends and fluctuations appear accurate based on field observations in classification and harvest data. The pre-season fawn/doe ratio of 73J/100F

was a 10% decrease from the ratio observed in 2021. The total buck/doe ratio was 32M/100F for the second consecutive year. Winter conditions are likely to reduce fawn survival and subsequently lower yearling buck recruitment going into the 2023 hunting season.

A sightability survey was conducted in the South Wind River herd unit from February 7-12, 2023 with about 37 hours total flying time, surveying 174 randomly selected subunits. We observed 2,686 mule deer during the sightability survey, with mule deer found in only 74 of 174 subunits. Several locations had 20-30 mule deer per group and one had 110 mule deer. Considering the heavy snow depths throughout the survey area, most mule deer were concentrated in relatively high densities in reduced geographic areas with lower snow loads, and larger than normal groups when compared with the annual classification survey flown in early December 2022. Although the survey methods are quite different, the sightability survey had 20% fewer mule deer than were observed during the classification survey 2 months prior (3,318), when mule deer were more widely distributed across all winter ranges.

The mid-winter abundance estimate of 5,532 mule deer produced by the sightability survey conducted in February 2023 is 12% below the post-season estimate, which seems reasonable following major winter conditions that ensued in that time frame.

2022 - JCR Evaluation Form

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

HERD: MD646 - SWEETWATER

HUNT AREAS: 96-97
PREPARED BY: STAN HARTER

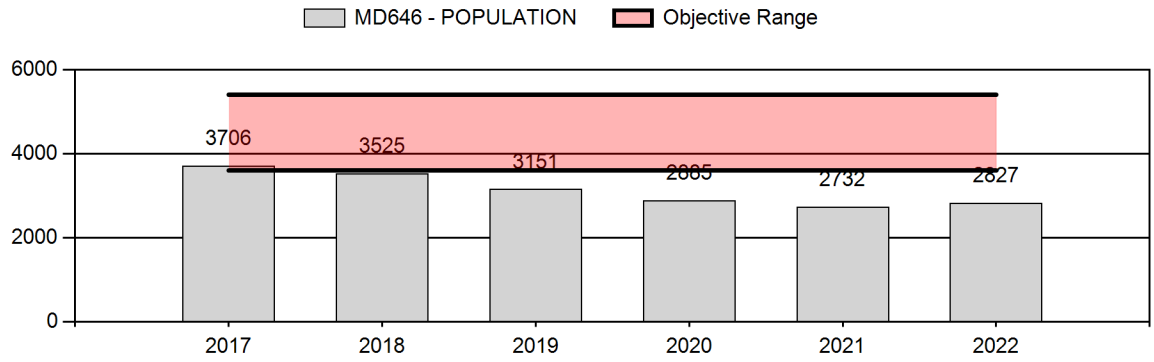
	2017 - 2021 Average	2022	2023 Proposed
Population:	3,200	2,827	2,868
Harvest:	285	201	200
Hunters:	719	582	575
Hunter Success:	40%	35%	35%
Active Licenses:	719	582	575
Active License Success:	40%	35%	35%
Recreation Days:	2,568	2,288	2,300
Days Per Animal:	9.0	11.4	11.5
Males per 100 Females	19	21	
Juveniles per 100 Females	75	83	

Population Objective (± 20%) :	4500 (3600 - 5400)
Management Strategy:	Recreational
Percent population is above (+) or below (-) objective:	-37.2%
Number of years population has been + or - objective in recent trend:	1
Model Date:	2/26/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	1%
Males ≥ 1 year old:	40%	41%
Proposed change in post-season population:	3%	1%

Population Size - Postseason



2023 Hunting Seasons
Sweetwater Mule Deer (MD646)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
96	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer
97	Gen	Sept. 1	Sept. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer
97	3	Sept. 1	Sept. 30	Oct. 15	Nov. 30	25	Any white-tailed deer
97	8	Sept. 1	Sept. 30	Oct. 15	Nov. 30	25	Doe or fawn white-tailed deer

2023 Region Q Non-Resident Quota: 75

2022 Hunter Satisfaction: 51.2% Satisfied, 19.6% Neutral, 29.2% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation. With favorable conditions on November 29, 2022, classification surveys were flown in hunt area 96, but winds increased too much to complete any aerial surveys in hunt area 97. Thus, a small portion of area 97 were done via ground surveys in December. These surveys resulted in observations of 1,280 mule deer. The 2022 post-season fawn/doe ratio of 83J/100F was above the long-term average of 73J/100F. The adult buck/doe ratio increased to 9AM/100F and the total buck/doe ratio reached 21M/100F for only the third time since 2013 and equaled the long-term average since 1994. Despite reduced buck harvest during the last 3 years of conservative hunting seasons with 3-point antler harvest restrictions, buck/doe ratios have not increased as expected, especially with generally good fawn/doe ratios which should lead to steady yearling buck recruitment and population growth, even in drought years.

Harvest increased 19% to 201 bucks (no does or fawns) in the 2022 hunting season. The Sweetwater mule deer herd unit remains 37.2 % below objective, with low buck/doe ratios. The last 3 hunting seasons did reduce mule deer buck harvest as desired, but buck/doe ratios remain at the minimum for “recreational” management, despite efforts to improve them.

The Sweetwater mule deer herd unit was chosen in 2022 as one of 5 “Focal” herds across Wyoming. To begin monitoring efforts in this herd, 210 mule deer were captured and outfitted with GPS transmitters in December 2022 (100 Fawns, 80 Does, and 30 Bucks). Captures were completed on December 16, after which winter conditions dramatically changed, with between 3 to 4 times the average snowfall in Jeffrey City and surrounding areas. As of May 15, 2023, 82 mortalities of marked mule deer have occurred, with deep snow conditions being a major contributing factor leading to starvation and predation losses. The latest mortality was detected on May 14, 2023. Mortality rates through May 15, 2023 are (60 of 100 fawns = 60%, 14 of 80 adult females = 17.5%, 8 of 30 bucks = 27%). Most of the collars retrieved so far have been found after scavengers have almost completely devoured and dismantled the carcass, with evidence of coyotes at most sites and mountain lion caching at 3 carcass sites. Although predation

is suspected on many of these, not enough evidence was present to definitively determine cause of death for most mortalities.

Predation is one possible, if not probable, factor in low population growth and poor yearling buck recruitment in the face of good fawn/doe ratios through time. In an effort to help this mule deer herd's fawn survival over winter, the Department requested and received funds through the Animal Damage Management Board in July 2022 to pay for coyote removals in the winter ranges of the Sweetwater herd unit, primarily in hunt area 97. These control efforts are to be in addition to ongoing coyote control efforts paid for by area livestock producers. As of May 11, 2023, 107 coyotes had been removed in the project area, with about 75% of the allotted budget used.

Changes made for the 2023 general license seasons in hunt areas 96 and 97 include increasing the number of antler points in the restriction from 3 to 4 (Antlered mule deer four (4) points or more on either antler or any white-tailed deer). This would place fewer bucks within the legal number of antler points and require extra hunter diligence to determine a legal buck, thus further limiting buck harvest. With the buck/doe ratio in the last 9 years being below or barely at the low end of the "recreational" level for mule deer seasons, we are concerned that lifting the APR season structure would negatively impact the buck portion of a population and the population as a whole, which is 37% below objective and likely declining. Also in response to low population level, low buck/doe ratios, and concerns about winter losses, the Region Q non-resident quota was reduced to 75 for the 2023 season. Lower hunter numbers as a result of APRs and fewer nonresidents should result in lower hunter harvest.

White-tailed deer are also being affected by the current winter, with numbers already lower than in previous years, with access almost entirely on private lands. For 2023, there will be 25 Type 3 licenses and 25 Type 8 licenses in area 97.

2.) Mule Deer Initiative Habitat Information

Weather

Precipitation

Precipitation from October 2021 through September 2022 was above the 30 year average. Winter snows usually contribute the majority of the annual precipitation, but the winter of 2021-22 was a very light snow year. In 2022, the majority of the precipitation fell in May, and over 5.5" of rain fell in August in the Sweetwater area. The growing season precipitation (April-June 2022) was slightly below the thirty year average, as was the high elevation SSF seasonal range average precipitation (May- July 2022) (Figure 1). Temperatures through the summer (June-September) were well above average. This precipitation information is generated from the PRISM (Parameter-elevation Relationships on Independent Slopes Model) dataset developed by Oregon State University. For the Sweetwater Herd Unit, precipitation information is based on 1 weather station located near Jeffrey City, WY.

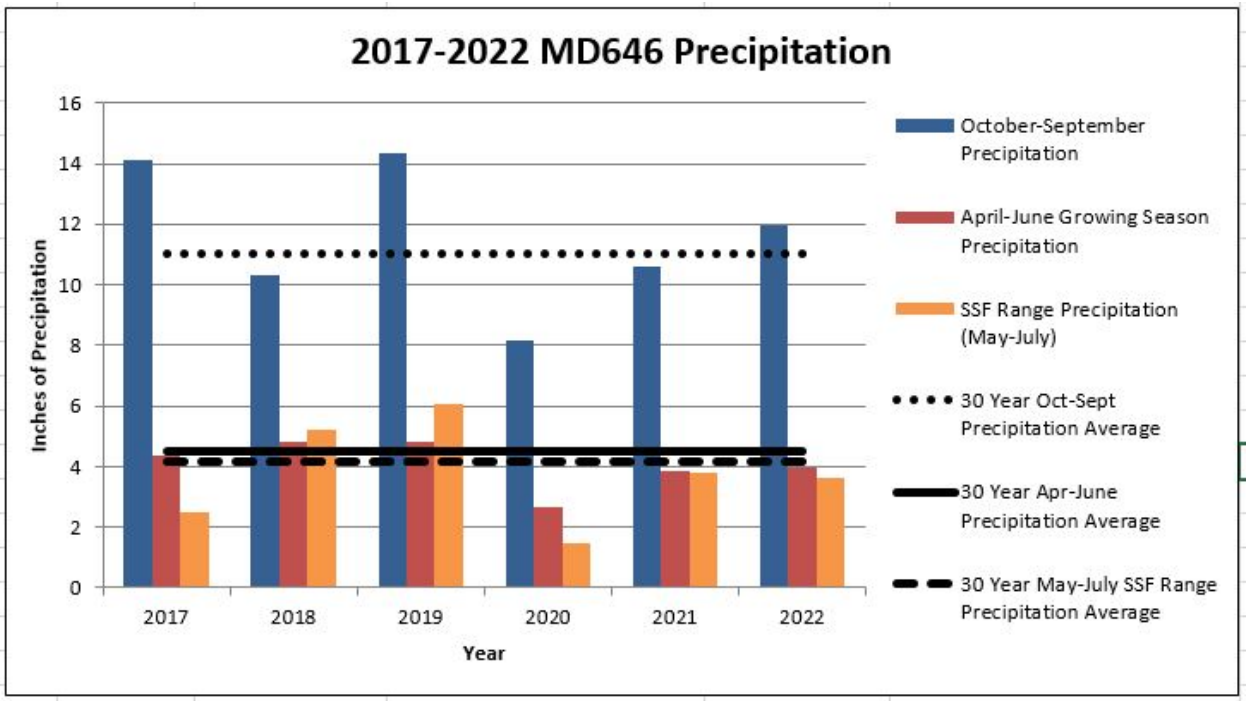


Figure 1. Annual precipitation levels compared to 30-year averages.

Winter Conditions

The 2022-2023 winter was characterized by well above normal snowfall, with January receiving the highest snowfall on record. Temperatures which were colder than normal, coupled with the heavy snow and high winds, created difficult conditions for wintering wildlife. A total of 59.2" of snowfall was recorded in Jeffrey City from September 1, 2022 through April 30, 2023, although December 2022 snowfall amounts were not recorded for the Jeffrey City weather station. Average temperatures were three degrees below normal for the November-February time period in the Jeffrey City area. As usual, high winds persisted across the herd unit.

Habitat

Growing season precipitation was slightly below average for the 2022 season, and the timing of the precipitation was unusual. Most of the annual precipitation came in August, after herbaceous forages had already cured out for the summer. Above normal temperatures and very low precipitation from June-August likely further decreased quality vegetation production. Several years of lower than normal precipitation amounts may be contributing to drying of springs, seeps, and streams in the Green Mountain and Sweetwater Rocks areas. These riparian habitats are important for mule deer and other wildlife in the area.

Significant Events

Habitat enhancements implemented within the Sweetwater Mule Deer Herd Unit were focused on projects to reduce conifer encroachment from priority habitats like aspen stands and riparian areas. A total of 581 acres of encroached limber pine, lodgepole pine, and juniper were mechanically removed from aspen and riparian habitats on Green Mountain, both on BLM and private lands.

Rapid Habitat Assessments

In 2015, WGFD personnel initiated the Rapid Habitat Assessment (RHA) methodology to survey and assess important mule deer habitats. This method was developed to capture large-scale habitat quality metrics to better understand the condition of vegetation communities important to mule deer. RHAs provide a standardized habitat assessment conducted across the landscape. These assessments and resulting analyses are intended to provide a basis for mule deer population objective and other management decisions. They convey some insight into the habitat's long-term condition or carrying capacity.

From 2015-2022, 136 RHA's were conducted across the herd unit, mostly in the vicinity of Green Mountain, which is an important area for wildlife. In 2022, 12 RHA's were conducted, in aspen, riparian, and rangeland habitats, across a varied area of the Herd Unit. These, as is consistent across the herd unit, showed late seral vegetation communities, with high browse levels on shrubs and aspen. Most of the RHA's showed relatively high species diversity. Invasive species appear to be less of a problem in the Sweetwater Herd Unit when compared to much of the rest of the Lander Region. Of the 2022 RHA's, 2 were aspen for 84 acres, 3 were riparian for 60 acres, and 7 were in rangeland/shrub habitats for 907 acres. The majority of these were exhibiting a downward trend based mostly on the late seral condition and continued severe browse levels. Feral horse populations in the Sweetwater Herd Unit likely contribute to the excessive use on many herbaceous and woody forage species.

Aspen communities in the Sweetwater Mule Deer Herd Unit are typically in very late seral condition, exhibiting high levels of drying due to conifer encroachment. This results in decreased sprouting of young aspen suckers, and those that do sprout are at increased risk of browse by livestock, feral horses and wildlife, mostly elk. Severe browse levels on aspen suckers is drastically reducing the number of trees surviving to grow above 6 feet tall and above browse height. Species diversity of understory herbaceous forage plants is also lower than in what would be a healthy aspen stand. The Green Mountain Aspen and Riparian Enhancement Project is working to address these concerns by conducting large scale conifer removal and treatment.

Rangeland and shrub habitats across the Sweetwater Herd Unit are generally in good condition with good species diversity and low levels of cheatgrass and other invasive species present. In 2022, the RHA's conducted in shrub communities showed relatively low grass and forb production, which would be expected in a low precipitation year. The best production of any shrub assessments was within the Hadsell prescribed burn which BLM conducted in April 2021 and again in 2022 on the south side of Green Mountain. These burns produced a good response from herbaceous forage that stayed green long after much of the surrounding landscape had begun to senesce. Additional burns within the Hadsell pasture are planned for 2023. This type of habitat action will be encouraged given the vegetation response.

Riparian areas assessed in 2022 were in relatively good condition. On the east end of Green Mountain, many streams are being re-colonized by beaver, and appear to be holding water later into the year, and are showing greater willow and herbaceous vigor. Encroached conifer removal from private lands along Willow Creek, combined with the presence of beaver should improve the habitat conditions for mule deer. One private landowner has committed to protecting a large section of Willow Creek from livestock and feral horses in order to encourage beaver expansion and give willow and birch communities a chance to recover.

3.) Chronic Wasting Disease Monitoring & Management: This is a Tier 1 focal surveillance herd that was prioritized with mandatory CWD sampling in 2021. From 2020-2022, CWD samples were collected from 246 male mule deer (236 adults, 10 yearlings) and 12 adult female mule deer (apparently harvested by youth hunters) using extra field personnel, as well as increased use of check stations. CWD was detected in nine adult male mule deer since 2020 (3.8%). In addition, 25 white-tailed deer were tested from 2020-2022 (14 adult males with 3 positive for CWD = 21.4% and 11 adult females with 1 positive = 9.1%). To date, no CWD management actions have occurred in this herd unit.

4.) POP R (IPM) Model Evaluation: In 2021, WGFD managers began using Pop R integrated population models (IPM) to estimate population indices for mule deer. The bio-year 2022 post-season abundance estimate was 2,827 mule deer (CL = 2,507 to 3,237). This is a 3% increase over the post-season 2021 estimate in POP R, and is 37.2 % below objective (4,500). The post-season abundance estimates reflect observed trends through the years and trend fluctuations appear accurate based on field observations in classification and harvest data. The pre-season fawn/doe ratio of 83J/100F was a 6% increase above the ratio observed in 2021. The total buck/doe ratio reached 21M/100F for only the third time since 2013 and equaled the long-term average since 1994.

2022 - JCR Evaluation Form

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

HERD: MD647 - FERRIS

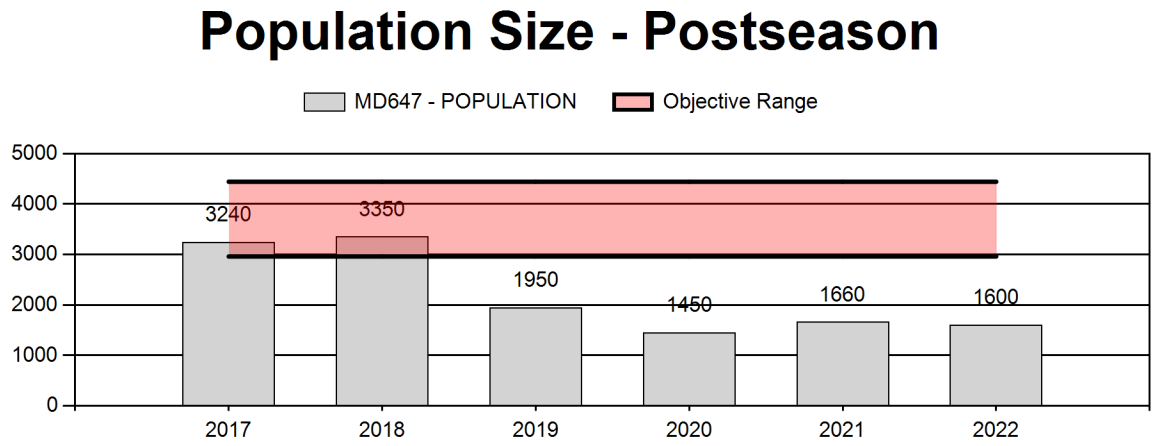
HUNT AREAS: 87
PREPARED BY: GREG HIATT

	2017 - 2021 Average	2022	2023 Proposed
Population:	2,330	1,600	1,000
Harvest:	95	50	40
Hunters:	118	65	50
Hunter Success:	81%	77%	80 %
Active Licenses:	118	65	50
Active License Success:	81%	77%	80 %
Recreation Days:	636	427	320
Days Per Animal:	6.7	8.5	8
Males per 100 Females	53	56	
Juveniles per 100 Females	80	80	

Population Objective (± 20%) :	3700 (2960 - 4440)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	-56.8%
Number of years population has been + or - objective in recent trend:	23
Model Date:	2/28/2023

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	0%
Males ≥ 1 year old:	13.8%	20%
Proposed change in post-season population:	15%	-37%



2023 Hunting Seasons
Ferris Mule Deer (MD647)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
87	1	Sep. 1	Sep. 30	Oct. 15	Oct. 31	**50**	Antlered mule deer or any white-tailed deer

2022 Hunter Satisfaction: 72% Satisfied, 14% Neutral, 14% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** Size of this herd increased in 2017 and 2018 following six years of low numbers, a result of improved precipitation, extensive habitat treatments and increased predator control. Losses during the severe 2018-19 and 2019-20 winters were significant, and were followed by marginal fawn production in 2020. Fawn production improved in 2021, and again in 2022, providing partial recovery from losses during those winters.

With this herd in special management, hunters expect better opportunities to see and harvest larger bucks than available in neighboring, general license, more productive herds. Hunter success dropped to 77% in 2022, the 2nd lowest in 8 years, and the average days hunted per deer harvested rose to the 2nd highest level in 34 years. Despite the lowered success and increased effort, hunter satisfaction remained essentially unchanged at 72%, but was still the 4th poorest in 14 years of records (Figure 1.). Hunter dissatisfaction also changed little and was again the 4th highest in 14 years. Three of the five hunter comments received expressed appreciation for maintaining hunting access, and none had complaints about deer numbers or buck quality.

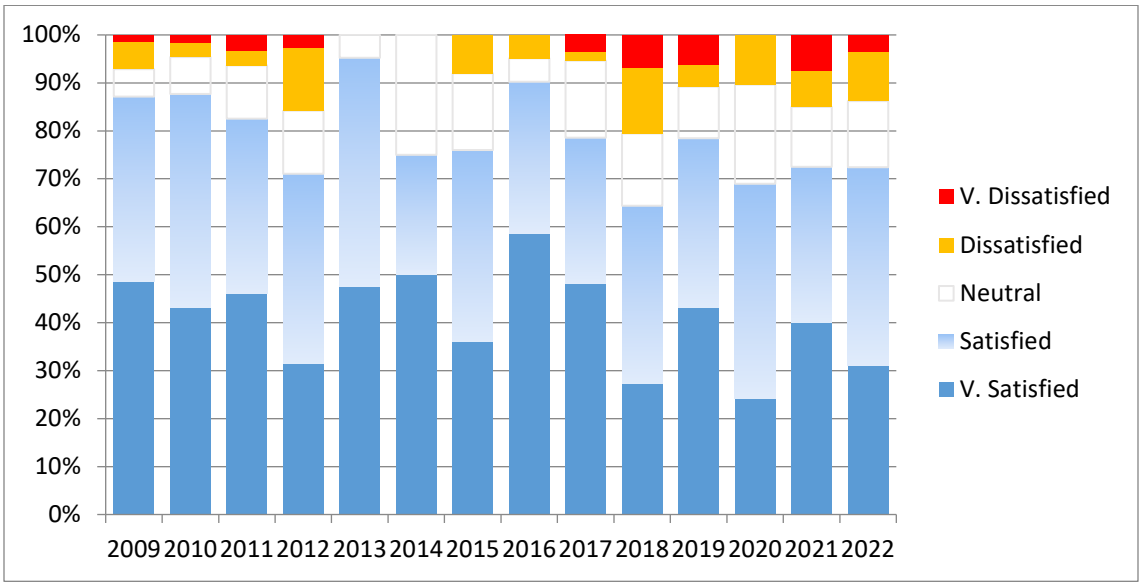


Figure 1. Hunter satisfaction and dissatisfaction for the Ferris Mule Deer Herd.

Antler measurements were collected on 26% of the reported harvest in 2022. Average antler spread remained stable at 23" in 2022 (Figure 2.). The maximum spread was 26", near the 4-year average. Only one buck checked in 2022 was Class 3, whereas 3 were in 2021, and none in 2019 or 2020. All other bucks checked from this area in 2022 were Class 2. These data suggest the herd was still recovering the older age classes following the 2018-19 and 2019-20 winters. As expected for a herd in 'special' management, Area 87 offered better hunting for wide, mature bucks than was available on the state-wide average (Figure3.).

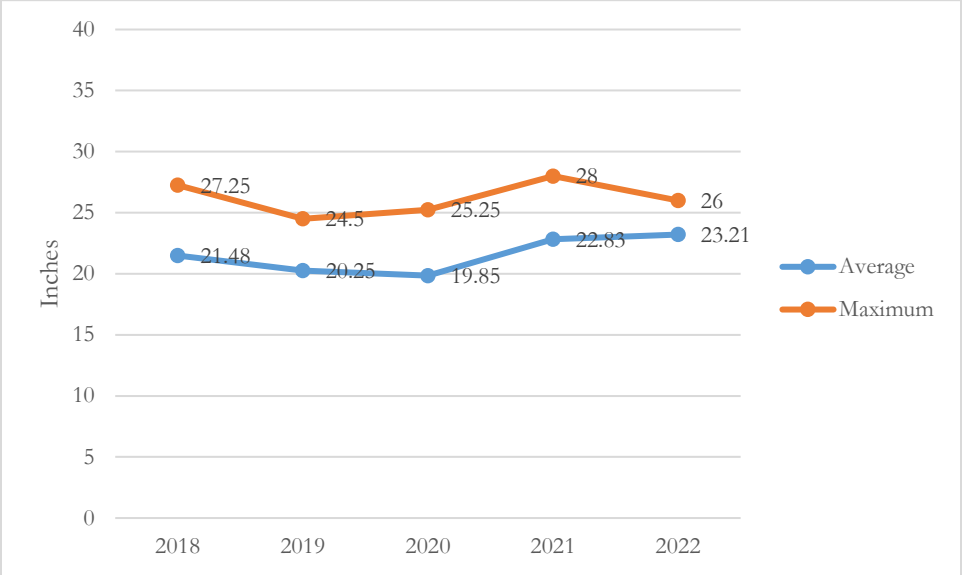


Figure 2. Average and maximum antler spread of harvested mule deer checked from the Ferris Mule Deer Herd.

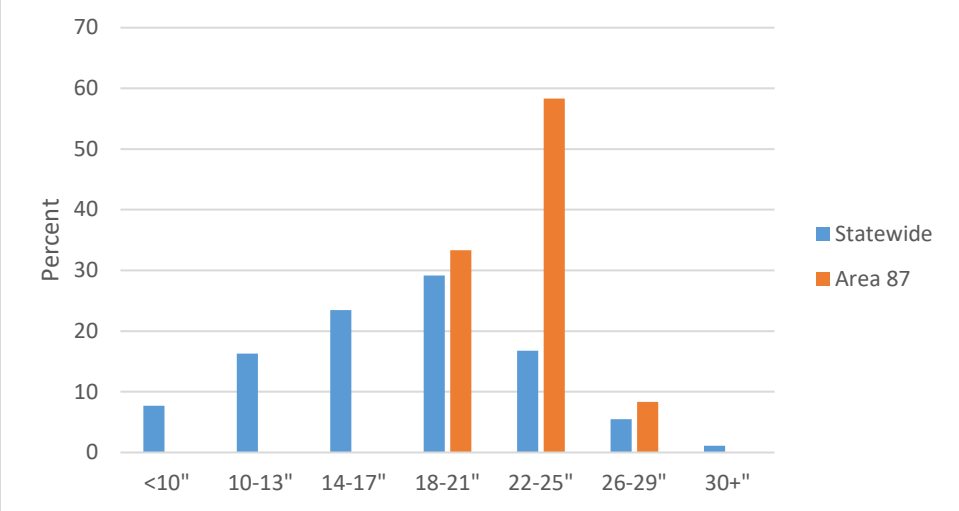


Figure 3. Antler spread of harvested mule deer bucks checked from the Ferris Mule Deer Herd compared to state-wide harvest checks in 2022.

Most classification data were collected from a helicopter again this year, after having only ground surveys in 2021 due to unrelenting winds that would not allow for safe helicopter surveys. As a result, sample size improved, but was still the smallest helicopter sample since 2014. The buck:doe ratio increased to 56:100, comparable to ratios recorded prior to the 2018-19 and 2019-20 winters. However, buck:doe ratios reported for this herd are inflated by major portions of the herd unit being unavailable to most hunters and remaining essentially unhunted. The ratio of adult buck:doe improved after four years of decline, but was still well below ratios seen prior to the two harsh winters. The proportion of Class 3 bucks has been steadily declining since these data were first collected in 2015, but improved to 5% in the 2022 classifications. Of the 83 Class 2 and Class 3 bucks found during the helicopter survey, 20% were in the checker-board and unavailable to almost all hunters.

Winter severity this past year was extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage over much of the herd unit. Seventeen (52%) of 33 collared adult doe pronghorn in the Red Desert immediately west of this herd unit died between January and early April 2023. Three of these collared does had crossed US 287 into this herd unit before dying in or near the Haystack Mountains winter range. Six telemetered mule deer from Green Mountain moved south to winter on rims south of Bairoil, across that same highway from where Ferris mule deer are wintering, and five (83%) of the six died, presumably from winter stress. Based upon the IPM postseason 2022 population estimate of 1600 animals and assuming losses to the Ferris mule deer will be similar to those observed in the neighboring Red Desert pronghorn and Chain Lakes mule deer herds, the end-of-year population of this herd is optimistically expected to be about 800 mule deer. These losses negate the gains made since the last hard winter. Mid-March classifications in the eastern portion of this herd unit, the only portion physically accessible for ground surveys due to deep heavy snows and closed highways, found 57 fawns per 100 adults. Ground classifications in the same portion of the herd unit in December had found 84 fawns:100 adults, suggesting losses in the eastern portion of the herd unit may have been less severe than in the Great Divide Basin.

Classification, harvest, antler measurement and satisfaction data all indicate this herd was recovering from losses in the 2018-19 and 2019-20 winters but had not yet approached objective size nor the desired supply of mature bucks. With heavy losses expected this winter, harvests need to be conservative again to allow the herd to recover. Depending on winter survival, the 50 Type 1 licenses would be expected to remove 20% of the bucks in the 2023 prehunt population.

2.) **Chronic Wasting Disease Monitoring & Management:** Because of its small size and low harvest rate, this herd is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred.

3.) **Population Modeling:** In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 1,600 (0-3300) mule deer. With

no independent estimates of herd size, the reliability and predictability of the IPM cannot easily be judged. A statistically adequate IPM with a satisfactory Rhat value was developed, but predicted a population less than half the classification sample size. Instead another IPM with poorer Rhat values was selected because population estimates from this model are consistent with past estimates and peaks and troughs roughly coincide with observed changes in deer abundance, usually in response to severe winters. The selected model predicts the 2022 posthunt herd size was more than 55% below the objective of 3,700 deer at posthunt 2022, before the harsh winter. For comparison, an updated spreadsheet population model developed because IPMs were not yet available estimated a slightly larger 2022 posthunt population of 1,900, still almost 50% below objective.

2022 - JCR Evaluation Form

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

HERD: MD648 - BEAVER RIM

HUNT AREAS: 90
PREPARED BY: ZACH GREGORY

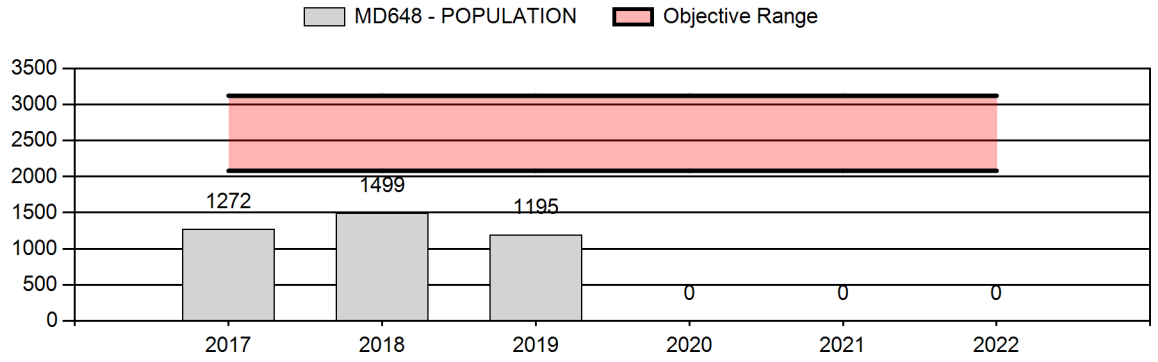
	2017 - 2021 Average	2022	2023 Proposed
Population:	793	N/A	N/A
Harvest:	51	33	31
Hunters:	70	46	43
Hunter Success:	73%	72%	72 %
Active Licenses:	70	46	43
Active License Success:	73%	72%	72 %
Recreation Days:	473	403	385
Days Per Animal:	9.3	12.2	12.4
Males per 100 Females	37	44	
Juveniles per 100 Females	50	56	

Population Objective (± 20%) :	2600 (2080 - 3120)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	12
Model Date:	None

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

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

Population Size - Postseason



2023 Hunting Seasons
Beaver Rim Mule Deer (MD648)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
90	1	Sep. 1	Sep. 30	Oct. 1	Oct. 31	50	Any deer

2022 Hunter Satisfaction: 63% Satisfied, 7% Neutral, 30% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: For the past two decades area 90 has been managed for trophy mule deer with limited licenses issued. License issuance has varied between 50 and 150 over the past 20 years. Given the more recent small number of licenses issued, harvest mortality has likely had little impact on the overall deer population in the area for many years. That said, the population has been below objective for over 10 years. Given low deer densities and no recent population growth, the hunt season in area 90 has been structured to provide a high quality recreational experience for a limited number of hunters.

Despite limited buck harvest in the herd unit for a number of years, indications are the population declined over the past several years. Environmental conditions in the area were quite harsh in both 2018 and 2019 resulting in poor fawn recruitment and survival. The summer of 2020 and 2021 was very dry throughout this herd unit and resulted in very poor vegetation production. The amount of moisture received in this past year was much needed and may contribute to better vegetation production than in the past. However, the winter of 2022-2023 has been quite harsh and persistent cold temperatures and snow pack will likely contribute to lower deer survival and continued population decline.

Classification surveys were redesigned in this herd unit in 2022. Unfortunately this design did not fit well with this low density deer herd and did not yield a statistically valid sample. This lack of classification data for this year and the past several years preclude calculating population estimates. Hunter satisfaction did see a reasonable jump in 2022 compared to 2021, 63% & 47% respectively. Hunter success also saw a notable increase in 2022 of 72% compared to 58% in 2021. Similarly days/harvest improved in 2022 to 12.2 compared to 14.4 in 2021. Nevertheless, days/harvest are quite high compared to the previous five year average while the success was similar. With the improvements in hunter satisfaction, days/harvest, and hunter success, and a population that is stable at best, there will be no changes to the season in 2023.

2.) Chronic Wasting Disease Monitoring and Management: This is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred. This herd has not been prioritized for CWD surveillance because harvest has been well below the level necessary to effectively estimate prevalence for over two decades.

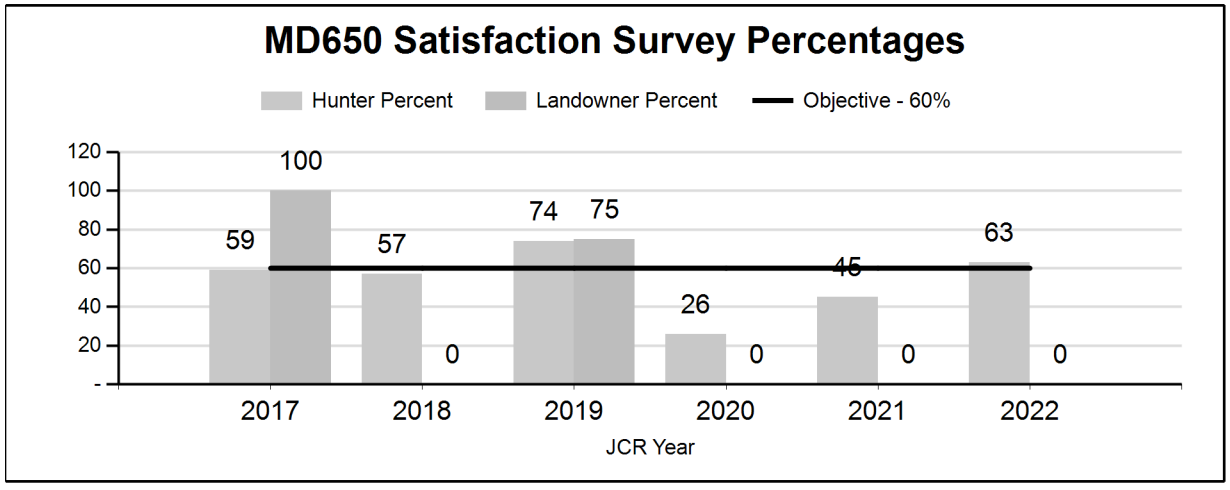
2022 - JCR Evaluation Form

SPECIES: Mule Deer
HERD: MD650 - CHAIN LAKES
HUNT AREAS: 98

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GREG HIATT

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	52%	63%	30%
Landowner Satisfaction Percent	64%	0%	0%
Harvest:	31	28	10
Hunters:	90	65	50
Hunter Success:	34%	43%	20 %
Active Licenses:	90	65	50
Active License Success:	34%	43%	20 %
Recreation Days:	287	182	200
Days Per Animal:	9.3	6.5	20
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

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:	4



2023 Hunting Seasons
Chain Lakes Mule Deer (MD650)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
98	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer, archery and muzzle-loading firearms only

2023 Region Q nonresident quota: 75 licenses

2022 Landowner Satisfaction: 100% Satisfied, 0% Neutral, 100% Dissatisfied
2022 Hunter Satisfaction: 63% Satisfied, 11% Neutral, 26% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** With the adoption of a hunter/landowner satisfaction objective for this herd, efforts are made to personally query major landowners on their satisfaction with deer numbers each year. All 3 landowners who responded this year were satisfied with deer numbers and the hunt last fall, but all three expressed concern over what this winter is doing to the herd. Hunter satisfaction improved to 63% in 2022, and was similar to that reported prior to the 2018-19 and 2019-20 winters (Figure 1.). As in 2021, few of the hunters surveyed were 'very satisfied' with their hunting experience. Hunter dissatisfaction declined again, from 35% to 26%, and a full 16% were very dissatisfied. The proportion of hunters 'very dissatisfied' with their hunting experience was the 2nd highest on record, after 2020. Three of four hunters providing written comment on this area expressed strong concern over low deer numbers. Hunting conditions apparently improved in 2022, but were still below hunter and landowner expectations for this herd.

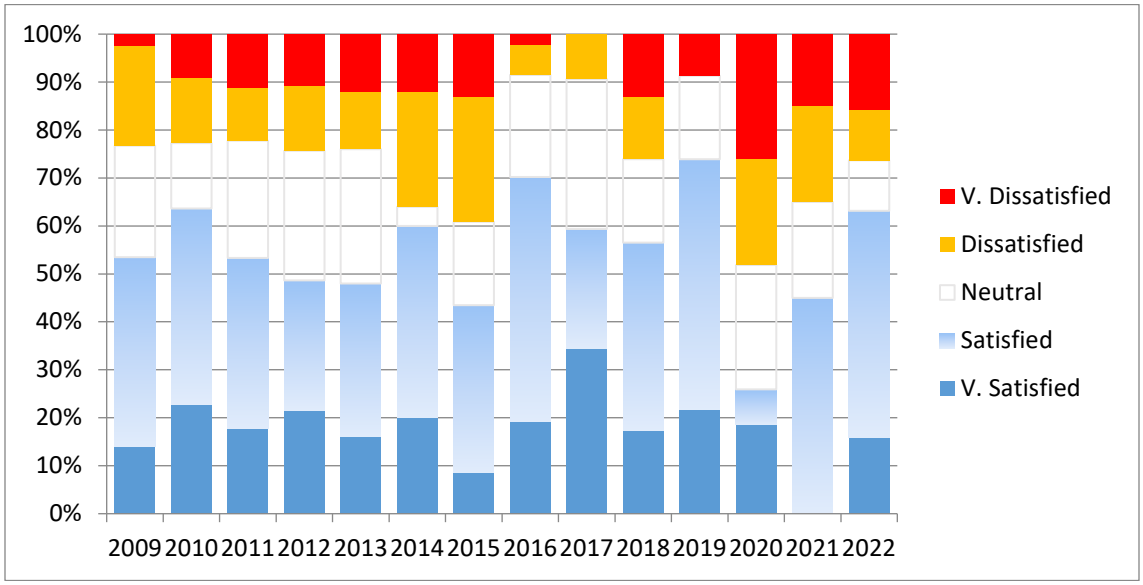


Figure 1. Hunter satisfaction and dissatisfaction for the Chain Lakes Mule Deer Herd.

Hunter success rose to 43%, returning to the normal range for this herd, and effort (days/animal) dropped to an 8-year low, both surprising because of low deer numbers and the 3-point antler restriction. Hunter numbers, however, dropped to a 25-year low, which may explain the improved success and effort. None of the deer harvested from this area in 2022 were checked in the field.

Winter severity this year has been extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage. This mule deer herd encompasses most of the eastern half of the Red Desert pronghorn herd unit. Thirty-three collared adult doe pronghorn were alive in the Red Desert herd at the end of December 2022, with roughly a third of these were within Deer Area 98. Seventeen (52%) of these 33 collared pronghorn does died between January and early April. Movements recorded from these pronghorn showed the same extreme migrations seen in the harsh 2018-19 and 2019-20 winters, as well as in 1983-84 and 1992-93. These migrations are typically not seen with mule deer in this herd, with most deer attempting to spend winters along wind-swept ridges and associated shrub lands within yearlong habitats. Winter losses to deer may be more extreme as a result. Six telemetered mule deer from Green Mountain moved into the Chain Lakes herd unit to winter on rims south of Bairoil, and five (83%) of the six died, presumably from winter stresses. Based upon the IPM postseason 2022 population estimate and assuming losses to mule deer being similar to those observed for the local pronghorn herd, the end-of-year population of this herd would optimistically be expected to be about 150 mule deer. This would be below the lowest estimated population in this herd in at least 20 years.

While antler point restrictions may not significantly affect harvest in this primitive weapon hunt area, they are necessary to prevent sharp increases in hunter numbers in this area when the rest of Region Q has antler point restrictions. With Areas 96 and 97 applying a 4-point antler restriction in 2023, the same is proposed for Area 98, with no changes in season dates. The nonresident quota for Region Q was reduced from 125 to 75 because of expected winter losses in both this and the Sweetwater mule deer herds.

2.) **Chronic Wasting Disease Monitoring & Management:** Because of its small size and low harvest rate, this herd is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data are available for this herd unit and no CWD management actions have occurred. During 2019 and 2020, 55 urban mule deer were removed from the city of Rawlins in the southeast corner of the herd unit under Chapter 56 permits, and 6 of these tested positive for CWD. None of the 22 deer removed from Rawlins under Chapter 56 in 2021 tested positive for CWD. No deer were removed by the Chapter 56 process in 2022, but several targeted collections from within the city tested positive for CWD.

3.) **Population Modeling**: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 300 (125-790) mule deer. With no independent estimates of herd size, nor a functional spreadsheet model, the reliability and predictability of the IPM cannot be judged. While failing to achieve desired Rhat

values, population estimates from the IPM are consistent with past estimates and peak and trough roughly with observed changes in deer abundance, usually in response to severe winters. This model predicts the 2022 posthunt herd size was 40% below the historic objective of 500 deer, which would not be consistent with the improved landowner and hunter satisfaction but is consistent with managers' observations.

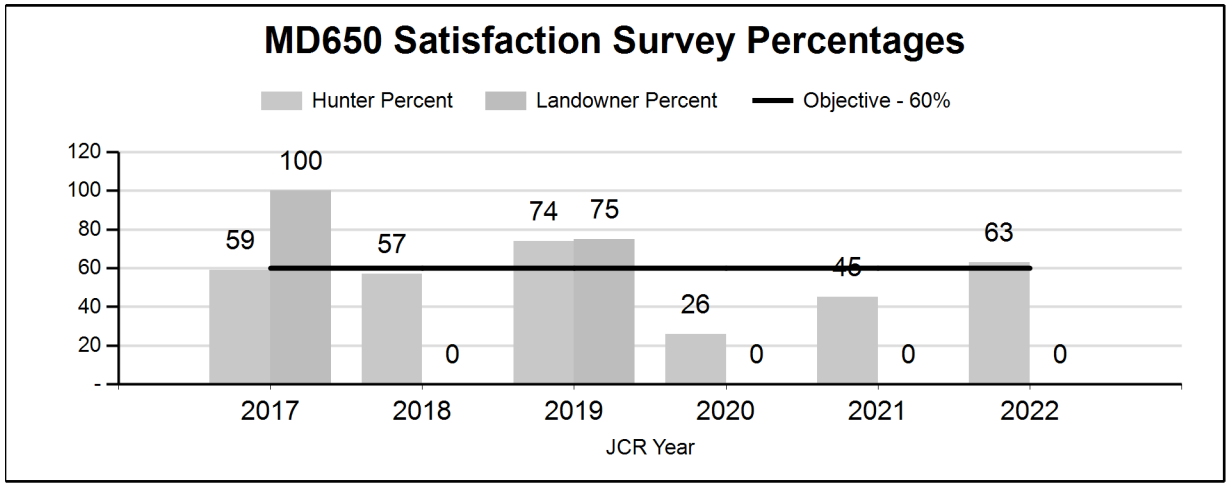
2022 - JCR Evaluation Form

SPECIES: Mule Deer
HERD: MD650 - CHAIN LAKES
HUNT AREAS: 98

PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GREG HIATT

	2017 - 2021 Average	2022	2023 Proposed
Hunter Satisfaction Percent	52%	63%	30%
Landowner Satisfaction Percent	64%	0%	0%
Harvest:	31	28	10
Hunters:	90	65	50
Hunter Success:	34%	43%	20 %
Active Licenses:	90	65	50
Active License Success:	34%	43%	20 %
Recreation Days:	287	182	200
Days Per Animal:	9.3	6.5	20
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

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:	4



2023 Hunting Seasons
Chain Lakes Mule Deer (MD650)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
98	Gen	Sep. 1	Sep. 30	Oct. 15	Oct. 20		Antlered mule deer four (4) points or more on either antler or any white-tailed deer, archery and muzzle-loading firearms only

2023 Region Q nonresident quota: 75 licenses

2022 Landowner Satisfaction: 100% Satisfied, 0% Neutral, 100% Dissatisfied
2022 Hunter Satisfaction: 63% Satisfied, 11% Neutral, 26% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** With the adoption of a hunter/landowner satisfaction objective for this herd, efforts are made to personally query major landowners on their satisfaction with deer numbers each year. All 3 landowners who responded this year were satisfied with deer numbers and the hunt last fall, but all three expressed concern over what this winter is doing to the herd. Hunter satisfaction improved to 63% in 2022, and was similar to that reported prior to the 2018-19 and 2019-20 winters (Figure 1.). As in 2021, few of the hunters surveyed were 'very satisfied' with their hunting experience. Hunter dissatisfaction declined again, from 35% to 26%, and a full 16% were very dissatisfied. The proportion of hunters 'very dissatisfied' with their hunting experience was the 2nd highest on record, after 2020. Three of four hunters providing written comment on this area expressed strong concern over low deer numbers. Hunting conditions apparently improved in 2022, but were still below hunter and landowner expectations for this herd.

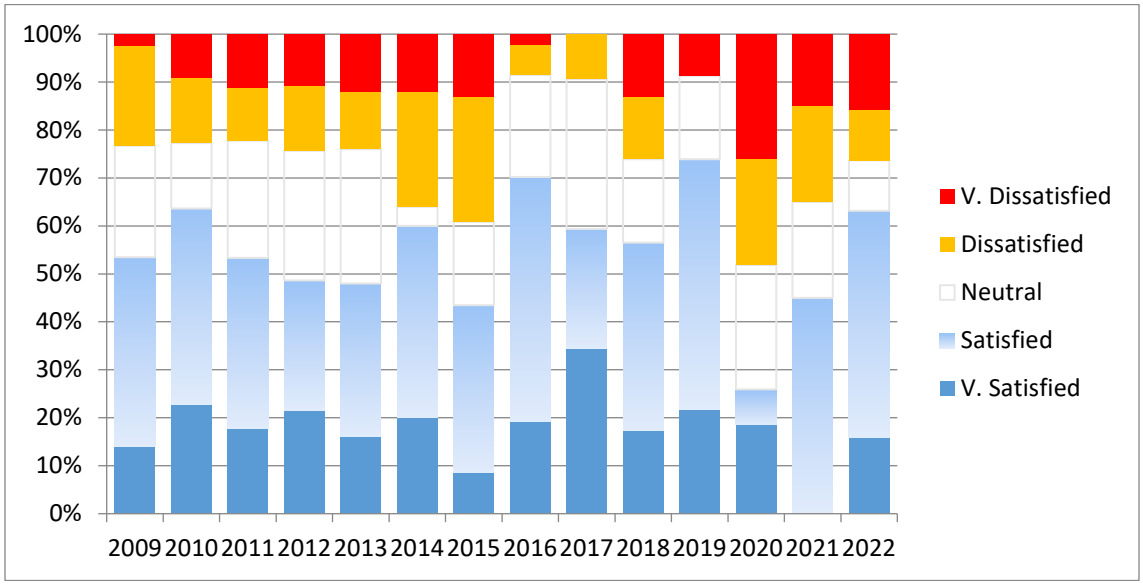


Figure 1. Hunter satisfaction and dissatisfaction for the Chain Lakes Mule Deer Herd.

Hunter success rose to 43%, returning to the normal range for this herd, and effort (days/animal) dropped to an 8-year low, both surprising because of low deer numbers and the 3-point antler restriction. Hunter numbers, however, dropped to a 25-year low, which may explain the improved success and effort. None of the deer harvested from this area in 2022 were checked in the field.

Winter severity this year has been extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage. This mule deer herd encompasses most of the eastern half of the Red Desert pronghorn herd unit. Thirty-three collared adult doe pronghorn were alive in the Red Desert herd at the end of December 2022, with roughly a third of these were within Deer Area 98. Seventeen (52%) of these 33 collared pronghorn does died between January and early April. Movements recorded from these pronghorn showed the same extreme migrations seen in the harsh 2018-19 and 2019-20 winters, as well as in 1983-84 and 1992-93. These migrations are typically not seen with mule deer in this herd, with most deer attempting to spend winters along wind-swept ridges and associated shrub lands within yearlong habitats. Winter losses to deer may be more extreme as a result. Six telemetered mule deer from Green Mountain moved into the Chain Lakes herd unit to winter on rims south of Bairoil, and five (83%) of the six died, presumably from winter stresses. Based upon the IPM postseason 2022 population estimate and assuming losses to mule deer being similar to those observed for the local pronghorn herd, the end-of-year population of this herd would optimistically be expected to be about 150 mule deer. This would be below the lowest estimated population in this herd in at least 20 years.

While antler point restrictions may not significantly affect harvest in this primitive weapon hunt area, they are necessary to prevent sharp increases in hunter numbers in this area when the rest of Region Q has antler point restrictions. With Areas 96 and 97 applying a 4-point antler restriction in 2023, the same is proposed for Area 98, with no changes in season dates. The nonresident quota for Region Q was reduced from 125 to 75 because of expected winter losses in both this and the Sweetwater mule deer herds.

2.) **Chronic Wasting Disease Monitoring & Management:** Because of its small size and low harvest rate, this herd is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data are available for this herd unit and no CWD management actions have occurred. During 2019 and 2020, 55 urban mule deer were removed from the city of Rawlins in the southeast corner of the herd unit under Chapter 56 permits, and 6 of these tested positive for CWD. None of the 22 deer removed from Rawlins under Chapter 56 in 2021 tested positive for CWD. No deer were removed by the Chapter 56 process in 2022, but several targeted collections from within the city tested positive for CWD.

3.) **Population Modeling**: In 2021, WGFD managers began using PopR integrated population models (IPM) to estimate population indices for mule deer and pronghorn. The bio-year 2022 postseason population estimate for this herd unit was 300 (125-790) mule deer. With no independent estimates of herd size, nor a functional spreadsheet model, the reliability and predictability of the IPM cannot be judged. While failing to achieve desired Rhat

values, population estimates from the IPM are consistent with past estimates and peak and trough roughly with observed changes in deer abundance, usually in response to severe winters. This model predicts the 2022 posthunt herd size was 40% below the historic objective of 500 deer, which would not be consistent with the improved landowner and hunter satisfaction but is consistent with managers' observations.

2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL635 - WIGGINS FORK
HUNT AREAS: 67-69, 127

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

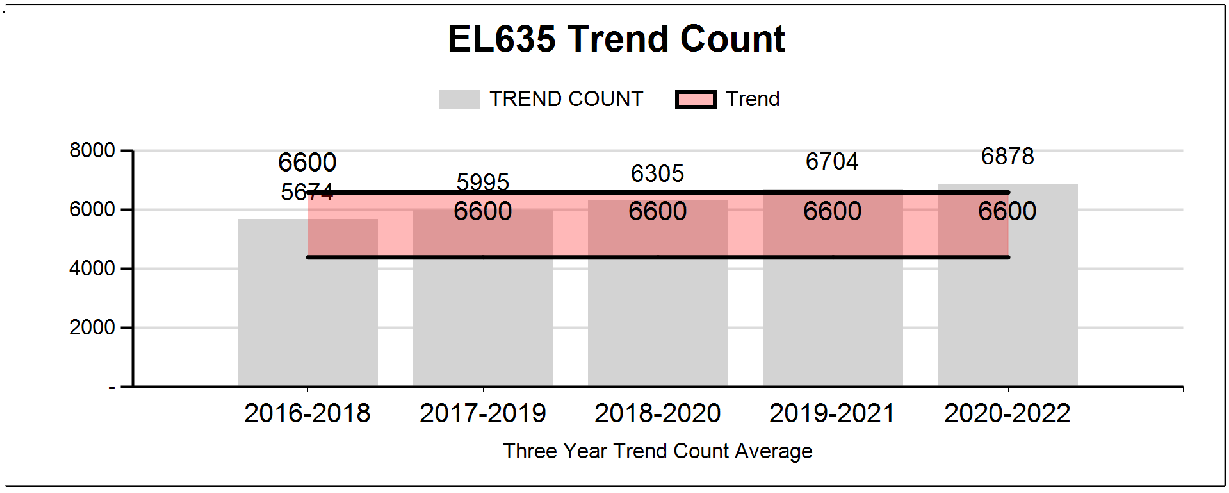
PREPARED BY: ZACH GREGORY

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	6,344	6,899	6,550
Harvest:	922	1,012	975
Hunters:	2,472	2,647	2,500
Hunter Success:	37%	38%	39 %
Active Licenses:	2,577	2,776	2,650
Active License Success	36%	36%	37 %
Recreation Days:	16,381	18,765	17,850
Days Per Animal:	17.8	18.5	18.3
Males per 100 Females:	17	24	
Juveniles per 100 Females	22	21	

Trend Based Objective (± 20%)	5,500 (4400 - 6600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	25%
Number of years population has been + or - objective in recent trend:	5

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

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



2023 Hunting Seasons
Wiggins Fork Elk (EL635)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
67	Gen	Sep. 15	Sep. 30				Any elk
67	Gen			Oct. 1	Oct. 10		Antlered elk
67	Gen			Oct. 11	Oct. 31		Antlered elk, spikes excluded
67	4	Sep. 15	Sep. 30	Nov. 1	Dec. 15	350	Antlerless elk
67	6	Sep. 15	Sep. 30	Dec. 1	Dec. 15	350	Cow or calf valid west of the Wiggins Fork and west of the East Fork downstream from the confluence with the Wiggins Fork
67	7	Sep. 15	Sep. 30	Oct. 15	Oct. 31	350	Cow or calf
67	7			Nov. 1	Nov. 30		Cow or calf valid west of the Wiggins Fork and west of the East Fork downstream from the confluence with the Wiggins Fork
67, 68, 69	9			Sep. 1	Sep. 30	150	Any elk, archery only
68	Gen	Sep. 15	Sep. 30				Any elk
68	Gen			Oct. 1	Oct. 10		Antlered elk
68	Gen			Oct. 11	Oct. 31		Antlered elk, spikes excluded
68	6	Sep. 15	Sep. 30	Nov. 1	Nov. 30	50	Cow or calf
69	Gen	Sep. 15	Sep. 30	Oct. 1	Oct. 31		Any elk
69	6	Sep. 15	Sep. 30	Oct. 1	Nov. 30	25	Cow or calf

127	Gen	Sep. 1	Sep. 30	Oct. 1	Oct. 31		Any elk
127	Gen			Nov. 1	Jan. 31		Antlerless elk

2022 Hunter Satisfaction: 69% Satisfied, 18% Neutral, 13% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: Personnel counted a total of 6,899 elk during the January 2023 trend count. This was 367 fewer elk than counted in 2022 and may be due to an increase elk harvest in hunt area 67. While the number of elk counted in areas 68 and 69 were significantly lower than previous years, the early and continued snow pack and winter conditions pushed elk that normally winter in these areas to area 67. The recent 3-year average of trend counts increased to 6,878. This is above the 20% range of the established objective of 5,500 elk, putting this herd over objective. This herd has 3 established sub-populations based on migratory movements and winter range use. The East Fork segment has an objective of 2,200 elk with 2,130 counted this year, slightly under objective. The South Dubois segment is below objective (1,100) with a 2022 winter count of 662. The Dunoir/Spring Mountain segment continues to be above the objective of 2,200 elk with a 2022 winter count of 4,109. This is moderately more than counted in 2021, but again this is due to elk movement from areas 68 and 69 into this sub-herd.

Overall hunter success increased slightly from 34% in 2021 to 38% in 2022. Area 67 did see a reasonable jump in overall success (39%) in 2022 compared to 2021 (31%). Both the Type 4 and 6 license success significantly increased in 2022 to 61% & 48%, respectively (in contrast to 2021 at 31% & 28%, respectively). Both the Type 4 and 6 licenses in area 67 are structured to increase antlerless harvest on the Dunoir/Spring Mountain segment with Type 6 license pressure focused exclusively on this segment. Due to the continued high numbers of elk counted in this sub-herd, a Type 7 license will be issued to increase cow/calf harvest. This license will also address other issues including: 1) hunter overcrowding and decreased hunt quality, which should increase harvest success and 2) it will still target the migratory portion of this herd. Access to elk on private land refuges is a major management concern hindering the area 67 Type 6 license effectiveness. We will continue to work with landowners in an attempt to increase access to private lands that will help disperse elk onto accessible public lands and facilitate an increase in harvest.

2.) Chronic Wasting Disease Monitoring and Management. This is a Tier 2 surveillance herd and was prioritized for CWD surveillance in 2021 and ended in 2022. A total of 212 samples have been collected over the past 3 years. In 2022, field personnel collected 100 samples. Of the 212 samples, 3 tested positive resulting in an estimated prevalence rate of 1.4%. No CWD management actions have occurred nor are any planned.

2022 - JCR Evaluation Form

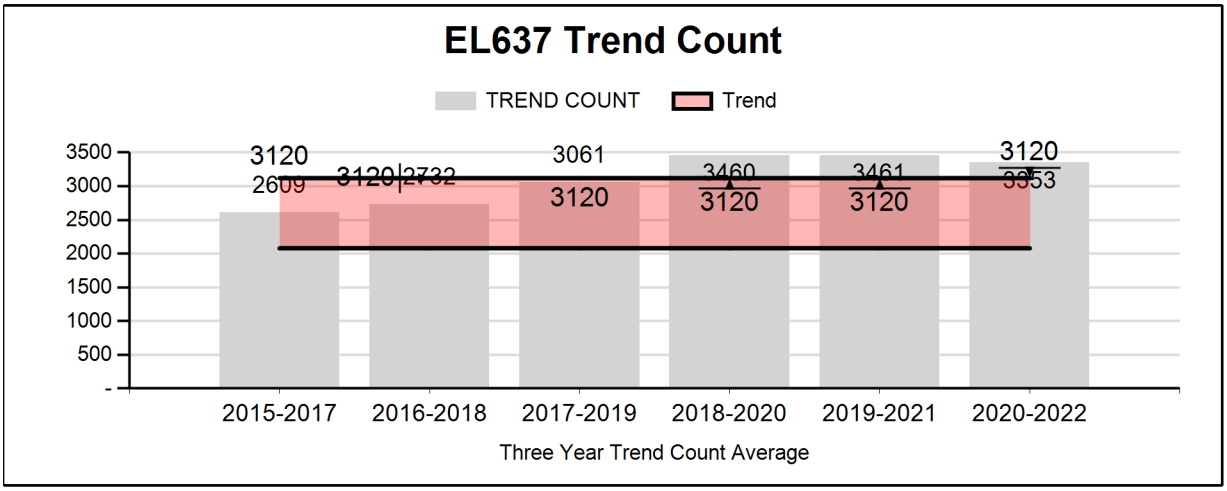
SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL637 - SOUTH WIND RIVER
HUNT AREAS: 25, 27-28, 99
PREPARED BY: STAN HARTER

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	3,222	3,130	3,000
Harvest:	630	690	750
Hunters:	1,781	1,835	1,850
Hunter Success:	35%	38%	41%
Active Licenses:	1,842	1,902	1,950
Active License Success	34%	36%	38%
Recreation Days:	12,797	13,390	13,500
Days Per Animal:	20.3	19.4	18
Males per 100 Females:	25	45	
Juveniles per 100 Females	31	32	

Trend Based Objective (± 20%)	2,600 (2080 - 3120)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	20%
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:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



2023 Hunting Seasons
South Wind River Elk (EL 637)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
25, 27	1	Sept. 1	Sept. 30	Oct. 1	Oct. 31	175	Any elk
25	4	Sept. 1	Sept. 30	Oct. 11	Oct. 31	75	Antlerless elk
25	5	Sept. 1	Sept. 30	Oct. 21	Oct. 31	75	Antlerless elk
25	5			Nov. 1	Nov. 10		Antlerless elk, valid north of the Sweetwater River
25	6	Sept. 1	Sept. 30	Nov. 1	Nov. 20	100	Cow or calf, valid north of the Sweetwater River
27	4	Sept. 1	Sept. 30	Oct. 1	Nov. 20	75	Antlerless elk
28	Gen	Sept. 1	Sept. 30	Oct. 1	Oct. 14		Any elk
28	Gen			Oct. 15	Oct. 22		Antlerless elk
28	4	Sept. 1	Sept. 30	Nov. 1	Nov. 20	175	Antlerless elk
99	1	Sept. 1	Sept. 30	Oct. 1	Oct. 31	150	Any elk
99	1			Nov. 1	Nov. 20		Antlerless elk
99	4	Sept. 1	Sept. 30	Oct. 1	Nov. 20	175	Antlerless elk

2022 Hunter Satisfaction: 63.3% Satisfied, 21.3% Neutral, 15.4% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The South Wind River elk herd unit has a mid-winter trend count objective of 2,600 elk. The 2022 trend count/classification survey flown in January and February 2023, when pooled with a ground count of elk just west of Lander, produced a count of 3,130 elk, with a 3-year average trend count of 3,353 elk (29% above objective). Snow conditions were the heaviest in several years with Lander receiving 4 times the average amount of snow for January, with most elk detected well away from forested habitats. Distribution shifts often occur between hunt areas 25 and 28 from year to year, depending on snow depths during classification/trend surveys. A record number of elk were observed in hunt area 25 this year, with many groups of elk in areas not typically found in high numbers, if at all, particularly north of Highway 287/789. Elk throughout the herd unit were mostly found on wind-blown ridges where where vegetation was available. It is likely winter mortality was higher than normal. An unconfirmed report was received about dead elk next to the Bison Basin Road near Alkali Creek.

The calf/cow ratio of 32J/100F for the herd unit was below the long-term average and the total bull/cow ratio of 45M/100F was the highest for the herd unit since 1994. The 2023 season structure is very similar to the largely successful 2022 season, which resulted in 690 total elk harvested and

overall 40% hunter success during regular hunting seasons. Hunter satisfaction was identical to that in 2021, and while hunter success dropped slightly to 38%, overall success was above the long-term average of 33%.

We removed the Type 6 license in hunt area 28 in 2022, which had targeted elk with mixed results in the vicinity of Lander City Limits and the North Fork Road, and instead successfully utilized a new regulation (Chapter 34) to provide "on-demand" harvest of elk in areas 28 and 127. In January and February 2023, at least 31 elk were harvested by permit holders, with another 4 harvested by Department personnel on the Chapter 56 permit. These harvests were implemented to reduce stored hay damage and to reduce the potential for brucellosis transmission from elk to cattle, however slight the risk within a few miles of Lander from Willow Creek to the North Fork Popo Agie. All elk harvested with Chapter 34 and Chapter 56 permits were tested for brucellosis and CWD. To date, none have tested positive for either disease, with a few results still pending. Although some of the Chapter 34 harvest occurred in hunt area 127, these elk were part of a group that spends considerable time in hunt area 28. These elk are not included in harvest totals in the 2022 elk harvest survey or in the JCR database. Hunts using Chapter 34 will continue through March 1, 2023 and will likely be used again in winter 2023-24.

Recent changes made to increase antlerless elk harvest continued to work well in 2022 despite a very mild, open hunting season. However, with continued trend counts above objective and increased calf recruitment, additional female harvest is needed to limit growth and move toward objective. With a high bull/cow ratio and hunter success at 84%, we are increasing the quota for the area 25 Type 1 licenses to increase opportunity. We reduced this quota in 2020 in response to complaints about the number of hunters increasing and elk decreasing in the portion of area 25 south of the Sweetwater River (particularly Cyclone Rim), but elk have become more available on public lands in the area between Beaver Creek and Twin Creek near Highway 287/789. Access in this portion of the hunt area can be an issue, so a modest increase of 25 licenses is prudent. The seasons above and future use of Chapter 34 should maintain or increase antlerless elk harvest in 2023, and help curtail population growth and move this herd toward objective.

2.) Chronic Wasting Disease Monitoring and Management. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred. South Wind River elk is not a focal CWD surveillance herd.

2022 - JCR Evaluation Form

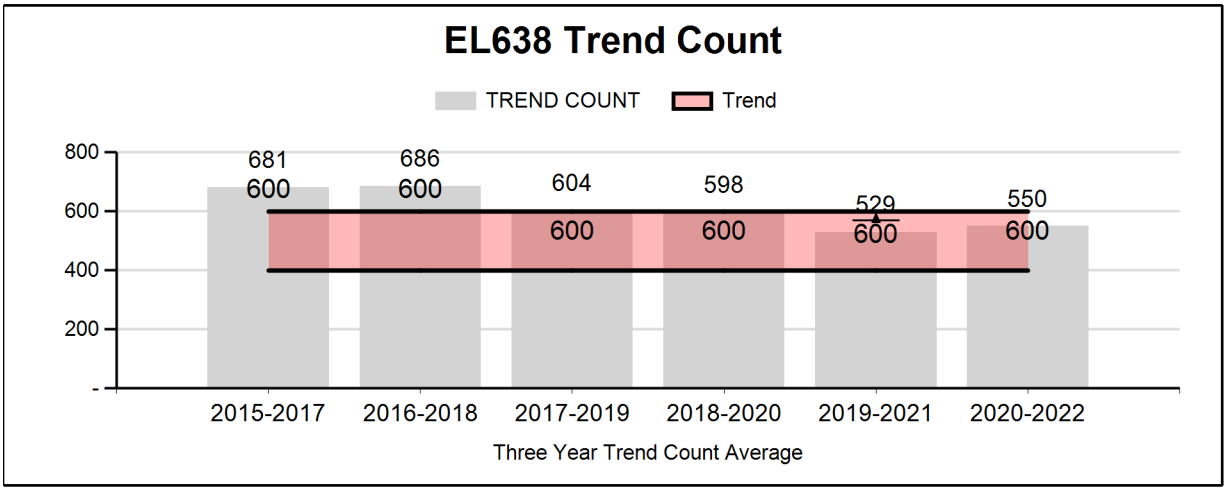
SPECIES: Elk
PERIOD: 6/1/2022 - 5/31/2023
HERD: EL638 - GREEN MOUNTAIN
HUNT AREAS: 24, 128
PREPARED BY: STAN HARTER

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	582	551	500
Harvest:	243	256	300
Hunters:	608	652	700
Hunter Success:	40%	39%	43 %
Active Licenses:	615	659	700
Active License Success	40%	39%	43 %
Recreation Days:	3,714	4,028	4,200
Days Per Animal:	15.3	15.7	14
Males per 100 Females:	40	52	
Juveniles per 100 Females	32	32	

Trend Based Objective (± 20%)	500 (400 - 600)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	10%
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:	0%	0%
Males ≥ 1 year old:	0%	0%
Juveniles (< 1 year old):	0%	0%



2023 Hunting Seasons
Green Mountain Elk (EL638)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
24	1	Sept. 1	Sept. 30	Oct. 1	Oct. 14	200	Any elk
24	1			Nov. 1	Nov. 30		Antlerless elk
24	4	Sept. 1	Sept. 30	Oct. 1	Oct. 14	75	Antlerless elk
24	4			Nov. 1	Nov. 30		Antlerless elk, also valid in Area 128
24	5	Sept. 1	Sept. 30	Nov. 1	Nov. 30	175	Antlerless elk
128	Gen	Sept. 1	Sept. 30	Oct. 1	Oct. 7		Any elk
128	Gen			Oct. 8	Oct. 14		Antlerless elk

2022 Hunter Satisfaction: 64.1% Satisfied, 17.9% Neutral, 18.0% Dissatisfied

2023 Management Summary

1.) Hunting Season Evaluation: The Green Mountain elk herd unit has a mid-winter trend count objective of 500 elk. The 2022 trend count/classification survey was flown in January 2023, and resulted in a count of 551 elk. The latest 3-year trend count average is 550, placing the population 10% above objective, but below the upper 20% "limit". Snow conditions were the heaviest in several years with Jeffrey City receiving between 3 to 4 times the average amount of snow for January and February, with most elk detected well away from forested habitats. Several groups of elk were located very close to Highway 287/789 and were mostly restricted to a few wind-blown ridges where vegetation was available. We received one report of feral horses chasing a group of elk off one of those open ridges west of Muddy Gap and into deep snow banks. Winter mortality may be higher than normal. An unconfirmed report was received about dead elk next to the Bison Basin Road near Alkali Creek.

The 2022 calf/cow ratio was 32J/100F (22% below the average of 41J/100F since 1994). The bull/cow ratio of 52M/100F is 63% above the long-term average, with the 5th most adult bulls observed in the last 15 years, with about an average number of spikes observed.

The total harvest for the herd unit in 2022 was 6 fewer than in 2021, with a small increase in antlerless and adult bull harvest, but a 68% reduction in spike harvest. Overall success of 39% was nearly identical to that in 2021, with an increase in Area 24 Type 1 success to 68%. But, success was lower for Type 4 and 5 hunters in Area 24, and general license hunters in Area 128. With increased hunter success, along with an increase in the number of adult bulls seen, we are recommending an increase of 25 Type 1 licenses in Area 24 in 2023. This modest increase is warranted given that, in the past, larger influxes of hunters negatively affects harvest success and hunter satisfaction. There are no changes to Type 4 and Type 5 seasons in Area 24, to help address some landowner concerns about elk numbers throughout the hunt area. In addition, the Casper Region made their Area 23 Type 4 and Type 5 licenses valid in the northeastern portion of Area 128 from November 15 – December 15 to address concerns about elk crossing the Dry Creek Road and into HA 128. Allowing 23 Type 4 and 6 license of 128 will hopefully increase harvest and allow HA 23 to keep moving toward objective.

2022 - JCR Evaluation Form

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

HERD: EL639 - FERRIS

HUNT AREAS: 22, 111
PREPARED BY: GREG HIATT

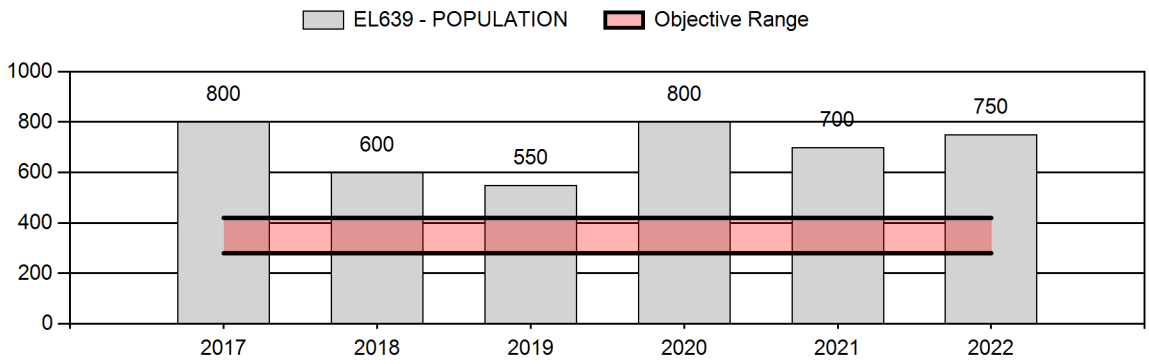
	2017 - 2021 Average	2022	2023 Proposed
Population:	690	750	725
Harvest:	145	182	195
Hunters:	295	324	340
Hunter Success:	49%	56%	57 %
Active Licenses:	309	351	340
Active License Success:	47%	52%	57 %
Recreation Days:	1,958	2,263	2,400
Days Per Animal:	13.5	12.4	12.3
Males per 100 Females	86	55	
Juveniles per 100 Females	41	35	

Population Objective (± 20%) :	350 (280 - 420)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	114%
Number of years population has been + or - objective in recent trend:	25
Model Date:	None

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

	JCR Year	Proposed
Females ≥ 1 year old:	17%	20%
Males ≥ 1 year old:	29%	33%
Proposed change in post-season population:	-4%	-3%

Population Size - Postseason



2023 Hunting Seasons
Ferris Elk (EL639)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
22	1	Sep. 1	Sep. 30	Oct. 8	Oct. 31	60	Any elk
22	1			Nov. 15	Dec. 15		Any elk, also valid in Area 111
22	1			Dec. 16	Dec. 31		Antlerless elk
22	6	Sep. 1	Sep. 30	Oct. 8	Oct. 31	50	Cow or calf valid in the Muddy Creek Drainage
22	6			Nov. 1	Dec. 31		Cow or calf valid in the entire area
111	1	Sep. 1	Sep. 30	Oct. 10	Oct. 31	70	Any elk
	1			Nov. 15	Dec. 15		Any elk, also valid in Area 22
	1			Dec. 16	Dec. 31		Antlerless elk
111	4	Sep. 1	Sep. 30	Oct. 10	Dec. 31	100	Antlerless elk
111	6	Sep. 1	Sep. 30	Nov. 1	Dec. 31	200	Cow or calf

2022 Hunter Satisfaction: 76% Satisfied, 12% Neutral, 12% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** Conditions for this year's trend count were ideal, with fresh, deep snow cover, good light and light winds for all days of flying. A total of 759 elk were counted, still well above the objective of 350 (See Appendix A). The trend count found 381 elk in the northern portion of this herd, but 282 (37% of the total) were in one herd low on Bear Creek on Pathfinder Ranch lands where they were largely unavailable during hunting season. Similarly, another 378 elk (50%) were in checker-boarded lands in the southern portion of Area 111 where hunter access is severely limited. The majority of the elk in this herd were unavailable for public harvest due to access limitations on private lands.

Because of continued generous hunting seasons, hunter success increased slightly in 2022, and the average number of days hunted per elk harvested declined, despite the increase in license quotas. Some of this improved access to elk may have been due to the creation of the Stone Creek HMA in the middle of the herd unit this year, although some hunters were able to access those private lands in previous years. It is difficult to interpret hunter success rates for Type 1 licenses in these two hunt areas because of the late bull hunt in the second

half of November and early December which allows them to hunt both areas. High success reported in Area 111 may include Area 22 licensees who harvested their elk in Area 111. Date of harvest reports indicate almost 25% of the Type 1 licenses were filled in the late hunt, primarily for Area 22. The intent of this late 'any elk' hunt is to increase hunter success and harvest by providing hunters with access to bulls on winter range that are normally behind locked gates during the regular season. This strategy appears to be successful. Success for Type 6 hunters in Area 22 improved, but was little changed for Type 4 and Type 6 hunters in Area 111. The Type 4 hunters in Area 111 again had higher success than those with Type 6 licenses.

Hunter satisfaction increased in both hunt areas, at 78% in Area 22 (Figure 1.) and 74% in Area 111 (Figure 2.). Hunter dissatisfaction also increased in both areas, with a smaller proportion of hunters being neutral about their hunting experience. Of 15 comments received from hunters in this herd, 3 complained about the lack of access to elk on private lands and 3 expressed appreciation for the AccessYes projects within the herd unit.

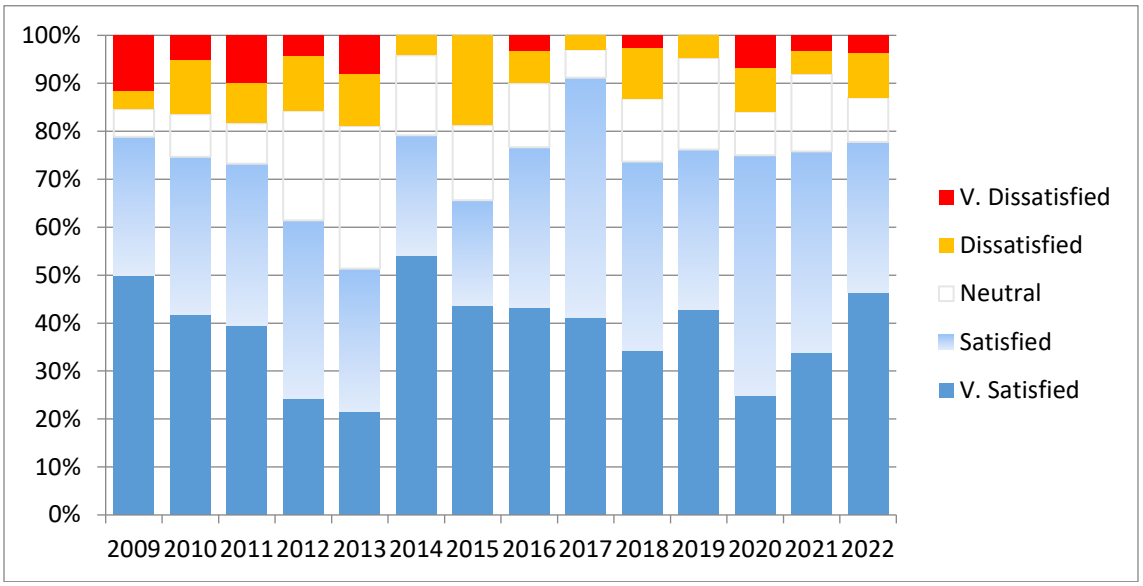


Figure 1. Hunter satisfaction and dissatisfaction for Area 22 in the Ferris Elk Herd.

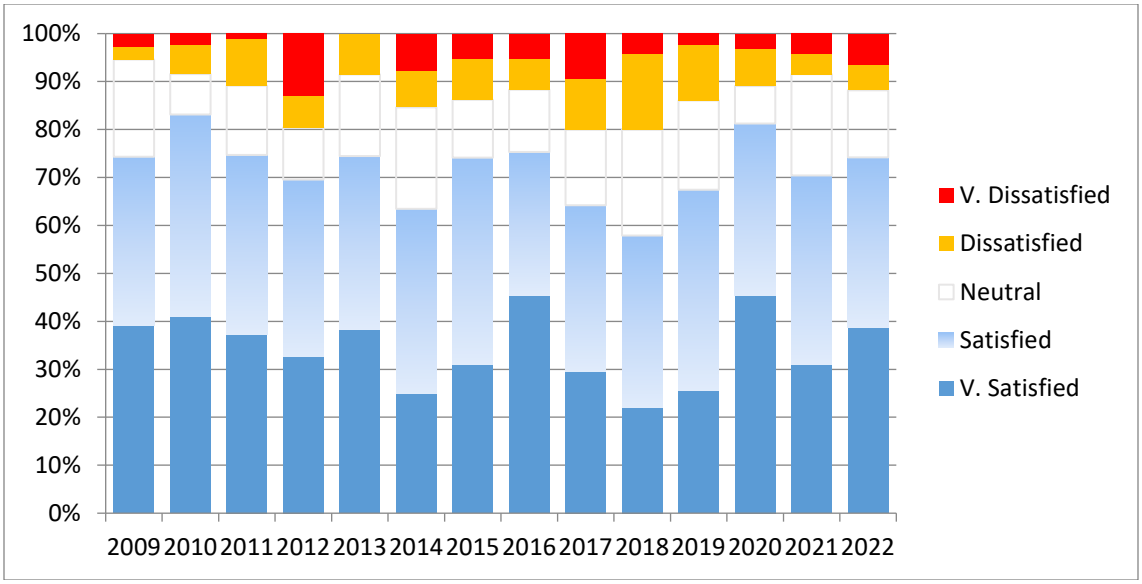


Figure 2. Hunter satisfaction and dissatisfaction for Area 111 in the Ferris Elk Herd.

The harvest of 89 antlered elk in 2022 was the largest ever taken from this herd, and the total harvest of 182 elk was the 3rd largest. Trend count data indicate these harvests are successfully controlling elk numbers in the largely publicly accessible northern portion of the herd unit while elk numbers in the largely unhunted southern portion of Area 111 continue to grow and place the herd over objective.

Calf production improved slightly to 35:100 this year, but was still low for this herd. The antlered:cow ratio remained stable at 55:100, the lowest in 9 years. The spike:cow ratio remained stable despite lower calf production in 2021.

Severity of the 2022-23 winter was extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover over most of the herd unit. High winter mortality has been documented with pronghorn and mule deer in and adjacent to this herd unit, but elk are better adapted to survive harsh winters than either pronghorn or mule deer. An emaciated, old cow elk had to be put down in Rawlins in the southwestern corner of the herd unit due to winter stress, and this animal tested negative for CWD. Some elk died due to winter stresses in herds to the west and it is not known if there were additional winter losses in this herd unit where elk may have been stranded by deep, crusted snows.

Antlerless harvests need to continue, and should be increased in the southern portion of the herd, but more than half the reproductive portion of this herd is unavailable for harvest on private lands or public lands with no access. The quota for Type 4 licenses in Area 111 is increased in 2023 because hunters with those licenses had higher success than those with Type 6 licenses for the past two years. License quotas need to be scaled according to the number of elk actually available for harvest, with the goal of retaining reasonable numbers of elk and hunting opportunity on public and accessible private lands. Assuming typical calf production and hunter success, the 2023 license quotas should continue to reduce elk numbers on the accessible portions of this herd, but unless hunter access changes, elk

numbers in the inaccessible checker-board in the southern portion of Area 111 will continue to grow unabated, leaving the herd unit as a whole above objective.

Early winter hunts have allowed for harvest of antlerless elk that were on private land and unavailable during October but have moved to winter ranges on public lands. A similar strategy was successfully employed beginning in 2019 for "any elk" seasons for the Type 1 licenses, running in late November and early December. To maintain harvest of surplus antlered elk, the same season is continued this year. Since many bull groups frequently cross the boundary between Areas 22 and 111 during the winter, the Type 1 hunters are again allowed to hunt both areas during this late "any elk" hunt and adjust their hunting locations accordingly.

Hunter success for Type 1 licenses exceeded the statewide mandated 60% criterion as a consequence of offering the additional early winter hunts. As in past years, consideration was given to separating the late hunt into a separate license type, which might lower hunter success towards the statewide standard. But weather conditions prevented hunters from accessing winter ranges occupied by elk during the late hunt in some past years, and it would be considered unfair to restrict hunters to a winter hunt where they may be physically unable to use their license. As a consequence of this second, early winter hunt, success rates for the Type 1 hunters have remained higher than the mandated 60%, despite recent increases in license quotas.

2.) **Chronic Wasting Disease Monitoring & Management:** Because of its small size and dispersal of harvest over months-long seasons, this herd is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred.

Appendix A
Winter Trend Count Report

Bio Year:	2022	**Herd Code:**	EL639
Species:	Elk	**Herd Unit:**	Ferris
Aircraft:	R66 helicopter	**Hunt Areas:**	22, 111
Pilot:	Dave Stinson, 307 Aviation	**Dates:**	18-19 Jan 2023
Observers:	Linnea Sailor	**Flight Time:**	**??** hrs
Conditions:	excellent snow cover, good light, light winds		

Survey Design:

An aerial helicopter trend count of this herd was flown on 18-19 January 2023. Due to favorable conditions and helicopter schedule, the bighorn sheep trend count/classification survey was flown at the same time. As a result, coverage of this year's elk trend count was expanded to include habitats likely to be occupied by bighorn sheep and was more extensive than in most previous years. Because of the combining of surveys, exact hours of flight for this elk survey are not quantifiable.

As in most previous winters, coverage of wintering areas was flown opportunistically, with flight paths adjusted according to where elk were expected, where other groups of elk were seen, where ridges were blown free of snow, and where tracks indicated elk might be found. All expected wintering areas were flown, including some which did not contain elk this winter. Efforts were made to classify the elk found, and this year all elk counted were also classified. Digital photography was used to classify larger herds.

Count Results:

Hunt Area	Count Block	Classification				Total	Herd Ratios (/100 cows)			
		Cows	Calves	Spikes	Bulls		Calf	Antler	Spike	Bull
22	All	0	0	1	50	51	--	--	--	--
111	North	193	49	32	56	330	25.4	45.6	16.6	29.0
111	South	208	90	23	57	378	43.3	38.5	11.1	27.4
Total		401	139	56	163	759	34.7	54.6	14.0	40.6

Conditions for this year's trend count were ideal, with fresh, deep snow cover (>20"), good light and fair winds for all days of flying. A total of 759 elk were counted, still well above the objective, 14% more than the 665 counted in BY2021 but slightly less than the 781 counted in BY2020. Locations and comparative group sizes of elk found during this survey are shown in Figure 1. Number of branch-antlered bulls are shown in red, with all other elk classes shown in blue. Counts in Area 111 were partitioned to identify elk found in checker-boarded, largely inaccessible lands in the southern portion using a boundary roughly following the Taper Ranch Road.

The trend count found 330 elk in the largely publicly available portion of this herd, but 282 of these (37% of the total) were in one herd below Pathfinder Ranch lands where they were largely

unavailable during hunting season. Another 378 elk (50%) were in checker-boarded lands where hunter access is severely limited.

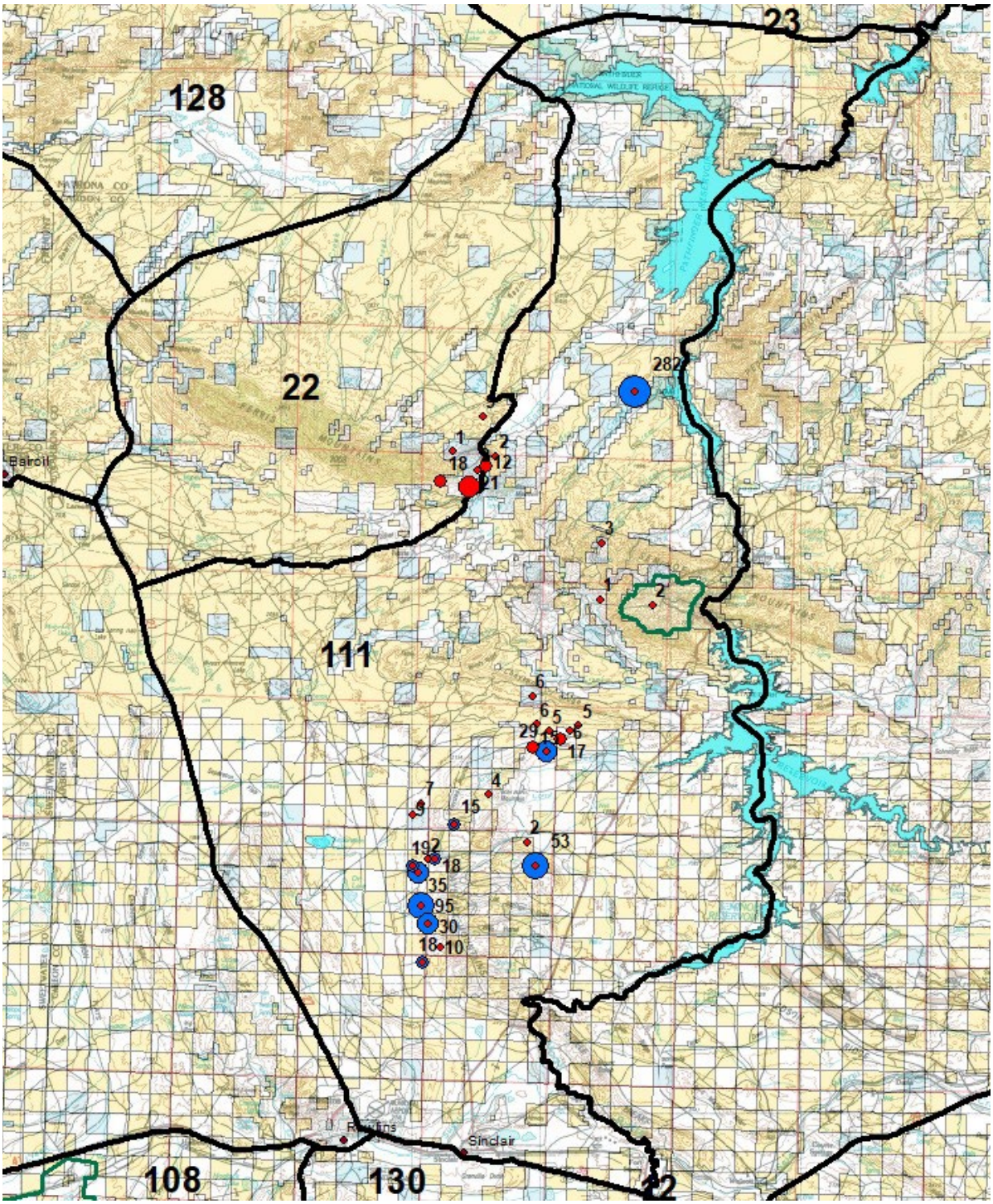


Figure 1. Locations and comparative group sizes of elk found in the Ferris Herd during the 2022 winter trend count on 18-19 January 2023. Branch-antlered bulls are shown in red, all other classes of elk are shown in blue.

2022 - JCR Evaluation Form

SPECIES: Elk
HERD: EL643 - SHAMROCK
HUNT AREAS: 118

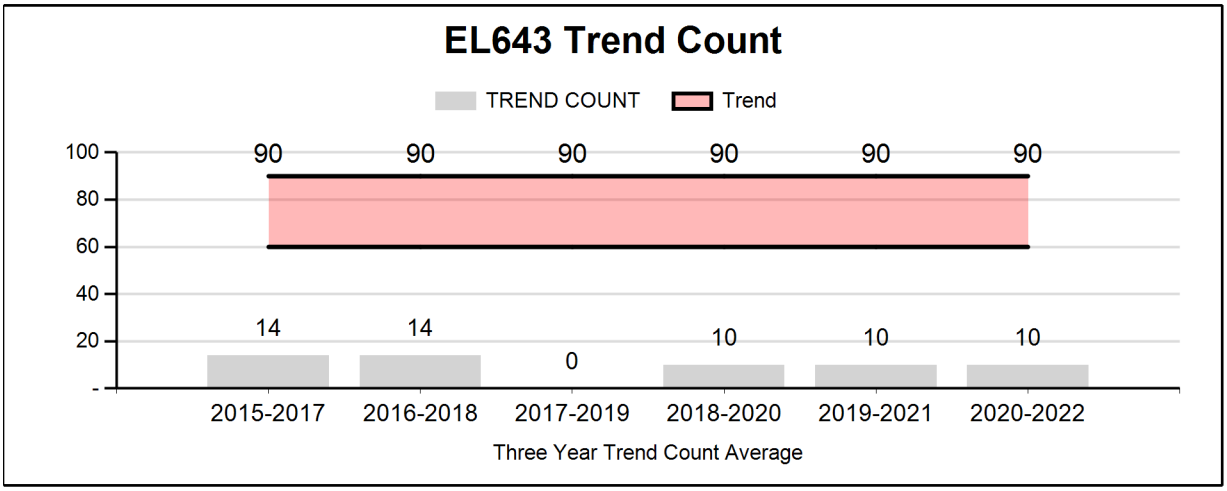
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GREG HIATT

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	31	0	0
Harvest:	52	79	80
Hunters:	87	112	115
Hunter Success:	60%	71%	70 %
Active Licenses:	96	119	120
Active License Success	54%	66%	67 %
Recreation Days:	472	471	470
Days Per Animal:	9.1	6.0	5.9
Males per 100 Females:	0	0	
Juveniles per 100 Females	0	0	

Trend Based Objective (± 20%)	75 (60 - 90)
Management Strategy:	Recreational
Percent population is above (+) or (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	6

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

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



2023 Hunting Seasons
Shamrock Elk (EL643)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
118	1	Sep. 1	Sep. 30	Oct. 22	Nov. 12	40	Antlered elk
118	4	Sep. 1	Sep. 30	Oct. 22	Nov. 30	30	Antlerless elk
118	6	Sep. 1	Sep. 30	Oct. 1	Nov. 30	60	Cow or calf valid south of the Mineral X Road (Sweetwater County Road 63 and B.L.M. Road 3206)

2022 Hunter Satisfaction: 60% Satisfied, 31% Neutral, 9% Dissatisfied

2023 Management Summary

1.) **Hunting Season Evaluation:** The most recent end-of-year trend count for this herd was flown in June 2021 using the same flight lines as flown in 2017. Only 32 elk were found, 10 less than in 2017 and more than 50 percent below objective. License quotas remained constant from 2018 through 2021 with 100 licenses available each year, but were increased in 2022 to a total of 130 licenses because of high hunter success rates. Success for Type 1 hunters dropped to 76% with the increased quota, returning to the normal range for this herd. Considering the terrain and cover is identical to most pronghorn hunts, this is a fairly reasonable success for bull hunters in this desert herd. Success for hunters with Type 4 licenses also showed the expected drop in success, to only 38%, the lowest in four years. But success for Type 6 hunters increased to 74%, despite the increased quota. These hunters have the longest season and the first opportunity to pursue elk with firearms, but that is true most years. Overall, hunter success increased slightly to 67%, a result of high success by Type 6 hunters.

With the decreased hunter success for two license types. hunter satisfaction dropped to 60%, the 5th lowest recorded in this herd in the past 14 years (Figure 1.). Hunter dissatisfaction also decreased, indicating an increased proportion of hunters were ambivalent about their hunting experience in 2022. The 30% increase in licenses in 2022 yielded an almost 40% increase in harvest and successfully reduced hunter success for the Type 1 licenses by 20%. The same seasons are proposed again in 2023.

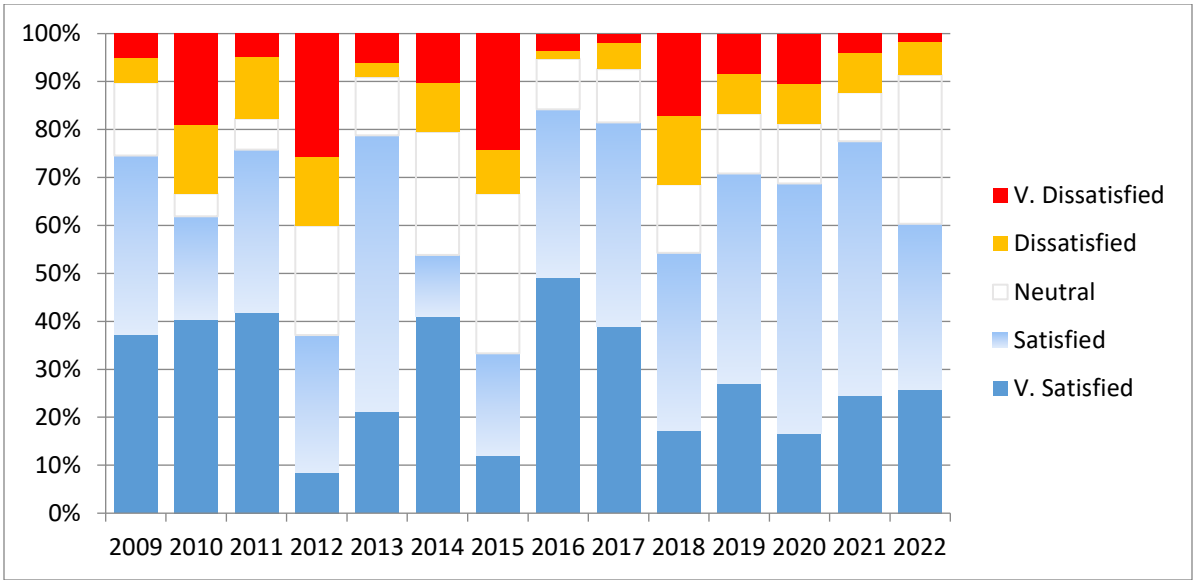


Figure 1. Hunter satisfaction and dissatisfaction in the Shamrock Elk Herd.

The opening date for the Type 6 licenses was pushed back three weeks to synchronize with the Type 1 and Type 4 seasons in 2020 following years of complaints from some hunters that the early cow hunt was disrupting the later hunts. Despite expectations, success for Type 1 hunters dropped to a record low 36% that year. The opening date for the Type 6 licenses was returned to October 1st in 2021, and success for the Type 1 hunters rebounded to a 30-year record high. No complaints about the October 1st opening date for the Type 6 season were received in 2021 nor 2022 and the same date is proposed in 2023.

Winter severity in 2022-23 was extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover, nearing 100% coverage. This elk herd encompasses most of the eastern half of the Red Desert pronghorn herd unit. Thirty-three collared adult doe pronghorn were alive in the Red Desert herd at the end of December 2022, with roughly a third of these within Elk Area 118. Seventeen (52%) of these 33 collared pronghorn does died during January through mid-April. Six telemetered mule deer from Green Mountain moved into the Shamrock elk herd unit to winter on rims south of Bairoil, and five (83%) of the six died, presumably from winter stresses. Domestic sheep on the Chain Lakes WHMA were shipped out in January because of the lack of feed, an inability to provide supplemental feed due to roads being filled with deep, crusted snow, and subsequent sheep deaths. While elk are better adapted to survive harsh winters than either pronghorn, mule deer or domestic sheep, at least four feral horses died in this herd unit during the winter, suggesting conditions may have been severe enough to affect elk survival as well. Elk within this herd were forced to move south and east to try to escape the crusted snow and were stopped by I-80 and US 287. Some elk succumbed to winter stress along I-80 near Wamsutter and it is not known if there are additional winter losses where other bands of elk were forced to remain.

2.) **Management Objective Review:** The unique Spring Trend Count objective for the Shamrock elk herd has only been in effect for three years, with only two aerial trend counts flown. Managers would prefer to keep that objective for another five-year cycle to see

whether it will provide a successful strategy for managing this small desert herd. To date, the simple act of conducting surveys and counting elk has appeased the major landowner critics opposed to other objectives proposed for this herd. Current elk numbers seem to satisfy public demand. While spring transect trend counts may not provide viable estimates of elk numbers in the herd, they may be useful indicators of population trend, which currently appears to be adequate for landowners and hunters.

3.) **Chronic Wasting Disease Monitoring & Management:** Because of its small size and low harvest rate, this herd is a Tier 3 surveillance herd. To date, no meaningful CWD prevalence data is available within this herd unit and no CWD management actions have occurred.

2022 - JCR Evaluation Form

SPECIES: Moose
HERD: MO620 - LANDER
HUNT AREAS: 2, 30, 39

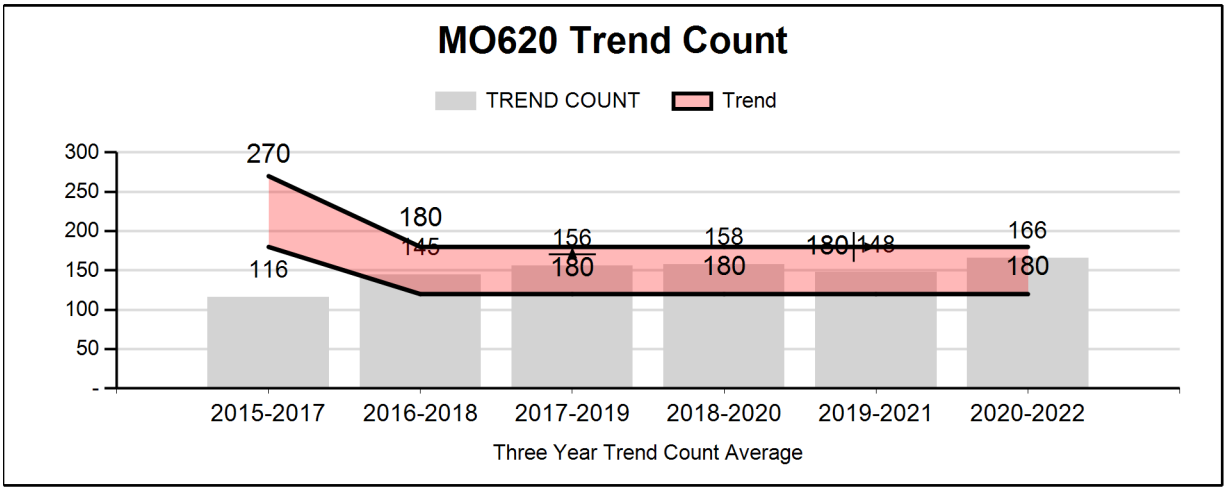
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: STAN HARTER

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	146	238	230
Harvest:	5	3	7
Hunters:	5	5	7
Hunter Success:	100%	60%	100 %
Active Licenses:	5	5	7
Active License Success	100%	60%	100 %
Recreation Days:	51	71	70
Days Per Animal:	10.2	23.7	10
Males per 100 Females:	68	79	
Juveniles per 100 Females	47	48	

Trend Based Objective (± 20%)	150 (120 - 180)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	59%
Number of years population has been + or - objective in recent trend:	2

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

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



2023 Hunting Seasons

Lander Moose (MO 320)

Hunt Area	License Type	Special Archery Dates		Regular Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
2, 30	1	Sept. 1	Sept. 30	Oct. 1	Nov. 20	7	Antlered moose (6 residents, 1 nonresident)
39				CLOSED			

2022 Hunter Satisfaction: No data available

2023 Management Summary

1.) Hunting Season Evaluation: Snow conditions were the heaviest in several years with Lander receiving 4 times the average amount of snow for January and similar conditions throughout both hunt areas, with most moose detected well away from forested habitats, with more moose found than usual in willow riparian habitats during classification/trend count flights conducted in January and February 2023.

As such, the 2022 mid-winter trend count of 238 moose was the highest number of moose observed in the Lander herd unit and was 108 moose more than average since 1994. The current 3-year trend count average is 166 moose, placing this population 11% above the objective of 150 moose, but within the ± 20% range. Harvest survey results from the 2022 season show only 60% bull harvest with 5 licenses valid in both hunt areas 2 and 30. However, 4 hunters submitted teeth for aging via cementum annuli, thus indicating an 80% success rate. The average age of 4 harvested bulls was 3.25 years (range 3-4) with an average antler spread of 34.4 inches (range 30” - 43.5”) from 4 measurements. Although the average age of harvested moose dropped below 4 in 2022, the average age was above 5 in 5 of the last 7 seasons, and antler size has also increased. At least one hunter reported harvesting the first bull seen, and dates of harvest seem to indicate a lack of selectivity by the successful hunters in 2022. The nonresident hunter did not harvest, in large part to being selective and not seeing large enough bulls before the season ended.

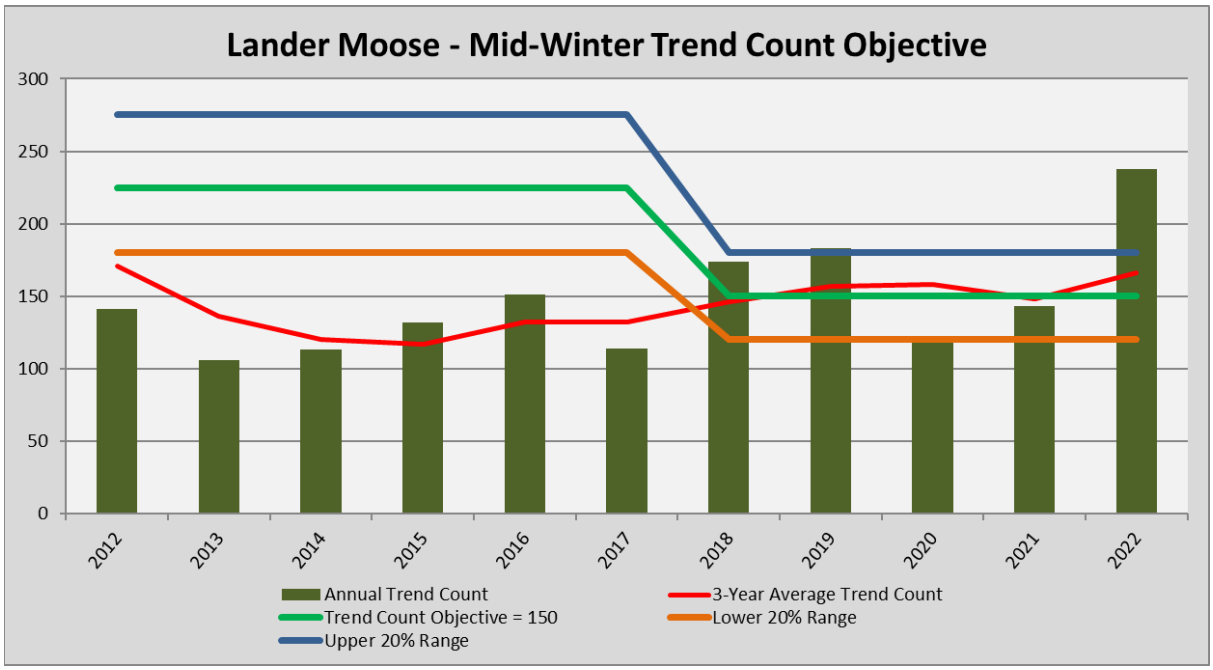
Hunter success was 100% in 4 of the last 6 seasons and 80% in the other 2 seasons. Hunting season structure has been conservative for the last 6 years due to concerns about population status. We observed a record high of 83 bulls and 238 total moose observed during classifications. Classification data revealed an above average calf/cow ratio of 48J/100F and the bull/cow ratio rose to 79M/100F.

After finding out that there were in fact only 3 bull moose harvested in area 2 and 30 in 2022, and average age was only 3.3 for those 3 bulls (median = 3), combined with concern about winter survival of moose calves and observed winter tick infestations, the originally recommended 10 Type 1 licenses (valid for antlered moose) was reduced to 7 (6 residents, 1 nonresident). This allows for a more conservative 2023 season, but with some increased opportunity. It is desired to see harvest statistics (success, age, antler size) improve.

Population Objective Review:

We reviewed the Lander Moose herd unit objective in February 2023. We changed the mid-winter trend count objective in 2018 to 150 based on a 3-year running average of the annual trend counts. The previous trend count objective of 225 moose was set in 2012 (a change from the previous population estimate objective of 450 moose that had been in place since 1994.

The following chart shows the trend count objectives (green line with upper and lower 20% ranges also indicated) and annual trend counts since 2012, with the 3-year average shown as a red line that indicates we've been almost exactly at the current objective since the latest change in 2018. As such, no change is recommended to the objective for Lander Moose.



2022 - JCR Evaluation Form

SPECIES: Moose

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

HERD: MO621 - DUBOIS

HUNT AREAS: 6

PREPARED BY: ZACH GREGORY

	2017 - 2021 Average	2022	2023 Proposed
Population:		N/A	N/A
Harvest:	5	5	5
Hunters:	5	5	5
Hunter Success:	100%	100%	100%
Active Licenses:	5	5	5
Active License Success:	100%	100%	100%
Recreation Days:	69	22	27
Days Per Animal:	13.8	4.4	5.4

Limited Opportunity Objective:

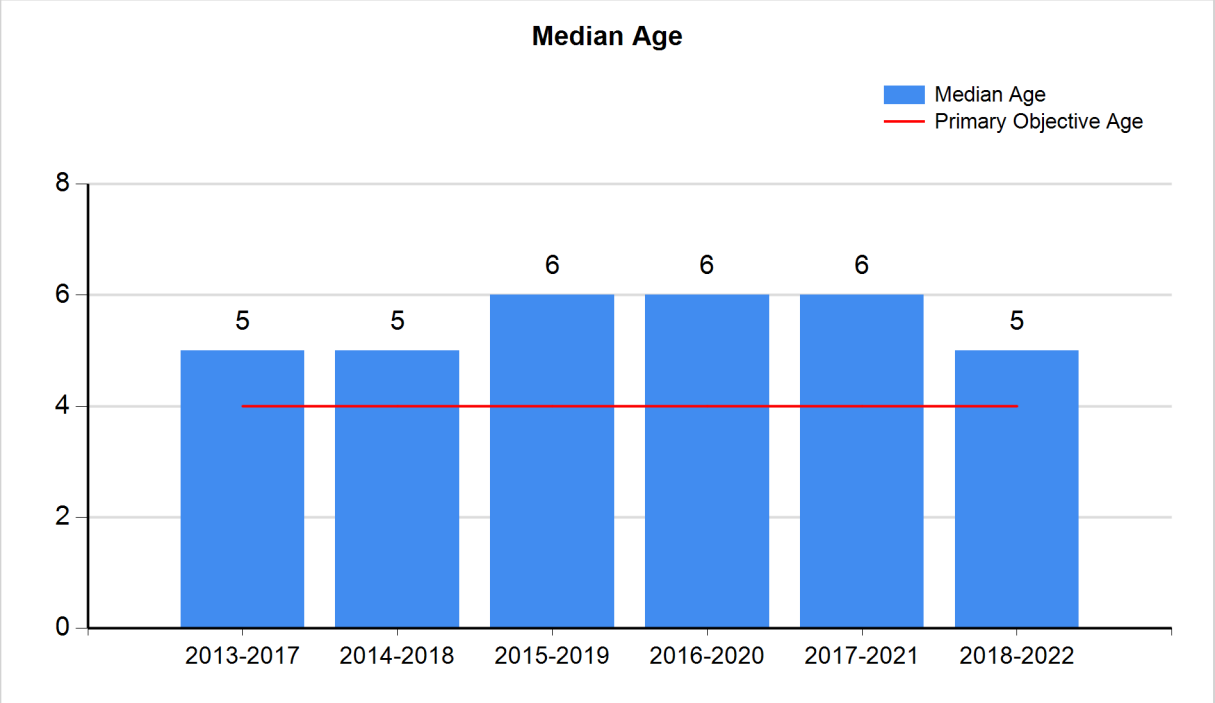
5-year running median age of harvested bulls is > 4 years

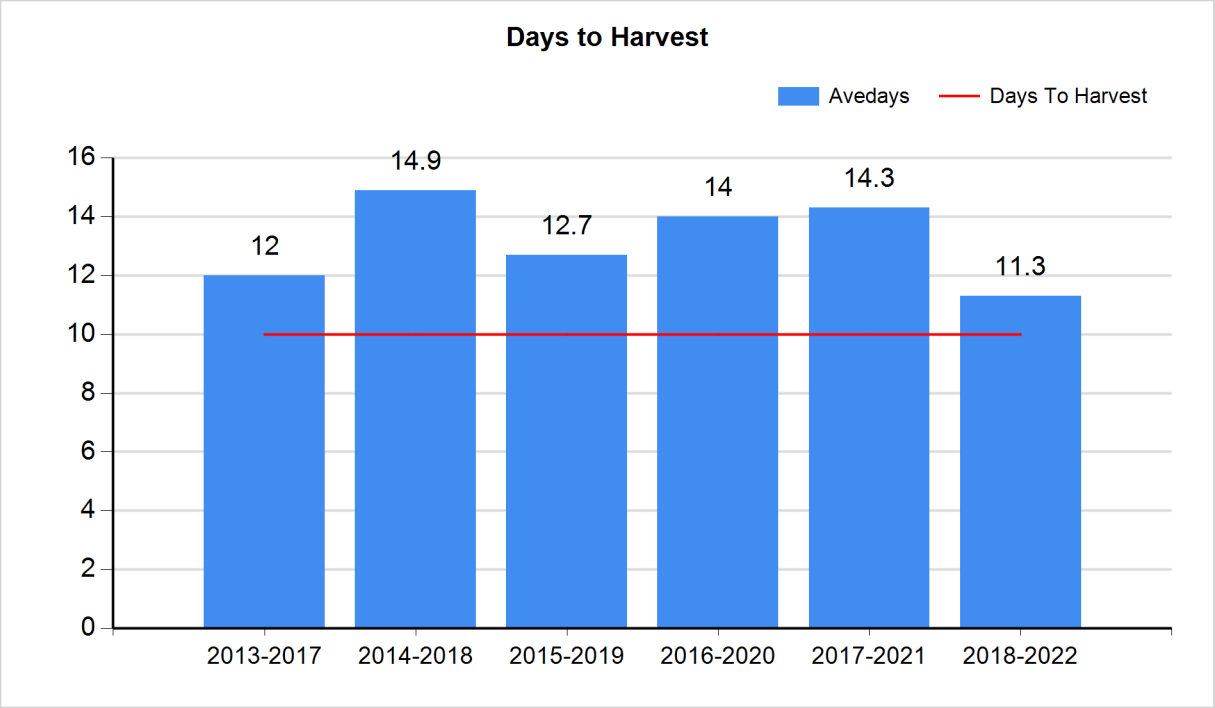
5-year running average of <= 10 days/animal to harvest

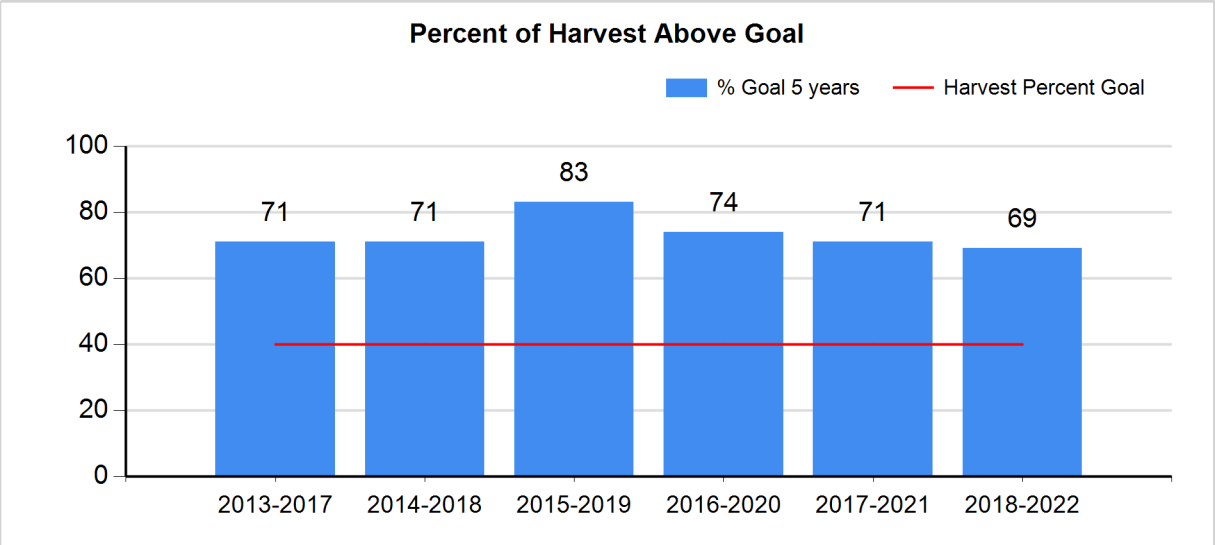
Secondary Objective:

5-year running average 40% of harvested bulls are > 5 years old

Management Strategy: Special




Days to Harvest
Avedays
Days To Harvest
16
14
12
10
8
6
4
2
0
12
14.9
12.7
14
14.3
11.3
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022


Percent of Harvest Above Goal
% Goal 5 years
Harvest Percent Goal
100
80
60
40
20
0
71
71
83
74
71
69
2013-2017
2014-2018
2015-2019
2016-2020
2017-2021
2018-2022

2023 Hunting Seasons
Dubois Moose (MO621)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
6	1	Sep. 1	Sep. 30	Oct. 1	Nov. 20	5	Antlered moose

2023 Management Summary

1.) Hunting Season Evaluation: The 2023 hunting season will remain unchanged from the previous 10 years for this hunt area/herd unit. The season will remain conservative with only 5 licenses issued. Harvest success has been 80-100% each of the last 10 years including 100% in 2022. This indicates hunters are able to find adult bull moose in the area. Unfortunately only two teeth were submitted in 2022, however based on those two teeth, the median age of harvested bulls was 4. Indications are the population continues to languish well below historical levels with low numbers of moose occupying traditional winter ranges throughout the area. While winter surveys did not reveal any increasing trend in the overall moose numbers, it does show that there is an adequate number of bulls available for harvest for the 2023 hunting season.

2022 - JCR Evaluation Form

SPECIES: Bighorn Sheep
PERIOD: 6/1/2022 - 5/31/2023

HERD: BS609 - WHISKEY MOUNTAIN

HUNT AREAS: 8-10
PREPARED BY: ZACH GREGORY

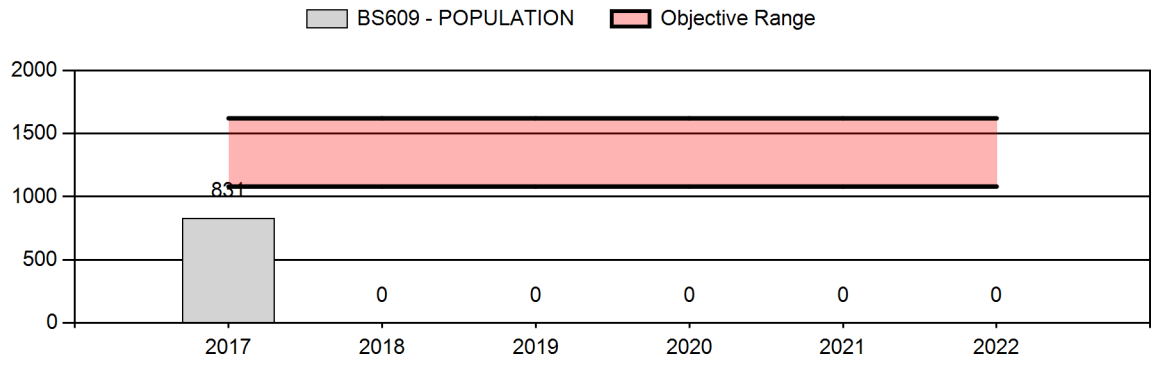
	2017 - 2021 Average	2022	2023 Proposed
Population:	166	N/A	N/A
Harvest:	10	7	12
Hunters:	18	12	14
Hunter Success:	56%	58%	86%
Active Licenses:	18	12	14
Active License Success:	56%	58%	86%
Recreation Days:	167	105	175
Days Per Animal:	16.7	15	14.6
Males per 100 Females	49	57	
Juveniles per 100 Females	21	36	

Population Objective (± 20%) :	1350 (1080 - 1620)
Management Strategy:	Special
Percent population is above (+) or below (-) objective:	N/A%
Number of years population has been + or - objective in recent trend:	12
Model Date:	None

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

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

Population Size - Postseason



2023 Hunting Seasons
Whiskey Mountain Bighorn Sheep (BS609)

Hunt Area	Type	Archery Dates		Season Dates		Quota	Limitations
		Opens	Closes	Opens	Closes		
8	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	4	Any ram (4 Resident)
9	1	Aug. 1	Aug. 14	Aug. 15	Oct. 15	5	Any ram (4 Resident; 1 Nonresident)
10	1	Aug. 1	Aug. 14	Aug. 15	Oct. 15	5	Any ram (5 Resident)

2023 Management Summary

1.) Hunting Season Evaluation: Since 2018 there has been insufficient demographic data collected in this herd to produce an accurate population estimate. Regardless, it appears the population continued to decline in 2022. Personnel classified a historically low number of sheep within the herd unit in 2022 with a sample of 224 due, in part, to weather conditions and the inability to fly area 8. Due to the low classification sample, age:sex ratios should be viewed with caution. That said, the lamb:ewe ratio was similar to 2021 being the highest it has been in the last 6 years at 36:100. Area 8 had a lamb:ewe ratio of 18:100, the lowest its been since 2017. Area 9 had a lamb:ewe ratio of 40:100 and area 10 had a ratio of 39:100, a significant increase from previous years. Hunter success in 2022 in areas 9 and 10 was 67% and 100%, respectively and well within the historic range for these areas. In 2022 the average age of rams harvested in 9 and 10 (11 and 8, respectively) indicate the availability of older rams in these hunt areas. Although the population has not improved, there still is ample hunting opportunity in areas 9 and 10. To best accommodate the new 90/10 split, an increase of one license to 5 in both areas 9 and 10 will allow one nonresident hunter every year in each hunt area in alternating years. The low harvest success of 20% in area 8 during 2022 was the lowest recorded in 20+ years, following 43% success during the previous 2 years (2020 and 2021). Prior to 2020 the 5-year average success was 55%. These recent poor success rates suggest and support field observations that overall ram numbers and hunter opportunity have declined. Four licenses (all going to resident hunters) will be issued in area 8 in 2023 in an effort to maintain harvest opportunity while allowing for increased growth and recruitment of younger rams.

In 2019, a lamb survival study was initiated in the eastern portion of this herd to determine cause specific mortality of lambs and track body condition of sheep in the population. In the spring of 2019, 24 adult ewes were outfitted with GPS collars and had VITs implanted to aid researchers in capturing neonate lambs. Graduate students from the University of Wyoming were able to capture 14 neonate lambs during spring, 2019. Between June, 2019 and January, 2020 all lambs subsequently died. The study continued in 2020/21 with 11 lambs captured and collared between May and June, 2020. Similar to 2019, all 11 collared lambs died by the end of February, 2021. Each year, roughly half of the collared lamb mortalities were attributed to pneumonia. In 2022, the study continued in the Red Creek sub herd, but unfortunately only 3 lambs were collared, all of which died. Given sheep availability during captures, ruggedness of the terrain, and access to

lambing areas, it was decided to stop collaring lambs in areas 9 and 10. During March of 2021, 14 ewes were captured, collared, and VITs implanted in 11 pregnant ewes in Area 8. This capture effort was the first time sheep had ever been captured and handled in the area. This study has continued since 2021 with approximately 20 collared sheep as of date with a scheduled completion of field work and captures in March, 2024. The same study objectives to collect body condition, pathogen levels, and lamb survival remained the same as conducted previously in other portions of this herd unit (Areas 9 and 10) and some surrounding herds. Of particular interest so far from these Area 8 sheep is that body condition (fat levels) are much better than sheep sampled from the east side of this herd unit, moderate lamb survival, and seasonal range use showing relatively small and consistent distribution among years.

In collaboration with the Eastern Shoshone & Northern Arapaho Tribal Fish and Game, the WGFD and University of Wyoming, implemented "test and remove" of bighorn sheep infected with *Mycoplasma ovipneumoniae* (MOVI) in the Red Creek portion of the herd unit. Bighorn sheep that test positive for MOVI twice within a 14 month period with at least 2 months in between testing are considered "chronic carriers" and are removed. To date, 11 ewes have met the definition as a chronic carrier and all 11 of those have been removed. Lambing season in 2022 was the first glimpse at reproduction/survival after removing 7 of the chronic carriers. During 2022-2023 winter classifications, personnel counted 15 ewes, 7 lambs, 7 mature rams, and 1 yearling ram. This number of lambs (ratio of 47:100) has not been observed in this sub-herd in the past 6 years. In fact, this is more observed lambs than has been seen in the last 6 years combined. We are still in the beginning stages of the project, and are not making inferences about this increased number of lambs, but this is an encouraging step forward.

2. Management Objective Review: The Whiskey Mountain BHS herd population objective is 1,350 sheep. While the population has been in decline for quite some time, managers agree the current objective is appropriate and an acceptable management goal, especially given the presumption bighorn sheep numbers will rebound with expanded "test and remove" in the herd. Through recent research, disease has been identified as the main factor in extremely low recruitment rates. In response, managers have elected to initiate a test and remove program to increase recruitment in this herd and reverse the downward trend in the population. Also, forage utilization on Whiskey Mountain BHS winter range indicates ample available habitat to support the current population objective. Finally, while we have not been able to generate a reliable population estimate, a new abundance estimate technique using trail cameras will be utilized in 2023-2024 to perhaps improve our ability to estimate this population's size.

2022 - JCR Evaluation Form

SPECIES: Bighorn Sheep
HERD: BS615 - FERRIS-SEMINOE
HUNT AREAS: 17, 26

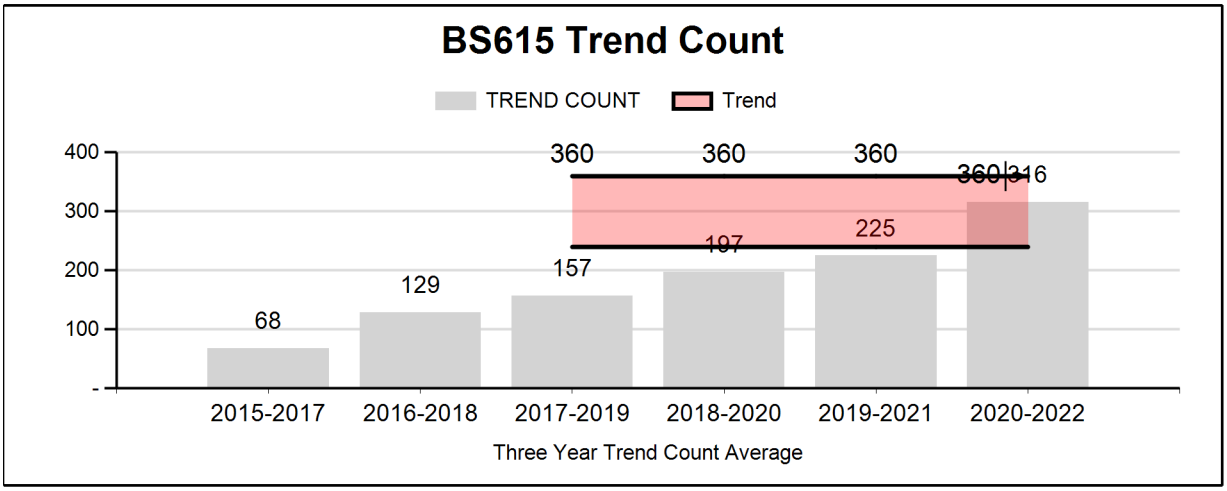
PERIOD: 6/1/2022 - 5/31/2023
PREPARED BY: GREG HIATT

	2017 - 2021 Average	2022	2023 Proposed
Trend Count:	202	409	300
Harvest:	5	11	32
Hunters:	5	11	32
Hunter Success:	100%	100%	100%
Active Licenses:	5	11	32
Active License Success	100%	100%	100%
Recreation Days:	34	74	32
Days Per Animal:	6.8	6.7	1
Males per 100 Females:	61	0	
Juveniles per 100 Females	48	0	

Trend Based Objective (± 20%)	300 (240 - 360)
Management Strategy:	Special
Percent population is above (+) or (-) objective:	36%
Number of years population has been + or - objective in recent trend:	14

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

	JCR Year	Proposed
Females ≥ 1 year old:	0%	10%
Males ≥ 1 year old:	12%	10%
Juveniles (< 1 year old):	0%	0%



2023 Hunting Seasons
Ferris-Seminoe Bighorn Sheep (BS615)

Hunt Area	Type	Archery Dates Opens	Archery Dates Closes	Season Dates Opens	Season Dates Closes	Quota	Limitations
17	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	~~10~~	Any ram (9 residents, 1 nonresident)
17	6	Aug. 15	Aug. 31	Sep. 15	Oct. 31	12	Ewe or lamb (11 residents, 1 nonresident)
17	7	Aug. 15	Aug. 31	Sep. 15	Oct. 31	5	Ewe or lamb (4 residents, 1 nonresident) valid within the Sand Creek drainage
26	1	Aug. 15	Aug. 31	Sep. 1	Oct. 31	2	Any ram (2 residents)
26	6	Aug. 15	Aug. 31	Sep. 15	Oct. 31	3	Ewe or lamb (3 residents)

2023 Management Summary

1.) **Hunting Season Evaluation:** A winter trend count flown in January 2023 had ideal conditions of fair winds, good light and near-continuous deep snow cover. Observers found 409 bighorn sheep, providing a 3-year average of 316 sheep and reaching the objective of 300 (see Figure 1. and Appendix A.). As is typical, the majority (62%) of these animals were in the Seminoe Mountains in Area 17, with another 31% in the Ferris Mountains. Less than 8% were found in the Bennett Mountains. Lamb production improved from 47:100 in 2021 to 54:100, and was within the normal range for this herd. Lamb production was again higher in Area 26 (86:100) than in Area 17 (49:100).

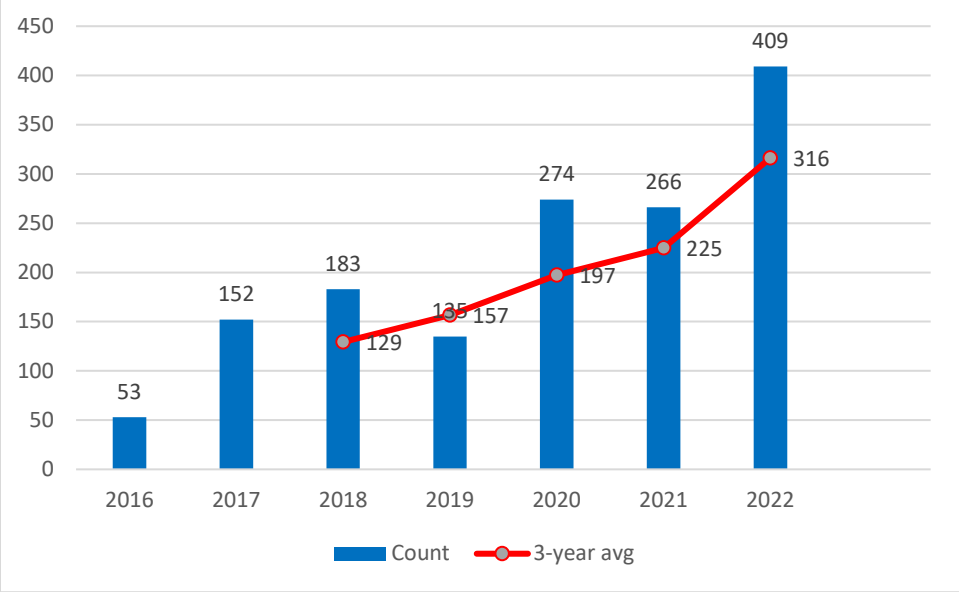


Figure 1. Winter trend counts and 3-year averages for the Ferris-Seminoe Bighorn Sheep Herd.

Ram:ewe ratios ranged from a low 40:100 in the Ferris Mountains to 257:100 in the Bennett Mountains, with the combined herd ratio at 72:100, less than the 87:100 observed in 2021. A total of 130 rams were found during the trend count, compared to 96 rams in 2021. As in 2021, two-thirds of the rams were found in the Seminoe portion of Area 17. Average age of harvested rams declined from 7.4 years in 2019 to 7.0 years in 2020 and 6.7 years in 2021, but remained essentially stable in 2022 at 6.6 years (Figure 2.). While there is a good supply of rams, the majority appear to be younger, products of the exceptional lamb production seen within this herd in most years.

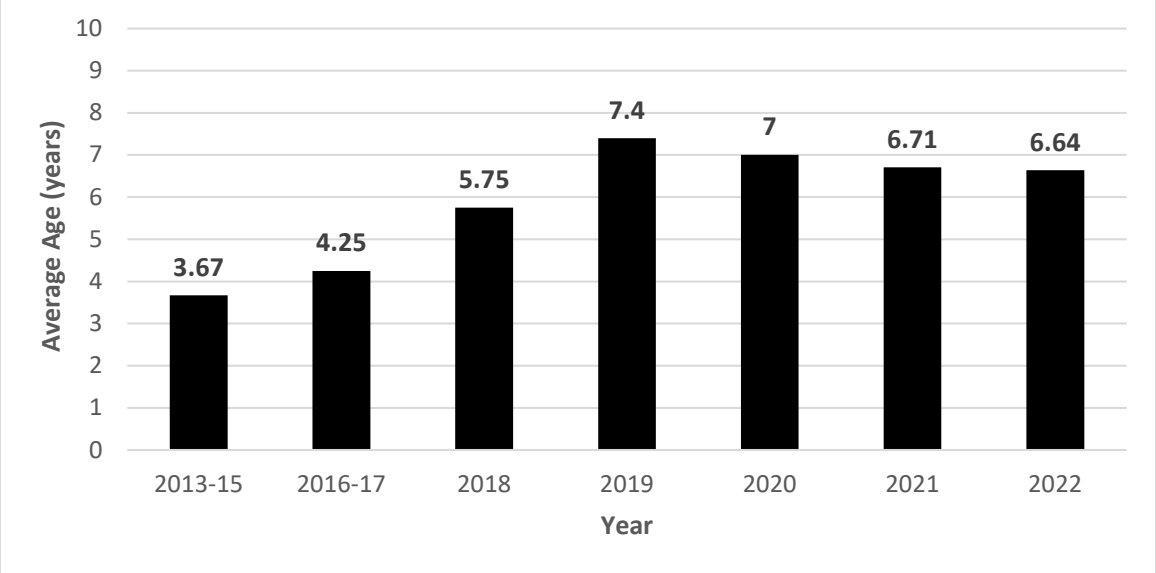


Figure 2. Average age of rams harvested from the Ferris-Seminoe Bighorn Sheep Herd.

License quotas were separated between the two hunt areas for the first time in 2021. Trend count data show there are enough mature rams for another increase in the quota for Area 17. The combined total for the herd would be 12 licenses for rams, an increase of two over the 2022 quota. With the herd reaching objective size and lamb production and survival remaining high, harvest of ewes has become necessary. First, the healthy lamb production and survival seen in this herd is largely due to major habitat treatments in the past decade. To maintain the high productivity of this herd, bighorn sheep numbers need to be managed to maintain the range health of those habitats. And secondly, the greatest threat to this herd is the possibility of disease transfer from domestic animals outside the herd unit. To address this threat, it is necessary to keep bighorn sheep numbers at a healthy density to minimize the likelihood of bighorn sheep trying to disperse or wander to new ranges which may harbor dangerous pathogens.

A spreadsheet model of this herd suggests an annual harvest of about 20 ewes would be adequate to stabilize herd growth. To prevent overharvest of the small proportion of the population in Area 26, only 3 Type 6 ewe/lamb licenses are issued in that area. Twelve licenses are available as Type 6 licenses valid for all of Area 17. Because of the easy access to the Seminoe Mountains, it is expected most of these will be filled near the Seminoe Road

at the eastern edge of the area. To ensure that some ewe harvest comes off sheep ranges on the eastern end of the Ferris Mountains, 5 Type 7 ewe/lamb licenses are also issued for Area 17, valid only in the Sand Creek drainage.

Winter severity in 2022-23 was extreme, with below normal temperatures, high winds, and record snowfall producing deep crusted snow cover over much of the herd unit. High winter mortality was documented in pronghorn and mule deer herds west and south of this herd unit, but none of the bighorn sheep with active collars for the Bennett Mountain monitoring study died from winter stress. Conditions along the Miracle Mile were more moderate than on the south or west sides of the Seminoe Mountains, or the Ferris Mountains. Pick-up skull recoveries following other hard winters suggest bighorn sheep on the south slopes of the Seminoe Mountains have had poorer survival than on other winter ranges in this herd, and it appears that pattern may have been repeated again this winter. At least one ewe, with a non-functioning radio collar, was found dead by shed hunters south of the Red Hills. Spring classifications found noticeably fewer lambs remaining in the southern portion of the Seminoe Mountains (24:100) than on the north (60:100) or in the Bennett Mountains (44:100). Overall, mid-April classifications found 43 lambs:100 ewes where 54:100 were seen in January, indicating lamb mortality was not excessive. This April survey did not sample any bighorn sheep from the Ferris Mountains, so it is not known how lamb survival fared in that segment of the herd. Even if winter losses were above normal this year, there should be enough bighorn sheep to support the expected ewe harvest. While a combination of ewe harvest and above normal winter mortality could potentially reduce this herd below objective size, the high lamb production and survival seen in this herd should produce a prompt recovery.

Appendix A
Winter Trend Count Report

Bio Year:	2022	**Herd Code:**	BS615
Species:	Bighorn sheep	**Herd Unit:**	Ferris-Seminoe
Aircraft:	R66 helicopter	**Hunt Areas:**	17, 26
Pilot:	Dave Stinson, 307 Aviation	**Dates:**	18-19 Jan 2023
Observers:	Linnea Sailor	**Flight Time:**	**??** hrs
Conditions:	excellent snow cover, good light, light winds		

Survey Design:

An aerial trend count of this herd was flown on 18-19 January 2023. As in 2021, the bighorn sheep trend count/classification survey was flown simultaneous with the Ferris elk trend count. Again, coverage of this year's bighorn sheep trend count was expanded to include habitats likely to be occupied by elk and was more extensive than in most previous years. Because of the combining of surveys, exact hours of flight for this bighorn sheep survey are not quantifiable.

As in previous trend counts, all known or suspected bighorn sheep wintering areas on the Ferris, Seminoe and Bennett Mountains were flown, guided by past flights and telemetry locations. Efforts were made to classify all bighorn sheep found. Digital photography was used to classify larger groups.

Count Results:

Hunt Area	Count Block	Classification				Total	Herd Ratios (/100 ewes)	
		Ewes	Lambs	Rams	Uncl		Lamb	Ram
17	Ferris	63	37	25	0	125	58.7	39.7
17	Seminoe	111	55	87	0	253	49.5	78.4
26	All	7	6	18	0	31	85.7	257.1
Total		181	98	130	0	409	54.1	71.8

Conditions for this year's trend count were exceptional, with fresh, deep snow cover, good light and light winds for all days of flying. A total of 409 bighorn sheep were counted, significantly more than the 266 counted in BY2021 and the 274 found in BY2020. As is typical, the majority (92%) of the animals were in Area 17, with two-thirds of these in the Seminoe Mountains and the remainder in the Ferris Mountains. All of the increase in the trend count this year was in the Seminoe Mountains, which more than doubled in number, with counts for the Ferris and Bennett portions of the herd essentially unchanged from 2021. Locations and relative group size of bighorn sheep found during this survey are shown in Figure 1.

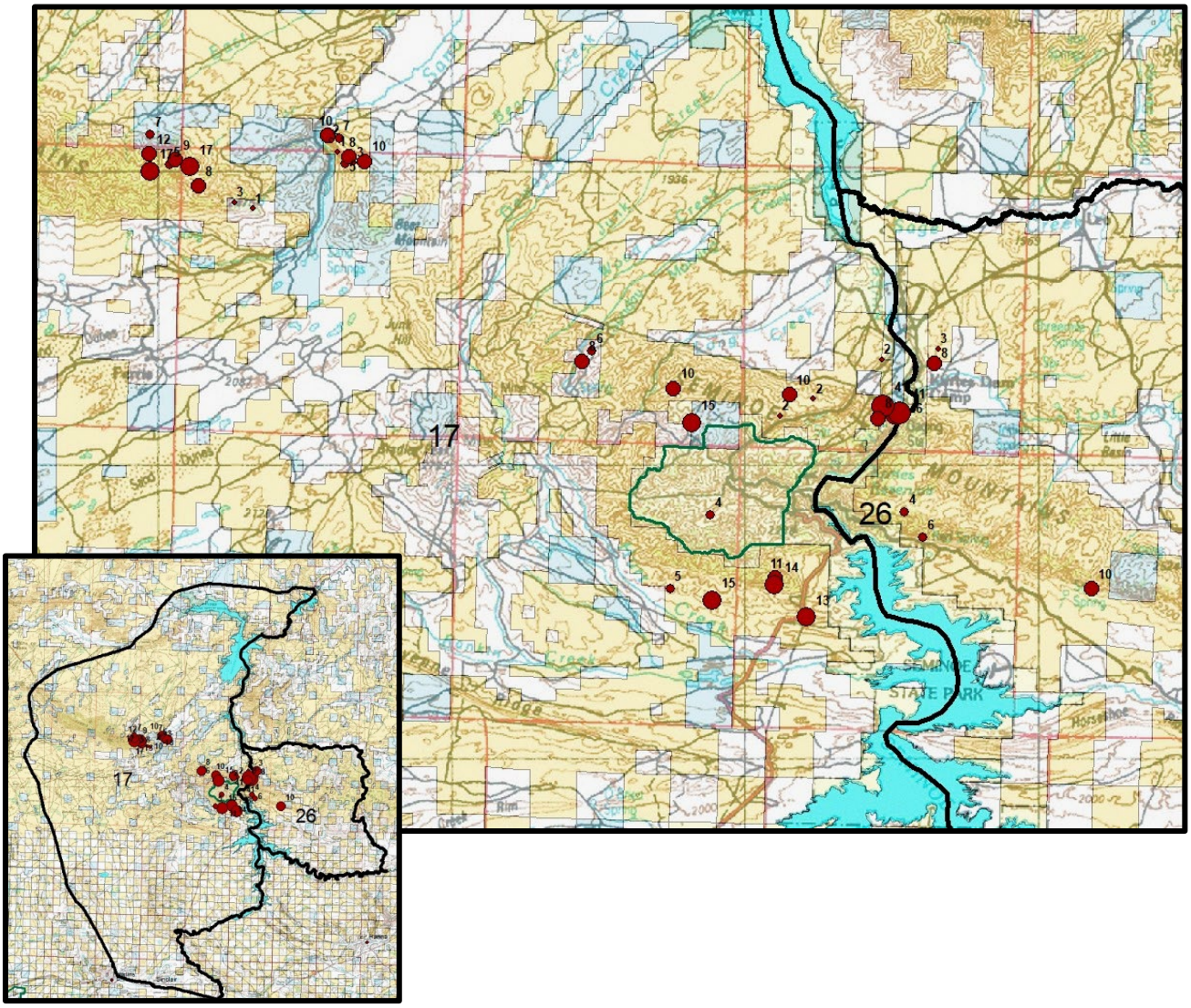


Figure 1. Locations and groups sizes of bighorn sheep found in the Ferris-Seminoe Herd during the 2022 winter trend count on 18-19 January 2023.